

# DST-INSPIRE INTERNSHIP SCIENCE CAMP - 2017



Department of  
Science & Technology  
Government of India

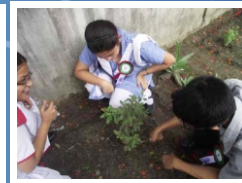
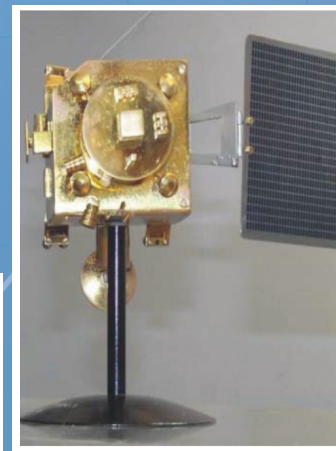
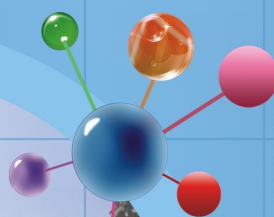


Jagadis Bose  
National Science Talent Search  
Government of West Bengal

55<sup>th</sup> Science Camp  
"Learning Science"

March 27-31, 2017

At JB Centre of Excellence for Student – Scientists



**Jagadis Bose National Science Talent Search**

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## “Learning Science”

### About JBNSTS

Jagadis Bose National Science Talent Search (JBNSTS), Kolkata was conceptualized in 1958 by visionaries such as Dr. B C Roy, Sir J J Ghandy and others to commemorate the Birth Centenary Celebration of India's first modern scientist, Acharya J C Bose. The program was inaugurated by Pandit Jawaharlal Nehru. JBNSTS is an autonomous institute promoted by the Department of Higher Education, Government of West Bengal. It is administered by a Governing Body with representatives from the State Government, academia and industry. In the last five and half decades, JBNSTS has grown to become a premiere institute of non-formal science education in India with the objective towards pursuit of excellence through motivation, identification and nurture of young talented science students. Since 1961, JBNSTS has been conducting Senior Scholarship program in West Bengal for undergraduate students of science, engineering and medicine. This organization is considered as the oldest and first talent search institute of India and this prestigious scholarship is very well recognized across the globe. Since 2015, JBNSTS has also initiated a Junior Talent Search Test – a scholarship program for the students who are studying science in class XI. This program has been started to motivate and nurture the students from a younger age.

JBNSTS helps students to realize the importance of excellence in the scientific world and try to cultivate this in their own lives as students of science. It also encourages students towards the learning of basic sciences and inculcates scientific spirit in the minds of high school and undergraduate students. Focus has been given on unconventional and dynamic methods of non-formal accelerated learning through "out-of-class" activities, which have led to the recognition of intellectually sensitive and inquisitive minds.

JBNSTS is also conducting Teachers Training Program by involving middle school science teachers from different districts of West Bengal. Hands-on activity based science teaching has given the main emphasis throughout this program and accordingly science kits have been developed and distributed amongst the participating teachers for demonstrating scientific principles in front of the students in the classroom. The financial support for most

of the activities of JBNSTS is provided by the Department of Higher Education & Department of Science & Technology, Government of West Bengal. In addition, Council of Scientific & Industrial Research (CSIR), Department of Science & Technology (DST), Government of India & some other Industries also collaborates with JBNSTS in such activities.



### About DST-INSPIRE Program



Innovation in Science Pursuit for Inspired Research (INSPIRE)" is one of the innovative programs developed by the Department of Science & Technology, Govt. of India for attraction of talent to Science and had been launched in December 2008. The basic objective of INSPIRE is to attract talented youth, ranked within top 1% in Class X board examinations and presently studying Science in +2 levels, to study science and motivate them to take up research career and inculcate scientific thought processes in all walks of their life and thus build the required critical human resource pool for strengthening and expanding the Science & Technology system and Research & Development base. It also aims to excite the interns by rubbing shoulders with global leaders in science including Nobel Prize Winners to experience the joy of innovations.

**INSPIRE Program has three schemes:**

**I. Scheme for Early Attraction of Talent for Science:** It aims to attract talented youth to study science by providing INSPIRE award of Rs.5,000/- to one million young learners in the age group 10-15 years for a duration of five years and arrange summer and winter camps for youth in various locations for top 1% in Class X board examinations with global leaders in science to experience the joy of innovations on an annual basis through INSPIRE internship.

a) **INSPIRE Award**

In order to seed and experience the joy of innovation, every year two lakh school children in the age-group of 10 to 15 years i.e., 6th to 10th standards are being identified for the INSPIRE Award. Each INSPIRE Award envisions an investment of Rs.5,000/- per child. The scheme plans to reach at least two students per secondary school during the next five years.

b) **INSPIRE Internship**

"Motivating talented youth to take-up research as a personal undertaking" by rubbing shoulders with global icons of science including Nobel Prize Winners, is the objective of INSPIRE Internship. This component of the program aims at working as a life-long catalyzing experience for the 11th graders in science stream.

**II. Scholarship for Higher Education:** I.Scholarship for Higher Education (SHE) aims at attracting talented youth into undertaking higher education in science intensive programs, by providing scholarships and mentoring through 'summer attachment' to performing researchers. The scheme offers 10,000 scholarships every year @ Rs 0.80 lakh per year to talented youth in the age group 17-22 years, for undertaking Bachelor and Masters level education in Natural and Basic Sciences. However, the 18 Science subject such as (1) Physics, (2) Chemistry, (3) Mathematics, (4) Biology, (5) Statistics, (6) Geology, (7) Astrophysics, (8) Astronomy, (9) Electronics, (10) Botany, (11) Zoology, (12) Bio-chemistry, (13) Anthropology, (14) Microbiology, (15) Geophysics, (16) Geochemistry, (17) Atmospheric Sciences and (18) Oceanic Sciences, either as major/honors or their combination in BSc/Integrated, MSc/Integrated MS course will be under the scope of INSPIRE Scholarship. The main feature of the scheme is mentorship support being planned for every scholar through [INSPIRE scholarship](#).

This scheme offers 10,000 scholarships every year @ Rs.80,000/- each for undertaking Bachelor and Masters level education in the Natural & Basic sciences, possessing any of the following criteria:

- Students who happen to be among the top 1% in 12th standard at their respective Board Examinations and are pursuing courses in Natural and Basic sciences at the B.Sc. or Integrated M.Sc. levels. Courses are not included other than Natural and Basic sciences in the current scheme in view of the focus on research in Basic sciences.
- Students who have secured in the Joint Entrance Examination of JEE-Advance top 10,000 ranks, JEE-Main (top 10,000 ranks) plus those clearing NEET (top 10,000 ranks), and who also opt to study Natural and Basic sciences in any academic institute or university leading to graduate and post-graduate degree, would be eligible for scholarship.
- Students admitted to Indian Institute of Science Education and Research (IISER), National Institute of Science Education and Research (NISER), Department of Atomic Energy Centre for Basic Sciences (DAE-CBS) at the University of Mumbai or happen to be Kishore Vaigyanik Protsahan Yojana (KVPY), National Talent Search Examination (NTSE), Jagadis Bose National Science Talent Search (JBNSTS) scholars and Science Olympiad Medalists, opting to undertake courses in the Natural & Basic sciences leading to B.Sc. and M.Sc. degrees are eligible for "[SHE](#)" scholarship.

**III. Assured Opportunity for Research Careers:** Assured Opportunity for Research Careers (AORC) aims at attracting, attaching, retaining and nourishing talented young scientific Human Resource to strengthened the R&D foundation and base by offering doctoral INSPIRE Fellowship in the age group 22-27 years, in both Basic and Applied sciences (including engineering and medicine). It also aims at assuring opportunities for post-doctoral researchers through a scheme (similar to the New Blood program of the Royal Society of UK) through contractual and tenure track positions for five years in both Basic and Applied sciences areas through an INSPIRE Faculty Scheme.

**a. INSPIRE Fellowship**

INSPIRE fellowship aims at enhancing research fellowships for doctoral studies and opening up partnerships with private sector for topping the Government's efforts in nurturing talents for scientific research. This scheme is applicable to Basic and Applied sciences as well as Medicine, Agriculture etc. with provision of multiple entries. The fellowship will be offered to (1) University 1st Ranker in a particular subject at PG level examination in Basic and Applied Science courses as well as (2) INSPIRE scholar, who have secured aggregate marks of 65 % or above at the 2 year MSc or 5 year Integrated MSc/MS.

**b. INSPIRE Faculty Scheme**

INSPIRE Faculty Scheme opens up an 'Assured Opportunity for Research Career (AORC)' for young researchers in the age group of 27-32 years. It is expected to augment high quality scientific manpower in scientific and educational institutions. It provides attractive opportunities to young achievers for developing independent scientific profiles and intends helping them emerge as S&T leaders in the long term. The Scheme offers contractual research positions. It provides career opportunities, but it is not a guarantee for tenure positions after 5 years.



## “Learning Science”

### Organizing Committee

#### Academic Committee:

Prof. (Dr.) Maitree Bhattacharyya, Director, JBNSTS

Dr. Paromita Roy, Deputy Director, JBNSTS

Dr. Abhijit Kar, Scientific Officer, JBNSTS

Dr. Smarajit Manna, Student Advisor, JBNSTS

#### Camp Coordinator :

Mr. Dipankar Sarkar

#### Mentors :

##### **Dr. Maitree Bhattacharyya**

Professor & Director

Jagadis Bose National Science Talent Search, Kolkata

##### **Dr. Dhrubajyoti Chattopadhyay**

Vice Chancellor

& Professor of Biochemistry

Amity University, Newtown, Kolkata

##### **Dr. Samita Basu**

Professor, Chemical Science Division

Saha Institute of Nuclear Physics, Kolkata

##### **Dr. Samit Kumar Ray**

Professor and Director

SN Bose National Centre for Basic Sciences, Kolkata

##### **Dr. Dulal Senapati**

Associate Professor, Chemical Science Division

Saha Institute of Nuclear Physics, Kolkata

##### **Dr. Ananda Dasgupta**

Associate Professor, Department of Physical Science

Indian Institute of Science Education and Research (IISER),

Mohanpur Campus, W.B.

##### **Dr. Samir Kumar Pal**

Professor, Department of Chemical, Biological

& Macromolecular Sciences,

S. N. Bose National Centre for Basic Sciences, Kolkata

##### **Dr. Abhijit Bhattacharyya**

Professor, Department of Physics

University of Calcutta, Kolkata

##### **Dr. Parthasarathi Mukhopadhyay**

Associate Professor, Department of Mathematics,

RK Mission Res. College, Narendrapur, Kolkata



##### **Dr. Sanghamitra Sengupta**

Assistant Professor, Department of Biochemistry

University of Calcutta, Kolkata

##### **Dr. Arnab Chakraborty**

Assistant Professor, Applied Statistics Unit (ASU)

Indian Statistical Institute, Kolkata

##### **Dr. Ishani Deb**

Assistant Professor, Department of Biochemistry

University of Calcutta, Kolkata

##### **Dr. Anindita Ukil**

Assistant Professor, Department of Biochemistry

University of Calcutta, Kolkata

##### **Dr. Debajyoti Ghoshal**

Assistant Professor, Inorganic Chemistry Section,

Department of Chemistry, Jadavpur University, Kolkata

##### **Dr. Soumen Basak**

Senior Professor, Chemical Science Division,

Saha Institute of Nuclear Physics Kolkata

##### **Dr. Abhijit Kar**

Scientific Officer

Jagadis Bose National Science Talent Search, Kolkata

##### **Dr. Smarajit Manna**

Student Advisor

Jagadis Bose National Science Talent Search, Kolkata



### CAMP RULES

#### **Welcome to the 55th Science Camp of JBNSTS entitled 'Learning Science'**

Here you will have a unique experience of learning science through active interaction with great scientists and be encouraged to share your ideas with others. No test/grade – only learning science in a different way.

#### **General Instructions:**

- The camp hours are from **09:00 a.m. to 6:00 p.m.** You are to attend all the sessions in your school uniform. **MOBILE PHONES MUST BE KEPT IN SWITCHED OFF MODE DURING ALL ACADEMIC SESSIONS.**
- Each participant has to make registration daily.
- An academic visit to **Centre for Research in Nanoscience & Nanotechnology (CRNN), University of Calcutta, Salt Lake Campus, Kolkata** has been arranged on **29th March, 2017**. On that day the camp hour may be extended.
- All the participants will be divided into groups. There will be a group leader for each group selected by group members. Each group has to prepare a project based on the 'hands-on activity' at the laboratory and present the same (PowerPoint / Chalk & talk) during project presentation session (31st March, 2017). Each group will get 10 minutes for presentation/ demonstration and 5 minutes for discussions.
- You will not be given any home work, but you are expected to interact freely with the experts, your group members and other groups.
- SUBMISSION OF ALL DOCUMENTS AND REIMBURSEMENT WILL BE MADE AT **REGISTRATION DESK ONLY.**

#### **Submission of important documents:**

- You are required to submit an attested copy of your 10th Standard Board Examination Mark Sheet, INSPIRE Registration Form endorsed by your Principal/HM, filled-in STUDENT'S INFORMATION SHEET (Blue Sheet) and Student's DECLARATION during **lunch break on 27th March, 2017.**

#### **Book Bill :**

- All the participants will receive a **Book Grant of Rs.1,200/-**. All the participants have to submit the original bill(s) for the book(s), endorsed by the Principal/HM and filled-in Book Grant Reimbursement Form along with a Xerox copy of the 1st page of the account Pass-Book during **morning registration (09.00 a.m. to 10.00 a.m.) on 28th March, 2017**

#### **Travel Bill :**

- Travel bills (as per instruction communicated to the Principal/HM) are to be submitted along with relevant documents (tickets etc.) **during lunch break on 28th March, 2017 (for RESIDENTIAL participants) and during morning registration on 30th March, 2017 (for NON-RESIDENTIAL participants).**
- You are required to fill up the **FEED BACK SHEET** and submit it **during lunch break on 31st March, 2017.**

#### **Reimbursements:**

Reimbursement for Travel expenses will be made on **30th March, 2017 (01.00 p.m. – 02.00 p.m.) (for RESIDENTIAL participants) and 31st March, 2017 (01.00 p.m. – 02.00 p.m.) (for NON-RESIDENTIAL participants).** Book Grant will be reimbursed to participants' account through NEFT.

In case, any payment related assistance / clarifications are needed, you may contact our accounts section.

**On the last day i.e. 31st March, 2017 you will receive the Participation Certificate.**



## “Learning Science”

### BRIEF INTRODUCTION TO THE EXPERTS

#### DR. MAITREE BHATTACHARYYA

Dr. Maitree Bhattacharyya is presently a Professor and Director of Jagadis Bose National Science Talent Search. She graduated from Presidency College with Honours in Physics and obtained M.Sc. degree from Calcutta University. Started research career in Department of Biophysics and Molecular Biology, Calcutta University with a Ph.D. degree in 1991. She pursued research with Research associateship from CSIR and joined Calcutta University as an Assistant Professor in 1994 to start with independent research laboratory. Later on, she was awarded DBT Overseas fellowship and worked as Visiting Scientist in UCSD, USA. Now she is the Professor, Department of Biochemistry, University of Calcutta (On lien). Ten students have already been awarded Ph.D. degree under her supervision and now she is leading a group of ten research scholars which comprises of Ph.D. and post doctoral students. She has published several research articles and chapters in books of International repute. Her research interests include (i) Study of microbial diversity in coastal and estuarine water and soil sediment in the world heritage site, Sundarbans. Exploration of dynamic correlations among physical, chemical and biological domains of this estuarine ecosystem. Inventorisation of microbial diversity along Indian coast; (ii) Identification of risk factors and biomarkers in the disease dynamics of diabetes associated cardiovascular disease and dyslipidemia; (iii) Application of green chemistry in bioremediation and biotransformation of heavy metal toxicity in industrial effluent, green synthesis of nanoparticles and (iv) Protein structure- function and interactions with special interest to heme proteins, bio molecular interaction.

Apart from academic research and teaching, she aims,

To develop Scientific and Technological sphere of India especially the human resource to the level of highest possible International Standard.

To develop Science and Technology of modern India so as to make India self-reliant to the extent possible in all spheres including Agriculture, Industry and Medicine.

To inculcate scientific and rational temper within the younger section of the population towards developing a modern India based on logical foundation, objective and realistic state of mind and against all kinds of superstition, obscurantism and illogical thinking and actions.

#### DR. DHRUBAJYOTI CHATTOPADHYAY

Dr. Chattopadhyay is presently the Vice Chancellor of Amity University, Kolkata. He is formerly Pro Vice-Chancellor (Academic), University of Calcutta and Director of Centre for Research in Nanoscience and Nanotechnology. He is an eminent academician and researcher in his area of study. He has received a number of awards and recognition of his research work like Young Scientist Award, Membership of Guha Research Conference, Professor Umakant Sinha Memorial Award, Fellowship of National Academy of Science, Fellowship of Indian Academy of Sciences, Fellowship of West Bengal Academy of Science and Technology etc. Presently he is the President of West Bengal Academy of Science and Technology and Society of Biological Chemists (India). His area of research is Regulation of gene expression of negative stranded RNA viruses, the structure-function studies of different regulatory proteins, Oxidative damage of different macromolecules in the cell and its mechanism, microbial diversity study, culture dependent and independent, Metagenomics, industrial enzymes etc. He is the life member of different organizations like Society of Biological Chemists, Indian Science Congress Association, Indian Virological Society, Indian Biophysical Society, Asiatic Society, Biotechnological Society of India etc.

#### DR. SAMITA BASU

Dr. Samita Basu is a Professor at the Chemical Sciences Division, Saha Institute of Nuclear Physics, Kolkata. She did her Ph. D. from Indian Association for the Cultivation of Science under supervision of Prof. Mihir Chowdhury in 1989. Her current research interests are photochemistry in homogeneous (solvent) and heterogeneous (micelles, reverse micelles, vesicles) media, Electron Transfer & Hydrogen abstraction, Interaction between small drug-like molecules with protein and DNA.

#### DR. SAMIT KUMAR RAY

Dr. Samit Kumar Ray is presently the Director and Professor at SN Bose National Centre for Basic Sciences, Kolkata. He obtained M.Sc. in Physics (1982), M.Tech. in Materials Science (1984) and Ph.D. (1991) from IIT, Kharagpur. He worked as a Scientist-B for a brief stint in 1984-85 at Solid State Physics Laboratory, Delhi. He joined IIT Kharagpur as a Lecturer in 1991 and rose to the position of Full Professor in 2004 and Professor (HAG) in 2010. He has served as the Head of the Department of Physics (2011-2014), founder Head of the School of Nanoscience and Technology (2014-2016) and Dean, Postgraduate Studies and Research (2015 – 2016) at IIT Kharagpur. Prof. Ray's research interest in the broad area of experimental condensed matter physics focusses on semiconductor nanostructures, epitaxial growth of quantum structures, nanophotonics and physics of nanodevices. His research has run the gamut from very practical fields such as pseudomorphic strained SiGe/SiGeC alloy heterostructures for high mobility MOSFETs to low dimensional quantum structures. His studies on Ge quantum dots and strained Ge to achieve light emission from an indirect bandgap semiconductor are useful to realize Si based lasers in future. His research results on floating-gate flash memory, quantum dot infrared photodetectors and nanowire heterojunctions are considered as significant breakthroughs for future nanodevice applications. Prof. Ray has supervised twenty three Ph.D. students (another twelve continuing at IIT Kharagpur) and more than fifty dissertations in UG and PG levels. He has completed 16 sponsored research projects worth over Rs.18 crore as a PI/Co-PI.

Prof. Ray is a recipient of the INSA Young Scientist Award (1993), Homi J. Bhabha Award (2001), MRSI-ICSC Superconductivity & Materials Science award (2015), MRSI medal lecture award (2007) and CDIL award of IETE (1997). He is a fellow of the Indian Nation Academy of Engineering (INAE) and West Bengal Academy of Science & Technology. Prof Ray has published more than 290 research papers in peer reviewed journals, one US patent, six book chapters and co-authored a book on “Strained Silicon Heterostructures: Materials and Devices” published by IEE, UK. He has served as a visiting faculty / Scientist at the Tokyo Institute of Technology, Japan, University of Delaware, Newark, USA, University of Texas, Austin, USA, Max-Planck Institute for Solid State Research, Germany, Queen's University of Belfast, UK, National Taiwan University, Taiwan and CGU University, Taiwan. He is an editorial board member of Scientific Reports, Frontiers in Materials : Optics and Photonics – Switzerland, Journal of Nano Energy and Power Research – USA and Nanotrends, India. He serves in a number of national committees that include Research Council member, CGCRI, DST PAC member on Condensed Matter Physics & Materials Science and International bilateral projects, PRSG member, Deity Centers of Excellence in Nanoelectronics and projects approved by the office of the Principal Scientific Adviser to the Government of India .

#### DR. ANINDITA UKIL

Dr. Anindita Ukil is presently an Assistant Professor in the Department of Biochemistry, University of Calcutta. She did her M.Sc. in Biochemistry from Calcutta University and Ph.D. from Infectious Diseases and Immunology Division at Indian Institute of Chemical Biology, Kolkata. Her research interest is focused on studying the negative regulators of macrophage signal transduction cascade and elucidating their role in intramacrophage parasite survival. Dr. Ukil is interested to identify those negative regulators using visceral leishmaniasis as a model macrophage associated disease. She is the recipient of Prof. B.K. Bachhawat Memorial Young Scientist Lecture (2014) by National Academy of Sciences, Allahabad (NASI), India; SERB Women Excellence Award (2013) by Department of Science and Technology; and Young Scientist Award (2010) in Biomedical Sciences by National Academy of Sciences, Allahabad (NASI), India. Dr. Ukil has several research publications in national and international peer reviewed journals.

#### DR. ISHANI DEB

Dr. Ishani Deb is presently an Assistant Professor in the Department of Biochemistry, University of Calcutta. She did her M.Sc. in from Calcutta University and Ph.D. from Jadavpur University, Kolkata. Her research interest is focused on Understanding the role of Circadian clock in opioid addiction; Cerebral ischemic stroke and Circadian clock. Dr. Deb has several research publications in national and international peer reviewed journals.

**DR. DULAL SENAPATI**

Dr. Dulal Senapati received his Master degree in 1998 with Physical Chemistry specialization from Jadavpur University and then joins same year to the Inorganic and Physical Chemistry Division in Indian Institute of Science, Bangalore for PhD program in the field of Physical Chemistry and Chemical Physics. After receiving his PhD degree in 2004, immediately he joined in the Chemistry Department at the Georgia Institute of Technology as a Research associate and continued till 2008 in the field of Single Molecule Raman Spectroscopy. Later Half in 2008 he joined Jackson State University as a staff scientist and continued till he joined to Saha Institute of Nuclear Physics in February 2013 as an Associate Professor and established Nanophotonics Group there. Dr. Senapati has published more than 60 international peer reviewed papers and wrote 6 book chapters. His work got total 3047 citation with 'h-index' of 27. He holds a visiting faculty position in National University of Science and Technology, Russia. His current research activity in SINP broad defined as “application of highly anisotropic nanomaterials in ultra-sensing, theranostics, microscopy, and in developmental optics”.

**DR. ANANDA DASGUPTA**

Dr. Ananda Dasgupta did his B.Sc. and M.Sc. in Physics from Jadavpur University and also did Ph.D. from the same university. Formerly he was associated with Xavier's College and Jadavpur University as a Faculty member. Presently he is Associate Professor of Physical Science Department at IISER-Kolkata. His research interest focused on Lie - algebraic techniques in the field of Quantum Optics, especially in squeezed states and matter radiation interaction. Dr. Dasgupta has several research publications in national and international peer reviewed journals.

**DR. SAMIR KUMAR PAL**

Dr. Samir Kumar Pal is a Professor at the Dept. of Chemical, Biological & Macromolecular Sciences of S. N. Bose National Centre for Basic Sciences, Kolkata. He did M.Sc. in Physics in 1994 and Ph. D. in 2000 on Laser Spectroscopy (picosecond). During the year 2000 – 2003, he worked as a Post-Doctoral Fellow at California Institute of Technology (CALTECH), U.S.A. under Prof. A. H. Zewail, Nobel Laureate in Chemistry in 1999. He is a Regular Visiting Professor of CALTECH, USA; TU Brunswick, Germany; University Aarhus, Denmark; Durham University, UK; University Leiden, Netherlands etc. His research interests include Ultrafast Spectroscopy of Molecules and Nanomaterials, Solar Devices and Biomedical Instrumentation. 14 students have already obtained their Ph.D. degree (all settled in abroad) and 12 scholars are working for the same under the able guidance of Dr. Pal. He has 170 research publications in international Peer-referred Journals, 5 Books and 14 Patents (including one has been approved). Dr. Pal was awarded with UKERI in 2007 for his work in the field of Nano-science. He is one of the editors of EPJ techniques and Instrumentation (Springer, London), Advances in Physical Chemistry (Hindawi, USA). He has been refereed in nos. of journals such as Nature, Angew. Chem., Journal of the American Chemical Society, Journal of Physical Chemistry, Journal of Chemical Physics, Biochemistry etc.

**DR. ABHIJIT BHATTACHARYA**

Dr. Abhijit Bhattacharyya is a Professor of Physics at Calcutta University. He did B.Sc. from Presidency College in 1990, M.Sc. from IIT, Kanpur in 1992 and Ph.D. from Bose Institute in 1998. He was the recipient of Alexander von Humboldt Award at University of Frankfurt, Germany during his Post Doctoral research. He made some important scientific visits to CERN (Geneva), Yukawa Institute (Japan), ICTP (Italy). His research interest focused on High Energy Physics, QCD Phase Transition, Heavy Ion Collisions and Compact Stars. Dr. Bhattacharyya has several research publications in national and international peer reviewed journals.

**DR. PARTHASARATHI MUKHOPADHYAY**

Dr. Parthasarathi Mukhopadhyay is the Associate Professor of Mathematics in Ramkrishna Mission Residential College, Narendrapur. He is also a guest faculty (Post Graduate) at Ramkrishna Mission Vidyamandir, Belur Math. Dr. Mukhopadhyay did his M.Sc. in Pure Mathematics, M. Phil. & Ph.D. in Mathematics from C.U. He published lots of research papers in National & International journals. He also published books for undergraduate level and school level. He attended many conferences & seminars at National & International level. He is a life time member of the Calcutta Mathematical Society

**DR. SANGHAMITRA SENGUPTA**

Dr. Sanghamitra Sengupta received the M.Sc. and Ph.D. degrees in 1991 and 1998, respectively, from the Department of Biochemistry, University of Calcutta. After obtaining postdoctoral training in the Department of Genetics of Case Western Reserve University and Stanford University, USA, she joined the Human Genetics Unit of the Indian Statistical Institute as a research scientist. She has been a faculty member in the Department of Biochemistry, University of Calcutta, since 2005. She is a member of the Indian Society of Human Genetics, Society of Biological Chemists and Indian Association of Cancer Research. Her main research interests include host genetics of infectious disease and cancer genomics. Besides, she bears an active interest in the environmental and human metagenomics. Her work has resulted in 30 research publications in peer-reviewed journals.

**DR. ARNAB CHAKRABORTY**

Dr. Arnab Chakraborty is presently the Assistant Professor at Applied Statistics Unit, Indian Statistical Institute, Kolkata. He did B. Stat and M. Stat from Indian Statistical Institute, Kolkata and Ph.D. from Stanford University, USA. He loves to motivate students to learn mathematics by exploring new ideas. A thorough hater of the routine way adopted in most schools and textbooks to teach mathematics.

**DR. SMARAJIT MANNA**

Dr. Smarajit Manna did his B.Sc. and M.Sc. in Physics. Worked as Junior Research Fellow and Senior Research Fellow at Jadavpur University and Delhi University South Campus respectively and received his Ph.D. degree from Jadavpur University Currently working as Student Advisor at JBNSTS, Kolkata. His research interest includes conduction mechanism through biological membranes and the underlying dynamics. His research interests are Statistical analysis of dynamical systems and Bio-informatics. Dr. Manna has 8 research publications in national and international journals and he is one of the authors of the book chapter “Electrical noise in cells, membranes and neurons in: Understanding Complex Systems”, Springer Berlin/ Heidelberg. He is working as Student Advisor of JBNSTS and apart from guiding students he is carrying out different academic and research work. His current research interests include statistical analysis of dynamical systems and Bio-informatics.

**DR. ABHIJIT KAR**

Dr. Abhijit Kar received his PhD in Chemistry-Materials Science from Jadavpur University, India. He has carried out his postdoctoral research in Sungkyunkwan University, South Korea, Swiss Federal Laboratory at Zürich, Switzerland; visiting scientist at RYhr Universität, Germany. Dr. Kar has about 15 years of research & teaching experience. His current research interest comprises of Application of Nanotechnology for Advanced Materials Processing and Characterizations. He has developed expertise on Different Materials Characterization Techniques; Mechanical & Functional Property Evaluation of Materials. He has worked on different similar and dissimilar materials joining techniques and Thermodynamic Modeling of materials. He is one of the first and pioneer research scientist worked on lead free solder development for electronics/microelectronics applications from India. Dr. Kar has published 39 research papers in Journals and contributed in book chapter on Electron Microscopy. Dr Kar has edited a book entitled Nanoelectronics and Materials Development. Abhijit also serves as reviewer of many International Peer Reviewed Journals from Elsevier & Springer. He is editorial board member of Journal of Materials Sciences and Applications, American Association for Science & Technology, Journal of Energy and Natural Resources etc.

**DR. DEBAJYOTI GHOSHAL**

Dr. Debajyoti Ghoshal is presently an Assistant Professor at the Department of Chemistry (Inorganic Section), Jadavpur University. He did his M.Sc. from Visva-Bharati, Santiniketan and Ph.D. from Jadavpur University. His research interest is focused on Non-covalent interactions, Functional supramolecular architecture, Crystal engineering and Molecular materials. Dr. Ghoshal has several research publications in national and international peer reviewed journals.

**DR. SOUMEN BASAK**

Dr. Soumen Basak is a Senior Professor at the Chemical Science Division, Saha Institute of Nuclear Physics, Kolkata. He did his Ph.D. from University of Chicago in 1982 and then joined SINP as faculty member in 1987. Dr. Basak has several research publications in national and international peer reviewed journals.


# “Learning Science”

## Day to Day Program

### Day 1 : Monday, March 27, 2017

09:00 a.m. – 09:45 a.m.	<b>Registration</b>	
09:45 a.m. – 10:00 a.m.	<b>Welcome Address</b> <b>Dr. Maitree Bhattacharyya</b> , Professor & Director, Jagadis Bose National Science Talent Search, Kolkata	
10:00 a.m. – 11:30 a.m.	<b>‘Origin of Life’</b> <b>Dr. Dhrubajyoti Chattopadhyay</b> , Vice Chancellor, Amity University, Kolkata	
11:30 a.m. – 01:00 p.m.	<b>‘Photochemistry at Interface’</b> <b>Dr. Samita Basu</b> , Professor, Chemical Science Division, Saha Institute of Nuclear Physics, Kolkata	
01:00 p.m. – 02:00 p.m.	Lunch & Interaction	
02:00 p.m. – 06:00 p.m.	<b>‘Let’s improve your research aptitude – do some active research’</b> <b>Dr. Smarajit Manna</b> , Student Advisor & <b>Dr. Abhijit Kar</b> , Scientific Officer, JBNSTS, Kolkata	

### Day 2 : Tuesday, March 28, 2017

09:00 a.m. – 10:00 a.m.	<b>Registration</b>	
10:00 a.m. – 11:30 a.m.	<b>‘Excitements with Materials in Nanoscale’</b> <b>Dr. Samit Kumar Ray</b> , Professor & Director, SNBNCBS, Kolkata	
11:30 a.m. – 01:00 p.m.	<b>Write-up Session: On some issues of National Importance</b> <b>Dr. Anindita Ukil</b> , Assistant Professor & <b>Dr. Ishani Deb</b> , Assistant Professor, Department of Biochemistry, University of Kolkata	
01:00 p.m. – 02:00 p.m.	Lunch & Interaction	
02:00 p.m. – 06:00 p.m.	<b>‘Let’s improve your research aptitude – do some active research’</b> <b>Dr. Smarajit Manna</b> , Student Advisor & <b>Dr. Abhijit Kar</b> , Scientific Officer, JBNSTS, Kolkata	

### Day 3 : Wednesday, March 29, 2017

09:00 a.m. – 10:00 a.m.	<b>Registration</b>
10:00 a.m. – 11:00 a.m.	<b>‘Nanoscience &amp; Nanotechnology: Fundamental and Applications’</b> <b>Dr. Dulal Senapati</b> , Associate Professor, Chemical Science Division, SINP, Kolkata
11:00 a.m. – 11:30 a.m.	Lunch & Interaction
11:30 a.m. – 06:00 p.m.	<b>Academic Visit to Centre for Research in Nanoscience &amp; Nanotechnology(CRNN), CU, Salt Lake Campus, Kolkata</b>

### Day 4 : Thursday, March 30, 2017

09:00 a.m. – 10:00 a.m.	<b>Registration</b>
10:00 a.m. – 11:30 a.m.	<b>‘The Three-body Problem’</b> <b>Dr. Ananda Dasgupta</b> , Associate Professor, Department of Physical Science, IISER, Kolkata
11:30 a.m. – 01:00 p.m.	<b>‘Development of Indigenous Devices and Nanomedicines for Community Linkage’</b> <b>Dr. Samir Kumar Pal</b> , Professor, Dept. of Chemical, Biological & Macromolecular Science, SNBNCBS, Kol.
01:00 p.m. – 02:00 p.m.	Lunch & Interaction
02:00 p.m. – 03:30 p.m.	<b>‘The fundamental constituents of matter and their interactions’</b> <b>Dr. Abhijit Bhattacharyya</b> , Professor, Department of Physics, C.U., Kolkata
03:30 p.m. – 05:00 p.m.	<b>‘Constructibility — an Old Engima’</b> <b>Dr. Parthasarathi Mukhopadhyay</b> , Associate Professor, Department of Mathematics, R K Mission Residential College, Narendrapur, Kolkata
05:00 p.m. – 06:00 p.m.	Summing up Session

### Day 5 : Friday, March 31, 2017

09:00 a.m. – 10:00 a.m.	<b>Registration</b>
10:00 a.m. – 11:30 a.m.	<b>‘Understanding DNA, molecular backbone of life’</b> <b>Dr. Sanghamitra Sengupta</b> , Assistant Professor, Department of Biochemistry, CU, Kolkata
11:30 a.m. – 01:00 p.m.	<b>‘Puzzles and Magic with Mathematics’</b> <b>Dr. Arnab Chakraborty</b> , Assistant Professor, Applied Statistics Unit, ISI, Kolkata
01:00 p.m. – 02:00 p.m.	Lunch & Interaction
02:00 p.m. – 06:00 p.m.	<b>Project Presentation by the Participants</b> <b>Judges: Dr. Soumen Basak</b> , Senior Professor, Chemical Science Division, SINP, Kolkata <b>Dr. Debajyoti Ghoshal</b> , Assistant Professor, Department of Chemistry, J.U., Kolkata