

DST-INSPIRE INTERNSHIP SCIENCE CAMP - 2012



Department of Science & Technology
Govt. of India

In association with



Jagadis Bose National Science Talent Search
Govt. of West Bengal

Science Camp Entitled:

“বিজ্ঞানের জগৎ”

May 15 – 19, 2012

At JB Centre of Excellence for Student – Scientists



Jagadis Bose National Science Talent Search,

1300, Rajdanga Main Road, Kasba, Kolkata – 700 107

Phone : 2441 7542, 2442 8270 Fax : (033) 2442 8267

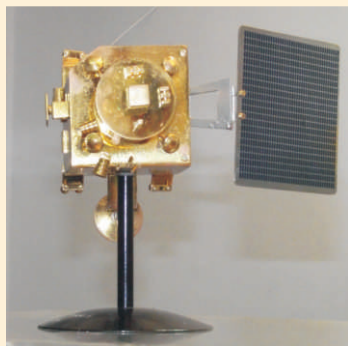
E-mail: jbnsts@gmail.com / jbnsts@vsnl.com; Website : <http://www.jbnsts.org>

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. Since 1961, JBNSTS is awarding the prestigious Jagadis Bose Scholarships to selected group of undergraduate students of science, engineering and medicine.



In the last five decades, JBNSTS has grown to become a premiere institute of non-formal science education in the eastern and northeastern States of India with the objective towards pursuit of excellence through motivation, identification and nurture of young talented science students. It 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. JBNSTS also encourages students towards the learning of basic sciences and inculcates scientific spirit in the minds of young high school and undergraduate students. Focus has been 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. Since 2004, JBNSTS has launched an innovative middle school science Teachers Training Program which has brought into its ambit motivated teachers from the districts of West Bengal. JBNSTS has developed science kits and distributed to the teachers for demonstrating scientific principles to the middle school 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 & Industries also collaborate with JBNSTS activities.

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About DST-INSPIRE Program

Innovation in Science Pursuit for Inspired REsearch (INSPIRE) is an innovative programme being implemented by the Department of Science and Technology (DST), Govt. of India. The basic objective of INSPIRE is to communicate to the youth of the country the excitement of creative pursuit of science, attract talent to the study of science at an early age and thus build the required critical human resource pool for strengthening and expanding the Science & Technology System and Research & Development base. Under the INSPIRE project 'Scheme for Early Attraction of Talents for Science' (SEATS) is a program to inspire talented Science students (*top 1% performers in class-X board examination*) into basic science streams.



A striking feature of the programme is that it does not believe in conducting competitive exams for identification of talent at any level. It believes in and relies on the efficacy of the existing educational structure for identification of talent and builds on opportunities that can be derived within the systems.

Science camps are a great way for children to explore the principles and methods of scientific research and strive to get young people interested in science at an early age. They are based on concepts of facilitated self-learning, holistic education, group activities, exchange of cross-cultural ideas, motivation towards independent thought and action and forming life-long friendships with similar minded people and established scientists. Leadership, passion and appreciation of the nature around us are invaluable characteristics for future scientists, and the Science Camp activities strive to encourage these traits.



Organizing Committee

Chief Patron:

Dr. A. Mukhopadhyay, DST, Govt. of India

Academic Committee:

Prof. (Dr.) Papiya Nandy, Hony. Director, JBNSTS

Dr. Paromita Roy, JBNSTS

Dr. Abhijit Kar, JBNSTS

Dr. Smarajit Manna, JBNSTS

Camp Coordinators:

Shri Joydip Das, Asst. Director (admin), JBNSTS

Ms. Sucharita Kundu

Shri Dipankar Sarkar

Mentors

Prof. Siddhartha Roy

Director

Indian Institute of Chemical Biology

Kolkata – 700032

Dr. Anjan Ghosh

Vice President

Total Quality Management

Exide Industries Ltd.

Kolkata – 700 071

Prof. Basudev Bhattacharya

President, Sky watchers' Association

Kolkata – 700031

Dr. Brajadulal Chattopadhyay

Department of Physics, Jadavpur University

Kolkata-700032

Dr. Subodh Mahanti

Honorary Director and

Scientist 'F', Vigyan Prasar

Noida - 201309, U.P.

Prof. Sujata Tarafdar

Department of Physics, Jadavpur University

Kolkata-700032



Prof. Partha Ghose

Platinum Jubilee Fellow, National Academy of Sciences, India
Senior Scientist, Bose Institute, Kolkata

Dr. Paromita Roy

Deputy Director, JBNSTS

Prof. K. C. Das

Professor (Retd.), Math. Department, Jadavpur University
Kolkata - 700032

Prof. Subhendu Ghosh

Department of Bio-Physics,
University of Delhi South Campus,
New Delhi-110021

Prof. Partha Deb Ghosh

Professor, Department of Botany, Kalyani University
Nadia -741235

Prof. Chitra Mandal

Professor & Head, Cancer and Cell Biology
Indian Institute of Chemical Biology
Kolkata – 700 032

Dr. Dipankar Banerjee

Associate Professor,
Indian Institute of Astrophysics,
Bangalore – 560034

Name of the participating schools:

- Jenkins School, Coochbehar
- Monindranath High School, Coochbehar
- Dinhata Sani Devi Jain high School, Coochbehar
- Rambhola High, Coochbehar
- Katwa Kashiram Das Institution, Burdwan
- Katwa Bharati Bhaban, Burdwan
- Katwa Ramkrishna Vidyapith, Burdwan
- Tenya Santi Sudha Das Vidyamandir, Burdwan
- Kandra J.M. High School Burdwan
- Dainhat High School, Burdwan
- Malihat Kandra High School, Burdwan
- Barasat M G M High School, N 24 pgs
- Dum Dum Kishore Bharati School, Kolkata

BRIEF INTRODUCTION TO THE EXPERTS

DR. PAPIYA NANDY

Prof. Papiya Nandy received her Masters degrees in Physics from University of Calcutta and University of California at Santa Barbara and Ph.D. on Liquid Crystals from Kent State University, USA. Her post-doctoral work was in Experimental Biophysics from Max Planck Institute, Göttingen, Germany. Later she was Associate Professor of Physics in University of Ulm, Germany. She joined Physics department in Jadavpur University and besides teaching for more than 30 years in the Science and Engineering faculties, she was and still is in charge of several research projects. Her field of research encompasses membrane biophysics, numerical analysis of DNA and protein sequences and application of Nanomaterials in ceramics and bio systems. She has more than hundred research publications in peer reviewed journals and 3 patent awards. She has guided several Ph.D. and Masters thesis. She is currently the Emeritus Fellow of Jadavpur University and the Honorary Director of JBNSTS, of which she is a scholar from the first batch. At JBNSTS her objective is to make it a vibrant and dynamic institution, to motivate, identify and nurture young talented science students and establish the base of scientific enquiry and culture of tomorrow.

DR. SIDDHARTHA ROY

Prof. Siddhartha Roy, presently the Director, Indian Institute of Chemical Biology, is associated with scientific research in Structural Biology & Bio-Informatics Division of this institute. He did his Ph.D from University of Delaware; Newark, F.N.A, F.A.Sc. In his academic career, he received several awards/fellowships like Meritorious Service Award in 1986 from Dept. of Health & Human Service USA, Human Frontier Services Fellowship in 1993 and the Santi Swarup Bhatnagar Prize in 1999. His current research interests include Macromolecular Interaction: Recognition and Engineering and Drug Development. He has numerous scientific publications in renowned journals.

DR. ANJAN GHOSH

Dr. Anjan Ghosh, a JBNSTS Scholar of 1970, got the Senior Cambridge degree from Calcutta Boys' School in 1969. He did his B.Sc. with Physics honors and B.Tech. in Instrumentation and Electronics Engineering from Jadavpur University and M.B.A. from Indian Institute Social Welfare and Business Management. Then he turned into science journalism. He was the author of the science column of the Sunday Miscellany supplement of the Statesman. He is presently the Vice President, Total Quality Management, Exide Industries Limited, Kolkata.

DR. BASUDEB BHATTACHARYYA

Prof. Basudev Bhattacharyya, a now-retired Physics teacher of Behela College, is the President of 'Sky Watchers' Association', Kolkata. He loves physics but lives with Astronomy. Prof. Bhattacharyya studied Astronomy in his B.Sc. course and subsequently expertise in Astronomy, Astronomical observations and sky watching at Sky Watchers' Association (SWA). For more than two decades he has been engaged in propagating Science and Astronomy among the common people through hundreds of lectures and slide shows, seminars, televisions and workshops and public sky observations through telescopes and binoculars. He published lots of papers and articles on astronomy and astronomical events in different periodicals and news papers. Prof. Bhattacharyya has long been associated with the Science Program of JBNSTS.

DR. BRAJADULAL CHATTOPADHYAY

Dr. Brajadulal Chattopadhyay is currently Associate Professor, Department of Physics, Jadavpur University, Kolkata. He did his B.Sc, M.Sc and Ph. D. from Calcutta University. Dr Chattopadhyay has many publications in international journals and patents in India and USA. He is one of the authors of book of ACB Publication entitle 'Methane A future solution for energy crisis: Energy from Green Biomass'. Dr. Chattopadhyay is the recipient of several awards / fellowships such as National Scholarship, Government of India, Research Fellowship, UGC, Government of India, Postdoctoral Fellowship, DBT, Government of India, Research Associateship, DAE, Government of India and Overseas Associateship, DBT, Government of India.

DR. SUBODH MAHANTI

Dr. Subodh Mahanti, a well-known science communicator, did his B.Sc (Honours) from Burdwan University (1976) and MSc from Banaras Hindu University (1978). He was awarded National Scholarship and BHU Gold Medal for standing first in M.Sc. He did his Ph.D in Organic Chemistry (1982) and subsequently worked in Molecular Biology. For the last 20 years he has been working in the field of science popularization. Presently he is the Honorary Director of Vigyan Prasar, an autonomous organization set up by the Department of Science & Technology, Government of India, for taking up large-scale science popularization tasks and has co-ordinated a number of nationwide programmes undertaken by Vigyan Prasar. Dr. Mahanti has received a numbers of awards for his contributions in the field of science popularization including NCSTC National Award for Best Science and Technology coverage in Mass Media for the year 2003. Among other awards received by Dr. Mahanti include FIE Foundation National Award (2000), Delhi Hindi Academy Award (2006), Dr. Meghnad Saha Award (2005), and Atma Ram Purashkar of the Kendriya Hindi Sansthan, Agra Ministry of HRD, Government of India (2007). Dr. Mahanti writes both in Hindi and English. Besides his research papers, he has written more than 300 popular science articles and edited/authored/co-authored more than 20 books.

DR. SUJATA TARAFDAR

Dr. Tarafdar is a Professor of Physics at Condensed Matter Physics Research Centre, Jadavpur University, Kolkata since 1990. She did her B.Sc, M.Sc and PhD from Jadavpur University. Formerly she was a lecturer in Physics at BKC College, Kolkata during 1984-90. Her research area includes disordered systems, fractals, patterns in nature - viscous fingering, crack patterns, polymer electrolytes etc.

DR. PARTHA GHOSE

Dr. Ghose is a Senior Scientist, Platinum Jubilee Fellow (National Academy of Sciences, India) and is associated with Center for Astro Particle Physics & Space Science, Bose Institute. He was also a former faculty of SN Bose National Centre for Basic Sciences, Kolkata. He did his graduation and doctorate from Calcutta University. He has occupied distinguished positions in different academic institutions in India and abroad. Prof Partha Ghose has written many popular science articles in Bengali and English for various Journals and magazines and dailies. He was associated with the production of videocassette series on 'Classical Mechanics' and 'Quantum Theory' for UGC Country- wide Classroom series. Prof Ghose was associated with many episodes of the popular television science serial titled 'Quest'. He has also been a part of different science programs involving students from various levels. Prof. Ghose was the joint conductor of the first Science Camp of JBNSTS and held in November, 2006.

DR. PAROMITA ROY

Dr. Paromita Roy did her Bachelors in Psychology (with special paper in family counseling), as well as in Masters in Industrial Psychology and Organizational Behavior from Delhi University. She received her PhD from Delhi University in Clinical Psychology and worked in the field of cognitive deficits in schizophrenia from Delhi University. Dr. Roy has extensive field experience in the area of clinical psychology. Her expertise is in educational psychology, soft skill training, human resource development, curriculum planning, strategy development, pedagogy, teacher training and student counseling. She has been with JBNSTS since 1993. Her focus is on educational paradigms with a socio-holistic view. With her long experience with creative science students and teachers, she has been instrumental in designing tailor made science enrichment programs.

DR. K. C. DAS

Prof. K C Das would like to be introduced as someone whose passion is Mathematics. Though he cleared engineering entrance examinations when he was a student, he chose to study mathematics. Subsequently he taught at IIT Kharagpur from 1972-1984. From 1984 to 2008 he has been a Professor in Mathematics at Jadavpur University.

DR. SUBHENDU GHOSH

Dr. Subhendu Ghosh is currently Professor, Department of Biophysics, University of Delhi South Campus. He did his B.Sc. from Calcutta University (Presidency College), M.Sc., M.Phil and PhD in Biophysics from Jawaharlal Nehru University, New Delhi. His research interests include Cognitive Neuroscience, Ion Channels and Electrophysiology, Apoptosis and Neuronal Disorders, and Theoretical Biology. Dr. Ghosh occupied several distinguished positions such as Post-Doctoral fellow at Jawaharlal Nehru University, Research Officer & Principal Investigator in a DST Young Scientist Project at Jawaharlal Nehru University, UGC Research Associate at the Department of Biophysics, University of Delhi South Campus. Visiting Scientist at the University of Chicago Medical School, Chicago, at the Northwestern University Medical School, Chicago, Lecturer and Reader at the Department of Biophysics, University of Delhi South Campus, Professor, Department of Animal Sciences, School of Life Sciences and Center for Cognitive Science, University of Hyderabad, Professor at the Department of Biophysics, University of Delhi South Campus, Visiting Professor at the Max Planck Institute for the Physics of Complex Systems. Dr. Ghosh visited several Institutes and Universities and delivered talk abroad, such as Centre for Informatics (ZIH), Technical University, Dresden, Max Planck Institute for Human Cognitive & Brain Sciences, Leipzig, Humboldt University, Berlin, University College of London, Ear Institute, London, Medical University, Vienna, Institute of Molecular Physiology & Genetics, Bratislava, Slovak Republic, Albert Einstein School of Medicine, New York, Kegg Graduate Institute, Claremont, Birming Young University, Utah etc. He has many research publications in renowned journals and book chapters. Apart from a good academician, Dr. Ghosh is also a very good Classical Singer, a Dramatist, a Music Director and a Cultural Activist. He studied under Lt. Ustad Hafeez Ahmed Khan (Padmashree) of Rampur Gharana in Delhi and Lt. Pandit Ramesh Nadkarni of Bombay and performed at many places in India and abroad.

DR. PARTHA DEB GHOSH

Prof. Partha Deb Ghosh is a Professor of Botany in Kalyani University, West Bengal. He has completed his M.Sc. from Calcutta University in the year 1972, Ph.D. from Centre of Advanced Study on Cell and Chromosome Research, Dept. of Botany, Calcutta University in 1978 and Post Doctoral Fellowship from the same Institution in 1979. During the period of his research he was associated with different prestigious Institutions like Jadavpur University, Kolkata; Jawaharlal Nehru University, New Delhi; Banaras Hindu University; Central Institute of Medicinal and Aromatic Plants, Lucknow and acquired expertise in operational techniques of high-tech Instruments. Prof. Ghosh was honored with many awards like Indian National Science Academy Medal (Young Scientist Award), K.B Dutta Memorial Award, DPI merit Scholarship and Distinguished Scientist, UGC-MAPRD. He held the position of Head of the Department of Botany, Kalyani University during 1991 – 1993. Prof. Ghosh is also actively associated with several educational board/ council in state/ national level. His present interests in the field of research are Micropropagation of rare and endangered medicinal plants, selection of abiotic stress tolerant lines in mulberry and leguminous crops, selection of heavy metal toxicity lines in crop plants, molecular Characterization of genomic DNA in medicinal, aromatic and oil yielding plants, database analysis of medicinal and crop plants using Bioinformatic tools etc.

DR. CHITRA MANDAL

Dr. Mandal is currently Professor and Head, Cancer and cell Biology Division, Indian Institute of Chemical Biology, Kolkata. She did her M.Sc. in Organic Chemistry, Ph.D. in Bio-Organic Chemistry from Indian Institute of Science, Bangalore and post-doc on molecular Immunology at University of Pennsylvania, USA. Main theme of her research group is to understand the mystery of glycosylation of biomolecules to investigate disease-related problems. She has opened up new avenues in sialoglycobiology.

Dr. Mandal is an elected fellow of all three Indian academies (The Indian Academy of Sciences, National Academy of Sciences and Indian National Science Academy) and West Bengal Academy of Science and Technology. She is a recipient of prestigious “Sir J.C. Bose National Fellowship” Award (2010) by DST, Dr. Yellapragada Subba Rao Memorial Lecture Award (2011) by INSA, “Senior Scientist Oration Award” (2008) by Indian Immunology Society, 'BioTech Product and Process Development and Commercialization Award' (2005) by DBT, 'Kshanika Oration Award' (2002) by ICMR, The P. B. Rama Rao Memorial Award (2001) by S.B.C and 'Smt Chandaben Mohanbhai Patel Industrial Research Award' (2000) by VASVIK.

DR. DIPANKAR BANERJEE

Dr. Dipankar Banerjee is a Professor at Indian Institute of Astrophysics, Bangalore from where he got his Ph.D. He completed his Bachelors and masters degree from Calcutta University. He was a post doctoral fellow at Belgium and North Ireland. He has participated in Total Solar eclipse expeditions to different parts of the globe like from AN-32 Indian Air-force aircraft in 1994, from Anji, China in 2009 (longest total eclipse of this century) from Easter Island, Chile in 2010. Professor Banerjee is member of Royal Astronomical Society, Astronomical Society of India and co-principal investigator of the Coronagraph mission to be launched on Indian Satellite Aditya. He has several publications in reputed national and international journals.

Day to Day Program

Day 1 : Tuesday, May 15, 2012

10:00 a.m. – 11:00 a.m.	Registration
11:00 a.m. – 11:30 a.m.	Orientation
11:30 a.m. – 12:00 noon	Welcome Address by Prof. Papiya Nandy, Director, JBNSTS
12:00 noon – 01:00 p.m.	Inaugural Lecture : A Motivational Lecture Prof. Siddhartha Roy, Director, Indian Institute of Chemical Biology, Kolkata
01:00 p.m. – 02:00 p.m.	Lunch & Interaction
02:00 p.m. – 03:30 p.m.	“Team Sprit” Dr. Anjan Ghosh, Vice President, Total Quality Management, Exide Industries Ltd., Kolkata
03:30 p.m. – 05:00 p.m.	“Transit of Venus” Prof. Basudev Bhattacharyya, President, Sky watchers' Association, Kolkata
05:00 p.m. – 06:00 p.m.	Tiffin Break
06:00 p.m. – 08:00 p.m.	“Bacterial Concrete - A new hope for future Construction Technology” Dr. Brajadulal Chattopadhyay, Department of Physics, Jadavpur University, Kolkata

Day 2 : Wednesday, May 16, 2012

09:15 a.m. – 09:45 a.m.	Registration
09:45 a.m. – 11:00 a.m.	A Motivational Lecture Dr. Subodh Mahanti, Honorary Director and Scientist 'F', Vigyan Prasar, Noida, U.P
11:00 a.m. – 01:00 p.m.	“Fractals : Patterns of Nature” Prof. Sujata Tarafdar, Department of Physics, Jadavpur University, Kolkata
01:00 p.m. – 02:00 p.m.	Lunch & Interaction
02:00 p.m. – 05:00 p.m.	“Twinkle Twinkle Quantum Star” Prof. Partha Ghose, Senior Scientist, Bose Institute, Kolkata
05:00 p.m. – 06:00 p.m.	Tiffin Break
06:00 p.m. – 07:30 p.m.	“Higher Education: The Right Start” Dr. Paromita Roy, Deputy Director, JBNSTS, Kolkata

Day 3 : Thursday, May 17, 2012

09:30 a.m. – 10:00 a.m.	Registration
10:00 a.m. – 11:30 a.m.	“The Pigeon-Hole Principle” Prof. K C Das, Professor (Retd.), Department of Mathematics, Jadavpur University, Kolkata
11.30 a.m. – 01.00 p.m.	“Brain, Computer and Music” Prof. Subhendu Ghosh, Department of Bio-Physics, University of Delhi South Campus, New Delhi
01:00 p.m. – 02:00 p.m.	Lunch & Interaction
02:00 p.m. – 05:00 p.m.	“New horizon of plant genetics and innovations” Prof. Partha Deb Ghosh, Department of Botany, Kalyani University, Nadia
05:00 p.m. – 06:00 p.m.	Tiffin Break
06:00 p.m. – 08:00 p.m.	“Folk Origin of Hindustani Ragas” Prof. Subhendu Ghosh, Department of Bio-Physics, University of Delhi South Campus, New Delhi

Day 4 : Friday, May 18, 2012

08:30 a.m. – 09:30 a.m.	Registration & Departure for Science City
10:00 a.m. – 01:00 p.m.	Educational Visit to Science City, Kolkata
01.00 p.m. – 02.00 p.m.	Lunch & Interaction
02.00 p.m. – 05.00 p.m.	Educational Visit to Science City, Kolkata
05.00 p.m. – 05.30 p.m.	Departure from Science City
05:30 p.m. – 06:30 p.m.	Tiffin Break
06:30 p.m. – 07:30 p.m.	CD Show on Scientific Research

Day 5 : Saturday, May 19, 2012

09:30 a.m. – 10:00 a.m.	Registration
10:00 a.m. – 11:30 a.m.	“Scientific research and Human health: Need of the hour” Prof. Chitra Mandal, Cancer and Cell Biology Department, Indian Institute of Chemical Biology, Kolkata
11.30 p.m. – 01.00 p.m.	Valedictory Lecture Dr. Dipankar Banerjee, Indian Institute of Astrophysics, Bangalore
01:00 p.m. – 02:00 p.m.	Lunch & Interaction
02.00 p.m. – 05.00 p.m.	Egg Dropping Contest

A DST-JBNSTS Science Camp

“বিজ্ঞানের জগৎ”

(15th – 19th May, 2012) JB Centre of Excellence for Student-Scientists,
1300, Rajdanga Main Road, Kasba, Kolkata 700 107

Paste
Stamp-size
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here

Student's information sheet

Name of the student (in block letters):

Permanent address with contact number and e-mail Id(mandatory):

School's name (in block letters) & Address with pin code & phone no.:

Percentage of marks obtained in the 10th standard Board examination held in 2011:

Percentage of marks obtained in science subjects:

Favorite subject:

Who is your role model in science?

Would you like to pursue a career in science?

What is your expectation from a science camp?

स जीवति मनो यस्य मननेन हि जीवति

Have you heard about JBNSTS before the camp? How?

Signature of Student

“বিজ্ঞানের জগৎ”

(15th – 19th May, 2012) JB Centre of Excellence for Student-Scientists,
1300, Rajdanga Main Road, Kasba, Kolkata 700 107

Feedback sheet

Name of the student (in block letters):

School's name (in block letters) & address with pin code, phone no. & email-id:

What is your opinion about this science camp? Which of the sessions have you enjoyed more and why? How does it motivate you to pursue your future?

Your comments on how the science camp could have been made better?

स जीवति मनो यस्य मननेन हि जीवति

Signature of Student