Annual Report 2017-18

INSTITUTE OF ADVANCED STUDY IN SCIENCE AND TECHNOLOGY

(An Autonomous Institute under Department of Science and Technology, Govt. of India)

"Science is a way of thinking much more than it is a body of knowledge."

- **Carl Sagan,** an American astronomer, cosmologist, astrophysicist and astrobiologist, author, science popularizer, and science communicator in astronomy and other natural sciences.

"Discovery consists of seeing what everybody has seen and thinking what nobody else has thought."

- **Albert Szent-Györgyi,** a Hungarian biochemist who won the Nobel Prize in Physiology or Medicine in 1937

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Foreword

The IASST's Annual Report 2017-18 covers research and academic outputs in terms of infrastructure, technology, scientific manpower generation and several outreach ventures of the institute during the year 2017-18. This was the final year of my tenure as Director to serve IASST with the active support of the faculty and other staff. It is a sincere belief that the vision of original founders of IASST has now come to some level of fruition, although in the same breadth, we feel that the achievement is not proportionate to the long journey of 39 years since its establishment in 1979. This has been mainly because neither its founder, the Assam Science Society, had resources to support the new borne institute nor the Government of Assam supported it adequately for the growth of infrastructure and manpower so that it could flourish as a scientific institute in the region. It was only from the time of its taking over in 2009 by DST, Govt. of India that the true research spirit came alive and infrastructure and other research ambience began taking shape. This is clear from a glance at few parameters with actual values for the periods 2009-12, 2013-16 and 2017-18 presented below.

Research laboratory and civil infrastructures and residential accommodation facilities of IASST got augmented substantially during last five years and several construction projects namely Essential Services Staff Quarter, Engineering Unit, Boundary wall of BCH and Director's Residential Quarter were completed and taken over during the year 2017-18. Eighty percent of the construction of Central

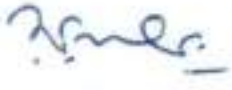
Parameters	2009-12	2013-16	2017-18	Parameters	2009-12	2013-16	2017-18
Total land area (sqft)	864000	864000	864000	Core Faculty	15	16	14
On use land (sqft)	576000	864000	864000	NPF*	1	8	4
Building area (sqft)	8464	15331	15331	NPDF**	0	8	8
Road network (sqft)	19368	64560	64560	RA	3	20	13
Green area (%)	89.42	79.58	79.58	JRF/SRF	63	68	22
Core fund (Cr.)	40.84	82.34	28.86	Publications	155	343	58
EMP fund (Cr.)	9.86	21.70	4.85	IF (total/per paper)	196/1.27	584/1.70	124/1.94
Internal revenue (Cr.)	0.60	3.25	1.06	Patent filed	5	11	5
				PhD awarded	27	36	24

*NPF: National Program Faculty; **NPDF: National Post-Doctoral Fellow

Instrumentation Facility (CIF) and GLP compliant Animal House Facility was completed during the same period and these buildings will be taken over soon. Several sophisticated research equipment including TEM, GC-MS-MS, Time Resolved Fluorescence Spectrophotometer, Raman Spectrometer and CHNS Analyser were added to the pool of equipment in CIF. These facilities have also been a factor in IASST becoming an excellent research centre to attract talented research scholars for doing quality science. In fact, in the last five years, there had been a sharp increase in the number of JRF/RA/PDF/NPF who joined IASST with scholarship/fellowship under different national programmes. Eight (8) NPDFs and thirteen (13) RAs joined IASST and raised these numbers to 12 and 20 respectively during 2017-18 and currently (Sept.,2018), one hundred twenty eight (128) Ph. D. scholars are on roll and pursuing research in the institute. Twenty four (24) research scholars received Ph. D. degree during 2017-18 which is the highest number of Ph. D produced by the institute in a single year since the introduction of this academic programme. Some of them already had placements as PDF in laboratories inside and outside the country. To provide guidance and leadership to the large number of young researchers, the process of recruitment of eight (8) scientist positions started during 2017-18 and more scientists will be in place soon. The year also saw several new initiatives, which were outcome of the efforts for reorientation of institute's activity in the light of deliberations in the review meetings of the autonomous bodies initiated by DST during early part of 2017-18. It is realized that institute's research strategy should be a balanced mix of basic science and technology generation so that it can create start-up opportunities. IASST started an Incubation Centre named "IASST Societal Venture and Entrepreneurship Consortium" (ISVEC) during the year. Two groups of incubatees of IASST were hosted in ISVEC for testing proof of concept of two of IASST's technologies. The institute has been taking up various other related activities under ISVEC for the benefit of prospective entrepreneurs and also putting best possible efforts to generate internal revenues. During the year Rs. 1059 lakh (3.2% of core budget) was generated against Rs. 35.1 lakhs during 2016-17 (1.2% of core budget).

Institute's activity under its scientific societal responsibility has been intensified during the year. In the two adopted ST community villages, farmers adopted rural technologies on IASST's initiative for production of mushroom, eri silk and vermicompost. One health camp was organized and the International Yoga Day was also celebrated in the two adopted villages. Under the Laboratory Exposure Visit Programme, more than 2500 school and college students of North East (NE) India were hosted in the institute. During the year, the institute also observed and celebrated different national programmes including Swachhta Pakhwada, National Science Day, Hindi Diwas, Vigilance Day, International Yoga Day, Commemoration of 75th anniversary of the Quit India Movement, Independence Day and Republic Day in right earnest with a devotional spirit towards collective consciousness, action and dedication of IASST in the service of the nation.

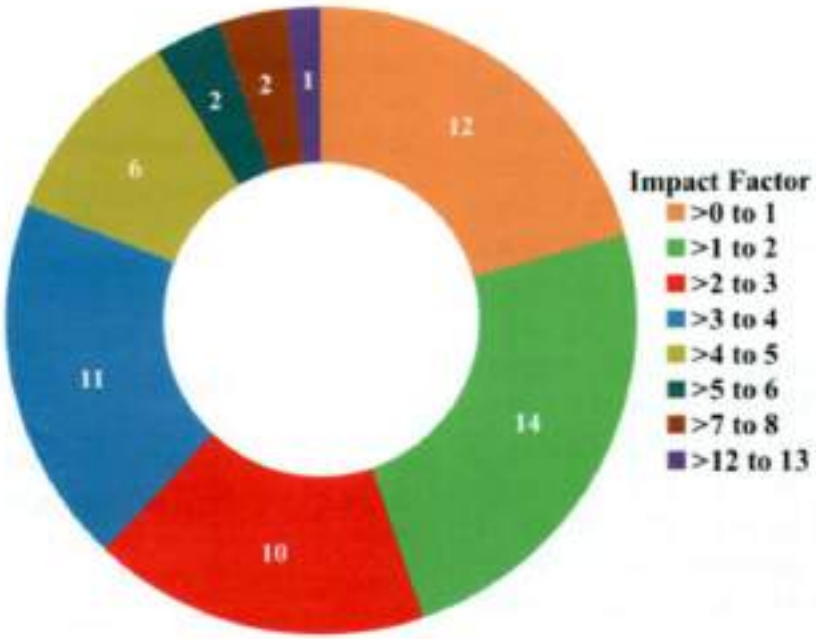
Overall, IASST witnessed satisfying growth momentum during the year. I would like to put on record the valuable suggestions and guidance received from Governing Council, Scientific Advisory Council, Building Works and Finance Committee in execution of the different activities. The members of Annual Report preparation committee did an excellent job in bringing the report to the final shape within the set time limit. Finally, I take this opportunity to complement the entire IASST family for their continuous efforts towards growth of IASST. It is a pleasure to present the activities and achievements of this public funded national R&D institute to the esteemed readers.



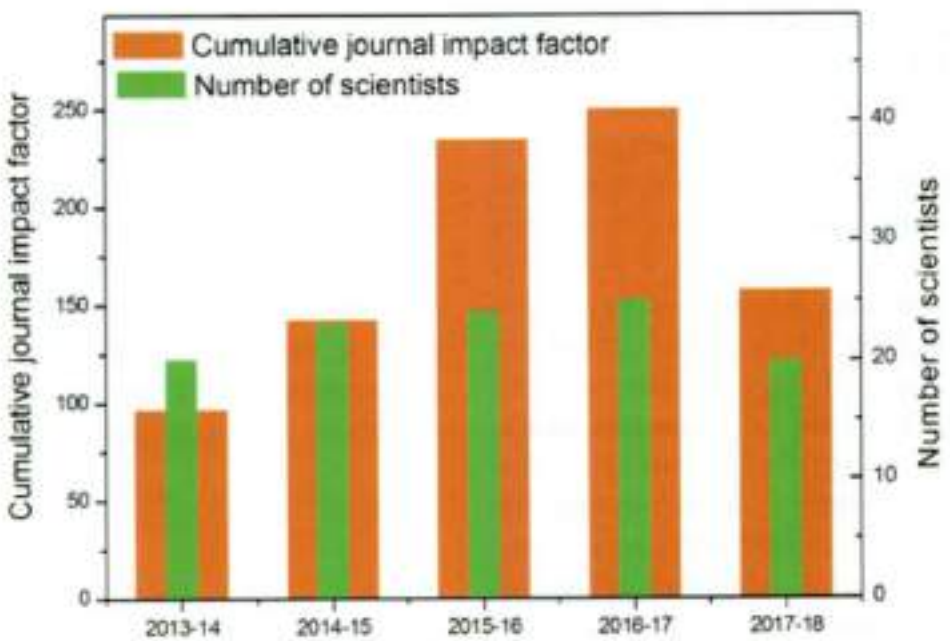
(N. C. Talukdar)
Director

Research output at a Glance

Distribution of journal papers published during 2017-18 over various impact factor ranges



Impact factor trend over last five years



Highlights : 2017-18

Basic research

- Interesting observation made on transformation of vertically aligned carbon nanotubes into intramolecular junctions prepared by atmospheric pressure PECVD.
- Protein monolayer shows reversible hysteresis when individual protein molecule contains effective surface charge but irreversible hysteresis exists for neutral protein near the isoelectric point.
- Structural and morphological modifications of polymeric thin films take place even in the presence of nonsolvent.
- Simulations based on Density Functional Theory (DFT) were carried out to understand the elemental process of vacancy-interstitial interaction in fcc-bcc semicoherent interfaces.
- In stochastic modelling, the notion of various type of vacation policies have been utilized to construct different types of queuing models.
- Detection of omega 3 and omega 6 fatty acid in scented rice varieties of North Eastern Region (NER) of India.
- Previously untested three medicinal herbs endemic to NE region were found to keep fasting blood glucose level and body weight of high fat and high fructose fed obese Albino rat in check upto 12 weeks.
- An Elsevier survey based analysis on DST Institute Research Overview (2012-16) ranked IASST 3rd amongst the 14 DST institutes based on field weighted citation impact.

Innovation research

- A herbal nutraceutical candy has been formulated using endemic Garcinia species of NE region. This candy has several health benefits particularly in metabolic diseases.
- A dietary phytochemical has been developed as a potential drug candidate to cure breast cancer subtypes.
- Developed dual sensing of vitamin B12 by optical and electrical impedimetric techniques using Silk Fibroin as a platform.
- A method for detection of Cholesterol developed using Aggregation-Induced Emission Enhancement (AIEE).
- A nanocomposite coating material was developed for fabricating of conducting fiber.
- Using IASST's patented technology for protection of bell metal against corrosion and for lustre enhancement, production of plasma coated bell metal objects including plaque of Kamakhya is taken up in the incubation centre (ISVEC) of IASST.

Scientific manpower generation & training

1. Ph.D. awarded - 24
2. M. Sc. projects - 30
3. B.Sc. projects - 02
4. Summer training - 15

Scientific manpower placement

1. Postdoctoral placements at IASST from other institutes – 15
2. Postdoctoral placements from IASST at other
   - International institutions - 02
   - National institutions - 07
3. Project fellows from IASST obtained PhD positions at
   - International institutions – 02
   - National institutions – 02

Academic & research promotion activity

- 03 MoUs have been signed with Research centres/Universities/Companies from Assam

Infrastructure development:

- New mammalian cell culture facility has been established.
- Major equipments added to CIF : TEM, GC-MS-MS, Raman spectrometer, Time Resolved Fluorescence spectrometer, CHNS analyzer, HPLC systems (2nos).

Basic and Applied Plasma Physics

The Basic and Applied Plasma program at IASST is focussed on two broad areas 1) Basic Plasma Science which mainly includes study of fundamental processes in low temperature laboratory plasma and 2) Applied Plasma Science. The fundamental research mainly encompasses nonlinear processes such as sheath characteristics in ionospheric condition laboratory plasma produced using a magnetic filter, ion acoustic soliton, shock and Peregrine soliton (Rogue wave) in multicomponent plasma, and dust acoustic solitons, shock, Mach cone and vortex formation in dusty plasma. On the other hand, the applied plasma research covers the thrust areas of 1) Development of Proton Exchange Membrane Fuel Cell (PEMFC) by plasma polymerization, 2) Synthesis of nanomaterial in liquid plasma discharge and 3) Cold atmospheric Pressure Plasma for polymer surface modification and waste water purification.

A. Basic Plasma Science

A.1. Studies on sheath characteristics in low temperature plasma relevant to Lower Earth Orbit (LEO) condition:

Low density (n_e ~10^6 - 10^7 cm^{-3}) and low temperature (T_e ~ 0.25 - 0.40 eV) plasma has been produced by diffusion from a hot cathode discharge plasma source through a magnetic filter. The plasma parameters are very close to the ionospheric Lower Earth Orbit plasma condition. Sheaths are non-neutral high electric field region formed at the plasma boundary. Sheath studies in low temperature and low density plasma has been a topic of interest for understanding spacecraft interaction with ionospheric plasma and other important plasma processes in application devices, e.g., negative ion sources for neutral beam injection in fusion devices, payload design for satellite, space propulsion thrusters, etc. A schematic of the plasma boundary sheath is shown in Fig. 1.1. Although ion sheaths have been studied extensively, a few experiments on electron sheaths have been reported. In normal laboratory plasmas, ion sheaths are common at floating or negatively biased electrodes. The explicit formulation and clear interpretation of the sheath formation in plasmas are due to Bohm who introduced the idea of ion acceleration (in a presheath region) to a sufficient velocity for the ion density to exceed the electron density everywhere within the sheath. Introduction of negative ions to positive ion - electron plasma modifies the quasineutrality of the plasma by reducing the electron density. Low density and low temperature positive ion - negative ion dominated plasma fulfils the criteria of lower earth orbit (LEO) plasma.

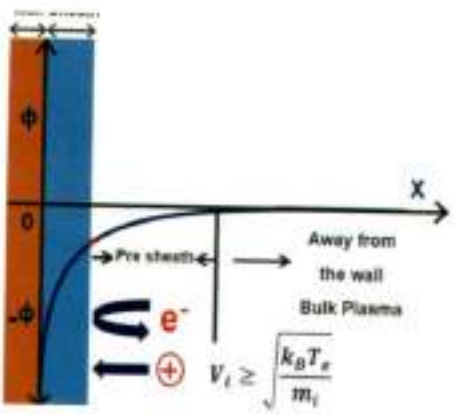


Fig. 1.1. Formation of plasma sheath. Ions having velocity greater than the ion acoustic speed can only enter the sheath region formed by the negatively biased wall whereas the electrons are repelled.

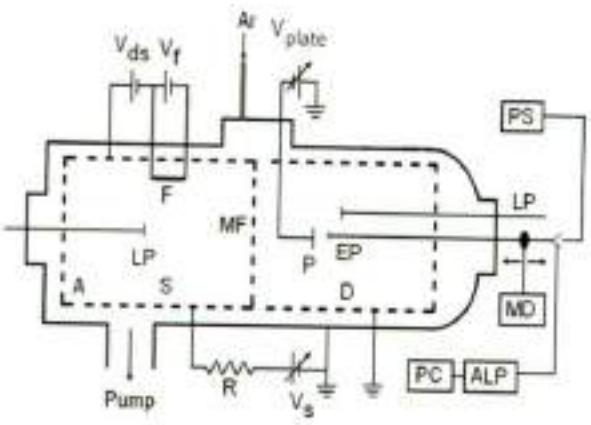


Fig. 1.2. Schematic diagram of the experimental setup

The experiment is performed in a stainless steel chamber of 55 cm diameter and 110 cm length. The schematic diagram of the device is shown in Fig. 1.2. The magnetic filter is placed in the middle of the source (S) and diffused (D) sections. Experiments are performed in the diffused section. Typical plasma parameters such as electron density (n_e) and electron temperature (T_e) are measured in the source (T_e ~ 2 eV, n_e ~ 10^8 cm^{-3}) as well as the diffused section (T_e ~ 0.2 eV, n_e ~ 10^6 cm^{-3}) using the planar Langmuir probe. Ion and electron sheaths are produced in front of a stainless steel plate 2 cm in diameter biased to positive and negative voltages and placed in the middle of the diffused section. An emissive probe made up of a tungsten filament, 0.05 mm in diameter and 3 mm in length, is used to measure the plasma potential using the inflection point method in the limit of zero emission.

LEO plasma comparison: The Low Earth Orbit (LEO) plasma environment consists of electron density (n_e ~ 10^4 – 10^6 cm^{-3} and electron temperature(T_e ~ 0.02 – 0.2 eV), which is quite close to our experimental parameters in diffused section. Ion sheath characteristics in low density low temperature plasma i.e., in the diffused section are measured in front of the 2 cm diameter stainless steel plate biased negatively with respect to the plasma potential. In order to form an electron sheath in front of the plate, it is biased positively with respect to the plasma potential. Ion sheath potential profiles in front of the plate in the diffused plasma is shown in Fig. 1.3(a) for different plate bias potentials (-20 V and -40 V). In the bulk plasma, a constant plasma potential (-2.5 V) is maintained, and a sharp fall in potential occurs starting from the sheath edge. The ion sheath thickness is measured to be ~1 cm (~5 λ_d) for -20 V which slightly increases to 1.3 cm for -40 V. The sheaths expand for higher plate bias voltages. Electron sheath profiles drawn for positive bias voltages (+20 V and +40 V) are shown in Fig. 1.3(b). The sheath thicknesses are also obtained from the measured ion density using the well known Child – Langmuir Law. The arrowmarks (Fig. 1.3) show the location of the sheath edges

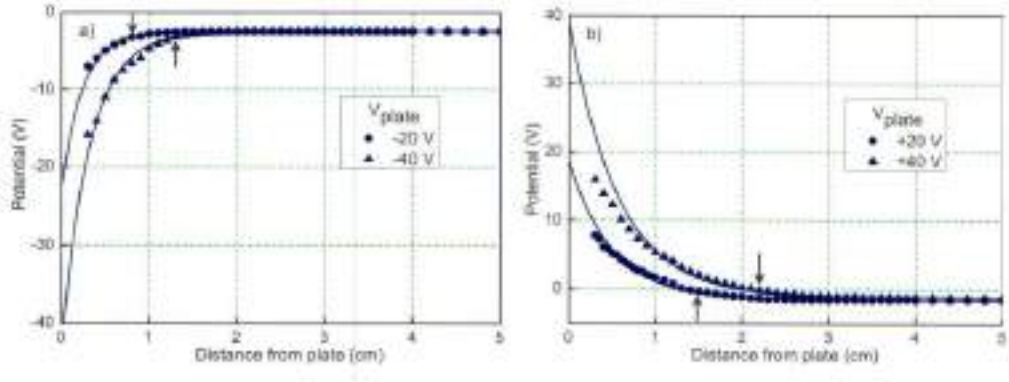


Fig. 1.3. Axial profiles of the measured plasma potential (a) ion sheath (b) electron sheath. The circles represent the sheath structures for V_{plate} = ∓20 V and triangles represent structures for V_{plate} = ∓40 V. The plate position is at 0 cm.

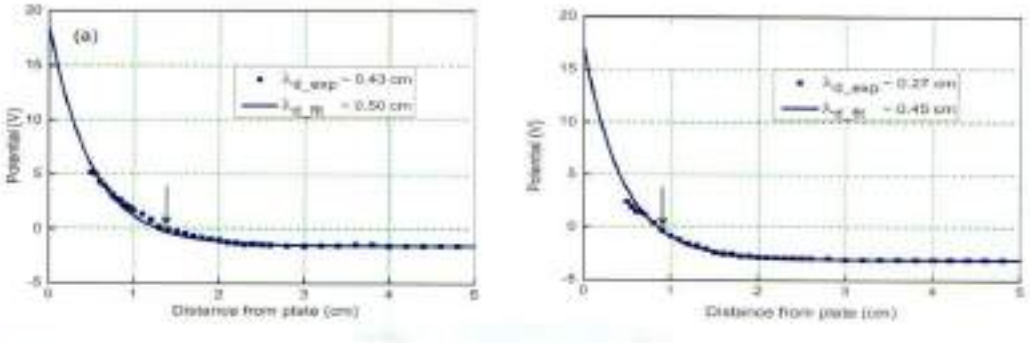


Fig. 1.4. Axial sheath profiles (blue squares) representing the electron sheath with constant V_{plate} = ∓ 20 V. n_e ~ (a) 8×10^5 cm^{-3} (b) 3×10^7 cm^{-3}.

for different plate bias voltages obtained from the measured current density. The experimental profiles are fitted with the theoretical profiles obtained from the Debye sheath model. The Debye sheath model is expressed as, $V(x)= V_{plate} \exp\left(\frac{-|x|}{\lambda_e}\right) + V_{plasma}$, where V(x) is the sheath potential, V_{plate} plate bias voltage, λ_e electron Debye length and V_{plasma} is the plasma potential are also shown along with the experimental profiles in Fig. 1.3. The Debye length λ_{e_fit} values used in the theoretical model fit well (shown in Fig. 1.3) with the measured profiles and are consistent with the experimental values. The parameter, λ_{e_exp} i.e., the experimental Debye length is obtained from the measured electron density and electron temperature.

Sheath potential profiles in front of the plate, biased at +20 V for different electron densities in the diffused section, are shown in Fig. 1.4. It is observed that the plasma potential in the diffused section becomes more negative with increasing source discharge current. With the increase in plasma density in the source, the diffusion through the magnetic filter increases due to which the electron and ion loss rates balance at higher negative plasma potential. The sheath thickness reduces with increasing electron density and follows the Debye sheath model. On the other hand, when equal electron and ion density condition is maintained, we measured equal ion and electron sheath thickness. This observation has supported the results of a recent numerical experiment in Iowa University of USA.

A.2. Observation of high amplitude shock in a multicomponent plasma with negative ions:

The study of shock like structures in a plasma medium is a topic of interest since many decades. The theory of ion acoustic shock in a plasma is described by the Korteweg-de Vries - Burger's (KdV-Burger's) equation which can be derived from the fluid equations of motion. In a plasma, composed of electron, Argon (Ar) positive and Fluorine (F) negative ions, we have performed experiment on shock wave in a double plasma device. We have excited the shock wave by applying a ramp signal of rise time 10 μs to the source anode. The evolved density perturbation is received by a planar Langmuir probe of 6 mm diameter in the target section and recorded in a digital storage oscilloscope. The observed density perturbations recorded at 6 cm from the separation grid which is kept floating at the target section is shown in Fig. 1.5, where δn

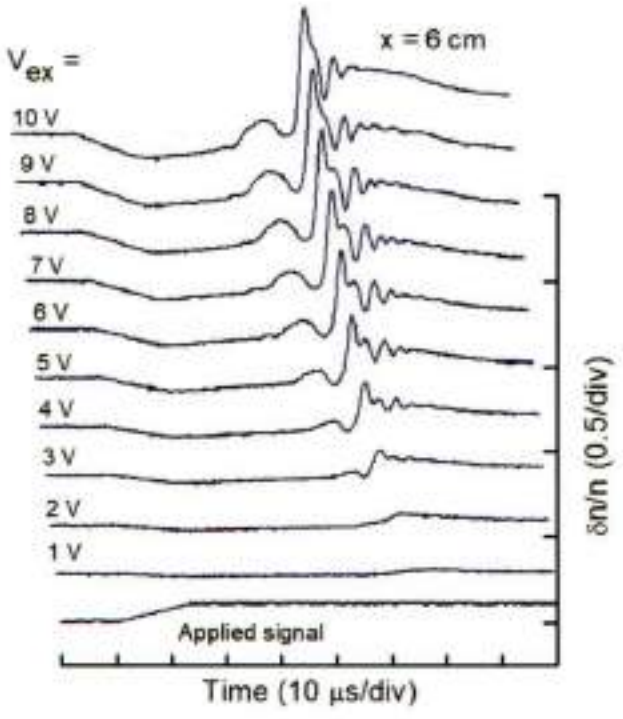


Fig. 1.5. Observed shock profiles at x = 6 cm for different excitation voltages. The bottom trace is the applied ramp pulse.

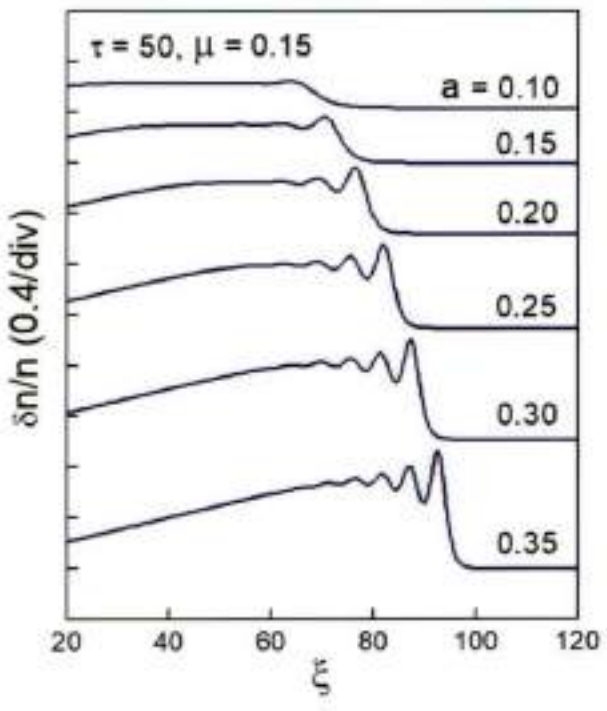
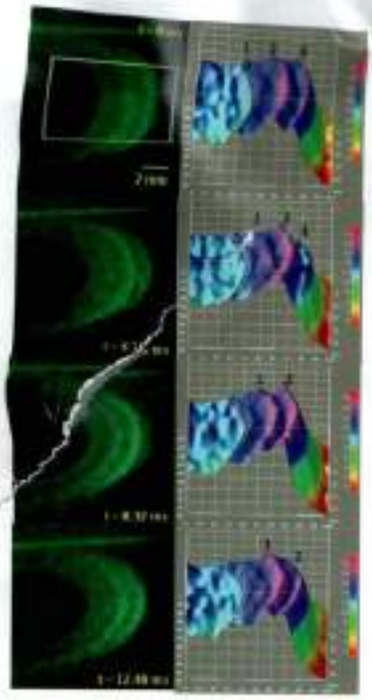


Fig. 1.6. Numerical results of KdV-Burgers equation for different initial wave amplitude a at time t=50. The dissipation coefficient μ=0.15 as the Landau damping is inherent in the system.



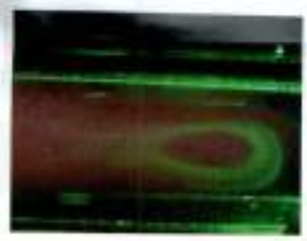


Fig. 1.11. Snapshot of the dust cloud with a void in a horizontal layer.

Fig.1.12. Images of observed dust acoustic wave (left) and corresponding 3D intensity profile (right).

Argon plasma is produced inside the glass tube at pressure ~ 10^{-2} mbar. By applying rf power (13.56 MHz, 6 - 15 W). Carbon nanopowder with average particle radius ~ 50 nm is initially kept inside the tube. As the plasma is turned on, the particles are lifted up due to plasma ion bombardment. A dense cloud of nanodust surrounding a small void is formed inside the plasma which is viewed with the help of laser light illumination (532 nm and 50 mW). The dust dynamics are recorded by using a high speed digital camera (240 - 420 fps). A typical image of the observed dust cloud with the void is shown in the Fig. 1.11. The void has the diameter of 0.74 cm. A self-excited dust acoustic wave (DAW) is also observed originating at the void's boundary. The ion-dust streaming instability leads to the excitation of this spontaneous dust acoustic wave. A 3D representation of the intensity profile of the observed wave is obtained from the recorded images using ImageJ software and is shown in Fig. 1.12. The wave parameters are measured and found to be: wavelength ~ 0.14 cm, DAW velocity ~ 14 cm/s, and frequency ~ 100 Hz. The average charge on 25 - 50 nm dust is estimated from the OML theory as Q_d ~ 37 - 75 e. From these parameters, the other dusty plasma parameters such as dust density ~ 10^4 cm^{-3}, inter-particle distance ~ 0.025 - 0.02 cm, Coulomb coupling parameter ~ 0.26 - 1.33 are estimated. Thus, the self-excited dust acoustic wave observed in our experiment has been used to diagnose/ characterize nanodusty plasma.

A.5. In-situ production of nanodusty plasma:

Low temperature laboratory plasma plays a significant role in producing nanoparticles, metal oxides and nano-composites using different types of reactive gases. In most of the laboratory discharges, nanodusty plasma (i.e., plasma containing nanometer size particles) is produced either by introducing particles externally or by growing them inside the plasma. The plasma grown particles have wide application such as in thin film deposition, manufacturing of advanced material and device fabrication.

Fig. 1.13. Image showing the lower layer of dust.

We have observed the formation of nanometer to submicron size particle in an Argon-acetylene plasma discharge. Initially plasma is produced inside a cylindrical glass tube of length 12 cm and inner diameter 2.8 cm and filled with Ar gas at pressure 0.07 - 0.06 mbar by applying rf power. Acetylene (C_2H_2) gas is then injected into the plasma and the background pressure is maintained at 0.05 mbar. The C_2H_2 molecules are dissociated in Ar plasma and carbon atoms nucleate to grow in size to form

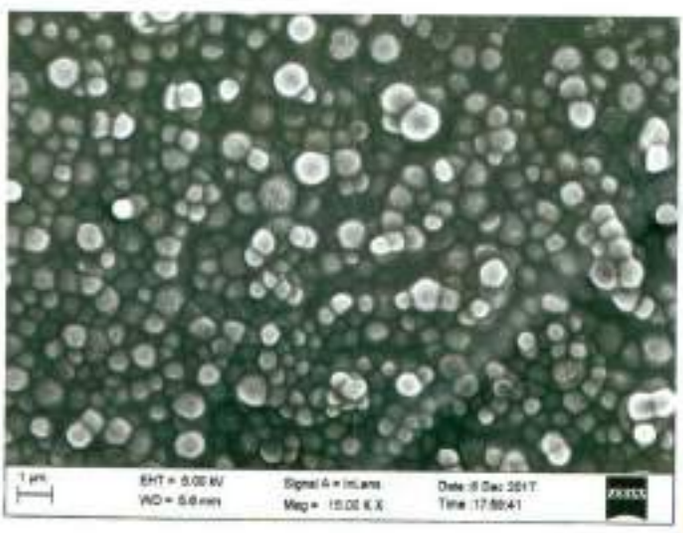


Fig. 1.14. SEM image of in-situ grown particles.

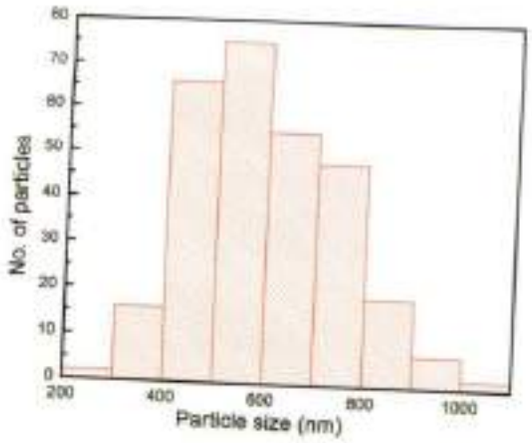


Fig.1.15. Size distribution of particles.

particles of different sizes ranging from nanometer to submicron. The particles acquire negative charge and form a dust cloud almost filling the whole plasma volume. The in-situ grown particle cloud is viewed with the help of 532 nm green laser and recorded using a digital video camera at high frame rate (240-1000 fps). The dust cloud shows a very complex dynamics. In the lower layer of the dust column, self-excited waves are observed to generate from the void boundary, a snapshot of which is shown in Fig. 1.13. Preliminary analysis shows that the observed wave has a frequency of 100 Hz. It is also observed that there are some bigger particles (submicron to micron in size) residing outside the nanodust cloud (i.e. near the glass wall) in the form of a circular ring.

In order to know the size distribution, the particles are collected from the glass tube and then their SEM images are obtained. One such image is shown in Fig. 1.14. The size of the observed particle is found to be ranging from 200 nm to 1000 nm with an average of 550 nm as shown in Fig. 1.15. UV-VIS absorption spectroscopy confirms that the particles are

A.6. Study of dust acoustic solitary waves and shocks:

The propagation characteristics of small amplitude dust acoustic (DA) solitary waves (SWs) and shocks are studied in an unmagnetized dusty plasma with a pair of trapped positive and negative ions. Using the standard reductive perturbation technique with two different scaling of stretched coordinates, the evolution equations for DA SWs and shocks are derived in the forms of complex Korteweg de Vries (KdV) and complex Burgers' equations. We have investigated the weakly nonlinear propagation of small amplitude dust-acoustic solitary waves and shocks in a dusty pair-ion plasma with dust charge fluctuations due to trapped positive and negative ion species. Using the reductive perturbation technique, we have derived the evolution equations for these solitary waves and shocks in the forms of KdV and Burgers equations with a complex nonlinear coefficient [Fig.1.16]. The latter becomes complex due to vortex-like distributions of two oppositely charged ion species. Travelling wave solutions of these KdV and Burgers equations are obtained and analysed numerically. The effects of the trapped positive (negative) ions with a hump (dip) shaped distributions as well as flat-topped and Boltzmannian ones on the profiles of the height and width of the solitary waves and shocks are also investigated.

It is also found that for a particular value of the positive (negative) trapped ion parameter with trapped negative (positive) ion distributions moving towards the thermal equilibrium, the nonlinear coefficient A decreases [Fig. 1.17] sharply irrespective of any change in the positive (negative) ion density ratios ($\mu_p = n_{p0}/Z_{d0}n_{d0}$ and $\mu_n = n_{n0}/Z_{d0}n_{d0}$, with n_{p0} and n_{n0} denoting the number density for trapped positive and negative ions, is the dust charge state and n_{d0} is dust density). It is also seen that the change of distribution of the trapped positive (negative) ions from a hump (dip) shaped through flat-topped to Boltzmannian has weighty effect on the height and width of both solitary and shock wave potentials.

In another work we have tried to describe the

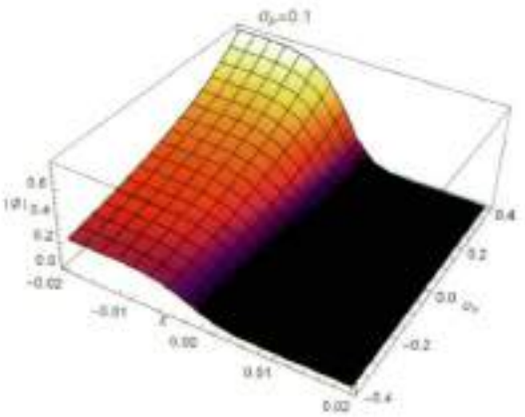


Fig. 1.16. The wave potential with χ and σ_n ($\sigma_n = T_{n0}/T_n$) at a specific value of σ_p ($\sigma_p = T_{p0}/T_p$), with T_n, T_{p0} and T_{n0} are the trapped negative ion, free positive ion and free negative ion temperatures respectively.

salient features of relativistic degenerate plasmas in presence relativistic non-degenerate ion and ion beams in different regime of operation namely weakly or non-relativistic and relativistic. Both subsonic and supersonic waves are found to be supported by such type of plasma environment. The wave phase velocity with ion beam concentration reduces as we move from non-relativistic to relativistic plasma regime. Interestingly, in the non-linear analysis, the soliton amplitude variation with ion beam concentration closely resembles to the typical wave phase velocity variation in the linear regime. The variation of phase velocity both in subsonic and supersonic range is found to be pertinent with ion beam concentration [Fig. 1.18]. Typical soliton characteristics of the plasma waves are observed for different physical situation throughout the study except in the subsonic regime of relativistic plasma. The dominant effect of magnetic field in controlling the plasma dispersion in either subsonic or supersonic wave propagation in both non-relativistic and relativistic plasma is observed .Here we have tried to describe basic features of solitary wave propagation in presence of the above mentioned plasma ingredients analytically considering different possible

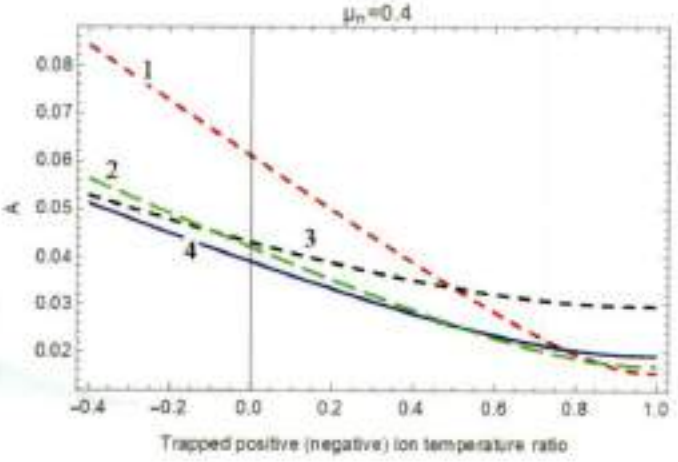


Fig. 1.17. For plot (1) and (2), σ_n is 0.5, with $\sigma_n = 0.6$ and $\mu_n = 1$. Similarly for plot (3) and (4), $\sigma_n = 0.5$, with $\sigma_n = 0.6$ and $\mu_n = 1$.

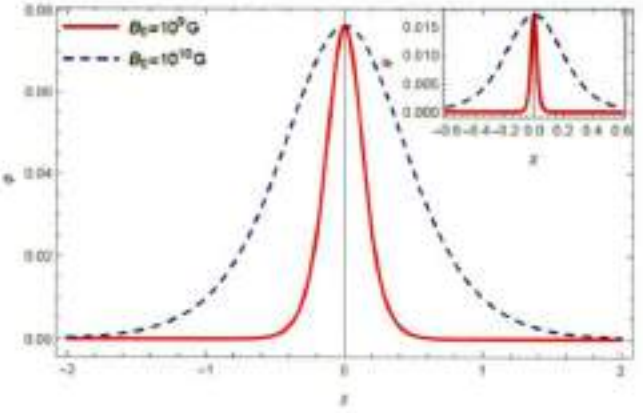


Fig. 1.18. Variation of φ (amplitude) with magnetic field B_0 in weakly or non- relativistic case in the supersonic regime, Inset variation of φ with magnetic field in relativistic case in the supersonic regime.

B. Applied Plasma Science

Fuel cell will be the most promising renewable source of energy in the near future. The fuel cell research has seen a tremendous growth in the recent years. Scientists have developed fuel cell assembly with high proton conduction efficiently. However, the use of high percentage of Platinum (Pt) as an electrode catalyst and Nafion as a conventional electrolyte (membrane) makes the cost very high. This issue can be tackled by developing low loaded Pt electrode and a low cost membrane, which are the key components of a Membrane Electrode Assembly (MEA) in a Proton Exchange Membrane Fuel Cell (PEMFC). A natural bio-membrane (extracted from betel nut leaf) containing electronegative groups have been developed as an electrolyte through sulfonated polypropylene deposition and low loaded Pt/Ag electrode catalysts have been prepared by using plasma co-sputtering method.

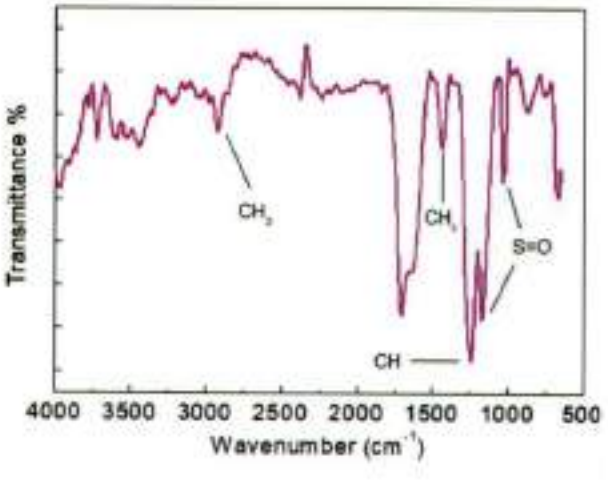


Fig. 1.19. FTIR spectra of sulfonated polypropylene.

B.1. Development of plasma modified bio-membrane:

At first, the presence of electronegative groups like -COOH and $-SO_3H$ is confirmed through FTIR spectroscopic analysis. Then, a MEA is prepared by pressing a bio-membrane in between two standard carbon electrodes and its performance in PEMFC is tested using single fuel cell testing station. The virgin bio-membrane shows a maximum power density of 120 mW/cm^2 with open circuit voltage (OCV) of 0.94 Volt. However, the performance is lower than the synthetic polymer membranes, as high internal porosity of the bio-membrane leads to huge amount of fuel leakage across the membrane.

To overcome the fuel leakage and to enhance the proton conductivity, the bio-membrane is modified by grafting it with polypropylene and triflouromethane sulfonic acid (TMSA).

Fig. 1.19 shows the FTIR spectrum of sulfonated polypropylene deposited over silicon wafer for 5 minutes at constant gas feed rate of 10 sccm. Fig. 1.20 depicts FTIR spectra of the virgin bio-membrane as well as treated plasma polymerized bio-membranes at same conditions for different time. In Fig. 1.19, the peaks 1027 cm^{-1} and 1170cm^{-1} stand for symmetric stretching vibration and symmetric vibration of two S = O bonds in the SO_3H group. The presence of polypropylene can be seen in the peaks 1247 cm^{-1}, 1436 cm^{-1}, 2920 cm^{-1} which correspond to bending vibration of CH, asymmetric vibration of CH^3 and CH^2 respectively. From the FTIR spectrum of the treated bio-membrane it is found that the band around 3400 cm^{-1} (ascribed to O-H stretching vibration of -COOH) becomes broader after plasma polymerization. The peaks at 2920cm^{-1} and 2842cm^{-1} due to CH asymmetric and symmetric stretching also seem to be weakened after plasma grafting. The peak at 1020cm^{-1} and 1230cm^{-1} are due to sulfonic group (shifted) and the mixer of sulfonic and polypropylene respectively.

From AFM analysis, the average roughness of the bio-membrane is in the range 39 - 340 nm, which decreases with the gas feeding rate and deposition time. Approximately 100 nm clusters are formed along with nanopillar structure. These nanostructures are responsible for the overall conductivity of the membrane. The contact angle of the hydrophilic virgin membranes also found to increase up to 110° after treatment. The performance of the plasma

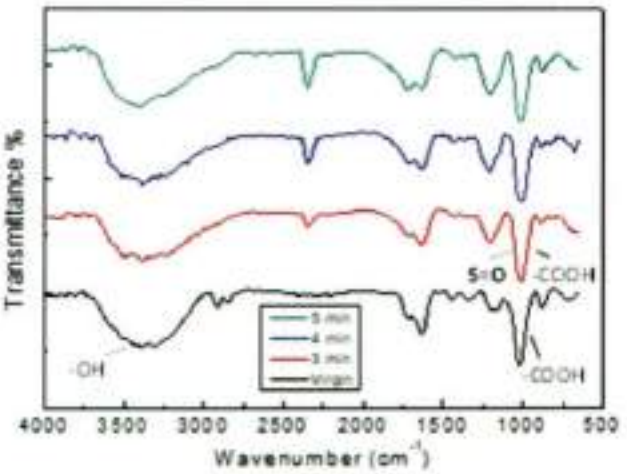


Fig. 1.20. FTIR spectrum of virgin and plasma polymerized bio-membrane.

polymerized bio-membranes in PEMFC is tested using single fuel cell station. The membranes treated at 10 sccm gas feed rate show better performance in comparison to membranes treated at 25 sccm. The maximum power density is found to be 244 mW/cm^2 by using the bio-membrane polymerized at 10 sccm and 5 min deposition time. The performance is found to develop two fold increase than the virgin bio-membrane. The polarization curve is shown in Fig. 1.21. The average roughness of the same membrane is 50 nm as per AFM analysis. There may be two main reasons of better performance in case of 10 sccm gas feeding rate than 25 sccm. One reason is the increase in the hydrophobicity of the bio-membrane in case of 25 sccm, which prevents water flow and as a result, obstruction in proton transport takes place. The other reason is the increase in membrane thickness due to higher deposition of sulfonated polymer. Hence, the optimized conditions for a good performance are at 10 sccm gas feed rate and 5 minutes of deposition time.

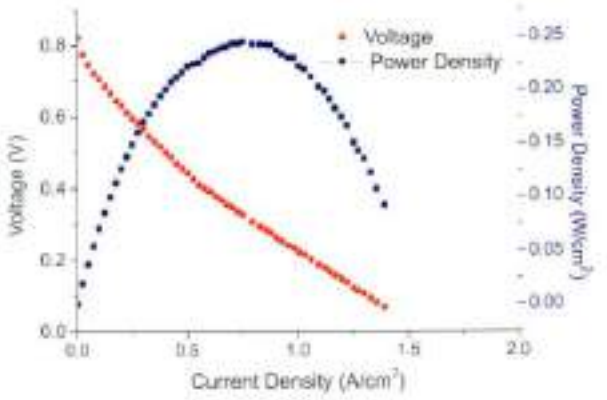


Fig. 1.21. Polarization curve of plasma polymerized bio-membrane.

B.2. Development of low loaded electrode catalyst:

Plasma co-sputtering method is used to develop the low loaded electrode catalysts. Two targets, Pt (Platinum) and Ag (Silver) are simultaneously sputtered at high pressure of 0.1 mbar on carbon paper which is later used as GDL (Gas Diffusion Layer) as shown in Table 1. This GDL with Pt and Ag catalysts is used as anode in the fuel cell. Taking standard electrode (ElectroChem) as cathode and Nafion 212 as proton exchange membrane, the MEA is prepared. The fabricated MEA is tested in a manual fuel cell testing station (KPAS, Chennai).

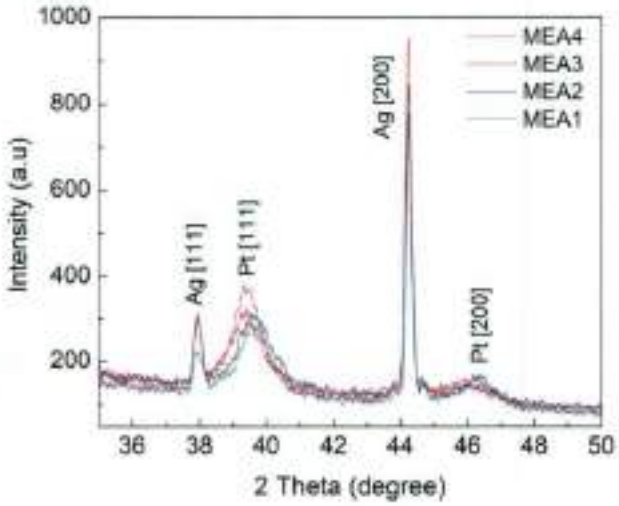


Fig. 1.22. XRD spectra of Pt and Ag deposited MEA.

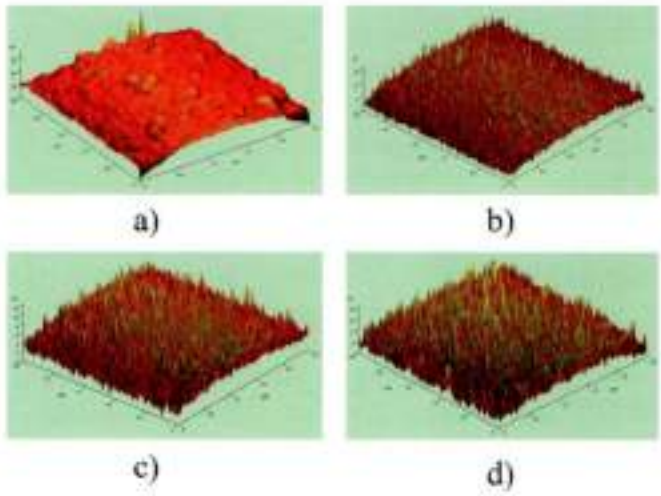


Fig. 1.23. AFM micrographs (2.5 x 2.5 μm^2) for samples of (a) MEA1, (b) MEA2, (c) MEA3 and (d) MEA4.

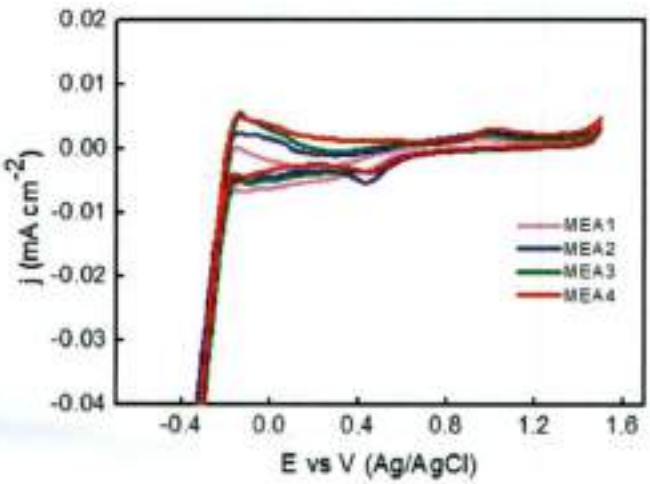


Fig. 1.24. Cyclic Voltammetry of different MEAs.

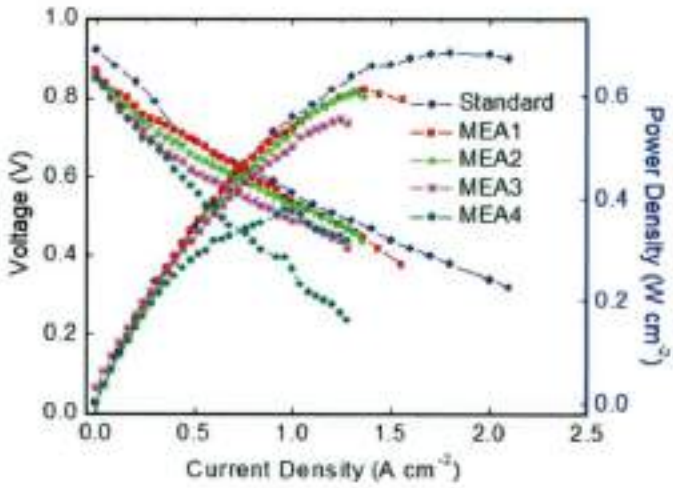


Fig. 1.25. Polarization curves of different MEAs.

Table 1: Pt and Ag loading of prepared MEAs

Sample	Cathode loading (mg cm^{-2})	Total Pt and Ag anode loading (mg cm^{-2})	Pt loading (mg cm^{-2})	Ag loading (mg cm^{-2})
MEA1	1	0.035	0.017	0.018
MEA2	1	0.049	0.027	0.022
MEA3	1	0.059	0.032	0.027
MEA4	1	0.068	0.039	0.029

The XRD peaks (Fig. 1.22) around 39° and 46° reveal the presence of Pt [111] and Pt [200] crystal planes and peaks at 36° and 44° reveal the presence of Ag [111] and Ag [200] crystal planes. AFM micrographs (Fig. 1.23) reveal that for the sample of MEA1, no nanopillar structure is formed. A few cluster of deposited Pt and Ag atoms are observed. The formation of nanopillar structures of samples for MEA2, MEA3 and MEA4 with increasing number density of nanopillar is noticed. The number density of the nanopillars and its thickness increases with increasing loading.

From the CV curves, it can be said that electrochemically active surface area (ECSA) decrease with decrease in loading as shown in Fig. 1.24. It is due to the fact that at low loading, amount of Pt and Ag atoms is less for effective cathodic reactions. Dense nanopillars take active part in electrochemical reactions resulting higher ECSA. Fig. 1.25 shows the polarization curves for MEAs prepared at 0.1 mbar argon pressure for different anode Pt loading, keeping cathode Pt loading constant at 1 mg cm^{-2}. MEA1 has very poor cell performance. This is due to the fact that very low Pt loadings at the anode leads to insufficient active sites for electrochemical reactions. The experimental results of co-sputtered electrode catalysts are summarized in Table 2.

Fig. 1.26. Photograph of In-Liquid plasma discharge.

mainly by gas phase method and liquid phase method. The advantage of the later method is the direct formation of nanomaterial within the liquid from a metallic electrode or from the liquid solution itself, the produced nanostructure materials are dispersed throughout the liquid. Therefore the nanoparticles can be obtained in one-step process. Most importantly this method can provide size and shape controllable nanoparticles simply by adjusting electrode gap and power supply or by using specific surfactants in different liquid solutions. Generation of plasma above or inside liquids is rapidly rising due to its potential applications in material, environmental and medical technologies. Because of the specific optical, electrical, magnetic and catalytic properties of nanomaterial, it has received a lot of attention for extensive research in recent years. Nanoparticles (NP) have a wide range of applications such as in electronics, gas sensors, in dye-sensitized solar cells, photocatalyst and biological labeling.

Table 2: Performance measurements of prepared MEAs

Sample	Cathode loading (mg cm^{-2})	Total Pt and Ag anode loading (mg cm^{-2})	Pt loading (mg cm^{-2})	Ag loading (mg cm^{-2})	Power density (mW cm^{-2})	Mass specific power density (mW μg^{-1})
Standard	1	1	1	0	684	0.342
MEA	1	1	0.035	0.017	0.018	3840.371
MEA2		0.049	0.027	0.022	545.6	0.520
MEA3		0.059	0.032	0.027	607.2	0.573
MEA4		0.068	0.039	0.029	612	0.573

The cell performance is found to be highest for MEA4 with anode Pt loading 0.039. This is because the presence of high number density of nanopillar deposited at the electrode catalysts. With more Pt loading at the anode, cell performance may increase, but the prepared electrode will be no more low loaded.

B.3. In-Liquid plasma discharge for the synthesis of WO_3 nanoparticles:

Nanoparticles are synthesized in plasmas

In-Liquid plasma has been successfully generated inside a glass chamber containing distilled water between a copper plate (anode) and a tungsten rod (cathode) for the synthesis of tungsten tri-oxide (WO_3) nanoparticles (NP_s). A high voltage AC signal (6 kV, 50 Hz) is applied to initiate the discharge and maintained for 5-10 minutes. As soon as the voltage is applied between the two electrodes redistribution of electric field in the liquid takes place. Since water behaves as dielectric an electric double

layer is formed near the surface of the tungsten tip (live electrode), which result in the localisation of the larger part of the electric field in the proximity of the electrode. The localisation of the electric field simulates the formation of a conductive channel, heated up to 7000 K by electric current. The plasma generated in the channel has been rapidly expanding from the channel into water towards the grounded copper plate as shown in the Fig. 1.26. The plasma channel mostly contains atomic hydrogen (H) and hydroxyl (OH) radicals. As the temperature on the tip of the tungsten rod is very high, it results in fast evaporation of tungsten atoms which immediately reacts with OH radicals to form WO_3 nanoparticles.

The growth of WO_3 nanoparticles is confirmed by obtaining the UV-Vis spectra of the obtained sample as shown in the Fig. 1.27. The size distribution of WO_3 nanoparticles has been analysed by Zeta potential analyser. Typical data are shown in Fig. 1.28. The average size of the nanoparticles is found to be in the range of ~ 300 nm, with few particles in the range of ~3 nm. Detailed investigation on the growth mechanism and control over the process parameters is being carried out.

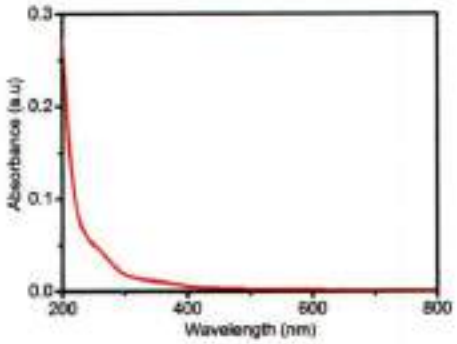


Fig. 1.27. UV-Vis spectrum of WO_3 Nps.

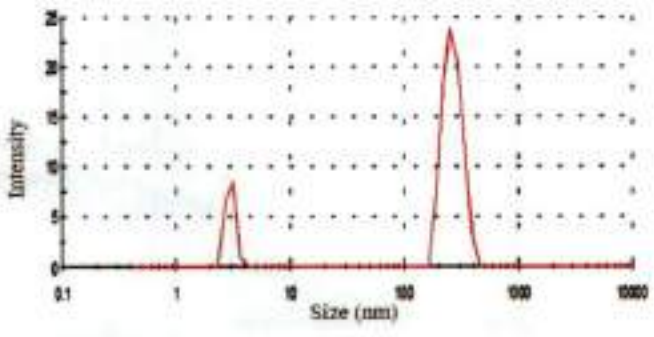


Fig. 1.28. Size distribution of WO_3 Nps.

B.4. Cold Atmospheric Pressure (CAP) plasma for dye degradation:

Cold atmospheric pressure (CAP) plasma attracts high attention because of their potential interest for different technologies, such as plasma processing for polymer surface modification in particular plasma polymerization, functionalization of polymer surface for improved adhesion, wettability etc., surface decontamination, plasma bio-medical applications and dye wastewater treatments. Non thermal atmospheric pressure plasmas (also called cold atmospheric pressure plasma) are characterized by the non-equilibrium distribution of energies between different species of plasma. Such plasmas are cold or non-thermal because the plasma gas remains at room temperature and highly reactive chemical species such as reactive oxygen species (ROS) and reactive nitrogen species (RNS) are generated by the high-temperature plasma electrons.

For the generation of Dielectric Barrier Discharged (DBD) CAP plasma a high voltage AC signal (2 kV, 50 kHz) has been applied between a live electrode (copper rod), which is placed inside a glass tube and a grounded electrode (aluminium strip) wrapped on the outer surface of the tube at one end. The glass tube serves as a dielectric layer. A plasma plume (length ~ 1-3 cm, diameter ~ 1 mm) blows out into open air with the flow of the Argon (Ar) gas through the glass tube.

The CAP plasma has been applied for degradation of Methylene Blue ($C_{16}H_{18}ClN_3S$) dye, with modification of electrode system, by putting the grounded electrode under a glass petri dish, containing 6 ml of Methylene Blue (MB) solution as shown in Fig. 1.29. Preliminary characterisation of the plasma jet has been done

Fig. 1.29. Methylene Blue degradation by CAP plasma treatment.

by obtaining Optical Emission Spectroscopy (OES) data. It reveals the presence of different types of ROS and RNS as shown in Fig. 1.30. The presence of reactive species as well as the energetic electrons is responsible for the dissociation of water molecules into OH, H_2O_2 etc. The radicals attract on the double bond between N atoms as well as on the sulfonic group present in MB, for its degradation by breaking the bonds. The degradation of MB with time in CAP plasma environment is shown by taking UV-Vis spectrum as shown in Fig. 1.31. After 20 minutes of plasma treatment (PT) complete degradation of MB has been observed. The results indicate potential use of the CAP process in waste water treatment.

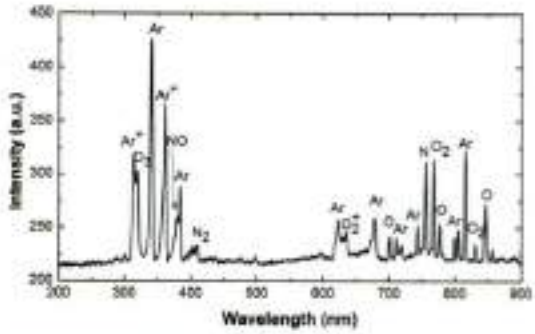


Fig. 1.30. Emission spectra from 200 to 900 nm observed in the Ar plasma jet.

B.5. Synthesis of Zinc Oxide nanoparticles (through chemical route):

Zinc Oxide Nanoparticles (ZnO-NPs) were synthesized by chemical precipitation method at low temperature using Zinc nitrate hexa hydrate [Zn $(NO_3)_2$.$6H_2O$] and sodium hydroxide (NaOH) as precursors followed by annealing at different temperatures ranging from 30°C to 600°C for two hours. The XRD results reveal that the prepared ZnO-NPs exhibit hexagonal wurtzite structure and the increasing annealing temperatures lead to an increase in the average crystallite size as well as improvement in the crystallinity. SEM images reveal the formation of nearly spherical ZnO nanoparticles with slight agglomeration. The FTIR spectra of all the samples exhibits peak, which corresponds to Zn-O stretching band. The UV-Vis absorption spectra show a slight decrease in optical band gap from 3.84 eV to 3.56 eV with increase in annealing temperature. The room temperature PL spectra with excitation wavelength 320 nm show increase in UV emission intensity with respect to annealing temperature.

It is seen that both structural and optical properties of resulting ZnO products depend on

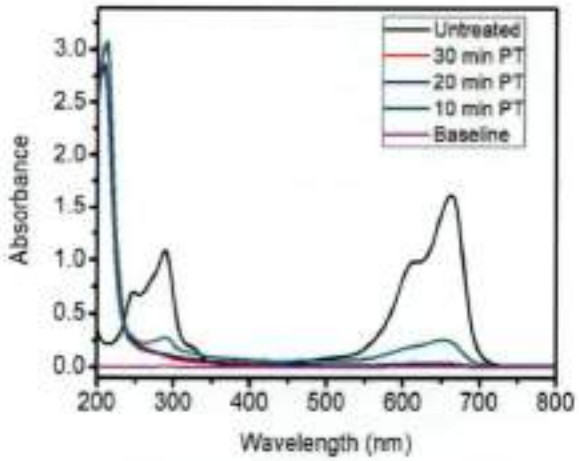


Fig. 1.31. UV-Vis spectra of MB with time after CAP plasma treatment.

annealing temperature. The XRD results reveal that estimated crystallite sizes increase with an increase in the annealing temperature [Fig. 1.32]. In addition, the reduction in FWHM with increasing annealing temperatures has confirmed the improvement of the crystallinity of the ZnO samples. SEM images depict that the particles are nearly spherical with agglomeration and their sizes found to increase upon increasing annealing temperature. The FTIR spectra reveal the characteristic peak for Zn-O stretching vibration.The UV-Vis absorption spectra of the prepared ZnO-NPs shows a slight red shift in absorption peak and the band gap energy observed to be decreased with increasing annealing temperatures. The PL results show increase in intensity of UV emission with the increasing annealing temperature and also exhibit defect related visible emission. Based on these results, it can be concluded that annealing at various temperatures is an effective process, in improving the crystal quality as well as modifying the optical properties of the prepared ZnO products.

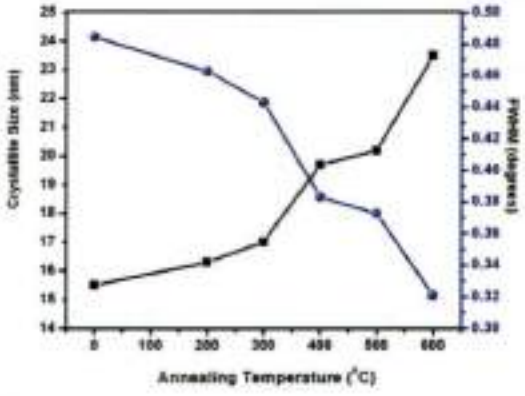


Fig. 1.32. Variation of the crystallite size with different annealing temperatures.

Advanced Materials Science

1st Row (Front)(L to R): Dr. Devasish Chowdhury, Associate Professor-II; Dr. Arup R. Pal, Associate Professor-I;Dr. Neelotpal Sen Sarma, Associate Professor-II; Dr.Munima B. Saharia, Associate Professor-I; Dr.Sarathi Kundu, Associate Professor-I; Dr. Biswajit Choudhury, INSPIRE Faculty.

2nd Row (L to R): Gautomi Gogoi, Technical Asst.; Bandita Kalita, JRF; Deepshikha Gogoi, JRF; Ankita Deb, JRF; Sweety Biswasi, INSPIRE-JRF; Tishamoni Kashyap, Technical Asst.;Payal Saha, JRF; Jahnabi Gogoi, JRF.

3rd Row (L to R): Bablu Basumatary, JRF; Dr. Abdul Barik, NPDF; Ashim Ch. Bhowal, SRF; Jayanta Sharma Boruah, JRF; Ujjal Saikia, SRF; Purbajyoti Bhagowati, INSPIRE-JRF; Santanu Podder, JRF; Raktim Jyoti Sarmah, JRF.

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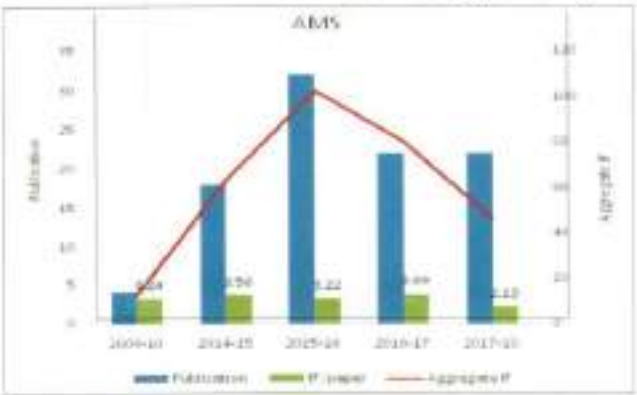
Absent in photograph: Parijat Borgohain, SRF; Dr. Robinson Jose, DBT-RA; Manash Jyoti Deka, SRF; Achyut Konwar, CSIR-SRF; Sristi Majumdar, SRF.

Summary

Scientist (Core):	05 (M: 04, F: 01)	Referred Journal Publications:	22
Technical Officer:	NIL	Cummulative Impact factor:	49.96
Scientist (National Fellow):	02 (M:02)	Ph.D. awarded:	05
INSPIRE Faculty:	01 (M:01)	Invited Scientific/chief guest/guest lecture:	08
JRF?SRF:	23 (M: 14, F: 09)	Recognition/Honour/award:	06
JRF/SRF (INSPIRE):	02 (M: 01), (F:01)	Invited talks/Conference presentation:	08
		Scientific manpower joined IASST from other national organisation:	01
		Technology developed:	



Advanced Materials Sciences

Advanced Materials Sciences group at IASST is working on sensors, energy and environment, various aspects of soft materials and designing materials for bio-medical applications. Here is an account of the accomplishments during last one year.

A. Sensor Materials

A.1. Dual sensing of vitamin B_{12} by optical and electrical impedimetric techniques using Silk Fibroin as a platform:

In this work, a label free dual electro-optical sensing system based on silk fibroin protein for vitamin B_{12} has been reported. Label free sensors, devoid of utilization of expensive recognition elements like aptamers, antibodies etc. has been regarded as an emerging class of sensors. Herein, photoluminescence and electrical impedance techniques are employed for sensing vitamin B_{12}. A limit of detection as low as 20 nM is achieved via fluorescence technique. Further, the electrical impedimetric technique is also employed for vitamin B_{12} sensing by developing micro patterned films of silk protein based on soft lithographic techniques. The micro patterned films exhibit quite stable electrical properties and indicate about six and seven order increase its current density after interaction of B_{12} in aqueous and human blood serum respectively. The limit of detection in the aqueous medium is found to be about 17 ppm, while the system is able to detect the presence of B_{12} in human blood serum of concentration as low as 0.25 ppm.

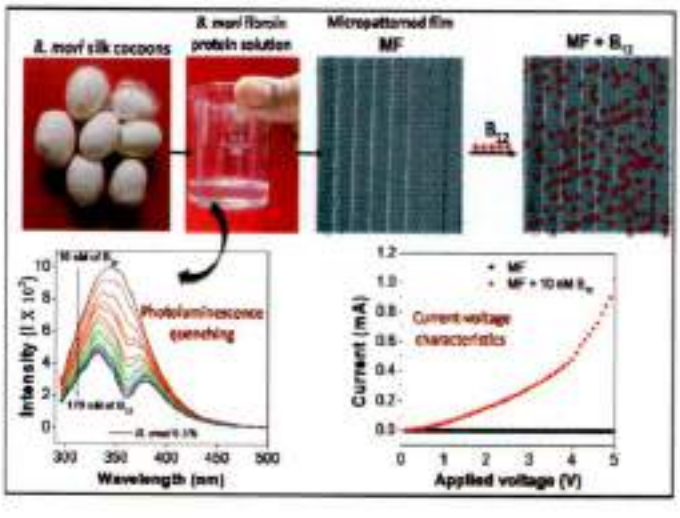


Fig. 2.1. Extraction of B. mori silk fibroin protein and fabrication of its micropatterned film (MF) for the sensing of vitamin B_{12} via photoluminescence quenching and current-voltage characterization.

Thus, the silk fibroin based platform with such high sensitivity enables this platform to be integrated with a suitable portable gadget for instant detection of B_{12} in real samples (Fig. 2.1)

A.2. Conductivity study of solid poly-electrolytes based on hydroiodic and iodic acid salts of 2-vinylpyridine-acrylonitrile copolymer:

Present work reports and compares the conductivity property of the copolymer of 2-vinylpyridine and acrylonitrile and its hydroiodic (HI) and iodic (HIO_3) acid salts. The copolymer was synthesized with the help of free radical polymerization method and their corresponding salts were synthesized by acidifying the polymers with 10% solution of HI and HIO_3. A probable mechanism is also proposed for the formation of the copolymer salts. The alternating current conductivities are measured within the temperature range of 30-90°C by varying the frequency from 42 Hz to 5 MHz and found to be significantly higher conductivities of the salts than that of the copolymer. There observed a 10^3 and 10^2 fold increase in ionic conductivities for the salts of HI and HIO_3 respectively. The ionic transport numbers are also measured with the help of Standard Wagner Polarization technique and the values for HI and HIO_3 salts are found to be 0.96 and 0.81 respectively, which are relatively higher than that of the copolymer (0.71). The apparent activation energies for conduction are found to be 0.1723, 0.2770 and 0.0604 eV for the copolymer, its HI and HIO_3 salts respectively.

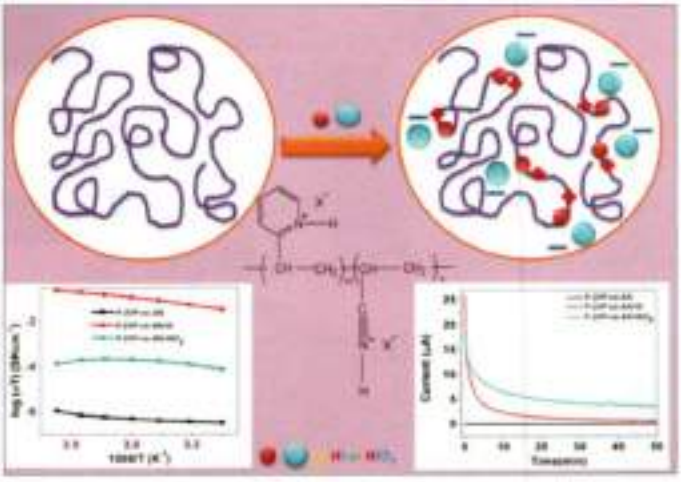


Fig. 2.2. Conducting properties of the polymer and its salts.

The copolymer and the salts are thermally stable upto 190° C. The prepared copolymer, its HI and HIO_3 acid salts are amorphous in nature and the glass transition temperatures are found as 57, 46 and 53° C respectively. The ionic conductivity value of the 2-vinylpyridine-acrylonitrile copolymer is enhanced significantly by preparing its HI and HIO_3 salts which is the major importance of this work (Fig. 2.2).

A.3. One-Pot Synthesis of Carbon Nanodots in an Organic Medium with Aggregation-Induced Emission Enhancement (AIEE): A Rationale for "Enzyme-Free" Detection of Cholesterol:

Addressing the limitations associated to the detection of cholesterol, in this work a one-pot synthesis of carbon nanodot in the organic medium (CD_{org}) from a novel bile acid hydrazone based organogel was demonstrated. Amazingly, CD_{org} possesses the aggregation-induced emission enhancement (AIEE) phenomenon which rationally aids in the "enzyme-free" detection of cholesterol through a fluorescence turn-on mechanism. On dilution of THF/Water mixture of CDorg with its poor solvent (water), a 9.8-fold enhancement in its PL emission is witnessed. Such an enhancement in PL emission is credited to the molecular restrictions occurred due to the formation of nanoaggregates of CD_{org}, thereby initiating radiative pathway for exciton decay. Interestingly, on adding cholesterol to CD_{org}, we observed the similar enhancement in its PL emission without using any cholesterol oxidase (ChO_x) enzyme. The limit of detection (LOD) and limit of quantification (LOQ) of cholesterol is found to be as low as 1.09μM and 3.64μM, respectively. Hence, this contribution highlights the "enzyme-free" fluorescence turn-on detection of cholesterol by a novel carbon nanodot rationally designed to extend its applicability in an organic medium, where it is still considered a major restraint (Fig. 2.3).

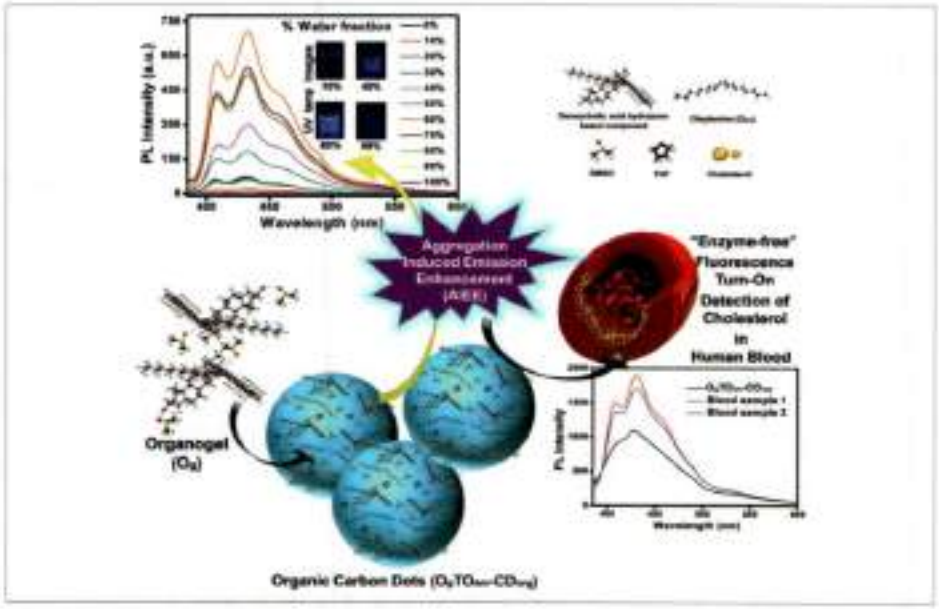


Fig. 2.3. Schematic diagram showing aggregation-induced emission enhancement (AIEE) phenomenon used for the detection of cholesterol.

A.4. Carbon Dot based Fluorescence sensor for Retinoic acid:

In this work chitosan carbon dot (chiCD) based fluorescence sensor was developed which can selectively detect Retinoic acid (RA). The CDs were prepared from chitosan hydrogel and further conjugated with NaF to develop a chiCD-NaF system for the detection of Retinoic acid based on its PL properties. It was found that addition of NaF resulted in the enhancement of fluorescent spectra of ChiCD. Addition of RA to the chiCD-NaF system resulted in quenching of the PL spectra. The detection of RA was selective as there is no change in PL properties using other vitamins viz. ascorbic acid, choelcalciferol, Folic acid, Riboflavin, Tocopherol etc. The chiCD-NaF systems were also checked with two commercially available capsule containing mixtures of vitamins and here too PL change was insignificant demonstrating selectivity of RA.

B. Carbon nanomaterials

B.1. Tea-Carbon Dots-Reduced Graphene Oxide: An Efficient Conducting Coating Material for Fabrication of a conducting fabric:

The present study reports a facile and green method for reduction of graphene oxide using carbon-dots (CDs) derived from 'Assam CTC (Crush Tear Curl) Tea'. Subsequently, the tea-CDs reduced graphene oxide (TCD-rGO) was used for fabrication of a cotton-based conducting fabric with anticipated applicability in different electronic gadgets where high flexibility of the conducting material is required. Coating of cotton with TCD-rGO improved the thermostability of the fabric. The initial degradation temperature for the TCD-rGO coated fabric was found to increase by 30°C compared to that of the bare cotton fabric. The electrical property of the coated fabric was evaluated. TCD-rGO coated fabric possessed a sheet resistance of 229 ± 20 Ω/sq and electrical conductivity 623 ± 54 S/m, which was comparable to that of the other graphitic conducting textile materials reported so far. The ohmic behavior and the electrical stability of the material was also studied. This particular approach eliminates the use of any toxic chemicals and other high cost synthetic products for fabrication of conducting textiles. Finally, to test the practical viability of the material developed, a stripe from the fabricated conducting fabric was used in a circuit to light up a series of LED bulbs (Fig. 2.4).

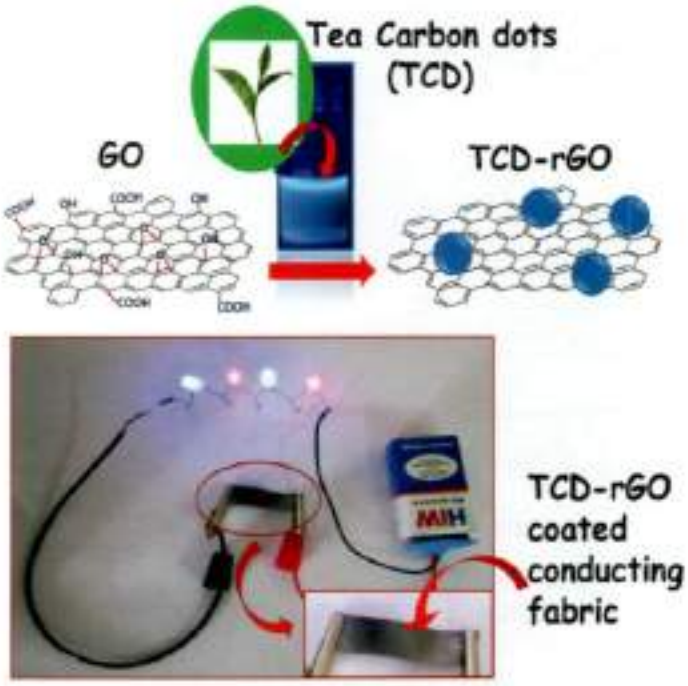


Fig. 2.4. Schematic Representation showing the process of fabricating conducting fabric.

B.2. Chiral carbon dots and their effect on the optical properties of photosensitizers:

In this work, for the first time we successfully prepared chiral carbon dots from chiral precursors. We prepared a few D-carbon dots using D-methionine, D-glucose, D-glucosamine, and L-carbon dots from L-methionine, L-aspartic acid and L-alanine. We also demonstrate that the chirality of the carbon dots can affect the optical properties of photosensitizer molecules like azobenzene. In the presence of azobenzene, D-carbon dots and L-carbon dots interacted differently when irradiated with UV light, as azobenzene in the presence of UV transforms from stable trans to metastable cis form. Thus azobenzene can react differently with D- and L-carbon dots when irradiated with UV light.

B.3. Tuning the wettability and photolumine scence of graphene quantum dots via covalent modification:

Tuning of the photoluminescence of graphene quantum dots (GQDs) through modulation of the bandgap and chemical doping is important for the GQDs use in optoelectronic devices. Herein, tuning of dual properties, i.e., wettability (hydrophilic to hydrophobic) and photoluminescence, of graphene quantum dots is demonstrated. We synthesized graphene quantum dots (GQDs) and alkylated graphene

quantum dots (C12-GQDs) by simple chemical exfoliation (top-down technique) of graphite nanopowder. The synthesized GQDs are highly hydrophilic due to the presence of oxygenated functional moieties. We successfully functionalized the synthesized GQDs covalently with dodecyl amine (DDA) and simultaneously reduced them with glycine to render hydrophobicity on the GQD surface. Herein, glycine plays a dual role as a chemical functionalizer and reducing agent. All the characterizations of GQDs and C12-GQDs were carried out by UV-visible absorption spectroscopy, scanning electron microscopy, Fourier transform infrared spectroscopy, dynamic light scattering, Raman spectroscopy, and contact angle analysis. Interestingly, after covalent modification, we also observed the tuning of photoluminescence (from green to blue) of GQDs. Thus, we can easily tune the dual properties, i.e., wettability and photoluminescence, of GQDs by simple covalent modification with long-chain alkyl ($-C_{12}H_{27}$) groups.

C. Energy and Environment

C.1. Investigations on the transformation of vertically aligned carbon nanotubes into intramolecular junctions prepared by atmospheric pressure PECVD and superior field emission property:

Since the turn of the new millennium, researchers have been trying to use atmospheric pressure PECVD to deposit different carbon nanostructures. Atmospheric pressure glow discharge plasma assisted chemical vapor deposition (AP-PECVD) process is used in this work for the growth of carbon nanotubes (CNTs) on inconel substrate without using any external catalyst. Four different sets of samples are prepared by varying the growth time. The grown nanostructures are then characterized by different microscopic and spectroscopis techniques. Field emission measurements are also done on the grown structures. Nowadays, an important part of the research on carbon nanostructures is focused on the intramolecular junctions of CNTs because of their unusual properties and important applications in nano-devices. Our investigations revealed that vertically aligned CNTs transformed into intramolecular junctions of CNTs with an increase in deposition time from 4 to 10 minutes. This time dependence for the transformation is investigated and correlated with other characterization results. We have been able to experimentally control the production of these nanostructures by varying the deposition time. This is the first time when atmospheric pressure non-thermal plasma has been used to develop intramolecular junctions in carbon nanostructures.It is seen that field emission behavior is the best for the vertically aligned CNTs but it also improves when the junctions of CNTs are present in the matrix after increasing growth time to 15 minutes. The investigations reveal that branching brings favorable defects in the grown CNTs that can give rise to impressive field emission current density. The formation of intramolecular junction can be visualized through a schematic model to understand the mechanism behind the growth of these junctions and how they helped in improving the field emission (Fig. 2.5).

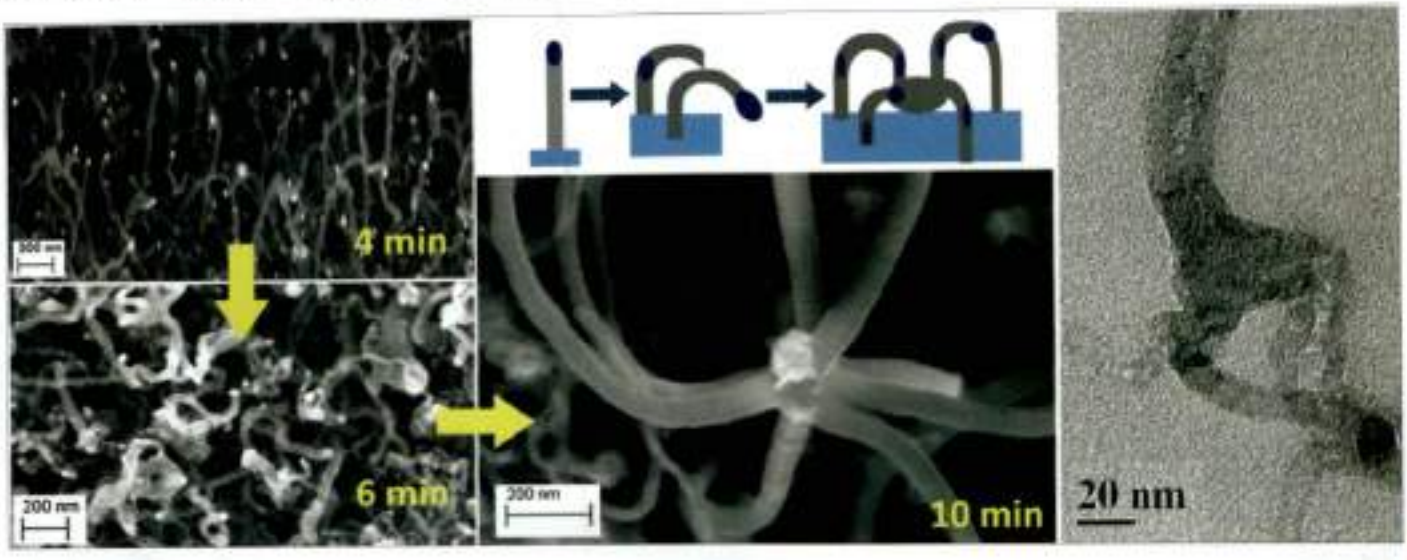


Fig. 2.5. Formation of intramolecular junctions in the carbon nanostructures prepared by atmospheric pressure glow discharge plasma.

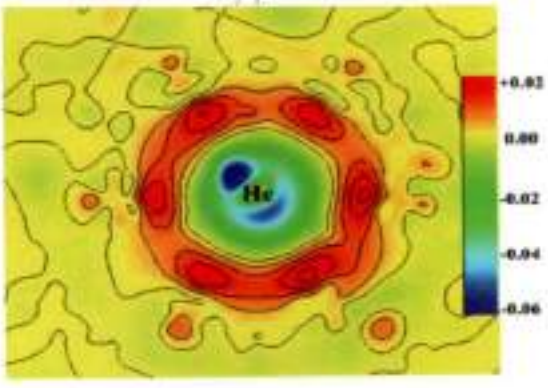
C.2. Magnetocaloric material for solid state cooling:

With the invention of solid state cooling technique in the magnetic cooling industry the conventional cooling with vapour gas are getting replaced leading towards an eco-friendly environment. Out of the numerous magnetocaloric materials, Heusler alloys also possess the mechanism of attaining a very low temperature from a high temperature surrounding and vice-versa with the application or removal of an external magnetic field. Among all, the off-stoichiometric Ni-Mn-In have reports with large magnetocaloric effect. Also, there are reports of achieving enhanced magnetocaloric effect by tuning the structural and magnetic phase temperatures with the introduction of an additional element into this alloy. One possibility is to dope Ni-Mn-In with Cu in trace amount having experimental evidence of rich magnetiocaloric properties. Two different offstoichiometric compositions, $Ni_{50}Mn_{35}In_{15}$ and $Ni_{50}Mn_{35}In_{10}$, have been taken as the starting points based on previous experimental results. Cu has been introduced in the percentage concentration from 1% to 5%. A linear change in electronic and magnetic properties has been observed for the first set of compositions while properties are fluctuating for the second set of compositions owing to the different site occupancies. Further study in this line to calculate the thermodynamic parameters of the system is ongoing.

C.3. Structural material with fcc/bcc semicoherent interfaces:

Detailed knowledge about the effect and crucial role of defects on the performance of the material is very essential before engineering them for the extreme environment applications. Materials used in nuclear fusion reactors will be always exposed to very high doses of radiation which may lead to a large number of defects such as vacancies and interstitials. Interstitial like He may accumulate inside the material causing damage by formation of voids. Additionally, the presence of vacancy has an enormous impact on clustering, segregation and precipitation of the solute atoms. Solute diffusion mechanism is controlled by the strength of interaction between a vacancy and the solute atom, which can vary for different types of elements. We have performed theoretical simulations based on density functional theory (DFT) to understand the elemental process of vacancy-interstitial atom interaction in fcc-bcc semicoherent interfaces. Our results suggest that the presence of a metallic vacancy may act as a sink for defect and favor the migration of He interstitials leading to their aggregation at the interface (Fig. 2.6). The potential capability of the vacancy to accommodate He atoms was also predicted with a higher affinity towards Nb. This aggregation of He atoms is driven by local density of electron and strain in a region in the neighborhood of Nb. Finally, we propose a plausible picture of defect energetics in the vicinity of the interface based on the Voronoi volume and Bader's charge analysis. This analysis may replace the conventional methods used for surface energetics mapping which are extremely tedious for such large systems.

(a)



(b)

Configuration	MDI: Cu4	MDI: Nb4
V+1He	12.19	19.24
V+2He	11.38	13.96
V+3He	10.00	11.78
V+4He	9.44	10.61
V+5He	9.16	9.88

Fig. 2.6. (a) 2-dimensional charge density difference plot along the interfacial plane is plotted in presence of a He interstitial. The color scale is in e/Å^3. (b) Average Voronoi volume per He atoms in the metallic vacancy (V) + nHe (n = 1, 2, 3, 4 and 5) complexes in A$^{(1)}$ at the misfit dislocation interaction (MDI) site of the first neighboring interfacial layers.

Materials

materials have interesting structural and ysical properties depending upon the nteractions present in atomic and mesoscopic scale, thermal fluctuations, self-assembly, etc. Soft materials also have a wide range of technological applications. Different structures, interactions and properties are identified from such systems from their bulk and thin film conformations.

D.1. Hysteresis behaviours of protein monolayer:

Successive compression-decompression cycles of the surface pressure (π) - specific molecular area (A) isotherms of protein (BSA) monolayers show that reversible hysteresis persists if the protein molecules contain effective positive or negative surface charges. However, for neutral condition, i.e., close to the isoelectric point of the protein, irreversibility in the hysteresis behaviour dominates. Out-of-plane structures obtained from the X-ray reflectivity analysis suggest that at lower surface pressure monomolecular layer of BSA is formed on the water surface. With increasing surface pressure, molecules start to lift-up from the water surface in such a way that semi-major axis makes an angle with the water surface. Depending on the surface pressure and surface charge of BSA, monomolecular or bimolecular layer of tilted BSA molecules is formed on the water surface, however, formation of bimolecular layer is observed when the pH is relatively closer to the BSA isoelectric point. After complete decompression, tilted monomolecular or bimolecular structures again transform into monomolecular layer as evidenced from the structural analysis of the films deposited at lower surface pressures in the second compression, however, structural hysteresis varies depending upon the subphase pH or protein surface charge. Structures obtained from the films deposited at first and second compressions at lower pressure implies that although structural dissimilarity is present but structural hysteresis is only present near the isoelectric point of BSA and becomes negligible below and above that pH. Competitive electrostatic and van der Waals interactions are responsible for such hysteresis behaviours and structural modifications (Fig. 2.7).

D.2. Structures and interactions among globular proteins above the isoelectric point in presence of divalent ions:

Small angle neutron scattering (SANS) study reveals that at pD ≈7.0, above the isoelectric point of the globular protein Bovine Serum Albumin (BSA), in the presence of different divalent ions (Mg^{2+}, Ca^{2+}, Sr^{2+} and Ba^{2+}), the short-range attractive interaction remains nearly constant and the intermediate-range repulsive interaction decreases with increasing salt concentration up to a certain concentration value but after that remains unchanged. However, for the monovalent ion (Na^{+}), repulsive interaction decreases gradually up to 1M salt concentration. Dynamic light scattering (DLS) study shows that for all ions, diffusion coefficient of BSA decreases with increasing salt concentration and then nearly saturates (Fig. 2.8).

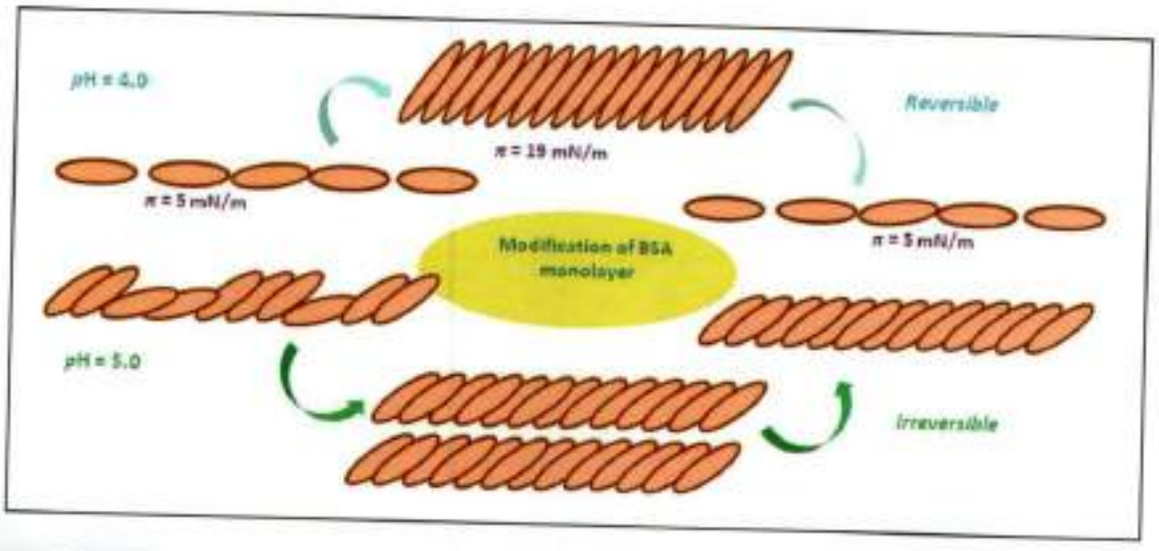


Fig 2.7. Reversible and irreversible hysteresis of BSA monolayer at two different subphase pH, i.e., at pH = 4.0 (below isoelectric point) and 5.0 (near isoelectric point).

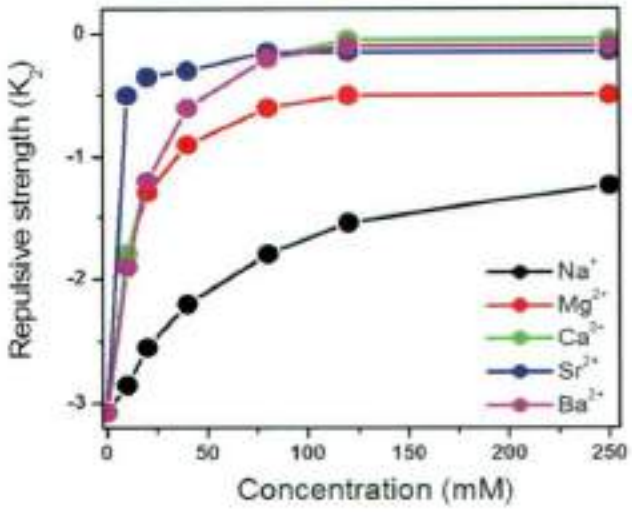


Fig. 2.8. Variation of repulsive strength (K_2) obtained from the SANS analysis using two-Yukawa potential model with the change in salt concentration for a fixed BSA concentration (10 wt %) and solution pD ≈ 7.0 and in the presence of NaCl, $MgCl_2$, $CaCl_2$, $SrCl_2$ and $BaCl_2$.

D.3. Restructuring of polyelectrolyte thin films in presence of nonsolvent:

Effects of nonsolvent (toluene) on two different polyelectrolyte thin films are studied by investigating their out-of-plane structures and in-plane surface morphologies. X-ray reflectivity analysis shows that the thicknesses of sodium poly (acrylic acid) (PAA) and poly (sodium 4-styrenesulfonate) (PSS) thin films increase if the films are kept for longer time inside toluene and nearly a linear relation is maintained [illegible] the film thickness and seasoning time. S[illegible] topographies obtained from atomic f[illegible] microscopy show that the surface morpholog[illegible] and roughnesses change after dipping the films inside toluene as restructuring takes place on the surfaces of the films. Although toluene is nonsolvent for both PAA and PSS, however, restructuring of nanometer-thick polyelectrolyte is clearly visible and the effect is much more pronounced for thicker PAA and PSS films than the thinner one. Nonsolvent-induced structural relaxation of stressed structures developed under 2D confinement is the most probable reason for such structural and morphological modifications (Fig. 2.9).

D.4. Intrinsic fluorescence of globular proteins in presence of different divalent ions from their solution and thin film conformations:

Optical emission behaviours of lysozyme and bovine serum albumin, from bulk and thin film geometry, have been studied in the presence of three different divalent ions (Mg^{2+}, Ca^{2+} and Ba^{2+}) by using different spectroscopic (steady state fluorescence, UV-Vis and FTIR) techniques. Additionally protein thin films on silicon surfaces have been prepared and morphological studies have been carried by atomic force microscopy. Mainly, dynamic quenching behaviours have been identified for both the

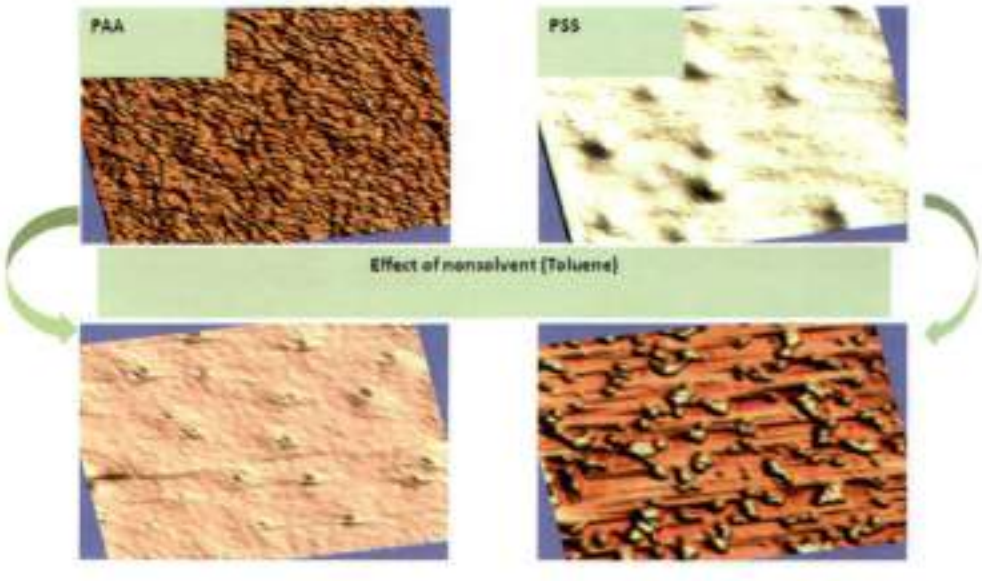


Fig. 2.9. AFM images of PAA and PSS polymer thin films before and after dipping inside nonsolvent (toluene).

proteins in the presence of Mg^{2+}, Ca^{2+} and Ba^{2+} ions. Protein molecular conformation modify in thin film as compare to that of bulk values, consequently quenching efficiency also modifies. ATR-FTIR studies confirm the conformational changes of proteins in the presence of all the divalent ions. Although all the metal ions used are divalent in nature and belong to the same group of the periodic table but depending upon their individual characteristics like electron affinity, ionic radius, etc. the magnitude of the protein and hydrated ion interaction varies and accordingly the quenching efficiency modifies. Quenching is maximum for Ca^{2+} ions and then for the other two ions. Our study clearly indicates the geometry dependent physical and biological functions of proteins.

E. Photocatalysis

An important requisite for an effective photocatalytic reaction is the presence of available charge careers. Defects innate in materials at the reduced dimension can influence the career recombination dynamics and affect the photocatalytic process of a system. Graphitic carbon nitride ($g\text{-}C_3N_4$) is one such 2D layered materials where carbon and nitrogen defects play a prominent role in regulating charge career dynamics. The basic constituting unit of $g\text{-}C_3N_4$ is s-heptazine rings with alternately bonded C, N atoms stacked layer-by-layer. On shining light on $g\text{-}C_3N_4$ the photogenerated electron-hole pair (exciton) can undergo migration in the vertical stacking direction (inter-planar) or in the horizontal direction along the plane or chain (intra-planar, intra-chain) as shown in Fig. 2.10. However, presence of defects can interrupt the facile excitons migration and dissociate it into free electron and holes. Positron annihilation spectroscopy (PAS) which is an important tool for defect identification in a material reveals that density of nitrogen related defect variation depends on the calcination temperature at which $g\text{-}C_3N_4$ is prepared. Time dependent photolumine scence spectroscopy supports that excitons bound to nitrogenated defects have an elongated lifetime as compared to the free excitons. These results can help in the understanding of the applications of this material for photocatalytic dye degradation, water splitting, photovoltaics, etc.

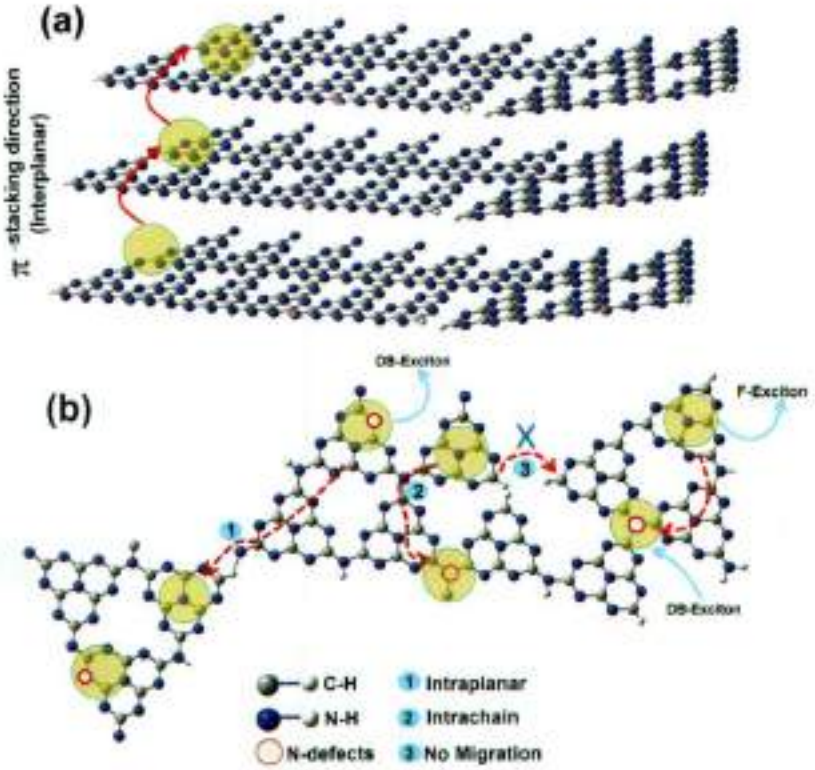


Fig. 2.10. Schematic shows exciton migration in (a) p-stacking direction (inter-planar), and (b) intra-planar migration (1) and intra-chain (2) migration. Free excitons (F-exciton), when attached to nitrogen related defects (N-defects) create bound excitons (DB-exciton). Exciton migration is prohibited if C-H or N-H moiety terminates the heptazine link.

Mathematical and Computational Sciences

1st row (L to R): Dr. Gautam Choudhury, Associate Professor-II; Dr. Lipi B. Mahanta, Associate Professor-II; Niranjan Bhagawati, Technical Officer- B.

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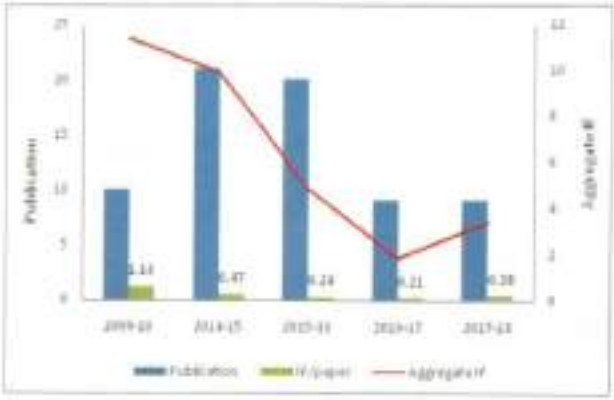
Summary

Scientist (Core):	2 (M:1, F: 1)	PhD Awarded:	3
Scientist (Project):	1 (F: -1)	Invited Scientific/Chief guest/ guest of honour lectures:	0
DST INSPIRE Faculty:	0	International visits/Short term training/conference with national/international support:	8
JRF/SRF:	8 (M: 01, F: 07)	Technology developed:	1
Referred Journal Publication:	13		
Cumulative Impact factor:	5.115		



Mathematical and Computational Sciences

Researchers within this programme carry out research in five major areas of Mathematical sciences viz. Stochastic Process, Topology, Fluid dynamics, Fuzzy set theory & its application and Image processing.

A. Stochastic Process:

Queueing theory is a branch of Applied Stochastic Process with growing application in the field of Industrial Engineering, Digital Communication Systems and Tale Communication Systems etc. And as such is a very important area of present day research.

A.1. Reliable Queueing System:

We have investigated different types of models which includes the random vacation policy, modified vacation policy, repeated optional service showing application in IEEE802.16e system and Production - inventory system.

In random vacation policy (RVP) model, the server is allowed to take a maximum say, Y number of successive vacations, if the system remains empty after the end of a vacation. After completion of Y successive vacations if the system is still empty, the server becomes dormant in the system and waits for the upcoming arrival. The maximum number of vacations taken by the server is a discreter and om variable. These type of Random vacation policy vacation model has been studied for single as well as batch arrival single server queue having application in IEEE802.16e system.

In modified vacation policy (MVP) the operation of a close down period, type 1 vacation period, type 2 vacation period, start-up period and dormant period is captured. This type of modified vacation policy has been developed for both single and batch arrival queue showing application in production and inventory system.

We have also investigated a repeated and optional service under random vacation policy and modified vacation policy. In repeated and optional service, the server provides two types of general heterogeneous services where an arriving customer has the option to choose any one of the two types of service before its service start. If a customer is not satisfied by the service provided by the service channel then it has an option to go for repeated service again (but only once). The application of this type of repeated and optional service in IEEE802.16e communication system has been studied.

A.2. Unreliable Queueing System:

An unreliable queueing system is characterised by failure of the service station where the server stops servicing and waits for a repair to start, which is usually referred to as waiting time of the server or delay time.

Bernoulli vacation schedule is a vacation model which implies that just after completion of a service selected by a customer; the server either takes a vacation of random duration or may continue staying in the system. And on completion of the vacation period, the server is back to the system even if there is no customer to serve.

An unreliable queueing model with two types of general heterogeneous service and optional repeated service has been inspected. The server in this model provides two types of general heterogeneous service to an arriving unit (customer) who has an option to repeat the same type of service again (once); if it is not satisfiedby the service provided by the service channel. While providing services, the server may break down at any moment and as soon as breakdown occurs the server is sent for repair. Immediately after the server is fixed (i.e., repaired), the server starts its remaining service to the customers in both types of service or repeated service.

An unreliable server queue with two phases of service and Bernoulli vacation schedule has also been encountered, where the server provide to each unit two phases of heterogeneous service in succession: First phase of service followed by the Second phase of service. While providing service by the server, the service facility fails for short interval of time i.e. Breakdown occure. As soon as breakdown occurs the server is sent for repair and immediately after repair, the server provides the remaining service to the customers in both phases of service. After each SPS computation the server go for a vacation with some probability or may continue to serve next unit with its complementary probability.

For all these type of models we have studied various stochastic processes such as queue length process, waiting time process, busy period processes and backlog processes.

Moreover, for unreliable queueing models we have carried out the reliability aspects. Further, we have investigated cost optimization problem of these models.

A.3. Development of queuing models for efficient clinical management:

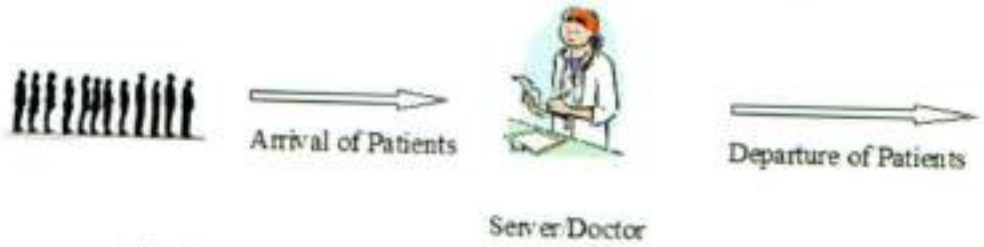


Fig. 3.1. A typical queuing system in any health organization.

Operation research (OR) is the research of strategies, interventions, tools or knowledge that can enhance the quality, coverage, effectiveness or performance of the application or programme in which the research is being conducted. OR is different from clinical or epidemiological research in that it examines a system (in this case the health care system) rather than focusing on an individual or a group of individuals (as in clinical or epidemiological research where patients are examined). In addition, operational research has at its core, the goal of improvement of a system (the health care system) (Fig. 3.1). To do this, it is necessary to identify challenges in the system and evaluate or recommend solutions.

The subject of fractional calculus is as old as differential calculus, but remains unexplored outside its theoretical bounds. Here, we attempt to apply that concept to queueing theory and develop its properties on the simple Markovian model. The resultant characteristics of the proposed model are implemented both with simulated and real-life values. It is revealed that the concept put forward conforms to both and fits very well to the theory of queues, particularly when the server is not found to function as it should. A classic example may be the absence of doctor(s) or his/her leaving the hospital in between for other works, despite patients waiting for treatment.

As revealed from the results, the pattern of mean arrival of patients, expected service time, mean queue size and the total number of patients in the queue at time t conforms to the findings of the simulated data. Here it is observed that the mean queue size of the developed queue model is not equal to zero as per the simulated results because in real life patients arrive at the system much before the service starts. Henceforth all values decrease with time and reach a cusp at t = 450.

B. Topology:

The concept of Topology evolved out of geometry and set theory which analyses notions such as space, dimensions and transformation. Topology plays a significant role in almost every field of science and technology. Basically our work is focuses on both fundamental and applied research. Our research group works mainly on Topological properties and also some significant applications in fuzzy sets, multi sets, soft sets. The notion of fuzzy, soft and multi sets are generalisation of sets which are found to be useful in mathematical formulation of many real life problems.

Many fields of modern mathematics have been emerged by violating a basic principle of a given theory only because useful structures could be defined this way. Multiset is one of such concept that has arisen violating the conventional assumption that every mathematical objects occur without repetition. Topologies on multisets can be useful in studying similarities and dissimilarities between objects which are multisets. We have studied many basic concepts on topological structures of multisets. Closed sets, which is a fundamental concepts in Topology have been generalised in a Multiset topological space. This has given rise to many unique behaviours of Multiset Topology and also to modify the concept of intersection between two multisets to the notion of Quasi-coincidence. The notion of metric (distance) function between points in a multisets are also investigated which can be later proved to be useful in fields like computer science etc. We, at the same time endeavoured to study if a metric can be defined in a multiset topological space which will generate the topology on that space. Such spaces are called metrizable spaces which are considered to be very well-behaved due to some of their beautiful characteristics. We have

also applied the concepts of multiset topology in spatial modelling of relations between objects in GIS. In literature, there are theories and explanations for need of mining complex relationship in spatial data which involves multi-feature co-location, self co-location, one to many relationship and so on. We so made an attempt to evaluate topological relations between objects which are multisets with the help of notions in a multiset topological space and also by taking valid assumptions.

C. Fluid dynamics:

Fluid dynamics is constituted by mainly two sub disciplines, aerodynamics and hydrodynamics. In this area, observations are done in macroscopic level. The continuum hypothesis is considered that is we consider the bulk behaviour of the fluid by assuming that the fluid continuously distributed in a given space. Our work is to investigate the effect of different parameters in the heat and mass transfer flow. All kind of flow follows the law of conservation of energy and momentum. The Navier-Stockes equations describe these properties of the motion of the fluid. Our work is to study the flow of fluid in different environments like isothermal plate, ramped plate, porous medium, free convection, forced convection etc.,with different kinds of fluid like viscous, non-viscous etc.; in different types of flow like steady, unsteady etc.and under different characteristics like fluid pressure, density, mass, mass diffusivity, thermal diffusivity, viscosity etc.

D. Fuzzy set theory and its application:

The set whose boundary is not sharp or precise has been studied by the notion of fuzzy set and its logic introduced by L. A. Zadeh in 1965. It is worth mentioning that this notion originated a new theory of uncertainity, distinct from the notion of probability. We have applied the concept of fuzzy theory on the development of a mathematical model based on the phylogenetic relationship among the biological sequences. During the study, we developed a fuzzy code technique for molecular phylogenetic analysis. This proposed theory has potential to encode or decode information related to the evolution of sequences traversing from one stage to another in phylogenetic trees. Now, we are working on the development of a mathematical model for the construction of the phylogenetic tree of nucleic acid and protein sequences without sequence alignment and compare it with the tree built using alignment method such as clustalW or Muscle for validating our model.

E. Pattern Recogination and Machine Learning:

Pattern recognition (PR) and Machine Learning (ML) can be viewed as an attempt to automate parts of the Data Analysis methods. Pattern Recognition aims at providing technical system with the capability of reacting purposefully to a situation and to signals coming from environment. Pattern Recognition is a two-fold task, namely developing decision rules based on previous knowledge and using it for taking decision regarding unknown pattern. Learning problem is the problem of choosing the desired dependence on the basis of empirical data. Recent study shows that conventional segmentation techniques do not provide high accuracy result. Nowadays Deep Learning (DL) algorithms (Convolutional Neural Network) are demanding topic of research in computer vision forum and are better than conventional techniques as they do not involve segmentation and yet gain better efficiency. Fig 3.2 Depicts the methodology.

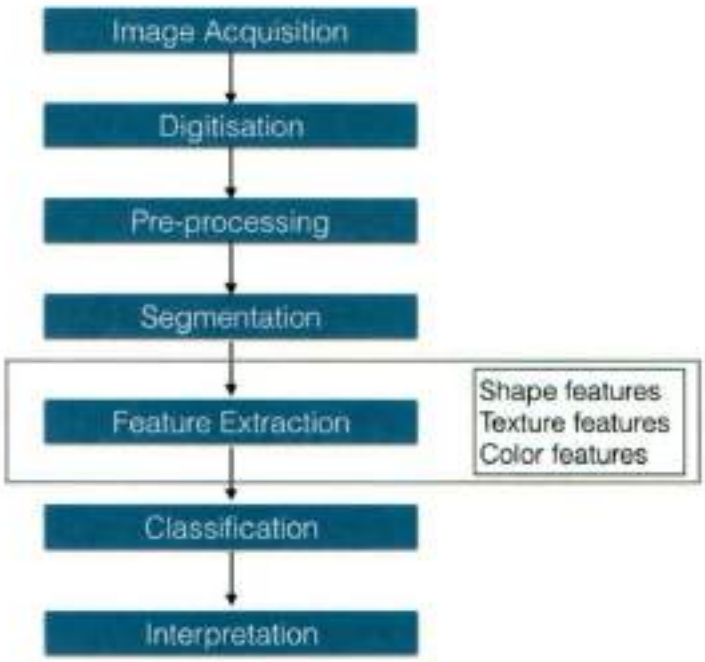


Fig. 3.2. Standard Image Processing and Pattern recognition methodology.

The work in CCNS by the group involved in Image processing and Pattern Recognition are carrying out research in various domain of medical images. These images either fall into the category of pathological images or radiological images, i.e. images collected from results of the respective tests. Pathological tests

are again either of histopathological nature (i.e. involving tissue samples) or cyto-pathological (i.e. involving cells). The tests of these category involved in our research are Papsmear, Fine Needle Aspiration Cytology (FNAC) and Biopsy. The tests involved in the other category, viz. radiological, are non-invasive and very common. The images of these nature involved in our study are Mammography and CT.

Again the domain of disease being concentrated on presently is Cancer, as medical tests are an inherent part of this disease treatment from treatment start to end. It is used not only to diagnose the disease but also in later stages of clinical management. Timely and accurate detection and diagnosis are vital to the prolonged survival of the patients. In fact, tests are most effective when conducted for cause of early detection.

With this motivation the team is working on developing PR algorithms based on ML and DL techniques for various areas of the human body. The selections of these areas are done either because these domains are most prevalent or because it involves a domain for which are automation is urgently needed. These researches fall into the category of inter-disciplinary studies as a deep understanding of the cell, tissue and tumour structure and their progress is a must to incorporate that knowledge into the algorithms. In this process hand-holding is the only means between the technical group and group of pathologists/ radiologists/clinicians.

The team has been able to successfully develop algorithms, using various techniques, in areas of cervix cancer Papsmears (for both conventional and liquid based cytology (LBC) method), biopsy of the oral area, biopsy of central nervous system (CNS) tumours of the category medulloblastoma (which occur mainly in children), CT of lung, FNAC of breast. Separate studies and development of separate algorithms becomes necessitated because the pattern of the cell, tissue and finally tumour is different as the disease progresses or for different parts of the body. Fig 3.3 illustrates a study on cervical cancer using Papsmears (conventional method).

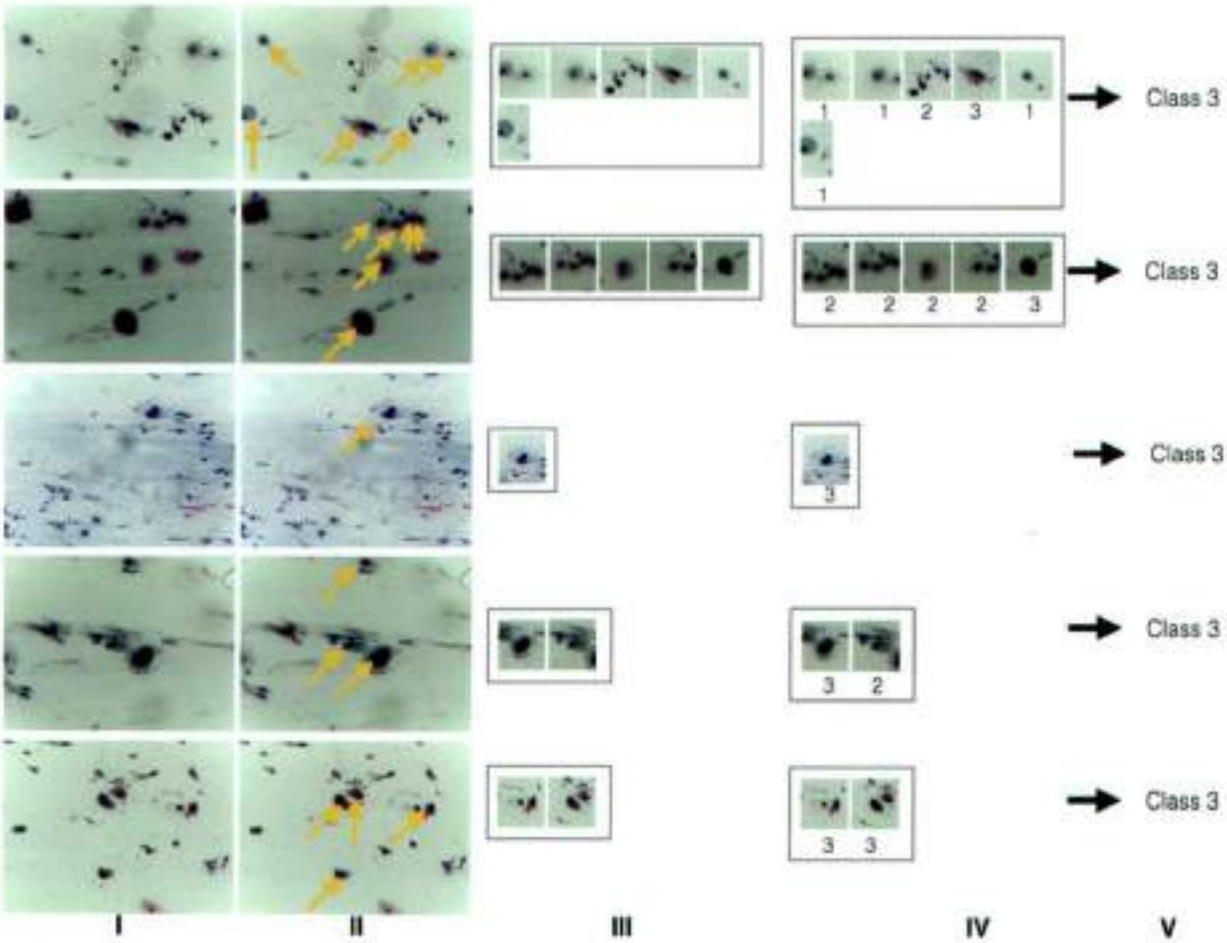


Fig.3.3. Column I contains the original image, Column II contains the ground truth image, Column III contains the cells identified by PapScanner (the software developed in IASST), Column IV is the classifier output of the individual cell and final column gives the final class of the query image (HSIL in this case).

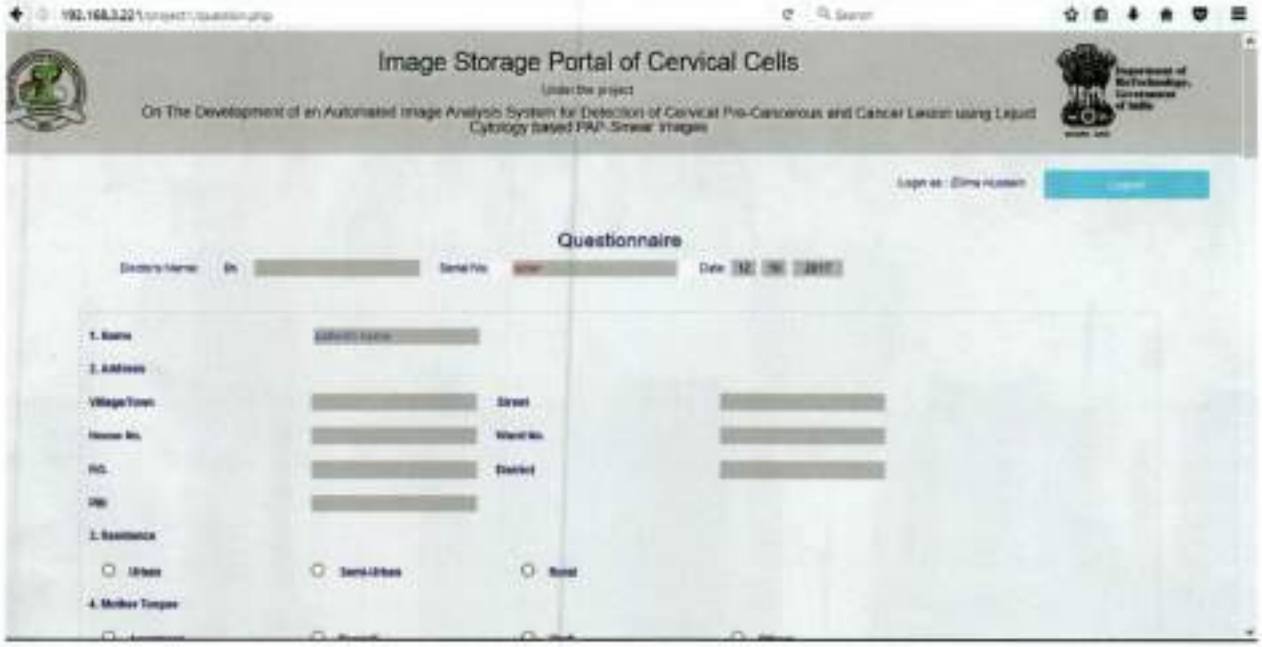


Fig. 3.4. Screenshot of proposed portal for Image Storage.

Again, Fig. 3.4 showcases a portal created for cervix cancer Papsmear (LBC method) images created for future use in public domain. To carry out the studies the team is specially focusing on images collected indigenously, in collaboration with various prominent health institutions of the city, namely B.Borooah Cancer Research Centre, Gauhati Medical College and Hospital, Ayursundra Healthcare Pvt. Ltd. etc., apart from using the databases available in public domain. The team is also focusing on development of databases of the images collected in a systematic manner, viz. feature statistics, diagnostics details etc. which can be used by all interested scientists or physicists either for learning, discussing or for any scientific research.

Bio-statistical approach for detecting breast cancer: Using the tools of statistics, biostatisticians help answer pressing research questions in medicine, biology and public health. An approach has been taken to apply statistical techniques to categorise the measurement of benign and malignant features in FNAC samples of the breast, from patients suspected of breast cancer. The main objective of this study is to utilize the Pearsonian system of curves to identify the family of distribution for the morphological features which are used to quantify the dysplastic changes of nuclei. In FNAC diagnostic techniques, the changes in terms of shape and size of nuclei play an important role in dysplasia detection of a cancer cell. Pathologists consider these changes as important features to study abnormality.

In the benign group,

- Area of a breast cell nucleus follows the Type II probability distribution,
- perimeter follows Type VII and
- ? circularity follows the Type IV.

In the Malignant group,

- ? Area of a breast cell nucleus is characterized by Type I family of distribution,
- ? perimeter by Type IV and
- ? circularity by the Type VII family of distribution.

It suggests a possible basis for the development of more realistic bio-statistical models in the presence of deviations from normality of the distributions of cell nucleus and its implications are applicable for the design of diagnostic strategies for breast cancer management. Visual observation from the plots of the probability curves also confirms the difference of characteristics for different morphological features between the two groups of breast cell. It is hoped that the findings of this work will be useful for the practitioners in various fields of theoretical and applied sciences and that it may serve as computational basis for the computer scientist in the development of cancer diagnosis technique.

Biodiversity and Ecosystem Research

1st row (L to R): Dr. Debajit Thakur, Associate Professor- I; Dr. Mojibur R. Khan, Associate Professor-I; Dr. N.C. Talukdar, Professor; Dr. Suresh Deka, Professor; Dr. Arundhuti Devi, Associate Professor-I; Dr. Soumyadeep Nandi, Ramalingaswami Fellow.

2nd Row (L to R): Shabiha Nudrat Hazarika, JRF; Rajkumari Mazumdar, Project Technical Assistant; Chingakham Juliya Devi, CSIR-JRF; Madhurankhi Goswami, JRF; Manashi Das, SRF; Dr. Ananya Barman, DBT - RA; Juri Saikia, JRF - RGNF; Satapdi Saha, JRF; Bithorai Basumataory, JRF; Parijat Saikia, NPDF; Rictika Das, DST DISHA.

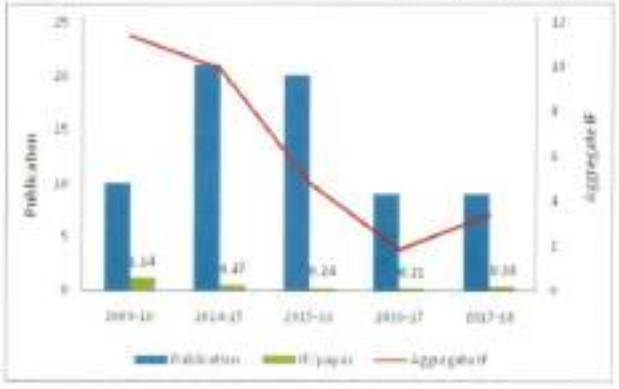
3rd Row (L to R): Mehjabin Ali, Project Assistant; Chandana Malakar, DBT- JRF; Atlanta Borah, JRF; Ranjita Das, JRF- RGNF; Sujata Deka, JRF; Tulsi Kumari Joishy; SRF DST-INSPIRE; Dr. Madhusmita Dehingia, Research Associate; Shantanu Das, JRF; Debyayan Deb, JRF; Dr. Atanu Adak, Research Associate.

4th Row (L to R): Anupam Bhattacharya, Research Associate; Dr. Bhaskar Das, NPDF; Arun Kumar, DBT - JRF; Khanindra Sharma, JRF; Arjun Karke, Project Assistant; Dr. Kaustuvmani Patowary, DBT - RA; BhuwanBhaskar, JRF; Anwar Hussain, Research Associate; Dr. Kaushik Bhattacharya, NPDF; Dr. Kamal Das, DBT-RA; Dr. Rinkumoni Kalita, NPDF.

Summary

Scientist (Core):	5 (M:4 F: 1)
Ramalingswami Fellow:	M: 01
DST INSPIRE Faculty:	M: 01
NPDF/RA/ DST Women Scientist:	17 (M:13, F:04)
SRF/JTF:	32 (M:06, F: 26)

Ph. D. awarded:	8
Referred Journal Publications:	15
Cumulative Impact Factor:	37.701
Extramural Project:	Complete 1, Ongoing 8
Invited Scientific/Chief guest/ Guest of honour lectures:	4
Conference presentation awards:	4
Scientific manpower joined IASST for other national organization:	4
Scientific manpower joined other national organization from IASST:	7



Bio-diversity & Ecosystem Research

The program includes a wide array of research opportunities in the domain of sericulture/seribiotechnology inclusive of diversity of silkworm moth, effect of anthropogenic activity in ecosystem and environment on health of microorganism and higher organism within it, restoration of disturbed/polluted ecosystem. Other areas of research under BER are understanding range of diversity of bacteria in crop seeds and its role in different crop development stages, role of genetics, diet and geography on human gut microbiome and its health and microbial prospecting for alternate energy

A. Microbial diversity and interactions in ecosystem

A. 1. Bacterial diversity inside surface sterilized seeds of *Oryza sativa* var. Kolajoha, *Vigna radiatavar.* Pratap, *Lycopersicum esculenta* var. Podali:

As many as 70 morphologically distinguishable isolates of endophytic bacteria in surface sterilized seeds (SSS) of Kolajoha rice were obtained on nutrient agar (NA), Jensens media (JN) and Pikoskaya's agar (PKA) and based on Sanger sequencing of 16SrRNA gene amplified products of individual isolate's genomic DNA bacteria, representatives of 14 genera and 29 species were detected. Results of next generation sequencing analysis carried out for the bacterial endophytic diversity based on 16SrDNA region revealed that Bacterioidetes, Proteobacteria, Firmicutes and Cyanobacteria were the most dominant phyla in Kolajoha rice seeds at 27%, 27%, 16% and 8%, respectively. Culture based 30 isolates of endophytic bacteria in surface sterilized seeds of green gram variety Pratap were representatives of 8 genera and 21 species which were lower than those of Kolajoha rice. Sanger sequencing data for green gram showed dominance of two bacterial phyla namely, Proteobactertia and Firmicutes out of the total 7 phyla (Fig. 4.1).

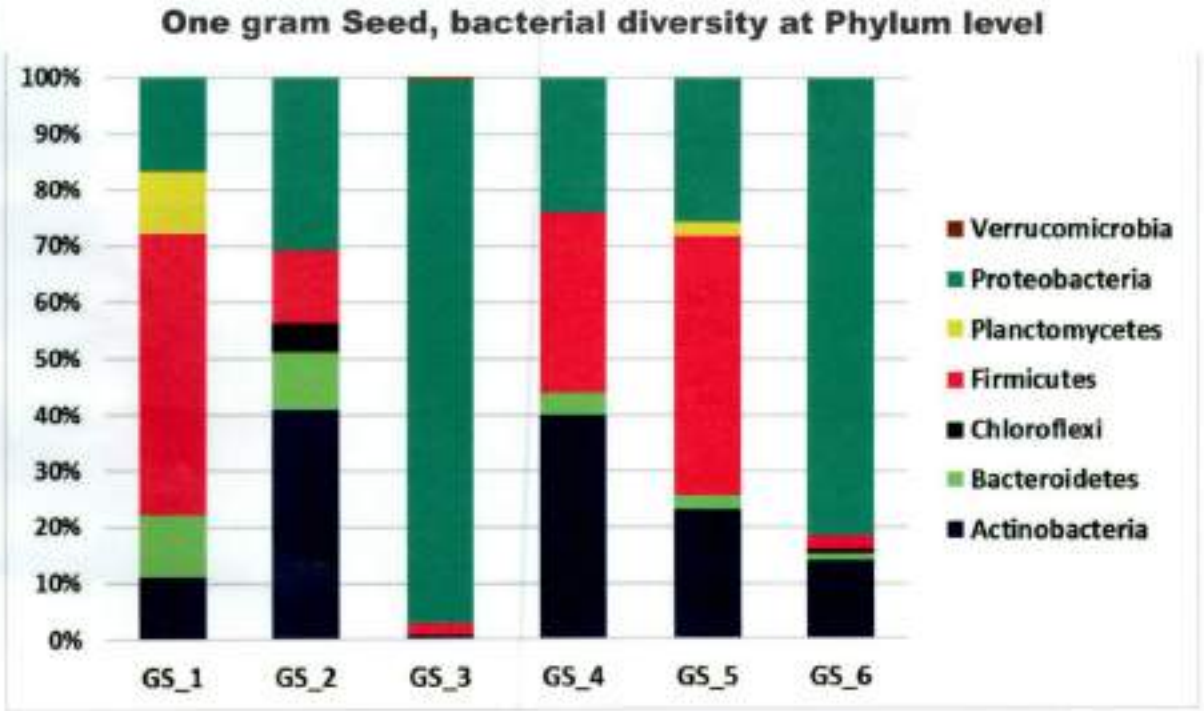


Fig. 4.1. Variation in distribution of seven endophytic bacterial phyla seen from next generation sequencing analysis carried out for the bacterial endophytic diversity based on 16S rDNA region in composite bacterial genome extracted separately from six lots of 1 gram seeds of green gram (Vigna radiata var. Pratap). This data clearly suggest that seed to seed diversity of endophytic bacteria is common in nature.

A. 2. Successional pattern of endophytic bacterial phyla in SSS seeds and seedling at two growth stages of Kolajoha:

A distinct successional pattern of endophytic bacteria in 10 representative phyla was observed (Fig. 4.2) through analysis of next generation sequence data from surface sterilized seeds (SSS) and SSS origin seedlings at 5 and 15 days showed variation in the community in growth stages of rice. This data suggest that during different growth stages, Kolajoha rice plants allow proliferation of specific bacteria which might possess attributes for supplementing plant physiological functions specific to requirement of particular growth stage.

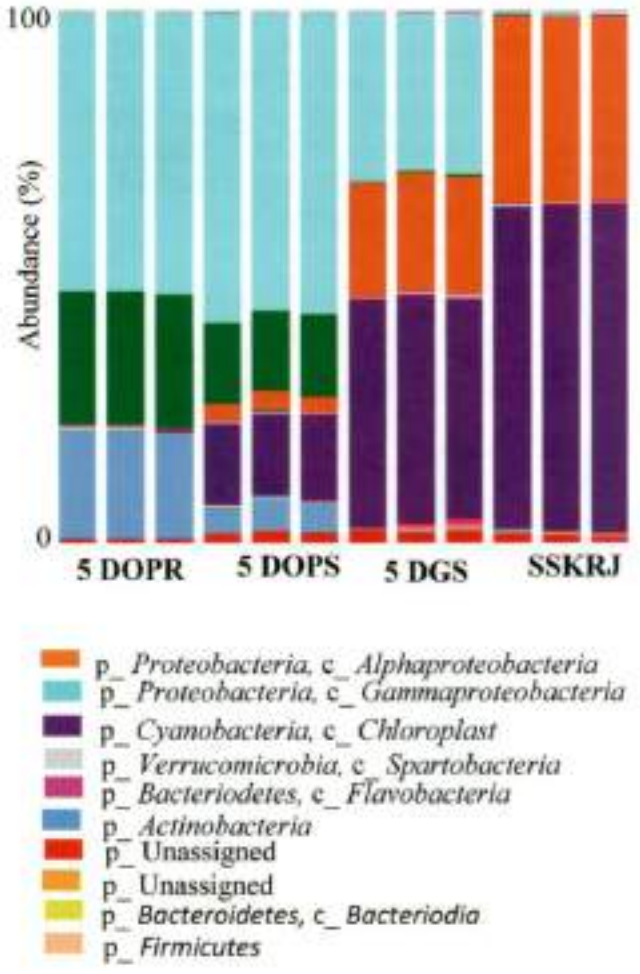


Fig. 4.2. Relative abundance of top 10 bacterial phyla from all the OTUs in different parts of the Kolajoharice at three different time intervals: 0th day surface sterilized Kolajoha rice seed (SSKJRS), 5th day germinated seeds (DGS) and 15th day old plant shoot (DOPS) and 15th day old plant root (DOPR) grown in sterile Hoagland solution under aseptic condition. Please note that the length of the color bar indicates relative abundance of a bacterial phyla and change in color bar at different stages indicate dynamics of endophytic community. The communities, which were abundant in seeds vanishes and the growing plant promotes proliferation of different bacterial phyla.

A. 3. Can beneficial and harmful bacteria colonizer of animal gut colonize plant:

In view of common occurrence of food poisoning from intake of harmful bacteria infected vegetables through plant route, controlled environment experiments are being carried out in IASST to determine (1) whether a plant pathogenic bacterium colonizes tomato plants and can produce toxic substances of non-plant origin and (2) whether beneficial probiotic bacteria such as *Lactobacillus* can colonize rice plants. In experiments, conducted following Koch's postulates, it was found that *Staphylococcus scuieri* could colonize surface sterilized seed borne tomato plants. Furthermore, laser confocal microscopic image of tobacco cells in suspension culture showed that endophytic bacterial population could be reduced by using cocktail of antibiotics of carbanicillin and streptomycin (Fig. 4.3).

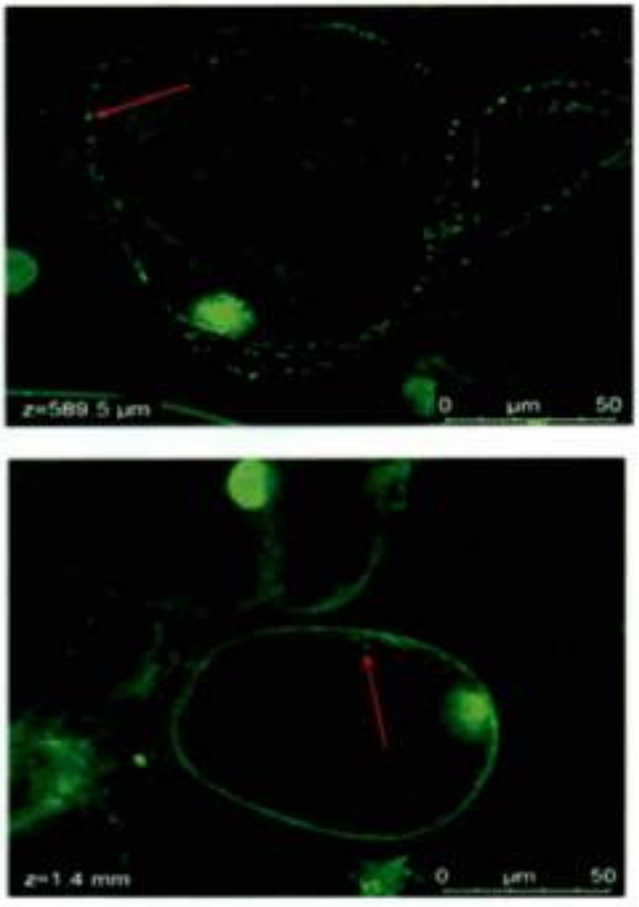


Fig. 4.3. Confocal microscopic image of Bacteria in cells in suspension culture of tobacco treated with cocktail of carbanicillin and streptomycin at 0 (left) and 20 ppm (right) concentration of each. Live/Dead bacterial staining kit L7012 was used to visualize endophytic bacteria. The Syto9 stain used in this study is permeable to membrane and it is also to bind mitochondrial DNA besides bacterial cells. However, bacteria remain confined to periphery between cell and cell membrane. Please note the reduction in number of bacteria in periphery of cell of antibiotic treated suspension culture.

The goal is to produce endophytic bacteria free/reduced bacterial load carrying plants through callus/suspension culture and study interaction by inoculation with mouse gut origin pathogenic bacteria. Interaction of human probiotic *Lactobacillus* sp. with rice plants was attempted in another experiment and as a first step GFP tagged clones of E. coli are generated and used successfully to colonize rice plants (Fig. 4.4). Subsequently, Lactobacillus strains will be tagged with GFP markers and inoculated into SSS borne rice plants for confirmation of its colonization ability inside and interaction.

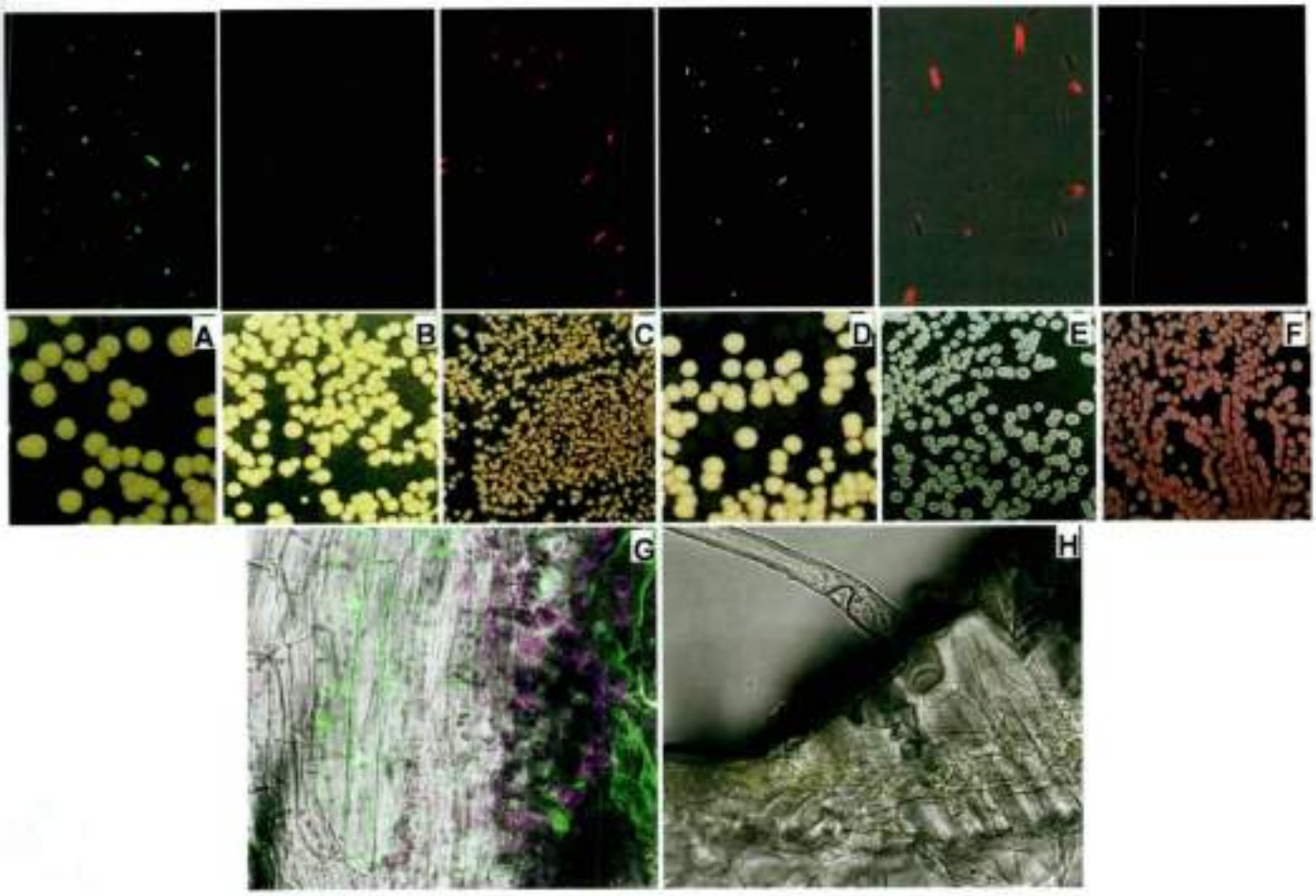


Fig. 4.4. Colonies of *Escherichia coli* strains JM109 and Dh5 a transformed with fluorescent protein expressing vectors, (A) pGFP, (B) pAmCyan, (C) pDsRed2, (D) pZsYellow, (E) pE2Crimson, (F) pmCherry and their differently colored corresponding cells visualized by confocal microscopy on the top row. Successful colonization of E. coli JM109 and DH5a expressing, Cherry (G), Green (G) and Yellow fluorescent protein (H) in roots of seven day old Maguribao variety seedlings of rice.

A. 4. Support of bacterial diversity to crop in Jhum cycle agro-ecosystem:

Based on the preliminary knowledge on the distribution of bacteria in rhizosphere, a detail investigation was carried out on the culture independent bacterial diversity in specific niches of rhizosphere of crops grown in Jhum cycles of different duration and interesting results were recorded. Jhum agro ecosystem, also known as shifting agriculture involves cutting and burning of a forest in March/April and growing mixed crops for consecutive two seasons and leaving the land fallow for varying duration before resuming burning and farming again. Shorter fallow period in Jhum agroecosystem subject the cultivated crop and the ecosystem to stress condition. Culture dependent bacterial population diversity in strongly adhered and loosely adhered rhizosphere soil of crops grown in shorter Jhum cycle field was more than those in longer cycle's field crops (Fig. 4.5). This diversity pattern suggests that under stress condition, a plant might attract more bacteria towards root surface from soil for its growth and development. The higher population and diversity of bacteria in a stressed soil might be due to deposition of higher quantity of organic carbon. Analysis of strongly adhered

rhizosphere (SARs), loosely adhered rhizosphere (LARs) and bulk soil (BS) of crop of Jhum cycles by CHNS analyser showed higher amount of C content in rhizosphere of crops in short duration Jhum cycle compared to those in longer duration Jhum cycle. In 2008, van der Heijden put forward a hypothetical relationship between nutrient status in soil and microbial contribution to plant productivity. Microbes were hypothesized to be most important for the productivity of nutrient poor ecosystems. It was also hypothesized that microbial diversity is negatively correlated with nutrient status. Higher the nutrient content in stable soil system, lower the microbial diversity. The current data on level of bacterial population and diversity in rhizosphere of crop in the stressed agroecosystem of 5 year Jhum cycle which are nutrient poor provide support to this hypothesis. Interestingly, it was also observed that application of a bacterial consortia of *Enterobacter hormaechei* RCE-1, *Enterobacter asburiae* RCE-2, *Enterobacter lundwigii* RCE-5 and *Klebsiella pneumoniae* RCE-7to rice in 5 years of Jhum cycle field resulted in 25% and 21% grain yield increase in rice compared to 14% to 18% yield increase in 20 years of Jhum crop cycle field in two consecutive years. This result further supports that microbial contribution is more important for crop productivity in nutrient poor soil.

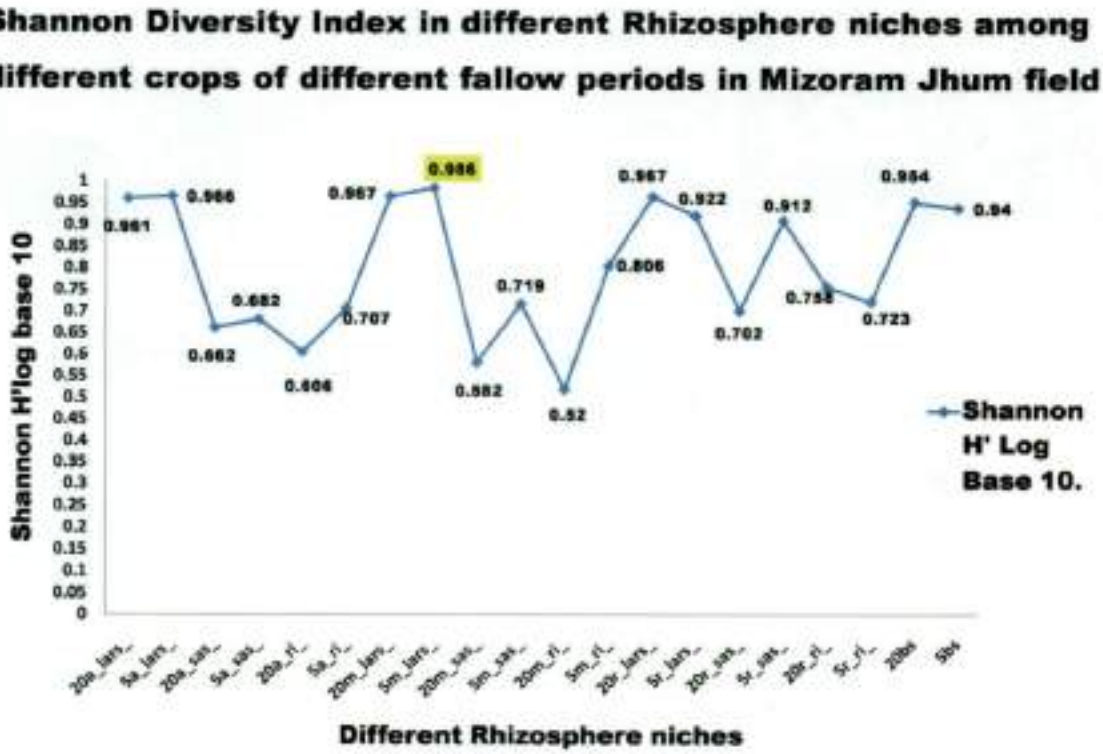


Fig. 4.5. Shannon diversity index based on next generation sequencing of 16S rRNA gene amplicon from metagenomes of rhizospheric niches of 3 crops of 5, 8 and 20 years jhum cycle crops. lars= loosely adhered rhizospheric soil, sas= strongly adhered rhizospheric soil, bs= bulk soil, r= rice, m= maize and a= arahar.

A. 5. Comparative assessment of carbon sequestration potential and livelihood sustainability of different indigenous land-use systems in Lower Assam, North East India:

A reconnaissance survey showed prevalence of forest, monoculture plantations and agroforestry systems as major land use systems in the Lower Assam, Brahmaputra Valley (Kamrup, Goalpara and Bongaigaon districts). Fifteen (15) different land use types sampled so far from the systems which include 8 different types of traditional agroforestry systems (pineapple, areca, cocoa, orange, broom, sandal dominated mixed agroforestry systems, jhumlands and traditional homegardens); 4 monoculture orchard systems (lemon, banana, papaya, ziziphus); 2 Fallowlands (jhum andabandoned forest) and Shorea robusta forest conserved by communities. Structure and composition of vegetation in different systems were studied. Dendrometric measurements of different vegetation compartments have been

erformed adopting standard methodologies. Quantitative estimation of different structural composition of the concerned ecosystems are in analytical stage. For development of allometric equations for plant biomass estimation individual plants of different size class and species have been harvested and sub samples are collected and dried using standard procedure. Biomass data and soil parameters including soil carbon at different depths (0-10 cm, 10-20 cm, 20-30 cm, 30-50 cm and 50-100 cm) of different systems will provide index of sustainability and recommendation for management intervention for livelihood sustainability.

B. Isolation of biosurfactant producing bacterial strains for general welfare of plants and treatment against human dermatophytic fungi

B. 1. Potentiality of biosurfactant producing microbes in plant growth promotion and plant pathogen elimination:

Biosurfactants are potential surface active agents known for its effective antifungal activity and ability to promote effective colonization of plant roots by plant growth promoting rhizobacteria (PGPR) in bioinoculants (both biofertilizer and biopesticide) based production of agricultural crop. Although, there are extensive research on PGPR derived from crop rhizosphere, PGPR potential of bacteria from hydrocarbon contaminated field colonized (HCFC) plant rhizosphere has not been investigated systematically. In this study, a total of twenty bacterial isolates were obtained from HCFC plant rhizosphere of several crops (*Cyperus bravifolius, Mimosa pudica, Cymbopogon winterianus, Ageratum conyzoides* etc.). The isolated bacteria were subsequently screened for biosurfactant production and plant growth promotion potential. The potential isolate *Bacillus altitudinis* MS16 (Genbank accession number: MG066459) showed significant antifungal (Fig. 4.6) and plant growth promoting activity *in vitro* (Fig. 4.7) and need further *in planta* study to evaluate its efficiency to be used as an alternative to chemical pesticide for sustainable agriculture.

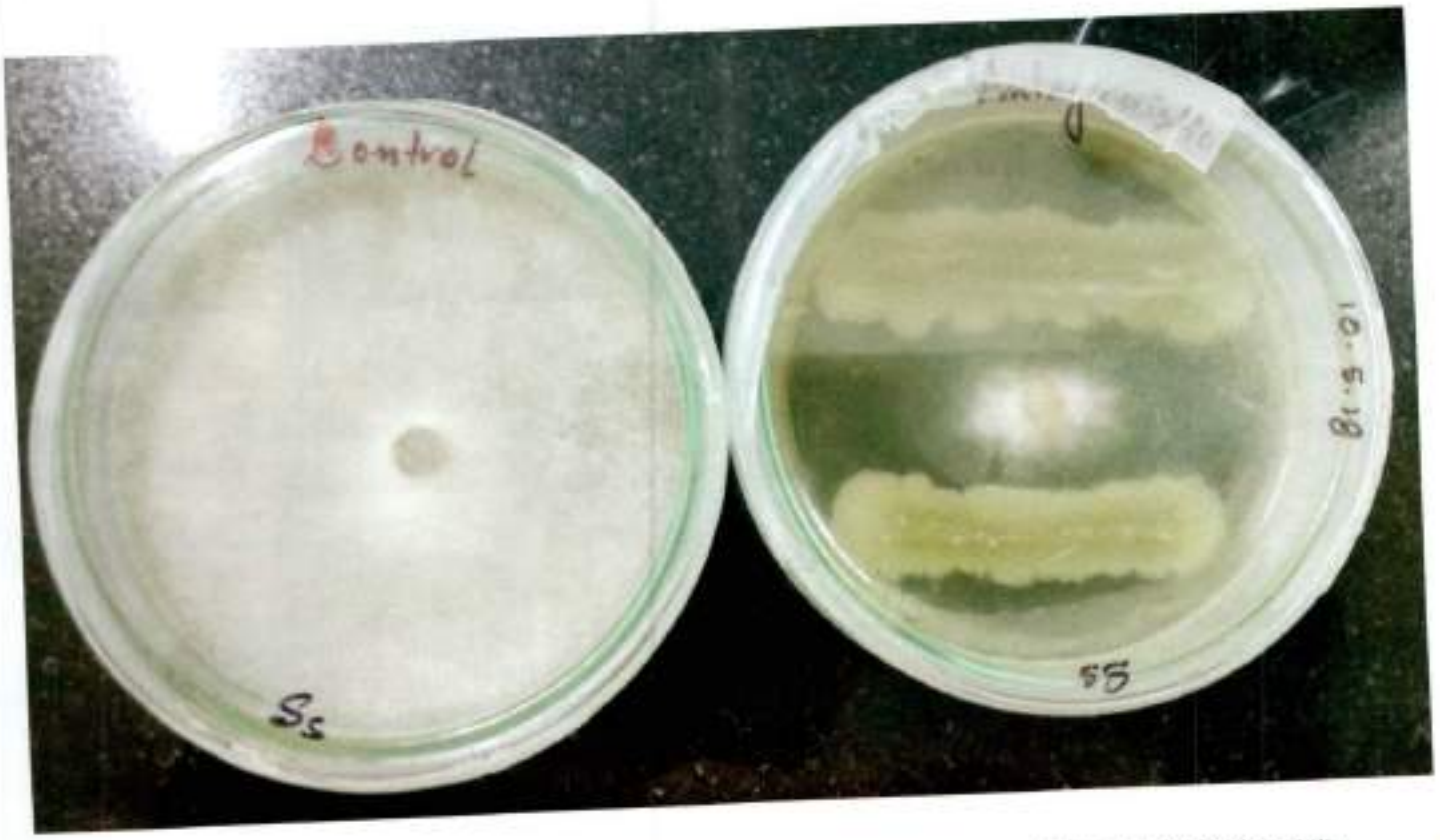


Fig. 4.6. Antagonistic activity of *Bacillus altitudinis* MS16 in dual culture plate assay. A 5 mm plug of Sclerotinia sclerotiorum grown on agar medium containing 1:1 ratio of Sabouraud dextrose agar (SDA) and Nutrient agar (NA) for 10 days without *Bacillus altitudinis* MS16 (A), whereas the growth of Sclerotinia sclerotiorum was inhibited on inoculation of *Bacillus altitudinis* MS16 on same media and same incubation period (B).

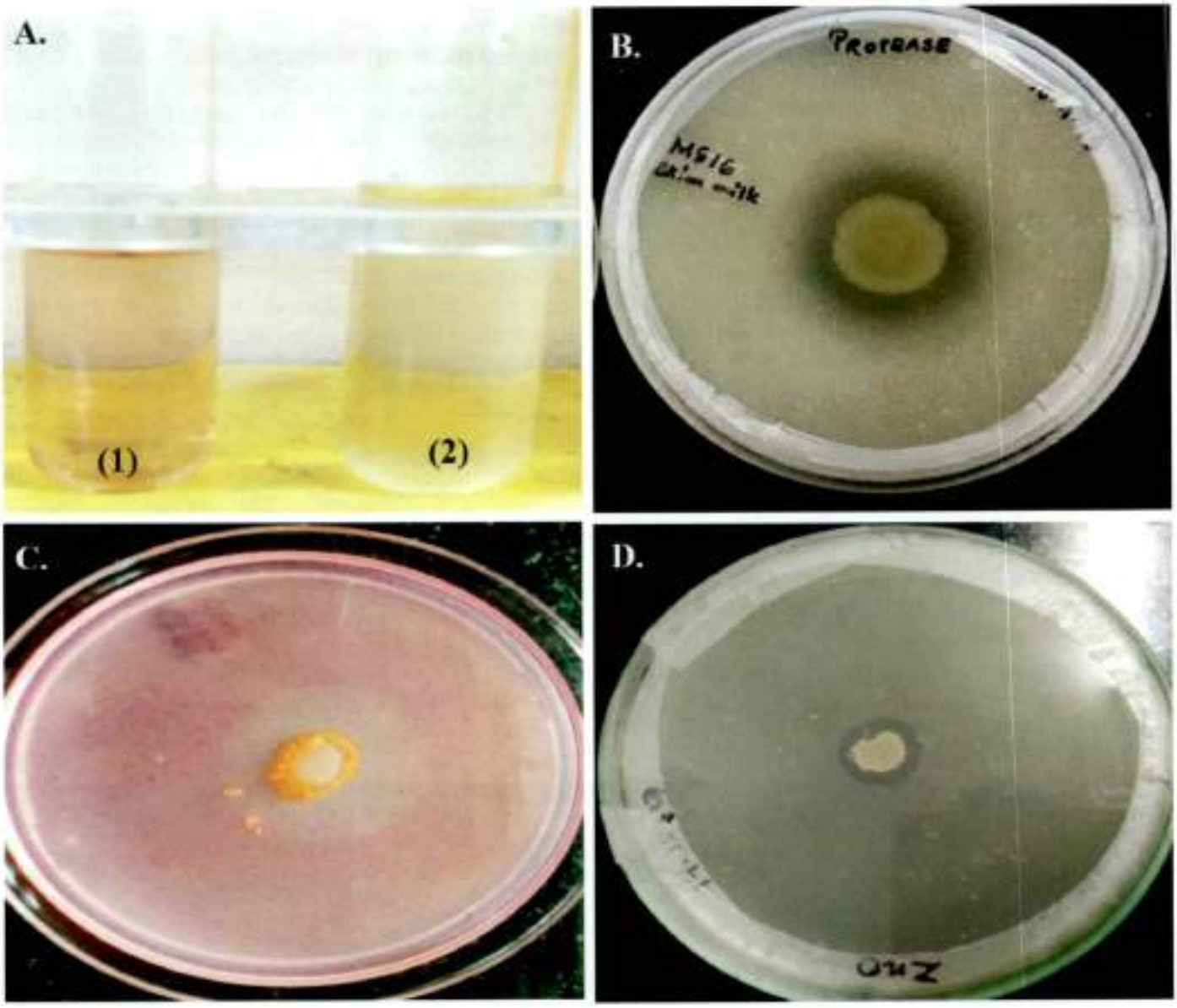


Fig. 4.7. Plant growth promoting activity of *Bacillus altitudinis* MS16. Indole-3-Acetic acid production (A) development of colour on addition of Salkowski reagent to cell free supernatant of *Bacillus altitudinis* MS16 (1), No colour development on addition of Salkowski reagent to sterile nutrient broth (2), Protease activity. Halozone observed around the bacterial colony after 48 h of incubation (B), Cellulase activity. Halozone observed around the bacterial colony after treatment with 0.01 % of Congo red (C), Zinc solubilization. Clear halo observed around the bacterial colony after incubation for 10 days (D).

B. 2. Rhamnolipid biosurfactant for treatment of dermatophytic fungal infection caused by Trichophyton rubrum:

Dermatophytic infections caused by *Trichophyton rubrum* is the most prevalent superficial mycoses worldwide. It accounts for more than half of all the incidences of fungal infections globally which makes the fungus important from the medical perspective. Also, increasing incidences of drug resistance and associated toxicity highlight the imperativeness of alternative treatment strategies. This work aims to evaluate the anti-dermatophytic effect of a rhamnolipid biosurfactant produced by *Pseudomonas aeruginosa* SS14 *in vitro* and in mice models. The effect of rhamnolipid on the spore germination and hyphal proliferation was studied in vitro. SEM and AFM studies of the effect of rhamnolipid on the hyphal morphology were conducted. The effect of the rhamnolipid on experimentally induced cutaneous dermatophytosis was evaluated in mice models. Results revealed that column purified rhamnolipid could effectively suppress spore

germination and hyphal proliferation at 500 µg/ml. In the mice model experiment, the rhamnolipid was effective in completely curing dermatophytosis at the end of 21 days treatment period which was comparable to the commercially available standard antifungal terbinafine. The results are suggestive of the effectiveness of rhamnolipid in control of dermatophytosis caused by *T. rubrum* (Fig. 4.8).

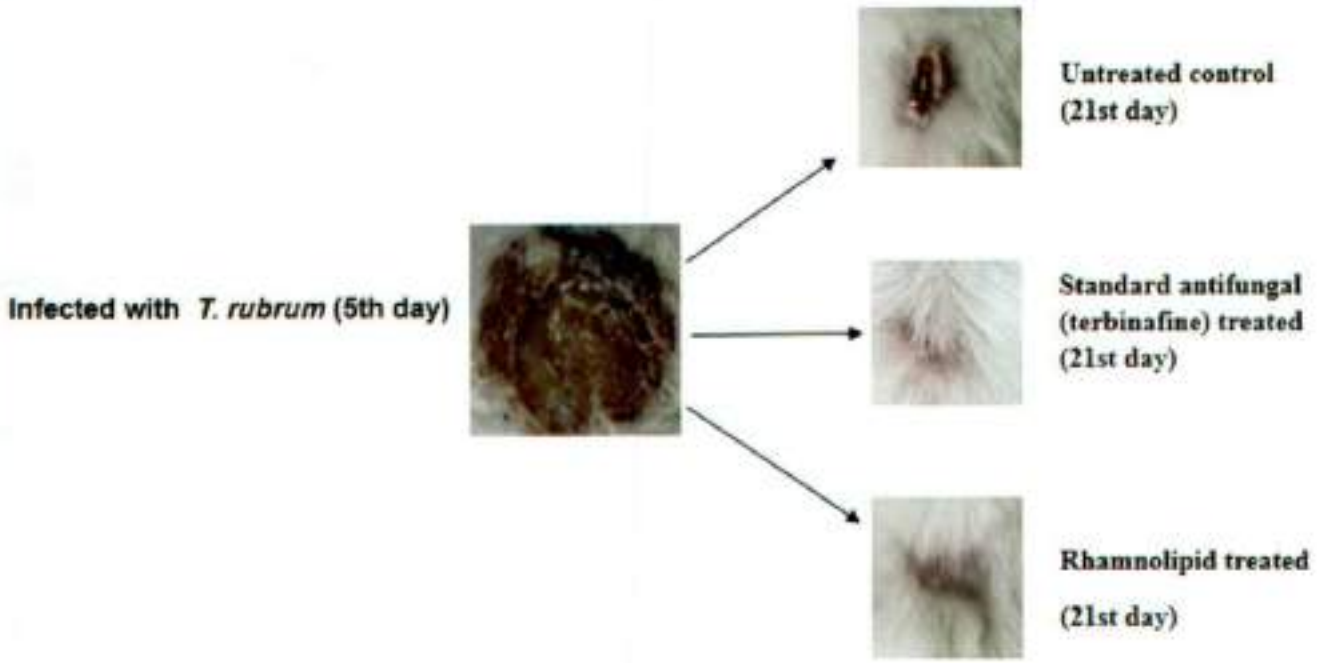


Fig. 4.8. Photographs representing suppression of cutaneous trichophytosis caused by *Trichophyton rubrum* in a mice model of experimentally induced dermatophytosis after treatment with rhamnolipid produced by *Pseudomonas aeruginosa* SS14 at 5th day and 21st day. Terbinafine served as the standard drug control. The infected mice were treated topically with 100 µl of RL/terbinafine solution at concentration 500 µg/ml for 21 days on daily basis. At the end of the 21 days treatment period, both the treatment groups (Terbinafine and RL) showed complete suppression of the infection in comparison to the untreated control.

C. Traditional dietary habits and human microbiome

C. 1. Rice beer: There has been a research interest in understanding the ingredients and attributes in traditional drinks and their implication in health of ethnic communities of different geographic locations. This research is exploring (1) rice beer fermentation process of various ethnic groups in the North-East of India in which various types of herbs are used and also (2) traditionally prepared products of NE India. Current focus has been to analyse microbial composition in starter cakes and beneficial secondary metabolites in the final drink. This will follow detailed quantitative integration on health benefits derived from regular consumption of such drinks. Research has been initiated to understand the microbial and metabolite profiles of the different varieties of rice beer and their probable effects on human microbiome and health (Fig. 4.9).

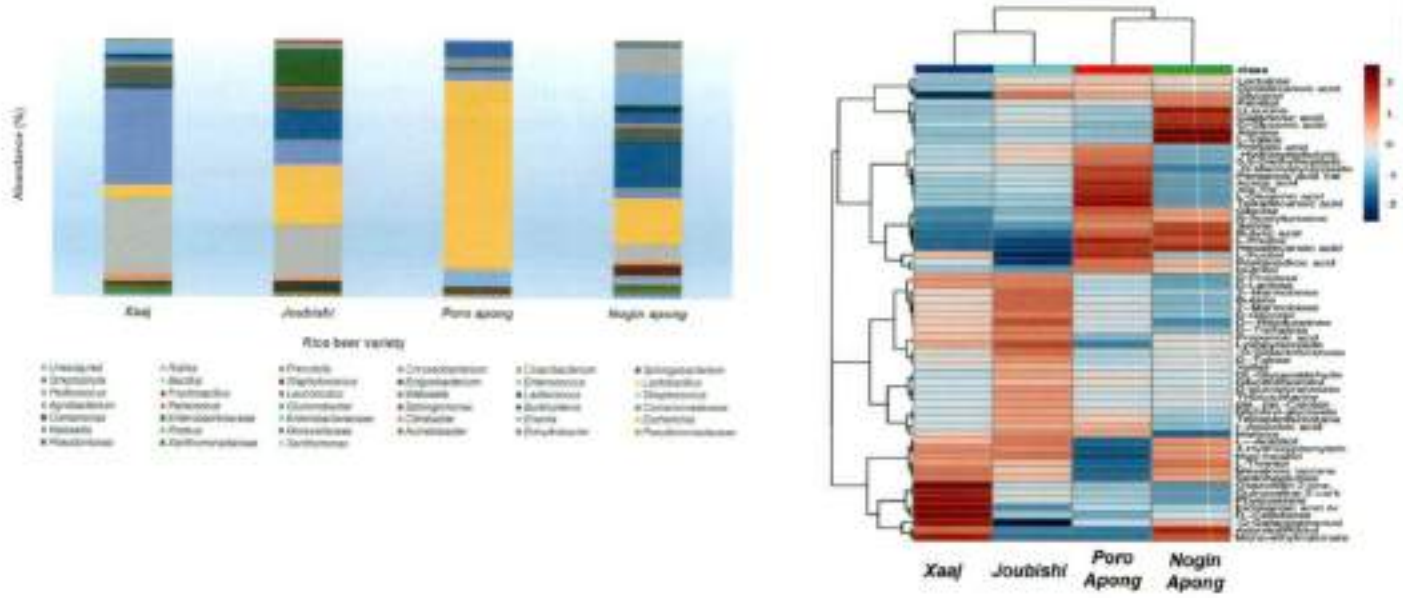


Fig. 4.9. A bar chart on the bacterial diversity of four different varieties of rice beer (A) and a heatmap of the major metabolites (B) indicate differences in the rice beer varieties.

A population based study was conducted on three rice beer consuming ethnic groups *(Mishing, Ahom and Bodo)* to study the effect of rice beer on gut microbiome and human health. A total of 570 volunteers participated in the study, which included both rice beer consumers (n=474) and non-consumers (n=96) (Fig. 4.10). Stool, blood and fecal samples of the volunteers are now being analysed to understand the role of rice beer on gut bacteria, stool and blood metabolites and health parameters (Fig. 4.11).

Fig. 4.10. Interactions with the volunteers during the study.

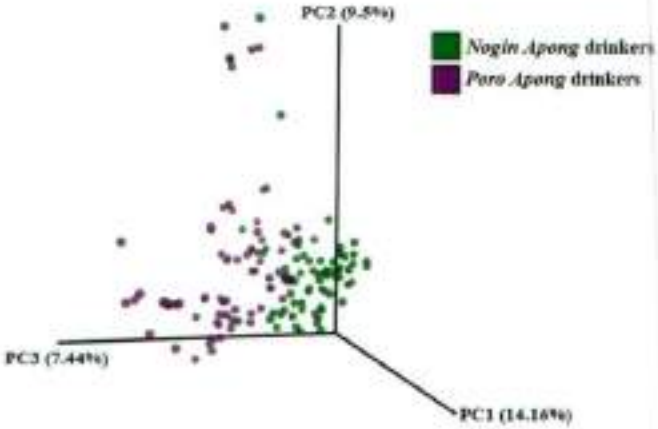


Fig. 4.11. A Principal Coordinate Analysis (PCoA) plot based on the gut bacterial profiles of the drinkers of the two varieties of Apong in the *Mishing* population indicates differences in their gut bacteria.

C. 2. **Dairy products:** Bovine milk and its products are widely consumed due to their nutritional and therapeutic values. Traditionally in Assam, people prefer curds prepared from raw milk over those prepared from boiled milk. We aimed to address the issue with the analysis of microbial diversity and metabolite profiles of these two types of curds (Fig. 4.12). Initial results indicate that the curds prepared from raw milk has more diversity of the bacteria under genus *Lactobacillus* than those prepared from boiled milk.

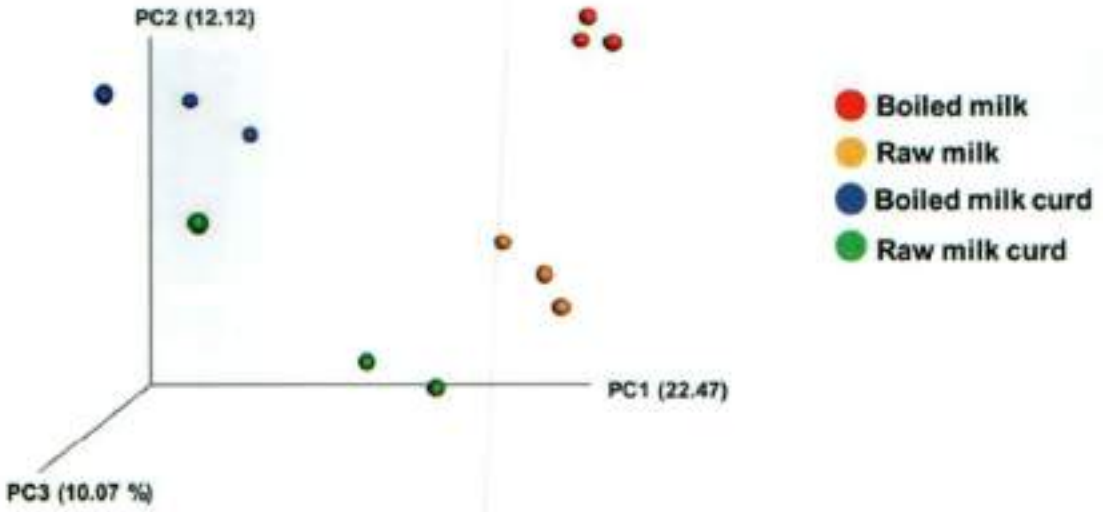


Fig. 4.12. Unweighted Principal Co-ordinate Analysis (PCoA) plot showing differences among the dairy products based on bacterial diversity.

C. 3. *In vitro* agarwood oil production

In our continuous effort to develop in vitro agarwood oil production technology in the cell culture of the plant *Aquilaria malaccensis* (Fig. 4.13), we have focussed on the genes of sesquiterpene biosynthesis and their regulation. A full length cDNA of farnesyl pyrophosphate synthase (FPS) gene, a primary gene expressed in the sesquiterpene pathway has been cloned into a pGEMT easy vector system and transformed into E. coli JAM109 (Fig. 4.14). The insert was sequenced and has shown to be a homolog of FPS genes. Currently, research is underway with pCambia1301 mobilized in *Agrobacterium tumefaciens* for overexpression in the callus.

Fig. 4.13. Development of callus culture of Aquilaria malaccensis.

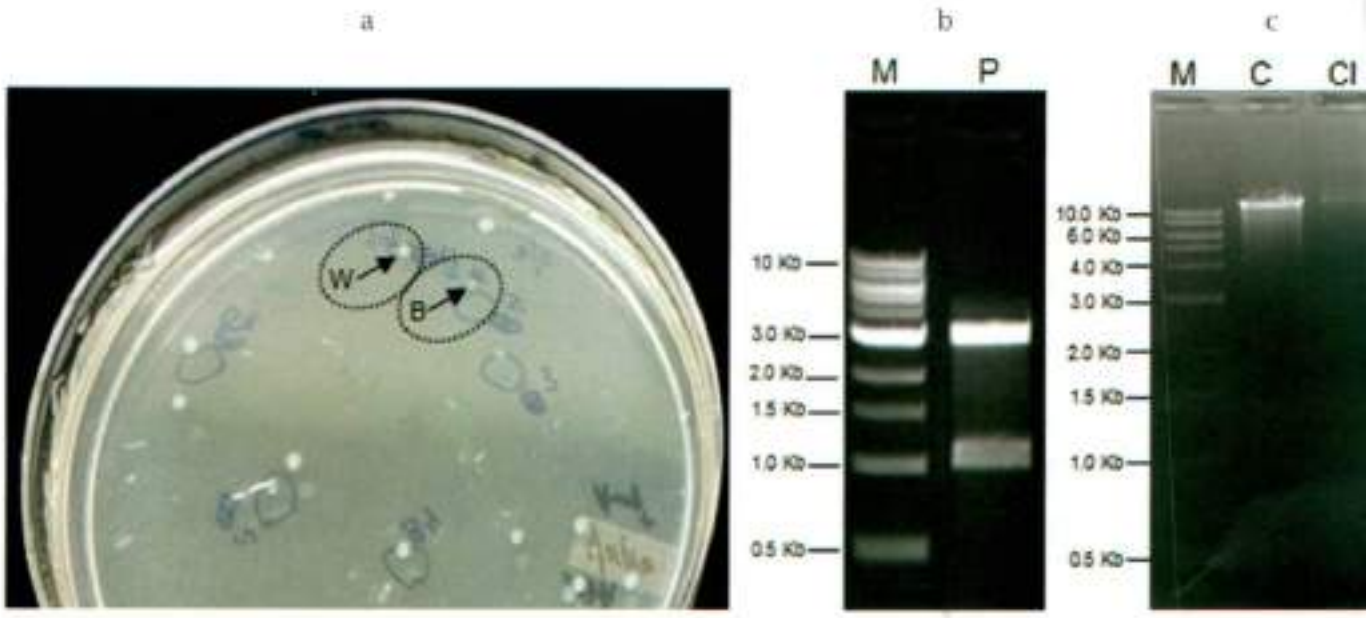


Fig. 4.14. (a) LB agar plate with transformed (W) and untransformed (b) JAM109 colonies. (b) pGEMT vector with fps ge (M-1 kb DNA ladder, P-Not1digested pGEMT vector). (c) pCAMBIA1301 vector (C-pCAMBIA1301 without fps gene, C pCAMBIA1301 with fps gene).

D. Phylogenetic and functional characterization of Tea rhizobacteria for growth promotion and disease suppression in commercial tea cultivars

Tea [*Camellia sinensis* (L.) O. Kuntze, family Theaceae] is an economically important, non-alcoholic caffeine-containing beverage crop cultivated for its leaf. The major tea growing areas in India are Assam, Darjeeling, the Nilgiri and other places in South India. The Darjeeling hill area represents a unique geo-environmental perception and tea is grown here at up to 2000 m above mean sea level. The quality, flavour, aroma and other important traits of Darjeeling tea are primarily attributable to its geographical origin. The climatic condition of the region also contributed to the inimitable flavour and aroma of Darjeeling tea. However, the geographical location and the climatic condition of Darjeeling are also congenial to different fungal diseases in tea plants. In addition, the regular use of chemicals as fertilizers, fungicides and pesticides in tea growing areas has indirectly had a negative impact on the environment. Therefore, there is an immediate need to reduce the use of chemical inputs for a sustainable approach to tea cultivation. The study of plant growth promoting rhizobacteria (PGPR) is relatively advanced in different agricultural crops, however, research on this bacterial group associated with the tea crop still requires further study.

In our study, the indigenous tea rhizobacter were isolated from seven tea estates Darjeeling located in West Bengal, India (Fi 4.15). One hundred fifty isolates were screene for antagonistic activity against six differe plant fungal pathogens i.e. *Nigrospor sphaerica* (KJ767520), *Pestalotiopsis theae* (ITC 6599), *Curvularia eragostidis* (ITCC 642 *Glomerella cingulata* (MTCC 2033), *Rhizocton solani* (MTCC 4633) and *Fusarium oxysporu* (MTCC 284), out of which 48 isolates we antagonist to at least one fungal pathogen use These 48 isolates exhibited multifariou antifungal properties like the production siderophore, chitinase, protease and cellula and also plant growth promoting (PGP) trai like IAA production, phosphate solubilizatio ammonia and ACC deaminase production (Fi 4.16). Amplified ribosomal DNA restrictio analysis (ARDRA) and BOX-PCR analysis base genotyping clustered the isolates into differe clades. Finally, four isolates, namel *Brevibacillus agri* strain TTD5, *Aneurinibacill aneurinilyticus* strain TTD21, *Sporosarcin koreensis* strain BT22 and *Bacillus megateriu* strain NT5, were selected for plant growt promotion study in two tea commerci cultivars TV-1 and Teenali-17 in nurse conditions (Fig. 4.17). The plant growt promotion study showed that the inoculation consortia of these four PGPR isolate significantly increased the growth of tea plant i nursery conditions. This study underlines the

importance of the functionally efficient rhizobacterial population associated with commercially cultivated tea plant in Darjeeling district, West Bengal, India. Microbial based bio-formulation containing this sort of PGPR can be used for sustainable tea cultivation in tea growing areas. However, different multi-locational field trials and the interaction of these PGPRs with other native soil microflora have to be evaluated in future to establish these PGPRs.

Fig. 4.15. Map showing the location of sample collection sites for the isolation of Tea rhizobacteria.

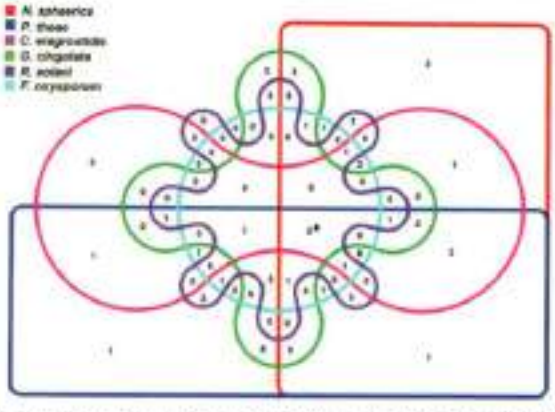


Fig. 4.16. The Venn diagram shows the distribution of 48 antagonistic rhizobacterial isolates into 6 profiles which are representing the 6 test fungal pathogens. (*2 isolates showed antagonistic activity against all the test fungal pathogens).

Figure 4.17: Evaluation of different treatments of PGPR in ?eld experiment at Kopatic tea estate in TV-1 and T- 17 tea clones- (A) and (B) 6 months old tea plants with PGPR inoculation. (C) and (D) the tea plants after 6 months of PGPR inoculation. (E) Showing Shoot and root length and number of the leaves of control, commercial fertilizer and treatment11 harvested tea plants after 6 months of treatment. Experiment details: Figure (A, B) The equal sizes of six month old tea clones were selected for this experiment and the clones were maintained in polyethene sleeves of size 15- 17.7 cm lay?at, 20-25 cm long and 150 gages thick. The experiment was designed in blocks and there were total 13 blocks. The blocks were made by bamboo. There were 13 different treatments for 13 blocks including one block for commercial fertilizer and one block for the untreated control plants. Each block had total of 30 plants in three replicates i.e., one replicate had 10 tea plants. Figure (C, D) Showing the plants after 6 months from treatment. The plants were harvested after 6 months and growth parameters were observed

E. 1. Developing a biosorbent from shell of *Euryale ferox* Salisbury for removal of basic fuchsin dye

Euryale ferox Salisbury is an environmentally and economically important wetland macrophyte. We investigated the adsorption of a carcinogenic dye, basic fuchsin in the aqueous phase onto the seed free hard shell (SFHS) of *E. ferox* so as to establish the thrown away residue as a novel, efficient, biofriendly and economically low-cost alternative adsorbent against other expensive adsorbents. Bioadsorbent was characterised by TGA, SEM, FTIR and Zetasizer analyses. The operating variables such as adsorbent amount, adsorbate concentration, contact time, pH and temperature were optimized in a batch system. SFHS was stable in a wide range of pH. The zeta potential measurements indicated that the material developed a negative charge at pH > 1.0 and therefore is suitable for adsorptive removal of cations (dye) from aqueous phase. The maximum biosorption capacity of *E. ferox* was found to be 19.48 mg/g. SFHS powder was successful in removal of 97.4% of the dye from 40 mg/L aqueous solution at 298K (Fig. 4.18).

Fig. 4.18. Graphical representation of the adsorption of basic fuchsin dye by *Euryale ferox* Salisbury.

The interactions between the biomaterial and the dye cations have been shown to involve -OH groups of the material and NH/NH2groups of the dye with likely participation of =CO groups of the *E. ferox*. The process has been found to be exothermic and spontaneous accompanied by considerable decrease in enthalpy, entropy and Gibbs energy of the process. Of the different kinetic models used, it was found that the interactions conform to a pseudo-second order model indicating that the dye cations may be held to the biomaterial surface through more than one site. The adsorption data fitted both Freundlich and Langmuir isotherms suggesting chemisorption of the dye cations on *E. ferox* followed by physisorption on the adsorbed layer. Our results confirmed that *E. ferox* residue biomass could be very effective in the removal of cationic dyes like basic fuchsin from aqueous medium.

E. 2. Oil exploration activities: Assessment of hazardous impacts on 'Golden silk' cultivation

North-East India, particularly Assam, is holding a unique position in India with regard to petroleum exploration and production. However, leakage of crude petroleum during drilling, transportation and storage is a common phenomenon in oil field areas. The released petroleum hydrocarbons and the heavy metals are likely to adversely affect the growth of plants in soils. The Muga silkworm (*Antheraea assamensis*) is an economically important insect, unique and endemic to the North Eastern Region of India, particularly Assam. Oil spills have degraded most of the Som (*Machilus bombycina*, the host plant of Muga silkworm) plantation in adjacent to the upper Assam oil fields of India affecting the production of silk cocoons. In the present study, aliphatic-aromatic hydrocarbons (AlArHs) were detected as pure or substituted forms in contaminated Som (*M. bombycina*) plant leaves collected from six sampling sites (Table 3). The AlArHs varied from 5.44 to 96.8 mg/kg during pre-monsoon and 10.7 to 125.4 mg/kg during post-monsoon period. The concentrations of three-ring PAHs were relatively higher while four- and five-ring PAHs were lower in plant samples. This may be due to two reasons: the volatilization of the low molecular weight PAHs is likely to bring them to the leaves much more easily than the high molecular weight PAHs and secondly, the latter also have low absorptivity. Further, detection of anthracene and phenanthrene in plant leave samples might be due to airborne fallout of polyaromatic hydrocarbons. Since *A. assamensis* is a very sensitive insect, the presence of anthracene and phenanthrene in *M. bombycina* plant leaves may affect its immune function and cause problems and abnormalities in the functioning of vital organs like kidney, liver, respiratory tract, lungs, and skin inflammation as are reported for animals. Thus, it can be inferred that increased mortality rate of *A. assamensis* may perhaps be due to the presence of PAHs in host plant.

Table 3: Aliphatic and aromatic hydrocarbons detected in contaminated *M.bombycina* plant leaves

Serial No.	Compound Name	Serial No.	Compound Name	Serial No.	Compound Name
1	m-xylene	11	Pristane	21	Heptacosane
2	Nonane	12	Octadecane	22	Octacosane
3	Decane	13	Phytane	23	Nonacosane
4	Undecane	14	Nonadecane	24	Hentriacontane
5	Dodecane	15	Eicosane	25	Phenanthrene
6	Tridecane	16	Heneicosane	26	Anthracene
7	Tetradecane	17	Docosane		
8	Pentadecane	18	Tricosane		
9	Hexadecane	19	Tetracosane		
10	Heptadecane	20	Pentacosane		

In the study, m-xylene was found in some of the leave samples which can be attributed to the naturally occurring m-xylene in petroleum which in turn was transported through air to the plant from nearby oilfields. Xylene is one of the most toxic volatile organic compounds (VOC) emitted by petroleum industry and is known to cause delayed ossification and behavioural effects in animals. Thus, from the present study, we can say that the deposition of hydrocarbons on the M. bombycina plant leaf surface is a result of flaring of natural gases near the *A. assamensis* plantation area.

Total carbohydrate in *M. bombycina* plant leaves ranged from 22.90-29.78% and crude protein content ranged from 10.94-27.14% which were found to be lower than the uncontaminated sample.Reduction in carbohydrate content in polluted plant leaves sample may correspond with a lower photosynthetic rate and higher energy requirements due to air pollutant such as heavy metals and hydrocarbons. Reduction in crude protein content of polluted plant leaf samples might be due to the enhanced rate of protein denaturation and break down of protein to amino acid. Presence of heavy metals in *M. bombycina* plant leaf samples would also interfere with crude protein resulting in decreased protein content.Continuous burning of pollutant matter like hydrocarbons and heavy metals & toxic gases and the resultant increasing temperature were the main reasons for reduction of all constituents of *A. assamensis* host plants.

F. Rhamnolipid biosurfactant coated Zero-valent iron nanoparticle: A credible approach towards potential petroleum hydrocarbon remediation

Rhamnolipid coated iron nano-particles (FeNPs) were synthesized using rhamnolipid obtained from the strain *Pseudomonas aeruginosa* KPDBT9. The produced FeNPs were characterized by XRD, FTIR, TGE, SEM and TEM analysis. The effect of different concentrations of FeNPs on the growth and production of rhamnolipid produced by *Pseudomonas aeruginosa* KPDBT9 was investigated. The growth and biosurfactant production of the bacteria was determined in terms of Optical density (OD_{600nm}) and surface tension (ST) reduction. Further, the impact of various concentrations of FeNPs on petroleum hydrocarbon (PHC)(taking crude oil as model PHC) degrading efficiency of *Pseudomonas aeruginosa* KMP9 was enumerated under standardized conditions. Through detailed characterization, the type of FeNPs was confirmed as Zero-valent iron nano particle (ZVFeNp) which was identified to be spherical in shape and about 30 nm in diameter. Depending on the concentration, ZVFeNp can either have a positive or a negative impact on the bacterial growth and biosurfactant production. A concentration of ZVFeNp up to a range of 0.1g/L results in maximum biosurfactant production along with maximum bacterial growth (OD_{600} =2.298) and ST reduction (26.2 mN/m). Further increment in ZVFeNp concentration resulted in drastic minimization of ST reduction and bacterial growth. Likewise, depending on the concentration, ZVFeNp can have either a positive or a negative impact on the bacterial PHC degradation efficiency. According to gravimetric estimation, after three weeks of incubation, the maximum PHC degradation i.e. 62.06 % was recorded when ZVFeNp was added at 0.1 g/L concentration and there was a significant reduction in PHC degradation when the ZVFeNp concentration was increased further. GCMS analyses were correlated with gravimetric data which reveals that when ZVFeNp was added at 0.1 g/L concentration, *Pseudomonas aeruginosa* KPDBT9 was capable of removing a wide range of petroleum hydrocarbons in comparison with controls including different aliphatic hydrocarbons and PAHs (Fig. 4.19).

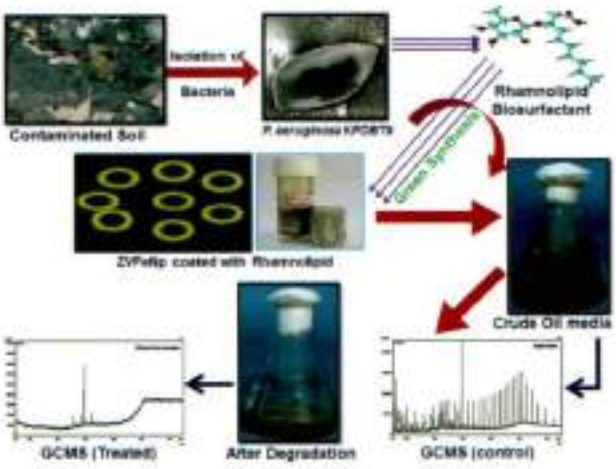


Fig. 4.19. Schematic diagram representing the green synthesis of rhamnolipid coated ZVFeNp and it's efficacy towards PHC degradation.

G. Constructed wetland approach for assessment of sustainability of natural wetland of Assam

In the first phase of the experiment, circular barrel-shaped tanks were placed under a transparent rain shelter. These tanks were cut open for the easy propagation of three types of macrophytes collected from Deepor Beel. Each tankwere filled with a bottom layer of 4-5 cm diameter gravel to a depth of 10 cm, to serve as the drainage layer. A middle layer of washed sand with 10 cm depth for waste water dispersal and a top layer (20 cm) of soil sediment was taken to enable macrophyte propagation. Synthetic waste water as mimicking the degraded polluted wetlands was added. This experimental set-up has just started where plant, water (effluent and influent) and sediment samples collection and analysis at a regular interval will provide data for assessment of the ability of these macrophytes to remove pollutants.

H. Computation biology and bioinformatics

H.1. Correlation study of epigenetic factors controlling gene expression

Currently one of the active areas of research focuses on the development and implementation of computational algorithms to analyze the enormous amount of biological data produced in recent days. Example of such data are, Genomic and Proteomic sequences, Next Generation Sequencing data, viz, ChIP-seq, ChIP-chip, transcriptome etc. Generation of such large scale data brings in the challenge to manage and analyze. Therefore, studies directed towards the development or improvement of efficient computational methods to manage and investigate these data has become highly essential. Such frameworks are essential to conduct studies to address different fundamental biological phenomena.

The mechanism of generation of a wide range of highly ordered and reproducible cell types from a single-cell embryo still remain the area of active research. Albeit all cells in a multicellular organism carry an identical genome, they develop a distinct cellular lineage. Studies have revealed that the maintenance of cell lineage identity is controlled by major determinants, namely the transcription factor (TF), DNA-methylation, non-coding RNA molecules, post-translational modifications of the histones and Polycomb complexes. These epigenetic regulators work in an orchestrated fashion. In an ongoing study, we are trying to determine the correlation of these epigenetic regulators in gene regulation. For this purpose we are integrating numerous data (related to gene expression, histone modifications, methylation, etc.) from different experimental studies. This gives us the multidimensional understanding of gene regulation.

H.2. Development of alignment free methods for phylogenetic analysis

Apart from this, the present days research also focuses in designing and developing computational applications for efficient sequence analysis of the massive data available in numerous repositories. Recently, with the advent of the technological advancement, we are overwhelmed with the colossal amount of information from genomics. With the emergence of such vast data, we confront the challenge of sequence analysis. Most often biologist tries to infer evolutionary relationship among the sequences. The traditional alignment-based method for such studies has certain limitations. A number of studies have proposed non-alignment based method as an alternative approach. We developed an alignment-free algorithm for faster sequence analysis. The novelty of our approach is the inclusion of fuzzy integral algorithm with Markov chain. The method estimates the parameter of a Markov chain by considering the frequencies of occurrence of all possible nucleotide pairs from each DNA-sequence, which is further utilized to calculate similarity among all pairwise combinations of DNA-sequences.

I. Human microbiome as a therapeutic target for improving women health

To understand the association of host microbiome with women's health outcomes, the research currently focuses on elucidating the role of gut and vaginal microbiome and microbial-derived metabolites in the onset and pathogenesis of premature natural menopause (PNM) in Indian women. Outpatient individuals who visited the Menopause Clinic in the OPD of the Department of Obstetrics and Gynecology, Guwahati Medical College and Hospital (GMCH), Guwahati during June-August 2017 were surveyed. Of the 123 individuals surveyed, 39 were excluded and 84 were selected [case: n=24 (28.6%); control: n=60 (71.4%)] for the study based on the designed inclusion and exclusion criteria. Fecal and urine samples were self-collected by the selected study participants, while vaginal swap and blood samples were collected in the hospital. Each sample was collected in triplicate from each participant (once in a week for 03 consecutive weeks). For control group individuals, sampling was started after determining the last

menstrual period (LMP). First sampling was done 48-72 h after cessation of the last LMP blood flow, followed by two additional samplings done at 1 week interval to cover the 3 phases of menstrual cycle (follicular, ovulatory and luteal). ELISA-based quantification of TSH, FSH and estradiol confirmed the classification of the selected individuals into case and control groups. Sixty samples have been collected from the selected participants, and further sample collection is in progress. The health-related quality of life (HRQoL) scale, called Menopause Rating Scale (MRS) categorized the case group into 4 subgroups based on the severity of menopausal symptoms: no/little (01), mild (01), moderate (03) and severe (19). Analysis of the Assam population revealed that PNM severity was correlated with early age of marriage. Our earlier study revealed that one of the factors that impose critical biases to cultivation-independent studies of microbial ecology is the method of metagenomic DNA extraction used (Keisam et al., 2016). In the present study, a modified enzymatic-bead beating method was developed for metagenomic DNA extraction from fecal and vaginal samples and optimized for maximum DNA recovery, purity, high microbial-specific DNA content and maximum microbial diversity. Spectrophotometric analysis revealed that the developed method gave significantly (one-tailed, paired Student's t-test: $p<0.01$) higher recovery of quality DNA (130.2±28.27 g/g sample; $A_{260/280}$=1.89±0.02; $A_{260/230}$=1.79±0.12) than the standard kit method used in Earth Microbiome Project (5.71±0.69 g/g sample; $A_{260/280}$=1.81±0.10; $A_{260/230}$=0.51±0.08) (Fig. 4.19). Eubacterial community profiling of 16S rRNA gene V6-V8 region using PCR-DGGE showed that the developed method brought out more microbial diversity than the kit regarding the number of species-specific V6-V8 fragments and their intensity. Survey and recruitment of study participants from other states of NE India and profiling of vaginal and gut microbiota of case and control groups are in progress.

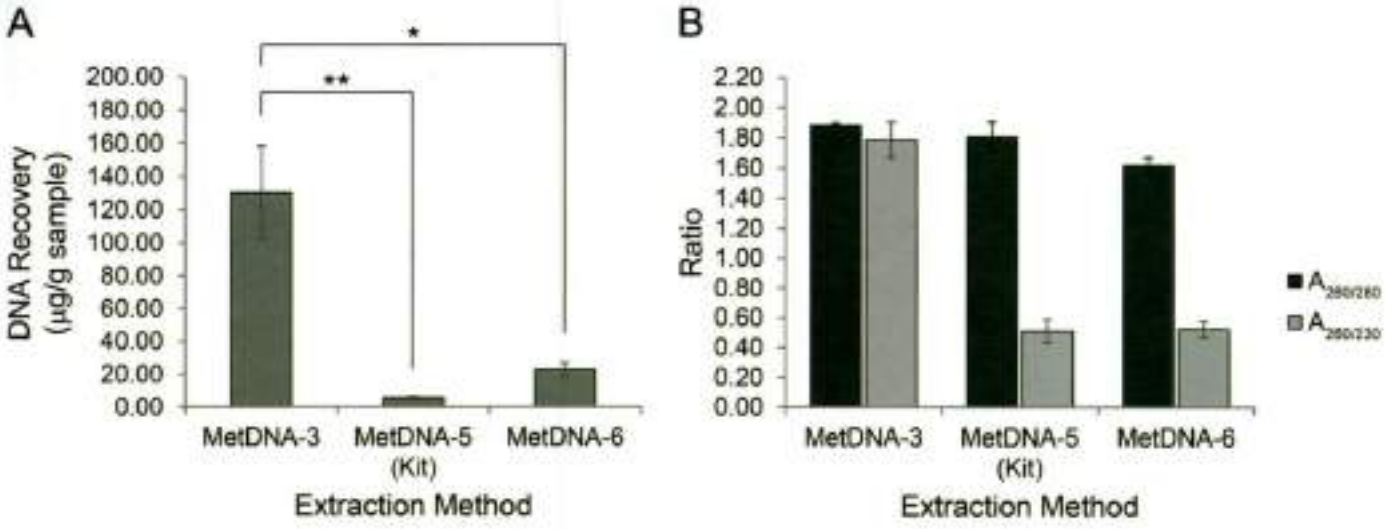


Fig. 4.19. Developed metagenomic DNA extraction method (MetDNA-3) efficiently extracts microbial DNA with high yield and purity. Recovery of the metagenomic DNA (A), and their purity level (B) after extracting using the developed methods and commercial MOBIO's PowerFecal DNA Isolation kit [MetDNA-5 (Kit)] (Qiagen) from fecal samples (n=3). The cell lysis principles used are: MetDNA-3 (enzymatic after RNALater removal, mechanical and chemical); MetDNA-5 (Kit) (mechanical and chemical); MetDNA-6 (enzymatic with RNALater, mechanical and chemical). Data are expressed as the arithmetic means±standard error of the means. Significant differences between the methods are indicated by asterisks (**: $p < 0.01$, *: $p < 0.05$; one-tailed, paired Student's t-test).

Traditional Knowledge based Drug Development and Delivery

1st row (L to R): Dr. Suman Kumar Samanta, Scientist-C; Dr. Rosy Mondal, DST INSPIRE Faculty; Dr. Rajlakshmi Devi, Associate Prof.-II; Dr. N.C. Talukdar, Professor; Dr. Joshodeep Boruwa, Scientist-E.

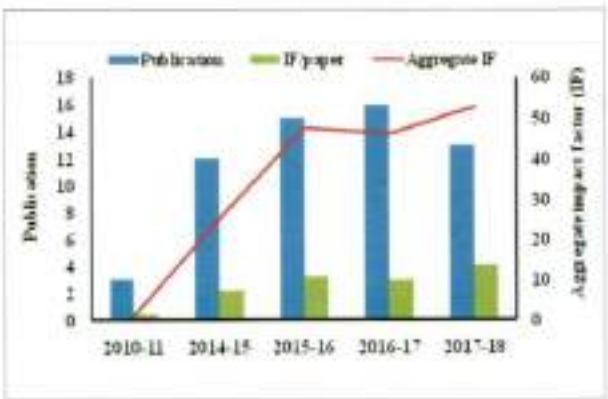
2nd row (L to R): Shilpi Saikia, JRF; Puspanjali Khound, JRF; Krishna Nayani Dutta, SRF; Swarnali Bhattacharjee, JRF; Bhaswati Kashyap, JRF; Paramita Choudhury, JRF; Barsha Deka, SRF; Dr. Ankita Hazarika, RA-I.

3rd row (L to R): Simanta Bharadwaj, TA; Manish Kumar, Temporary guest JRF; Dr. Partha Pratim Dutta, RA-II; Partha Pratim Sarma, JRF; Sagar R Barge, SRF.

Absent in photograph: Dr. Raghuram Kandimalla, RA-II; Momita Das, RGNF-SRF.

Summary

Scientist (Core):	2 (M:1, F: 1)	PhD Awarded:	6
Scientist (Project):	2 (M: 2)	Invited Scientific/Chief guest/ guest of honour lectures:	2
DST INSPIRE Faculty:	1 (F)	International visits/Short term training/conference with national/international support:	4
JRF/SRF:	12 (M: 04, F: 08)	Technology developed:	1
Referred Journal Publication:	13		
Cumulative Impact factor:	52.8		



Traditional Knowledge based Drug Development and Delivery

Research focus of the traditional knowledge based drug discovery programme is validation of selected folklore herbal plants/formulation against diabetes and other metabolic syndrome. Past research in the institute has validated claims of local healers on therapeutic effect of herbs and formulation on diabetes and cardiovascular condition. While continuing this effort, our recent focus has been integration of knowledge of experimental biology, natural and synthetic product chemistry, pharmacology and analytical chemistry, biochemistry and computational biology with validated traditional knowledge for meeting final goal of therapeutic product for cure and prevention of metabolic syndrome. Under this program, few other researches of value in medical applications are also carried out.

A. Development of different chromatographic methods for isolation of active constituents

A.1. HPLC technique to quantify the two essential fatty acid viz. linoleic acid (ω 6 fatty acid) and linolenic acid (ω 3 fatty acid) in the rice grain (Oryza sativa), indigenous to North Eastern Region of India

The present study provides an experimental evidence of the nutraceutical benefit of indigenous rice from North East part of India. In this study we have chosen four varieties of scented-rice and one pigmented-rice from Assam, India and three different pigmented-rice from Manipur, India. Joha is an aromatic rice of Assam known since ages for its rich aroma and nutraceutical benefits. The current study investigated the chemical constituents present in these varieties of aromatic (Joha) rice and their effects on the enzymes involved in metabolic disorder. *In vitro* biochemical studies have revealed the presence of phenolics and flavonoids along with significant antioxidant potential. The present study revealed that the scented and pigmented rice seeds indigenous to North-East India were rich in two unsaturated essential fatty acids viz. linoleic acid (ω 6 fatty acid) and linolenic acid (ω 3 fatty acid) (Fig. 5.1). Bioactive guided fractionation against the α-glucosidase inhibition activity indicated the major active component as linolenic acid and linoleic acid, which were confirmed by HPLC and LCMS spectral data analysis. The present investigation also provided an easy method of HPLC guided detection of the two essential fatty acids in the rice grain even in microgram level (Fig. 5.2). Thus, from the present study the scented rice grains have been established as a significant nutraceutical for diabetic patients.

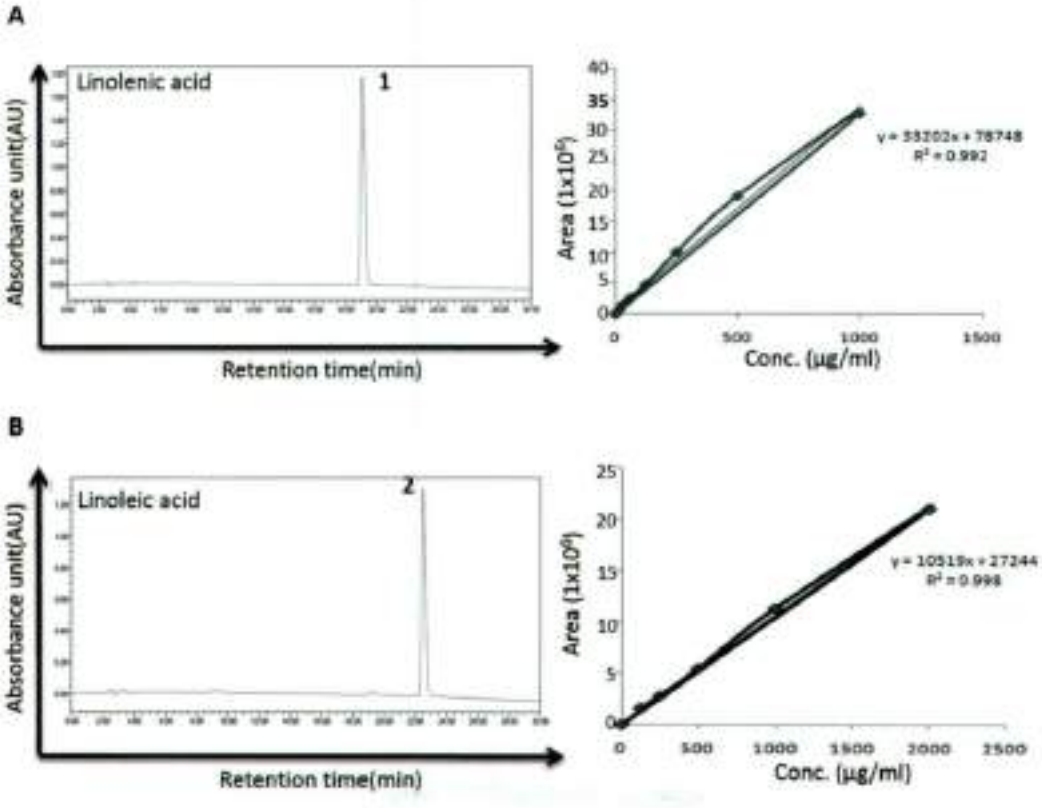


Fig. 5.1. HPLC standard curve: (A) HPLC chromatogram of linolenic acid (1) with the standard curve and (B) HPLC chromatogram of linoleic acid (2) with the standard curve.

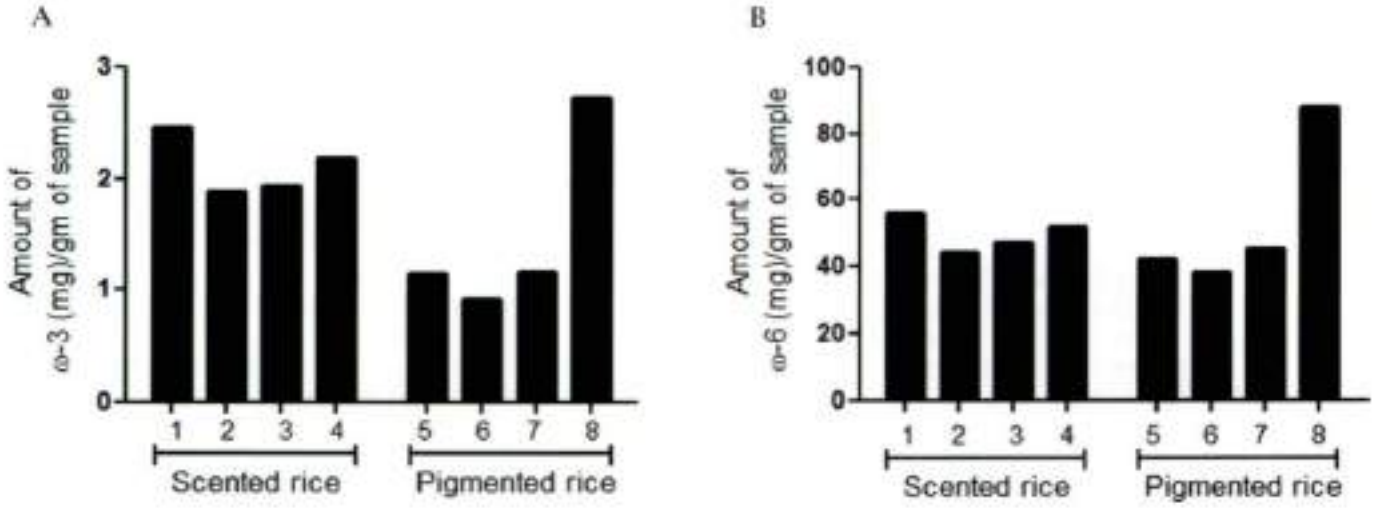


Fig. 5.2. HPLC guided quantification: (A) Quantification of linolenic acid in scented and pigmented rice (B) quantification of linoleic acid in scented and pigmented rice. Here, 1 = Kola Joha, 2 = Kon Joha, 3 = Keteki Joha, 4 = Maniki madhuri Joha, 5 = Chak Hao Amubi, 6 = Chak hao Poireiton, 7 = Chak hao Sempak, and 8 = Kakoa Bao for both the figure.

A.2. Development and validation of chromatographic fingerprinting method for quality analysis of *Clerodendrum colebrookianum* Walp. and quantification of biomarker compounds

Clerodendrum colebrookianum Walp. is one of the most popular potential medicinal plant available in the North Eastern Region of India and has been used to treat hypertension and other metabolic complications like diabetes, obesity etc. from a long time by the different ethnic communities. Though extensively used in the field of herbal medicine with scientific validation, this medicinal plant is still not properly standardized from quality control point of view. Our research group approach was to validate and fix the quality control standards by establishment of various chromatographic, phytochemical and biological profiles of this medicinal herb to check the possible adulteration and quality of raw material. Various pharmacognostic parameters like morphology, microscopy, physicochemical analysis, qualitative and quantitative phytochemical analyses were performed. Chromatographic and spectral fingerprint including HPTLC, GC-MS and HPLC-PDA-MS analyses were performed to get the chemical fingerprint profile of different parts of *C. colebrookianum* Walp.

A GC-MS fingerprint has been developed and major non-polar compounds are marked in the different parts of the plant (Fig. 5.3). The abundant compounds in leaf are Phytol (7.28%, RT 25.78), Palmitic/Hexadecanoic acid (7.09%, RT 27.55), Alpha linoleic/Octadecanoic acid (9.96%, RT 31.02).

A HPLC-PDA-MS based fingerprint (Fig. 5.4) of *C. colebrookianum* Walp. leaf extract has been developed for quality analysis and quantification of marker compound. A biomarker compound of *C. colebrookianum* Walp. was also characterized and quantified from different solvent extract.

A validated HPTLC fingerprint (Fig. 5.5) and quantification method has been developed in our laboratory to assess the quality and protect the adulteration, which can be used as a quality control tool for herbal medicine practice.

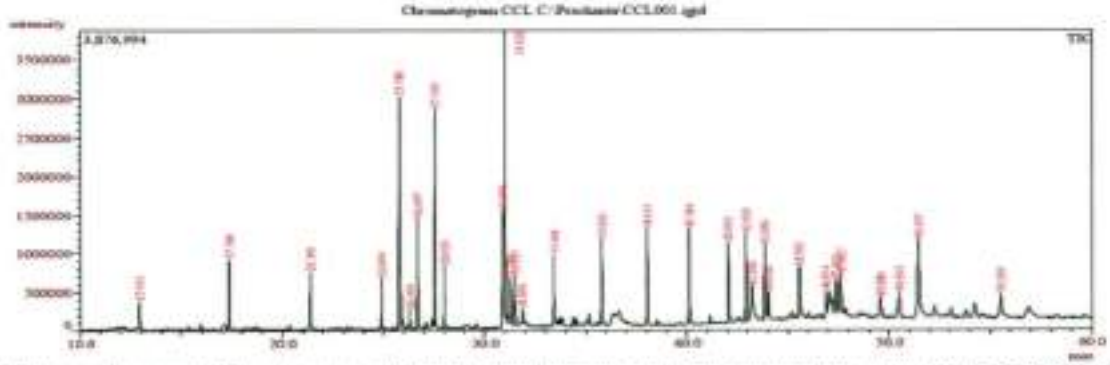


Fig. 5.3. GC-MS chromatogram of *Clerodendron colebrookianum* leaf extract. Major compounds peak at RT 25.78 (Phytol), 27.55 (Hexadecanoic acid), 31.02 (Octadecanoic acid).

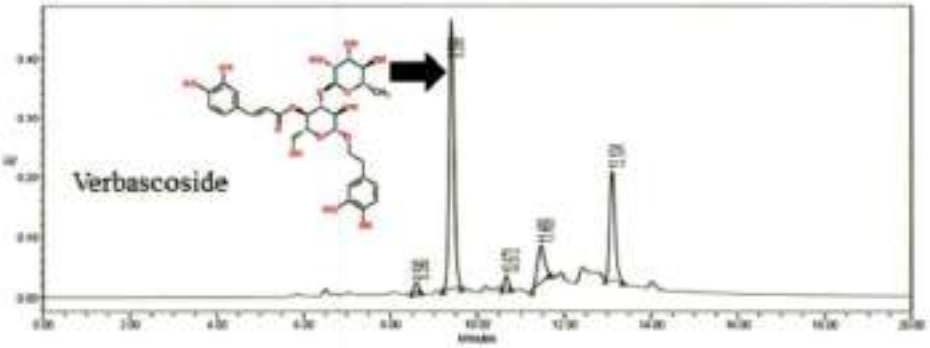


Fig. 5.4. HPLC-PDA chromatogram of *Clerodendron colebrookianum* leaf extract. Major compounds peak at RT 9.33 and characterized as Verbascoside, m/z 623 (M-1).n

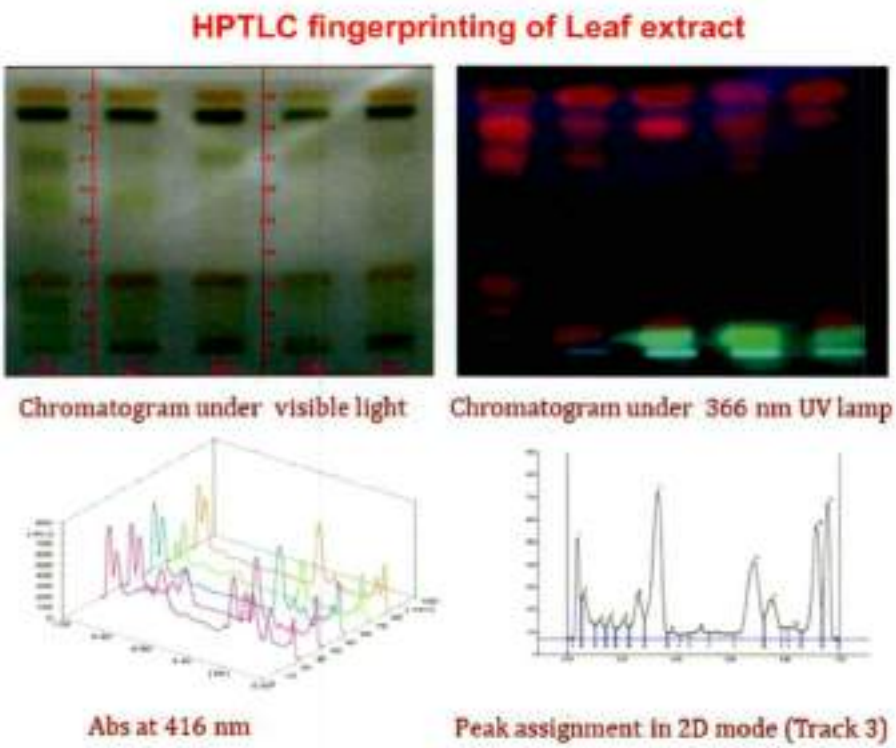


Fig. 5.5. HPTLC fingerprint of *Clerodendron colebrookianum* leaf extract. H= Hexane, C= Chloroform, EA= EtOAC, M= Methanol, A= Acetone.

B. Cancer genomics, Oncovirus, Biomarker development, medical biotechnology

Cancer is associated with mutated genes, and analysis of tumour-linked genetic alterations is increasingly used for diagnostic, prognostic and treatment purposes. The genetic profile of solid tumours is currently obtained from surgical or biopsy specimens to diagnose and manage disease for 1,000 years. Information acquired from a single biopsy provides a spatially and temporally limited snap-shot of a tumour and might fail to reflect its heterogeneity, as a result, highlights the difficulty of dictating a therapeutic course of action which is likely to underestimate the complexity of the genomic landscape of the tumour. There are many difficulties in obtaining a tissue biopsy—including the discomfort suffered by the patient, inherent clinical risks to the patient, potential surgical complications and economic considerations-meaning that multiple or serial biopsies are often impractical. In addition, some tumours are not accessible for biopsy, the procedure itself might increase the risk of the cancer 'seeding' to other sites, and the procedure might not be recommended for patients receiving antiangiogenic treatment. Considering these limitations on the use of single biopsies, new ways have evolved to observe tumour genetics and tumour dynamics. One of the current development is cell free nucleic acid (cfNA-DNA, mRNA and microRNA) in plasma also known as a 'liquid biopsy', which would be useful for numerous diagnostic applications and would avoid the need for tumour tissue biopsies as it delivers the possibility of taking repeated blood samples, consequently allowing the changes in cfNA to be traced during the natural course of the cancer treatment (Fig. 5.6).

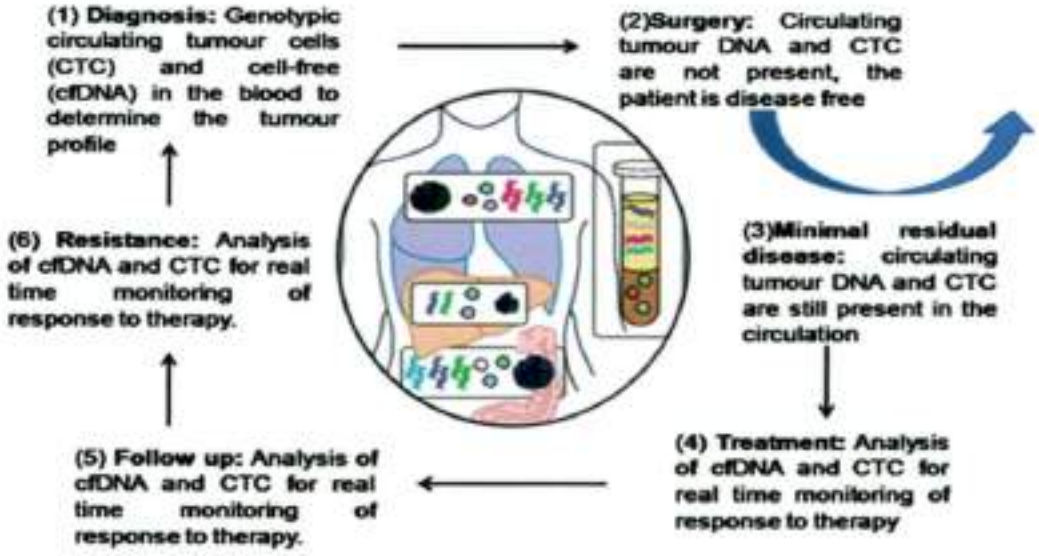


Figure 5.6: Schematic representations of cell free DNA as diagnosis, prognosis, and follow-up cancer testing in plasma of cancer patients.

We are working on cell free DNA (cfDNA) using the most prevalent cancer in Northeast India i.e. Head and neck squamous cell carcinoma (HNSCC) using cfDNA as noninvasive biomarker in early cancer diagnosis. Some preliminary experimental results are highlighted here. At the initial stage of standardization of cfDNA isolation, BCT Streck™ tubes (Streck Inc., Omaha, NE, USA) were used. The cfDNA isolation was carried using THP method, Norgen and QIAamp circulating nucleic acid kit using QIAvac 24 plus setup in our study to optimize cfDNA isolation methods. The quantification of isolated DNA samples was done using qubit fluorometer 3.0 and nano-drop to determine the sensitivity of the quantification assay. The concentration of samples with nano-drop using Norgen Kit was found to be in the range of 86- 270.04 ng/µl followed by the samples isolated using QIAamp Circulating Nucleic Acid Kit with QIAvac 24 Plus setup in the range of 99 - 318 ng/µl. The purity of kit based on isolated samples was found to be ~1.8 in ratio of 260/280 and a 260/230 ratio of ~2.0. Further quantification using qubit fluorometer 3.0 was found to be in the range of 0.22 – 0.63 ng/µl (THP) (Fig. 5.7). The kit based method of cfDNA isolation using Norgen Kit was in the range 0.49-1.06 ng/µl, followed by QIAamp Circulating Nucleic Acid Kit with QIAvac 24 Plus setup with 0.65- 3.21 ng/µl.

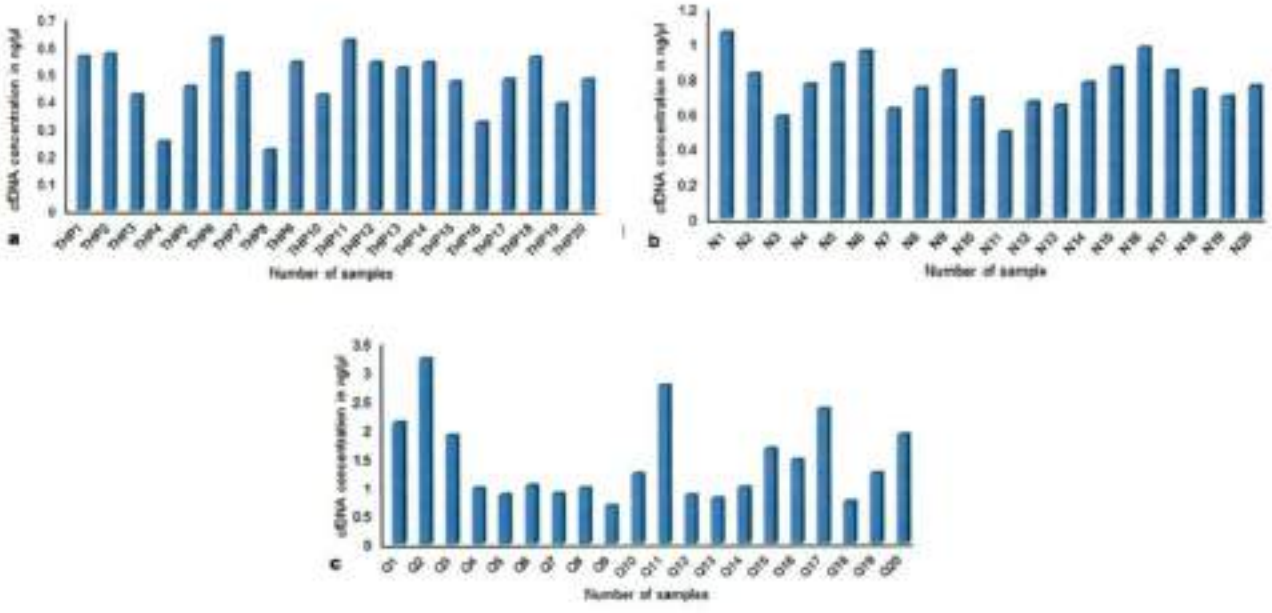


Fig. 5.7: CfDNA quantification using Qubit fluorometer 3.0(a) cfDNA isolation using THP method (THP) (b) cfDNA isolation Norgen Kit (N) (c) cfDNA isolation with QIAamp Circulating Nucleic Acid Kit (Q).

CfDNA fragment analysis was also performed to determine the fragment size of the isolated cfDNA samples, which is still a topic of debate in scientific community.

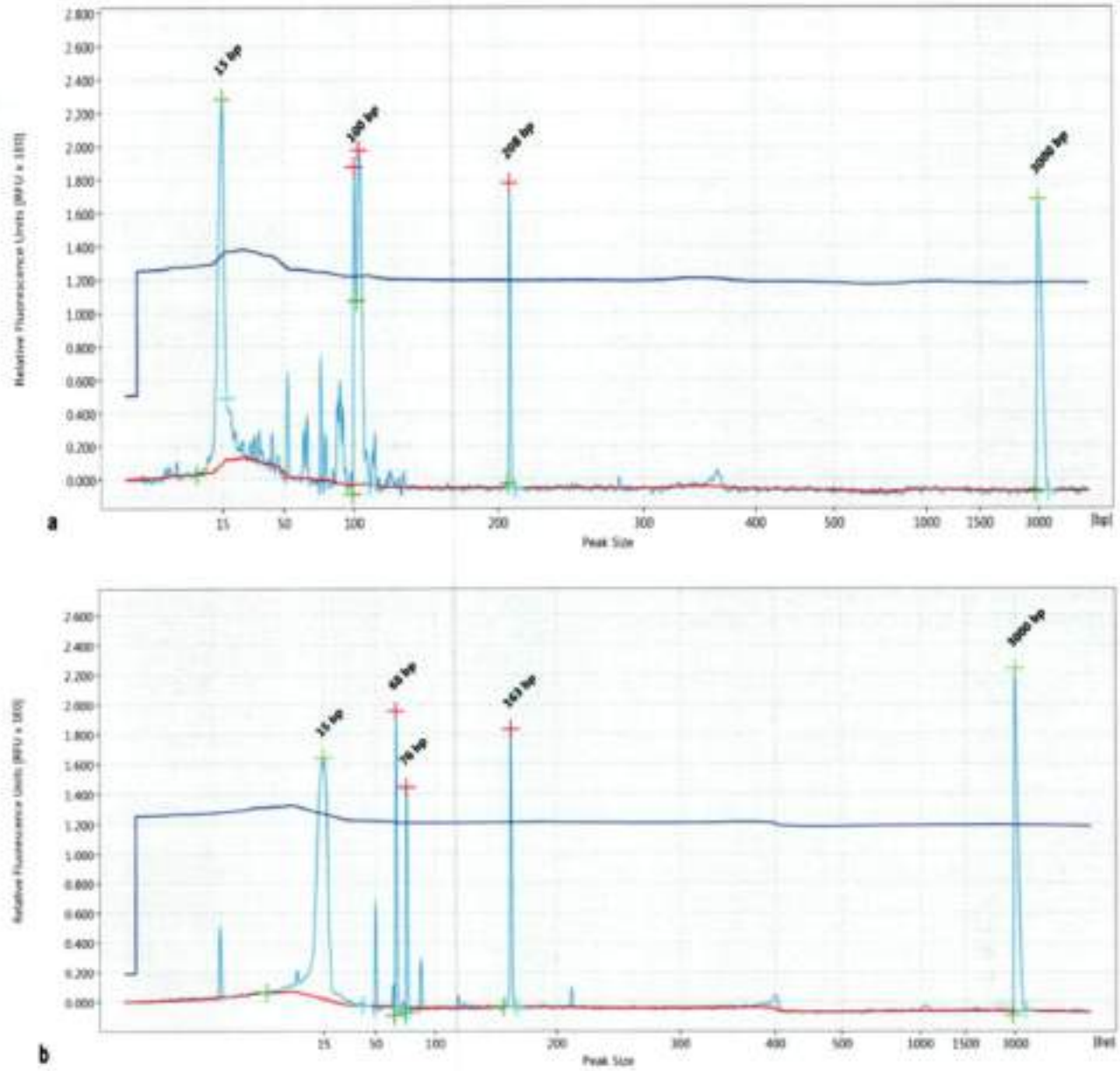


Fig. 5.8.: Fragment analysis of samples using QIAamp Circulating Nucleic Acid Kit method: (a) Electropherogram shows the cfDNA fragment size distribution of 20 pooled cfDNA samples. (b) Electropherogram of cfDNA fragment size distribution of cfDNA of highest concentration quantified using Qubit fluorometer 3.0.

Using our standard method of isolation i.e. QIAamp Circulating Nucleic Acid Kit was found to be of 108bp, 124bp, 184bp and 248bp (Fig. 5.8). On the basis of our findings we were able to answer certain key questions, such as the accurate method of cfDNA quantification and the fragment length distribution in cancer patients. These are essential questions to be addressed in synchronization of cfDNA base liquid biopsy research. Therefore, the cfDNA must include a common standard quantitative and qualitative approach, which could help the clinicians in implementation of the cfDNA concentration range and fragment length in early prognosis of HNSCC.

C. Propolis: A natural product for drug discovery

Bee products are an interesting source of new therapeutics, especially for cancer therapy and most of these products are from plant origin. Propolis, a resinous mixture collected by honey bees from the leaf buds, saps and barks of numerous botanical sources, has been used by ethnobotany and traditional practitioners as early as 3000 BCE. Due to use of a wide variety of flora exudates from different geographical regions, honeybees are likely to give rise to chemical constituent which are very diverse

and complex. Our research focus is to know the nature, chemical profile and the biomedical applications of propolis and their therapeutic role. The antimicrobial and antioxidant properties of ethanolic extract of propolis (EEP) were evaluated for their ability to act against microorganism, scavenge free radicals and protect against damage caused by oxidizing agents. The EEP exhibited antimicrobial property and showed antioxidant activity by scavenging free radicals and inhibiting hemolysis in human erythrocytes incubated with an oxidizing agent. Gas chromatography-mass spectrometry analysis revealed that EEP contains important compounds belonging to triterpenoid group such as alpha and beta-amrin, acetate-(3.beta.)-Lup-20(29)-en-3-ol, lupeol and betulin etc which shows variety of biological activities as was revealed from the antioxidant test of this study. Results showed that the native EEP has strong antiproliferative effect on cancer cell lines and the effects manifested in dose and time-dependent manner. These findings demonstrate that propolis from Assam possesses broad biological activities and promising for the treatment and/or prevention of various diseases related to microorganisms, oxidative stress and antitumor formation.

D. Regulation of diabetes induced hyperglycaemia by targeting phosphoenolpyruvate carboxykinase (PEPCK)

Glucose is the primary metabolic fuel and major energy supply for most living cells. Thus, maintaining its levels in an optimal range is crucial for health and survival, and its imbalance can lead to many metabolic disorders. Diabetes mellitus is a metabolic condition, characterized by glucose intolerance. There are two principle forms of diabetes: Type 1 diabetes in which the pancreas fails to produce the insulin which is essential for survival and Type 2 diabetes (T2DM) that accounts for around 90% of all diabetes cases, results from the body's inability to respond properly to the action of insulin produced by the pancreas. Dysregulation of gluconeogenesis (biosynthesis of new glucose from non-carbohydrate carbon substrates) is critically responsible for fasting hyperglycemia (abnormally high blood glucose) in T2DM patients. Phosphoenolpyruvate carboxykinase (PEPCK) the key rate-limiting enzyme in gluconeogenic pathway gets overexpressed during T2DM leading to glucose overproduction or hyperglycaemia. Thus, inhibition of PEPCK by lowering its activity is a promising new therapeutic approachfor treatment of diabetes. With this rationale, there have been efforts to identify keyamino acid residues in PEPCK that have major but not essential roles in enzyme catalysis.

PEPCK requires a nucleotide, GTP (guanosine triphosphate), for its enzymatic activity which contains three essential phenylalanine residues (F517, F525, F530 or Phe-triad). In order to find the role of Phe-traid on the catalytic activity of PEPCK, its available cDNA clone, was PCR amplified and sequenced. Plasmid containing PEPCK insert was then Alanine substituted at Phe-17, Phe-25, Phe-30 positions. The mutated gene was then sequenced, which confirmed its substitution at the selected residues. In order to find out possible modulators against wild type and mutated PEPCK, about 1000 known anti-diabetic compounds of North East India were selected and virtual screening was performed. PEPCK model was prepared in Discovery Studio 4.1 (DS 4.1) software and Swiss Model server. The study revealed that plants belonging to the family of Fabaceae constitute the highest number of traditionally used anti-diabetic plants of NE India followed by Mrytacceae and Annonaceae. Molecular docking of all the compounds with PEPCK as receptor model showed Ephedrine (-634.4 kcal/mol), Caffaic acid (-470 kcal/mol), Farnesol (-453.1 kcal/mol), Anonaine (-415.3kcal/mol), tetrahydropalmitine (-18.50 kcal/mol) and genistein (23.49 kcal/mol) as top molecules for further study. These modulators are predicted to bind to the active sites of PEPCK model and the complexes are likely to be highly stable with similar binding pocket as for its nucleotide (Fig. 5.9).

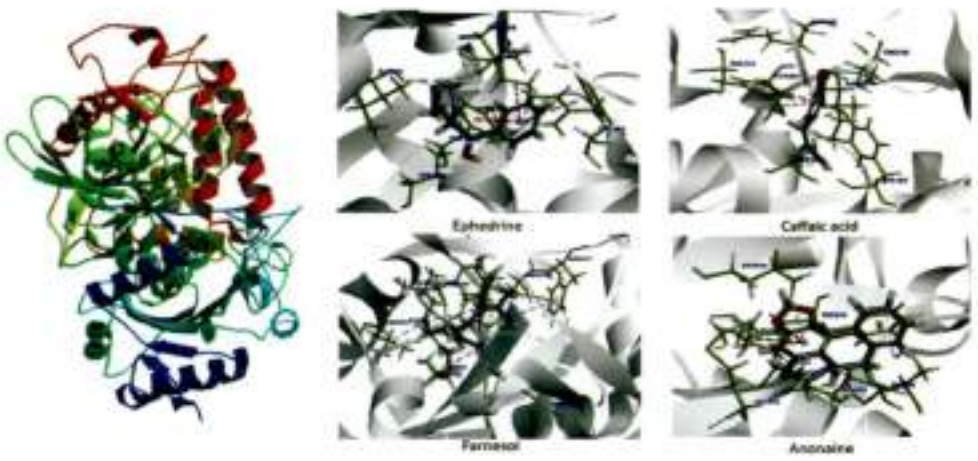


Fig. 5.9. Biological assembly of human cytosolic phosphoenolpyruvate carboxykinase - PDB ID: 1KHF (A). Likely interactions of modulators with the active sites of PEPCK model (B).

Extramural projects both completed and ongoing

Completed projects of Advanced materials sciences program

1. **PI- Dr. Munima B. Sahariah**
   Title of the project: Electronic, magnetic and lattice dynamical properties of magnetic shape memory alloys
   Funding Agency: DST, Govt. of India
   Total fund: Rs. 26 lakhs
   Duration: 2013 to 2017
   Updated Progress: The microscopic mechanism of structural transformation and the stability of phases which are responsible for the characteristic behaviour of magnetic shape memory alloy Ni-Fe-Ga were understood using first principles Density Functional Theory.

Completed projects of Biodiversity and ecosystem research program

1. **PI- Dr. N. C. Talukdar**
   Title of the project: Impact assessment of Jhuming on native plants and soil microbiota and restoration of sustainable Jhum agro-ecosystem in Northeast India
   Funding Agency: DBT, Govt. of India
   Total Fund: Entire project fund of Rs. 542.14 lakhs (IASST component of Rs 57.62 lakhs
   Duration: 2012 to 2016
   Updated Progress: Jhum agro-ecosystem prevails in about 65% land areas of North East India which is constituted by hills and mountains system. This project explored below ground microbial diversity, specifically arbuscular mycorrhizal and rhizospheric bacteria of crop grown in Jhum Fallow Cycle (JFC) of different duration and their role in jhum agro-ecosystem stability in collaboration with other 7 national institutes. Bacterial diverstity in strongly adhered rhizosphere soils of rice, arhar and maize of 5 years Jhum Fallow cycle (JFC) was found to be higher both by culture and Next Generation Sequencing methods. Application of consortium of four efficient rhizosphere of rice was found to result in higher grain yield increase overcontrol in 5 years JFC than those in 20 years JFC.

Completed projects of Traditional knowledge based drug development and delivery program

1. **PI- Dr. R. Devi**
   Title of the project: Development and elucidation of mechanism of action of herbs to treat Diabetic neuropathic pain
   Funding Agency: DBT, New Delhi, Govt. of India
   Total fund: 40 lakhs
   Duration: 2015 to 2018
   Updated Progress: The main achievement of this project is the isolation of an active fraction from *Ziziphus jujuba* which showed potent response in controlling the diabetic neuropathic pain (DNP). The results of the study indicate that bioactive molecules are polar in nature. We have developed an herbal formulation from this research work for the treatment of DNP. This part of the work has already been published in Frontiers in Cellular Neuroscience, 2017, 11:73. doi: 10.3389/fncel.2017.00073 **(Impact factor: 4.55) and one Indian patent has been filed. Patent application No (201631008543)**

Ongoing projects of Basic and applied plasma physics program

1. **PI- Dr. Joyanti Chutia**
   Title of the project: Development of plasma modified bio-membrane and low loaded electrode catalyst for proton exchange membrane fuel cell by plasma process
   Funding Agency: SERB, DST, Govt. of. India
   Total fund: Rs. 36 lakhs
   Duration: 2015-2018
   Goal: Aim of this research is to develop fuel cell assembly with bio-membrane as well as plasma enhanced modification in the properties associated with proton exchange membrane (PEM) of naturally existing bio-membrane to reduce cost of fuel cell. One of the objectives behind the project is to develop plasma grafted bio-membrane with good proton conduction property, thermal stability at temperature higher than 800 C and low fuel permeability.

Ongoing projects of Basic and applied plasma physics program

2. **PI- Dr. Sumita K. Sharma**
   Title of the project: Study of dynamical behavior of nanodusty plasma produced in a reactive gas discharge
   Funding Agency: Women Scientist Scheme (WOS-A), DST, Govt. of India
   Total fund: 31 lakhs
   Duration: 2017 to 2020
   Goal: Aim of this work is to produce nanodusty plasma containing plasma grown nanometer size particles. Various dynamical processes exhibited by the plasma grown particles such as waves, instabilities and structure formation will be studied.

Ongoing projects of Advanced materials sciences program

1. **PI- Dr. Devasish Chowdhury**
   Title of the project: Development of nanoparticle or microparticle adjuvanted subunit oral vaccine against poultry salmonellosis.
   Funding Agency: DBT, New Delhi, Twinning Program
   Total fund: Rs. 18.43 lakhs
   Duration: 2016-2019
   Goal: The present study has been undertaken with the hypothesis that the subunit vaccine formulation comprising whole outer-membrane protein (obtained from capsular type A and D of *Pasteurella multocida)* that are adjuvanted with either calcium phosphate nanoparticle or aluminum hydroxide nanoparticles or poly-lactide co-glycolide microparticles would confer protective immune in pigs against swine pasteurellosis. . In the present proposal it is hypothesized that calcium phosphate nanoparticle or aluminum hydroxide nanoparticle adjuvanted outer membrane protein vaccine would give strong antibody response and would replace the conventional alum adjuvanted vaccine.

2. **PI- Dr. Arup Ratan Pal**
   Co-Investigator: Prof. H. Bailung
   Title of the project: Plasma Based Synthesis of Materials for Plasmonic Infrared Photodetector
   Funding Agency: SERB, Government of India
   Total fund: Rs. 83.20 lakhs
   Duration: March 19, 2018 to March 18, 2021
   Goal:
   1. Preparation of infrared (IR) transparent electrode by growing carbon nanostructures by atmospheric pressure glow discharge plasma enhanced chemical vapour deposition process.
   2. Synthesis of IR absorbing nanostructures by magnetron sputtering and tuning the plasmon absorption band of the nanostructures up to 3000 nm by tailoring the properties of the material with optimization of synthesis conditions.
   3. Development of plasmonic IR detector by using the above mentioned IR transparent electrode and IR absorbing nanostructures, and study of the device performance including spectral responsivity, detectivity, time response and stability, and study of device photo-physics.

3. **PI- Dr. S. Kundu**
   Title of the project: Structure, pattern and elastic behaviour of model membranes in presence of nanomaterials
   Funding Agency: DST, Nano Mission, Govt. of India
   Total fund: Rs. 57,00,565/-
   Duration: 2015-2018
   Goal: Aim of this research is to explore structure, pattern, mechanical and optical properties of lipid layer at interfaces in absence and presence of nanomaterials and biomaterials.

4. **PI- Dr. Biswajit Choudhury**(DST INSPIRE Faculty)
Title of the project:"Hybrid nanomaterials of semiconductor metal oxides-carbon nanomaterials deposited with noble metal nanoparticles for energy and environmental applications."
Funding Agency: DST
Total fund: Rs. 35 Lakhs
Duration: 30.03.2016 to 30.03.2021
Goal: The project aims to understand the photocatalytic activity of semiconductor metal oxides (TiO2, ZnO, CeO2, etc) and carbon nanomaterials (graphene, C3N4) in pristine as well as in its hybrid forms deposited with Au, Ag etc., under the illumination of visible light. Plasmonic effect tunability with size, shape variation will also be considered.

5. **PI- Dr. Sagar Sharma**(DST INSPIRE Faculty)
Title of the project: New n-type organic semiconductors for optoelectronics: Synthesis, characterization and device fabrication
Funding Agency: DST, Govt. of India
Total fund: Rs.35 lakhs
Duration: 2014-2019
Goal: The aim of the research is to design and investigate new types of n-type organic semiconductor. It involves the computationally investigationof the properties of new n-type organic semiconductor, followed by their synthesis and possible applications in organic field effect transistor devices.

Ongoing projects of Mathematical and computational sciences program

1. **PI- Dr. Lipi B. Mahanta**
Title of the project: On the development of an automated image analysis system for detection of cervical pre-cancerous and cancer lesions using liquid cytology based pap smear images.
Funding Agency: DBT, Govt. of India
Total fund: Rs. 50.93 lakhs
Duration: 2016-2019
Goal:
1. To design & develop a Decision Support Software for detection of cervical pre-cancerous & cancerous lesions.
2. To assess the impact of somerisk factors (socio-economic, environmental, lifestyle, medical history, diet, anthropometry and hematology) of the patients.
3. To evaluate human papillomavirus (HPV) DNA testing as an alternative screening method. Mathematical and computational sciences program

Ongoing projects of Biodiversity and ecosystem research program

1 **PI- Dr. N. C. Talukdar**
A.1. Title of the project: DBT's Scented Rice Program for the NE- "Microbial roles in yield management of scented rice of North East India."
Funding Agency: DBT, Govt. of India
Total fund: As a group- Rs 221.22 lakhs (IASST component of Rs.36.84 lakh
Duration: 2016 to 2019
Updated Progress:
1. Endophytic bacterial population in four varieties of aromatic rice seeds i.e. *Kola Joha, Keteki Joha, Kon Joha and Maniki Madhuri Joha* varied from 3.96 to 4.87 Log CFU/g seeds indicating low level of endophytic bacterial population.
2. Identification of bacterial isolates by 16S rDNA genes sequences demonstrate existence of 04, 03, 02 and 04 different types of bacterial populations in seeds of Kola Joha, Keteki Joha, Kon Joha and Maniki Madhuri Joha, respectively.
3. Preliminary NGS data on endophytic bacterial profile in 0 days surface sterilized seeds, 5 days old seedlings and roots and shoots of 15 days old seedlings of *Kola Joha* suggest occurrence of bacterial community succession in different stages of growth.
4. Most of the seed explants responded to callus induction on MS media supplemented with different composition of phytohormones and with or without antibiotics. The findings indicates highest callusing index of *Keteki Joha* and *Maniki Madhuri Joha* in MS media supplemented with 2.5 mgL^{-1} 2,4-D; whereas *Kola Joha* and *Kon Joha* in MS Media supplemented with 4 mgL^{-1} NAA + 1.0 mgL^{-1} Kinetin and 2.5 mgL^{-1} 2,4-D + 0.5 mgL-1 NAA, respectively. Selected calli were sub-cultured on the same fresh media and subjected to regeneration of plants.

A.2. **Title of the project**- Integrating herbal medicine of NER with contemporary approaches in develop therapeutic strategeies for metabolic syndrome.

Funding Agency: DBT, Govt. of India

Total fund: As a group- Rs 2455.793 lakhs (IASST component of Rs. 1043.28 lakhs

Duration: 2017 to 2019

Updated Progress: Project achievements: 1st April 2017 to 15th June 2018.

1) **Plant collection, extraction and bioactive guided fractionation:**
   A total of nine medicinal plants (*Allium hookeri, Allium odorum, Antidesma acidum, Costus speciosus, Dillenia indica, Kaempferia galangal, Lagerstroemia flosreginae, Lysimachia candid, Premna herbacea*) have been collected from NER region and extraction and bioactive guided fractionation of the all the plants materials has been done.
2) **Chemical profiling:**
   We have performed the qualitative and quantitative chemical profiling of the extracts and bioactive fraction of five medicinal plants through phytochemical analysis and HPLC technique.
3) **Establishing the toxicity profiling of the plant extracts:**
   The toxicity profiling of seven medicinal plants (*A. hookeri, A. odorum, A. acidum, D. indica, L. flosreginae, L. candid and P. herbacea*) has been established through trypan blue assay. The acute toxicity profiling of the all these plant extracts also established using in vivo animal models.
4) **In vitro antioxidant and anti-diabetic potential of plant extracts:**
   We have established the *in vitro* antioxidant ability of all the plant extracts through DPPH, ABTS and reducing power assays. The *in vitro* anti-diabetic ability of the same was performed through α-amylase assay.
5) **Cell based assays:**
   We have successfully established the Intra cellular ROS reducing ability and glucose uptake ability of the extract and bioactive fractions of seven medicinal plants (*A. hookeri, A. odorum, A. acidum, D. indica, L. flosreginae, L. candid and P. herbacea*) through FACS analysis. We induced insulin resistance in L6 cells through free fatty acid and reverted the same using these medicinal plants extracts.
6) **In vivo experiments:**
   a) Evaluation of plant extracts against high fat and carbohydrate induced metabolic syndrome in rats:
   A total of five medicinal plant extracts (*A. hookeri, D. indica, L. flosreginae, L. candid and P. herbacea*) has been evaluated to treat metabolic syndrome in high fat and fructose fed rats. The mid experimental observation showed the positive results towards controlling the metabolic syndrome by plant extracts.
   b) Evaluation of effect of diet and plant extracts treatment on gut microbiota of animals:
   We are also establishing the link between changes in gut microbial profile and precipitation of metabolic syndrome in animals fed with various diets and plant extracts.

2. **PI- Prof. Suresh Deka**

Title of the project- Application of Glycolipid Biosurfactant for General Welfare of Economically Important Crops with special reference to Management of Phytopathogenic Fungi.

Funding Agency: DBT, Govt. of India.

Total fund: Rs. 25.93 lakhs

Duration: 2017-2020

Updated Progress: This research will help to develop a biopesticide from Glycolipid Biosurfactant (particularly Rhamnolipid) against plant pathogenic fungi of *Capsicum chinense* (Bhut jolokia) and *Zea mays* (Maize).The main fungal diseases of *Capsicum chinense* are die-back disease caused by *Colletotricum gleosporoides*, stem rot and wilt caused by *Sclerotinia sclerotiorum* and leaf spot caused by *Corynespora cassicola* Similarly, the main fungal diseases of Zea mays are maydis blight (*Bipolaris maydis*), charcoal rot (*Macrophomina phaseolina*) and banded leaf & sheath blight (*Rhizoctonia solani sasakii*). The rhamnolipid biosurfactant produced by certain bacterial strains will be tested against these plant pathogenic fungi to develop formulations of bio-pesticide to control the diseases.

3 **PI- Dr. Mojibur R. Khan**
A.1. Title of the project- DBT's-Unit of Excellence project, "Effect of traditional dietary habits on human gut microbes: dairy products of Nepali population and traditional rice beer of tribes of Assam on gut bacterial profile"**Funding Agency:** DBT, Govt. of India
Total fund: Rs 133.14 Lakhs
Duration: 01.04.2016 to 31.03.2019 i.e. 3 years
Updated Progress: This study will reveal the effect of dairy products and rice beer on gut bacterial profile and health of individuals. The probable outcomes will be a) Components of dairy products and rice beer influencing the gut bacterial profile, b) Gut bacteria responsive to the components of dairy products and rice beer, c) the microbial metabolites that are formed in response to altered gut bacterial profile and d) probable effect of the microbial metabolites on health.

A.2. Title of the project- DBT's- Advanced Level Institutional Biotech hub, "Establishment of Institutional Level Biotech Hubs (IBT Hubs) for North Eastern states of India."
Funding Agency: DBT, Govt. of India
Total fund: Rs 78.55 Lakhs
Duration: 14.11.2016 to 14.11.2019, i.e 3 years
Updated Progress:Advanced Level Institutional Biotech hub at IASST is providing laboratory facility for the research scholars of IASST and the neighboring institutes. Training and workshops are arranged under Biotech hub for UG, PG and PhD scholars.

4 **PI- Dr. Debajit Thakur**
Title of the project: Exploration and conservation of microbial resources prevalent in protected forest ecosystems and tea rhizosphere soil of Assam.
Funding Agency: DBT, Govt. of India
Total fund: Rs 27.10 lakhs
Duration: 2017-2020
Goal: Aim of this research is to explore Tea rhizobacteria from commercial tea estates and actinobacteria prevalent in protected forest ecosystems of Assam and preservation for plant growth promotion, plant and human disease control. Antimicrobial metabolites producing microorganisms (especially Actinobacteria) will be preserved and a database will be created. The database would help for future development of clinically/ pharmaceutically important drug molecule/s.

5 **PI- Dr. Soumyadeep Nandi** (Ramalingaswami Fellow)
Title of the project: Correlation study of different determinant of gene regulator.
Funding Agency: DBT, Govt. of India
Total fund: Rs 88 Lakhs
Duration: 2015-2020
Goal: The aim of the study is to determine the interplay among numerous epigenetic factors and other regulators during the differentiation or disease condition.

6 **PI- Dr. Wahengbam Romi** (INSPIRE Faculty)
Title of the project: Human Microbiome as a Therapeutic Target for Improving Women Health: Role of Vaginal and Gut Microbiota in the Onset and Pathogenesis of Premature Natural Menopause.
Funding Agency: DST, Govt. of India
Total fund: Rs. 35 Lakhs
Duration: 2016-2021
Updated Progress: This study hypothesizes that temporal and spatial variation in the microbiome of reproductive-age (30 – 40 years) women correlate with the onset and pathogenesis of premature natural menopause (PNM). We are adopting multiomics approach combined with reverse microbial culturomics to elucidate the role of gut and vaginal microbiome and microbial-derived metabolites in the onset and pathogenesis of PNM in Indian women, assess their variation between individuals of different ethnicity, socio-economic strata, diet and nutritional status, and devise a model for prediction of PNM.

Ongoing projects of Traditional knowledge based drug development and delivery program

1. **PI- Dr. R. Devi**
   Title of the project: Chemical profiling of Joha and Black rice of NER for nutritional, nutraceutical parameters and aroma compounds.
   Funding Agency: DBT, New Delhi, Govt. of India.
   Total fund: 1.02 crore
   Duration: 2016 to 2019
   Goal: Isolation, characterization and quantification of phytochemicals in different scented rice of Assam and development of value added products for health benefit.

2. **PI- Dr. Rosy Mondal** (DST INSPIRE Faculty)
   Title of the project: Cell -free nucleic acids as non -invasive for cancer detection.
   Funding Agency: DST, Gov. of India
   Total fund: Rs 35 Lakhs
   Duration: 2015-2020
   Updated Progress: The research aims to detect the presence and fractions of circulating cell free DNA (cfDNA) in plasma of head and neck cancer patients and to determine the feasibility of deep sequencing approach in cancer detection. It also aims to determine if cfDNA copy number variation can be used to dynamically monitor response to therapy in cancer.

Publications in cited Journals

Author (s)	Title	Journal name	Volume & Issue no./ page no.	Month/Year of publication
Basic and applied plasma physics				
T. Deka et al.	Observation of self-excited dust acoustic wave in dusty plasma with nanometer size dust grains	Phys. Plasmas	24 /9/ 093706	September /2017
P. Pathak et al.	Observation of ion acoustic multi-Peregrine solitons in multicomponent plasma with negative ions	Phys. Lett. A	381/ 48/ 4011	October /2017
B. Borgohain and H. Bailung	Ion and electron sheath characteristics in a low density and low temperature	Phys. Plasmas	24/11/ 113512	November /2017
N. C. Adhikary	Nonlinear dust-acousticet al. solitary waves and shocks in dusty plasmas with a pair of trapped ions	Phys. Plasmas	24/073703	June /2017
M. K. Deka et al.	Characteristics of solitary waves in a relativistic degenerate ion beam driven magneto plasma	Phys. Plasmas	25/012102	January /2018
M. Goswami et al.	Effect of annealing temperatures on the structural and optical properties of zinc oxide nanoparticles prepared by chemical precipitation method	Optik	158/1006	January /2018
N. Buzarbaruah et al.	Study on discharge plasma in a cylindrical inertial electrostatic confinement fusion device	Phys. Lett. A	381/30/ 2391	May /2017
Advanced materials science				
S. Chakravarty et al.	Silk fibroin as a platform for dual sensing of vitamin B12 using photoluminescence and electrical techniques	Biosens. Bioelectron	112/ 18-22	March /2018
M. J. Deka and D. Chowdhury	Chiral carbon dots and their effect on the optical properties of photosensitizers	RSC Adv.	7/53057	November /2017
M. J. Deka et al.	Tuning the Wettability and Photoluminescence of Graphene Quantum Dots via Covalent Modification	New J. Chem.	42(1)/355-362	January/ 2018

Author (s)	Title	Journal name	Volume & Issue no./ page no.	Month/Year of publication
Advanced materials science				
A. Konwar et al.	Tea-Carbon Dots-reduced Graphene Oxide: An Efficient Conducting Coating Material for Fabrication of E-Textile	ACS Sustain Chem Eng.	5(12)/ 11645 -11651	October/ 2017
N. Gogoi et al.	One-Pot Synthesis of Carbon Nanodots in an Organic Medium with Aggregation-Induced Emission Enhancement (AIEE): A Rationale for "Enzyme-Free" Detection of Cholesterol.	ACS Omega	2/3816-3827	July/ 2017
S. Majumdar	Carbon Dot based Fluorescence sensor for Retinoic acid.	Chemistry Select	3/673 -677	January/ 2018
B. K. Sah and S. Kundu	Modification of hysteresis behaviors of protein monolayer and the corresponding structures with the variation of protein surface charges.	Colloids Surf B Biointerfaces	159/696	August/ 2017
H. Talukdar and S. Kundu	Thin films of protein (BSA, lysozyme) - Polyelectrolyte (PSS) complexes show larger red-shift in optical emissions irrespective of protein conformation.	J. Mol. Struct.	1143/84-90	April/ 2017
H. Talukdar and S. Kundu	Restructuring of polyelectrolyte thin films in the presence of nonsolvent.	Chemical Physics	504/57-65	February/ 2018
S. Kundu et al.	Structures and interaction among globular proteins above the isoelectric point in the presence of divalent ions: A small angle neutron scattering and dynamic light scattering study.	Chem. Phys. Lett.	693/176-182	February/ 2018
A. C. Bhowal and S. Kundu	A comparative study on intrinsic fluorescence of BSA and lysozyme proteins in presence of different valent ions from their solution and thin film conformations.	Luminescence	33/267-276	August/ 2017
A. C. Bhowal and S. Kundu	Growth of Gold Nanocrystals on BSA Thin Films.	AIP Conf. Proc.	1832/ 080010-1 -080010-3	May/ 2017

Author (s)	Title	Journal name	Volume & Issue no./ page no.	Month/Year of publication
Advanced materials science				
H. Talukdar and S. Kundu	Structural and optical behavior of thin films of protein (BSA)-Polyelectrolyte (PAA, PSS) complexes.	AIP Conf. Proc.	1832/ 080011-1-080011-3	May/ 2017
K. Das and S. Kundu	Ion specific 2D to 3D structural modification of Langmuir monolayer at lower surface Pressure.	AIP Conf. Proc.	1832/ 080009-1-080009-3	May/ 2017
B. K. Sah and S. Kundu	Modification of structure and pattern of lipid monolayer on water and solid surfaces in presence of globular protein.	AIP Conf. Proc.	1832/ 080012-1-080012-3	May/ 2017
U. Saikia et al.	Electronic Properties of Acetaminophen Adsorbed on 2D Clusters: A First Principles Density Functional Study.	ChemistrySelect	2, 3613-3621	May/ 2017
H. Saikiaet al.	A Simple Chemical Route toward High Surface Area CeO2 Nanoparticles Displaying Remarkable Radical Scavenging Activity.	ChemistrySelect	2 (11)/3369 -3375.	April/ 2017
G. Rajenderet al.	In situ decoration of plasmonic Au nanoparticles on graphene quantum dots-graphitic carbon nitride hybrid and evaluation of its visible light photocatalytic performance	Nanotechnology	28/395703	September /2017
K. Srivastava et al.	Telluroxanes: Synthesis, structure and applications	J. Organomet. Chem.	861/174 -206	February/ 2018
S. R. Sahoo et al.	Charge transport, optica and nonlinear optical properties of CF3substituted acene compounds: a DFT study	Theor. Chem. Acc.	136/9/99	September /2017

Author (s)	Title	Journal name	Volume & Issue no./ page no.	Month/Year of publication
Advanced materials science				
S. R. Sahoo et al.	Charge transport and prototypical optical absorptions in functionalized zinc phthalocyanine compounds: A density functional study	J. Phys. Org. Chem.	31/4/e3785	March/2018
Mathematical and computational sciences				
K. Shravan and B. C. Tripathy	Generalised Closed Sets in Multiset Topological Space	Proyecciones Journal of Mathematics 2018	37(2)/223-237	
A.K. Saw and B.C. Tripathy	H(i)-Connected Ditopological Texture Space	Boletim da Sociedade Paranaense de Matem´atica	37(1)/87-97	2017
A.K. Saw, S. Nandi and B.C. Tripathy	Fuzzy code on RNA secondary structure	Int J Pure Appl Math.	114(3)/483 -501	2017
G. Choudhury and M. Deka	A batch arrival unreliable server delaying repair queue with two phases of service and Bernoulli vacation under multiple vacation policy	Qual. Technol. Quant. M.	15(2)/ 157-186	2018
G. Choudhury and M. Deka	A batch arrival unreliable server delaying repair queue with two phases of service and Bernoulli vacation under multiple vacation policy	Qual. Technol. Quant. M.	15(2)/ 157-186	20182018
G. Choudhury and C. R. Kalita	An M/G/1 queue with two types of general heterogeneous service and optional repeated service subject to server's breakdown and delayed repair	Qual. Technol. Quant. M.	https://doi .org/10.10 80/16843 703.2017. 1331499	2017
A. Mahanta et al.	Some structural and dynamical properties of mandelbrot set	International Journal of Applied Mathematics & Statistical Sciences (JAMSS)	6(3)/35 -58	2017

Author (s)	Title	Journal name	Volume & Issue no./ page no.	Month/Year of publication
Mathematical and computational sciences				
A. Mahanta et al.	Iterated Function Systems as a Generator of Fractal Objects	International Journal of Creative Research Thoughts	6(1)/122 -142	2018
T. Y. Rahman et al.	Textural pattern classification for oral squamous cell carcinoma	J. Microsc.	269(1)85 -93	2018
S. Mahanta and G. Choudhury	On queue with two types of general heterogeneous service with Bernoulli feedback	Cogent Mathematics & Statistics	5(1)/1-9	2018
S. Banerjee et al.	Near-set based mucin segmentation in histopathology images for detecting mucinous carcinoma	J. Med. Syst.	41:144 DOI 10.1007/s 10916-017 -0792-6	2017
D. Das et al.	Morphology-based feature classification between childhood medulloblastoma and normal brain cells using Neural Networks	International Journal of Advance Research in Science and Engineering,	6(12)	December/ 2017
R. N. Bora et al.	Analysis of morphological features of benign and malignant breast cell extracted from FNAC microscopic image using the Pearsonian System of Curves.	J. Cytol.	35:99-104.	2018
D. Das et al.	Automated histopathological diagnosis of pediatric medulloblastoma- a review study	International Journal of Applied Engineering Research (IJAER)	13(11)/ 9909- 9915	2018
K. Bora et al.	Fuzzy NSCT packet based feature extraction method for automated classification of Pap smear images	International Journal of Applied Engineering Research (IJAER)	13(9)/ 6709- 6716	2018
Biodiversity and ecosystem research				
S. S. Devi et al.	Isolation and selection of cellulose-degrading microorganisms for utilization along with earthworms in efficient conversion of municipality waste mix to compost.	Curr. Sci.	114/6/ 1261- 1274.	March/ 2018

Author (s)	Title	Journal name	Volume & Issue no. /page no.	Month/ Year of publication
Biodiversity and ecosystem research.				
S. K. Samanta et al.	Phytochemical portfolio and anticancer activity of Murraya koenigii and its primary active component, mahanine.	Pharmacol. Res.	129/227-236	March/ 2018
D. Thakuria and N. C Talukdar	Soil microbes in sustaining agro-ecosystem productivity.	Fertilizer and Environment News.	3(2)/ 8-12	July / 2017
G. D. Nongthombam et al.	Evaluation and Selection of Potential Biomass Sources of North-East India towards Sustainable Bioethanol Production.	Front. Energy Res.	5(16)/ 1-13	July/ 2017
Biodiversity and ecosystem research				
D. D. Joshi et al.	Nutraceutical from Capsicum chinense fruits in shelf-stable herbal matrix.	Innov. Food Sci. Emerg. Technol.	42/130 -137	June/ 2017
D. Wangkheirakpam et al.	Green Synthesis of Multifunctional Silver Nanostructures Using the Leaf Extract of Ficus pomifera Wall.	Energy Environ.	9/1/96 -101	March/ 2017
S. Sen et al.	Production, Characterization, and Antifungal Activity of a Biosurfactant Produced by *Rhodotorula babjevae* Ys3.	Microb Cell Fact.	6/95	May/ 2017
J. Lahkar et al.	Novel approaches for application of biosurfactant produced by *Pseudomonas aeruginosa* for biocontrol of Colletotrichum capsici responsible for anthracnose disease.	Eur. J. Plant Pathol.	150/57 71	May/ 2017
R. Patowary et al.	Application of biosurfactant in enhancement of bioremediation process of crude oil contaminated soil	Int Biodeterior Biodegradation.	doi.org/10. 1016/j.ibiod .2018.01 .004	March/ 2018
M. Dehingia et al.	Ethnicity influences gut metabolites and microbiota of the tribes of Assam, India.	Metabolomics	13:69	April/ 2017

Author (s)	Title	Journal name	Volume & Issue no. /page no.	Month/ Year of publication
Biodiversity and ecosystem research.				
L. E. Taylor II et al.	Engineering enhanced cellobiohydrolase activity	Nat Commun.	9(1)/1186.	March/ 2018
J. Dutta and D. Thakur	Evaluation of multifarious plant growth promoting traits, antagonistic potential and phylogenetic affiliation of rhizobacteria associated with commercial tea plants grown in Darjeeling, India.	PLoS ONE	12(8)/e0 182302.	August / 2017
S. Kalita et al.	Utilization of *Euryale ferox* Salisbury seed shell for removal of basic fuchsin dye from water: equilibrium and kinetics investigation.	RSC Adv.	7/27248 -27259	2017
S. Kalita et al.	Suitability of groundwater for drinking and irrigation purposes of Guwahati city, Assam, India: An assessment of its quality.	Res J Chem Environ.	3/22-31 ·	2018
P. Tamuly and A. Devi	Bioaccumulation of toxic and essential mineral elements content of Assam tea	Pollution Research	36/513 -519	2017
G. Kaushik and S. Bordoloi	Length-weight and length length relationships of *Balitora brucei* Gray, 1830 and *Psilorhynchus balitora* (Hamilton, 1822) from the Ranganadi river of Assam, India	J Appl Ichthyol.	33(6)/ 1301 -1302	August/ 2017
G. Kaushik et al.	Length-weight relationships of three indigenous fishes collected from Ranganadi River of Lakhimpur district, Assam, India	J. Appl. Ichthyol.	33(6)/ 1237 -1239	July/ 2017
A. Ohler et al.	A study on amphibian fauna of Arunachal Pradesh (India)	Alytes	36 (1-4)/ 276-288	2018

Author (s)	Title	Journal name	Volume & Issue no. /page no.	Month/Year of publication
Biodiversity and ecosystem research				
S.B. Gohain and S. Bordoloi	Higher concentration of heavy metals in surface water and fish near a municipal solid waste dump in Guwahati, Assam, India	Curr. Sci.	113(9)/ 1659 -1661	November /2017
J.F. Hossain and S. Bordoloi	Adaptive Modifications in Four Fish Species of the Genus Garra (Teleostei; Cyprinidae) in Basistha River, Assam, India	Microsc. Microanal.	24/310 -317	June/ 2018
Traditional knowledge based drug development and delivery				
H. Kalita et al.	Antimoicrobial tethering on suture surface through a hydrogel: a novel strategy to combat postoperative wound infections	RSC Adv.		7June/ 2017
S. Divakar et al.	Iminoenamine based novel androgen receptor antagonist exhibited anti-prostate cancer activity in androgen independent prostate cancer cells through inhibition of AKT pathway	Chem. Biol. Interact.		July/ 2017
R. Kandimalla et al.	Bioactive fraction of Annona reticulata bark (or) Ziziphus jujuba root bark along with insulin attenuates painful d iabetic neuropathy through inhibiting NF-?B inflammatory cascade	Front. Cell Neuroscil.		11/73February /2017
S.K. Samanta et al.	Phytochemical Portfolio and Anticancer Activity of Murraya koenigii and its Primary Active Component, Mahanine.	Pharmacol. Res.	129/227 -236.	March /2018
D. Gogoi et al.	Anticoagulant mechanism, pharmacological activity, and assessment of preclinical safety of a novel fibrin(ogen)olytic serine protease from leaves of Leucas	Sci. Rep.	8/6210	April /2018
R. Kandimalla et al.	Glycogen-Gold nanohybrid escalates the potency of silymarin.	Int. J. Nanomedicine	12/7015 -7035	September/ 2017
S. Kalita et al.	Functionalization of β-lactam antibiotic on lysozyme capped gold nanoclusters retrogress MRSA and its persisters following awakening	Sci. Rep.	8/5778	March/ 2018

Author (s)	Title	Journal name	Volume & Issue no. /page no.	Month/Year of publication
Traditional knowledge based drug development and delivery				
U. Goswami et al.	Transferrin-Copper Nanocluster-Doxorubicin Nanoparticles as Targeted Theranostic Cancer Nanodrug	ACS Appl. Mater. Interfaces.	10(4) / 3282 -3294	January /2018
B. Choudhury et al.	Garcinia morella fruit, a promising source of antioxidant and anti-inflammatory agents induces breast cancer cell death via triggering apoptotic pathway	Biomed. Pharmacother.	103/562 -573	April /2018
A. Konwar et al.	A Novel Approach to Fabricate Compact Cotton Patch without Weaving: A Smart Bandage Material.	ACS Sustain. Chem. Eng.	6(5) / 5806 -5817	April/ 2018
M. Kumar al.	Application and optimization of minimally invasive cell-free DNA techniques in oncogenomics	Tumor Biol.	40(2)	February/ 2018

Publications in conference proceedings

Sl. No.	Author (s)	Title	Conference	Volume & Issue name	Month/Year of no./page no. publication
Mathematical and computational sciences					
1	SumanTewary, Chandan Chakraborty, Lipi B. Mahanta, Indu Arun, Rosina Ahmed and Sanjoy Chatterjee	AutoIHC-Analyzer: Computer assisted microscopy for automated evaluation of ER, PR and Ki-67 molecular markers	Paper : 859 IEEE EXPLORE I2CT 2017 2nd International Conferences for Convergence of Technology (I2CT), Pune, India 07 April -08 April -09, 2017	AVAILABLE ONLINE DOI: 10.1109/I2CT.2017.8226288	2017
2.	Daisy Das, Lipi B. Mahanta, Shabnam Ahmed	Morphology-based feature classification between childhood medulloblastoma and normal brain cells using Neural Networks	10th International conference on Recent Development in Engineering Science, Humanities and Management, Panjab University	Article No. 55 AVAILABLE ONLINE ACM New York, NY, USA ©2016 ISBN- 978-1-4503-4753-2 doi>10.1145/3009977.3010068	2017

Pubication as Book chapter

Author (s)	Other details
Biodiversity and ecosystem research	
R. K. Sarma, Ratul Saikia, and N. C. Talukdar T. Barman, A. R. Pal	**Chapter title**-Mitochondrial DNA Based Molecular Markers in Arbuscular Mycorrhizal Fungi (AMF) Research. Chapter. **Book title** -Molecular Markers in Mycology. Part of the series Fungal Biology. **Publisher**-Springer International Publishing, Switzerland. **Page no.**- 243-250. 2017.
Bengyella Louis, Soyanika Devi, P. Roy and N. C. Talukdar,	**Chapter title**-Paradigm Host-range Evolution of Cochliobolus lunatus in Post-genomic era. **Book title** -Pathogenicity of Cochliobolus species in post-genomic era. **Publisher**-Studium Press LLC, USA. **Page no.**- 105-123. 2017.
Priyanka Sharma, Jintu Dutta, Debajit Thakur	**Chapter title**-Future Prospects of Actinobacteria in Health and Industry. **Book title**-New and Future Developments in Microbial Biotechnology and Bioengineering. Actinobacteria: Diversity and Biotechnological **Applications** Publisher-Elsevier. **Page no.**-305-324.

Author (s)	Other details
Traditional knowledge based drug development and delivery	
Choudhury, J. H., R. Das, S. Laskar, S. Kundu, M. Kumar, P. P. Das, Y. Choudhury, R. Mondal and S. K. Ghosh	**Chapter title**- Detection of p16 Promoter Hypermethylation by Methylation-Specific PCR. **Book title** -The Retinoblastoma Protein. Methods in Molecular Biology **Edition- In:** Santiago-Cardona P. (eds) **Publisher**- Humana Press, New York, NY **Print ISBN**978-1-4939-7564-8 **Online ISBN**978-1-4939-7565-5 **Page number** - pp 111-122 **eBook Packages**-Springer Protocols

Contribution to World Database

Biodiversity and Ecosystem research

Author (s)	Title	Database	Year
A. Borah and D. Thakur	Isolation of endophytic actinobacteria from tea (Camellia sp.) from Assam, India for study of plant growth promoting traits and biocontrol	Isolation of endophytic actinobacteria from tea (Camellia sp.) from Assam, India for study of plant growth promoting traits and biocontrol	2018
M. Goswami and S. Deka	Biosurfactant production by a rhizosphere bacteria Bacillus altitudinis MS16 and its promising emulsification and inherent antifungal activity	NCBI GenBank Accession no.: Mg066459	2018

Presentation in Conferences/seminars as invited speaker

Faculty	Title	Programme Name	Date & Venue
Basic and applied plasma physics			
H. Bailung	Plasma – The Fourth State of Matter: A Multidisciplinary Field of Research		January20, 2018 Assam Don Bosco University, Sonapur, Guwahati
Advanced materials science			
D. Chowdhury	Techniques of Thin Film characterization	National Workshop on "Thin Film Technology and Applications"	February 9-13, 2018 at NIT, Nagaland
D. Chowdhury	Hybrid cotton nanocomposite as antimicrobial bio-film	International Conference on "Advances in Polymer Science and Technology"	November 23-25,2017 at New Delhi
D. Chowdhury	Carbon nanomaterial based Fluorescence Sensor	International Conference on "Nanotechnology:Ideas, Innovations and Initiatives-2017" (ICN:3I-2017)	December 06-08, 2017 at Indian Institute of Technology (IIT) Roorkee

Faculty	Title	Programme Name	Date & Venue
Advanced materials science			
D. Chowdhury	Synthesis and Application of Hybrid Carbon Nanomaterial	5th International Conference on "Advanced Nanomaterial and Nanotechnology" (ICANN-	5th International Conference on "Advanced Nanomaterial and Nanotechnology"
D. Chowdhury	Carbon Nanomaterial	Refresher course in "Nano Science and Nano Technology"	April 1, 2017 at Gauhati University, Guwahati
S. Kundu	Structure, morphology and related properties of organic thin films	17thInternational Conference on "Thin Films" (ICTF-2017)	November 13-17, 2017 at National Physical Laboratory, New Delhi
S. Kundu	Spectroscopic studies on organic thin films	International Conference on Molecular Spectroscopy (ICMS 2017)	December 8-10, 2017 at Mahatma Gandhi University, Kottayam, Kerala, India
S. Kundu	Semi-reversible Collapse of Preformed Fatty Acid Salt Langmuir Monolayer on Water Surface	International Conference on Nanoscience and Technology (ICONSAT-2018)	March 21-23, 2018 at Centre for Nano and Soft Matter Sciences (CeNS), Bengaluru, India.
S. Kundu	DNA-Lipid/Surfactant	7th Symposium of the DNA Society of India	November 17-18, 2017 at IASST, Guwahati
Mathematical and computational sciences			
G. Choudhury	A Single Server queueing system with two types of heterogeneous service and generalized vacation under repeated service policy	International Conference on "Recent Trends in Mathematical Sciences" (RTMS-2018)	March 25, 2018 at Department of Applied Mathematics, Maharaja Bir Bikram University jointly with Tripura
G. Choudhury	Teaching and Learning Methods	58th Annual International Conference of Association of Microbiologists of India & International Symposium on "Microbes for Sustainable Development: Scope & Applications" (MSDSA-2017)	November 16-19, 2017 at Babasaheb Bhimrao Ambedkar University, Lucknow
Biodiversity and ecosystem research			
N.C.Talukdar	"Integration of teaching and research in higher education" in Induction training for faculties organized by Teaching learning Centre under the MHRD, Govt. of India.(As a Resource Person)	Initiative of Madan Mohan Malaviya National Mission on Teachers and Teaching	November 27, 2017 at Tezpur University

Faculty	Title	Programme Name	Date & Venue
Biodiversity and ecosystem research			
N.C.Talukdar	Culture-independent approach for assessment of bacterial diversity and its role in plant productivity and agroecosystem sustainability. (As a Lead lecture)	105th Indian Science Congress	March 16-20, 2018 at Manipur University, Imphal
N.C.Talukdar	Creation of innovation eco-system through leveraging bio resources of the State. (As a Resource Person)	One day workshop on "Biotech Park and Innovation" organized by the Centre for Innovation and Future Studies under Assam Administrative Staff College (AASC), Guwahati in collaboration with Guwahati Biotech Park	March 28, 2018 at Assam Administrative Staff College (AASC), Guwahati
W. Romi	Amplicon Analysis through Different Pipelines" and hands-on-training on "Basic LINUX Commands and Microbiome 16S Amplicon Analysis using QIIME	Workshop on "Metagenomics and Microbial Ecology"	March 21-23, 2018 at IASST, Guwahati
S. Deka	Biosurfactant for management of phytopathogenic fungi	International Conference on "Innovation and Translational Dimensions: Food, Health and Environmental Biotechnology"	March 9-11, 2018 at Motilal Nehru National Institute of Technology (MNNIT) Allahabad
S. Nandi	Data Science in NGS data analysis	Data Science Brain Storming Meeting	June 9, 2017, Amity University, Haryana
Soumyadeep Nandi	Determinants of gene regulators	Emerging Trends in Computational Biology	December 16-17, 2017 School of Computational and Integrative Sciences, JNU, New Delhi
Traditional knowledge based drug development and delivery			
R. Devi	Basic Techniques in Molecular Biology	Training Programme on Basic Techniques in Molecular Biology	August 17, 2017 at Department of Botany, Goalpara College, Guwahati
R. Mondal	Genomic on Cancer	Application of Nanotechnology for Biological Science Research	April 20, 2017, Pub Kamrup College, Guwahati

Contributory papers in conference/seminar

Basic and applied plasma physics

Author(s)	Title	Conference name	Oral/poster	Date & Venue
A. Boruah, S.K. Sharma and H. Bailung	1D collision between two unequal dust acoustic solitons in a strongly coupled dusty plasma.	8th International Conference on the Physics of Dusty Plasmas	Oral	May 20-25, 2017, Prague, Czech Republic
A. Boruah, S.K. Sharma and H. Bailung	Study of collision between two dust acoustic solitons of different amplitude in a strongly coupled dusty plasma.	32nd National Symposium on Plasma Science & Technology	Poster	November 7-10, 2017, IPR, Gandhinagar
A. Boruah, S.K. Sharma and H. Bailung	Observation of high amplitude ion acoustic shock in multicomponent plasma with negative ions.	32nd National Symposium on Plasma Science & Technology	Poster	November 7-10, 2017, IPR, Gandhinagar
A. Boruah, S.K. Sharma and H. Bailung	Electron/ion sheath characteristics in low temperature and low density plasma.	32nd National Symposium on Plasma Science & Technology	Poster	November 7-10, 2017, IPR, Gandhinagar
T. Deka, A. Boruah, S.K. Sharma and H. Bailung	Experimental observation of self-excited dust acoustic wave in nano dusty plasma.	32nd National Symposium on Plasma Science & Technology	Poster	November 7-10, 2017, IPR, Gandhinagar
Y. Bailung, T. Deka, A. Boruah, S.K. Sharma and H. Bailung	Experimental observation of dynamic structures in dusty plasma flowing past an obstacle.	32nd National Symposium on Plasma Science & Technology	Poster	November 7-10, 2017, IPR, Gandhinagar
R.R. Khanikar and H. Bailung	Realization of cold atmospheric pressure (CAP) plasma jet and its application in PET surface modification.	32nd National Symposium on Plasma Science & Technology	Poster	November 7-10, 2017, IPR, Gandhinagar
P. Pathak, S.K. Sharma and H. Bailung	Observation of rogue waves in multicomponent plasma.	National Conference on Recent Advances in Science and Technology	Oral	March 15-17, 2018at ASTU, Guwhati
T. Deka, Y. Bailung, S.K. Sharma and H. Bailung	Observation of dust acoustic wave in nano dusty plasma.	National Conference on Recent Advances in Science and Technology	Poster	March 15-17, 2018at ASTU, Guwhati
Y. Bailung, T. Deka and H. Bailung	Study of voids in dusty plasma.	National Conference on Recent Advances in Science and Technology	Poster	March 15-17, 2018at ASTU, Guwhati

Basic and applied plasma physics

Author(s)	Title	Conference name	Oral/poster	Date & Venue
B. Chutia, S.K. Sharma and H. Bailung	Study of in-situ grown dust particles by plasma processes.	National Conference on Recent Advances in Science and Technology	Poster	March 15-17, 2018at ASTU, Guwhati
P.J. Boruah, R. R. Khanikar and H. Bailung	Development of plasma discharge in liquid for the synthesis of metal oxide nanoparticles.	National Conference on Recent Advances in Science and Technology	Poster	March 15-17, 2018at ASTU, Guwhati
Sweety Biswasi and A.R.Pal	Plasma Process Based Fabrication of Organic Thin Film Transistor	International Conference on Sophisticated Instruments in Modern Research	Poster	June 30-July 1, 2017 at IIT Guwahati
Deepshikha Gogoi and A.R.Pal	Plasmonic Hot Carrier Generation in Hybrid Nano-System based Photovoltaic Devices	International Conference on Sophisticated Instruments in Modern Research	Poster	June 30-July 1, 2017 at IIT Guwahati
Santanu Podder and A.R.Pal	Titanium Nitride based Plasmonic Hot Carrier Device having Wavelength Tunability in the Vis-NIR Region	International Conference on Sophisticated Instruments in Modern Research	Poster	June 30-July 1, 2017 at IIT Guwahati
Sweety Biswasi and A.R.Pal	Plasmonic Thin Film Transistor using Plasma Based Process	17th International Conference on Thin Films	Poster	November 13-17, 2017, CSIR-NPL, New Delhi
Deepshikha Gogoi and A.R.Pal	Plasmonic Hot Carrier Generation in Hybrid Nano-material based Photovoltaic Devices	17th International Conference on Thin Films	Poster	November 13-17, 2017, CSIR-NPL, New Delhi
Advanced materials science				
D. Chowdhury	Techniques of Thin Film characterization	National Workshop on Thin Film Technology and Applications		February 913, 2018, at NIT Nagaland
D. Chowdhury	Hybrid cotton nanocomposite as antimicrobial bio-film	Int. Conference on Advances in Polymer Science and Technology		November 23-25, 2017, at New Delhi
D. Chowdhury	Carbon nanomaterial based Fluorescence Sensor	International Conference on Nanotechnology:Ideas, Innovations and Initiatives-2017 (ICN:3I-2017)	Oral	December 6-8, 2017, at Indian Institute of Technology (IIT) Roorkee, India
D. Chowdhury	Synthesis and Application of Hybrid Carbon Nanomaterial	5th International Conference on Advanced Nanomaterial and Nanotechnology (ICANN-2017)	Oral	December 18-21, 2017 at Indian Institute of Technology Guwahati

Advanced materials science

Author(s)	Title	Conference name	Oral/poster	Date & Venue
Devasish Chowdhury	Carbon Nanomaterial	Refresher course in Na no Science and Nano Technology at UGC-Human Resource Development Center (Former Academic Staff College), Gauhati University	Oral	April 1, 2017 at Gauhati University, Guwahati
S. Kundu	Structure, morphology and related properties of organic thin films	17th International Conference on Thin Films (ICTF-2017)	Oral	November 13-17, 2017 at National Physical Laboratory, New Delhi, India.
S. Kundu	Spectroscopic studies on organic thin films	International Conference on Molecular Spectroscopy (ICMS 2017)	Oral	December 8-10, 2017 atMahatma Gandhi University, Kottayam, Kerala, India
S. Kundu	DNA-Lipid/Surfactant Complexes at Interfaces	7th Symposium of the DNA Society of India	Oral	November17-18, 2017, IASST, Guwahati
A. C. Bhowal, S. Kundu	Studies on surface morphology and electrical conductivity of PEDOT:PSS thin films in presence of gold nanoparticles	62ndDAE Solid State Physics Symposium (DAE-SSPS 2017)	Poster	Dec 26-30, 2017, BARC, Mumbai
H. Talukdar, S. Kundu	Thin film of polyelectrolyte complex nanoparticles for protein sensing	62ndDAE Solid State Physics Symposium (DAE-SSPS 2017)	Poster	Dec 26-30, 2017, BARC, Mumbai
S. Pandit, S. Kundu	Optical and Structural Behaviors of Crosslinked Polyvinyl Alcohol Thin Films	62ndDAE Solid State Physics Symposium (DAE-SSPS 2017)	Poster	Dec 26-30, 2017, BARC, Mumbai
S. Pandit, S. Kundu	Polymer Thin Film as Coating Layer to Prevent Corrosion of Metal/Metal Oxide Film	62ndDAE Solid State Physics Symposium (DAE-SSPS 2017)	Poster	Dec 26-30, 2017, BARC, Mumbai
Biodiversity and ecosystem research				
T. Sinha, S. Deka, J. Baruah and N.C. Talukdar	Visualization of endophytic bacteria in cereal, legume and oilseeds using Scanning Electron Microscope and comparison with Culture Based Method	International Conference on "Sophisticated Instruments in Modern Research"	Poster	July 30-01, 2017, at IIT, Guwahati

Biodiversity and ecosystem research

Author(s)	Title	Conference name	Oral/poster	Date & Venue
T. Sinha and N.C. Talukdar	Unraveling the microbiome of oilseed, mustardusing Scanning Electron Microscopy and culture dependent approach	International Symposium on "Biodiversity and Biobanking"	Poster	January 27-29, 2018,at IIT, Guwahati
M. Das and N.C. Talukdar	Jhum cycle's crop plant shapes bacteria flora in its rhizosphere under stress condition	International Symposium on "Biodiversity and Biobanking"	Poster	January 27-29, 2018,at IIT, Guwahati
S. Deka and N.C. Talukdar	Mung Bean Seed Endophytes	International Symposium on "Biodiversity and Biobanking"	Poster	January 27-29, 2018,at IIT, Guwahati
M. Shadab and N.C. Talukdar	Endophytic bacteria diversity of tobacco plant and plant cell suspension culture	International Symposium on "Biodiversity and Biobanking"	Poster	January 27-29, 2018,at IIT, Guwahati
G. Raj and N.C. Talukdar	Mature seeds of native rice varieties harbor unique blend of resident bacterial flora	International Symposium on "Biodiversity and Biobanking"	Poster	January 27-29, 2018,at IIT, Guwahati
A.K. Dutta and N.C. Talukdar	Anti-diabetic drug development targeting PEPCK	International Symposium on "Biodiversity and Biobanking"	Oral	August 21-23, 2017, at Cochin, Kerala
G. Raj and N.C. Talukdar	Unexplored world of native rice varieties	7th Symposium of the DNA Society of India	Poster	November 17-18, 2017at IASST, Guwahati
Rinkumoni Kalita	Smallholder tea plantations for climate change mitigation and sustainability: An assessment from Barak Valley, Assam, North East India	Conference on engaging india and canada: perspectives on sustainability	Poster	May 11-12, 2017, Shastri Indo - Canadian Institute, New Delhi
Rinkumoni Kalita	An ethnobotanical study of medicinal plants used by tea-tribe in southern assam, northeast india	Translational Research on Natural Products for Therapeutic Uses (TRNPT 2017)	Poster	November 21, 2017, IASST, Guwahati
Rinkumoni Kalita	Tea Agroforestry for climate change mitigation: An assessment from Barak Valley, Assam	National Seminar on Prospects and Challenges of Plant Science Research in India	Poster	November 25-26, 2017, Gauhati University
Rinkumoni Kalita	Tea agroforestry: is the system an interesting compromise for sustainable development and fight against deforestation?	International Symposium on Biodiversity and Biobanking (BIODIVERSE 2018)	Poster	January 27-29,2018. IIT Guwahati

Biodiversity and ecosystem research

Author(s)	Title	Conference name	Oral/poster	Date & Venue
K. Das	Efforts to identify sex specific DNA marker in Hippophae rhamnoides ssp. turkestanica by Amplified Fragment Length Polymorphism using DNA analyzer (Licor-model 4300)"	International Conference on "Sophisticated Instruments in Modern Research"	Oral	July 30 - July 1, 2017 at IIT, Guwahati
B. Kashyap, A. Kaushik, S. Borah, B. Deka, S. Barge, S. Bharadwaj, B. Gogoi, P.P. Dutta, R. Kandimalla, J. Boruwa, S. Dasgupta and N.C. Talukdar	Comparative Antioxidant Potential of Few Selected Plants of North East India	National workshop on "Translational Research on Natural Products for Therapeutic Uses: North-East Chapter	Poster	November 21, 2017 at IASST, Guwahati
S. Sen, A. Bora and S. Deka	Anti-dermatophytic effect of a sophorolipid biosurfactant produced by Rhodotorula babjevae YS3 against *Trichophyton mentagrophytes*	Workshop on Translational Research on Natural Products for Therapeutic Uses	Poster	November 21, 2017 at IASST, Guwahati
K. Patowary and S. Deka	Recovery Of Petroleum Hydrocarbons From Refinery Sludge By Rhamnolipid Biosurfactant Producing Bacterial Consortium	4th International conference on Environment and Ecology	Poster	February 12-14, 2018 at Gauhati University
R. Patowary, M.C. Kalita, and S. Deka	Biosurfactant mediated biodegradation of phenanthrene by *pseudomonas aeruginosa* sr17	4th International conference on Environment and Ecology	Oral	February 12-14, 2018 at Gauhati University
N. Sarma and S. Deka	Antifungal Property of Biosurfactant against Plant Pathogenic Fungi Colletotrichum gloeosporioides And Corynespora Cassiicola	4th International conference on Environment and Ecology	Poster	February 12-14, 2018 at Gauhati University
M. Goswami and S. Deka	Isolation, characterization and evaluation of antifungal activity of biosurfactant produced by *Bacillus altitudinis* Ms16	4th International conference on Environment and Ecology	Poster	February 12-14, 2018 at Gauhati University

Biodiversity and ecosystem research

Author(s)	Title	Conference name	Oral/poster	Date & Venue
C. Malakar and S. Deka	Rhamnolipid biosurfactant of Pseudomonas aeruginosa sr17 against Staphylococcus aureus.	Biosangam 18: Int. conf. on innovation and translational dimension: food, health andenvironmental biotechnology	Poster	March 9-11, 2018 at Motilal Nehru National Institute of Technology (MNNIT) Allahabad
M. Goswami and S. Deka	Biosurfactant producing and plant growth promoting Bacillus altitudinisMS16 for sustainable agriculture	Biosangam 18: Int. conf. on innovation and translational dimension: food, health andenvironmental biotechnology	Oral	March 9-11, 2018 at Motilal Nehru National Institute of Technology (MNNIT) Allahabad
R. Thakur, M. Dehingia, N.C. Talukdar and M.R. Khan	Variations in gut microbiota and fecal metabolite profile anociated with consumption of jaggery based distilled liquor by the tea-tribe population of Assam, India	International Symposium on Biodiversity and Biobanking"	Poster	January 27-29, 2018, IIT, Guwahati, Assam
R. Thakur,M. Dehingia, N.C. Talukdar and M.R. Khan	Biochemical analysis of a traditional jaggery-based distilled liquor (Chulai) consumed by the tea-tribal population of Assam (India) and its effects on liver function and blood metabolites.	7th Symposium of the DNA Society of India	Poster	November 17-18, 2017, IASST, Guwahati
Y.B. Chaudhari and M.R .Khan	Exploration of novel cellulases from Indo-Burma Biodiversity Hotspot	7th Symposium of the DNA Society of India	Poster	November 17-18, 2017, IASST, Guwahati
S. Goyari and B. Bhaskar	The Progenitors: Biofertilizer for sustainable agriculture system	DST-Lockheed Martin-Tata Trusts andFederation of IndianChambers of Commerce and Industry (FICCI)	Oral	June 24, 2017, IIT Mumbai
B.Bhaskar, A. Adak and M.R.Khan	Effect of rice beer an animal behavior	International Symposium on "Biodiversity and Biobanking"	Oral	January 27-29, 2018, IIT, Guwahati
B.Bhaskar and M.R.Khan	Effect of rice beer on gut bacteria	NextGen Genomics, Biology,Bioinformatics and Technologies	Poster	October 2017, Bhubaneswar
B.Bhaskar, A. Adak and	Application of CRISPR-based technology in probiotics	7th symposium of DNA society of India	Poster	November17-18, 2017, IASST, Guwahati
T.K.Joishy and M.R.Khan,	Microbial and metabolite diversity of dairy products collected from North-east India	International Symposium on Biodiversity and Biobanking"	Poster	January 27-29, 2018, IIT, Guwahati

Biodiversity and ecosystem research

Author(s)	Title	Conference name	Oral/poster	Date & Venue
C. Malakar and S. Deka	Study of microbial diversity & metabolites of dairy products collected from North-East of India	7th Symposium of the DNA Society of India	Poster	November17-18, 2017, IASST, Guwahati
P. Sarkar and M.R.Khan	Gut bacterial diversity of laboratory mice- A comparative study	International Symposium on Biodiversity and Biobanking"	Poster	January27-29, 2018, IIT, Guwahati
P. Sarkar, R. Kandimala, M.C. Kalita and M.R.Khan	Effect of whisky on gut bacterial Profile	7 th Annual Symposium of DNA Society of India	Poster	November17-18, 2017, IASST, Guwahati
P. Sarkar, R. Kandimala, M. Dehingia, M.C. Kalita and M.R.Khan	Differential effects of whisky brands on human gut microbiome and fecal metabolome.	Int. conference on NextGen Genomics, Biology, Bioinformatics and Technologies	Poster	October 2017, Bhubaneswar, Odisha
P. Sarkar, M.C. Kalita and M.R. Khan	A comparative study based on the analysis of gut microbial profile with two different pipelines	BioSangam an International conference on Innovations and Translation Dimensions: Food,Health and Environmental Biotechnology	Oral	March 9-11, 2018, Department of Biotechnology, Motilal Nehru National Institute of Technology, Allahabad
A. Adak, S. Das, D. Deb and M.R. Khan	Effect of rice beer on human health	Cardiovascular Research Convergence	Poster	August 11, 2017, Translational Health Science AndTechnology Institute
S. Das, D. Deb and M.R. Khan	Nutraceutical properties of rice beer	Translational Research on Natural Products for therapeutic uses, Indian Soc.	Poster	November 21, 2017
S. Das, D. Deb and M.R. Khan	Nutraceutical properties of rice beer	Translational Research on Natural Products for therapeutic uses, Indian Soc. for Translational Research	Poster	November 21, 2017
M. Dehingia and M.R. Khan	Oligotyping of human intestinal microbiota of 15 ethnic groups of India	ADNAT silver jubilee convention and International conference on "Biodiversity and Biobanking"	Poster	January27-29, 2018 at IIT Guwahati
M. Dehingia and M.R. Khan	Mitochondrial DNA D-loop variation across the tribal population of India.	7th symposium of the DNA Society of India.	Poster	November 17-18, 2017. IASST, Guwahati

Biodiversity and ecosystem research

Author(s)	Title	Conference name	Oral/poster	Date & Venue
R. Sultana, N.C. Adhikary, N.C. Talukdar and M.R. Khan	Effect of composite culture of microbes on the electrical power generation in a double chambered microbial fuel cell	58th Annual Conference of AMI & International Symposium on "Microbes for Sustainable Development: Scope and Applications"	Poster	58th Annual Conference of AMI & International Symposium on "Microbes for Sustainable Development: Scope and Applications"
J. Saikia and D. Thakur	Isolation and characterization of endophytic actinomycetes associated with Orchids and screening for their in vitro plant growth promoting and antimicrobial biosynthetic potential	International Symposium on "Biodiversity and Biobanking: From Microbes to Man"	Poster	January 27-29, 2018, IIT, Guwahati
A. Borah and D. Thakur	Assessment of endophytic actinobacteriaassociated with Camellia sp. for in-vitro plant growth promoting activity and biological control of Tea fungal pathogens	International Symposium on "Biodiversity and Biobanking: From Microbes to Man"	Poster	January 27-29, 2018, IIT, Guwahati
S.N. Hazarika and D. Thakur	Isolation and Screening of Actinobacteria from Tea to study their effect on plant growth promotion and disease suppression	International Symposium on "Biodiversity and Biobanking: From Microbes to Man"	Poster	January 27-29, 2018, IIT, Guwahati
R. Das and D. Thakur	Assessment of plant growth promoting pesticide herbicide tolerant tea rhizobacteria for disease control and biodegradation of chemical Agro-inputs.	International Symposium on "Biodiversity and Biobanking: From Microbes to Man"	Poster	January 27-29, 2018, IIT, Guwahati
R. Mazumdar and D. Thakur	Exploration of Actinobacteria from Selected Forest Ecosystems of Assam for the production of antimicrobial metabolites.	International Symposium on "Biodiversity and Biobanking: From Microbes to Man"	Poster	January 27-29, 2018, IIT, Guwahati
Suravi Kalita	Generation of baseline data of water quality of Deepor beel - A Ramsar wetland for development of remediation technique	International Symposium on "Biodiversity and Biobanking: From Microbes to Man"	Poster	February 16-19, 2018.IIT Roorkee
Khanindra Sharma	Paper Mill Effluents: Identification of Emerging Pollutants in Taranga Beel of Assam, India	International Symposium on "Biodiversity and Biobanking: From Microbes to Man"	Poster	February 16-19, 2018.IIT Roorkee

Traditional knowledge based drug development and delivery

Author(s)	Title	Conference name	Oral/poster	Date & Venue
A. Hazarika	Herbal-formulation of *Clerodendrum Colebrookianum* Walp and *Allium* Sativum changes hepatic saturated fat distribution to ameliorate metabolic syndrome in Rats	Translational Research on Natural Products for Therapeutic Uses	Poster	November 21, 2017 at IASST, Guwahati
H Kalita	Role Of Musa balbisianacolla In The Treatment Of Metabolic Syndrome : With Special Reference To Diabetes.	Translational Research on Natural Products for Therapeutic Uses	Poster	November 21, 2017 at IASST, Guwahati
P.K. Deb	A Potent Hmg-Coa Reductase Inhibitor Phenylethanoid Diglucoside (Prd-Cc-001) Isolated from Clerodendrum colebrookianum Walp	Translational Research on Natural Products for Therapeutic Uses	Poster	November 21, 2017 at IASST, Guwahati
K.N. Dutta	Contemporary Approach To Identify The Nutraceutical Potential Of Aromatic Rice (Joha) Against Metabolic Disorder.	Translational Research on Natural Products for Therapeutic Uses	Poster	November 21, 2017 at IASST, Guwahati
K.N. Dutta P. Choudhury	Contemporary Approach To Identify The Nutraceutical Potential Of Aromatic Rice (Joha) Against Metabolic Disorder.	Translational Research on Natural Products for Therapeutic Uses	Poster	November 21, 2017 at IASST, Guwahati
M. Kumar, R. Mondal, S.K.Ghosh	Circulating cell-free DNA as a non-invasive biomarker in head and neck squamous cell carcinoma: A study from Northeast India	7th symposium of DNA society of India	Poster	November 17-18, 2017. IASST, Guwahati

Lectures delivered at other institutes

Faculty	Topic	Date & Venue
Basic and applied plasma physics		
Heremba Bailung	Report on DST-SERB School on Plasma Theory.	July 7, 2017, CEERI, Pilani
Biodiversity and ecosystem research		
Wahengbam Romi	The Invisible Drivers of Food Production: Fermented Foods & Beverages	February 13,2018, Department of Applied Biology, University of Science & Technology (USTM), Meghalaya
Traditional knowledge based drug development and delivery		
Rosy Mondal	Genomics on Cancer	April20 , 2017, Pub Kamrup College, Guwahati

Other activities
Visits to national/international institutes/laboratories

Faculty/Research scholar	National/international institutes/ laboratories	Date
Basic and applied plasma physics		
Heremba Bailung	CEERI, Pilani	July 7, 2017.
Advanced materials science		
N. Sen Sarma	Programme on effective Communication and Presentation Skills for Scientists/ Technologists	February 12-16, 2018 , Centre for Organization Development (COD), Hyderabad sponsored by DST, GoI.
N. Sen Sarma	Training Programme on Administrative Vigilance	September 18 -202017, Department of Science & Technology, Technology Bhawan, New Delhi.
Biswajit Choudhury	SYPOG-Young Scientists Conclave in India International Science Festival	October 13-16, 2017, Anna University, Chennai, India.
Sarathi Kundu	IISc, Bengaluru, India.	March 23, 2018
Biodiversity and ecosystem research		
N. C. Talukdar	1.Institute of Reservoir Studies, Ahmedabad, Gujarat and addressed the Institute technical staff and Scientist on Scientific collaboration between IASST and IRS through singing MOU.	Aug 23, 2017
Jilmil Barua	Newton-Bhaba Felowship, University of Reading, UK	April- Sept, 2018
Arun Kumar	The Second Indian C. elegans Meeting	February23 - 26, 2018, National Institute of Immunology, Aruna Asaf Ali Marg, New Delhi-110067, India
M.R. Khan	One-day Nobel Laureates Seminar, organised by the Department of Biotechnology, Government of India in association with the Nobel Foundation.	February 5 ,2018, Rashtrapati Bhawan, New Delhi, India
Juri Saikia	International Symposium on Biodiversity and Biobanking	January27-29, 2018, IIT Guwahati

Faculty/Research scholar	National/international institutes/ laboratories	Date
Biodiversity and ecosystem research		
Seydur Rahman (NPDF)	DoNER workshop on "Capacity Buildingof Teachers, Researchers and Bio-Medical Practitioners of North Eastern Region on Advanced Techniques in Molecular Biology and Microbiology" College of Veterinary Science, Khanapara, Guwahati	May 30 - June 8, 2017.
Arun Kumar	Laboratory of Dr. Aishwarya Baruah, Assam Agriculture University, Jorhat.	March19-20, 2018
Traditional knowledge based drug development and delivery		
Rajlakshmi Devi	Women Scientists & Entrepreneurs Conclave, India International Science Festival-2017, Chennai.	October 13-16, 2017,
Rajlakshmi Devi	Short Term Training Program on Analytical Instruments & their Application (GCMS, & HPLC) at Guwahati Biotech Park, IIT Guwahati	November 9-10, 2017
Rajlakshmi Devi	ACTREC DBT - NER Training Program, ACTREC, Tata Memorial Centre, Kharghar, Navi Mumbai	December 4-29, 2017
Rosy Mondal	21st National science exhibition, Vivekananda Krirangan, New Barrackpore, Kolkata-131	August 24 -27 2017,
Rosy Mondal	Kalyani University	March 29- April 3, 2018
Prashanta Kumar Deb	21st National Exhibition at New Barrackpore, Kolkata	August24 - 27, 2017
Prashanta Kumar Deb	Government Achivements & Expo -2017, Pragati Maidan, New Delhi	July14-16, 2017
Prashanta Kumar Deb	Application of HRMS and LC-HRMS/MS instrument for the analysis of natural products.CDRI, Lucknow	March 27 - 29, 2018
Paramita Choudhury	Basic Cell Culture Technology, NCCS, Pune	May 15- 18, 2017
Paramita Choudhury	ACTREC, DBT - NER Training Program, Tata Memorial Centre, Kharghar, Navi Mumbai	February 13- 27, 2018
Swarnali Bhattacharjee	ACTREC, DBT - NER Training Program, Tata Memorial Centre, Kharghar, Navi Mumbai	February 13- 27, 2018
Sanjeeb Kalita	Visiting academic at Deakin University, Australia.	April 18, 2017 to April 17, 2018

M.Sc. / B. Tech projects/training courses offered at IASST

Name(s) of trainee	Programme and supervisor	Title of work	Duration
Basic and applied plasma physics			
Sagar Kiran Dewan Guwahati University	M. Sc. Dissertation Heremba Bailung	Growth and study of acoustic waves in a dusty plasma	6 months
Dipamoni Doley IIT (ISM) Dhanbad	SSP 2017 Heremba Bailung	Production of plasma using filamentary discharge and its characterization using electrostatic probe	3 months
Advanced materials science			
Jahnabi Gogoi	M.Sc. final semester dissertation work, 2017 N. Sen Sarma	Synthesis and Characterization of hydrogel from PVA, formaldehyde and glycerol	2 months
Upasana Phukon	M.Sc. final semester dissertation work, 2017 N. Sen Sarma	Synthesis and characterization of a lead-curcumin based compound and its incorporation into an organoge	l2 months
Prerana Das	B.Sc. 4th semester dissertation work, Summer Internship Programme2017 N. Sen Sarma	Synthesis And Characterization of PVA and PVA doped with solvents like DMSO, DMF, Styrene and Acrylonitrile	2 months
Subham Kumar Sahoo	Devasish Chowdhury (Self-financed summer training)	Physico-chemical study of azobenzene Nanocluster Immobilized on Graphene sheet	2 months
Ananya Dutta	M.Sc. final semester dissertation work, 2017 Devasish Chowdhury	Synthesis of Fluorescent Hydrophobic grapheme quantum dot via Covalent Modification	3months
Tuhin Bhattacharjee	M.Sc. final semester dissertation work, 2017 Devasish Chowdhury	Synthesis of Fluorescent Carbon Dot for Sensing of Retinoic acid	3months
Sultana Rijuwana Haque	M.S semester dissertation work, 2017 Devasish Chowdhury	Tea Carbon Dots-reduced graphene oxide coated conductive fabric	6 months
Janardon Borgohain, student of M.Sc. in Physics, 4th semester, Gauhati University	Advanced Materials Science, Arup Ratan Pal	Synthesis of Zirconium Nitride Nanoparticles by Magnetron Sputtering	6 months
Amlan Borah	M.Sc./ Sarathi Kundu	Preparation and Characterization of Polymer and Nanoparticle mixed Polymer Thin Films	5 months
Upama Das	Munima B. Sahariah (Institute funded summer training)	Understanding the Monte Carlo Technique	02 months
Konica Roy	Munima B. Sahariah (Self-financed summer training)	Molecular dynamics study on thermodynamical properties of aluminium	02 months

Biodiversity and ecosystem research

Debdeep Mukherjee, KIIT University, Orissa	Summer training under the supervision of N. C	Fundamental techniques of Microbial Fuel Cells	2 months
Nurmi Tabing,B. Tech. 5th. Semester, NIT, Yupia, Arunachal Pradesh	Summer training under the supervision of S. Deka	Isolation of Bacteria from vermicompost and their characterization	1 month
Dipumani Barman, M.Sc. 5th. Sem. Assam University , Silchar	Summer training under the supervision of S. Deka	Enumeration of bacterial flora from different soils and vermicompost samples and screening of biosurfactant producing bacteria"	1 month
Satabdi Bhattacharya	Dissertation work, M.R. Khan	Probiotic characterization of lactic acid bacteria from rice beer	6 months
Juri Devi	Internship, M.R. Khan	Isolation and characterization of lactic acid bacteria from dairy products	2 months
Smriti Sinha	Internship, M.R. Khan	Establishment of in-vitro cell culture from Aquilaria malaccensis	1 month
Subhra Kumari	Internship, M.R. Khan	Establishment of in-vitro cell culture from Aquilaria malaccensis	1 month
Anirban Kundu	Dissertation work, M.R. Khan	Isolation of probiotics from rice beer following ICMR guidelines	6 months
Aishwariya Kartha	Dissertation work, M.R. Khan	Screening of probiotics from curd following ICMR guidelines	6 months
Upasana Saikia Department of Microbiology, School of Bioengineering and Bioscience, Lovely Professional University, Punjab	M.Sc. dissertation project work, Debajit Thakur	In-vitro Screening of Actinobacteria against Human Fungal Pathogens	1 month
Njabungle Riame Institute of Science and Technology, Gauhati University Guwahati, Assam	B.S. VIII semester training and project work, Debajit Thakur	Screening of culturable Actinobacteria isolated from protected forest ecosystems of Assam for the production of antifungal metabolites against human and plant pathogens	5 months
Maitreyee Das	M.Sc. training project , Debajit Thakur	Metagenomic study to identify bacterial abundance in root, shoot and germinating seeds by using NGS data analysis approach	1 months
Mrinmoy Patra Department of Botany, Banaras Hindu University	M.Sc. dissertation project work Debajit Thakur	Screening of extracellular metabolites produced by Actinobacteria against human fungal Pathogens	1 month
Mrinmoy Patra	M.Sc. Dissertation project Wahengbam Romi	Molecular identification of culturable vaginal bacterial species of healthy reproductive age women in North-East India	6 months
Rekhashree Dutta	Dissertation work under Arundhuti Devi	ASSESSMENT of water and sediment quality at the Guwahati municipal corporation dumping site in west Boragaon near Deepor beel wetland-A Ramsar site	6 months
Hachina Ahmed	Dissertation work under Dr. Arundhuti Devi	Speciation of copper and chromium in sediment collected from different part of Deepor beel-A Ramsar site	6 months

Aksha Chowdhary	Summer training under Dr. Arundhuti Devi	Analysis of water quality near Gauhati Refinery.	2 months
Maialangki Suchiang	Dissertation work under Dr. Arundhuti Devi	Speciation of heavy metals (lead and nickel) in sediment collected from Deepor beel- A Ramsar site.	6 months

Traditional knowledge based drug development and delivery

Aditya Narayan Konwar	Rajlakshmi Devi (Self-financed summer training)	Isolation of micro organisma from preserved samples of Garciniapedunculata and screening of their anti microbial activity	2 months
Vijeta Jaiswal	Rajlakshmi Devi (Self-financed summer training)	Screening of anti microbial effect of metabolites isolated from Garciniapedunculata.	2 months
Anwesha Sarmah	Rajlakshmi Devi (Self-financed summer training)	Isolation of Anthocyanin from the flower of Clerodendrumspeciosum.	1 month
Mahesh Kumar	Rajlakshmi Devi (Institute funded summer training)	Study of Androgen receptor	1 month

Recognition/Honour/Research Awards/Prizes

Name	Particulars
Basic and applied plasma physics	
Tonuj Deka	Best poster award, NCRAST-2018 ASTU, Guwahati.
Abhijit Boruah	Recipient of DST's International travel support for oral presentation in 8th International Conference on the Physics of Dusty Plasmas during May 20 - 25, 2017 held at Prague, Czech Republic.
Advanced materials science	
Devasish Chowdhury	IAAM Scientist Medal for the year 2017 given by International Association of Advanced Materials (IAAM), Sweden.
Sristi Majumdar	Awarded DBT-ISNM fellowship to attend Nanobioteck-2017, 6-8 December 2017 at KTDC Samudra, Kerala.
Neelotpal Sen Sarma	Acted as Expert Committee Member for advising on strategy and roadmap to ensure effective utilization of instruments of Guwahati Biotech Park, Guwahati.
Neelotpal Sen Sarma	Acted as Resource Person for the PhD Coursework of Chemistry Department, Gauhati University 2017-18 for the subject CH504: Electrochemical Impedance, Conductivity of Solid state materials.
Sarathi Kundu	Acted as Subject Expert for interview to upgrade BSR fellowships of five PhD scholars of Physics Department, GU
Sarathi Kundu	Acted as a Resource Person for the Refresher Course in Nano Science and Nano Technology (Botany, Chemistry, Biotechnology, Physics, Electronics & Zoology) and interacted with the participants for discussion and hands on demonstration on Atomic Force Microscope.
Biodiversity and ecosystem research	
N.C.Talukdar	Delivered the 21st Dr. B.V. Mehta Memorial Lecture organised by Jorhat Chapter of Indian Society of Soil Science organized at Department of Soil Science, Assam Agricultural University, Jorhat during 23rdOct, 2017.
N.C.Talukdar	Rajya Sabha TV Eureka Interview of Dr. N. C. Talukdar telecasted on National TV channels on "Relevance of bio-diversity in North-East" with anchor T.V.Venkateswaran on 24th March, 2018. Link to access through YouTube https://www.youtube.com/watch?v=mJVsA9pC9NQ
N.C.Talukdar	Chairman of Expert Committee Meeting of Twinning R&D program for NER on "Medicinal and Aromatic Plants Biotechnology and Drug Development (MAP)" held in Conference Room 2nd Floor NER-BPMC, A -258, S. B. House, Defense Colony, New Delhi held on 19-20thFeb, 2018.

Name	Particulars
Biodiversity and ecosystem research	
Yogesh B. Chaudhari	Best poster award in the 7th Symposium of the DNA Society of India, 2017 at IASST Guwahati during 17th-18th November, 2017.
Madhusmita Dehingia	Best Poster award in the ADNAT silver jubilee convention and International conference on Biodiversity and Biobanking "Biodiverse-2018" held on 27-29th January, 2018 at IIT Guwahati, India.
Madhurankhi Goswami	Best Oral Presentation award at BIOSANGAM-2018 an International Conference on "Innovations and Translational Dimensions: Food, Health and Environmental Biotechnology," for the Technical Session Food and Agricultural Biotechnology held at Motilal Nehru National Institute Of Technology (MNNIT), Allahabad, Uttar Pradesh during March 9-11, 2018.
Madhurankhi Goswami	Best Oral Presentation award at "international conference on environment and ecology 2018" for the Technical Session- II (Environmental Biotechnology, Microbiology and Bioremediation) held at Gauhati University, Guwahati, Assam hosted by Dept. of Zoology, Gauhati University, Guwahati, Assam in association with International Foundation for Environment and Ecology in collaboration with Confederation of Indian Universities (CIU), New Delhi on 12-13-14 February 2018.
BIF Centre, IASST	Achieved fourth position and received the award for "Incentive Awards for Publication-2017" by DBT.
Gitartha Kaushik	Selected as NPDF under SERB, DST.
Suresh Deka	Chaired a technical session in the International Conference on "Innovation and Translational Dimensions: Food, Health and Environmental Biotechnology" held at at Motilal Nehru National Institute of Technology (MNNIT) Allahabad during 9-11 March, 2018.
Suresh Deka	Nominated as a Ph. D. thesis examiner of Madurai Kamraj University and examined a thesis entitled "Integrated fermentative production of Polyhydroxyalkanote (PHA) and Biosurfactant (BS) using Staphylococcus hominis LDC-108 and its application" submitted by V. Rajeswari.

Name	Particulars
Traditional knowledge based drug development and delivery	
Rajlakshmi Devi	Attended as an expert member in Cardiovascular Research Convergence-2017, August 12, 2017, THSTI, Faridabad for evaluation of poster competititon.
Raghuram Kandimalla	Attended as an expert member in Cardiovascular Research Convergence-2017, August 12, 2017, THSTI, Faridabad for evaluation of poster competititon.
Manish Kumar	First Prize in Oral presentation in DNA Society of India, 17th - 18th November 2017, IASST, Guwahati.
Manish Kumar	CSIR -SRF 2018.

List of PhD awardees

Name of student	Name of supervisor	Title of the thesis	Award giving university
Basic and applied plasma physics			
Bhabesh Kumar Nath	Joyanti Chutia	Development of Proton Exchange Membrane for Fuel Cell by Plasma Process	Gauhati University
Aziz Khan	Joyanti Chutia	Development of Fuel Cell Membrane Electrode Assembly with Low Loaded Platinum Nano-Catalyst Synthesized by Plasma Sputtering	Gauhati University
Advanced Material Science			
Sudesna Chakravarty	N. Sen Sarma	Development of functional Hybrid, materials for Sensing and Bio medical Applications	Gauhati University
Paresh Saha	N. Sen Sarma	A Study of Group(II VI) Metal Chalcogenide Quantum Dots and Thin Films	Gauhati University
Upama Baruah	Devasish Chowdhury	Functionalized Carbon Nanomaterials for Optical/Sensing Applications	Gauhati University
Chabungbam S. Singh	Munima B Sahariah	Ab-initio calculations on electronic, magnetic and lattice dynamical properties of Ni-Fe-Ga Heusler alloy	Gauhati University
Biodiversity and ecosystem research			
Robinson C. Jose	N.C.Talukdar	Study on plant-fungal interaction in Zizania latifolia – Ustilago esculanta and Saccharum spontaneum-Sporisorium scitamineum and their economic value	Gauhati University
Sumalata Hijam Devi	N.C.Talukdar	Diversity of cellulolytic microorganisms and cellulose enzymes from earthworms of Imphal, Manipur	Gauhati University
Siddhartha Narayan Borah	Suresh Deka	Studies on the antifungal properties of biosurfactant produced by Pseudomonas aeruginosa with reference to Fusarium verticillioides and Fusarium oxysporum f. sp. Psi	Gauhati University
Kaustuvmoni Patowary	Suresh Deka	Development of bacterial consortia for removal of hydrocarbon pollutants from contaminated sites of oil field soil of Assam	Gauhati University
Priyanka Sharma	Debajit Thakur	Bioprospecting of antagonistic metabolites producing Actinomycetes from selected forest ecosystems of Assam, India.	Gauhati University, Guwahati

Name of student	Name of supervisor	Title of the thesis	Award giving university
Biodiversity and ecosystem research			
Jintu Dutta	Debajit Thakur	Genetic and functional diversity of Tea rhizobacteria for the production of plant growth promoting traits and bio-control of phytopathogens.	Gauhati University, Guwahati
Mihirjyoti Pathak	Arundhuti Devi	Production, purification and characterization of bioflocculant from a bacterium capable of inhabiting petroleum hydrocarbon source and its application in treatment of oil-field formation water	Gauhati University
Gitumani Devi	Arundhuti Devi	Air and Soil Quality near Lakhmoni Oil Field, Bokota, Assam and Impacts on Muga (Antheraea assama) Cultivation	Gauhati University
Gitartha Kaushik	S. Bordoloi	A study on diversity of fish fauna in Lakhimpur district, Assam and biological study of two species of conservational importance	Gauhati University
Sonali Borpatra Gohain	S. Bordoloi	Impact of municipal waste disposal on surrounding ecosystem at Boragaon site, Guwahati, Assam	Gauhati University
Traditional knowledge based drug development and delivery			
Rahul Sarma	Rajlakshmi Devi	Antioxidant and Hypolipidemic properties of bioactive fractions of Garciniapedunculata roxb. in stress induced rat model.	Gauhati University
Sima Kumari	Rajlakshmi Devi	A study on cardio-protective activities of Hydrocotyle sibthorpioides (Lam.), Centella asiatica (L.) and Amaranthus viridis (L.) in experimental animal model	Gauhati University

Traditional knowledge based drug development and delivery

Meetali Deori	Rajlakshmi Devi and Dipali Devi	Evaluation of certain pharmacological properties of silk protein sericin and pupae of muga silkworm Antheraea assamensis helfer	Gauhati University
Himadri Kalita	Rajlakshmi Devi	A study on the possible antioxidant, antidiabetic and antihyperlipidemic activity of Musa balbisiana extracts on rat	Gauhati University
Rajhuram Kandimalla	Jibon Kotoky	Evaluation of Pharmacological and Biopharmceutical Potentiality of Ziziphus jujuba and Annona reticulate	Gauhati University
Sanjeeb Kalita	Jibon Kotoky	Development and Evaluation of Nanoparticulate Drug and Delivery System for anti-microbial and anticancer agents	Gauhati University

List of IASST member of different category who joined other National and International lab

Name of the IASST members	Name of supervisor	Position and current laboratory
Basic and applied plasma physics		
Bhabesh Kumar Nath	Joyanti Chutia	NPDF, Tezpur University
Advanced materials science		
Priyanka Dutta	N. Sen Sarma	Postdoctoral position at University of Bordeaux, France.
Sudesna Chakravarty	N. Sen Sarma	Postdoctoral position at the Laboratory of Biochip Technology, Yonsei University, South Korea
Upama Baruah	Devasish Chowdhury	Institute-Post-doctoral Fellow, Indian Institute of Technology, Guwahati.
Biodiversity and ecosystem research		
Partha Paul, SRF in DBT sponsored adhoc project in IASST	N.C.Talukdar	CSIR- JRF, Institute of Microbial Technology, Chandigarh
Sharmila Talukdar, SRF in DBT sponsored adhoc project in IASST	N.C.Talukdar	CSIR-JRF, Institute of Microbial Technology, Chandigarh
Bhaskarjyoti Gogoi, RA in DBT sponsored adhoc project in IASST	N.C.Talukdar	SERB-NPDF, Dibrugarh University
Rupamoni Thakur, SERB-NPDF	N.C.Talukdar	Scientist-C, ICMR, Dibrugarh
Priyanka Sharma, Ph.D of IASST	Debajit Thakur	SciecaSERB-NPDF, Malaria Drug Discovery, International Centre for Genetic Engineering and Biotechnology (ICGEB) New Delhi-110067
Jintu Dutta, Ph.D. of IASST	Debajit Thakur	SERB-NPDF, Biosciences and Bioengineering Department IIT Guwahati, Guwahati-781039
Anushka Khasnobish, JRF in INSPIRE faculty program	Wahengbam Romi	Ph.D. Research Student (under Japanese Government Monbukagakusho [MEXT] Scholarship 2018), Graduate School of Environmental and Life Science, Okayama University, Okayama, Japan

List of IASST member of different category who joined other National and International lab

Traditional knowledge based drug development and delivery

Sima Kumari	S. K. Banerjee	NPDF at Drug Discovery Research Centre, THSTI, Faridabad, Haryana. (2017)

List of lab members who are from other national laboratories or abroad and had joined IASST

Name of the IASST member	Name of IASST	Earlier place (laboratory) of work
Advanced materials science		
M. A. Barik	N. Sen Sarma	Dept of ECE, Tezpur University
Biodiversity and Ecosystem research		
Anowar Hussain	N. C. Talukdar	Tezpur Univeristy, Tezpur
Parijat Saikia	N. C. Talukdar	Tezpur University, Tezpur
Seydur Rahman	N. C. Talukdar	North Eastern Hill University, Shillong
Asim Duttaa	N. C. Talukdar	North Eastern Hill University, Shillong
Rinku Moni Kalita	N. C. Talukdar	Assam University, Silchar
Kamal Das	N. C. Talukdar	Delhi University, New Delhi
Archana Nath	Debajit Thakur	Department of Biotechnology and Bioinformatics, NEHU, Shillong
Ananya Barman	Debajit Thakur	Department of BSBE IIT-Guwahati. Guwahati-781039
Simang Champramary	Soumyadeep Nandi	Research Scholar; University of Szeged, Hungary
Arnav Saha	Soumyadeep Nandi	Department of MBBT, Cotton university, Guwahati
Kaushik Bhattacharjee	M. R. Khan	Department of Biotechnology and Bioinformatics, NEHU, Shillong-22
Arun Kumar	M. R. Khan	IIT Mumbai
Bithorai Basumatary	M. R. Khan	IIT Guwahati
Shatabdi Saha	M. R. Khan	Assam University, Silchar
Traditional knowledge based drug development and delivery		
Manish Kumar (CSIR-SRF)	Rosy Mondal	Assam University, Silchar

A. In the capacity of the Director;participations and presentations of N.C.Talukdar in different meetings/functions

1. Presented IASST performance during Heads of all the ABs meeting at TIFAC, Vishwakarma Bhavan, Shaheed Jit Singh Marg, New Delhi held on 15th April, 2017.
2. Attended DST Directors Conclave Meeting where a brief presentation was made on IASST in front of the Honorable Ministry of Science & Technology, GoI held at S.N. Bose National Centre for Basic Sciences, Kolkata during 2-3rd May, 2017.
3. Made a presentation on IASST in Biology and Medical Sciences section during the Sectoral Expert Committee meeting held at TIFAC, Vishwakarma Bhavan, Shaheed Jit Singh Marg, New Delhi held on 23rd June, 2017.
4. Made a presentation on IASST in Chemical, Material and Engineering Sciences section along with Dr. Neelotpal Sen Sarma and Dr. Devasish Chowdhury during the Sectoral Expert Committee meeting held at TIFAC, Vishwakarma Bhavan, Shaheed Jit Singh Marg, New Delhi held on 23rd June, 2017.
5. Opening ceremony lecture on the first conference on "Sophisticated Instruments in Modern Research" organised by Central Instrument Facility (CIF), IIT Guwahati organised in association with IASST; SAIC, Tezpur university; SAIF, Gauhati University; and SAIF, NEHU, IIT-Guwahati, Assam, India held on 30th June, 2017.
6. Made a presentation on IASST along with Dr. Heremba Bailung in Physical and Mathematical Sciences section by during Sectoral Expert Committee meeting held at TIFAC, Vishwakarma Bhavan, Shaheed Jit Singh Marg, New Delhi held on 13th July, 2017.
7. Attended as invitee for the inauguration of Auditorium & spelling out Government of Assam's Action Plan on Act East Policy at Maniram Dewan Trade Centre complex, Betkuchi, ISBT, Guwahati on 6th Oct, 2017 which was addressed by Honoble CM, Govt. of Assam.
8. Attended the second Noble Prize Series, India 2018 with theme of "Education and the value of teachers" under the theme "Education Powering National Growth" conducted by Department of Biotechnology with ongoing collaboration with Noble Media AB in partnership with Govt. of Goa at Rastrapati Bhawan, Delhi held on 5th Feb, 2018.
9. As chief guest of the different functions-
   - In the inaugural function on occasion of "University Science Festival" with a noble goal in promoting scientific temper and research organized at Assam University, Silchar during 7th-9th April, 2017.
   - In the inaugartion function of Orientation Program 2017 of USTM, Meghalaya held on 6th Sept, 2017.
   - In the National Seminar "Harmony with Nature in the context of Chemistry, Environmental Issues and Challenges" organized at Pub Kamrup College, Baihata Charialı, Assam held on 11thSept, 2017.
   - In the inaugural function of the Conferences on "Bioprocessing India" organized at Department of BioSciences and Bioengineering, IIT, Guwahati held on 9thDec, 2017.
   - In the State Science and Engineering Fair to inaugurate the State Science and Engineering Fair at Regional Science Centre, Guwahati held on 9thDec, 2017.
   - At the University of Science & Technology on 5th North East Graduate Congress (NEGC) held on 17th Feb, 2017.
   - On the National Science Day Programme of Assam Jatiya Bidyalay, Guwahati held on 28th Feb, 2018.
   - In the workshop cum awareness program on "Lifestyle diseases and its management" in Tezpur Science Centre organized by Advance Level Institutional Biotech Hub, Department of Biotechnology, Gauhati University in association with Assam Science Society held on 24th March, 2018.

B. Director, Dr. N. C. Talukdar participated as expert member in different task force and academics-

1. 2nd SAC Meeting of Chemical Ecology Programme linking NER & Bangalore Researchers. Kohima, Nagaland at NASTEC, Dimapur held on 10th & 11th April, 2017.
2. 14th Meeting of Apex Committee of NERBPMC for North Eastern Region of India organized at Conference Room, 2nd Floor, NER-BPMC, A-258, S.B. House, Defence Colony, New Delhi held on 1st Nov, 2017.
3. First Governing Body of Krishnagurı Adhyatmik Visvavidyalaya- Visvavidyalaya Conference Hall held on 2nd Dec, 2017.

4. First consultative meeting on setting up of "Women Biotechnology Network Park in North Eastern Region of India" at BIRAC office, 1st Floor, MTNL Building, 9 CGO Complex, Lodhi Road, New Delhi held on 19thDec, 2017.
5. Served Expert Committee meeting to review progress of "Ethno Medicinal Research Centre (EMRC) of DST, New Delhi at Hengbung, Senapati District, Manipur held on 6th Feb, 2018.
6. 2. Attended as a member of Finance Committee Meeting, NIPER-Guwahati. Guwahati Biotech Park, IIT - Guwahati held on 4th June, 2017.
7. First meeting of Board of Governance (BoG)-Gauhati University Institiute of Science and Technology (GUIST) in the premises of new GUIST Building of Gauhati University held on 30thAug, 2017.
8. Finance Committee meeting of NIPER, Guwahati held at Guwahati Biotech Park, IITG on 11thDec, 2017.
9. Executive Committee meeting for the Second phase of "Development/upgrading infrastructure in Medical Colleges in North-Eastern States of India" & "Research Grants to support MD/MS thesis to Medical Students in North Eastern Region.Tezpur University Guest House at Maligaon, Guwahati held on 15th Dec, 2017.
10. 15th meeting of Apex Committee for North Eastern Region Biotechnology Programmes at Conference Room, 2nd Floor NER-BPMC, A -258, S. B. House, Defence Colony, New Delhi held on 26thMarch, 2018.
11. 3rd SAC and Project Steering Committee (PSC) meeting of Chemical Ecology Programme linking NER & Bangalore Researchers at Imphal held on 19-20th April, 2018.
12. Attended 5th Research Review Committee meeting in the Board room of Assam Down Town University held on 25th April, 2018.

C. Evaluation and examination of Thesis by Dr. N.C.Talukdar-

1. Viva-voice examination on the Ph.D. thesis of Shri Akshay Ch. Deka of Downtown University, Guwahati, held on 14th Aug, 2017.
2. External Examiner for the Oral Defense examination of Ms. Samprit Kataki for the thesis entitled "Assessment of Bioenergy by-products (anaerobic digestate and Biochar) as potential crop production inputs" for award of Ph.D. degree. Department of Energy, Tezpur University. 16th Dec, 2017.
3. Examiner of the Ph.D. thesis entitled "Macrofungal diversity of North East India and development of nanoparticle based detection of Mushroom toxin" of Ms. Aasma Parveen a Ph.D. scholar of Biotechnology Department, AAU.
4. As one of the member panel of examiner to evaluate the Ph.D. thesis thesis entitled: "Isolation and Identification of Bioactive Components from Natural Products Responsible for Antihypertensive Efficacy," of Mr. Lokesh Deb, Jawaharlal Nehru Technological University, Kukatpally, Hyderabad, Telangana, India.
5. Thesis entitled "Microbial diversity at Iron Ore Mined-Out Sites in Odisha, and its significance in Ecological Restoration submitted by Mr. Vivek Kumar Choudhary (Department of Botany) for the degree of Doctor of Philosophy, Delhi University.

D. Dr. Diganta Goswami in the capacity of Registrar

Delivered a guest of honour lecture on "Management of Soil Health for sustainable agriculture" on occasion of "celebration of world soil health day and distribution of soil health cards" organised by KVK, Assam Agricultural University, Darrang held on 5th December, 2017.

I. Conference / Seminar / Workshop / Training Course / Symposium Organized

(1) Seventh Symposium of DNA Society of India

IASST in association with Cotton University organized the 7th Symposium of DNA Society of India on 17th - 18th November, 2017. The theme of the symposium was "Importance of DNA Fingerprinting, Cataloguing and Utilization of the Bioresources of North-East India". Twenty eminent scientists of repute including Prof. Sankar Kumar Ghosh, Vice-Chancellor, Kalyani University, Nadia, West Bengal and Prof. Sher Ali, Centre for Interdisciplinary Research in Basic Sciences, Jamia Millia Islamia, Jamia Nagar, New Delhi delivered scientific talks. Sub-theme of the symposium was: DNA based approach for the Plant (Horticulture, Medicinal and Agricultural), Animal including Human and Microbial Bio-diversity studies, Molecular Interaction between Organisms, Molecular Therapeutics, Molecular Breeding, and Genetics and Functional Genomics. More than 100 scientists, teachers and research scholars from different institutes of eastern and North East India made presentation on the sub-theme of the workshop. Financial supports for organising the symposium were received from the Department of Science and Technology (DST), Govt. of India; Indian Council of Medical Research (ICMR), Govt. of India; Department of Biotechnology's (DBT's) Institutional BioTech Hub, IASST, and North East Chemicals Corporation (NECC), Guwahati.

Top: Keynote lecture by Prof. S. K. Ghosh, Vice Chancellor, Kalyani University, Nadia. Poster presentation· Bottom: Scholars explaining their research to the Judge for their poster evaluation.

(2) Workshop on Translational research on Natural Products for Therapeutic Uses

The third workshop of the Indian Society for Translational Research (ISTR) was held on theme "Translational research on Natural Products for Therapeutic Uses." It was organized by the NE Chapter of ISTR on 21st Novebmer, 2017 in the IASST's auditorium. Dr. Gopal Kundu, NCCS, Pune, Dr. Ashis kumar Mukherjee, Tezpur University, Dr.Nabin C. Barua, NEIST, Jorhat, Dr. Manoj Pillai, SciEX Bangalore, Dr. S S Ghosh, IIT Guwahati, Dr. Sanjay Banerjee, THST, Dr. Prabhanshu Tripathi, THSTI, New Delhi delivered the invited talks. More than 100 delegaters participanted in the workshop.

Dr. Gopal Kundu, Senior Scientist at National Centre for Cell Science, Pune delivering lecture during the workshop to the scientists and research scholars of IASST.

(3) Workshop on 'Metagenomics and Microbial Ecology'

A workshop on "Metagenomics and Microbial Ecology" was organized during 21st - 23rd March, 2018 in the auditorium of IASST. The workshop was organized by the Advanced level Institutional Biotech Hub, IASST and a part of the finicial support came from the DBT's Unit of Excellence project executed in IASST. Important topics covered within the theme were Next Generation Sequencing (NGS) data analysis. Through a series of lectures and hands-on training from experts namely, Dr. Dhiraj Dhotre (NCCS, Pune), Dr. Dwipendra Thakuria (CAU, Barapani), Dr. Syed G. Dastager (NCIM-NCL, Pune), Dr. W. Romi (IASST) and Mr. Debashis Panda (Assam Agricultural University, Jorhat) all the participants including research scholars and post-doctoral fellows from various institutes of India benefited greatly from this daylong workshop.

Dr. Dhiraj Dhotre, NCCS, Pune, delivering his lecture during the workshop.

(4) VIBHA-VANI North-East Zonal Conclave

A two days VIBHA-VANI North-East Zonal conclave was organised jointly by VijnanaBharati and IASST on the theme 'Science for masses' on 9th to 10th September, 2017 in the IASST auditorium. The inaugural function of the conclave was graced by the Hon'ble Governor of Assam, Shri. Banwarilal Purohit as the chief guest.

Hon'ble Governor of Assam, Shri Banwarilal Purohit is addressing the gathering on the occasion of VIBHA-VANI North-East Zonal Conclave.

(5) One Day Workshop on Wetland Ecosystem of Assam and its Productivity Enhancement

IASST organised a brainstorming session on "Wetland ecosystem of Assam and its productivity enhancement" on 28th August, 2017 in IASST auditorium. In the event, Dr. Dipayan Dey, Chariman, South Asian Forum for Environment, delivered a talk titled "A Day-out in Wetland". In his talk, Dr. Dey extensively dealt on the experience of their organization's flagship programme "Wetland Conservation." Their wetland program cover nine Ramsar sites and around 13 Pan-Indian wetlands in India. He also narrated plight of East Kolkata Wetland due the dumping of garbage and free fishing activities in their wetland. He described their efforts in generating awareness among the fishermen and involved them in restoring the near-death stage wetland. Dr. Dey pointed out that, there is urgent requirement of wetland conservation and protection policy. He also drew attention on similarity between the East Kolkata and Deepor Beel wetland plight. Several experts on wetland ecology also took part in the workshop and emphasized on holding a national level workshop to work out strategy for research on wetland ecosystems including Deepor Beel of Assam.

Dr. Dipayan Dey, Chariman, South Asian Forum for Environment delivering the Keynote lecture in the Workshop on Wetland Ecosystem.

(6) One-day Science Communication Workshop

A one day science communication workshop was organized jointly by Wellcome Trust/DBT India Alliance (WTD-IA) and IASST on 8th June, 2017 in the institutes auditorium. One hundred research scholars and young scientists participated in the event. The three members team from WTD-IA namely, Dr.(Ms.) Sarah Iqbal, Public Engagement Officer, Dr. (Ms.) Ranjana Sarma and Dr. Madhan Kumar Anandhakrishnan, Grants Adviser conducted the workshop. First lecture by Dr.(Ms.) Sarah Iqbal introduced some aspects on Research Ethics with case study. Dr. (Ms.) Ranjana Sarma in the very next lecture discussed on Science Communication. Dr. Sarma delivered a lecture on "Presentation Skills-Power Point, Poster etc." and successfully conveyed to the participants, what a good Power Point presentation is, and how the materials are arranged in a slide. Dr. Madhan Kumar Anandhakrishnan in his presentation on "Writing a Manuscript" provided very useful tips on how to write a good manuscript. There were also additional inputs to the research scholar participants for Grants writing skill, CVs, and on conducting one self in an interview for achieving success. The speaker also made a brief presentation on different activities of the Wellcome trust/DBT India Alliance Fellowship Programme.

Dr. Ranjana Sarma, Grants Adviser, Wellcome Trust /DBT India Alliance, delivering lecture on SciComm101 to the attendees of the workshop at IASST.

II. EVENTS AND CELEBERATIONS

(1) Independence Day

IASST celebrated the 71st Independence Day in its campus with a day long program. The National Flag was hoisted by the Director of the institute and followed up by the National Anthem and a short address to the gathering of employees and research scholars. Patriotic and devotional songs and dances were performed by the research scholars and staff in IASST auditorium. A quiz competition was conducted on the theme "Indian Freedom Movement" where IASSTians participated with great enthusiasm. An Independence Day special short film was also projected in the IASST auditorium.

IASST family members participating National Flag hoisting ceremony on the occasion of 71st Independence day.

(2) World Environment Day

The World Environment Day on the theme "Connecting people to nature" was celebrated with full enthusiasm by the IASST community in the IASST campus on 5th June, 2017. The event was kicked-off by playing the video of the documentry "Earth Anthem" produced by the famous singer Michael Jackson. This was followed by a video on the environmental landscape of IASST campus. In a short speech competition on 'Role of the IASST in Nature Conservation' organised in the auditorium, research scholars and staff members participated actively. This was followed by plantations of valuable tree species in the different parts of IASST campus.

Students delivering short speech on the occasion of world environmental day.

IASST members planting saplings.

(3) Yoga Day celebration at IASST

The entire fraternity of IASST observed the International Yoga Day on 21st June, 2017. A yoga and meditation session was conducted by Swami Barun Anand, Founder of Anandapuram (Institute of Yoga and Meditation), Nalbari, Assam.

A scene of Yoga practice conducted by Swami Barun Anand, Founder of Anandapuram (Institute of Yoga and Meditation), Nalbari at IASST.

(4) Commemoration of 75th Anniversary of the Quit India Movement

IASST commemorated the 75th anniversary of the Quit India Movement on 9th August 2017. In the day long event, following activities were conducted: Pledge taking, Quit India movement Quiz and New India Manthan- Share your ideas for a New India. The event of the day came to the end with the pledge, 'Sankalp se Siddhi – Attainment through Resolve' with resolve to carry it forward to the year 2022. The staff, scientist and scholars of IASST took the pledge for contributing towards a Corruption free India, Clean India, Poverty free India, Terrorism free India, Casteism free India and Communalism free India.

(5) Teachers' Day

To pay tribute to Dr. Sarvepalli Radhakrishnan, the research scholars of IASST celebrated the Teacher's Day on 5th September, 2017 with great enthusiasm. In the touching gesture, the research scholars surprised their supervisors with gift of potted plants. Several talented research scholars performed songs and dances on stage and made the day memorable. Dr. Biswajit Choudhury who is an Inspire faculty also lit up the evening with the soothing tune of his guitar and melodious voice.

Members of IASST celebrating Teachers' Day in the evening of 5th Sept, 2017.

(6) Hindi Diwas

IASST celebrated Hindi Diwas with great enthusiasm on 14th September, 2017. On the occasion Mr. Mohan Koirala, Assistant Director (Official language) Bhramaputra Board, Guwahati delivered a talk. Drawing competition for children of employees of IASST and local residents, essay competition and Hindi poem recitation competition for employees and research scholars were also organized on this occasion. The winners were awarded with certificate and gifts.

Mr. Mohan Koirala, Assistant Director of Official language, Bhramaputra Board, Guwahati delivering his speech on the occasion.

(7) Swachhta Hi Seva

Following a directive from the Ministry of Science and Technology, DST, New Delhi regarding 'Swachhata Hi Seva' Fortnight Campaign starting from 15th September 2017 to 2nd October 2017 was observed. IASST held a meeting to start and discuss issues related to the Campaign. This was followed up with the cleaning activities inside IASST campus and in the periphery of the institute inhabited by local people. To take the mission further, on 29th of November, 2017 a booklet was distributed with the information on the Waste Management System developed at IASST. In the meeting the primary discussion was about, how we can manage the waste of our lab and office. Detail of the waste management system was also presented in power point by Dr. Dharmaeswar Das. The booklet designed for the members of IASST had all the required information such as, the location of the waste bins, what to do with the hazardous waste, how the biodegradable waste is managed at IASST.

Members of IASST taking part in the mission 'Swachhata Hi Seva'

(8) Vigilance Awareness Week with Integrity Pledge

IASST begun Vigilance Awareness Week during 30th October, to 4th November, 2017 for six days with the "Integrity Pledge" led by Dr. Narayan Chandra Talukdar, Director, IASST with all the faculty members, students and staffs of the institute taking the oath. As a part of the Vigilance Awareness Week, 2017, an awareness talk was organized in the Auditorium of IASST on 1st November at 10:30 am. Shri Rajashekara N, IPS, SP and Head of Branch, Central Bureau of Investigation, Guwahati, was invited to deliver talk on vigilance awareness and to educate members of IASST on vigilance related activity. Professor Heremba Bailung, Head, physical science welcomed the gathering and Dr. Neelotpal Sen Sarma, Vigilance officer of IASST introduced the speaker to the audience. Sri Rajashekara N, spoke on the various issues and incidences related to the corruption at various stage of our society as well as in our working places. He discussed the problem in very homely manner and answered the question on various related issues which was asked from the audience. Dr. Diganta Goswami, Registrar, IASST offered vote of thanks at the end of the meeting.

Dr. N.C. Talukdar, Director IASST administering the pledge to the IASST fraternity

(9) 39th Foundation Day

The 39th Foundation day of IASST was celebrated on 3rd of November, 2017 to mark the beginning of the institute on 3rd November in 1979. The foundation day lecture was delivered by Prof. V. Nagaraja, President, JNCASR, Bangalore. Felicitation and short speeches were given by Prof. D.N. Buragohain, Founder Director, IIT Guwahati and Dr. T. Madan Mohan, Adviser, Department of Biotechnology, Govt. of India. Prof. B.N. Goswami, Former Director, IITM, Pune delivered a lecture and Prof. Bhabesh Ch. Goswami, VC, CU gave his presidential remark. A cultural programme by flute specialist, Dipak Sarma and Tarali Sarma and folk dancers was also organized in the event.

Clockwise: Sports activities carried out on the occasion of Foundation day; cultural event on the Foundation Day; Prof. D. N. Buragohain, Former Director, IIT, Guwahati delivering lecture on the occasion.

(10) Prime Minister's speech on 125th Birth Anniversary Celebration of Prof. S. N. Bose

On the occasion of the birth anniversary of Physicist Satyendra Nath Bose, the Honorable Prime Minister Shri Narendra Modi addressed to the scientists and research scholars of DST institutes in India through video-conferencing. IASST family members also attended the lecture through video-conferencing in the auditorium of IASST.

IASST family listening to the speech of Honorable Prime Minister Shri Narendra Modi on occasion of 125th Birth Anniversary Celebration of Prof. S.N. Bose

(11) Republic Day Celebrations

IASST celebrated the 69th Republic Day on 26th January, 2018 with the customary unfurling of the National Flag followed by the National Anthem. Faculty, staff and research scholars were motivated to put maximum efforts in research, technology and innovation outputs for raising the quality and standards of the institute in a competitive way and contribute towards building a strong and better India. Inspirational patriotic short films were also screened for the IASST family.

Dr. N. C. Talukdar, Director, IASST addressing the family members of IASST on the occasion of 69th Republic Day

(12) National Science Day- 2018

IASST organised a two day celebration of National Science Day 2018, on 27-28th February, 2018, with a theme - "Science for Society". The event attracted more than 1500 visitors from various educational institutes, and had generated considerable interest in media. National Science Day 2018 had three parts - Lectures by eminent personalities, Exhibition of innovations from north-eastern India, and an interactive session on R&D commercialisation for the innovators which was organised under the aegis of IASST Social Venture & Entrepreneurship Consortium (ISVEC). Additionally, the villagers from Bakrapara and Kollapara villages of Rani Block in Kamrup Dist., which are adopted by IASST, demonstrated several rural technologies.

On the first day, inaugurral talk was delivered on "multi wavelength view of universe" by Prof. Dhruba Jyoti Saikia of TIFR, Pune who is also the Founder Vice Chancellor of Cotton University, Guwahati. Then Padmashree Prof. MV Padma Srivastava from AIIMS , Delhi, delivered a talk on 'Improving stroke care in India' . Prof Srivastava inaugurated the Exhibition of Innovations. In post lunch session, eminent innovator from Assam, Dr. Uddhab Kumar Bharali, also known as the 'Machine Man of Assam', delivered a talk on Innovation. The day ended with a talk by eminent woman entrepreneur of Assam, Ms Tanushree Hazarika on 'creation of entreprise', which was arranged by ISVEC. The second day started with a lecture in Assamese by Prof. Abani Kumar Bhagabati , Guwahati University , with title ' Biodiversity: Pressure, Threats and Conservation Efforts'. This was followed by a talk arranged by ISVEC on 'Intellectual Property Rights', by SIPP facilitator , advocate Subhasish Ghosh, Founder , Seenergi IPR, Kolkata.

In the two day long exhibition of innovations, 50 innovators from various places of north-eastern India had participated. IASST had arranged transportation and stay for all the innovators, and also HD TVs for 10 innovators, who wanted to give audio-visual demonstrations of their innovations. A number of school students also presented science based models in the exhibition. To carry forward the innovations from the exhibition hall to targeted beneficiary, ISVEC had invited several strategic audiences to visit and interact with the innovators.

Prof. MV Padma Srivastava from AIIMS, Delhi delivering lecture and interacting with the audience.

Registration of students for National Science Day.

Snap shots of National Science Day Exhibition

III. Eminent Scientists / Personality who visited and delivered lectures

During the year 2017-18, the institute invited several distinguished scientists, experts in relevant fields from different reputed organizations of the country as a part of continuous efforts for enhancing quality of R & D of IASST and also for exploring research collaboration with other scientists/institution. The details of visits are presented below-

Date	Photo	Name of visitor and affiliation	Title of Talk/Lecture
03.09.2017		**Dr. T. Ramasami** Former Secretary, Ministry of Science and Technology, Govt. of India	India in Global science and Technology: A new perspective in pro poor technology world and Acharya JC Bose: An Inspirational Model for Indian science
20.12.2017		**Prof. A.N. Rai** Former Vice-Chancellor, Mizoram University & NEHU and former Director of NAAC	Higher Education scenario in India
03.11.2017		**Prof. V. Nagaraja** President, JNCASR, Bangalore	Foundation day lecture
27.02.2018		**Prof. M.V. Padma Srivastava,** Padma Shri Dept. of Neurology AIIMS, New Delhi.	Improving stroke care in India
01.12.2017		**Sri Srinivas Lanka** Advisor, Corporate Enterprises and Government Initiatives, GoI.	Market Driven Innovation
27.02.2018		**Dr. Dhruba Jyoti Sainia** Senior Professor, TIFR, Pune	Multi wavelength view of universe

Date	Photo	Name of visitor and affiliation	Title of Talk/Lecture
12.12.2017		**Dr. Akio Ebihora** Professor, Gifu University, Japan	Biochemistry and Bioprocessing
19.03. 2018		**Prof. Subhra Chakraborty** Staff Scientist VII (Professor), NIPGR, New Delhi	Nutritional and plant genomics
25.05.2017		**Dr. Shobhana Narasimhan** Prof. JNCASR, Bangalore	Method in the Madness: Descriptors and the Rational Design of Materials from First Principles
11.12.2017		**Dr. Dong-Yup Lee** Assistant Professor, Chemical and Biomolecular Engineering, National University of Singapore	System biology and Bioprocessing for innovation
26.02.2018		**Prof. A.K. Ganguli** Former Director, INST, Mohali and Professor at IIT Delhi	Design of Nanostructures for energy and environmental applications
03.11.2017		**Prof. B.N. Goswami** Former Director, IITM, Pune	Development and Operationalization of a Integrated, Multiscale, Distributed Hydrological Flood Forecastiong System for greater Brahmaputra Basin
21.08.2017		**Dr. Rafikul Alam** Department of Mathematics, IIT(G), Guwahati	Fiedler companion pencils for rational matrix functions and the recovery of minimal bases and minimal indices
29.08.2017		**Prof. M. Guru Prem Prasad** Department of Mathematics, IIT(G), Guwahati	Mathematics behind Fractals

Date	Photo	Name of visitor and affiliation	Title of Talk/Lecture
01.06.2017		**Dr. Nabanita Saikia** Postdoctoral Research Associate, Department of Physics, Michigan Tech University, Michigan, USA.	Biomolecular recognition and Supramolecular Self-Assembly at the Solid/Liquid Interface: A Theoretical Perspective
04.05.2017		**Dr. B K Bordoloi** Director, BBIPL (India) and CEO Bordoloi Biotech, LLC (USA)	From Discovery to New Product Development
14.08.2017		**Dr. Anjana Kakoti Mahanta** Prof. Department of Computer Science, Gauhati University, Guwahati	Plagiarism: Its Practice and Detection Methods
16.08.2017		**Dr. Manash R. Das** Scientist & Assistant Professor, Material Sciences and Technology Division, NEIST, Jorhat	Reduced graphene oxide nanosheets decorated with monometallic and bimetallic nanoparticles: A Multifunctional material for photothermal therapy and bio-molecules detection application.
14.08.2017		**Dr. Thangjam Robert Singh** Assistant Prof., Department of Biotechnology, Mizoram University, Aizawl, Mizoram	Potentials and Problems of Banana; Genetic Resources of NE India
22.08.2017		**Prof. Ramesh Chandra Deka** Professor, Department of Chemical Sciences, Tezpur University, Tezpur	Molecular Modelling and Computer aided Drug Design
23.03.2018		**Dr. Shailendra Asthana** Structural Bioinformatics Drug Discovery Research Center, Translational Health Science and Technology Institute, Faridabad	Computational microscopy: need of the hour
28.02.2018		**Prof. Abani Kumar Bhagabaty** Dept. of Geography Gauhati University, Guwahati	Biodiversity: Pressure, Threats and Conservation Efforts

Date	Photo	Name of visitor and affiliation	Title of Talk/Lecture
09.03.2018		**Dr. Hemjit Talukdar** Cardiologist, Hyatt Hospital, Lalganesh, Guwahati	Heart disease and its preventive measure
27.02.2018		**Dr. Uddhab Bharali** Inventor, North Lakhimpur, Assam	Innovation
28.02.2018		**Mr. Subhasish Ghosh** Founder-cum-Partner, Seenergi IPR, Kolkata Patent Attorney and SIPP Facilitator	Intellectual Property Rights
27.02.2018		**Ms. Tanushree Hazarika** Founder of Eclectic Northeast, Eminent woman entrepreneur from North-Eastern India	Creation of enterprise
03.08.2017		**Ms. Soma Chattopadhyay** Manager Incubator, Venture Centre, NCL Innovation Park, Pune.	Entrepreneurship Development program at NCL, Pune
21.03. 2018		**Mr. Sumanta Basu** Senior Program Manager, United States-India Educational Foundation (USIEF), Kolkata	Schemes of USIEF including Fulbright Nehru fellowship

ONGC Team visit-

A team from ONGC visited IASST facilities and interacted with scientists and students of IASST. On the occasion, Dr. RK Vij, ED Asset Manager, ONGC, Jorhat and Mr. S Sur, ED-Head Institute of Reservoir Studies (IRS), ONGC Ahmedabad, delivered lecture in the auditorium of the institute. The main purpose of this visit was establishing research collaboration between IRS & IASST through signing MOU.

ONGC Team on IASST Visit

IV. Popular Talk/Lecture delivered by the in-house speakers

This year fragment in-house talks were also organized within the institute to promote intense brainstorming among faculties and research scholars. Most of these talks were prepared and presented by keeping in view multidisciplinary nature of research in IASST. The details of the talks are listed below-

In-house seminar speakers and topics shown date wise-

Date	Name of Visitor/ Speaker	Title of Talk/Lecture
21.04.2017	Dr. Rosy Mondal, TKBDDD Programme	Cell free DNA: an old discovery, a late development
	Dr. Sumita Sharma, BAPP Programme	Experiments in laboratory dusty plasma: fundamental processes and applications
28.04.2017	Dr. Devashish Chowdhury, AMS Programme	Introduction to Nanoscience & Nanotechnology
28.04.2017	Mr. Anupam Bhattacharya, BDER Programme	Bioinformatics approach to identify Casual Variants responsible for Hypospadias: A case study
05.05.2017	Dr. Rajlakshmi Devi, TKBDDD, Programme	Traditional medicine of North East region of India: A scope for the treatment of metabolic syndrome
	Dr. Sailendra Goyari, BDER Programme	Bypassing Nature's prolonged route to agar wood formation through in-vitro culture approach- Scope and Challenges
09.05.2017	Dr. Munima Sahariah, MCS Programme	Cu-Nb layered nanocomposite as a material for extreme environment
	Dr. Asim Kumar Dutta, BDER Programme	Regulation of blood glucose homeostasis by Phosphoenolpyruvate Carboxykinase
12.05.2017	Dr. Arundhati Devi, BDER Programme	Impact of industrial waste on ecosystem, and investigation of remedial measure
16.05.2017	Dr. Gautam Choudhury, MCS Programme	Classical queueing Model and its development leads to present status
	Dr. Nandana Bhardwaj, TKBDDD Programme	Silk: a versatile biomaterial for tissue engineering and biomedical applications
23.05.2017	Prof. Suresh Deka, BDER Programme	Phytoremediation of hydrocarbon contaminated soil of oil field of upper Assam
	Prof. Anowar Hussain, BDER Programme	Medicinal Plants: Alternate source of new drug discovery
30.05.2017	Dr. H. Bailung, BAPP Programme	Solitons in Fluids- Plasmas- Biology (A high school level introduction to mathematical modelling)
06.06.2017	Dr. Arup Ratan Pal, BAPP Programme	Nanomaterial synthesis and processing using plasma
02.06.2017	Dr. Romi Wahengbam, BDER Programme	From Community to Singularity: The Shifting Trend in Microbial Ecology Research

Date	Name of Visitor/ Speaker	Title of Talk/Lecture
02.06.2017	Dr. Sarathi Kundu, AMS Programme	Soft matters
13.06.2017	Prof. T.K. Dutta, MCS Programme	Beauty of Mathematics and Applications to the ....
16.06.2017	Dr. N. C. Talukdar, Director	More about microbial companion in and on hidden half of plant
20.06.2017	Dr. M.R. Khan, BDER Programme	Gut feeling on 'Darwinism'.
27.06.2017	Dr. Debajit Thakur, TKBDDD Programme	A little about Tea Camellia sinensis (L.) O. Kuntze- A caffeine- containing beverage crop.
18.07.2017	Dr. Raghuram Kandimalla, TKBDDD Programme	The role of oxidative stress in precipitation of various diseases with special reference to diabetic neuropathy
21.07.2017	Dr. S. Nandi, BDER Programme	Can we control our genes?
04.08.2017	Dr. Biswajit Choudhury, AMS Programme	Nanomaterials for Optoelectronic and energy applications
04.08.2017	Dr. Sagar Sharma, AMS Programme	Safety in Research Laboratories

BAPP-Basic and Applied Plasma Physics, **AMS**-Advanced Material Science, **MCS**- Mathematical and Computational Science, **BDER**-Bio-Diversity and Eco-system Research, **TKBDDD**-Traditional Knowledge Based Drug Development and Delivery

V. In memory of those who served IASST

A. First Memorial Lecture on the occasion of birthday of Late Professor Jyoti Prasad Medhi

In the memory of Dr. Jyoti Prasad Medhi, an Emeritus Professor of Gauhati University and former Director & Honorary Professor of IASST who passed away on 3rd February 2017, a memorial lecture was organized at IASST on 30 June 2017, which is the birthday of Late Professor J. P. Medhi. Dr. Hiranya Kumar Nath, Professor, Department of Economics and International Business, Sam Houston State University, USA delivered the Memorial lecture on the topic 'Time Series Analysis', on which Prof. Medhi was an authority. Prof. Labananda Choudhry and Prof. Kishor Kumar Das, Department of Statistics, Gauhati University and other distinguished personalities paid their homage to Prof. Jyoti Prasad Medhi and highlighted the profound contribution of Prof. Medhi towards the science and society and his commendable academic achievements. Several speeches narrated their memories and experiences gained in the company of late Prof. Jyoti Prasad Medhi during his long academic and scientific carrier.

A. First Memorial Lecture on the occasion of birthday of Late Professor Jyoti Prasad Medhi

B. Obituary- Demise of Dr. Padum Azad for heavenly abode

Late Dr. Padum Azad

Late Dr.Padum Azad, Rtd Scientist and Ex Registrar of IASST left for heavenly abode on July11, 2018. Born on May 1, 1947 at Chatia village of Sonitpur District of Assam. Dr. Azad passed B.Sc. from Darrang College and M. Sc. (Agri- Botany) from Gauhati University in the year 1970. After passing M.Sc., he joined in Bengal Chemical Company as sales executive for few years and later in the year 1976, he joined as a research fellow for pursuing Ph. D degree in the Department of Agri-Botany, Gauhati University. However, family obligation pushed him to return to his native place without completion of Ph. D and join as a teacher in the Chatia Higher Secondary School. After a long gap of five years, in the year 1984, he again resumed his Ph. D research in Gauhati University and completed Ph.D. degree in the year 1987. In 1988 he joined IASST as Senior Research Fellow and later promoted to different ranks in scientist cadre. He also served as Registrar of IASST for few years. He retired from the IASST in the year 2008. IASST fraternity will always remember his contribution towards the growth and development of the IASST. IASST family pray to almighty for eternal peace of his soul.

VI. New Initiatives during 2017-2018

A. Setting up of an incubation centre named IASST Social Venture and Entrepreneurship Consortium (ISVEC)

With the purpose of translating the scientific activities and resulting technologies of IASST for the benefit of society, the institute established an incubation centre named as IASST Social Venture & Entrepreneurship Consortium (ISVEC) and the inauguration function was graced by Prof. Ashutosh Sharma, Secretary, Dept. of Science & Technology, Government of India on 21st July, 2017. As the chief guest, Prof. Sharma unveiled the ISVEC plaque on this date.

Inauguration of ISVEC by Prof. Ashutosh Sharma on 21-07-2018

The main objectives of ISVEC are -

Promotion of incubation of business, or of new technology which benefit society: encouraging entrepreneurship in North-Eastern India and providing an ecosystem for entrepreneurship with a technical, legal, commercial and financial support system; Providing guidance to the entrepreneurs in every dimension through hand-holding services which include comprehensive mentoring, consultancy & training from experts from different parts of the world, Acting as a point of coordination between industry, research laboratories and academia, Facilitating government & private sector partnerships in technology development & commercialization of research results; Taking all necessary steps, including policy advocacy, in order to meet the above mentioned objectives.

Activities of ISVEC in 2017-18

1) **Formation of a management committee.**
2) **Engagement of a program execution on temporary basis for execution of ISVEC activities.**
3) **Launching of Newsletter** : ISVEC launched its newsletter – "Creators". Two volumes of the newsletter were published during the year. The Creators carried information on various initiatives of different agencies for promotion of the entrepreneurship. It also carried articles on Govt. policies such as Start-Up India Policy, Stand-Up India Policy, Start-Up Assam Policy, Biotechnology Policy of Assam, and the initiatives such as Single Window Agency by the Govt. of Assam.

The inaugural volume of the newsletter of ISVEC – 'Creators'

4) Organising a Workshop on "Market Driven Innovation & Grooming of Entrepreneurs in NE India" on 01-12-2017.

The resource personnel included; Dr. USN Murthy, Director, NIPER; Mr.Sriniwas Lanka, Ex-CEO of Sun Pharma and Advisor to Corporate Enterprises and government initiatives like *Jan Aushadhi Scheme*; Sri Vinod Seshan , IAS, Secretary, Investment Cell of Govt of Assam; Sri Girindra Brahma, AGM, SIDBI, Sri T.N. Shukla, Head (Microbanking) of Utkarsh Small Finance Bank; Sri Subhrajyoti Bharali, Founder of Asomi Group and the Managing Director of Industrial Co-operative Bank Ltd, Guwahati, Sri Vikramaditya Das; Executive Director, Grameen Sahara, Sri Partha Paul, Scientist, NEIST, Jorhat and Sri Satya Ranjan Borah, Executive Director, Kherkhuti Pvt Limited, Entrepreneur, Writer & Social worker. Students from IASST and other colleges of Guwahati, and some local entrepreneurs were among the 100 audiences in the workshop. Each resource personnel spoke on the field of their expertise, relevant to the subject of the workshop.

Sri Srinivas Lanka, Advisor to corporate enterprises and government initiatives like Jan Aushadhi Scheme, delivered a lecture to the students, scientists and innovators in the workshop

Launch of newsletter of ISVEC, "Creators", during workshop on 01-12-2018
From left : Sri Girindra Brahma, Mr. Srinivas Lanka, Dr. USN Murthy, Dr. N.C. Talukdar

5) Initiatives to Commercialize technologies developed at IASST

ISVEC has taken up initiatives to commercialize the R&D outputs of IASST, which include a nutraceutical herbal candy from *Garcinia morella*, developed by five JRFs of IASST based on research conducted at IASST, protective transparent coating on bell metal using radio-frequency plasma technology, a health drink made from rice. The initiatives are at various stages of progress.

6) Demonstration on 3D printing

On 27-03-2018, a demonstration of 3D printing was organized at the auditorium of IASST.

7) Start-up Incubation

A small space has been provided as incubation centre to the JRFs, who are developing the nutraceutical candy. Through this initiative, the students are getting exposed to various activities for start-ups, such as packaging, labelling, human-resource management, accounting, regulatory and commercial matters. ISVEC is also gaining experience for attracting and promoting incubatees for their start-ups in its upcoming large incubation centre. ISVEC also arranged mentoring sessions for the incubatees, taken by Mr. Srinivas Lanka.

8) Echo-system Development

- On 17-12-2017, representative of ISVEC attended an annual farmers' meet to understand the needs of rural economy.
- On 12-01-2018, ISVEC representative participated in a consultancy on system development in north-eastern India, organized by the Govt of Assam.
- On 03rd-04th February, 2018, ISVEC representative also participated in Advantage Assam program, organized by Govt of Assam.
- On 29-03-2018, in a workshop conducted by the Assam Administrative Staff College, the Member-Secretary of ISVEC, proposed to the officials of the Govt. of Assam; a concept of public funded physical market-place for start-ups - 'Start-Up Bazar'.
- ISVEC helped in information gathering and strategic inputs for the consultancy round of proposed Women's Biotechnology Park of North-East under DBT, New Delhi.

9) Development of website of ISVEC

The first phase of the website of ISVEC, https://srasta-iasst.org was developed in 2017-18. A snapshot of the newly developed home page of ISVEC is shown below -

10) Participation of ISVEC in National Science Day organised in IASST-

Mr. Subhasish Ghosh founder of Seenergi IPR, Kolkata, Mr. Pankaj Maji, MD, Mesco Equipments Pvt Ltd, Kolkata and Mr. S. J Bharali, founder of Asomi Group interacting with the innovators in the NSD exhibition stall under patronage of ISVEC

A. In the exhibition of innovations during the NSD 2018, ISVEC invited Strategic Audiences who have the potential to carry forward the innovations from the exhibition hall to the target audience. Personnel from Guwahati Municipality Corporation; Guwahati Blind School; Mr. Anupam Dutta, Sr. Faculty,State Institute of Panchayat & Rural Development (SIPRD); Mr. Palash Ranjan Gharphalia, ACS, Commissioner for Persons with Disabilities, Government of Assam and Mr. Subhajyoti Bharali, Founder of Asomi Group visited the exhibition and interacted with the innovators. Villagers under the banner of 'Grameen Sahara' also visited the stalls.

B. To guide the innovators and to take innovations into enterprises, renowned innovator from Assam, Dr. Uddhab Kumar Bharali; Eminent woman entrepreneur from north-eastern India, Ms. Tanushree Hazarika, were invited to guide the innovators. Also a lecture on patent, with special emphasis on start-ups was organized.

Dr. Uddhab Kumar Bharali (first on the left row) interacting with entrepreneurs of Rani Development Block, who have started small scale production of eri silk, mushroom and vermicompost.

C. An interactive session was organised on R&D commercialization and start-up formation, on 28-02-2018. The resource personnel included Prof. Shantikam Hazarika, Founding Director; AIM, Dr. N. C. Talukdar, Director, IASST; Mr. Subhasish Ghosh, Founder of Seenergi IPR; Mr. Siddhartha Lahkar, Asst. Manager, NEDFI; Mr. Sooraj Bajoria, Chartered Accountant; and Mr. Gopal Chandra Taparia, Chartered Accountant; The questions were asked on the subjects like start-up formation, venture funding, filing and commercialization of patents, marketing of innovations, technical supports by IASST, etc. To make the interaction understandable by the maximum number of audiences, the Program Executive conducted the session in Hindi.

B. Setting up and development of the Bioresource Conservation Hub (BCH) to attract visitors with entry fee as an Institute's income generation venture:

A plot of about 7 acres land outside the current boundary of IASST campus was lying unused because of its marshy nature and lack of protection. In 2014, a drain of 3 metre deep was made all along this already low lying area and a kaccha embankment was made as boundary of the marshy area which was allotted to IASST by Goa. Trees were planted on the boundary and gradually earth filling work in phase manner, construction of concrete boundary wall, planting of specific type of plants unique to NE India in blocks have been taken up during the last 4 years to convert it into a bioresource conservation hub (BCH). During the year, (1) block of host plants (4 types) for 3 types of silkworm, (2) block of 25 types of indigenous minor fruits (3) block of high value wood tree, (4) block of indigenous firewood tree, (5) blocks of medicinal plants have shaped the abandoned land into a small BCH. A 750m pavement road and 520 m sand road with indigenous fragrant flowers planted on both sides of the road in sequence to ensure release of fragrance round the year for visitors who walk through. The BCH now emerges as a mini bioresource park of biodiversity education and recreation and health benefit for visitors as well as, for R&D supporting activities. IASST intends to open it to public with entry fee as one of its income generating ventures.

During the year, entire IASST family involved in growing scented rice in about 200 m^2 area inside BCH and carried out all the operations right from the seedbed raising to harvesting with great joy and enthusiasm and was a source of great learning experience on growing rice particularly for research scholars who hail from cities and has very little idea about the cultivation of the highest consumed cereal of the world population.

IASST staff and their family members transplanting scented rice seedlings (Top) and lighting "dia" (Kati bihu) in the field at the transtition of flowering to grainfilling stage. This ritual of "dia" lighting is believed to protect the grain from sucking insects. Light trapping of insect has been one of the scientific methods of insect pest control in agricultural practices across all cultures.

VII. Intensification of the IASST's scientific social responsibility

Last 3 years, IASST has been carrying out different programmes as a part of discharging its scientific social commitment. However, during 2017-18, the following two programmes have been given due importance:

(a) Tribal community development programme (TCDP)

(b) Promoting laboratory experience based science teaching & learning

(a) TCDP of IASST: Since 2015, IASST has been promoting erisilk rearing in limited areas for tribal community (Bodo) women in two districts namely, Nagaon and Morigaon. Initially, 10 families in each of the two villages were provided disease free erisilk worm seeds, host plant (castor) seed, mosquito nets for erisilk production. During the subsequent year (2016), each of this family trained a women member of one more family in the neighbourhood who also took up erisilk rearing with inputs supplied by IASST. During that year, 14 unproved reeling machines were provided to them which resulted in 16% efficiency in silk recovery from cocoon compared to hand reeling. This activity was carried out in collaboration with Nagaon College as the houses of the beneficiary families were situated near to the college campus. The staff of the Department of Zoology, Nagaon College helped in monitoring the activities and providing expert guidance to the beneficiaries. With this initial success of the erisilk rearing, IASST decided in the year 2016, to adopt two schedule tribe community villages (Bodo/Rabha community) situated about 20 km away from IASST campus in Rani Development Block of Rural Kamrup district. The 198 families of the two villages (Kollapara and Bakrapara) were surveyed for details of their economic status before intervention of rural technology. During 2017-18, four production venture items namely, erisilk rearing, mushroom cultivation, high value black rice cultivation and vermicomposting have been continuing. At the end of two and half years, a change is beginning to be visible in these two villages where most of the families were in the poverty line during 2016.

(1) Erisilk rearing venture:

This started with 6 ladies showing interest at the end of a two days training programme organised at IASST for 20 participants from the two villages in 2016. During last two and half years, number of eri silk rearer families have increased to 34. The items provided by IASST are i) Small eri larvae ii) eri larvae feeding stand iii) insect proof net to protect the larvae iv) eri leaves in the peak period of feeding v) support for marketing network to sell cocoon in competitive price. Seven batches of rearing completed so far and in the last batch, eggs were hatched centrally in a rearer house and new borne larvae were distributed among the 34 new families in the year 2017. Each family could earn a total of Rs. 25,036 (maximum) to Rs. 335 (minimum) from multiple rearings in a year (Table 4).

TABLE 4. Quantity of ericocoon and pupa and amount earned by selling these by three categories of eri rearing families during 2017-2018.

Earning group category	Name of the person/ No. of rearing	Quantity ofcocoon sold (g)	Amount (Rs) earned from cocoon	Quantity of pupa sold (Nos)	Amount (Rs) earned from pupa	Total amount (Rs) earned
High	Anima Kachari/5	13,643	9,545	30,983	15,491	25,036
	Kostey Boro/3	3,075	2,155	8,600	9,200	11,355
	Ila Kachari/5	10,660	3,492.00	11,656	5,828.00	9,320
Medium	Gathori Kachari/2	2,900	2,030	7,560	5130	7,160
	Urmila Kachari/4	3,500	2450	6,980	3490	5,940
	Urmila Boro/3	3,250	2,275	7,300	3,550	5,825
	Putuli Boro/3	4,125	2887.5	6,033.5	2916.7	5804.2
	Moromi Kachary/3	2,783	1,913	7,733	3,816	5729
Low	Sonati Boro/3	1,673.5	1,196	3,925	1,862.5	3,058
	Bimola Daimary/2	1,537.2	1,075	3691	2,145.5	3220.5
	Pradip Rabha/3	2,170	1,520	4,900	2,350	3,870
	Daibaki Boro/2	1,017.5	716	2,625	1,312.5	2,028

1) Total no of rearer: 34 nos. 2) Total quantity of cocoon harvested (g) : 81,402. 3) Total amount of money earned from cocoon: Rs. 53,972.50. 4) Total amount of eri larvae produced (g): 1,75,752.50. 5) Total amount of money earned from eri larvae: Rs. 92,658.10. 6) Total income from cocoon pupae: Rs. 1,46,600.00.

ST village women with the Erisilk larvae container in front of the Community production centre of Bakrapara and Kollapara villages under Rani development block.

A eri rearer of Bakrapara village with the 5th instar larvae of his 3rd batch of production.

(2) Mushroom Cultivation Venture:

During the year 2017-18, a total of 27 families of Bakarapara and Kollapara villages of Rani took part in the Mushroom cultivation venture introduced by IASST. IASST provided the spawn of mushroom along with high density polythene bags to the cultivator. They produced 297 kg of mushroom and earned Rs. 59,452/- from the year first batch.

(3) Black rice cultivation Venture:

In an attempt to meet the demand of black rice both as a raw material for high quality rice beer and delicacy rice, few farmer families of the two villages were introduced to black rice cultivation by providing only 3 kg seeds in the year 2016. 55 kg yield was obtained from 3 kg of seeds in 2016. Five more farmers grew black rice in 2017 and each using 4 kg seeds produced 422 kg rice. During the current year (2018), using 4 kg seed, 20 more farmer families took up black rice cultivation venture.. The details are presented in the Table 5.

Table 5: Details of farmers, production and money earned from sale of Black rice in 2016-17.

Cultivator's name	Production (kg)	Total price @ Rs 70/kg
Govinda Boro	60	4200
Rajesh Kachari	108	7560
Dhireswar Kachari	113	7910
Pradip Rabha	80	5600
Satyaram Boro	61	4270
Total	**422**	**29540**

(4) Vermicompost production venture:

A total of six farmers of both the adopted villages were trained for preparation of vermicompost. IASST provided the materials for preparation of vermicomposting unit in their respective houses. The construction work of vermicomposting unit is under progress.

The overall goal of this societal venture of IASST is to raise the economical condition of the two villages by involving each family in the 4 production ventures. As the villager's confidence towards this effort of IASST started growing, a small room was taken on rent in premises of one family of the village which has now been used as an office cum library for the IASST staff and villagers.

The women folk of IASST adopted Bakrapara & Kollapara villages who started earning from erisilk rearing and mushroom cultivation are taught alphabet and how to sign in informal outdoor class.

A health camp and yoga day celebration on 22nd June, 2018 organised by IASST in the village brought great feeling among the people. IASST also installed 6 solar lamps of 150 watt on the street of village to chase the wild elephant at night which has been a menace in the village for last few years. The women folk of the village who took up these ventures were interested to put an amount of their earnings in savings bank but most of them could not sign. IASST is now teaching them the vernacular alphabet and how to sign their names by engaging a retired school teacher. As they learn to sign, IASST will take bank officers to the village to open bank accounts in the name of these women. This engagement of IASST and enthusiasm of the villagers resulted in celebration of 26th Dec, 2017 as Village Day in which the village artists performed songs and dances in colourful costumes unique to their community. On this date of 2016, IASST put its first step in the village.

The adopted village girls performing Rabha dance in traditional costume on occasion of the Village day

Director, IASST and the consultant (village adoption program) distributed prizes to the performers of Boro and Rabha community dance on the occasion of village day

(b) Promoting Laboratory Experience-based Science Teaching & Learning

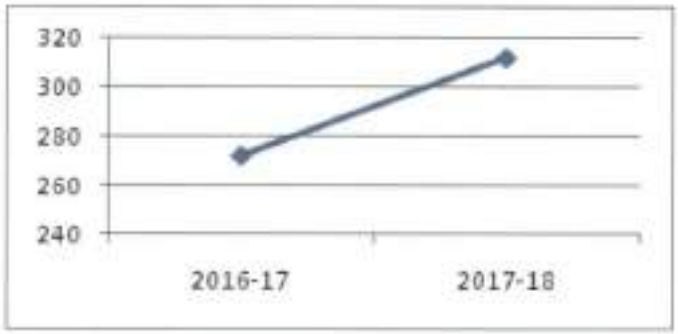
(1) Laboratory visit programme for the students of Schools, Colleges and Universities of North East India for exposure to IASST research facilities.

(2) Participation to showcase IASST in national events.

Laboratory visit programme for the students of Schools, Colleges and Universities of North East India for scientific exposure

During the year, IASST hosted 13 batches of student visitors from schools, colleges and universities of Northeast India. The students were exposed to the range of research activities and infrastructure facilities available in different laboratories of the institute. In lab, students were shown and explained the functioning of the sophisticated equipment such as SEM, GC-MS, confocal microscope, etc. and also delivered lecture by Institute scientist on theoretical aspects of research under different programmes followed by demonstration. It was always a great deal of enthusiasm visible in face of the visiting students. IASST is optimistic that this experience will have long lasting impression and help build science as their career goal. The detail of the visit is listed below-

Date of visit	Name of School / College and standard of students	No. of visitors			Program visited
		Teachers	Students	Total	
09/05/2017	9th Std., Under scheme of 20th DST, Govt. Of Manipur, Science Excursion for School Students	4	49	53	BAPP, AMS, MCS, BDER, TKBDDD
21/02/2018	9th Std., Under scheme of 21st DST, Govt. Of Manipur, Science Excursion for School Students	4	39	43	BAPP, AMS, MCS, BDER,TKBDDD
05/02/2018	10th Std., Singerpara Patidarrang H.School, Kendua	1	2	3	BAPP, AMS, MCS, BDER, TKBDDD
21/06/2017	B Sc (Botany), M. C. College, Barpeta	4	24	28	BDER, TKBDDD
29/06/2017	B Sc (Botany), JN College, Boko	2	17	19	BDER, TKBDDD
18/08/2017	B Sc (Botany), M.C. College, Barpeta	2	19	21	BDER, TKBDDD
20/10/2017	BSc (Zoology), Golapara College, Goalpara	3	51	54	BDER, TKBDDD
13/02/2018	BSc (Botany), Margherita College, Margherita	3	13	16	BDER, TKBDDD
11/05/2017	BSc (Botany), Cotton College State University, Guwahati	1	23	24	BDER,TKBDDD
23/05/2017	MSc (Zoology), Bajali College, Pathsala	1	04	05	BDER,TKBDDD
20/06/2017	MSc (Biotechnology), St. Anthony College, Shillong	2	24	26	BDER,TKBDDD
15/11/2017	M.Sc. (Zoology), Dakshin Kamrup College, Mirza	3	10	13	BDER,TKBDDD
05/04/2017	M.Sc. Chemistry students, Gauhati University, Guwahati	1	37	38	AMS



Growth in no. of visiting students to IASST laboratories.

BAPP-Basic and Applied Plasma Physics, **AMS**-Advanced Material Science, **MCS**- Mathematical and Computational Science, **BDER**-Bio-Diversity and Eco-system Research, **TKBDDD**-Traditional Knowledge Based Drug Development and Delivery

VIII. Participation to showcase IASST in national events

During the year, IASST participated in 8 exhibitions throughout the country and displayed silk varieties in NE India, selective sensor for ammonia detection, microbial antifungal formulation, production process for Rhamnolipid Biosurfactant and agar wood oil production technique developed in IASST, Hybrid nonmaterial, plasma coating on bell surface were also displayed. A glimpse of the research activities under different progamme and technologies and innovations of the institute were also presented in the different exhibitions listed below-

Date	Name of the exhibition	Place	Organizer
May 4-6, 2017	Vibrant Northeast 2017	Guwahati, Assam	CARD, ASSOCHAM and Ministry of NE Region
July 14-16, 2017	GASE - 2017	Pragati Maidan, New Delhi	NNS Media Group, New Delhi
Aug24-27, 2017	21st NSE, Kolkata	Kolkata, West Bengal	CCSCOY, Kolkata
Sept 20-21, 2017	Handloom Expo	Guwahati, Assam	ASTEC, Guwahati, Assam
Oct13-16, 2017	IISF- 2017	Chennai, Tamil Nadu	Ministry of S & T, GoI, and Vijnana Bharati
Jan 28, 2018	AALS	Nalbari, Assam	AALS, Nalbari, Assam
Feb 3-4, 2018	AAGIS	Guwahati, Assam	Government of Assam
Feb 10-11, 2018	Innovation Festival	Guwahati, Assam	RSC, Khanapara

GASE- Government Achievements & Schemes Expo, NSE- National Science Exhibition, **IISF**- India International Science Festival, **AALS**-All Assam Lekhika Samarooh, **AAGIS**-Advantage Assam-Global Investors Summit, **ASTEC**-Assam Science Technology and Environment Council, **CCSCOY**- Central Culcutta Science and Culture Organization for Youth, **RSC**-Regional Science Centre.

R&D supporting activities

Engineering, Administration, Information Technology and Finance

Administrative Staff

1st row (front, L TO R): Suresh Sharma,S.O (Accts); Dr. Diganta Goswami, Registrar; Dr. Narayan Ch. Talukdar, Director;Prof.Dharmeswar Das, Chief Consultant; Pradyut Borkataki, FAO; Prabodh Kumar Deka, S.O (Admin)

2nd row (L TO R): Madhabi Das, MTS; Sanjubi Sharma, Assistant; KshSharmina Devi, Receptionist Saraswati Bora, Superintendent; Nirmali Devi, Hindi Assistant; Pinky Taye, Assistant; Nripen Ch. Goswami, MTS; MunnaBasfor, Sweeper; Phatik Baishya, Driver; Nimai Hazam, Driver.

3rd row (L TO R): Dwijendra Ch. Deka, Superintendent; Satish Das, MTS; Raful Baishya, MTS; Nabajyoti Choudhury, Project Manager; Diganta Das, Assistant; Subrata Goswami, Technical Assistant; Gora Gupta, Assistant; Arup Jyoti Deka, Assistant.

4th row (L TO R): Srikanta Baishya, MTS; Bikash Jyoti Das, Animal Keeper; Munindra Singh,Tech. Assistant II; Prabhat Barma, Assistant; Rabin Ch. Kalita, Superintendent; Rajesh Sharma, PRO, Lelin Gogoi, PS to the Director; Ramen Mahnata, Superintendent; Lakshi Kanta Saud, MTS; Pradip Das, MTS; Binoy Kumar Choudhury, MTS; Bimal Das, Driver; Dr.Anil Kumar, Technical coordinator.

Technical Support Staff

1st row front (L to R): Mr. Gautam Kr. Medhi, IEME; Dr. Nirab Chandra Adhikary, Technical Officer -B; Dr. Tarini Dev. Goswami, Assistant Librarian; Mr. Jayanta Borthakur, Network& System Administrator; Mrs. Julie Bordoloi, Technical Assistant-II; Mrs.Juri Pathak, Technical Officer-A; Mr. NiranjanBhagaboti, Technical Officer-B;Mr. R. N. Pathak, Project Engineer;Mr. SankarDaimari , Work Supervisor; Md. Mohmad, JE (Civil); Mr. MonitaDeka, Assistant Engineer ; Mr. Prakash Kr Kachari, Field Supervisor

2nd row (L to R) : Sarala Deka, Multi-Tasking Staff; Anima Baishya, Cleaner;Madan Chandra Kalita, Multi-Tasking Staff; Babul Ch. Deka , Multi-Tasking Staff ; Bipul Kumar Das, Multi-Tasking Staff ;Mr. NayanTalukdar, Technical Officer; Mr. SubrataGoswami, Technical Assistant-II; Mr. Mukta Ram Kumar, Work Supervisor; Mr.AbinashNath , Animal Keeper ; MunnaBasfor, Sweeper; Srikantallaishya, Multi-Tasking Staff; Satish Ch. Das, Multi-Tasking Staff; Krishna Kanta Swargiary, Technician

3rd row (L to R): Mr. DebajitDeka, Jr. Network Administrator;PhatikBaishya, Driver; Prasanta Ch. Das, Field Assistant; Bolin Das ,Multi-Tasking Staff; ManomohanHuzuri, Technical Assistant, BikashJyoti Das,Animal Keeper; GwhwmBasumatary, Animal Keeper; TarunTalukdar, Multi-Tasking Staff;

SubhrajitSengupta, Professional Assistant; Bimal Das, Driver;Madhu Ram Kalita, Electrical Helper

A. Civil infrastructure creation during the year 2017-18

A number of engineering project works were undertaken during the year 2017-18. DST earmarked capital cost separately for infrastructure building in IASST. These are detailed below:

1. Central Instrumentation Facility (CIF) and Drug Development Centre Building

To house the sophisticated instruments under central Instrument Facility (CIF) and to accommodate drug development centre, this building was planned and designed. The project is being executed through the contractor, M/S Bhaskar Baruah. The work started in May 2017. The estimated cost of the project is Rs.1000.00 lakh.The building consists of G+2 RCC having total floor area of 3800 Sq.m. There is also provision for third floor extension. The work is in completion stage and likely to be handed over in December 2018. The Building shall have the following facilities:

Ground Floor : Central Instrument Facilities for TEM, NMR, GCMS, AAS,XRD,AFM, Herb Preparation and Store Room, Plant and Soil Sample preparation, Office chamber, Lobby,Electrical Panel room etc.

First Floor: Histo-Pathological Assembly, Molecular grade Water production room, Bio Chemistry Analyser, FTC, Centrifuge, DNA Sequencer, UV VIS Spectrometer, RTPCRELISA reader, Raman Spectrometer, Quality control and quality assurance laboratory for phyto-pharmaceutical.

Second Floor: Atal Incubation Centre.

CIF and Drug Development centre Building at the final stage of completion

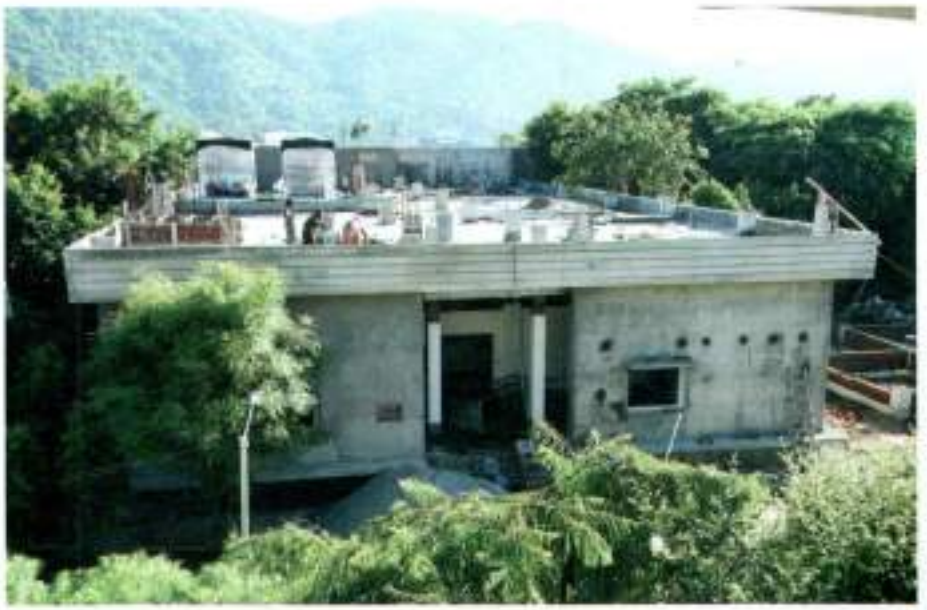
2. Director's Bungalow and Essential Service Staff Quarter (ESSQ)

To provide proper residential facility to the Director and to house few essential service staff, construction of two separate buildings started in 2016-17. The work was executed through the contractor M/S D.S. Trading. The total work value of the project was. Rs. 145.00 lakh. There are 12 nos. of quarter for essential service staff in the G+2 storied building with built up area of 580 Sqm. The Director's quarter is of Duplex type having 330 Sqm built up area. The job was started in April 2016 and is completed in 2017-18. The boundary wall of Director's residence was also built through a separate contract with M/S Sunrise Enterprise spending Rs. 27.00 lakh.

Bioresource Conservation Hub with blocks of valuable wood species (A), minor fruits (B), sericulture host plants (C), fragrant flower road (D), paver block road (E), and Director's residence inside (F).

3. Animal House Construction

This facility is for advanced animal experimentation for both IASST Scientists and research scholars and scientists of other institutes of North Eastern Region on payment basis. The project is being executed through the Contractor, M/S Bhaskar Baruah at a contract value of Rs.325.00 lakh. The built up area of the facility is 630 Sqm and is of single storeyed structure with a provision of another storey. The work is in progress and anticipated completion time is December 2018.



The sophisticated GLP compliant Animal House Facility (AHF) Building is nearing completion

4. Mini Sports complex building

Construction of a Mini Sports complex building with provision of space for Gymnasium tools, Badminton and Table Tennis was started in Dec, 2017. The project is being executed through the contractor M/S Bhaskar Baruah.at a contract value of Rs.78.00 lakh. It is a two storeyed Structure with a built up area of 400 Sq m. The building is in completion stage.

Sports Facility building for Gymnasium, Badminton and Table tennis

5. Vertical extension of the Old hostel

A 200 Sq.m. area G+1 Old Hostel building where nine scholars resided, has been upgraded with construction of 2nd floor measuring 200 Sq.m. as residential facilities for the essential staff and is completed in March 2018.

6. Earth filling and road development work in Bioresource Conservation Hub (BCH)

The earth filling at the BCH area has been continuing from last three years in phase manner and with the current financial year work volume of Rs.93.00 lakh. (approx. volume of earth is 20000 CuM), 90% earth filling work in BCH is completes and it is expected that from 2018-19 season, BCH will be opened for visitor on entry fee basis. About 750m of paver block road has been built inside BCH and the work was allotted to M/s D.P. Agarwal at the contract value of Rs.83 lakhs.

7. Main Campus beautification

Alongside the road from main gate to Administrative and Academic building and towards the Sports Complex and SSH, SS railing was erected for protection and beautification of the landscape. This work was allotted to Mr. Pradip Talukdar and Mr. Pranjal Chakravarty at a work value of Rs 26.00 lakh. The job is completed during the financial year 2017-18.

SS Railing in front of the Academic and Administrative Building

Facilities created/upgraded to support R&D:

B. 1. New Addition to Central Instrumentation Facility of IASST

Central Instrumentation Facility (CIF) of IASST includes sophisticated equipments mainly to cater to the needs of researchers of IASST and to ensure access to this facility on payment basis for the researchers of other scientific organizations and universities. To the already existing facility, sophisticated equipments such as Transmission Electron Microscope, Model-JEM-2100 Plus (HR), JEOL'S; Benchtop Modular Photoluminescence Spectrophotometer, Horiba; Picosecond Fluorescence Lifetime Spectrophotometer, Edinburgh Instruments Ltd.; Micro Raman Spectrometer, Model-LABHRev-UV-Open and one more Horiba model GC-MS-MS was added as major instruments during 2017-18.

B. 2. Bioinformatics Infrastructure Facility (BIF)

Bioinformatics Infrastructure Facility (BIF) was established at IASST in the year of 2011-2012 by the financial support from the Department of Biotechnology (DBT), Government of India and completes six years of providing training and bioinformatics services (sequence analysis, docking study, molecular dynamics simulations) to the researchers of the North eastern region. During 2017-18, bioinformatics modules such as basic bioinformatics, NGS data analysis, R programming, metagenomics data analysis, docking were accessed by different researchers of NE region. Blast2Go pro and a software namely Origin Pro was installed during the year 2017-18. BIF organized one day hands-on workshop on "Basics of Bioinformatics and way to multiple applications" on March 29, 2017 and 25 participants from 4 Science Colleges of Assam attended. Dr. Probodh Borah, College of Veterinary Science, Guwahati, Sri Saurov Mahanta, NIELIT, Guwahati, Dr. Soumyadeep Nandi, IASST. Mr. Nabajyoti Goswami and Mr. Anupam Bhattacharya were the resource persons in the workshop.

Workshop and lectures organized by BIF, IASST

B. 3. Advanced Level Institutional Biotech Hub

A biotech hub was set up in the institute in 2012 with the financial support from Department of Biotechnology (DBT), Govt. of India to foster development of biotechnology in the institute and also to train and enhance skill on basic techniques of microbiology and molecular biology for undergraduate and postgraduate students of other institutes. The biotech hub has been upgraded to Advanced Level Institutional Biotech Hub during 2017-18 and 15 PhD and 5 postdoctoral researchers have utilized the facility for their research. The biotech hub organized a workshop on "Metagenomics and Microbial Ecology" during 21st - 23rd March, 2018 in IASST and an outreach programme to make school students aware on human microbiome and it influence on human health in Shankardev Shishu Niketan, Tulshibari (Kamrup rural) on 26th March 2018.

Outreach programme organized by Biotech Hub, IASST

B. 4. Medicinal Plant Conservatory (MPC)

IASST maintains a MPC with an array of medicinal herbs shrubs and trees in its campus. This MPC's major emphasis is on maintenance of medicinal herbs with potential to prevent and cure metabolic disorders such as Type II diabetes and cardiovascular diseases. During the year, 12 more herbs added to the existing list of Ambellica officinalis, Alpinia galangal, Citrus grandis, Citrus morella, Clerodendrum colebrookianum, Clerodendrum philippinum, Cuinamomum tamala, Eugenia jambolana, Murraya koenigii, Musa balbisiana, Ocimum sanctum, Stevia, Rauwalfia tetraphylla, Terminalia arjuna, and Tinospora cordifolia.

B. 5. Animal House Facility (AHF)

The existing AHF of IASST houses a reasonable number of experimental animals catering to the need of the scientists of traditional knowledge based drug discovery program, molecular biotechnology program of IASST and also providing services to other institutions of North eastern India like Tezpur University, Govt Ayurvedic College, IIT Guwahati etc. In view of the increasing requirement of space in AHF for both scientist of IASST and other institutes, construction of the state of the art new AHF of 630 sq. m. has been initiated during 2016-2017. Presently the different species of laboratory animals in maintained AHF are Albino rats (Wistar), Albino mice (Swiss), Guinea pigs (Duncan Hartley) and Rabbits (New Zealand white) which are maintained and used as per guidelines of Committee for the Purpose of Control and Supervision of Experiments on Animals (CPCSEA) Government of India, Animal Welfare Division and guidance provided by the institute CPCSEA committee.

B. 6. Central Computational and Numerical Laboratory (CCNL)

The current CCNL facility under mathematical and computational programme of IASST include 20 all-in-PCs each configured for high class performance. These PCs are installed with Ubuntu 14.04, Linux (Ubuntu 12.04 LTS), Linux, Windows (Version 8 and 10) and RedHat. The high end softwares installed in the PCs are MATLAB-r2012a (in 1 PC) and MATLAB-2017b (in 5 PCs), Mathematica, PYTHON, SPSS, Gaussian 09, QIIME, MINICONDA, ANACONDA, CYTOSCAPE, Quantum Espresso, SPRKKR and VSP (Vienna Ab Initio Simulation Package). The facility caters to the computational needs of research scholars (full-time regular scholars as well as part-time interns) and scientists of both IASST and other institutes of the region. The domains of research area being catered to at present are: Image processing & Pattern recognition of Medical images/ballistic images, Stochastic processes, Topology, ab initio electronic structure calculations and analysis of the Metagenomic data of plant-microbe interaction, all requiring high performance cluster computations.

B. 7. Knowledge Resource Centre (KRC) activities

The Knowledge Resource Centre (KRC) of IASST is basically a Special Library. It is a member of the National Knowledge Resource Consortium (NKRC), National Digital Library (NDL), Developing Library Network (DELNET) and Current Science Association (CSA). The KRC provides relevant information services in all forms to the academic and administrative staff of the institute. The centre also opens up some of its services to the researchers of other educational institutes and faculty members of science and technology and allied subjects of the institute. The KRC's collection include 9742 books, 2185 bound volumes, 85 thesis, 184 dissertations and 64 reports, 639 non-book materials (CD, DVD, etc.), 429 research papers (journal articles and chapters in book). The KRC provides its patrons access to subscribed e-resources like e-journals comprised of scholarly contents via wi-fi and LAN (Local Area Network) connections.

During the year 2017-2018, the services and activities were improvised with 214 new books procured based on the requisition of the patrons, 976 books circulated, 404786 photocopies provided, 100 internet applications visitors, 440 scans, etc. The library is open from 9.00 AM in the morning to 9.30 PM in the evening in two shifts. The KRC has developed Digital Library facility with DSpace (Institutional Repository) software. It provides access to the resources of the institute like research publications, thesis, patents, policies reports, newspaper clippings, etc. It is accessible only through the institute's LAN or wi-fi facilities. During the year, the KRC has computerized and RFID (Radio Frequency Identification Device) based circulation facilities and KOHA Library Management Software. The books can be issued through the manual process or the kiosk facility at the KRC and books can be returned using the above two processes and by simply dropping the issued book at the book drop box placed near the auditorium. The RFID enabled Gate facility has

also been developed for security purposes.

B. 8. Activity carried out to empower IASST staff with Hindi language skills

(I) Hindi Training

IASST organized the Hindi training programme under Hindi Shikshan Yojana of Govt of India, under which Praveen/Pragya classes started from 20th July 2017 and ended in the month of November 2017 in lieu of the implementation of Hindi as an official language. In this programme, 14 employees took classes in Praveen course and 6 employees took classes for Pragya programme. Mr. Naresh Mahicha, Hindi Pradhyapak of Hindi training scheme, Hindi Prashikshan Yojana, Govt. of India provided the training to the employees of IASST.

(II) Hindi Workshop

For the last quarter of 2017 (October-December) a quarterly Hindi workshop was organised by IASST to implement Hindi on 26th December 2017. Mr. Kalicharan Basfor, Senior Manager (Official language), State Bank of India, Bhangaghar Branch was guest, he taught employees how to write noting and drafting in Hindi.

C. Information Technology, e-governance and e-finance promotion in IASST

IASST introduced full implementation of 100% e-governence and e-finance in April, 2017 and it has been running smoothly bringing ease and efficiency in every way in IASST administration. The followings are new facilities created during this year-

1. Establishment of a virtual class room

The Virtual classroom was established at IASST at a total cost of Rs. 2826750/-. With the help of this facility, IASST is now able to conduct virtual classes which removes the limitation of time and physical barriers and small size class/seminar rooms at different floors and building. Now faculties can interact with students without being physically present in the institute just by using his own device such as desktop with webcam, laptop, and smart phones. Similarly, the virtual classroom teaching organized in IASST can be broadcasted to outside IASST's remote area schools and colleges. These schools and colleges will be able to interact with IASST teachers with or without having their traditional VC infrastructure.

2. Upgradation of Campus Wi-fi network

IASST has upgraded its campus Wi-fi network infrastructure from stand-alone Access Point (AP) infrastructure to a centralized controller based infrastructure by covering most of common areas of entire campus at a total cost of Rs.1485554/-. These newly installed APs supported technology like 802.11ac (Wave 2) capable of providing better internet connectivity/speed to the users and guests by maintaining proper authentication mechanism.

3. Strengthening the surveillance system and LAN extension

IASST had strengthened its surveillance system by installing new CCTV cameras in different places of the IASST campus and also in building corridors, labs and this system hosted at a total cost of Rs.1953315/-. The Local area Network (LAN) has been extended to some more areas of the campus by laying underground fibers and installing manageable network switches.

4. e-mail facility for research scholars

A cloud based institutional email hosting service has been introduced to provide emails to all the research scholars and all the IASST literary members associated with research work by using a separate domain. With this facility, the long standing difficulty in correspondence with foreign university, eminent professor for position vacancy enquiry and scientific journals during the time of publication of manuscript have been eliminated.

5. Starting of e-Procurement process using CPPP and GeM

From the year 2017-18, IASST started using e-tendering process with the help of Central Public Procurement Portal (CPPP) of Government of India, a yet another level of achieving decimal transparency in tendering process. The IASST started purchase of goods through Govt. e-market place (GeM) from Nov 2017. Till the end of the year 2017-18, the institute purchased goods amounting Rs. 928000/- through GeM.

6. Implementation of a online job portal

IASST had started a separate online job portal for its major vacancies, Ph D admission program etc. where an applicant has to complete entire application process on online only achieving much reduced level of the manual intervention and bringing transparency in the different steps in recruitment as well as admission process.

7. Intensification of e-Governance

(I) E-Office Training

In this duration, (April 26-28, 2017) e-Office training for all the employees and scientists of the institute obtained hands on training from

Mr. Robin Chauhan, Project Manager and Mr. Arjun Singh, e-Office project Division from NIC, New Delhi. This resulted in fast-pace implementation of e-Office application in the institute.

(ii) E-Procurement Training

Training session on e-procurement was conducted by resource persons namely, Kabita Roy Das, Technical Director, Bhargab Das, Senior Programmer, and Rezaul Haque, Senior Programmer, from NIC, Assam State Center on July 13, 2017 in IASST seminar room. This training included orientation and hands on use of e-procurement system (e-tender process) and admin and accounts staff of IASST involved in tendering process received the training and implemented e-tendering subsequently.

(ii) E-office review meeting

Internal e-office review meeting was held on 24th July 2017 under the chairmanship of Director, IASST involving the members of implementation committee, sytem administrator and user members to review the progress progress of e-Office implementation and to tackle issue such as Disaster Recovery (DR) arrangement for IASST e-Office; reduction in the number of steps involved in a file movement and creation of part file.

(iv) PFMS EAT module training program

On 9th October 2017, a training program was organised at IASST under the auspices Principal of Accounts, Ministry of Science and Technology, New Delhi on implementation of PFMS-EAT (Expenditure, Advance and Transfer) module. Three officials from PFMS Unit of Assam namely Mr. Hillol Kashyap, Mr. Bibhas Basak and Mr. Chaman Lal Bagri attended the training as a resource person. Representatives from six Govt. organisations and one NGO participated in this training. The program started with a brief welcome speech by Director IASST, Dr. N. C. Talukdar. During the training session resource persons elaborated on the PFMS EAT module and its implementation procedure for all Agencies of Central Sector schemes was elaborated. At the conclusion of training an interaction session was conducted. The training program ended with concluding remarks from Finance and Accounts Officer of IASST.

D. IASST Staff Welfare Measures

IASST has been persistently carrying out several welfare measures and introducing new measures time to time for welfare of the employees of IASST

1. Medical Facility

The institute has its medical reimbursement system through which bills on expenses of both indoor and outdoor treatment in respect of all employees and their family members are reimbursed as per CGHS rules and rates. In addition to regular employees, the medical facility is also provided to research scholars and temporary employees engaged for short term on contract basis. One part time allopathic doctor is also engaged as part-time consultant for 3 days a week for consultation in the institute as well as in his private chamber. Facilities like rest bed, pressure machine and common medicines are available in the institute. A dedicated room equipped with routine medical equipment and medicines is being used as Doctor's Chamber in the main building. Beside this the institute empanelled few reputed hospitals of Guwahati to provide medical facilities as per central government/CGHS rates. These includes-1) Ayursundra Superspecialty Hospital, Gorchuk, Guwahati-35 (2) Hayat Hospital, Lalganesh, Guwahati-34, (3) Arya Hospital, Rehabari, Guwahati-8, (4)GNRC limited, Guwahati-6 (5)GNRC Limited, Sixmile, Guwahati-22 (6) Narayana Superspecialty Hospital, Amingaon, Guwahat-31 and (7) Panacea Medical Research and Diagnostic, Bhangagarh, Guwahati. Out of these, Hayat Hospital, Arya Hospital, Ayursundra Superspcialty Hospital and Panacea provide medical facility to beneficiaries on credit basis. These hospitals also organized "Health checkup and Awareness camps" at IASST time to time to spread awareness about risky non-communicable diseases and advise on good life style and healthy living to keep doctor's away.

2. Canteen and Mess Facility

The institute canteen is outsourced to a private Caterer who serves meals, snacks and beverages in hygienic condition to employees, students and guests. The private caterer also provides hygienic food to the boarders and guests in the Dorothy Hodgkins Students and Scientists' Home.

3. Benevolent Fund

An IASST employees' Benevolent Fund was established by equal contribution from employees and the Institute. All the regular staff members are members of the Fund. The fund envisages a benefit in the form of one-time payment to nominees of the members in case of death and permanent disability while in service.

4. Group Insurance

A Group Insurance Scheme for the employees of the institute is operating with the Life Insurance Corporation of India. All the regular employees of the institute are members of the scheme. Subscription for the scheme is made by the institute to get appropriate insurance cover for each group of employees.

5. Health Camp for IASST family

IASST organised a medical health check-up camp for the entire research scholar, staff and their family members on 9th March 2018. The camp was started with a talk "Prevention and Treatment of the Heart diseases" delivered by Dr. Hemjit Talukdar, Medical Director, Hayat Hospital, Guwahati. A team of doctors from Hayat Hospital, Guwahati were invited for the camp. As many as 200 staff of IASST got their health check-up carried out. A number of health check-up such as general physical examination, blood pressure, body mass index (BMI), dental, skin, blood sugar and hemoglobin level.

6. Creation of limited Housing Facility

The institute has limited housing facility. Six (6) nos. of quarters in the old residential building are allotted to few essential service staff of the institute. A new building containing twelve nos. of quarter for essential service staff and two dormitories (One each for boys and girls) is constructed and already occupied. In the newly constructed, Dorothy Hodgkins Students and Scientists Home (SSH), the Director and Superintendent of SSH are also residing temporarily in absence of dedicated type quarters. Construction of quarter for the Director is completed and likely to be occupied very soon. In the SSH and the Old hostel, accommodation have been made for 52 nos. of research scholars. Moreover, there are 3 (three)

nos. of VIP suites and six (6) nos. of scientist room in SSH for accommodating guests who visit IASST from various parts of India and abroad. In the essential Service quarter complex, there is arrangement of 12 Godrej bunker beds in each of the separate rooms for boys and girls accommodation who visit IASST for different training and summer internship.

E. Adoption of Different Government policies in IASST

1. Reservation Policy

The Institute is following post based rosters for affecting the prescribed percentage of reservations to SC/ST/OBC in all its new recruitments as per Government of India Rules in this regard.

2. Official Language Policy

The institute is taking special drive on implementation of provisions of Official Language Act and the rules made and instructions issued thereunder. All the Letter heads of the Institute are in bilingual format. Annual Report of the Institute is published both in English and Hindi. All the nameplates and signboards of the institute are made bilingual (Hindi and English). The institute appointed a Hindi Assistant who is looking after the implementation of the official language at IASST. The employees have started getting used to writing note in the file in official Hindi language.Eleven employees of IASST have been given training in Hindi proficiency (Praveen and Pragya) programme in the year 2017-18. A workshop on Hindi was also organized in the institute on 26.12.2017. The institute is also celebrating Hindi Diwas in every year with great zeal to popularize Hindi as a "Rajbhasa".

F. Revenue Generation by the institute

The Institute realized that there has to be efforts towards revenue generationin the line of directives from GOI without affecting the primary mandates of high quality basic research and academic programme of producing Ph.Ds. and training graduate level students to develop research skill. Through several extramural grants, institute earns overhead charges which are handy in reducing the maintenance cost provision from core budget. Besides, the internal source of income generation during 2017-18 is highlighted in the following table. During the year 2017-18, the revenue earning was 1.60% of the core budget of IASST (1.059/28X100=3.8%) and higher than the resource generated during 2016-17 (0.351/28.56 X100= 1.2%).

Sources of Income	Amount (Rs,)
charge	245800.00
Sale Proceeds of institute products	155391.00
Other Receipts (tender paper charge, bank interest etc.)	3995202.00
Hostel/guest house receipt	23099.00
Interest from FDR	2440059.00
Overhead	3731813.00
Total	**10591364.00**

An amount of approx. Rs.15.00 lakh was earned during 2017-18 revenue for providing limited accommodation to staff and student inside IASST campus and such earning of 2018-19 will be added to the total revenue generation of IASST.

G. Administrative meeting of IASST

1. Tenth Meeting of the Governing Council

The tenth meeting of Governing Council of IASST held on 23rd September 2017 in the Technology Bhavan, Department of Science and Technology (DST), New Delhi under the Chairmanship of Professor Ashutosh Sharma, Secretary, DST. The major recommendations of the meeting were (a) approval for filling up of vacant positions of faculties in the institute, (2) Preparation of detail proposal for creation of 12 new positons in IASST, (3) Separate allocation of capital cost for building cum infrastructure in the Institute, (4) Submission of performance report of the Director for consideration of extending his tenure and (5) For creating provision of engaging Adjunct Professor from university in IASST and sending IASST faculty as Adjunct Scientist to university through MOU and (6) For ensuring that Ph.D. research scholars write their research in form of popular science articles in language comprehensible for common citizen.

Prof. Ashustosh Sharma,Secretary, DST chairing the Tenth GC meeting of IASST held in Technology Bhawan, New Delhi on 23rd Sept, 2017

COMPOSITION OF GOVERNING COUNCIL OF IASST

Chairman

Prof. Ashutosh Sharma
Secretary,
Department of Science &Technology
Government of India, New Delhi

Members

Prof. Sibaji Raha
Director
Bose Institute,
Kolkata

Prof. A. N. Rai
Biochemistry Department
North-Eastern Hill University (NEHU),
Shillong

Dr. Mridul Hazarika
Vice-Chancellor
Gauhati University
Guwahati

Prof. Rabindranath Pal
Saha Institute of Nuclear Physics (SINP)
Kolkata

Mr. B. Anand, IAS
Joint Secretary and Financial Advisor
Department of Science &Technology
Government of India, New Delhi

Ms. V.S. Bhaskar, IAS
Additional Chief Secretary to the
Govt. of Assam, Guwahati

Dr. N. C. Talukdar
Director
Member -Secretary
IASST, Guwahati

2. Ninth Meeting of the Scientific Advisory Council

The ninth meeting of the Scientific Advisory Council (SAC) of IASST was held on 17th September 2017 at IASST, Guwahati under the chairmanship of Professor P. Balaram, former Director IISC, Bangalore. The major recommendation of the meeting were (1) Purchase of TEM, Raman spectroscopy, Time resolved fluorescent spectroscopy, (2) for holding two meeting of next SAC for two days for interaction on project and progress of individual scientists and (3) arrangement for exposure visit and laboratory experience based science teaching & learning for teachers and students of schools under the scientific social responsibility of IASST.

Dr. P. Balaram, chairing the Ninth SAC meeting of IASST held in the Conference room of IASST on 17th Sept, 2017

Composition Of Scientific Advisory Council Of Iasst

Chairman
Prof. P. Balaram
Former Director
IISC Bangalore

Members
Prof. Dinakar S. Patil
Former Prof. &Head, Dept. of Metallurgical Eng. & Material Sciences, IIT Mumbai

Prof. Sibaji Raha
Former Director
Bose Institute,
Kolkata

Prof. Gautam Dey
Chief Scientist & Head
Nanostructured Materials Division
CSIR-Central Glass& Ceramic
Research Institute, Kolkata

Prof. Pranob Goswami
Dept. of Biosciences and Bioengineering
IIT Guwahati

Prof. U.C. Gupta
Head, Dept. of Mathematics
IIT Kharagpur

Prof. Arun Chattopadhyay
Chemistry Department
IIT, Guwahati

Dr. Niranjan Chakraborty
Director
National Institute of Plant Genome Research
New Delhi

Dr. Kanury Venkata Subba Rao
Former Head DDRC, Translational Health Science and Technology Institute, Faridabad

Prof. Appa Rao Podile
Vice Chancellor, University of Hyderabad, Hyderabad

Prof. H. Bailung
Head, Physical Sciences Division
IASST

Member-Secretary: Dr. N. C. Talukdar
Director,
IASST, Guwahati

3. Ninth Meeting of the Finance Committee

The ninth meeting of the Finance Committee of IASST was held on 21st July 2017 under the Chairmanship of Dr. N. C. Talukdar, Director IASST. Mr. J. B. Mahapatra, IRS, Joint Secretary and Financial Advisor and Dr. M. Prithviraj, Scientist-G, DST, New Delhi were also attended the meeting.

The major recommendations/suggestions were:

(a) Need for inclusion of the entire grants-in-aid received under Salary and General Head in Income and Expenditure Account and Capital Grant in Balance Sheet from the Financial Year 2017-18.

(b) Provision of budget proposal for Rs. 33.02 crores for the Financial Year 2017-18.

(c) Minimisation of the number of Bank accounts to the barest minimum and recommended to merge all project related grant receipts and expenditure into one or two project bank account. For the extramural project of value up to Rs. 10.00 crores and above, separate bank account may be maintained.

(d) Resubmission of the proposal for construction of Auditorium/Conference Hall by incorporating underground parking facility, visiting scientist accommodation facility (guest house).

(e) Modification of the proposal for construction of Central Instrumentation Facility from Assam type to G+2 structure.

(f) Formation of a Committee for creation of additional posts commensurate with 5-10 years period vision of the institute in the line of S&T vision of the country.

Composition Of Finance Committee Of Iasst

Chairperson

Dr. N. C. Talukdar
Director, IASST,
Guwahati

Members

Mr. B. Anand, IAS
Joint Secretary and Financial Advisor
Department of Science &Technology
Government of India, New Delhi

Dr. Praveer Asthana
Adviser/Scientist-G
Head, AI Division
Department of Science &Technology,
Govt. of India, New Delhi

Prof. B. C. Tripathy
IASST, Guwahati

Mr. Uttam Ch. Das
Registrar
IIT Guwahati
Member-Secretary: Mr. Pradyut Borkataki
FAO, IASST, Guwahati

4. Building Works Committee meeting

The sixteenth Building Works Committee (BWC) meeting was held at IASST on 29/06/2018 under the chairmanship of Dr. N. C. Talukdar, Director, IASST. Major decisions/ recommendations are given below:

1. The BWC after going through technical bid and price bid of the technically qualified bidder recommended allotment of the Work "Construction of Animal House Facility" at a negotiated price of Rs. 3.25crore to M/S Bhaskar Baruah with his technical collaborator M/S CSK Bio.
2. The committee recommended piling works in place of isolated footing for the CIF building
3. The committee discussed the concept and design of Mini Sports Complex having an estimated cost of Rs. 84.34 lakhand recommended for further processing
4. The committee discussed proposals for Construction of Residential quarter, Construction of 33KVA Electric Control room for providing dedicated power supply, construction of Training hall under Tribal people empowerment scheme and development of internal road and recommended for further processing.

Composition Of Building Works Committee of IASST

Chairperson

Dr. N. C. Talukdar
Director, IASST,
Guwahati

Members

Chief Engineer
CPWD Shillong or his nominee

Prof. Sudeep Talukdar
Department of Civil Engineering
IIT Guwahati

Prof. Heremba Bailung
IASST, Guwahati

Dr. Diganta Goswami
Member- Secretary
Registrar, IASST

H. Vigilance, RTI, Women Cell and activities during 2017-18 in IASST

The institute has a part-time Vigilance Officer appointed by the Department of Science and Technology, Govt. of India, New Delhi who deals with all vigilance matter pertaining to IASST, Guwahati. The Vigilance Officer furnishes certain reports/returns to the Chief Vigilance officer on regular basis. The vigilance officer is not directly associated in decision making or finalization of tenders/purchase and audit matters. No vigilance case was pending or contemplated against any employees of IASST during 2017-18.

The institute has a Central Public Information Officer (CPIO) who furnishes information under Right to Information Act (RTI) 2005. During the year 2017-18 thirteen(13) nos. of application under RTI Act 2005 were received online and replies were sent both online and in hard copies. The institute submitted all the quarterly returns for the year 2017-18 in the Central Information Commission (CIC) RTI Annual Return Information System.

IASST has a Women Cell constituted for woman welfare and to attend different problems/inconveniences of women employees in IASST which also acts as Internal Complaints Committee (ICC) to deal with Sexual Harassment of Women at Workplace. No complaints were filed to the Women Cell during the year 2017-18.

Chief Vigilance Officer, DST, New Delhi : **Dr. B. K. Shukla**

Vigilance Officer, IASST
: **Dr. Neelotpal Sen Sarma**

Appellate Authority (RTI), IASST
: **Dr. N.C. Talukdar**

Central Public Information Officer(CPIO), IASST : **Dr. Diganta Goswami**

Chairman, Academic Committee, IASST
: **Dr. Heremba Ballung**

Chairperson, Women Cell, IASST
: **Dr. (Mrs.) Munima B. Sahariah**

Nodal Officer, Public Grievance, IASST
: **Dr. (Mrs.) Sumita Kumari Sharma**

I. Recruitment of Academic staff

IASST started recruitment process to fill up eight vacant faculty positions: Natural Product Chemistry (Assoc. Prof.-II), Bio-diversity and Eco-System research Program/Wetland Ecology (Assoc. Prof.-II), Sericulture/Seri biotechnology (Assoc. Prof.-II), Plasma physics (Asstt. Prof.-II), Applied Mathematics (Asstt. Prof.-II), Molecular Biology (Asstt. Prof.-II), System Biology (Asstt. Prof.-II) and Biophysics (Asstt. Prof.-II). The advertisement was published in both regional and national papers in the month of August 2017. Shortlisting of application for all the positions been completed. The interview and filling up of these positions is likely to be completed within September 2018.

Persons who serve IASST in different capacity under different program

Dr. N. C. Talukdar	Director

Basic and Applied Plasma Physics

Dr. Heremba Bailung,	Professor II & Head
Dr. Joyanti Chutia,	Emeritus Professor
Dr. Sumita Kumari Sharma	DST Women Scientist
Dr. Nirab Chandra Adhikary.	Technical Officer –B
Bhabesh Kumar Nath	Project Scientist
Abhijit Boruah	SRF/Project Scientist
Pallabi Pathak	SRF
Tonuj Deka,	SRF
Binita Borgohain,	SRF
Yoshiko Bailung,	JRF (DST-INSPIRE)
Rakesh Rushel Khanikar	JRF (DST-INSPIRE)
Ibnul Farid	JRF (DST-INSPIRE)
Bidyut Chutia	JRF (DST-INSPIRE)
Palash J. Boruah	JRF (DST INSPIRE)
Kuldip Kalita	Project Scientist
Krishna Kanta Swargiary	Technician
Bipul Kumar Das	Multi-Tasking Staff

Advanced Material Science

Dr.Neelotpal Sen Sarma,	Assoc. Prof-II
Dr. Devasish Chowdhury	Assoc. Prof.-II
Dr. Arup Ratan Pal	Assoc. Prof-I
Dr. Sarathi Kundu,	Assoc. Prof.-I
Dr. Munima B. Saharia	Assoc. Prof.-I
Dr. Sagar Sharma	DST INSPIRE Faculty
Dr. Biswajit Choudhury	DST INSPIRE Faculty
Dr. Robinson Jose	DBT-RA
Dr. Abdul Barik	N-PDF
Upama Baruah	SRF
Bikash Sharma	SRF
Manash jyoti Deka	SRF
Achyut Konwar	SRF
Ashim Chandra Bhowal	SRF
Parijat Borgohain	SRF
Ujjal Saikia	JRF
Sristi Mazumdar	JRF
Hrishikesh Talukdar	SRF
Deepshikha Gogoi	JRF
Bandita Kalita	JRF

Jayanta Sharma Boruah	JRF
Suman Sarkar	NET JRF
Samarin Upadhaya	JRF
Subhankar Pandit.	JRF (DST-INSPIRE)
Sweety Biswasi	JRF (DST-INSPIRE)
Gautomi Gogoi	Project Asstt.
Ankita Deb	JRF
Jahnabi Gogoi	JRF
Purbajyoti Bhagowati	JRF (DST-INSPIRE)
Samiran Upadhyay	JRF
Payal Saha	JRF
Raktim Jyoti Sarmah	JRF
Tishamoni Kashyap	Research Asstt.
Babul Ch. Deka	Multi-Tasking Staff

Traditional Knowledge Based Drug development and Delivery

Dr. (Mrs.) Rajlakshmi Devi	Assoc. Prof.-II
Dr. Rosy Mondal	DST INSPIRE Faculty
Dr. Joshodeep Baruah	Scientist-E (Project)
Dr. Shyamashree Dasgupta	Scientist-D (Project)
Dr. Sumon Kr. Samanta	Scientist-C (Project)
Juri Pathak	Technical Officer-A
Julie Bordoloi.	Technical Assistant-II
Subrata Goswami.	Technical Assistant.
Sanjeeb Kalita,	SRF
Bhaswati Choudhury	SRF
Momita Das	JRF(RGNF-UGC)
R Elancheran	SRF
Raghuram Kandimalla	RA
Dr. Bhaskarjyoti Gogoi	RA
Himadri Kalita	SRF
Rahul Sarma	SRF
Ankita Hazarika	SRF
Sima Kumari	SRF
Krishna Nayani Dutta	SRF
Aditi Kaushik	SRF
Sagar Ramrao Barge	SRF
Prasanta Kr. Deb	JRF
Paramita Choudhury	JRF
Bhaswati Kashyap	Technical Asstt.
Simanta Bharadwaj	Technical Asstt.
Puspanjali Khound	JRF
Swarnali Bhattacharjee	JRF

Arup Jyoti Deka	Account Asstt.
Bikash Jyoti Das	Animal Keeper
Abinish Nath	Animal Keeper
Gwhwm Basumatary	Animal Keeper
Tarun Talukdar	Multi-Tasking Staff
Bolin Das	Multi-Tasking Staff
Sabin Kalita	Multi-Tasking Staff
Haren Medhi	Multi-Tasking Staff

Biodiversity and Ecosystem Research

Dr. N. C. Talukdar	Director & Professor
Dr. Suresh Deka	Professor-I & i/c RMES, LSD
Dr.(Mrs.) Arundhuti Devi	Assoc. Prof-I
Dr. Debajit Thakur	Assoc. Prof-I
Dr.M.R. Khan	Assoc. Prof-1
Dr. Soumyadeep Nandi.	Ramalingaswami Fellow
Dr. Nandana Bhardwaj.	DBT Bio Care Women Scientist
Dr.W. Romi	DST INSPIRE Faculty
Dr.Rupamoni Thakur	DBT-RA
Dr.Sailendra Gayari	NPDF
Dr.Seydur Rahman	NPDF
Dr.Asim Kr. Dutta	NPDF
Dr.Rinku Moni Kalita	NPDF
Dr.Parijit Saikia	NPDF
Dr.Bhaskar Das	NPDF
Dr.Archana Nath	NPDF
Dr.Kaushik Bhattacharya	NPDF
Dr. Anowar Hussain	RA
Dr. Amal Das	RA
Dr. Atanu Adak	RA
Dr. Partha P. Dutta	RA
Dr. Ananya Barman	DBT-RA
Dr. Kaustavmani Patowary	DBT-RA
Madhusmita Dehingia.	RA
Anupam Bhattacharya.	RA
Rictika Das	DST Women Scientist
Monikankana Kalita	SRF
Barsha Deka	SRF
Ranjita Das	JRF (RGNF-UGC)
Garima Raj	JRF
Manashi Das	SRF
Jilmil Baruah	JRF
Mohd Shadab	JRF
Sujata Deka	JRF

Nilam Sarma	JRF
Anurupa Goswami	JRF- INSPIRE Fellow
Atlanta Borah	JRF
Yogesh Babasaheb Chaudhari	CSIR-SRF
Gitumani Devi.	CSIR-SRF
Rupshikha Potowary.	CSIR-SRF
Priyanka Sarkar.	JRF
Suravi Kalita,	SRF
Bhuwan Bhaskar	JRF
Rabiya Sultana	JRF (UGC MANF)
Suparna Sen,	SRF
Khanindra Sharma	JRF
Tulsi Kumari Joishy	SRF-INSPIRE
Chingakham Jutiya Devi	JRF-CSIR, UGC
Chandana Malakar	DBT-JRF
Dibyayan Deb	JRF
Santanu Das	JRF
Shahiba Nodrat Hazarika	JRF
Monalisa Kalita	JRF
Tamali Sinha	JRF-CSIR
Juri Saikia	JRF (RGNF)
Madhurankhi Goswami	JRF
Aron Kumar	DBT-JRF
Satabdi Saha	JRF
Bithorai Basumatary	JRF
Manomohan Huzuri,	Technical Assistant
Madan Chandra Kalita	Multi-Tasking Staff
Srikanta Baishya	Multi-Tasking Staff
Prasanta Ch. Das	Field Assistant

Mathematical and Computational Sciences

Dr. Gautam Choudhury	Assoc. Prof-II
Dr. (Mrs.) Lipi B. Mahanta	Assoc. Prof-I
Niranjan Bhagaboti	Technical Officer-B
Tabassum Yesmin Rahman,	DST Women Scientist
Ajay Kr. Saw	JRF
Priyanka Kalita	JRF
Snigdha Mahanta	JRF
Karishma Shravan	JRF
Daisy Das	JRF
Silpisikha Goswami	JRF
Kangkana Bora	SRF-INSPIRE Fellow
Anjana Begum	JRF
Elima Hussain	JRF

Balabhadra Pathak	Multi-Tasking Staff

Administration and Accounts

Dr. Diganta Goswami	Registrar
Pradyut Borkataki	Finance & Accounts Officer
Rajesh Sharma	PRO
Prabodh Kr. Deka,	Section Officer (Admin.)
Suresh Ch. Sarma,.	Section Officer (Acctts.)
Rabin Ch. Kalita,	Superintendent
Ramen Mahanta,	Superintendent
Saraswati Bora,	Superintendent
Dwijendra Deka,	Superintendent
Lelin Gogoi	PS to Director
Munindra Singh	Technical Assistant
Diganta Das,	Assistant
Gora Gupta,	Assistant
Prabhat Ch. Barma	Assistant
Phatik Baishya	Driver
Nimai Hazam	Driver
Lakshmi Kanta Soud	Multi-Tasking Staff
Madhabi Das	Multi-Tasking Staff
Nripen Ch. Goswami	Multi-Tasking Staff
Satish Ch. Das	Multi-Tasking Staff
Niren Sarma	Multi-Tasking Staff
Ratul Baishya	Multi-Tasking Staff
Binoy Kr. Choudhury	Multi-Tasking Staff
Pradip Das	Multi-Tasking Staff
Madhu Ram Kalita	Multi-Tasking Staff
Munna Basfor	Sweeper

Temporarily engaged person

Jayanta Borthakur	Network& System Administrator
Ajay Kr. Chakraborty	Programme Executive
Nabajyoti Choudhury	Programme Manager
Nayan Talukdar	Technical Officer (Instrumentation)
Dr. Anil Kumar	Technical Coordinator
Debajit Deka	Jr. Network Administrator
Pinky Taye	Assistant
Kalpana Bala Das	Assistant
Hemanta Sharma	Assistant
Ksh. Sharmina Devi	Project Assistant
Nirmali Devi	Hindi Assistant
Milan Jyoti Das	Technical Assistant

Mehjabin Ali	Project Assistant
Lachman Thapa	Driver
Pranab Talukdar	Driver
Bimal Das	Driver
Sanjib Kr. Das	Driver
Prakash Kr. Kachari	Field Supervisor
Madan Kr. Das	Cook
Manindra Deka	Cook cum Hostel Care Taker

Engineering and Estate Management

Montu Deka,	Assistant Engineer
Temporarily engaged person	
Gautam Kr. Medhi	IEME
Gadadhar Deka	Project Engineer
Rupen Pegu	Fishery Management Assistant
Pinaki Adhikari	Manager BCH
Md. Mahammad	JE (Civil)
Pabitra Deuri	JE (Elect)
Shankar Daimari	Work Supervisor
Muktaram Kumar	Work Supervisor
Meenakshi Bora	Work Supervisor
Kumud Patgiri	Electrician
Hiren kalita	Resident Electrician
Uddipta Deka	Resident Electrician
Dharani Basumatari	Resident Electrician
Dijoraj Roy Choudhury	Plumber
Anima Baishya	Cleaner
Dinesh Deka	Gardener
Ajay Baishya	Mali

Knowledge Resource Centre

Dr. Tarini Dev. Goswami	Assistant Librarian
Kumud Baishya	Assistant
Sarala Deka	Multi-Tasking Staff

Temporarily engaged person

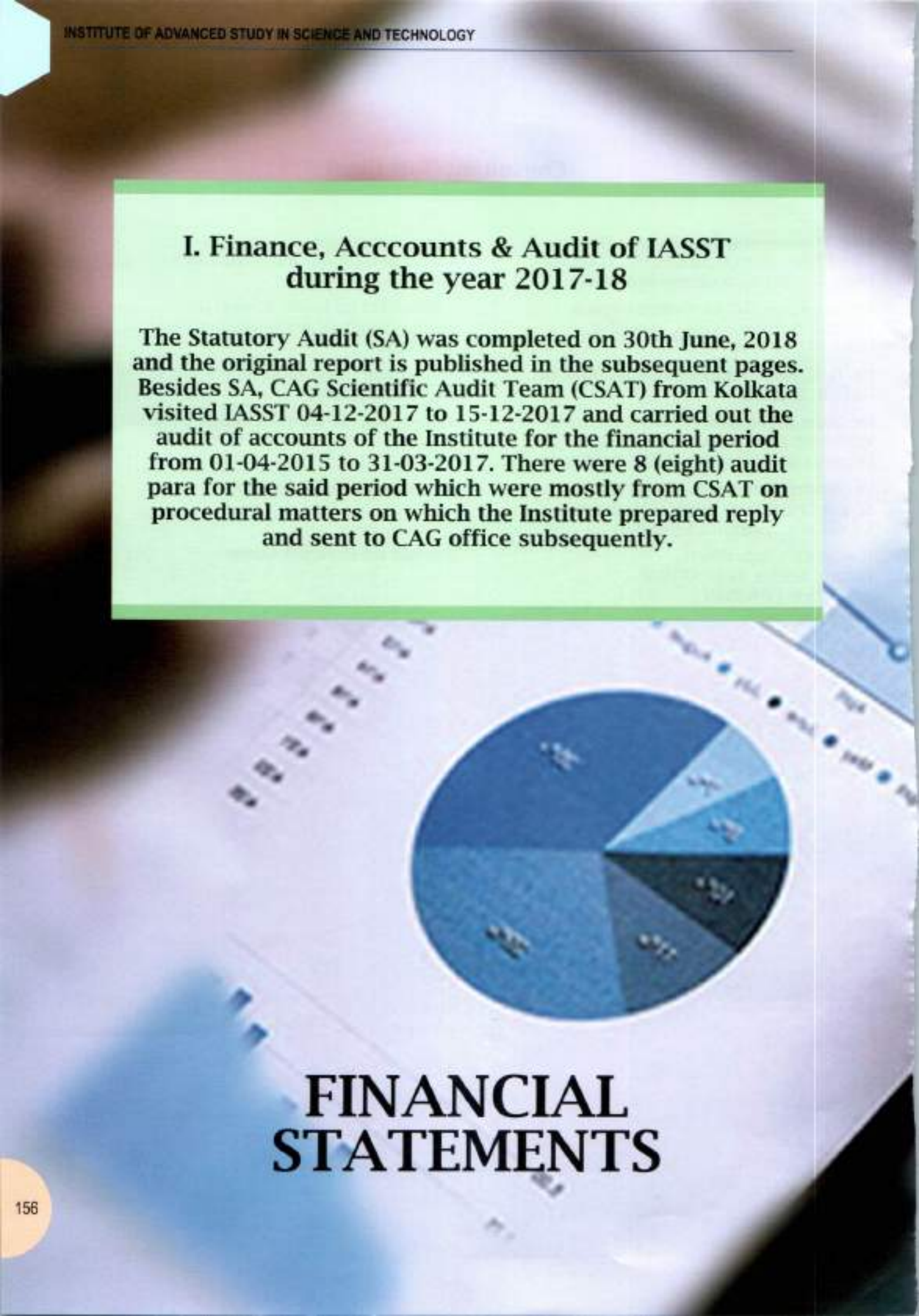
Subhrajit Sengupta	Professional Assistant

Consultant (Part-time)

Prof. Dharmeswar Das, Former Director & Vice Chancellor (A), ICAR-IVRI, Izatnagar; Dean, Assam Agricultural University	Chief Consultant (Administration & Infrastructure)
Prof. O. K. Medhi, Renowned Organic chemist & Former Vice Chancellor, Gauhati University	Consultant (In house project on carbonisation of tea waste and water hyacinth)
Dr. D. K. Hore, Former Regional Director, NBPGR, Shillong	Consultant (Plant bioresource taxonomy & BCH development)
Dr. Nalin Kr. Mohan, Former Director of Extension Education, AAU, Jorhat & Former Chief Scientist, RARS, Kahikuchi	Consultant (ST adopted village program)
Dr. Aswini Bezbaruah, MD (Medicine), Senior Consultant-Internal Medicine, Excel Care Hospital, Guwahati	Consultant Medical Officer
Pradip Kr. Chakraborty, Former Senior Audit Officer, AG Office, Guwahati	Consultant (Internal Audit)

I. Finance, Acccounts & Audit of IASST during the year 2017-18

The Statutory Audit (SA) was completed on 30th June, 2018 and the original report is published in the subsequent pages. Besides SA, CAG Scientific Audit Team (CSAT) from Kolkata visited IASST 04-12-2017 to 15-12-2017 and carried out the audit of accounts of the Institute for the financial period from 01-04-2015 to 31-03-2017. There were 8 (eight) audit para for the said period which were mostly from CSAT on procedural matters on which the Institute prepared reply and sent to CAG office subsequently.



FINANCIAL STATEMENTS

K P SARDA & COMPANY
CHARTERED ACCOUNTANTS

INDEPENDENT AUDITOR'S REPORT

TO
THE MEMBERS
THE INSTITUTE OF ADVANCED STUDY IN SCIENCE AND TECHNOLOGY
GUWAHATI

We have audited the accompanying Financial Statements of **The Institute of Advanced Study in Science & Technology, Paschim Boragaon, Garchuk, Guwahati** which comprise the Consolidated Balance Sheet as at 31st March, 2018, the Consolidated Receipts and Payments Account and the Consolidated Income and Expenditure Account for the year then ended, and a summary of significant accounting policies and other explanatory information.

Management's Responsibility for Financial Statements :

Management is responsible for the preparation of these financial statements that give a true and fair view of the financial position and financial performance of the society in accordance with the Accounting Standards generally accepted in India. This responsibility includes the design, implementation and maintenance of internal control relevant to the preparation and presentation of the financial statements that give a true and fair view and are free from misstatement, whether due to error or fraud.

Auditor's Responsibility :

Our responsibility is to express an opinion on these financial statements based on our audit. We conducted our audit in accordance with the Standards on Auditing issued by the Institute of Chartered Accountants of India. Those standards require that we comply with ethical requirements and plans and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the society's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of the accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Cond..P/2

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kpsarda@gmail.com
K P SARDA & COMPANY
SC-11, Parmeshwari Building, 2nd Floor
Chatribari Road, Guwahati - 781001, Assam
http://kpsardaco.org.in

Director
Institute of Advanced Study in Science & Technology

K P SARDA & COMPANY
CHARTERED ACCOUNTANTS

Opinion:

In our opinion and to the best of our information and according to the explanations given to us, the financial statements give the information required by the Act in the manner so required and give a true and fair view in conformity with the accounting principles generally accepted in India :

(a) In the case of the Balance Sheet, of the state of affairs of the Society, as on 31st March, 2018;

(b) In case of the Income and Expenditure Account of the Income/Expenditure of Society for the year ended 31st March, 2018;

(c) In case of the Receipts and Payment Account of the Receipts/Payments of Society for the year ended 31st March,2018

We further report that:

(a) We have obtained all the information and explanations to the best of our knowledge and belief were necessary for the purpose of our audit;

(b) In our opinion, proper books of account, as required by law have been kept by the Society so far as appears from our examination of those books;

(c) The Balance Sheet, the Receipts and Payments Account and the Income and Expenditure Account dealt with by this Report are in agreement with the books of account.

For K.P. Sarda & Co.
Chartered Accountants
FRN : 319206E

(CA. K P Sarda)
Partner
Membership No.054555

Place : Guwahati
Date : 20/07/2018

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THE INSTITUTE OF ADVANCED STUDY IN SCIENCE AND TECHNOLOGY

PASCHIM BORAGAON, GARCHUK, GUWAHATI- 781035

CONSOLIDATED BALANCE SHEET AS ON 31ST MARCH, 2018

PARTICULARS	Schedule	Amount (₹) 2017-18	Amount (₹) 2016-17
CAPITAL FUND & LIABILITIES			
Capital Fund	1	644,347,469.72	484,434,575.62
Reserve & Surplus	2	70,292.00	63,950.03
Earmarked Funds	3	26,545,877.49	27,869,869.80
Current Liabilities and Provisions	4	132,111,508.33	275,905,688.89
TOTAL :		**803,075,147.54**	**788,274,084.34**
ASSETS			
Fixed Assets	5	627,167,815.80	488,226,781.80
Investments	6	20,143,750.00	36,714,449.00
Current Assets, Loans and Advances	7	155,763,581.74	263,332,853.54
TOTAL :		**803,075,147.54**	**788,274,084.34**

NOTES ON ACCOUNT - SCHEDULE "8"

In terms of our report of even date annexed hereto.

For K. P. Sarda & Co.
Chartered Accountants
FRN : 319206E

(CA. K P Sarda)
Partner
Membership No. 054555

Place : G u w a h a t i
Date : 20/07/2018

Accounts Officer
पश्चिम बड़ागाव
Paschim Boragaon
गुवाहाटी-35 असम भारत
Guwahati-781035 Assam India

निदेशक / Director
Paschim Boragaon Guwahati-35 Assam India

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THE INSTITUTE OF ADVANCED STUDY IN SCIENCE AND TECHNOLOGY

PASCHIM BORAGAON, GARCHUK, GUWAHATI- 781035

CONSOLIDATED INCOME & EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31ST MARCH 2018

EXPENDITURE		Amount (₹)	INCOME		Amount (₹)
DST GENERAL FUND :			**DST GENERAL FUND :**		
General Expenses	63,400,387.42		Revenue Grant	214,452,000.00	
Salary & Allowances	99,955,858.00		Bank Interest	2,236,705.91	
Empowerment of SC/ST people	366,020.00	163,722,265.42	Interest on Fixed Deposit	992,937.00	
			Penal Interest	10,297.00	
MISCELLANEOUS & OTHERS :			Interest From Advance	258,303.00	
Salary & Allowances	274,994.00		Other Income	1,136,379.00	219,086,621.91
Bank Charges	2,814.90				
Miscellaneous	41,035.00		**MISCELLANEOUS & OTHERS :**		
Mess Expenditure	1,974,003.00		Bank Interest	344,680.00	
Audit Fees	185,850.00	2,478,696.90	Overhead Charges	3,731,813.00	
			Interest on FD	885,881.00	
Surplus transferred to			Other Income	2,106,102.11	
a) Unutilised Grant	55,364,356.49		Mess Dues	1,864,976.32	
b) Capital Fund	6,477,854.79	61,842,211.28	Room Rent	8,400.00	
			Guest Charges	14,699.26	8,956,551.69
		228,043,173.60			228,043,173.60

NOTES ON ACCOUNT - SCHEDULE "8"

In terms of our report of even date annexed hereto.

For K. P. Sarda & Co.
Chartered Accountants
FRN : 319206E

(CA. K P Sarda)
Partner
Membership No. 054555

Place : Guwahati
Date : 20/07/2018

2

लेखा अधिकारी / Accounts Officer, IASST, Paschim Boragaon, Guwahati-781035, Assam, India

कुलसचिव / Registrar

निदेशक / Director, IASST, Paschim Boragaon

THE INSTITUTE OF ADVANCED STUDY IN SCIENCE AND TECHNOLOGY

PASCHIM BORAGAON, GARCHUK, GUWAHATI- 781035

CONSOLIDATED RECEIPTS & PAYMENTS ACCOUNT FOR THE YEAR ENDED 31ST MARCH 2018

RECEIPTS		Amount (₹)	PAYMENTS		Amount (₹)
To **OPENING BALANCE :**			By **DST GENERAL FUND :**		
Cash in Hand	20,000.00		General Expenses		63,377,801.42
Cash at Bank (As per Schedule 7)	128,101,606.54	128,121,606.54	Capital Expenses		188,867,269.00
			Salary & Allowances		104,300,334.00
			Empowerment of SC/ST people		271,020.00
" **Grant- in-Aid**					
Capital Grant	82,489,871.00		" **EXTRAMURAL PROJECTS :**		
Revenue Grant (Annexure "G")	254,689,521.00	337,179,392.00	Contingency		2,278,831.47
			Consumables		10,556,554.50
			Overheads		1,428,400.00
" **OTHER RECEIPTS :**			Salary & Allowances		27,266,645.65
Bank Interest	4,143,723.11		Travel		1,968,093.00
Institutional Charges	3,731,813.00		Training		133,592.00
Interest on FD	3,432,996.00		Miscellaneous		323,536.00
TA Grant	473,133.00		Equipments		34,483,737.00
Penal Interest	10,297.00				
Other Income	3,751,839.22		" **MISCELLANEOUS & OTHERS :**		
Mess Dues	1,864,976.32		Salary & Allowances		274,994.00
Room Rent	8,400.00		Vehicle		1,158,644.00
Guest Charges	14,699.26	17,431,876.91	Bank Charges		2,814.90
			Miscellaneous		41,035.00
" Earnest Money Received (Annexure "B")		56,000.00	Mess Expenditure		1,974,003.00
			Audit Fees		185,850.00
" Fixed Deposit Matured		35226498			
			" Investment		20,000,000.00
" Advance from Project to Overhead		1,610,594.00			
			" Advance from Project to Overhead		1,610,594.00
" Advance from DST to Project		171,920.00			
			" Advance from DST to Project		171,920.00
" Security Deposits		19,392.23			
			" Earnest Money refunded (Annexure "B")		89,110.00
" Contribution to Employees Benevolent Fund		7,200.00			
			" **CLOSING BALANCE :**		
" CSIR SRF Contingency Grant (A Kanwar, U Baruah & R Elancheran)		60,000.00	Cash in hand	20,000.00	
			Cash at Bank (As per Schedule 7)	59,690,547.74	59,710,547.74
" Refund of Library Advance		200,000.00			
" **Advances**					
Equipments	269,156.00				
Salary	121,691.00	390,847.00			
		520,475,326.68			520,475,326.68

We have verified the above statement of Receipts & payments Account of the Institute of Advanced Study in Science & Technology, Paschim Boragaon, Guwahati - 781 035, Account - Plan for the period from 1st April 2017 to 31st March, 2018 from the Books of Accounts and vouchers

For K. P. Sarda & Co.
Chartered Accountants
FRN : 319206E

(CA. K P Sarda)
Partner
Membership No. 054555

Place : G u w a h a t i
Date : 20/07/2018

सहायक लेखाधिकारी
A/Accounts Officer
पश्चिम बड़ागाव
Paschim Boragaon
गुवाहाटी-35, असम भारत
Guwahati-781035, Assam India

Registrar
विज्ञान एवं
Science & Technology
पश्चिम बड़ागाव, गुवाहाटी-35, असम भारत
Paschim Boragaon, Guwahati-35 Assam India

निदेशक/Director
पश्चिम बड़ागाव
Paschim Boragaon
Science & Technology Guwahati-781035 Assam India

THE INSTITUTE OF ADVANCED STUDY IN SCIENCE AND TECHNOLOGY

PASCHIM BORAGAON, GARCHUK, GUWAHATI- 781035

SCHEDULE - 1 : :: CAPITAL FUND ::

	Amount(₹) 2017-18	Amount (₹) 2016-17
Opening Balance	484,434,575.62	
Add : Contribution towards Capital Fund (Addition to Fixed Assets)	217,395,240.00	
Add : Surplus for the year	6,477,854.79	
Add : Transferred from Unutilised Grant	14,494,005.31	
	722,801,675.72	
Less : Depreciation for the year	78,454,206.00	
	644,347,469.72	**484,434,575.62**

SCHEDULE - 2 : :: RESERVES & SURPLUS ::

	Amount(₹) 2017-18	Amount (₹) 2016-17
IASST Employees Benevolent Fund (664178)	70,292.00	60,633.00
IASST Corpus Fund (934064)	0.00	3,317.03
	70,292.00	**63,950.03**

SCHEDULE - 4 : :: CURRENT LIABILITIES AND PROVISIONS ::

		Amount(₹) 2017-18	Amount (₹) 2016-17
CURRENT LIABILITIES :			
Unutilised Grant in Aid	(As per Annexure "A")	120,286,647.10	214,318,347.89
Earnest Money	(As per Annexure "B")	1,068,398.00	1,101,508.00
Security Deposit Payabl	(As per Annexure "C")	6,219,019.23	215,000.00
Other Current Liabilitie	(As per Annexure "D")	4,537,444.00	304,083.00
Provision Againts Fixed Assets and Expenditure		0.00	59,966,750.00
		132,111,508.33	**275,905,688.89**

SCHEDULE - 6 : :: INVESTMENTS ::

	Amount(₹)
Opening Balance	36,714,449.00
Add : Investment made during the year	20,000,000.00
Add : Interest Accrued	1,098,149.00
Less : TDS	2,291.00
Less : Fixed Deposit matured during the year	35,226,498.00
Less : Interest received during the year	2,440,059.00
Balance as on 31/03/2018	**20,143,750.00**

Accounts Officer
Boragaon
Assam:India

Registrar

Director

THE INSTITUTE OF ADVANCED STUDY IN SCIENCE AND TECHNOLOGY

PASCHIM BORAGAON, GARCHUK, GUWAHATI- 781035

SCHEDULE - 7 : :: CURRENT ASSETS, LOANS & ADVANCES ::

		Amount(₹) 2017-18	Amount(₹) 2016-17
(A) CURRENT ASSETS :			
Cash in hand		20,000.00	20,000.00
Balance with Banks	**Account No.**		
SBI Khanapara Branch	(943972)	289,733.30	64,351,309.81
SBI Khanapara Branch - Workshop	(943723)	174,587.83	27,134.83
SBI Garchuk - Seminar	(888433)	0.00	65,478.50
Vijaya Bank - Travel	(000441)	161,746.29	40,239.29
Vijaya Bank - Conference	(000918)	0.00	103,278.00
SBI Khanapara - International Conference	(635294)	11,912.00	11,484.00
SBI - IASST Corpus Fund	(943064)	168,236.53	3,317.03
SBI Garchuk Branch - Project	(260721)	33,330,401.69	14,724,069.18
SBI - Herbal Medicine N.C. Talukdar	(862670)	14,794,200.98	28,924,330.80
Vijaya Bank - Chemical Profiling of Joha and Black	(002509)	0.00	4,648,265.00
Vijaya Bank -Microbial Roles in Yield Management -	(002510)	0.00	1,342,872.00
Vijaya Bank - Dev. Of nano particle - Poultry	(002508)	0.00	560,583.00
SBI - Inspire Fellow - Anurupa Goswami	(748311)	0.00	3,963.00
SBI - Fellowship for U.S. Visit - Yogesh	(863775)	0.00	24,171.00
SBI - CSIR SEF Neelam Gitumani Yogesh	(781982)	0.00	321,832.00
SBI - Inspire Faculty Award - Rosy Mondal	(862670)	0.00	7,193.00
SBI - Inspire Fellowship Program - Y. Bailung	(732582)	0.00	3,728.00
SBI - Inspire Fellowship Program - Tulsi Joshi	(757427)	0.00	3,445.00
SBI - Effect of Traditional Dietary - M.R. Khan	(749904)	0.00	880,963.00
SBI - Dev. Of Plasma Modified - J. Chutia	(733766)	0.00	227,793.00
Vijaya Bank - Glycolipid Biosurfactant - Suresh	(002790)	0.00	1,050,000.00
Vijaya Bank - Cervical Pre Cancerous and Cancer	(002653)	0.00	1,201,000.00
SBI - IASST Employees Benevolent Fund	(664178)	70,292.00	60,633.00
SBI - Students & Scientist Home (IASST)	(412886)	568,064.62	614,393.71
SBI G.U. Branch - Upgrading	(131613)	47,004.86	45,316.86
Vijaya Bank - Overhead/Miscellaneous	(000466)	10,074,367.64	8,854,813.53
	TOTAL (A)	59,710,547.74	128,121,606.54
(B) LOANS, ADVANCES & OTHER ASSETS :			
Crest Award		343,770.00	343,770.00
TDS		126,315.00	124,024.00
Advances against Expenditure of Grants (Annexure "E")		14,478,828.00	9,616,705.00
Advances against Fixed Assets (Annexure "F")		77,321,607.00	64,879,998.00
Imprest Advance		0.00	280,000.00
Advance from Extramural Project to Overhead		3,610,594.00	0.00
Advance from DST to Project		171,920.00	0.00
Committed Expense		0.00	59,966,750.00
	TOTAL (B)	96,053,034.00	135,211,247.00
	TOTAL (A+B)	**155,763,581.74**	**263,332,853.54**

वित्त एवं लेखा अधिकारी
Finance & Accounts Officer
आई.ए.एस.टी., पश्चिम बड़ागाव
IASST, Paschim Boragaon
गुवाहाटी-35, असम, भारत
Guwahati-781035, Assam, India

निदेशक/Director
आई.ए.एस.टी., पश्चिम बड़ागाव
IASST, Paschim Boragaon
Guwahati-781035, Assam, India

THE INSTITUTE OF ADVANCED STUDY IN SCIENCE AND TECHNOLOGY

PASCHIM BORAGAON, GARCHUK, GUWAHATI- 781035

SCHEDULE - 3 : **:: EARMARKED FUNDS ::**

Particulars	Salary	Benevolent Fund	Contingency	Travel	Consumables	Training	Overhead	Misc.	Bank Interest	Refund Against Advance (Receipt)	Refund (Payment)	Total(₹)
a) Opening Balance	16,483,097	-120	2,726,020	1,444,949	6,055,708	421,961	0	1,675,218	1,024,992	291,309	-2,253,264	27,869,870
b) Addition to the Funds												
i) Grants	23,285,662	0	2,089,879	997,612	11,686,797	334,000	1,843,571	0	0	0	0	40,237,521
ii) Other Receipts	473,013	120	0	0	0	0	0	509,358	1,772,146	0	0	2,754,637
	23,758,675	120	2,089,879	997,612	11,686,797	334,000	1,843,571	509,358	1,772,146	0	0	42,992,158
TOTAL (a+b)	40,241,772	0	4,815,899	2,442,561	17,742,505	755,961	1,843,571	2,184,576	2,797,138	291,309	-2,253,264	70,862,028
c) Expenditure towards objectives of Funds	27,266,646	0	2,278,831	1,968,093	10,556,555	133,592	1,428,400	323,536	0	0	0	43,955,653
	27,266,646	0	2,278,831	1,968,093	10,556,555	133,592	1,428,400	323,536	0	0	0	43,955,653
d) Advances												
PY Advance Adjusted	80,000	0	0	266,908	236,140	10,000	0	0	0	0	0	593,048
CY Advance Unadjusted	0	0	26,400	72,000	130,150	4,000	0	0	0	0	0	232,550
	-80,000	0	26,400	-194,908	-105,990	-6,000	0	0	0	0	0	-360,498
e) Net Balance as at the year end (a+b-c+d)	12895126.4	(0.0)	2563467.5	279560.0	7079960.5	616369.0	415171.0	1861039.9	2797138.2	291309.0	(2253264.0)	26545877.5

Registrar / Director

THE INSTITUTE OF ADVANCED STUDY IN SCIENCE AND TECHNOLOGY

PASCHIM BORAGAON, GARCHUK, GUWAHATI- 781035

SCHEDULE - 5 : **:: FIXED ASSETS ::**

PARTICULARS OF DEPRECIATION ALLOWABLE AS PER THE IT ACT, 1961 IN RESPECT OF EACH ASSET OR BLOCK OF ASSETS, AS THE CASE MAY BE, IN THE FOLLOWING FORM

Particulars	W.D.V on 01/04/17	Additons/(Deletion) >180 days	<180 days	Total	Depreciation	W.D.V on 31/03/18
Block "A" : 0%						
Land	0.00	0.00	0.00	0.00	0.00	0.00
Block "B" : 10%						
Building & Site Development	256,753,986.66	18,836,584.00	122,452,156.00	398,042,726.66	33,681,665.00	364,361,061.66
Furniture & Fixtures	23,046,837.45	1,729,024.00	10,973,075.00	35,748,936.45	3,026,240.00	32,722,696.45
Block "C" : 15%						
Equipments	193,474,598.67	29,810,634.00	21,027,383.00	244,312,615.67	35,069,838.00	209,242,777.67
Air Conditioner	3,672,504.00	426,644.00	624,384.00	4,723,532.00	661,701.00	4,061,831.00
Refrigerator	12,703.00	0.00	0.00	12,703.00	1,905.00	10,798.00
Projector	92,680.00	0.00	0.00	92,680.00	13,902.00	78,778.00
Vehicles	5,287,608.00	2,580,200.00	0.00	7,867,808.00	1,180,171.00	6,687,637.00
Block "D" : 40%						
Library	2,490,865.00	10,173.00	22,674.00	2,523,712.00	1,004,950.00	1,518,762.00
Computer	3,388,591.02	3,376,864.00	5,525,445.00	12,290,900.02	3,811,271.00	8,479,629.02
Printer & Xerox Machine	3,338.00	0.00	0.00	3,338.00	1,335.00	2,003.00
Computer Software	3,070.00	0.00	0.00	3,070.00	1,228.00	1,842.00
	488,226,781.80	56,770,123.00	160,625,117.00	705,622,021.80	78,454,206.00	627,167,815.80

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THE INSTITUTE OF ADVANCED STUDY IN SCIENCE AND TECHNOLOGY

PASCHIM BORAGAON, GARCHUK, GUWAHATI- 781035

SCHEDULE " 8 " **: SIGNIFICANT ACCOUNTING POLICES :**

1. **ACCOUNTING CONVENTION :**

The Financial Statements are prepared on the basis of historical cost convention, unless otherwise stated and on the Accrual method of accounting.

2. **REVENUE RECOGNITION :**

(a) Income on interest bearing securities and term deposits is recognised on accrual basis as and when these are realised.

(b) Income other than interest income are recognised on cash basis.

3. **INVESTMENTS :**

Term deposits with Banks are taken as investments and valued at accrual basis.

4. **FIXED ASSETS :**

Fixed Assets are stated at cost of acquisiton, inclusive of inward freight, duties and taxes and incidental and direct expenses related to acquisiton less depreciation.

5. **DEPRECIATION :**

(a) Depreciation on Fixed assets purchased/acquired/ constructed out of government grants is charged on WDV Method as per the rates specified under the Income Tax Act, 1961.

(b) Depreciation is charged to Capital Fund by way of reducing the net value of fixed assets.

6. **GOVERNMENT GRANTS/SUBSIDIES :**

Revenue grants are shown on realisation basis and expenditure thereof is charged to appropriate revenue heads. In the case capital grant, the capital fund is credited to the extent of the amount of acquisition of fixed assets and the balance remains in unutilised grant.

Finance & Accounts Officer
IASST, Paschim Boragaon

Institute of Advanced Study in Science & Technology

निदेशक/Director
IASST, Paschim Boragaon

THE INSTITUTE OF ADVANCED STUDY IN SCIENCE AND TECHNOLOGY

PASCHIM BORAGAON, GARCHUK, GUWAHATI- 781035

NOTES ON ACCOUNTS :

(i) No provision has been made in respect of Leave Salary.

(ii) Purchase of consumable items during the year are treated as expenditure and charged to revenue.

(iii) In the opinion of the Management, the current assets, loans and advances have a value on realisation equal or atleast to the aggregate amount shown in the Balance Sheet.

(iv) Balances under Current Liabilities, Loans and Advances are subject to conformation /reconciliation /adjustments, if any.

(v) No provision is made for contingent liability, except for cases where provision needs to be made, based on expert opinion.

(vi) Previous years figure have been rearranged and regrouped wherever considered necessary to facilitate comparison.

(vii) An amount of ₹ 3,317.03 that was shown as IASST corpus fund under the head Reserve & Surplus in the previous year has been transferred to unutilised grant of DST General Fund in the currrent year.

(viii) Any surplus balance that remains in Income & Expenditure A/c after adjusting the revenue expenditure with the revenue grant and other income is transferred to unutilised grant and capital

(ix) The amount of ₹ 1,44,94,005.31 of unutilised grant except for DST General Fund and Extramural Projects is transferred to capital fund. In earlier years surplus of income over expenditure (Miscellaneous Account) was shown under unutilised grant which is transferred to Capital Fund as this fund is maintained for keeping the records of income generation of the Institute.

(x) Any surplus of revenue grant alongwith other income over revenue expenditure of Extramural Projects is transferred to earmarked fund and it isn't included in the preparation of the Consolidated Income & Expenditure Account.

निदेशक/Director
पश्चिम बड़ागाव
Paschim Boragaon
Assam India

9

Accounts Officer
पश्चिम बड़ागाव
Paschim Boragaon
Assam India

Paschim Boragaon Guwahati-35 Assam India

THE INSTITUTE OF ADVANCED STUDY IN SCIENCE AND TECHNOLOGY

PASCHIM BORAGAON, GARCHUK, GUWAHATI- 781035

Annexure "A" - Unutilised Grant

		Amount(₹)
Opening Balance		214,318,347.89
Add : Capital Grant received during the year	82,489,871.00	
Add : Unutilised Revenue Grant for the year	55,364,356.49	
Add : Transfer of Corpus Fund (943064)	3,317.03	137,857,544.52
		352,175,892.41
Less : Contribution towards Capital Fund (Addition to Fixed A	217,395,240.00	
Less : Transfer to Capital Fund	14,494,005.31	231,889,245.31
Closing Balance		120,286,647.10

Annexure "B" - Earnest Money

			Amount(₹)
Opening Balance			1,101,508.00
Add : Received during the year			
Name of the Firm	**Details of Works**		
Jayanta Kr. Chaudhury	Vertical Extension of Building		56,000.00
Less : Payment made during the year			
Name of the Firm	**Details of Works**		
Converge System & Service	Storage System	61,000.00	
V. T. Vaccum Technology	Baratron Vaccum Gauge	8,110.00	
Rhino Elevators	Repair of Lift	20,000.00	89,110.00
Closing Balance			1,068,398.00

Annexure "C" - Security Deposit Payable

Repairing and Maintanence (General)	672,428.00
Repairing and Maintanence (SSH)	19,392.23
Building & Site Development	5,527,199.00
	6,219,019.23

Annexure "D" - Other Current Liabilities

	Amount(₹)
Upgrading	300,262.00
DST - Govt of Assam	3,821.00
Salary	121,691.00
CSIR SRF Contingency Grant (A Kanwar, U Baruah & R Elancheran)	60,000.00
Equipments	269,156.00
Advance from Extramural Project to Overhead	3,610,594.00
Advance from DST to Project	171,920.00
	4,537,444.00

Director

Institute of Advanced Study in Science & Technology

THE INSTITUTE OF ADVANCED STUDY IN SCIENCE AND TECHNOLOGY

PASCHIM BORAGAON, GARCHUK, GUWAHATI- 781035

Annexure "E" - Advance against expenditure on grant : **Amount(₹)**

Current year unadjusted advance :

	Project	DST General	Total	
Salary	0.00	7,165,272.00	7,165,272.00	
Empowerment of SC/ST	0.00	60,000.00	60,000.00	
Works and Services	0.00	1,795,142.00	1,795,142.00	
Contingency	26,400.00	865,245.00	891,645.00	
Travel	72,000.00	0.00	72,000.00	
Consumables	130,150.00	701,738.00	831,888.00	
Training & Conference	4,000.00	799,288.00	803,288.00	11,619,235.00

Earlier years unadjusted advance :

	Project	DST General	Total	
Contingency	12,440.00	1,127,775.00	1,140,215.00	
Travel	122,692.00	37,967.00	160,659.00	
Consumables	20,000.00	22,968.00	42,968.00	
Empowerment of SC/ST	0.00	315,000.00	315,000.00	
Training & Conference	222,700.00	623,054.00	845,754.00	
Works and Services	0.00	350,997.00	350,997.00	
Outsourcing	4,000.00	0.00	4,000.00	2,859,593.00
TOTAL :				**14,478,828.00**

Annexure "F" - Advance against Fixed Assets :

Current year unadjusted advance :

Other Construction (Land & Building)	8,958,282.00	
Furniture & Fixture	141,514.00	
Equipment	36,817,909.00	45,917,705.00

Earlier years unadjusted advance :

Computer & Peripherials	984,401.00	
Other Construction (Land & Building)	690,000.00	
Furniture & Fixture	36,000.00	
Equipment	29,693,501.00	31,403,902.00
		77,321,607.00

निदेशक/Director
Guwahati-781035 Assam India

& Accounts Officer
Paschim Boragaon
781035 Assam India

Science & Technology
पश्चिम बड़ागाव, गुवाहाटी-35 असम भारत

THE INSTITUTE OF ADVANCED STUDY IN SCIENCE AND TECHNOLOGY

PASCHIM BORAGAON, GARCHUK, GUWAHATI- 781035

ANNEXURE : "G"

DETAILS OF GRANT-IN-AID FOR THE FINANCIAL YEAR 2017-18

Sl.	Particulars	Capital Grant (₹)	Revenue Grant (₹)	Amount(₹)
1	DST General Fund	74,164,000.00	214,452,000.00	288,616,000.00
2	Anurupa Goswami	0.00	506,667.00	506,667.00
3	A R Pal	5,880,871.00	813,174.00	6,694,045.00
4	Arun Kumar	0.00	134,333.00	134,333.00
5	Bio Informatics	0.00	497,000.00	497,000.00
6	Biosurfactance	0.00	223,211.00	223,211.00
7	Biotech Hubs	1,000,000.00	2,059,000.00	3,059,000.00
8	Polymer & Polymer Nano	0.00	153,329.00	153,329.00
9	DBT -Crest (D Devi)	0.00	201,481.00	201,481.00
10	DBT RA (Kaustavmoni)	0.00	568,400.00	568,400.00
11	DBT RA (Rabinson)	0.00	453,200.00	453,200.00
12	DBT RA (Ibnul Farid)	0.00	368,000.00	368,000.00
13	DBT RA (Chandana Malakar)	0.00	260,000.00	260,000.00
14	DBT RA (Ananaya Barman)	0.00	558,800.00	558,800.00
15	DBT Scented Rice Programme (N C Talukdar)	0.00	890,000.00	890,000.00
16	Dev. Of nano particle - Poultry Salmonellosi	0.00	214,000.00	214,000.00
17	Diabetic Neuropathic	0.00	1,012,000.00	1,012,000.00
18	Glycolipid	0.00	573,000.00	573,000.00
19	Herbal Medicine	0.00	7,472,000.00	7,472,000.00
20	Inspire Fellow (B Choudhury)	0.00	1,374,304.00	1,374,304.00
21	Inspire Fellow (Kangkana Bora)	0.00	248,960.00	248,960.00
22	Inspire Fellow (Rosy Mondal)	245,000.00	1,477,996.00	1,722,996.00
23	Inspire Fellow (Y bailung)	0.00	380,000.00	380,000.00
24	Inspire Fellow (Tulsi Joshi)	0.00	380,000.00	380,000.00
25	Inspire Fellow (Sweety Biswas)	0.00	380,000.00	380,000.00
26	Inspire Fellow (Rakesh Rusel Khanikar)	0.00	380,000.00	380,000.00
27	Inspire Fellow (Subhankar Pandit)	0.00	380,000.00	380,000.00
28	Inspire Faculty (Sagar Sarma)	0.00	1,698,140.00	1,698,140.00
29	L B Mahanta	0.00	342,000.00	342,000.00
30	Effect of Traditional Dietary MR Khan (New	0.00	2,988,000.00	2,988,000.00
31	Muga cultivation (ASTEC)	0.00	536,000.00	536,000.00
32	Nano Material & Bimaterials	0.00	200,000.00	200,000.00
33	NPDF (Rupamoni Thakur)	0.00	868,462.00	868,462.00
34	NPDF Fellowship (Abdul Barik)	0.00	610,000.00	610,000.00
35	NPDF (Ashim Kr Dutta)	0.00	960,000.00	960,000.00
36	NPDF (Seydur Rahman)	0.00	960,000.00	960,000.00
37	NPDF (Rinkumoni)	0.00	960,000.00	960,000.00
38	NPDF (Parijat saikia)	0.00	574,000.00	574,000.00
39	Plasma modified	0.00	1,000,000.00	1,000,000.00
40	R Devi (Banana)	550,000.00	1,260,000.00	1,810,000.00
41	Ramalingaswami (S Nandi)	0.00	1,610,000.00	1,610,000.00
42	Sailendra Gayri	0.00	1,028,600.00	1,028,600.00
43	Sumita Kumari	650,000.00	850,000.00	1,500,000.00
44	Tissue Repairs	0.00	602,214.00	602,214.00
45	UGC Grant (MD Shadab)	0.00	281,250.00	281,250.00
46	VRP (A K Sahu)	0.00	950,000.00	950,000.00
		82,489,871.00	254,689,521.00	337,179,392.00

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Director
Boragaon
Assam India

Accounts Officer
Paschim Boragaon

Science & Technology

K P SARDA & COMPANY
CHARTERED ACCOUNTANTS

INDEPENDENT AUDITOR'S REPORT

TO
THE MEMBERS
THE INSTITUTE OF ADVANCED STUDY IN SCIENCE AND TECHNOLOGY
GUWAHATI

We have audited the accompanying Financial Statements of **Extramural Projects** of **The Institute of Advanced Study in Science & Technology, Paschim Boragaon, Garchuk, Guwahati** which comprise the Balance Sheet as at 31st March, 2018, the Receipts and Payments Account and the Income and Expenditure Account for the year then ended, and a summary of significant accounting policies and other explanatory information.

Management's Responsibility for Financial Statements :

Management is responsible for the preparation of these financial statements that give a true and fair view of the financial position and financial performance of the society in accordance with the Accounting Standards generally accepted in India. This responsibility includes the design, implementation and maintenance of internal control relevant to the preparation and presentation of the financial statements that give a true and fair view and are free from misstatement, whether due to error or fraud.

Auditor's Responsibility :

Our responsibility is to express an opinion on these financial statements based on our audit. We conducted our audit in accordance with the Standards on Auditing issued by the Institute of Chartered Accountants of India. Those standards require that we comply with ethical requirements and plans and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the society's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of the accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Cond..P/2

निदेशक/Director
पश्चिम बड़गाँव

+91 98640 60803, 94350 17315
+91 361 2512159, 2634672
kpsarda@gmail.com
K P SARDA & COMPANY
SC-11, Parmeshwari Building, 2nd Floor
Chatribari Road, Guwahati - 781001, Assam
http://kpsardaco.org.in

Accounts Officer
Paschim Boragaon

Director
Institute of Advanced Study in Science & Technology

K P SARDA & COMPANY
CHARTERED ACCOUNTANTS

(2)

Opinion:

In our opinion and to the best of our information and according to the explanations given to us, the financial statements give the information required by the Act in the manner so required and give a true and fair view in conformity with the accounting principles generally accepted in India :

(a) In the case of the Balance Sheet, of the state of affairs of the Society, as on 31st March, 2018;

(b) In case of the Income and Expenditure Account of the Income/Expenditure of Society for the year ended 31st March, 2018;

(c) In case of the Receipts and Payment Account of the Receipts/Payments of Society for the year ended 31st March,2018

We further report that:

(a) We have obtained all the information and explanations to the best of our knowledge and belief were necessary for the purpose of our audit;

(b) In our opinion, proper books of account, as required by law have been kept by the Society so far as appears from our examination of those books;

(c) The Balance Sheet, the Receipts and Payments Account and the Income and Expenditure Account dealt with by this Report are in agreement with the books of account.

For K.P. Sarda & Co.
Chartered Accountants
FRN : 319206E

(CA. K P Sarda)
Partner
Membership No.054555

Place : Guwahati
Date : 20/07/2018

निदेशक/Director

+91 98640 60803, 94350 17315
+91 361 2512159, 2634672
kpsarda@gmail.com
K P SARDA & COMPANY
SC-11, Parmeshwari Building, 2nd Floor
Chatribari Road, Guwahati - 781001, Assam
http://kpsardaco.org.in

वित्त एवं लेखा अधिकारी
Finance & Accounts Officer
आई.ए.एस.एस.टी., पश्चिम बड़ाइक

THE INSTITUTE OF ADVANCED STUDY IN SCIENCE AND TECHNOLOGY

PASCHIM BORAGAON, GARCHUK, GUWAHATI- 781035

BALANCE SHEET OF EXTRAMURAL PROJECTS AS ON 31ST MARCH, 2018

PARTICULARS	Schedule	Amount (₹) 2017-18	Amount (₹) 2016-17
CAPITAL FUND & LIABILITIES			
Capital Fund	1	87,329,028.22	66,695,239.22
Earmarked Funds	2	26,545,877.49	27,869,869.80
Current Liabilities and Provisions	3	36,293,512.18	61,860,939.18
TOTAL :		**150,168,417.89**	**156,426,048.20**
ASSETS			
Fixed Assets	4	87,329,028.22	66,695,239.22
Investments	5	10,143,750.00	32,487,951.00
Current Assets, Loans and Advances	6	52,695,639.67	57,242,857.98
TOTAL :		**150,168,417.89**	**156,426,048.20**

NOTES ON ACCOUNT - SCHEDULE "7"

In terms of our report of even date annexed hereto.

For K. P. Sarda & Co.
Chartered Accountants
FRN : 319206E

(CA. K P Sarda)
Partner
Membership No. 054555

Place : G u w a h a t i
Date : 20/07/2018

निदेशक / Director
भौ प्र वि एस टी, पश्चिम बड़ागाव
IASST, Paschim Boragaon
Guwahati-781035 Assam India

1

वित्त एवं लेखा अधिकारी
Finance & Accounts Officer
भौ प्र वि एस टी, पश्चिम बड़ागाव
IASST, Paschim Boragaon
गुवाहाटी-35: असम: भारत
Assam:India

रजिस्ट्रार / Registrar
पश्चिम बड़ागाव, गुवाहाटी-35, असम भारत
Paschim Boragaon, Guwahati-35 Assam India

THE INSTITUTE OF ADVANCED STUDY IN SCIENCE AND TECHNOLOGY

PASCHIM BORAGAON, GARCHUK, GUWAHATI- 781035

RECEIPTS & PAYMENTS ACCOUNT OF EXTRAMURAL PROJECTS FOR THE YEAR ENDED 31ST MARCH 2018

RECEIPTS		Amount (₹)	PAYMENTS	Amount (₹)
To **OPENING BALANCE :**			By **EXPENDITURES :**	
Cash in Hand	0.00		Contingency	2,278,831.47
Cash at Bank (As per Schedule 6)	53,924,207.98	53,924,207.98	Consumables	10,556,554.50
			Overheads	1,428,400.00
* **Grant- in-Aid**			Salary	27,266,645.65
Capital Grant	8,325,871.00		Travel	1,968,093.00
Revenue Grant (Annexure "E")	40,237,521.00	48,563,392.00	Training	133,592.00
			Miscellaneous	323,536.00
* Bank Interest		1,559,878.20	* Equipments	34,483,737.00
* Interest on Fixed Deposit		1,554,178.00	* Investment in Fixed Deposit	10,000,000.00
* Earnest Money Received (Annexure "B")		56,000.00	* Advance to Overhead A/c	1,610,594.00
* TA Grant		473,133.00	* Earnest Money refunded (Annexure "B")	89,110.00
* Fixed Deposit Matured		31,000,000.00	* **CLOSING BALANCE :**	
* Transfer From Overhead A/c (000466)		782.00	Cash in hand	0.00
			Cash at Bank (As per Schedule 6)	48,124,602.67 48,124,602.67
* **Advance from DST**				
Vijaya Bank - Conference (000918)		107,090.00		
SBI Garchuk - Seminar (888433)		64,830.00		
* Other Receipt		509,358.11		
* CSIR SRF Contingency Grant (A Kanwar, U Baruah & R Elancheran)		60,000.00		
* **Advance**				
Equipment	269,156.00			
Salary	121,691.00	390,847.00		
		138,263,696.29		138,263,696.29

We have verified the above statement of Receipts & payments Account of Extramural Projects of the Institute of Advanced Study in Science & Technology, Paschim Boragaon, Guwahati - 781 035, Account - Plan for the period from 1st April 2017 to 31st March, 2018 from the Books of Accounts and vouchers produced before us.

For K. P. Sarda & Co.
Chartered Accountants
FRN : 319206E

(CA. K P Sarda)
Partner
Membership No. 054555

Place : Guwahati
Date : 20/07/2018

2

वित्त एवं लेखा अधिकारी
Finance & Accounts Officer
आई.ए.एस.एस.टी., पश्चिम बड़गाव
IASST, Paschim Boragaon
गुवाहाटी-35, असम, भारत
Guwahati-35, Assam, India

निदेशक/Director
आई.ए.एस.एस.टी., पश्चिम बड़गाव
IASST, Paschim Boragaon
Paschim Boragaon, Guwahati-35 Assam India

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THE INSTITUTE OF ADVANCED STUDY IN SCIENCE AND TECHNOLOGY

PASCHIM BORAGAON, GARCHUK, GUWAHATI- 781035

SCHEDULE - 1 : :: CAPITAL FUND ::

	Amount(₹) 2017-18	Amount (₹) 2016-17
Opening Balance	66,695,239.22	
Add : Contribution towards Capital Fund (Addition to Fixed Assets)	34,483,737.00	
	101,178,976.22	
Less : Depreciation for the year	13,849,948.00	
	87,329,028.22	**66,695,239.22**

SCHEDULE - 3 : :: CURRENT LIABILITIES AND PROVISIONS ::

		Amount(₹) 2017-18	Amount (₹) 2016-17
CURRENT LIABILITIES :			
Unutilised Grant in Aid	(As per Annexure "A")	34,602,347.18	60,759,431.18
Earnest Money	(As per Annexure "B")	1,068,398.00	1,101,508.00
Other Current Liabilities	(As per Annexure "C")	622,767.00	0.00
		36,293,512.18	**61,860,939.18**

SCHEDULE - 4 : :: FIXED ASSETS ::

	Amount(₹)
Equipment as on 01/04/2017	66,695,239.22
Add : Addition on or before 03/10/2017	16,791,758.00
Add : Addition after 03/10/2017	17,691,979.00
Less : Depreciation for the year	13,849,948.00
Equipment as on 31/03/2018	87,329,028.22

SCHEDULE - 5 : :: INVESTMENTS ::

	Amount(₹)
Opening Balance	32,487,951.00
Add : Investment in Fixed Deposit during the year	10,000,000.00
Add : Interest Accrued	212,268.00
Less : TDS	2,291.00
Less : Fixed Deposit matured during the year	31,000,000.00
Less : Interest received during the year	1,554,178.00
Balance as on 31/03/2018	**10,143,750.00**

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निदेशक/Director
IASST, Paschim Boragaon

वित्त एवं लेखा अधिकारी
Finance & Accounts Officer
IASST, Paschim Boragaon
गुवाहाटी-35: असम: भारत

कुलसचिव/Registrar
पश्चिम बड़ागांव, गुवाहाटी-35: असम: भारत

THE INSTITUTE OF ADVANCED STUDY IN SCIENCE AND TECHNOLOGY

PASCHIM BORAGAON, GARCHUK, GUWAHATI- 781035

SCHEDULE - 6 : = **CURRENT ASSETS, LOANS & ADVANCES** =

		Amount(₹) 2017-18	Amount(₹) 2016-17
(A) CURRENT ASSETS :			
Balance with Banks	**Account No.**		
SBI Garchuk Branch - Project	(260721)	33,330,401.69	14,724,069.18
SBI - Herbal Medicine N.C. Talukdar	(862670)	14,794,200.98	28,924,330.80
Vijaya Bank - Chemical Profiling of Joha and Black	(002509)	0.00	4,648,265.00
Vijaya Bank -Microbial Roles in Yield Management -	(002510)	0.00	1,342,872.00
Vijaya Bank - Dev. Of nano particle - Poultry	(002508)	0.00	560,583.00
SBI - Inspire Fellow - Anurupa Goswami	(748311)	0.00	3,963.00
SBI - Fellowship for U.S. Visit - Yogesh	(863775)	0.00	24,171.00
SBI - CSIR SEF Neelam Gitumani Yogesh	(781982)	0.00	321,832.00
SBI - Inspire Faculty Award - Rosy Mondal	(862670)	0.00	7,193.00
SBI - Inspire Fellowship Program - Y. Bailung	(732582)	0.00	3,728.00
SBI - Inspire Fellowship Program - Tulsi Joshi	(757427)	0.00	3,445.00
SBI - Effect of Traditional Dietary - M.R. Khan	(749904)	0.00	880,963.00
SBI - Dev. Of Plasma Modified - J. Chutia	(733766)	0.00	227,793.00
Vijaya Bank - Glycolipid Biosurfactant - Suresh Deka	(002790)	0.00	1,050,000.00
Vijaya Bank - Cervical Pre Cancerous and Cancer	(002653)	0.00	1,201,000.00
	TOTAL (A)	48,124,602.67	53,924,207.98
(B) LOANS, ADVANCES & OTHER ASSETS :			
Crest Award		343,770.00	343,770.00
TDS		2,291.00	0.00
Advance to Overhead A/c		3,610,594.00	2,000,000.00
Advances against Expenditure of Grants (Annexure "D")		614,382.00	974,880.00
	TOTAL (B)	4,571,037.00	3,318,650.00
	TOTAL (A+B)	**52,695,639.67**	**57,242,857.98**

निदेशक / Director
भा.उ.अ.वि.प्रौ., पश्चिम बड़ागाव
IASST, Paschim Boragaon
Guwahati-781035: Assam: India

वित्त एवं लेखा अधिकारी
Finance & Accounts Officer
भा.उ.अ.वि.प्रौ., पश्चिम बड़ागाव
IASST, Paschim Boragaon
गुवाहाटी-35 : असम : भारत
Guwahati-781035: Assam: India

पश्चिम बड़ागाव, गुवाहाटी-35 : असम : भारत
Paschim Boragaon, Guwahati-35 Assam India

THE INSTITUTE OF ADVANCED STUDY IN SCIENCE AND TECHNOLOGY

PASCHIM BORAGAON, GARCHUK, GUWAHATI- 781035

SCHEDULE - 2 : **:: EARMARKED FUNDS ::**

Particulars	Salary	Benevolent Fund	Contingency	Travel	Consumables	Training	Overhead	Misc.	Bank Interest	Refund Against Advance (Receipt)	Refund (Payment)	Total(₹)
a) Opening Balance	16,483,097	-120	2,726,020	1,444,949	6,055,708	421,961	0	1,675,218	1,024,992	291,309	-2,253,264	27,869,870
b) Addition to the Funds												
i) Grants	23,285,662	0	2,089,879	997,612	11,686,797	334,000	1,843,571	0	0	0	0	40,237,521
ii) Other Receipts	473,013	120	0	0	0	0	0	509,358	1,772,146	0	0	2,754,637
	23,758,675	120	2,089,879	997,612	11,686,797	334,000	1,843,571	509,358	1,772,146	0	0	42,992,158
TOTAL (a+b)	40,241,772	0	4,815,899	2,442,561	17,742,505	755,961	1,843,571	2,184,576	2,797,138	291,309	-2,253,264	70,862,028
c) Expenditure towards objectives of Funds	27,266,646	0	2,278,831	1,968,093	10,556,555	133,592	1,428,400	323,536	0	0	0	43,955,653
	27,266,646	0	2,278,831	1,968,093	10,556,555	133,592	1,428,400	323,536	0	0	0	43,955,653
d) Advances												
PY Advance Adjusted	80,000	0	0	266,908	236,140	10,000	0	0	0	0	0	593,048
CY Advance Unadjusted	0	0	26,400	72,000	130,150	4,000	0	0	0	0	0	232,550
	-80,000	0	26,400	-194,908	-105,990	-6,000	0	0	0	0	0	-360,498
e) Net Balance as at the year end (a+b-c+d)	12895126.4	(0.0)	2563467.5	279560.0	7079960.5	616369.0	415171.0	1861039.9	2797138.2	291309.0	(2253264.0)	26545877.5

THE INSTITUTE OF ADVANCED STUDY IN SCIENCE AND TECHNOLOGY

PASCHIM BORAGAON, GARCHUK, GUWAHATI- 781035

SCHEDULE " 7 " **: SIGNIFICANT ACCOUNTING POLICES :**

1. **ACCOUNTING CONVENTION :**

The Financial Statements are prepared on the basis of historical cost convention, unless otherwise stated and on the Accrual method of accounting.

2. **REVENUE RECOGNITION :**

(a) Income on interest bearing securities and term deposits is recognised on accrual basis as and when these are realised.

(b) Income other than interest income are recognised on cash basis.

3. **INVESTMENTS :**

Term deposits with Banks are taken as investments and valued at accrual basis.

4. **FIXED ASSETS :**

Fixed Assets are stated at cost of acquisiton, inclusive of inward freight, duties and taxes and incidental and direct expenses related to acquisiton less depreciation.

5. **DEPRECIATION :**

(a) Depreciation on Fixed assets purchased/acquired/ constructed out of government grants is charged on WDV Method as per the rates specified under the Income Tax Act, 1961.

(b) Depreciation is charged to Capital Fund by way of reducing the net value of fixed assets.

6. **GOVERNMENT GRANTS/SUBSIDIES :**

(a) Revenue grants are shown realisation basis and expenditure thereof is charged to appropriate revenue heads. In the case capital grant, the capital fund is credited to the extent of the amount of acquisition of fixed assets and the balance remains in unutilised grant.

निदेशक/Director
IASST, Paschim Boragaon

6

Science & Accounts Officer
IASST, Paschim Boragaon
गुवाहाटी-35:असम:भारत

Science & Technology
पश्चिम बड़गाव, गुवाहाटी-35:असम:भारत

THE INSTITUTE OF ADVANCED STUDY IN SCIENCE AND TECHNOLOGY

PASCHIM BORAGAON, GARCHUK, GUWAHATI- 781035

NOTES ON ACCOUNTS:

(i) Any surplus of revenue grant alongwith other income over revenue expenditure is transferred to earmarked fund.

(ii) No provision has been made in respect of Leave Salary.

(iii) Purchase of consumable items during the year are treated as expenditure and charged to revenue.

(iv) In the opinion of the Management, the current assets, loans and advances have a value on realisation equal or atleast to the aggregate amount shown in the Balance Sheet.

(v) Balances under Current Liabilities, Loans and Advances are subject to conformation /reconciliation /adjustments, if any.

(vi) No provision is made for contingent liability, except for cases where provision needs to be made, based on expert opinion.

(vii) Previous years figure have been rearranged and regrouped wherever considered necessary to facilitate comparison.

(viii) As projects are earmarked funds, its transactions have not been included in the preparation of Consolidated Income & Expenditure Account.

निदेशक/Director
भा.उ.अ.प्रौ.वि. पश्चिम बड़ागाव
IASST, Paschim Boragaon

Finance & Accounts Officer
भा.उ.अ.प्रौ.वि, पश्चिम बड़ागाव
IASST, Paschim Boragaon
गुवाहाटी-35:असम:भारत
Guwahati-781035, Assam:India

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THE INSTITUTE OF ADVANCED STUDY IN SCIENCE AND TECHNOLOGY

PASCHIM BORAGAON, GARCHUK, GUWAHATI- 781035

Annexure "A" - Unutilised Grant

	Amount(₹)
Opening Balance	60,759,431.18
Add : Capital Grant received during the year	8,325,871.00
Add : Transfer from Overhead A/c - Vijaya Bank (000466)	782.00
	69,086,084.18
Less : Contribution towards Capital Fund (Addition to Fixed Assets)	34,483,737.00
Closing Balance	34,602,347.18

Annexure "B" - Earnest Money

			Amount(₹)
Opening Balance			1,101,508.00
Add : Received during the year			
Name of the Firm	**Details of Works**		
Jayanta Kr. Chaudhury	Vertical Extension of Building		56,000.00
Less : Payment made during the year			
Name of the Firm	**Details of Works**		
Converge System & Service	Storage System	61,000.00	
V. T. Vaccum Technology	Baratron Vaccum Gauge	8,110.00	
Rhino Elevators	Repair of Lift	20,000.00	89,110.00
Closing Balance			1,068,398.00

Annexure "C" - Other Current Liabilities

		Amount(₹)
Salary		121,691.00
CSIR SRF Contingency Grant (A Kanwar, U Baruah & R Elancheran)		60,000.00
Equipment		269,156.00
DST General Fund		
Vijaya Bank - Conference (000918)	107,090.00	
SBI Garchuk - Seminar (888433)	64,830.00	171,920.00
		622,767.00

निदेशक/Director

8

Paschim Boragaon

Paschim Boragaon, Guwahati-35 Assam India

THE INSTITUTE OF ADVANCED STUDY IN SCIENCE AND TECHNOLOGY

PASCHIM BORAGAON, GARCHUK, GUWAHATI- 781035

Annexure "D" - Advance against expenditure on grant :

		Amount(₹)
Current year unadjusted advance :		
Contingency	26,400.00	
Travel	72,000.00	
Consumables	130,150.00	
Training & Conference	4,000.00	232,550.00
Earlier years unadjusted advance :		
Contingency	12,440.00	
Travel	122,692.00	
Consumables	20,000.00	
Training & Conference	222,700.00	
Outsourcing	4,000.00	381,832.00
TOTAL :		**614,382.00**

निदेशक / Director
पश्चिम बड़ागाव
ASST. Paschim Boragaon
Guwahati-781035 Assam India

& Accounts Officer
ASST. Paschim Boragaon
Guwahati-781035: Assam:India

पश्चिम बड़ागाव, गुवाहाटी-35:असम:भारत
Paschim Boragaon,Guwahati-35:Assam:India

THE INSTITUTE OF ADVANCED STUDY IN SCIENCE AND TECHNOLOGY

PASCHIM BORAGAON, GARCHUK, GUWAHATI- 781035

ANNEXURE : "E"

DETAILS OF GRANT-IN-AID OF EXTRAMURAL PROJECTS FOR THE FINANCIAL YEAR 2017-18

Sl.	Name of the Project	Capital Grant (₹)	Revenue Grant (₹)	Amount(₹)
1	Anurupa Goswami	0.00	506,667.00	506,667.00
2	A R Pal	5,880,871.00	813,174.00	6,694,045.00
3	Arun Kumar	0.00	134,333.00	134,333.00
4	Bio Informatics	0.00	497,000.00	497,000.00
5	Biosurfactance	0.00	223,211.00	223,211.00
6	Biotech Hubs	1,000,000.00	2,059,000.00	3,059,000.00
7	Polymer & Polymer Nano	0.00	153,329.00	153,329.00
8	DBT -Crest (D Devi)	0.00	201,481.00	201,481.00
9	DBT RA (Kaustavmoni)	0.00	568,400.00	568,400.00
10	DBT RA (Rabinson)	0.00	453,200.00	453,200.00
11	DBT RA (Ibnul Farid)	0.00	368,000.00	368,000.00
12	DBT RA (Chandana Malakar)	0.00	260,000.00	260,000.00
13	DBT RA (Ananaya Barman)	0.00	558,800.00	558,800.00
14	DBT Scented Rice Programme (N C Talukdar)	0.00	890,000.00	890,000.00
15	Dev. Of nano particle - Poultry Salmonellosi	0.00	214,000.00	214,000.00
16	Diabetic Neuropathic	0.00	1,012,000.00	1,012,000.00
17	Glycolipid	0.00	573,000.00	573,000.00
18	Herbal Medicine	0.00	7,472,000.00	7,472,000.00
19	Inspire Fellow (B Choudhury)	0.00	1,374,304.00	1,374,304.00
20	Inspire Fellow (Kangkana Bora)	0.00	248,960.00	248,960.00
21	Inspire Fellow (Rosy Mondal)	245,000.00	1,477,996.00	1,722,996.00
22	Inspire Fellow (Y bailung)	0.00	380,000.00	380,000.00
23	Inspire Fellow (Tulsi Joshi)	0.00	380,000.00	380,000.00
24	Inspire Fellow (Sweety Biswas)	0.00	380,000.00	380,000.00
25	Inspire Fellow (Rakesh Rusel Khanikar)	0.00	380,000.00	380,000.00
26	Inspire Fellow (Subhankar Pandit)	0.00	380,000.00	380,000.00
27	Inspire Faculty (Sagar Sarma)	0.00	1,698,140.00	1,698,140.00
28	L B Mahanta	0.00	342,000.00	342,000.00
29	Effect of Traditional Dietary MR Khan (New	0.00	2,988,000.00	2,988,000.00
30	Muga cultivation (ASTEC)	0.00	536,000.00	536,000.00
31	Nano Material & Bimaterials	0.00	200,000.00	200,000.00
32	NPDF (Rupamoni Thakur)	0.00	868,462.00	868,462.00
33	NPDF Fellowship (Abdul Barik)	0.00	610,000.00	610,000.00
34	NPDF (Ashim Kr Dutta)	0.00	960,000.00	960,000.00
35	NPDF (Seydur Rahman)	0.00	960,000.00	960,000.00
36	NPDF (Rinkumoni)	0.00	960,000.00	960,000.00
37	NPDF (Parijat saikia)	0.00	574,000.00	574,000.00
38	Plasma modified	0.00	1,000,000.00	1,000,000.00
39	R Devi (Banana)	550,000.00	1,260,000.00	1,810,000.00
40	Ramalingaswami (S Nandi)	0.00	1,610,000.00	1,610,000.00
41	Sailendra Gayri	0.00	1,028,600.00	1,028,600.00
42	Sumita Kumari	650,000.00	850,000.00	1,500,000.00
43	Tissue Repairs	0.00	602,214.00	602,214.00
44	UGC Grant (MD Shadab)	0.00	281,250.00	281,250.00
45	VRP (A K Sahu)	0.00	950,000.00	950,000.00
		8,325,871.00	40,237,521.00	48,563,392.00

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& Accounts Officer
ASUT, Paschim Boragaon
Guwahati-781035: Assam:India

निदेशक/Director
ASUT, Paschim Boragaon
Guwahati-781035 Assam India

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THE INSTITUTE OF ADVANCED STUDY IN SCIENCE AND TECHNOLOGY

PASCHIM BORAGAON, GARCHUK, GUWAHATI- 781035

	Project Name	Opening Balance	Grant-in-Aid (a)	Interest (b)	Refund Against Advance (c)	Inter Transfer (d)	Maturity of FD (e)	Ex Grant (f)	Misc. Receipt (g)	Earnest Money (h)	Advance (i)	Total Receipts (j) = (a+b+c+d+e+f+g+h+i)
1	Aadhagen	-25,353.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	Anannya Goswami	73,437.00	206,447.00	506.65	0.00	76,800.00	0.00	0.00	0.00	0.00	0.00	283,753.65
3	Aquatic Biodiversity	-17,300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	Atmospheric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	A B Pal	0.00	6,099,095.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6,099,095.00
6	Arun Kumar	0.00	136,333.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	136,333.00
7	Bharalu River	-379,338.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	Bio Informatics	272,470.00	497,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	497,000.00
9	Biomarker	894,850.00	225,211.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	225,211.00
10	Biotech Hub	260,441.00	1,059,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1,059,000.00
11	Brain storming	-46,299.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	Brain storming core stakeholder	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	Brain storming meeting-3	-50,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	B-STR Internship Awards	28,171.00	0.00	417.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	417.00
15	Chemical input	2,633.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	Crops of Assam	250.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	CSIR	-71.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	CSIR (Neelam, Gitanjali, Nagesh)	47,122.00	0.00	4,729.75	0.00	289,710.00	0.00	0.00	0.00	0.00	0.00	294,439.75
19	Culture Collection - D. Thakur	1,16,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	DBT Core (D Devi)	142,770.00	201,401.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	201,401.00
21	DBT RA (Supriya Sen)	550.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	DBT RA (Ashim Kr. Dutta)	127,986.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	DBT RA (Kanchanmani)	0.00	560,400.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	560,400.00
24	DBT RA (Rakhimoni)	0.00	411,200.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	411,200.00
25	DBT RA (Himal Jyoti)	0.00	360,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	360,000.00
26	DBT RA (Chandana Malakar)	0.00	360,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	360,000.00
27	DBT RA (Ananya Barman)	0.00	330,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	330,000.00
28	DBT RA (R. Thakur)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	DBT Scented Rice Programme (B Devi)	8,443,365.00	0.00	0.00	0.00	5,000.00	0.00	0.00	0.00	0.00	0.00	5,000.00
30	DBT Scented Rice Programme (N C Talukdar)	1,326,357.00	890,000.00	0.00	0.00	15,543.00	0.00	0.00	0.00	0.00	0.00	905,543.00
31	Dev. Of nano particle - Poultry Salmonellosis	566,555.00	214,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	214,000.00
32	Diabetic Neuropathic	305,068.00	1,012,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1,012,000.00
33	DST (J Medhi)	-43,053.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
34	DST (Suitable Plant)	36.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35	Education	-33,390.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
36	Electronic Adhoc magnetic	28,460.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
37	Flora & Fauna	-80,567.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
38	Food culture	-3,172.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
39	Glycobiol	1,853,868.00	573,000.00	26,746.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	599,746.00
40	Govt of Assam	-160,117.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
41	Herbal Medicine	26,237,938.00	7,472,000.00	1,751,414.00	0.00	686,510.00	30,030,000.00	0.00	13,730.00	0.00	0.00	[illegible]
42	Herbo Fibres	95,600.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
43	Image Processing (Tabassum T)	77,336.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
44	Image Processing (IIR Mahanta)	5,250.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
45	Indentification	22,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
46	Inspire Faculty (S Pramanik)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
47	Inspire Fellow (B Choudhury)	345,998.00	1,371,388.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1,371,388.00
48	Inspire Fellow (Kangkana Bora)	8,487.00	245,960.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	245,960.00
49	Inspire Fellow (Rimy Mandal)	-371,967.00	1,722,986.00	1,177.90	0.00	170,944.00	0.00	71,200.00	0.00	0.00	0.00	[illegible]
50	Inspire Fellow (T Bailung)	-136,272.00	360,000.00	411.75	0.00	80,400.00	0.00	0.00	0.00	0.00	0.00	440,811.75
51	Inspire Fellow (Tulsi Joshi)	-116,555.00	360,000.00	565.75	0.00	73,800.00	0.00	0.00	0.00	0.00	0.00	434,365.75
52	Inspire Fellow (Swarup Biswas)	0.00	360,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	360,000.00
53	Inspire Fellow (Rakesh Rasul Khandkar)	0.00	360,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	360,000.00
54	Inspire Fellow (Subhankar Pandit)	0.00	360,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	360,000.00

वित्त एवं लेखा अधिकारी
Finance & Accounts Officer
आइ.ए.एस.एस.टी, पश्चिम बड़ागांव
IASST, Paschim Boragaon
गुवाहाटी-35: असम: भारत
Guwahati-781035 Assam India

पश्चिम बड़ागांव गुवाहाटी-35

निदेशक/Director
IASST, Paschim Boragaon
Guwahati-781035 Assam India

THE INSTITUTE OF ADVANCED STUDY IN SCIENCE AND TECHNOLOGY

PASCHIM BORAGAON, GARCHUK, GUWAHATI-781035

	Project Name	Opening Balance	Grant-in-Aid (a)	Interest (b)	Refund Against Advance (c)	Inter Transfer (d)	Maturity of FD (e)	IA Grant (f)	Misc. Receipts (g)	Earnest Money (h)	Advance (i)	Total Receipts (j) = (a+b+c+d+e+f+g+h+i)
55	Inspire Faculty (Namita Samal)	60,020.00	0.00	0.00	0.00	0.00	0.00	0.00	782.00	0.00	0.00	782.00
56	Inspire Faculty (Sagar Samal)	36,990.00	1,699,240.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1,699,240.00
57	Intestinal Microbiota	48,073.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
58	Investigation of Rogue Waves	11,393.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
59	[illegible]	190,995.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
60	Library Workshop	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
61	Loan (Fund)	1,000,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
62	[illegible]	1,302,000.00	[illegible]	14,927.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	[illegible]
63	Effect of Traditional Dietary Mill Khas (New)	415,507.00	1,500,000.00	[illegible]	0.00	[illegible]	0.00	0.00	0.00	0.00	17,365.00	[illegible]
64	Mega collaboration (ASTEC)	0.00	536,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	536,000.00
65	NABARD	29,275.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
66	Nano Material & Biomaterials	890,836.00	200,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	200,000.00
67	Normal Tea Plant	133.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
68	NPDF (Rajkumari Thakur)	300,107.00	660,863.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	660,863.00
69	NPDF Fellowship (Abdul Rashid)	754,000.00	633,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	633,000.00
70	NPDF (Ashwini Dutta)	0.00	960,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	960,000.00
71	NPDF (Nayab Rahman)	0.00	960,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	960,000.00
72	NPDF (Biotechnology)	0.00	960,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	960,000.00
73	NPDF (Pankaj Saikia)	0.00	574,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	574,000.00
74	Oxidative degradation	-173,901.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
75	[illegible]	79.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
76	Chemical study of Carbon dots	60,639.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
77	Physics Senses	-47,485.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
78	Planning Committee	359,954.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
79	Plasma modified	-69,887.00	1,000,000.00	[illegible]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	[illegible]
80	Polymer & Polymer Nano	-25,000.00	111,329.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	111,329.00
81	Polymer Based Sensors	-968.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
82	Proton Exchange	-337,361.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
83	R Devi (Biomass)	0.00	1,010,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1,010,000.00
84	Ramalingaswami (MR Khan)	1,605.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
85	Ramalingaswami (S Nandi)	239,150.00	1,610,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1,610,000.00
86	Ramalingaswami (S Kundu)	639,792.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
87	Ramanujan Fellow	652,500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
88	Sailendra Goyel	-79,431.00	1,070,640.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1,070,640.00
89	School Project (H Barkaty)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
90	Silk Protein Based	22,075.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
91	Stands	1,815.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
92	Structure of Enzymes	503,591.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
93	Sunita Kumari	0.00	1,500,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1,500,000.00
94	Tissue Repairs	13,903.00	602,218.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	602,218.00
95	Treatment of oil field	600,599.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
96	UGC Grant (MD Shahid)	11,303.00	261,250.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	261,250.00
97	VBF (J. T. Gogoi)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
98	VBF (A K Sahu)	0.00	950,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	950,000.00
99	VBF (Ashwani Kumar)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100	Wallingham Fund	5,375,500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
101	IASST Fund	8,631,197.11	0.00	1,200,321.00	0.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Total	13,920,287.96	45,565,795.00	[illegible]	0.00	[illegible]	[illegible]	[illegible]	[illegible]	56,000.00	[illegible]	[illegible]

Finance & Accounts Officer
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IASST, Paschim Boragaon
Guwahati-781035, Assam India

THE INSTITUTE OF ADVANCED STUDY IN SCIENCE AND TECHNOLOGY

PASCHIM BORAGAON, GARCHUK, GUWAHATI- 781035

	Project Name	Expenditure (E) Salary	Contingency	Equipment	Travel	Consumable	Training	Overhead	Misc.	Current Money (F)	Investment in FD (G)	Total (E+F+G)	Inter Transfer	Advance to Overhead A/c	Closing Balance
1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2	Anurupa Goswami	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
3	Aquatic Biodiversity	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
4	Atmospheric	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
5	A R Pal	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
6	Arun Kumar	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
7	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
8	Bio Informatics	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
9	Biosurfactant	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
10	Biotech Hub	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
11	Brain storming	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
12	Brain storming cum stakeholder	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
13	Brain storming meeting 3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
14	B-ACER Internship Awards	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
15	Chemical input	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
16	Crops of Assam	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
17	CSIR	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
18	CSIR (Neelam, Lalumoni, Nagesh)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
19	Culture Collection - D. Thakur	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
20	DBT (Core) (D Deo)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
21	DBT RA (Supriya Sen)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
22	DBT RA (Ashim Kr. Dutta)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
23	DBT RA (Kandarmoni)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
24	DBT RA (Rashmoni)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
25	DBT RA ([illegible])	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
26	DBT RA (Chandana Malakar)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
27	DBT RA (Ananya Barman)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
28	DBT RA (R. Thakur)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
29	DBT Scented Rice Programme (R Devi)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
30	DBT Scented Rice Programme (N C Talukdar)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
31	Dev. Of nano particle - Poultry Salmonellosis	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
32	Diabetic Neuropathy	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
33	DST (J Medhi)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
34	DST (Suitable Plant)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
35	Education	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
36	Electronic Alloys magnetic	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
37	Flora & Fauna	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
38	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
39	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
40	Govt of Assam	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
41	Herbal Medicine	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
42	[illegible] fellow	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
43	Image Processing ([illegible])	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
44	Image Processing (LB Mahanta)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
45	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
46	Inspire faculty (S Pramanik)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
47	Inspire Fellow (D Choudhury)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
48	Inspire Fellow ([illegible] Bora)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
49	Inspire Fellow ([illegible] Mandal)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
50	Inspire Fellow ([illegible])	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
51	Inspire Fellow ([illegible])	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
52	Inspire Fellow (Sweety Biswas)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
53	Inspire Fellow ([illegible])	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
54	Inspire Fellow ([illegible])	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

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वित्त एवं लेखा अधिकारी
Finance & Accounts Officer
IASST, Paschim Boragaon
Guwahati-781035, Assam, India

निदेशक/Director
IASST, Paschim Boragaon
Guwahati-781035, Assam, India

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	Project Name	Expenditure (h) Salary	Contingency	Equipment	Travel	Consumable	Training	Overhead	Misc	Earned Money (l)	Investment in FD (m)	Total (n) = (k+l+m)	Inter Transfer	Advance to Overhead A/c	Closing Balance
55	Inspire faculty ([illegible])	[illegible]	[illegible]	0.00	0.00	[illegible]	0.00	0.00	0.00	0.00	0.00	[illegible]	0.00	0.00	-0.00
56	Inspire Faculty (Sagar Sarma)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.00	[illegible]	0.00	0.00	0.00	[illegible]	0.00	0.00	[illegible]
57	Intestinal Microbiota	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
58	Investigation of Rogue Waves	0.00	[illegible]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	[illegible]	0.00	0.00	0.00
59	[illegible]	[illegible]	[illegible]	0.00	[illegible]	[illegible]	0.00	0.00	0.00	0.00	0.00	[illegible]	0.00	0.00	[illegible]
60	Library Workshop	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
61	Loan refund	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1,000,000.00	0.00	0.00
62	L R Mohanta	[illegible]	[illegible]	[illegible]	[illegible]	0.00	0.00	0.00	0.00	0.00	0.00	[illegible]	0.00	0.00	[illegible]
63	Effect of Traditional Dietary MR Khan (Pond)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.00	0.00	0.00	0.00	0.00	[illegible]	0.00	0.00	[illegible]
64	Mega calibration (ASTEC)	0.00	0.00	0.00	0.00	0.00	0.00	[illegible]	0.00	0.00	0.00	[illegible]	0.00	0.00	[illegible]
65	NABARD	0.00	[illegible]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	[illegible]	0.00	0.00	-0.00
66	Nano Material & Biomaterials	[illegible]	[illegible]	0.00	[illegible]	[illegible]	0.00	[illegible]	0.00	0.00	0.00	[illegible]	0.00	0.00	[illegible]
67	Normal Tea Plant	0.00	0.00	0.00	0.00	0.00	0.00	[illegible]	0.00	0.00	0.00	[illegible]	0.00	0.00	0.00
68	NPDF ([illegible] Thakur)	[illegible]	[illegible]	0.00	0.00	[illegible]	0.00	[illegible]	0.00	0.00	0.00	[illegible]	0.00	0.00	[illegible]
69	NPDF Fellowship (Abdul [illegible])	[illegible]	0.00	[illegible]	0.00	[illegible]	0.00	[illegible]	0.00	0.00	0.00	[illegible]	0.00	0.00	[illegible]
70	NPDF ([illegible] Dutta)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.00	[illegible]	0.00	0.00	0.00	[illegible]	0.00	0.00	[illegible]
71	NPDF ([illegible] Rahman)	[illegible]	0.00	0.00	0.00	[illegible]	0.00	[illegible]	0.00	0.00	0.00	[illegible]	0.00	0.00	[illegible]
72	NPDF ([illegible])	[illegible]	0.00	[illegible]	0.00	[illegible]	0.00	[illegible]	0.00	0.00	0.00	[illegible]	0.00	0.00	[illegible]
73	NPDF ([illegible] Saikia)	[illegible]	0.00	0.00	0.00	0.00	0.00	[illegible]	0.00	0.00	0.00	[illegible]	0.00	0.00	[illegible]
74	Oxidative degradation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
75	[illegible] (Microbial)	0.00	0.00	0.00	0.00	0.00	0.00	[illegible]	0.00	0.00	0.00	[illegible]	0.00	0.00	-0.00
76	Chemical study of Carbon dots	[illegible]	0.00	0.00	0.00	0.00	0.00	[illegible]	0.00	0.00	0.00	[illegible]	0.00	0.00	[illegible]
77	Physics [illegible]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
78	Planning Committee	0.00	0.00	0.00	[illegible]	0.00	0.00	0.00	0.00	0.00	0.00	[illegible]	0.00	0.00	[illegible]
79	Plasma modified	[illegible]	[illegible]	0.00	[illegible]	[illegible]	0.00	[illegible]	0.00	0.00	0.00	[illegible]	0.00	0.00	-0.00
80	Polymer & Polymer Nano	[illegible]	[illegible]	0.00	[illegible]	0.00	0.00	[illegible]	0.00	0.00	0.00	[illegible]	0.00	0.00	[illegible]
81	Polymer Based Sensors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	[illegible]
82	Proton Exchange	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	[illegible]
83	R Devi ([illegible])	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
84	Ramalingaswami (MR Khan)	0.00	[illegible]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	[illegible]	0.00	0.00	[illegible]
85	Ramalingaswami (S Nandi)	[illegible]	0.00	[illegible]	[illegible]	[illegible]	0.00	0.00	0.00	0.00	0.00	[illegible]	0.00	0.00	-0.00
86	Ramalingaswami (S Kundu)	0.00	[illegible]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	[illegible]	0.00	0.00	-0.00
87	Ramanujan Fellow	0.00	[illegible]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	[illegible]	0.00	0.00	[illegible]
88	[illegible] Layer	[illegible]	[illegible]	0.00	0.00	[illegible]	0.00	[illegible]	0.00	0.00	0.00	[illegible]	0.00	0.00	0.00
89	School Project ([illegible])	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
90	Silk Protein Based	0.00	[illegible]	0.00	0.00	0.00	0.00	[illegible]	0.00	0.00	0.00	[illegible]	0.00	0.00	0.00
91	[illegible]	0.00	0.00	0.00	0.00	0.00	0.00	[illegible]	0.00	0.00	0.00	[illegible]	0.00	0.00	[illegible]
92	Structure of Enzymes	[illegible]	[illegible]	0.00	0.00	[illegible]	0.00	0.00	0.00	0.00	0.00	[illegible]	0.00	0.00	[illegible]
93	[illegible] Kumari	[illegible]	0.00	0.00	0.00	0.00	0.00	[illegible]	0.00	0.00	0.00	[illegible]	0.00	0.00	[illegible]
94	Tissue Repairs	0.00	[illegible]	0.00	[illegible]	0.00	0.00	0.00	[illegible]	0.00	0.00	[illegible]	0.00	0.00	-0.00
95	Treatment of oil field	0.00	[illegible]	0.00	0.00	0.00	0.00	[illegible]	0.00	0.00	0.00	[illegible]	0.00	0.00	[illegible]
96	UGC Grant ([illegible])	[illegible]	[illegible]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	[illegible]	0.00	0.00	-0.00
97	VBP ([illegible])	0.00	0.00	0.00	0.00	0.00	0.00	[illegible]	0.00	0.00	0.00	[illegible]	0.00	0.00	[illegible]
98	VBP ([illegible])	0.00	0.00	0.00	[illegible]	0.00	0.00	[illegible]	0.00	0.00	0.00	[illegible]	0.00	0.00	-0.00
99	VBP (Ashwani Kumar)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	[illegible]	0.00	0.00	[illegible]
100	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.00	0.00	0.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
101	IASST Fund	[illegible]	[illegible]	[illegible]	[illegible]	0.00	0.00	0.00	0.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Total	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Accounts Officer
IASST, Paschim Boragaon
Guwahati-781035: Assam India

Director
IASST, Paschim Boragaon
Guwahati-781035 Assam India

K P SARDA & COMPANY
CHARTERED ACCOUNTANTS

INDEPENDENT AUDITOR'S REPORT

TO
THE MEMBERS
THE INSTITUTE OF ADVANCED STUDY IN SCIENCE AND TECHNOLOGY
GUWAHATI

We have audited the accompanying Financial Statements of **DST General Fund** of **The Institute of Advanced Study in Science & Technology, Paschim Boragaon, Garchuk, Guwahati** which comprise the Balance Sheet as at 31st March, 2018, the Receipts and Payments Account and the Income and Expenditure Account for the year then ended, and a summary of significant accounting policies and other explanatory information.

Management's Responsibility for Financial Statements :

Management is responsible for the preparation of these financial statements that give a true and fair view of the financial position and financial performance of the society in accordance with the Accounting Standards generally accepted in India. This responsibility includes the design, implementation and maintenance of internal control relevant to the preparation and presentation of the financial statements that give a true and fair view and are free from misstatement, whether due to error or fraud.

Auditor's Responsibility :

Our responsibility is to express an opinion on these financial statements based on our audit. We conducted our audit in accordance with the Standards on Auditing issued by the Institute of Chartered Accountants of India. Those standards require that we comply with ethical requirements and plans and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the society's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of the accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Cond..P/2

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kpsarda@gmail.com

K P SARDA & COMPANY

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Chatribari Road, Guwahati - 781001, Assam
http://kpsardaco.org.in

Finance & Accounts Officer
ASST, Paschim Boragaon
गुवाहाटी-35, असम/भारत

Director
Guwahati-781035 Assam India

K P SARDA & COMPANY
CHARTERED ACCOUNTANTS

Opinion:

In our opinion and to the best of our information and according to the explanations given to us, the financial statements give the information required by the Act in the manner so required and give a true and fair view in conformity with the accounting principles generally accepted in India :

(a) In the case of the Balance Sheet, of the state of affairs of the Society, as on 31st March, 2018;

(b) In case of the Income and Expenditure Account of the Income/Expenditure of Society for the year ended 31st March, 2018;

(c) In case of the Receipts and Payment Account of the Receipts/Payments of Society for the year ended 31st March,2018

We further report that:

(a) We have obtained all the information and explanations to the best of our knowledge and belief were necessary for the purpose of our audit;

(b) In our opinion, proper books of account, as required by law have been kept by the Society so far as appears from our examination of those books;

(c) The Balance Sheet, the Receipts and Payments Account and the Income and Expenditure Account dealt with by this Report are in agreement with the books of account.

For K.P. Sarda & Co.
Chartered Accountants
FRN : 319206E

(CA. K P Sarda)
Partner
Membership No.054555

Place : Guwahati
Date : 20/07/2018

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K P SARDA & COMPANY
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Paschim Boragaon
Guwahati-781035

Director
IASST

THE INSTITUTE OF ADVANCED STUDY IN SCIENCE AND TECHNOLOGY

PASCHIM BORAGAON, GARCHUK, GUWAHATI- 781035

BALANCE SHEET OF DST GENERAL FUND AS ON 31ST MARCH, 2018

PARTICULARS	Schedule	Amount (₹) 2017-18	Amount (₹) 2016-17
CAPITAL FUND & LIABILITIES			
Capital Fund	1	471,370,023.16	345,921,128.16
Current Liabilities and Provisions	2	92,184,188.92	198,387,497.40
TOTAL :		**563,554,212.08**	**544,308,625.56**
ASSETS			
Fixed Assets	3	471,370,023.13	345,921,128.13
Current Assets, Loans and Advances	4	92,184,188.95	198,387,497.43
TOTAL :		**563,554,212.08**	**544,308,625.56**

NOTES ON ACCOUNT - SCHEDULE "5"

In terms of our report of even date annexed hereto

For K. P. Sarda & Co.
Chartered Accountants
FRN : 319206E

(CA. K P Sarda)
Partner
Membership No. 054555

Place : G u w a h a t i
Date : 20/07/2018

1

वित्त एवं लेखा अधिकारी
Finance & Accounts Officer
आई.ए.एस.एस.टी, पश्चिम बड़ागाव
IASST, Paschim Boragaon
गुवाहाटी-35:असम:भारत
Guwahati-781035: Assam:India

पश्चिम बड़ागाव, गुवाहाटी-35: असम:भारत
Paschim Boragaon,Guwahati-35 Assam India

निदेशक/Director
आई.ए.एस.एस.टी, पश्चिम बड़ागाव
IASST, Paschim Boragaon
गुवाहाटी-35, असम भारत
Guwahati-781035 Assam India

THE INSTITUTE OF ADVANCED STUDY IN SCIENCE AND TECHNOLOGY

PASCHIM BORAGAON, GARCHUK, GUWAHATI- 781035

INCOME AND EXPENDITURE ACCOUNT OF DST GENERAL FUND FOR THE YEAR ENDED 31ST MARCH 2018

EXPENDITURE	Amount (₹)	INCOME	Amount (₹)
Expenditure on Grants		Revenue Grant	214,452,000.00
Salary	99,955,858.00	Bank Interest	2,236,705.91
Contingency (Details 1)	19,722,098.00	Interest on Fixed Deposit	992,937.00
Bank Charges	13,060.85	Penal Interest	10,297.00
Consumables (Details 2)	12,619,621.00	Interest From Advance	258,303.00
Training & Conference	1,831,779.57	Other Income	1,136,379.00
Travelling	1,988,193.00		
Honorarium	3,874,330.00		
Security Service	1,645,076.00		
Works and Services (Details 3)	21,706,229.00		
Empowerment of SC/ST people	366,020.00		
Surplus transferred to unutilised grant	55,364,356.49		
	219,086,621.91		219,086,621.91

NOTES ON ACCOUNT - SCHEDULE '5'

In terms of our report of even date annexed hereto.

For K. P. Sarda & Co.
Chartered Accountants
FRN : 319206E

(CA. K P Sarda)
Partner
Membership No. 054555

Place : G u w a h a t i
Date : 20/07/2018

2

निदेशक/Director
IASST, Paschim Boragaon
Guwahati-781035 Assam India

कुलसचिव/Registrar
पश्चिम बड़ागांव, गुवाहाटी-35 असम भारत
Paschim Boragaon, Guwahati-35 Assam India

वित्त एवं लेखा अधिकारी
Finance & Accounts Officer
IASST, Paschim Boragaon
गुवाहाटी-35: असम:भारत
Guwahati-781035 Assam India

THE INSTITUTE OF ADVANCED STUDY IN SCIENCE AND TECHNOLOGY

PASCHIM BORAGAON, GARCHUK, GUWAHATI- 781035

RECEIPTS AND PAYMENTS ACCOUNT OF DST GENERAL FUND FOR THE YEAR ENDED 31ST MARCH 2018

RECEIPTS		Amount (₹)	PAYMENTS		Amount (₹)
To **OPENING BALANCE :**			By **SALARY & ALLOWANCES :**		
Cash in hand	20,000.00		Salary	85,623,527.00	
Cash at Bank (As per Schedule 4)	64,598,924.43	64,618,924.43	N.P.S Contribution	11,093,849.00	
			Gratuity Premium	2,000,000.00	
			Benevolent Fund	7,200.00	
* **GRANT-IN-AID :**			Children Education	1,357,374.00	
From Ministry of Science and Technology Department of Science & Technology, New Delhi			Medical Contribution	1,670,046.00	
			Leave Travel Concession	430,753.00	
Capital Grant :			Leave Encashment	830,690.00	
			EPF Contribution	863,902.00	
A1/1ASST/CAP/003/2017/1	10,500,000.00		Telephone, Internet & Newspap	215,520.00	
A1/1ASST/CAP/003/2017/2	24,454,000.00		Uniform Allowances	205,473.00	104,300,334.00
A1/1/7/1ASST/2016	30,000,000.00				
A1/1ASST/CAP/003/2017/3	9,210,000.00	74,164,000.00	* **GENERAL EXPENDITURE :**		
			Contingency	20,060,127.00	
Revenue Grant :			Bank Charges	13,060.85	
A1/1ASST/GEN/003/2017/1	15,086,000.00		Consumables	12,272,462.00	
A1/1ASST/SC-SAL/003/2017/1	957,000.00		Training & Conference	2,180,719.57	
A1/1ASST/ST-SAL/003/2017/1	1,250,000.00		Travelling	1,924,287.00	
A1/1ASST/ST-GEN/003/2017/1	6,750,000.00		Honorarium	3,874,330.00	
A1/1ASST/SAL/003/2017/1	29,918,000.00		Security Service	1,645,076.00	
A1/1ASST/SAL/003/2017/2	64,655,000.00		Works and Services	21,407,759.00	63,377,801.42
A1/1ASST/GEN/003/2017/2	29,390,000.00				
A1/1ASST/SC-SAL/003/2017/2	2,073,000.00		* **CAPITAL EXPENDITURE :**		
A1/1ASST/ST-SAL/003/2017/2	2,708,000.00		Equipments	34,591,663.00	
A1/1ASST/ST-GEN/003/2017/2	14,625,000.00		Library	32,847.00	
A1/1ASST/SC-SAL/003/2017/3	798,000.00		Computer & Peripherals	4,305,645.00	
A1/1ASST/SAL/003/2017/3	24,889,000.00		A.C.	1,051,028.00	
A1/1ASST/ST-SAL/003/2017/3	1,042,000.00		Furniture & Fixtures	12,769,413.00	
A1/1ASST/ST-GEN/003/2016/2	8,625,000.00		Building & Site Development	134,695,117.00	
A1/1ASST/GEN/003/2017/3	11,686,000.00	214,452,000.00	Vehicle	1,421,556.00	188,867,269.00
* **INTEREST :**			* Empowerment of SC/ST people		271,020.00
Bank Interest	2,236,705.91				
Interest on Fixed Deposit	992,937.00		* **Advance to Extramural Projects**		
Penal Interest	10,297.00	3,239,939.91	Vijaya Bank - Conference (00091	107,000.00	
			SBI Garchuk - Seminar (888433)	64,830.00	171,920.00
* Transfer of Corpus Fund		3,317.00			
			* **CLOSING BALANCE :**		
* Miscellaneous Receipts		1,136,379.00	Cash in hand	20,000.00	
			Cash at Bank (As per Schedule 4)	806,215.95	826,215.95
* Refund of Library Advance		200,000.00			
		357,814,560.37			357,814,560.37

We have verified the above statement of Receipts & payments Account of the DST General Fund of Institute of Advanced Study in Science & Technology, Paschim Boragaon, Guwahati - 781 035. Account - Plan for the period from 1st April 2017 to 31st March, 2018 from the Books of Accounts and vouchers

For K. P. Sarda & Co.
Chartered Accountants
FRN : 319206E

(CA. K P Sarda)
Partner
Membership No. 054555

Place : Guwahati
Date : 20/07/2018

Finance & Accounts Officer
Paschim Boragaon
Assam:India

Director

A1

THE INSTITUTE OF ADVANCED STUDY IN SCIENCE AND TECHNOLOGY

PASCHIM BORAGAON, GARCHUK, GUWAHATI- 781035

SCHEDULE - 1 : :: CAPITAL FUND ::

	Amount(₹) 2017-18	Amount (₹) 2016-17
Opening Balance	345,921,128.16	
Add : Contribution towards Capital Fund (Addition to Fixed Assets)	181,752,859.00	
	527,673,987.16	
Less : Depreciation for the year	56,303,964.00	
	471,370,023.16	**345,921,128.16**

SCHEDULE - 2 : :: CURRENT LIABILITIES AND PROVISIONS ::

		Amount(₹) 2017-18	Amount (₹) 2016-17
CURRENT LIABILITIES :			
Unutilised Grant in Aid	(As per Annexure "A")	85,684,299.92	137,905,485.40
Security Deposit Payable	(As per Annexure "B")	6,199,627.00	215,000.00
Other Current Liabilities	(As per Annexure "C")	300,262.00	300,262.00
Provision Againts Fixed Assets and Expenditure		0.00	59,966,750.00
		92,184,188.92	**198,387,497.40**

SCHEDULE - 4 : :: CURRENT ASSETS, LOANS & ADVANCES ::

		Amount(₹) 2017-18	Amount(₹) 2016-17
(A) CURRENT ASSETS :			
Cash in hand		20,000.00	20,000.00
Balance with Banks	**Account No.**		
SBI Khanapara Branch	(943972)	289,733.30	64,351,309.81
SBI Khanapara Branch - Workshop	(943723)	174,587.83	27,134.83
SBI Garchuk - Seminar	(888433)	0.00	65,478.50
Vijaya Bank - Travel	(000441)	161,746.29	40,239.29
Vijaya Bank - Conference	(000918)	0.00	103,278.00
SBI Khanapara - International Conference	(635294)	11,912.00	11,484.00
SBI - IASST Corpus Fund	(943064)	168,236.53	
	TOTAL (A)	826,215.95	64,618,924.43
(B) LOANS, ADVANCES & OTHER ASSETS :			
Advance to Extramural Project			
Vijaya Bank - Conference (000918)		107,090.00	0.00
SBI Garchuk - Seminar (888433)		64,830.00	0.00
Advances against Expenditure of Grants	(Annexure "D")	13,864,446.00	8,641,825.00
Advances against Fixed Assets	(Annexure "E")	77,321,607.00	64,879,998.00
Imprest Advance		0.00	280,000.00
Committed Expense		0.00	59,966,750.00
	TOTAL (B)	91,357,973.00	133,768,573.00
	TOTAL (A+B)	**92,184,188.95**	**198,387,497.43**

4

Finance & Accounts Officer
IASST, Paschim Boragaon
Guwahati-35 Assam India
Guwahati-781035

कुलसचिव/Registrar

निदेशक/Director

Paschim Boragaon Guwahati

THE INSTITUTE OF ADVANCED STUDY IN SCIENCE AND TECHNOLOGY

PASCHIM BORAGAON, GARCHUK, GUWAHATI- 781035

SCHEDULE - 3 : **:: FIXED ASSETS ::**

PARTICULARS OF DEPRECIATION ALLOWABLE AS PER THE IT ACT, 1961 IN RESPECT OF EACH ASSET OR BLOCK OF ASSETS, AS THE CASE MAY BE, IN THE FOLLOWING FORM

Particulars	W.D.V on 01/04/17	Additons/(Deletion) >180 days	Additons/(Deletion) <180 days	Total	Depreciation	W.D.V on 31/03/18
Block "A" : 0%						
Land	0.00	0.00	0.00	0.00	0.00	0.00
Block "B" : 10%						
Building & Site Development	193,017,048.66	18,836,584.00	122,452,156.00	334,305,788.66	27,307,971.00	306,997,817.66
Furniture & Fixtures	22,482,482.00	1,729,024.00	10,973,075.00	35,184,581.00	2,969,804.00	32,214,777.00
Block "C" : 15%						
Equipments	120,028,317.45	13,018,876.00	3,335,404.00	136,382,597.45	20,207,234.00	116,175,363.45
Air Conditioner	3,672,504.00	426,644.00	624,384.00	4,723,532.00	661,701.00	4,061,831.00
Refrigerator	12,703.00	0.00	0.00	12,703.00	1,905.00	10,798.00
Projector	92,680.00	0.00	0.00	92,680.00	13,902.00	78,778.00
Vehicles	729,529.00	1,421,556.00	0.00	2,151,085.00	322,663.00	1,828,422.00
Block "D" : 40%						
Library	2,490,865.00	10,173.00	22,674.00	2,523,712.00	1,004,950.00	1,518,762.00
Computer	3,388,591.02	3,376,864.00	5,525,445.00	12,290,900.02	3,811,271.00	8,479,629.02
Printer & Xerox Machine	3,338.00	0.00	0.00	3,338.00	1,335.00	2,003.00
Computer Software	3,070.00	0.00	0.00	3,070.00	1,228.00	1,842.00
	345,921,128.13	38,819,721.00	142,933,138.00	527,673,987.13	56,303,964.00	471,370,023.13

Finance & Accounts Officer
Paschim Boragaon
Guwahati-781035 Assam India

Registrar
Paschim Boragaon
Guwahati-781035 Assam India

Director
Paschim Boragaon
Guwahati-781035 Assam India

THE INSTITUTE OF ADVANCED STUDY IN SCIENCE AND TECHNOLOGY

PASCHIM BORAGAON, GARCHUK, GUWAHATI- 781035

SCHEDULE " 5 " : SIGNIFICANT ACCOUNTING POLICES :

1. **ACCOUNTING CONVENTION :**

The Financial Statements are prepared on the basis of historical cost convention, unless otherwise stated and on the Accrual method of accounting.

2. **REVENUE RECOGNITION :**

(a)Income on interest bearing securities and term deposits is recognised on accrual basis as and when these are realised.

(b) Income other than interest income are recognised on cash basis.

3. **INVESTMENTS :**

Term deposits with Banks are taken as investments and valued at accrual basis.

4. **FIXED ASSETS :**

Fixed Assets are stated at cost of acquisiton, inclusive of inward freight, duties and taxes and incidental and direct expenses related to acquisiton less depreciation.

5. **DEPRECIATION :**

(a) Depreciation on Fixed assets purchased/acquired/ constructed out of government grants is charged on WDV Method as per the rates specified under the Income Tax Act, 1961.

(b) Depreciation is charged to Capital Fund by way of reducing the net value of fixed assets.

6. **GOVERNMENT GRANTS/SUBSIDIES :**

Revenue grants are shown as income on realisation basis and expenditure thereof is charged to appropriate revenue heads. In the case capital grant, the capital fund is credited to the extent of the amount of acquisition of fixed assets and the balance remains in unutilised grant.

वित्त एवं लेखा अधिकारी
Finance & Accounts Officer
Paschim Boragaon
Assam India

कुलसचिव/Registrar

निदेशक/Director
Guwahati-781035 Assam India

THE INSTITUTE OF ADVANCED STUDY IN SCIENCE AND TECHNOLOGY

PASCHIM BORAGAON, GARCHUK, GUWAHATI- 781035

NOTES ON ACCOUNTS :

(i) No provision has been made in respect of Leave Salary.

(ii) Purchase of consumable items during the year are treated as expenditure and charged to revenue.

(iii) In the opinion of the Management, the current assets, loans and advances have a value on realisation equal or atleast to the aggregate amount shown in the Balance Sheet.

(iv) Balances under Current Liabilities, Loans and Advances are subject to conformation /reconciliation /adjustments, if any.

(v) No provision is made for contingent liability, except for cases where provision needs to be made, based on expert opinion.

(vi) Previous years figure have been rearranged and regrouped wherever considered necessary to facilitate comparison.

(vii) An amount of ₹ 3,317.03 that was shown as IASST corpus fund under the head Reserve & Surplus in the previous year has been transferred to unutilised grant of DST General Fund in the currrent year.

(viii) Any surplus balance that remains in Income & Expenditure A/c after adjusting the revenue expenditure with the revenue grant and other income is transferred to unutilised grant.

Director

Finance & Accounts Officer

Paschim Boragaon

Assam:India

K P SARDA & COMPANY
CHARTERED ACCOUNTANTS

Form No. GFR-19A
FORM OF UTILIZATION CERTIFICATE

Sl. No.	Sanction Letter No.	Date	Amount (₹)
1	Government of India, Ministry of Science and Technology, Department of Science & Technology, New Delhi vide Letter No. AI/IASST/CAP/003/2017/1	14/06/2017	10,500,000.00
2	Government of India, Ministry of Science and Technology, Department of Science & Technology, New Delhi vide Letter No. AI/IASST/CAP/003/2017/2	22/09/2017	24,454,000.00
3	Government of India, Ministry of Science and Technology, Department of Science & Technology, New Delhi vide Letter No. AI/1/7/IASST/2016	14/03/2018	30,000,000.00
4	Government of India, Ministry of Science and Technology, Department of Science & Technology, New Delhi vide Letter No. AI/IASST/CAP/003/2017/3	23/02/2018	9,210,000.00
5	Government of India, Ministry of Science and Technology, Department of Science & Technology, New Delhi vide Letter No. AI/IASST/GEN/003/2017/1	13/06/2017	15,086,000.00
6	Government of India, Ministry of Science and Technology, Department of Science & Technology, New Delhi vide Letter No. AI/IASST/SC-SAL/003/2017/1	13/06/2017	957,000.00
7	Government of India, Ministry of Science and Technology, Department of Science & Technology, New Delhi vide Letter No. AI/IASST/ST-SAL/003/2017/1	13/06/2017	1,250,000.00
8	Government of India, Ministry of Science and Technology, Department of Science & Technology, New Delhi vide Letter No. AI/IASST/ST-GEN/003/2017/1	13/06/2017	6,750,000.00
9	Government of India, Ministry of Science and Technology, Department of Science & Technology, New Delhi vide Letter No. AI/IASST/SAL/003/2017/1	14/06/2017	29,918,000.00
10	Government of India, Ministry of Science and Technology, Department of Science & Technology, New Delhi vide Letter No. AI/IASST/SAL/003/2017/2	21/09/2017	64,655,000.00
11	Government of India, Ministry of Science and Technology, Department of Science & Technology, New Delhi vide Letter No. AI/IASST/GEN/003/2017/2	22/09/2017	29,390,000.00
12	Government of India, Ministry of Science and Technology, Department of Science & Technology, New Delhi vide Letter No. AI/IASST/SC-SAL/003/2017/2	22/09/2017	2,073,000.00
13	Government of India, Ministry of Science and Technology, Department of Science & Technology, New Delhi vide Letter No. AI/IASST/ST-SAL/003/2017/2	22/09/2017	2,708,000.00
14	Government of India, Ministry of Science and Technology, Department of Science & Technology, New Delhi vide Letter No. AI/IASST/ST-GEN/003/2017/2	22/09/2017	14,625,000.00
15	Government of India, Ministry of Science and Technology, Department of Science & Technology, New Delhi vide Letter No. AI/IASST/SC-SAL/003/2017/3	23/02/2018	798,000.00

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Director
Gauhati-781001 Assam India

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K P SARDA & COMPANY
CHARTERED ACCOUNTANTS

16	Government of India, Ministry of Science and Technology, Department of Science & Technology, New Delhi vide Letter No. AI/IASST/SAL/003/2017/3	23/02/2018	24,889,000.00
17	Government of India, Ministry of Science and Technology, Department of Science & Technology, New Delhi vide Letter No. AI/IASST/ST-SAL/003/2017/3	23/02/2018	1,042,000.00
18	Government of India, Ministry of Science and Technology, Department of Science & Technology, New Delhi vide Letter No. AI/IASST/ST-GEN/003/2016/3	22/02/2018	8,625,000.00
19	Government of India, Ministry of Science and Technology, Department of Science & Technology, New Delhi vide Letter No. AI/IASST/GEN/003/2017/3	23/02/2018	11,686,000.00
	Total		**288,616,000.00**

Certified that out of **₹ 28,86,16,000/-** Grant-in-Aid sanctioned during the financial year 2017-18 in favour of The Institute of Advanced Study in Science and Technology, Guwahati under this Ministry/Department's sanction letter vide details annexed above and interest from Bank **₹ 32,29,642.91** and opening surplus balance of **₹ 6,39,53,548.43** (being Cash & Bank Balance of ₹ 6,46,18,924.43 plus advance given ₹ 48,000.00 less earnest money refundable ₹ 7,13,376.00 of previous year) as on 01.04.2017, a sum of **₹ 35,54,66,431.39 /-** has been utilized for the purpose for which it was sanctioned (total expenditure of ₹ 35,66,16,424.42 less other receipts of ₹ 11,49,993.03 of current year) and a surplus balance of **₹ 3,32,759.95** (being Cash & Bank Balance of ₹ 8,26,215.95, plus advance given to extramural projects ₹ 1,71,920.00 and advance given ₹ 48,000.00 less earnest money refundable ₹ 7,13,376.00 of previous year) remaining unutilized at the end of the year which will be utilized and adjusted towards the grants -in - aid payable during the next year 2018-19.

Further certified that I have satisfied myself that the conditions, on which the Grant-in-Aid was sanctioned, have been duly fulfilled and that I have exercised the following checks to see that the money was actually utilized for the purpose for which it was sanctioned.

Checks exercised :

1. Examining of Cash Book, Bank Book & Ledger Accounts
2. Verification of compliance to terms of Sanction of Grants.
3. Verification of Vouchers.

For K. P. Sarda & Co.
Chartered Accountants
FRN : 319206E

(CA. K P Sarda)
Partner
Membership No. 054555

Place : G u w a h a t i
Date : 20/07/2018

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वित्त एवं लेखा अधिकारी
Finance & Accounts Officer
... पश्चिम बड़गांव
Paschim Boragaon
...-35: असम:भारत

पश्चिम बड़गांव, गुवाहाटी-35: असम:भारत
Paschim Boragaon Guwahati-35 Assam India

निदेशक / Director
IASST ...
Guwahati-781035 Assam India

K P SARDA & COMPANY
CHARTERED ACCOUNTANTS

INDEPENDENT AUDITOR'S REPORT

TO
THE MEMBERS
THE INSTITUTE OF ADVANCED STUDY IN SCIENCE AND TECHNOLOGY
GUWAHATI

We have audited the accompanying Financial Statements of **Miscellaneous, Student & Scientist Home, Upgrading Benevolent and Corpus Fund** of **The Institute of Advanced Study in Science & Technology, Paschim Boragaon, Garchuk, Guwahati** which comprise the Balance Sheet as at 31st March, 2018, the Receipts and Payments Account and the Income and Expenditure Account for the year then ended, and a summary of significant accounting policies and other explanatory information.

Management's Responsibility for Financial Statements :

Management is responsible for the preparation of these financial statements that give a true and fair view of the financial position and financial performance of the society in accordance with the Accounting Standards generally accepted in India. This responsibility includes the design, implementation and maintenance of internal control relevant to the preparation and presentation of the financial statements that give a true and fair view and are free from misstatement, whether due to error or fraud.

Auditor's Responsibility :

Our responsibility is to express an opinion on these financial statements based on our audit. We conducted our audit in accordance with the Standards on Auditing issued by the Institute of Chartered Accountants of India. Those standards require that we comply with ethical requirements and plans and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the society's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of the accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Cond..P/2

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http://kpsardaco.org.in

& Accounts Officer
Director

K P SARDA & COMPANY
CHARTERED ACCOUNTANTS

Opinion:

In our opinion and to the best of our information and according to the explanations given to us, the financial statements give the information required by the Act in the manner so required and give a true and fair view in conformity with the accounting principles generally accepted in India :

(a) In the case of the Balance Sheet, of the state of affairs of the Society, as on 31st March, 2018;

(b) In case of the Income and Expenditure Account of the Income/Expenditure of Society for the year ended 31st March, 2018;

(c) In case of the Receipts and Payment Account of the Receipts/Payments of Society for the year ended 31st March,2018

We further report that:

(a) We have obtained all the information and explanations to the best of our knowledge and belief were necessary for the purpose of our audit;

(b) In our opinion, proper books of account, as required by law have been kept by the Society so far as appears from our examination of those books;

(c) The Balance Sheet, the Receipts and Payments Account and the Income and Expenditure Account dealt with by this Report are in agreement with the books of account.

For K.P. Sarda & Co.
Chartered Accountants
FRN : 319206E

(CA. K P Sarda)
Partner
Membership No.054555

Place : Guwahati
Date : 20/07/2018

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Secretary/Director

Accounts Officer
Paschim Boragaon

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THE INSTITUTE OF ADVANCED STUDY IN SCIENCE AND TECHNOLOGY

PASCHIM BORAGAON, GARCHUK, GUWAHATI- 781035

BALANCE SHEET OF Miscellaneous, SSH, Upgrading, Benevolent & Corpus Fund
AS ON 31ST MARCH, 2018

PARTICULARS	Schedule	Amount (₹) 2017-18	Amount (₹) 2016-17
CAPITAL FUND & LIABILITIES			
Capital Fund	1	85,648,418.34	71,818,208.24
Reserves & Surplus	2	70,292.00	63,950.03
Current Liabilities and Provisions	3	3,633,807.23	17,657,252.31
TOTAL :		89,352,517.57	89,539,410.58
ASSETS			
Fixed Assets	4	68,468,764.45	75,610,414.45
Investments	5	10,000,000.00	4,226,498.00
Current Assets, Loans and Advances	6	10,883,753.12	9,702,498.13
TOTAL :		89,352,517.57	89,539,410.58

NOTES ON ACCOUNT - SCHEDULE "7"

In terms of our report of even date annexed hereto.

For K. P. Sarda & Co.
Chartered Accountants
FRN : 319206E

(CA. K P Sarda)
Partner
Membership No. 054555

Place : G u w a h a t i
Date : 20/07/2018

1

Accounts Officer
Paschim Boragaon
Guwahati-781035 Assam India

Registrar
Paschim Boragaon Guwahati-35 Assam India

निदेशक/Director

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THE INSTITUTE OF ADVANCED STUDY IN SCIENCE AND TECHNOLOGY

PASCHIM BORAGAON, GARCHUK, GUWAHATI- 781035

CONSOLIDATED INCOME & EXPENDITURE ACCOUNT OF Miscellaneous, SSH, Upgrading, Benevolent & Corpus Fund FOR THE YEAR ENDED 31ST MARCH 2018

EXPENDITURE	Amount (₹)	INCOME		Amount (₹)
Salary	274,994.00	**OTHER RECEIPTS :**		
		Bank Interest	344,680.00	
Audit Fees	185,850.00	Overhead Charges	3,731,813.00	
		Interest on FD	885,881.00	
Miscellaneous	41,035.00	Other Income	2,106,102.11	
		Mess Dues	1,864,976.32	
Mess Expenditures	1,974,003.00	Room Rent	8,400.00	
		Guest Charges	14,699.26	8,956,551.69
Bank Charges	2,814.90			
Surplus transferred to Capital Fund	6,477,854.79			
	8,956,551.69			8,956,551.69

NOTES ON ACCOUNT - SCHEDULE "7"

In terms of our report of even date annexed hereto.

For K. P. Sarda & Co.
Chartered Accountants
FRN : 319206E

(CA. K P Sarda)
Partner
Membership No. 054555

Place : Guwahati
Date : 20/07/2018

वित्त एवं लेखा अधिकारी
Finance & Accounts Officer
IASST, Paschim Boragaon
Guwahati-781035: Assam:India

निदेशक /Director
IASST, Paschim Boragaon
Guwahati-781035 Assam India

THE INSTITUTE OF ADVANCED STUDY IN SCIENCE AND TECHNOLOGY

PASCHIM BORAGAON, GARCHUK, GUWAHATI- 781035

CONSOLIDATED RECEIPTS & PAYMENTS ACCOUNT OF Miscellaneous, SSH, Upgrading, Benevolent & Corpus Fund FOR THE YEAR ENDED 31ST MARCH 2018

RECEIPTS		Amount (₹)	PAYMENTS	Amount (₹)
To **OPENING BALANCE :**			By **EXPENDITURES :**	
Unspent as on 31/03/2017		9,578,474.13	Salary	274,994.00
			Audit Fees	185,850.00
" **OTHER RECEIPTS :**			Miscellaneous	41,035.00
Bank Interest	347,139.00		Mess Expenditures	1,974,003.00
Overhead Char	3,731,813.00			
Interest on FD	885,881.00		" Bank Charges	2,814.90
Other Income	2,106,102.11			
Mess Dues	1,864,976.32		" Purchase of Tata Xenon Vehicl	1,158,644.00
Room Rent	8,400.00			
Guest Charges	14,699.26	8959010.69	" Investment	10,000,000.00
" Maturity proceeds from Fixed Deposits		4,226,498.00	" Transfer to DST	3,317.03
" Advance from Project		1,610,594.00	" Transfer to Project	782.00
" Security Deposits		19,392.23	" **CLOSING BALANCE :**	
			Unspent as on 31/03/2018	10,759,729.12
" Contribution to Employees Benevolent Fund		7,200.00		
		24,401,169.05		24,401,169.05

For K. P. Sarda & Co.
Chartered Accountants
FRN : 319206E

(CA. K P Sarda)
Partner
Membership No. 054555

Place : G u w a h a t i
Date : 20/07/2018

निदेशक/Director
IASST Paschim Boragaon
Guwahati-781035 Assam India

Finance & Accounts Officer
ASST. Paschim Boragaon
Guwahati-781035: Assam:India

THE INSTITUTE OF ADVANCED STUDY IN SCIENCE AND TECHNOLOGY

PASCHIM BORAGAON, GARCHUK, GUWAHATI- 781035

SCHEDULE - 1 : :: CAPITAL FUND ::

	Amount(₹) 2017-18	Amount (₹) 2016-17
Opening Balance	71,818,208.24	
Add : Surplus for the year	6,477,854.79	
Add : Contribution towards Capital Fund (Addition to Fixed Assets)	1,158,644.00	
Add : Transferred from Unutilised Grant	14,494,005.31	
	93,948,712.34	
Less : Depreciation for the year	8,300,294.00	
	85,648,418.34	**71,818,208.24**

SCHEDULE - 2 : :: RESERVES & SURPLUS ::

	Amount(₹) 2017-18	Amount (₹) 2016-17
IASST Employees Benevolent Fund (664178)	70,292.00	60,633.00
IASST Corpus Fund (934064)	0.00	3,317.03
	70,292.00	**63,950.03**

SCHEDULE - 3 : :: CURRENT LIABILITIES AND PROVISIONS ::

		Amount(₹) 2017-18	Amount (₹) 2016-17
CURRENT LIABILITIES :			
Unutilised Grant in Aid	(As per Annexure "A")	0.00	15,653,431.31
Advance from Project (Overhead)		3,610,594.00	2,000,000.00
Security Deposit (SSH)		19,392.23	0.00
OCL - DST Govt of Assa		3,821.00	3,821.00
		3,633,807.23	**17,657,252.31**

SCHEDULE - 5 : :: INVESTMENTS ::

	Amount(₹)
Opening Balance	4,226,498.00
Add : Investment made during the year	10,000,000.00
Add : Interest Accrued during the year	885,881.00
Less : Fixed Deposit matured during the year	4,226,498.00
Less : Interest received during the year	885,881.00
Balance as on 31/03/2018	**10,000,000.00**

SCHEDULE - 6 : :: CURRENT ASSETS, LOANS & ADVANCES ::

		Amount(₹) 2017-18	Amount(₹) 2016-17
CURRENT ASSETS :			
TDS Receivable		124,024.00	124,024.00
Balance with Banks	**Account No.**		
SBI - IASST Employees Benevolent Fund	(664178)	70,292.00	60,633.00
SBI - IASST Corpus Fund	(943064)	0.00	3,317.03
SBI - Students & Scientist Home (IASST)	(412886)	568,064.62	614,393.71
SBI G.U. Branch - Upgrading	(131613)	47,004.86	45,316.86
Vijaya Bank - Overhead/Miscellaneous	(000466)	10,074,367.64	8,854,813.53
TOTAL :		**10,883,753.12**	**9,702,498.13**

Accounts Officer
Paschim Boragaon
Guwahati-781035 Assam:India

Director
Paschim Boragaon
Guwahati-781035 Assam India

THE INSTITUTE OF ADVANCED STUDY IN SCIENCE AND TECHNOLOGY

PASCHIM BORAGAON, GARCHUK, GUWAHATI- 781035

SCHEDULE - 2 : **:: FIXED ASSETS ::**

PARTICULARS OF DEPRECIATION ALLOWABLE AS PER THE IT ACT, 1961 IN RESPECT OF EACH ASSET OR BLOCK OF ASSETS, AS THE CASE MAY BE, IN THE FOLLOWING FORM

Particulars	W.D.V on 01/04/17	Additons/(Deletion) >180 days	Additons/(Deletion) <180 days	Total	Depreciation	W.D.V on 31/03/18
Block "A" : 10%						
Building & Site Development	63,736,938.00	0.00	0.00	63,736,938.00	6,373,694.00	57,363,244.00
Furniture & Fixtures	564,355.45	0.00	0.00	564,355.45	56,436.00	507,919.45
Block "C" : 15%						
Equipments	6,751,042.00	0.00	0.00	6,751,042.00	1,012,656.00	5,738,386.00
Vehicles	4,558,079.00	1,158,644.00	0.00	5,716,723.00	857,508.00	4,859,215.00
	75,610,414.45	1,158,644.00	0.00	76,769,058.45	8,300,294.00	68,468,764.45

Finance & Accounts Officer
Paschim Boragaon
Guwahati-35 Assam India

Director
Paschim Boragaon Guwahati-35 Assam India

THE INSTITUTE OF ADVANCED STUDY IN SCIENCE AND TECHNOLOGY

PASCHIM BORAGAON, GARCHUK, GUWAHATI- 781035

SCHEDULE " 7 " : SIGNIFICANT ACCOUNTING POLICES :

1. **ACCOUNTING CONVENTION :**

The Financial Statements are prepared on the basis of historical cost convention, unless otherwise stated and on the Accrual method of accounting.

2. **REVENUE RECOGNITION :**

(a) Income on interest bearing securities and term deposits is recognised on accrual basis as and when these are realised.

(b) Income other than interest income are recognised on cash basis.

3. **INVESTMENTS :**

Term deposits with Banks are taken as investments and valued at accrual basis.

4. **FIXED ASSETS :**

Fixed Assets are stated at cost of acquisiton, inclusive of inward freight, duties and taxes and incidental and direct expenses related to acquisiton less depreciation.

5. **DEPRECIATION :**

(a) Depreciation on Fixed assets purchased/acquired/ constructed out of government grants is charged on WDV Method as per the rates specified under the Income Tax Act, 1961.

(b) Depreciation is charged to Capital Fund by way of reducing the net value of fixed assets.

निदेशक/Director

कुलसचिव/Registrar

Finance & Accounts Officer
Paschim Boragaon
Guwahati-781035, Assam:India

THE INSTITUTE OF ADVANCED STUDY IN SCIENCE AND TECHNOLOGY

PASCHIM BORAGAON, GARCHUK, GUWAHATI- 781035

NOTES ON ACCOUNTS :

(i) No provision has been made in respect of Leave Salary.

(ii) Purchase of consumable items during the year are treated as expenditure and charged to revenue.

(iii) In the opinion of the Management, the current assets, loans and advances have a value on realisation equal or atleast to the aggregate amount shown in the Balance Sheet.

(iv) Balances under Current Liabilities, Loans and Advances are subject to confirmation /reconciliation /adjustments, if any.

(v) No provision is made for contingent liability, except for cases where provision needs to be made, based on expert opinion.

(vi) Previous years figure have been rearranged and regrouped wherever considered necessary to facilitate comparison.

(vii) An amount of ₹ 3,317.03 that was shown as IASST corpus fund under the head Reserve & Surplus in the previous year has been transferred to unutilised grant of DST General Fund in the current year.

(viii) Any surplus balance that remains in Income & Expenditure A/c after adjusting the expenditure with the income is transferred to capital fund.

(ix) The balance of unutilised grant amounting to ₹ 1,44,94,005.31 is transferred to capital fund. In earlier years surplus of income over expenditure (Miscellaneous Account) was shown under unutilised grant which is transferred to Capital Fund as this fund is maintained for keeping the records of income generation of the Institute.

निदेशक/Director

कुलसचिव/Registrar

Accounts Officer

Assam India

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THE INSTITUTE OF ADVANCED STUDY IN SCIENCE AND TECHNOLOGY

PASCHIM BORAGAON, GARCHUK, GUWAHATI- 781035

Annexure "A" - Unutilised Grant

Opening Balance	15,653,431.31
Add : Unutilised Grant for the year	0.00
	15,653,431.31
Less : Transfer to Unutilised Grant of Project Fund	782.00
Less : Contribution towards Capital Fund (Addition to Fixed Assets)	1,158,644.00
Less : Transfer to Capital Fund	14,494,005.31
Closing Balance	0.00

निदेशक/Director

कुलसचिव/Registrar

& Accounts Officer

Paschim Boragaon

Assam:India

Wavy Maplet
Chersonesia intermedia Martin, 1895
Family: Nymphalidae

King Crow
Euploea klugii Moore, 1857
Family: Nymphalidae

Knight
Lebadea martha Fabricius, 1787
Family: Nymphalidae

Common Birdwing
Troides helena Linnaeus, 1758
Family: Papilionidae

Common Imperial
Cheritra freja Fabricius, 1793
Family: Lycaenidae

Yamfly
Loxura atymnus Cramer, 1782
Family: Lycaenidae

Common Crow
Euploea core Cramer, 1780
Family: Nymphalidae

Common Evening Brown
Melanitis leda Linnaeus, 1758
Family: Nymphalidae

Great Eggfly
Hypolimnas bolina Linnaeus, 1758
Family: Nymphalidae

Lime Swallowtail
Papilio demoleus Linnaeus, 1758
Family: Papilionidae

Common Mime
Papilio clytia Linnaeus, 1758
Family: Papilionidae

Forget me not
Catochrysops strabo Fabricius, 1793
Family: Lycaenidae

Common Bluebottle
Graphium sarpedon Linnaeus, 1758
Family: Papilionidae

Chocolate Pansy
Junonia iphita Cramer, 1779
Family: Nymphalidae

Nigger / Medus Brown
Orsotriaena medus Fabricius, 1775
Family: Nymphalidae

Common Palmfly
Elymnias hypermnestra Linnaeus, 1763
Family: Nymphalidae

Dark-branded Bushbrown
Mycalesis mineus Linnaeus, 1758
Family: Nymphalidae

Common Five-ring
Ypthima baldus Fabricius, 1775
Family: Nymphalidae

Peacock Pansy
Junonia almana Linnaeus, 1758
Family: Nymphalidae

Colour Sergeant
Athyma nefte Cramer, 1780
Family: Nymphalidae

Leopard Lacewing
Cethosia cyane Drury, 1770
Family: Nymphalidae

Fulvous Pied Flat
Pseudocoladenia dan Fabricius, 1787
Family: Hesperiidae

Indian Cabbage White
Pieris canidia Sparrman, 1768
Family: Pieridae

Red - spot Jezebel
Delias descombesi Boisduval, 1836
Family: Pieridae

Purple Sapphire
Heliophorus epicles Godart, 1823
Family: Lycaenidae

Common Branded Redeye
Matapa aria Moore, 1865
Family: Hesperiidae

Common Castor
Ariadne merione Cramer, 1777
Family: Nymphalidae

Common Grass Yellow
Eurema hecabe Linnaeus, 1758
Family: Pieridae

Tawny Coster
Acraea terpsicore Linnaeus, 1758
Family: Nymphalidae

Common Pierrot
Castalius rosimon Fabricius, 1775
Family: Lycaenidae

Common Mormon
Papilio polytes Linnaeus, 1758
Family: Papilionidae

Grass Demon
Udaspes folus Cramer, 1775
Family: Hesperiidae

Common Red Flash
Rapala iarbus Fabricious, 1787
Family: Lycaenidae

Grey Count
Tanaecia lepidea Butler, 1868
Family: Nymphalidae

Plain Tiger
Danaus chrysippus Linnaeus, 1758
Family: Nymphalidae

Pale Grass blue (Mating)
Pseudozizeeria maha Kollar, 1844
Family: Lycaenidae

Institute of Advanced Study in Science and Technology
Vigyan Path, Paschim Boragaon, Guwahati, Assam - 781035

Butterflies commonly viewed within the IASST campus during different seasons.
Photograph & Identification by : N. C. Talukdar and K.K. Prakash

INSTITUTE OF ADVANCED STUDY IN SCIENCE AND TECHNOLOGY

(An Autonomous Institute under Department of Science and Technology, Govt. of India)

Vigyan Path, Paschim Boragaon,Garchuk, Guwahati - 781035

INSTITUTE OF ADVANCED STUDY IN SCIENCE AND TECHNOLOGY

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