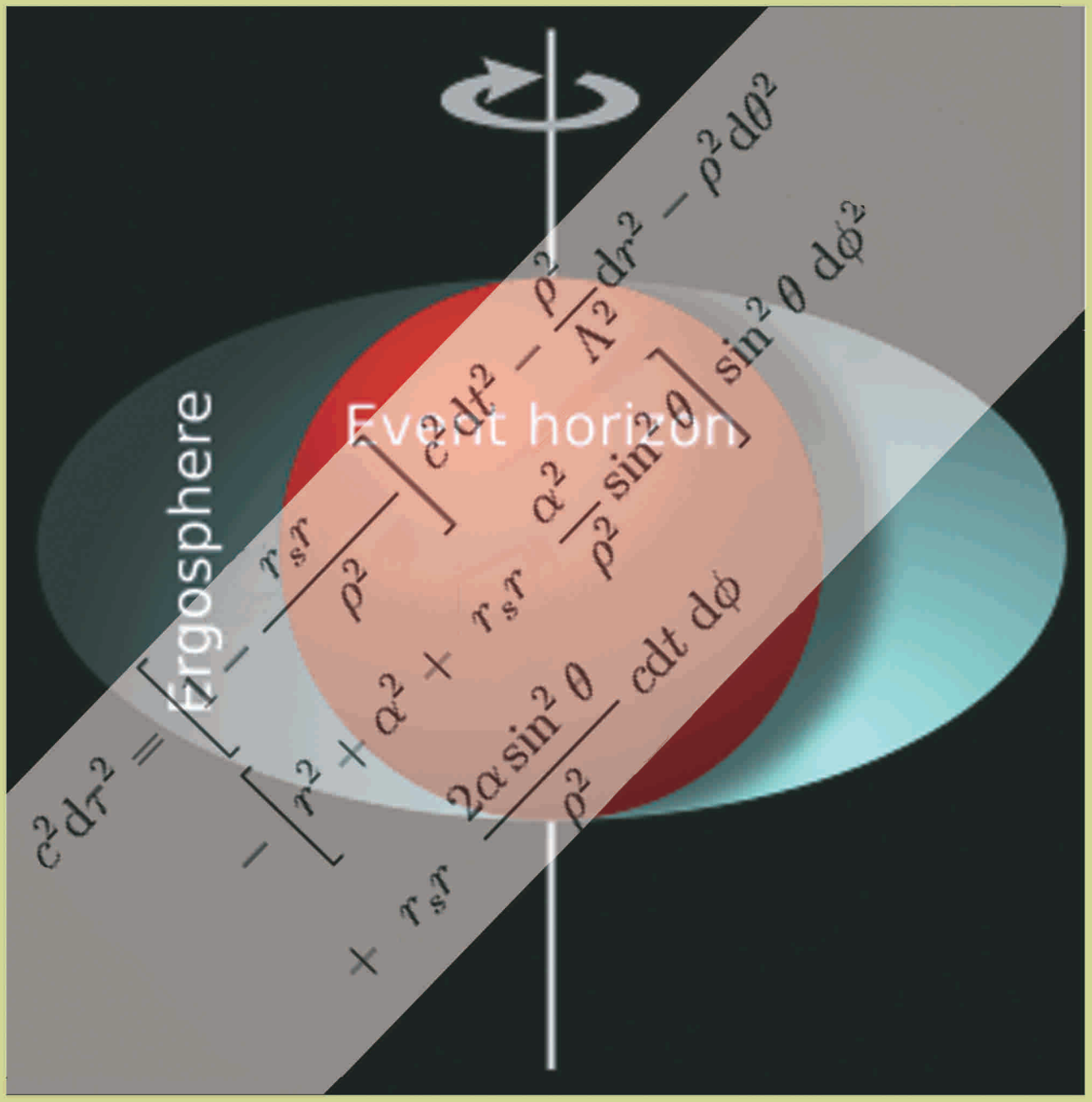
ANNUAL REPORT 2007-2008

SNBNCBS



CENTRE FOR BASIC SCIENCES 1986
S. N. BOSE NATIONAL
1894-1974
विज्ञानेन परिपश्यन्ति धीराः

S N BOSE NATIONAL CENTRE FOR BASIC SCIENCES

The Kerr metric describing the geometry of spacetime in the vicinity of a mass M rotating with angular momentum J. Prof. Roy Kerr, on the occasion of the first Chandrashekhar Memorial Lecture gave us a biographical account of how he discovered the Kerr metric. [The picture on the cover is taken from Wikipedia. Further details can be found there.]

Annual Report
2007 – 2008

Satyendra Nath Bose National Centre for Basic Sciences
Block JD, Sector III, Salt Lake, Kolkata 700 098


S. N. BOSE
সত্যেন্দ্রনাথ বসু
1894-1974

SATYENDRA NATH BOSE

It was the early nineteen twenties, Dhaka University had just started functioning. A young reader in the physics department decided to liven up the masters class by discussing a problem at the forefront of research in theoretical physics at that time. This was the issue of Planck's radiation law - a semi empirical fitting formula for the spectrum of black body radiation. Planck had come up with the formula in 1900 and twenty years later it still lacked a solid foundation. Meanwhile in 1905 Einstein had introduced the concept of photon to explain the photoelectric effect. To motivate the concept of photon, Einstein had made use of Planck's law, more precisely the high frequency part of it which was difficult to understand theoretically. By contrast the low frequency part of Planck's formula reduced to the well understood Rayleigh Jeans law.

The instructor had a bright idea for his lecture. He would try to reverse the Einstein path and use the photon picture to get the high frequency part of Planck's law. Photons were taken to be identical particles and what emerged was the entire Planck spectrum! The instructor was Satyendra Nath Bose and thus was born what was to become famous as Bose Einstein statistics. Bose wrote up his derivation of Planck's law and sent it for publication. It was rejected. In desperation, Bose sent the manuscript to Einstein who immediately realized the importance of what Bose had done. Einstein extended the calculation to particles of finite mass and was able to predict the phenomenon now known as Bose Einstein condensation (BEC). This was a phenomenon so strange that the experimentalists felt a compulsion to detect it in the laboratory. What followed was an intense struggle for seventy long years, opening up new vistas of reserach and finally led to the observation of BEC in 1995!

The life of Satyendra Nath Bose, thus makes some rather profound statements about the role of teaching and research in the development of science and the intimate relation between theory and experiment in the complete understanding of natural phenomena. As for the record, S. N. Bose was born in Calcutta in 1894. He studied in Presidency College where his batchmate was the other famous Indian physicist - Meghnad Saha. Bose joined the faculty of Calcutta University in 1916 and left for Dhaka in 1921. Later he became the Khaira professor of Calcutta University in 1945 and served for a while as the vice chancellor of Viswa Bharati in the fifties. He was made the national professor in 1958. Immensely interested in the languages and literature and different forms of art, S. N. Bose was the quintessential man of letters. His death in 1974 left a void in the intellectual world of the nation.

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FOREWORD

It gives me great pleasure to present to you the Annual Report for the year 2007-2008. The Annual Report for any scientific institution is an important document because it gives us a measure of our progress and helps us to bench mark; it is also a document that gives us accountability for the funds that we received.

In the previous year we had re-organized a number of organizational matters. This year we have consolidated these steps. In particular it has strengthened the offices of the two Deans Programme (Academic and Faculty) as well as the offices of the head of the department (HOD). They have been given new financial as well as administrative powers which resulted in effective decentralization in our decision making process. The Consultative Advisory Committee (CAC) which takes major decisions on important matters of administration and academic activities withinthe frame work of the policy decisions of the Governing Body (GB) and Finance Committee (FC) have met regularly and provided a channel of collective decision making. We would like to consider these as steps that will provide empowerment at different levels.

Strengthening our infrastructure and facilities for research has been a goal the Centre is pursuing since the last financial year. We believe that modern research is infrastructure and facility intensive and effective utilization of in-house as well as external facilities around the globe is needed to solve a problem comprehensively. A number of new experimental facilities have been installed and made operational. The Titanium-Saphire based femtosecond facility has been installed. This pushed the limit of resolution of the previous picosecond spectroscopy to sub-100fs regime. The facility is not only working, it has produced already a good number of very important publications. The Centre has also installed cluster computers for high performance computing which is being augmented with external project funding. Given the past record of computational physics of this Center we believe that this will strengthen our activities in this direction. We have also set-up a small optical lithography facility capable of sub 5 micron line features. This is being augmented to much smaller fabrications facility in the nanometer range using Focussed Ion Beam and Electron Beam Lithography both of which are in the process of procurement.

The new look Extended Visitor and Linkage Programme (EVLP) has been very active this year and our faculties have successfully organized 19 activities that include Conference/Symposia/Workshop/Advanced Schools. Some of them were international in character. The subjects range from the microcosmos to the cosmos - from DNA and biomolecules to black holes. This also reflects the flavor of the research in the Centre. This programme has already made an impact on our academic activities.

The Associate Programme has been strengthened and the Centre already has a number of new Associates. We have also initiated steps to revamp the Theoretical Physics Seminar Circuit (TPSC) programme to make it more compatible with the aspirations of the community at large. Prof. R. Ramesh of University of California, Berkeley delivered the C. K. Majumdar Memorial Lecture while Prof. William D. Arnett of University of

Arizona delivered the first S. Chandrasekhar Lecture. In terms of extra space, the Centre was lucky to have occupied part of the new construction activities. The administration along with the offices of the Director, the two Deans and the Registrar have found permanent location in the new building. The Library has also a new place and a new look. We have added a new hostel block for 30 students.

I am happy to note that the research output of the Centre has shown enhancement in terms of numbers. In particular, a number of the faculty members had a very fruitful academic year. I hope that we keep up our research output at a high level and bring in more focus so that we can make an international impact. Last year we have made more than 160 journal publications which amounts to on the average around 5 papers/Faculty per year. Some of our faculty members have done much more than the average. In the next page we provide a summary of our progress in terms of actual numbers.

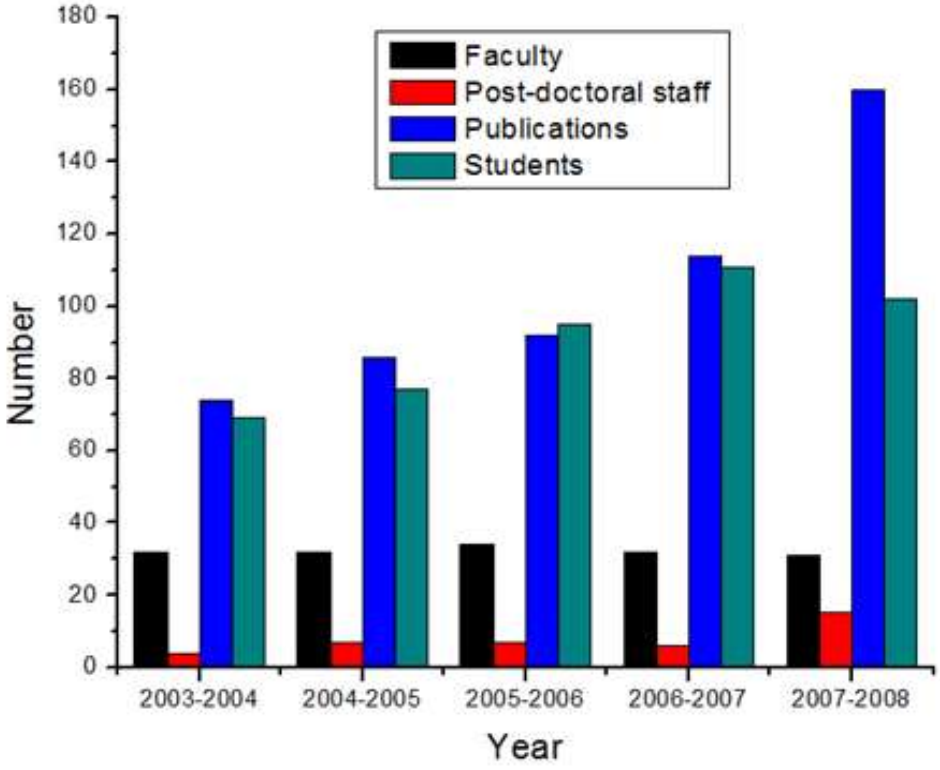
It is also a year when our administration had a big change. Our full time Registrar took a lien. I am sincerely grateful to Dr. Samir K. Paul and Dr. Ranjan Chaudhury for their sincere efforts as Acting Registrar. I am also grateful to the main officials of the Administration as well as the very capable support staff who did function as a team and indeed provided the complete facilitating activity that we needed. Without their full cooperation we could not have progressed.

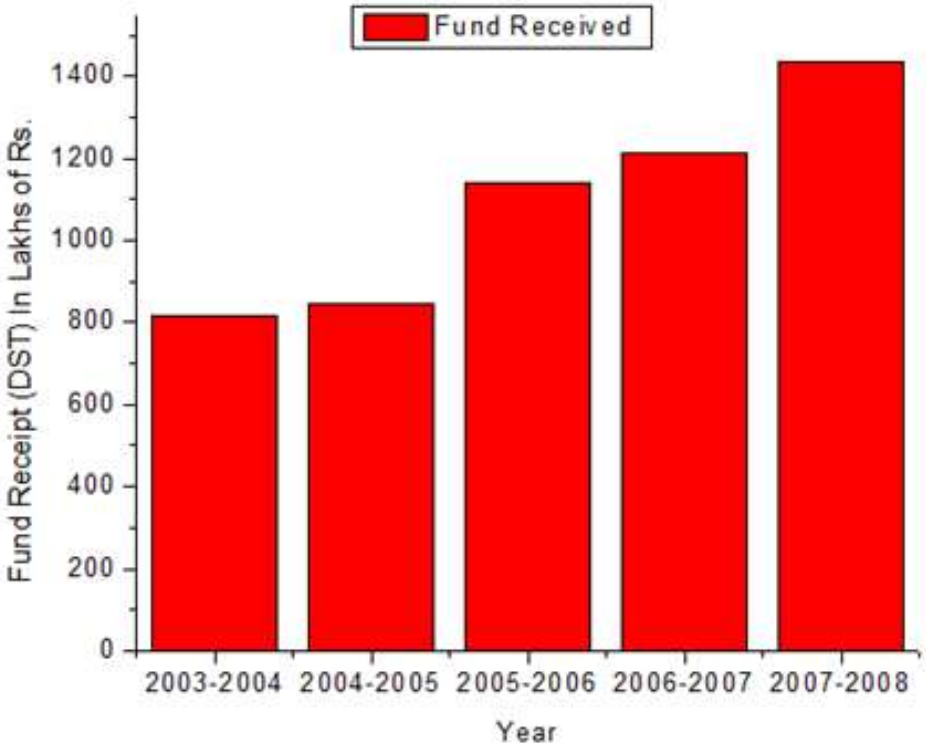
I am grateful to the Annual Report Committee for giving shape to this report which as you can make out has a new presentation. In particular, I would like to put on records the contributions of Ms. Surashree Banerjee (Dutta), Mr. Gurudas Ghosh, Mr. Sirsendu Ghosh and Ms. Mahua Mitra, for their efforts which made this report a reality.

I am indeed grateful to all our faculties, staff and students for a very fruitful year and for giving me enough reason to feel happy and proud. As a Director I strive to see that I can make a difference.

Arup Kumar Raychaudhuri
Director

Growth in last five years





REPORT FROM THE DEAN (Faculty)

The health of any research institution depends crucially on periodic infusion of bright young scientists and their fresh, new ideas. Last year, in order to strengthen it's existing faculty, the Centre envisaged recruitment of visiting faculty and Bose Fellows. We had applicants of high quality. Three Bose Fellows, one each in the Departments of Materials Sciences, Chemical, Biological and Macromolecular Sciences and Astrophysics and Cosmology were selected to join the Centre during this academic year. In addition, five visiting faculty joined the research programme. The impetus of this and the concerted effort of our Faculty members were clearly visible in the publication profile of the Centre. Not only was the average publication per faculty among the best among research institutions in the country, but also it was far more uniformly distributed than in previous years and many appeared in high quality journals.

The development of the DST sponsored Unit for Nanosciences (UNANST) proceeded full steam ahead with laboratories coming up in the new space made available by partial occupation of our new Faculty Building. In addition, a new Advanced Materials Research Unit (AMRU) was set up with DST funding, bringing together computational Materials scientists and those from Chemical and Biological streams.

The Centre's Associateship programme was remodeled thoroughly and an Extended Visitors Programme (EVLP) unit was set up to oversee all aspects of temporary visitors to our academic programme, including Senior and Junior Associates.

Our research collaborations with Germany, UK, Sweden, South Africa and the US continued throughout the year. The student exchange programme was finalized between the Centre and Uppsala University of Sweden.

Abhijit Mookerjee

REPORT FROM THE DEAN (Academic Programme)

The past year saw the academic programme of the Centre thriving in every way. The post B.Sc. Integrated Ph.D programme intake was small but the enthusiasm of the students made up for the shortfall in numbers. A large number of elective courses was available for the fourth semester students. It was decided to resume formal course work for the post M.Sc. Ph.D students with the first semester courses common to all the students. The year also saw a large number of conferences, workshops, schools and brainstorming sessions. There were a large number of international and national participants and all the programmes turned out to be very useful for the researchers as well as the beginning students. The Summer Project Programme which brought a number of undergraduates to the campus added to the vibrancy of the place.

The Centre continued to maintain an active schedule of academic programmes during the year. A brief profile is presented below:

Conferences/Workshops/Symposia organized by the Centre

Conference on "Advanced School on Applications of High Resolution X-Ray Techniques" during 3rd and 4th March 2008 at ITC Sonar Bangla

Organizers/Organizing Committee : Dr. Barnali Ghosh (Saha), SNBNCBS and Mr. Nirmal Chakraborty, PANalytical India Spectries Technologies Pvt. Ltd.

Conference on "Observational Evidence for Black Holes in the Universe (10th – 15th February, 2008) and Satellite Meeting on Neutron Stars, Black Holes and Gamma Ray Bursts (16th – 17th February, 2008) at Fort Radison, Vedic Village and SNBNCBS

Organizers/Organizing Committee : Prof. Sandip K Chakrabarti and Dr. Archan S Majumdar are joint Conveners. Both are from Astrophysics and Cosmology department of the Centre.

3rd Indo-Japan Conference on "Ferroics and Multiferroics" during 3rd – 8th February 2008 at IACS & SNBNCBS.

Organizers/Organizing Committee : Dr. Indra Dasgupta, Dr. Subodh Kumar De, Dr. Bhupendra N Dev, Dr. Sourav Giri, Dr. Priya Mahadevan, Dr. Subham Majumdar, Dr. Narayan Pradhan, Dr. Sugata Ray, Dr. Arup K Raychaudhuri, Dr. Tanusri Saha Dasgupta.

Workshop on "National Seminar on Mathematical Modelling of Pollution and Global Warming" during 12th-14th February 2008 at SNBNCBS

Organizers/Organizing Committee : Prof. Jyoti Das (CU) and Prof. Abhijit Mookerjee, SNBNCBS.

Workshop of "Electronic Structure : Theory and Applications" during 14th – 18th January 2008 at SNBNCBS

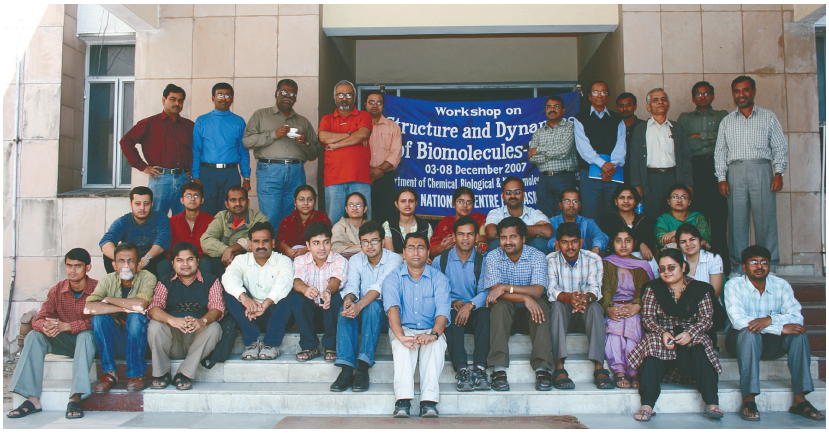
Organizers/Organizing Committee : Prof. Abhijit Mookerjee (SNBNCBS), Dr. I Dasgupta (IACS) and Dr. Biplab Sanyal (Uppsala University).

Conference on "Nonpertubative gauge theories and gravity" during 7th – 12th January 2008 at SNBNCBS

Organizers/Organizing Committee : Dr. Amitabha Lahiri, Dr. Manu Mathur, Dr. Samir K Paul (SNBNCBS) and Dr. Ambar N Sengupta.

Conference on "Structure and Dynamics of Biomolecules" during 3rd – 8th December 2007 at SNBNCBS

Organizers/Organizing Committee : Dr. Jaydeb Chakrabarti and Dr. Ranjit Biswas.



Workshop on "Light Scattering Methods in Dust Modelling" during 28th – 29th November 2007 at SNBNCBS

Organizers/Organizing Committee : Dr. S. K Sharma, SNBNCBS and Dr. A K Roy, ISI Kolkata

Brain Storming Session on "National/ Central Faculty for Remote Reference Magnetotelluric (RRMT) Network in India" during 26th – 27th November 2007 at EZCC-Aikataan Auditorium & SNBNCBS

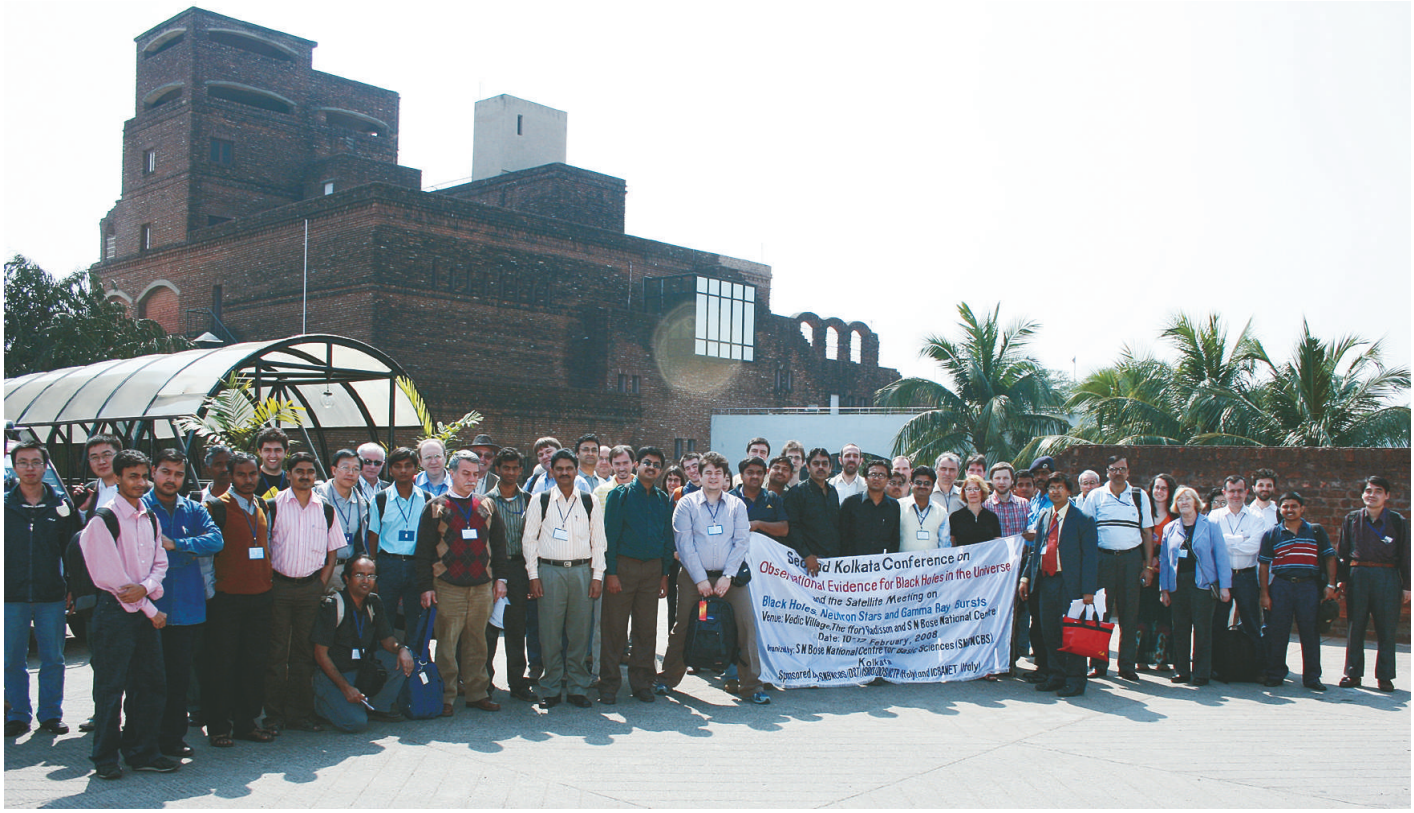
Organizers/Organizing Committee : Prof. Bimalendu B Bhattacharya, SNBNCBS and Dr. Shalivahan, Indian School of Mines, Dhanbad.

International Conference on "Ferromagnetic Shape Memory Alloys" during 14th – 16th November 2007 at HYATT, Kolkata & SNBNCBS

Organizers/Organizing Committee :Dr. P. K Mukhopadhyay and Dr. S. R. Barman.

Summer Research Project Students – 2007

1. Sayantari Ghosh (JNU-Delhi), 'High Tc Superconductivity', supervised by Dr. P. K. Mukhopadhyay
2. Shreya Nad (JNC-Student), 'Preparation of Bilayer Capacitor from a Fatty Acid', supervised by Dr. S. Sengupta.
3. Shweta Sangewar (JNC-Student), 'Theoretical Analysis of Olivines', supervised by Dr. S. Sengupta.
4. Souratosh Khan (St.Stephen's),'Polarization', supervised by Dr. M. Sanjay Kumar.
5. Ravi Pramod Kumar (JNC-Student), 'Quantum Transport', supervised by Dr. Priya Mahadevan.
6. Rajarshi Chakrabarti (CU), 'Spectroscopic studies of human serum albumin in normal and glycated conditions in a graded pH and temperatire environment', supervised by Dr. Ranjit Biswas.
7. Syamanta Kumar Goswami (Tezpur Uni.), 'A study on the basic characteristics of Co-Ni-Al Ferromagnetic Shape Memory Alloys' supervised by Dr. P. K. Mukhopadhyay.



Courses offered at the Centre during 2007- 2008.

Post B. Sc Courses

1st Year 1st Semester

SUBJECT	FACULTY
Classical Dynamics	Samir K Paul
Mathematical Methods I	Manu Mathur
Quantum Mechanics I	Subhasis Sinha
Electromagnetic Theory I	Amitabha Lahiri
Computational Methods in Physics I	Kinshuk Acharyya
Basic Laboratory	P K Mukhopadhyay

2nd Year 3rd Semester

SUBJECT	FACULTY
Quantum Mechanics III	Binayak Dutta Roy
Condensed Matter Physics	Abhijit Mookerjee & Tanusri Saha Dasgupta
Nuclear & Particle Physics	Asim K Ray
Project Based Courses	S S Manna, N.Nayak/A S Majumdar, Biswajit Chakraborty, Archan S Majumdar, Samir K Paul, Debashis Gangopadhyay, Abhijit Mookerjee.
Methods of Experimental Physics**	A K Raychaudhuri, Kalyan Mandal, A K Majumdar

** This course was common to Post B.Sc III Semester and Post M.Sc I Semester.

1st Year 2nd Semester

SUBJECT	FACULTY
Statistical Mechanics	Jayanta K Bhattacharjee
Mathematical Methods II	Samir Kumar Paul
Quantum Mechanics II	Binayak Dutta Roy
Electromagnetic Theory II	Partha Guha
Computational Methods in Physics II	Sumita Datta & Molly De Raychaudhury
Basic Laboratory	P K Mukhopadhyay, Kalyan Mandal

2nd Year 4th Semester

SUBJECT	FACULTY
Project Based Course	Students to choose one project from the floated projects.
Seminar Course – Electives I, II, III (Common with M-JRF)	Anindya Das, Barnali Ghosh, Asim K Ray
General Relativity & Cosmology	Debashis Gangopadhyay & Archan Majumdar
Advanced Statistical Mechanics	Surajit Sengupta
Non-Linear Dynamics (Reading Course)	Jayanta K Bhattacharjee
Advanced Quantum Field Theory	Rabin Banerjee & Biswajit Chakraborty
Advanced Mathematical Methods	Partha Guha
Advanced Condensed Matter Physics	Ranjan Chaudhury

Post M.Sc. Courses

Department of Material Sciences	
Semester I	
Methods of Experimental Condensed Matter I	Kalyan Mandal/A K Raychaudhuri/ A K Majumdar/P K Mukhopadhyay
Theoretical Condensed Matter I [Many-body theory and simulations]	Sugata Mukherjee/Priya Mahadevan
Semester II	
Theoretical Condensed Matter II	Ranjan Chaudhury/Kalyan Mandal
Methods of Experimental CondensedMatter II	Kalyan Mandal/A K Raychaudhuri/ A K Majumdar/P K Mukhopadhyay
Chemical, Biological and Macromolecular Sciences	
Semester I	
Mathematical Methods	Gautam Gangopadhyay
Quantum Mechanics; Dynamical Problems	Gautam Gangopadhyay
Advanced Statistical Mechanics	Jaydeb Chakrabarti
Exploration of ligand-protein Interaction	Samir Kumar Pal
Fundamentals of Biophysics	Rajib Kumar Mitra
Astrophysics & Cosmology	
Semester I	
Astrophysics, Cosmology & General Relativity	Sandip K Chakrabarti, Archan S Majumdar, Debashis Gangopadhyay
Theoretical Sciences	
Semester I	
General Theory of Relativity	Rabin Banerjee
Advanced Quantum Field Theory	Rabin Banerjee & Biswajit Chakraborty
Advanced Statistical Mechanics	Surajit Sengupta

Rabin Banerjee

REPORT ON ADMINISTRATIVE MATTERS

The administrative and technical staff members of the Centre have very professionally and sincerely carried out their duties for making the various activities of the Centre in 2007-2008 successful. Staff comprising of a strength of approximately 25 in the permanent, 13 in temporary and 27 in contractual category, have functioned effectively under the able leadership of the Director and the Registrar. The smooth running of the day to day activities of the Centre including guest house, security, EPABX, transport, cafeteria has been made possible due to the professional services provided by the various service contract agencies working closely with the various administrative departments of the Centre. The Centre has tried to enhance the capabilities of its administrative employees by encouraging them to attend various training programmes and workshops. The Centre has maintained a close communication with the Department of Science and Technology by replying to their various enquiries and parliamentary questions. No vigilance cases have been reported during the period of 2007-2008. The Centre has also adhered to the norms of the Right to Information Act and so far has not received any cases under the said act. The administration of the Centre has started functioning in its new building with effect from August 2007.

National Science Day Celebration with students from different schools in Kolkata.

Welfare Measures and Language Policy

The Centre is continuously making effort to improve its general welfare and security measures, language policy and training programmes as per GOI order/notification published from time to time. The Centre has constructed a Common Room, Tennis and Badminton Courts and Volleyball Court to promote indoor/outdoor games extensively. Matches and indoor competitions are organised at periodic intervals. About 250 various types of trees have been planted to maintain ecological and environmental balance. A small green house has also been developed for planting of seasonal flowers etc. to cater to the needs of beautification of Centre's lawn. Along the boundary wall 4 feet wide moorum pavement has been provided for security purpose as well as for constitutionals. The Centre provides transport facilities to all its staff members and students for pick-up and drop services as well as for all other official jobs. A car shed for parking Centre's vehicles has also been constructed keeping security considerations in mind.

The Centre has introduced a Contributory Medical Scheme, which extends medical support to all staff and visiting members of the Centre and their family members. Both hospitalisation and general day-to-day medical requirements are covered under the scheme. A number of renowned hospitals and diagnostic centres are within the network of the scheme. The Centre has also set up a medical unit with an allopathy and a homeopathy doctor visiting the campus regularly. Provisions for first aid treatment are also available in the Centre.

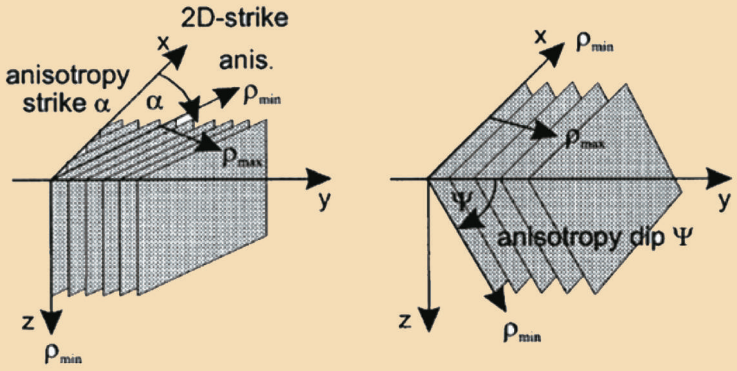
Periodically the Centre sends its employees for various training programmes in the interest of the Centre as well as to improve the work efficiency and career prospects. As per GOI RAJBHASA programme, the Centre sends employees by rotation to attend Hindi classes. Some of the employees have also attended the "RAJBHASA" conference in Delhi.

The Centre maintains GOI reservation policy in recruitment and promotion matters.

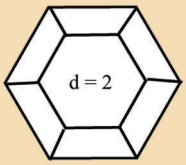
Ranjan Chaudhury
Acting Registrar

National Science Day Celebration

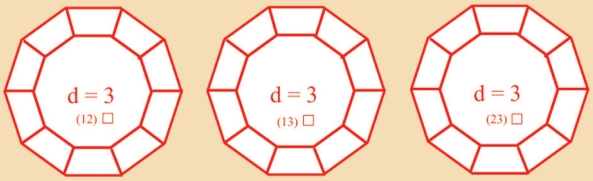
Department of Theoretical Sciences



Representation of anisotropy in earth materials

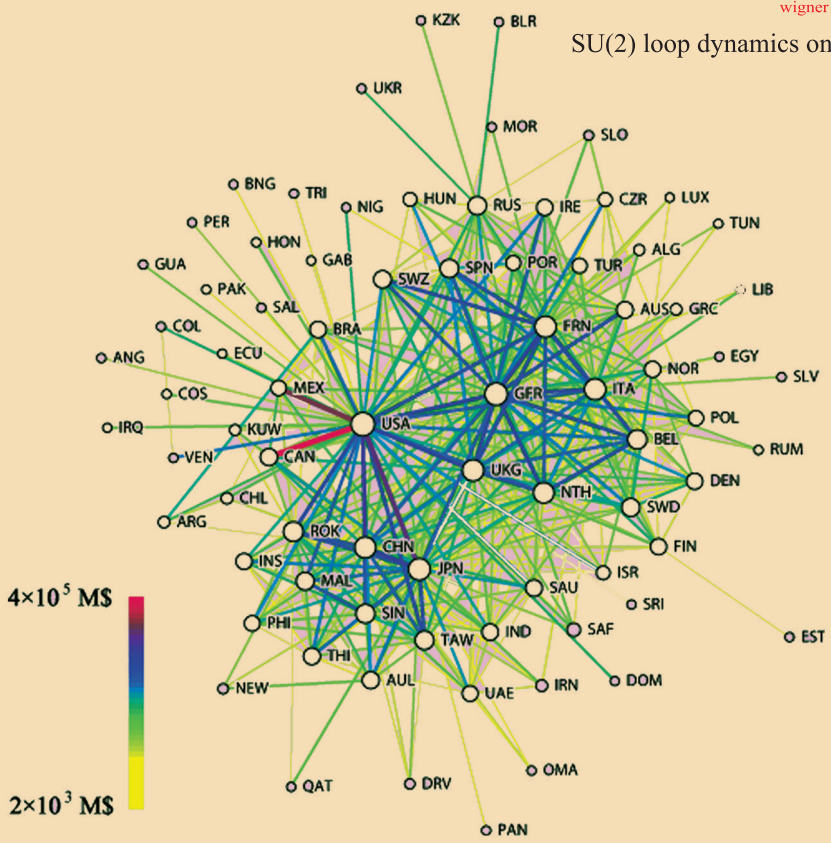


Wigner 18−j symbol

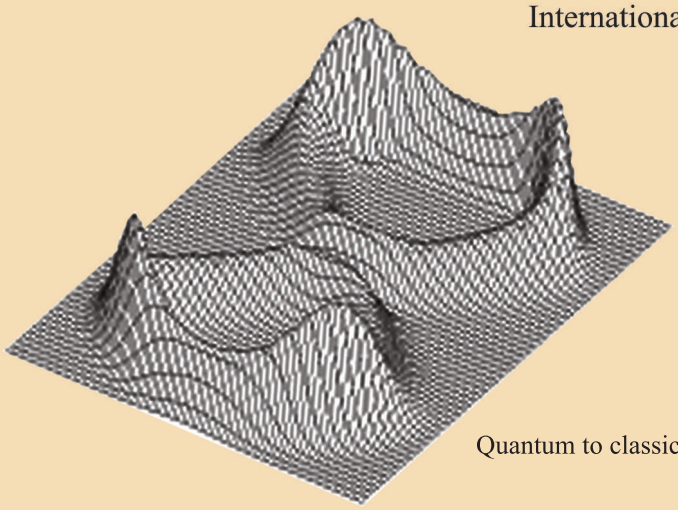


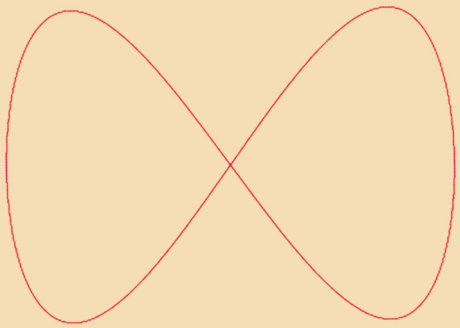
wigner 30-j symbol

SU(2) loop dynamics on lattice in (d+1) dimensions



International Trade Network, Year-2000





Quantum to classical trasition in the commensurate anisotropic oscillator

Academic Members

Faculty

Sl. No.	Name	Designation	Specialization
1.	R Banerjee	Professor	HEP[1] and QFT[2]
2.	J K Bhattacharjee	Senior Professor	Statistical Physics
3.	B B Bhattacharyya[3]	Senior Faculty	Geophysics
4.	B Chakraborty	Associate Professor	HEP and QFT
5.	P Guha	Reader	Mathematics and Mathematical Physics
6.	A Lahiri	Associate Professor	HEP, QFT, Gravitation and Mathematical Physics
7.	S S Manna	Professor	Statistical Physics
8.	M Mathur	Associate Professor	QFT and Lattice Gauge Theories
9.	A Mehta	Professor	Statistical Physics
10.	A Mohari	Faculty Fellow	Mathematics and Mathematical Physics
11.	N Nayak	Professor	Laser Physics and Quantum Information
12.	S K Paul	Reader	Mathematics and Mathematical Physics
13.	M Sanjay Kumar	Reader	Quantum Optics
14.	S K Sharma	Professor and Head	Optics

[1] High Energy Physics

[2] Quantum Field Theory

[3] Prof. B B Bhattacharyya is being supported by an external agency.

Post Doctoral Fellows

Sl. No.	Name	Designation	Specialization
1.	S Adhikari	PDF	Quantum Optics

Senior / Junior Research Fellows :

Sl. No.	Name	Specialization
1.	K Bhattacharya	Statistical Physics
2.	S. Bhattacharya	Gravitation
3.	S Chakrabarty	Statistical Physics
4.	C Chatterjee	QFT
5.	S Chatterjee	Mathematical Physics
6.	R Dasgupta	Statistical Physics
7.	D Datta	Statistical Physics
8.	S Gangopadhyay	HEP and QFT
9.	A Ghosh Hazra	HEP and QFT
10.	S G Kulkarni	HEP and QFT
11.	B R Majhi	HEP and QFT
12.	S Modak	HEP and QFT
13.	A Nandi	Statistical Physics
14.	D Ray	HEP and QFT
15.	A Saha	Statistical Physics
16.	S Samanta	HEP and QFT

Summary of Academic Activities

Rabin Banerjee

A recent approach to study the Hawking effect initiated by Wilczek and collaborators was modified leading to nontrivial simplifications. Also, a new approach to analyse the same effect was developed which was based solely on covariant expressions.

The tunnelling formalism was studied in details. Corrections to thermodynamic entities like temperature were computed. Modifications in the usual area law were obtained which agreed with other approaches. The effects of including noncommutativity in spacetime in the study of black holes were discussed. These ideas were summarised in an essay that received an "Honorable Mention" in the International Essay Competition (2008) conducted by GRF.

Jayanta K Bhattacharjee

The work done in the last twelve months covers :

i) Fluid Dynamics : investigation of third order structure factors in rotating turbulent flows and instabilities in a quasi-viscous disc accretion problems and hydraulic jumps.

ii) Statistical Physics : calculation of work distribution pertaining to Jarzynski equality and persistence crossover due to finite geometry.

iii) Quantum Physics : study of parametric resonance in a super-circular quantum dot.

Biswajit Chakraborty

My current interest involves studying the mathematical and statistical mechanics aspects of Noncommutative Quantum Mechanics and Quantum Field Theory. I am also working on their possible experimental signature in astrophysical and cosmological context.

I have 2 publications in refereed journals during this period. Supervised Ph.D. thesis of 2 students. I visited Centro Brasileiro de Pesquisa Fisikas (CBPF), and UFRJ Rio de Janeiro, Brazil, under TWAS-UNESCO visiting appointment during October-December '07 and gave 3 talks there. I also gave a talk in CHEP, IISc, Bangalore in February '08.

I taught 4^{th} semester course on Quantum Field Theory (jointly with Prof. R.Banerjee) to the Post B.Sc. students in SNBNCBS.

Amitabha Lahiri

i) Gravitation – the theory of black holes in the presence of a positive cosmological constant; the behaviour of classical and quantum fields near such objects;

ii) Mathematical physics – applications of category theory in quantum field theory and other branches of physics; differential structures and physics on path space of principal bundles;

iii) Quantum field theory – formation of flux tubes and monopoles in non-Abelian gauge theories; their dynamics in background fields and related consistency conditions.

He has three students, one working on each problem. Results were presented in one journal article and two conference articles. Four mathematical reviews were published by invitation.

S. S. Manna

The weighted International Trade Network can be looked upon as an excellent example of a complex network obeying scale-invariance and universality features. The scaled distributions of annual world trade volumes between countries collapse well to a log-normal distribution and it remains unchanged over a span of 53 years implying robustness or universality. Secondly, the nodal strength measuring the total trade volume of annual trade associated with a country grows non-linearly with its GDP with an exponent which varied from country to country but its distribution is peaked around a non-trivial value. It is also observed that a club of few rich countries trade among themselves a large fraction of the global trade and interestingly it is observed that the size of the club shrinks its size as time goes on.

Manu Mathur

I am interested and working in the following areas :

1) Loop quantization of gauge theories,
2) Duality Transformations in lattice gauge theories,
3) SU(3) and SU(N) coherent states,
4) Hamiltonian Flow method in Quantum Mechanics.

Organizer "International Conference on Non-Perturbative Gauge Theories and Gravity" (QGT-08) at SNBNCBS from 7th January 2008 - 12th January 2008.

Anita Mehta

Field : Statistical physics of complex systems, cognitive science

I am continuing to work on spatiotemporal heterogeneities in granular media with J. M. Luck (Saclay)), and G C Barker (Norwich). I am the only member of the S N Bose Centre to be part of an invited DST project on the cognitive sciences, on which I have started working recently. In the year 2007, I wrote a commissioned monograph for Cambridge University Press, Granular Physics. I serve on the Editorial Boards of CHAOS and Granular Matter. I was India's first Radcliffe Fellow to Harvard University in 2006-07, and one of two Indians to be elected a Fellow of the American Physical Society in 2007.

Nilakantha Nayak

Research interests : Quantum Optics, Laser Physics and Quantum Entanglement, Research work overlaps with Foundations of Quantum Mechanics.

Quantum Optics and Laser Physics :
Squeezing : It is the process of quantum noise in one of the non-commuting operators at the expense of the other in the framework of uncertainty relations. The study includes radiation fields and spin system.

Cavity-QED : Our research interests include the cavity-QED due to possibilities of verification of its results in the experimental artifice , the micromaser or microlaser.

Quantum entanglement :
This study includes both the bipartite and continuous variable entanglement.

S. K. Paul

Physical spin configurations corresponding to topological excitations expected to be present in the XY limit of quantum spin 1/2 Heisenberg anti-ferromagnets and ferromagnets are probed on a 2-dimensional lattice. Quantum vortices (anti-vortices) are constructed in terms of coherent spin field components as limiting case of meronic (anti-meronic) configurations. The crucial role of Wess-Zumino term in distinguishing vortices (anti-vortices) is highlighted in this procedure. The vortex (anti-vortex) in anti-ferromagnet corresponds to anti-vortex (vortex) in ferromagnet. This is due to staggering effect in the case of anti-ferromagnets.The work is done in collaboration with Ranjan Chaudhury (SNBNCBS). Two papers have been written in this direction.

M. Sanjay Kumar

(i) Aspects of coherent states, quantum to classical transition, and vortices in the commensurate anisotropic oscillator.

(ii) On partial scaling transform as an entanglement witness for (a) continuous variable systems and for (b) multiqubit systems.

S. K. Sharma

1. Light scattering studies in relation to :
   a) Characterization of Biomedical Tissues
   b) Characterization of Interstellar Dust
   c) General Inverse Problem
   d) Role of approximation methods
2. Scattering of acoustic waves in relation to :
   a) Characterization of Biomedical Tissues
   b) Role of approximation methods

B B Bhattacharyya

Some of the areas of interest of Professor Bimalendu B Bhattacharya are :

- Geophysical Exploration techniques for Oil, Minerals and Ground water with special reference to polymetallic sulphides, uranium, chromium, manganese, iron etc. in mineral exploration.
- Mining Geophysics, Engineering Geophysics and Environmental Geophysics
- Interpretation techniques of Geoelectrical methods like resistivity, induced polarization (IP), spontaneous polarization (SP), electromagnetic (em) – both continuous wave and transient.
- Acquisition, processing and interpretation of Remote Reference Magnetotelluric (RRMT) method
- Time Lapse or 4D MT
- MT studies for geothermal resources
- Nonlinear inversion of geophysical data
- Electrical anisotropy studies for crust and upper mantle
- Study of coal discontinuities using Radargrams
- Exploration Antarctica

Important Highlights

Some of the highlights of the year 2007-2008 for the department are:

- Dr. J K Bhattacharya joined the Department as Senior Professor
- Dr. A Mehta was Radcliffe fellow at Harvard University.
- Professor B B Bhattacharya was elected Fellow of the West Bengal Academy of Science and Technology.

There were 35 publications from the department in peer reviewed research journals, 8 Ph.D students either received their degrees or submitted the theses, 4 summer students were supervised and 4 academic meetings were organized.

List of Publications in Journals

Please see page 85 for the list of publications in peer reviewed journals.

Conferences/Symposia/Visits

Rabin Banerjee

Conference participation / visits :

- Invited speaker at ISI, Kolkata Centennial Conf. December 2007.
- Invited speaker at Yukawa Institute conf. on Quantum Field Theory, Tokyo, August 2007

Talks/ Seminars/ Colloquia :

- "Hawking flux and anomalies", Nihon University, Tokyo and KEK, Tsukuba,Japan, August 2007.
- "Hawking effect, anomalies and effective actions", ISI, Kolkata, December 2007.
- "Hawking radiation and covariant anomalies", SINP, Kolkata, January 2008.
- "Pedagogical introduction to Hawking radiation and anomalies" (set of two seminars), North Bengal University, Siliguri, February 2008.
- "Introduction to Hawking effect", IIT KGP, March 2008.
- "Hawking radiation, effective actions and covariant boundary conditions", IIT KGP, March 2008.

Jayanta Kumar Bhattacharyya

Conference participation / visits :

- 3 week visit to the University of Goettingen, Germany in November 2007.

Talks/ Seminars/ Colloquia :

- Set of 5 lectures on "Statistical Mechanics", at the Academic Staff College, Calcutta University, August 2007.
- Set of 3 lectures on "Non Linear Dynamics" at Jadavpur University refresher course for college teachers, September 2007.
- Invited lecture on "Indian Journal of Physics - a pre independence success story", in History of Indian Science, at Saha Institute, September 2007.
- Invited lecture on "What is a photon?", in Workshop on Photonics, at IIT Kharagpur, October 2007.
- "Pattern formation in reaction diffusion systems", at IIT Kanpur, 24th October 2007.
- Invited lecture on "Patterns in Nature" in Dynamic days, Delhi 2007, 3rd November 2007.
- Invited lecture on "Hydraulic jump" in Conference on strongly interacting systems, at MPI, Dresden, 16th November 2007.
- "Hydraulic Jump", at University of Goettingen, 1st December, 2007.

- Invited lecture on "Hydraulic jump", in Platinum jubilee conference on theoretical physics at ISI, Kolkata, December 2007.
- Keynote lecture on "Physics of rare events" in Statphys at IIT Guwahati, January 2008.
- Set of 5 lectures on "Turbulence" in Indo French workshop on turbulence at IISc Bangalore, January 2008.
- Set of 3 lectures on "Pattern formation" at the Academic staff college, Burdwan University, February 2008.
- Invited lecture on "Interaction between Kosambi, the mathematician and Kosambi, the philosopher" in symposium Remembering Kosambi, Department of History, Calcutta University, March 2008.

B. B. Bhattacharyya

Conference participation/visits :

- First Indo-German Workshop on Electromagnetic Induction Studies for Complex Geological Problems: March 14–18, 2008; Venue : Lonavala, Mumbai-Pune Road, India.
- "Geophysical Signatures over Gondwana Basins of India" on October 8, 2007 in the International Symposium of IGCP at Delhi University during October 8–14, 2007.
- Workshop on 'Structure and Dynamics of Biomoleculess 2007' (December 03 - 08, 2007) on December 05, 2007, SNBNCBS.

Talks/ Seminars/ Colloquia :

- Invited Paper titled "Time Lapse Magnetotellurics", in First Indo-German Workshop on Electromagnetic Induction Studies for Complex Geological Problems on March 15, 2008
- "Magnetotelluric Studies over Singhbhum Craton" in First Indo-German Workshop on Electromagnetic Induction Studies for Complex Geological Problems on March 16, 2008
- Invited Lecture on "Earth Science – Its challenges and Excitements" for the School Students Programme on January 15, 2008 in the 7th International Conference & Exposition on Petroleum Geophysics of Society of Petroleum Geophysicists at Hyderabad during January 14 – 16, 2008.
- Invited Paper titled "Strategy for Geophysical Exploration for Deeper Uranium Deposits" on January 18, 2008 in the Asian Mining Congress at Kolkata during January 17 – 19, 2008.
- Invited Lecture on "Antarctica Expedition" in the UGC-Academic Staff College, University of Calcutta on July 28, 2007.

Biswajit Chakraborty

Conference participation / visits :

- Visited CBPF, Rio de Janeiro, Brazil from 1st October'07 to 17th December '07, under TWAS-UNESCO Associateship Appointment.
- Visited CHEP, IISc, Bangalore during 11th -14th February '08.

Talks/ Seminars/ Colloquia :

- "On certain physical implications of noncommutativity of spacetime", at Centro Brasileiro de Pesquisas Fisikas (CBPF), Rio de Janeiro, Brazil on 31st October 2007.
- "On certain physical implications of noncommutativity of spacetime" at Universidade Federal do Rio de Janeiro (UFRJ), Rio de Janeiro, Brazil on 13th November 2007.
- "The spectrum of noncommutative disc" at UFRJ on 4th December 2007.
- "On the role of twisted statistics in the degenerate electron gas" at Centre for High Energy Physics (CHEP), IISc, Bangalore on 11th February 2008.

Partha Guha

Conference participation / visits :

- Regular visiting position at Max Planck Institute for Mathematics in Sciences, Leipzig visited MPI-MIS, July - September 2007.
- Visited Institute of Theoretical Physics, TU-Clausthal, 6-8, August 2007.
- Visited Department of Mathematics, University of Potsdam, 17-20 August, 2007.

Talks/Seminars/Colloquia :

- "Generalized Hamiltonian structure, complex Hamiltonian formalism and dissipative systems", in National Applied Mathematics meeting at Visva-Bharathi, 28th March, 2008.
- Gave a mini-lecture (5 lectures) course on "Geometrical and Lie theoretical methods in integrable systems" at IMI workshop on Nonlinear dynamics in Bangalore, 18-29 February 2008.
- Invited speaker on International Conference on Recent Developments in Nonlinear Dynamics at Bharathidasan University, 13th-16th February 2008 India.
- Invited speaker on "Recent development in quantum field theory", German QFT meeting at Leipzig, July 2007.

Amitabha Lahari

Conference participation / visits :

- Organiser, QGT08: International Conference on Non-Perturbative Gauge Theories and Gravity, SNBNCBS, 7th -12th January , 2008.

Sudhanshu Shekhar Manna

Conference participation/visits :

- Organized Statistical Physics Approaches to Multi-disciplinary Problems 7th -13th January, 2008 at the IIT, Guwahati as a Joint Convener.

Talks/ Seminars/ Colloquia :

- Invited Talk on "International Trade network, structure and properties" in SigmaPhi International conference on Statistical Physics, at the Orthodox Academy of Crete, Greece during 14th-18th July, 2008.

Manu Mathur

Conference Participation/ visits:

- 13th May 2007-18th May 2007, visited Harishchandra Research Institute (HRI), Allahabad.
- 20th May 2007-7th June 2007 visited The Institute of Mathematical Sciences (IMSc), Chennai.
- 22nd October 2007-27th October 2007 visited Indian Institute of Technology, Kanpur (IIT-K).

Talks/ Seminars/ Colloquia :

- "Loop approach to Lattice Gauge Theories" at HRI on 16th May 2007.
- "Loop approach to Lattice Gauge Theories" at IIT-K on 23rd October 2007.
- "The Mandelstam Constraints in Lattice Gauge Theories" in "International conference on Non-Perturbative Gauge Theories and Gravity (QGT-08), 12th January 2008.

Anita Mehta

Conference participation/visits :

- Invited speaker and panel discussant at National Symposium for the Advancement of Women in Science, Harvard University (2007).
- Invited speaker at Dynamics Days, Boston (2007).
- Discussion Meeting on Mechanisms of Pattern Formation, Coorg (2007).
- Invited speaker at International Conference on Frontiers of Research on Speech and Music, Calcutta (February 2008).
- Session chair and invited talk at FIP session at APS March Meeting (2008).
- Contributed talk at Glassy Dynamics session at APS March Meeting (2008).
- Invited talk at Satellite Meeting on Granular Physics at DeGennes Days, Paris (2008).
- Invited speaker and Panel Discussant (only one from India) in Science and Medicine Panel at the Rhodes Women Scholars 30th Anniversary Reunion, Oxford (2008).
- Visiting Senior Scientist (since 1995) at the Service de Physique Theorique, Saclay (May-June 2008).
- Visiting Professor, Northwestern University (July-August 2007).

Talks/ Seminars/ Colloquia :

- Seminar at Harvard University, 'Widely Applied Mathematics' series (2007).
- Colloquium at the Radcliffe Institute for Advanced Study, Harvard University (2007).
- Two-part Colloquium at Materials Research Science and Engineering Research Center, Northwestern University (2007).
- Seminar at National Brain Research Centre, New Delhi, (2007).

Department of Theoretical Sciences

M. Sanjay Kumar

- Seminar at Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore (2008).
- Seminar at University of Groningen, The Netherlands (2008).

Conference participation / visits :

- Seminar at University of Erlangen, Germany (2008).
- Visited The Institute of Mathematical Sciences, Chennai during 15th July – 14th September 2007.
- Seminar at Department of Physics, University of Budapest (2008).

Talks/ Seminars/ Colloquia :

Anilesh Mohari

- Set of 15 lectures on "Dissipative Systems in Quantum Optics" at The Institute of Mathematical Sciences, Chennai during 15th July – 14th September 2007.

Conference participation / visits :

- Workshop in Non-commutative Geometry, Operator Algebras, Ergodic Theory during 11th-22nd February, 2008, The Institute of Mathematical Sciences, Chennai.

Subodh Kumar Sharma

Conference participation / visits :

Nilakantha Nayak

- Workshop on "Light Scattering Methods in Dust Modelling" 28-29 November 2007.

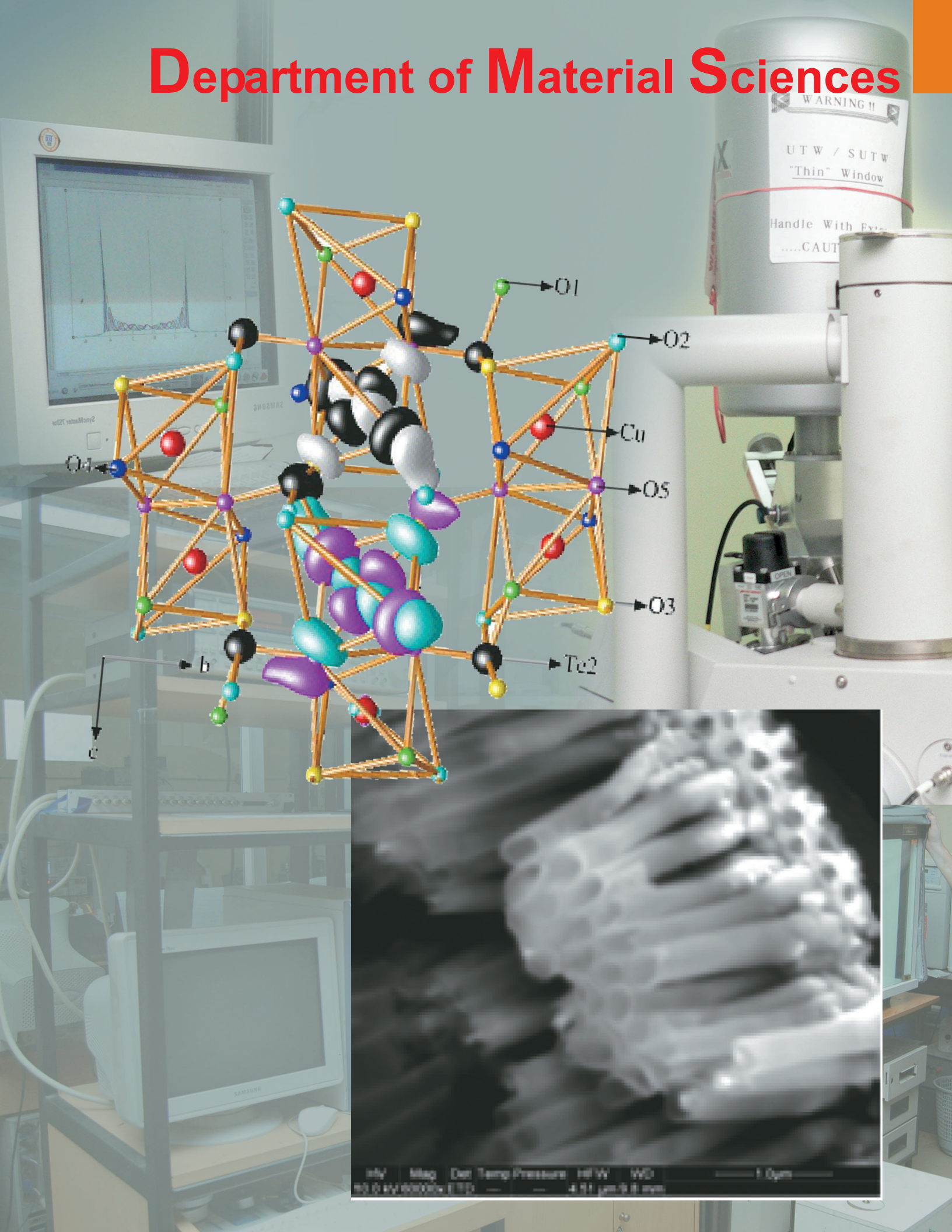
Conference participation / visits :

- "Atomic spin squeezing in a coherently driven cavity" in Workshop on coherent control of optical phenomena at IIT, Kanpur, Physics Dept., 9-10 July 2007.
- "Spin squeezing and entanglement" in Trends and challenges in quantum theory at Calcutta University, Applied Mathematics Dept., 27-28 February 2008.
- Visited Physics Dept., IIT, Kharagpur during 25-28 December, 2007 for collaborative research work.
- Visited Physics Dept., IIT, Kanpur during 19-20 April 2007.
- Visited IIT, Kanpur, Physics Dept during 26-31 October. 2007 for collaborative research work.
- Visited the Physics Department, Visva-Bharati during 30 March - 31 March.
- Visited the Physics Dept IIT, Kharagpur during 23 to 26 March 2008.

Talks/ Seminars/ Colloquia :

- "Reduction of quantum noises in spin systems", at the IACS, Kolkata on 19th March 2008.
- 'Spin squeezing and entanglement" at Physics Dept., IIT, Kanpur, April 2007.
- "Reduction of quantum noise in spin systems" at Physics Department, Visva-Bharati,March 2008.
- "Spin squeezing" at Physics Dept IIT, Kharagpur, March 2008.

Department of Material Sciences



Academic Members

Faculty

Sl. No.	Name	Designation	Specialization
1.	Ranjan Chaudhury	Reader	Magnetism and Superconductivity
2.	Priya Mahadevan	Reader	Electronic Structure of novel materials
3.	A. K. Majumdar Experiments	Research Professor	Condensed matter Physics :
4.	Kalyan Mandal	Associate Professor in nanosystems	Experimental study of magnetism
5.	Abhijit Mookerjee	Sr. Professor materials	Electronic Structure of disordered
6.	P. K. Mukhopadhyay	Associate Professor	Experimental study of shape memory alloys
7.	Sugata Mukherjee	Reader	Clusters and their properties
8.	A. K. Raychaudhuri	Sr. Professor nanosystems	Experimental study of oxides and
9.	Tanusri Saha-Dasgupta	Associate Professor	Electronic Structure of novel materials

Visiting Faculty and Post Doctoral Fellows

Sl. No.	Name	Designation	Specialization
1.	Rajini Kanth Bhogoju	Research Associate	Experimental study o magnetism
2.	Kuntal Chakraborty	Visiting Faculty	Experimental studies of materials
3.	Anindya Das	Research Associate	Experimental studies of materials
4.	Kaustuv Das	Research Associate	Experimental studies of materials
5.	Molly De Raychaudhuri	Visting Faculty	Electronic structure of novel materials
6.	Barnali Ghosh	Visting Faculty	Experimental studies of materials
7.	Sarathi Kundu	Visiting faculty	Experimental studies of materials
8.	Madhuri Mandal	PDF	Synthesis Characterization and Application of magnetic nano particles

Senior/ Junior Research Fellows

S. No.	Name	Specialization
1.	Mitali Banerjee	Experimental and theoretical studies of magnetic alloys
2.	Rudra Banerjee	Electronic and magnetic structure of clusters
3.	Mrinal Kanti Bera	Experimental study of nano-particles in interfaces
4.	Ritwik Bhattacharya	Experimental studies of materials
5.	Neeraj Kumar Chaubey	Experimental study of magnetic alloys
6.	Arka Chaudhuri	Experimental Study of magnetic materials
7.	Roby Cherian	Electronic Structure of novel materials
8.	Bipul Das	Experimental study of magnetic materials
9.	Hena Das	Electronic Structure of novel materials
10.	Soma Das	Experimental studies of materials
11.	Soumendu Datta	Theoretical study of novel materials
12.	Shreemoyee Ganguly	Electronic structure of disordered solids and clusters
13.	Debanjalee Ghosh	Experimental study of megnetic materials
14.	Manoranjan Ghosh	Experimental studies of materials
15.	Kapil Gupta	Electronic Structure of novel materials
16.	Ambika Prasad Jena	Theoretical studies of magnetic materials
17.	Venkata Kamalakar	Experimental studies of materials
18.	Abhinav Kumar	Electronic Structure of novel materials
19.	Rajesh Kumar Neogi	Experimental studies of materials
20.	Debabrata Pal	Experimental studies of magnetic materials
21.	Abhishek Pandey	Experimental study of magnetic alloys
22.	Moshiour Rahaman	Electronic structure of disordered solids
23.	Santosh Roy	Experimental nuclear physics
24.	Swarup Saha	Electronic Structure of novel materials
25.	Manish Kumar Sahai	Electronic Structure of novel materials
26.	Sudeshna Samanta	Experimental studies of materials
27.	Soumyajit Sarkar	Electronic Structures of novel materials
28.	Subrata Sarkar	Experimental studies of materials
29.	Tapati Sarkar	Experimental studies of materials
30.	Prashant Singh	Electronic structure of disordered solids
31.	Kartick Tarafder	Electronic structure of disordered solids
32.	Manoj Kumar Yadav	Electronic and magnetic structure of clusters

Summary of Academic Activities

Ranjan Chaudhury has worked on four different areas :

(i) Theoretical study of spin response in strongly correlated systems.

(ii) Topological excitations in low-dimensional quantum spin systems.

(iii) Transport in covalent molecular solids.

(iv) Quantum spin modelling of mutations in DNA.

Two publications appeared in journals based on this work.

Priya Mahadevan has worked on three different areas :

(i) Dilute magnetic semi-conductors: both in the bulk and in the nano-scale.

(ii) Charge and Orbital ordering in solids

(iii) Advanced theories of functional oxides : new routes to handle devices of the future.

Eight publications appeared in journals and five Research Fellows worked under Dr. Mahadevan's supervision.

A.K. Majumdar has worked on four different topics :

(i) Magneto-transport properties of ion-beam sputtered Fe-Cr multilayers of typical thickness of 1 to 2 nanometers.

(ii) Ni nanocrystals, grown in a planar array on TiN matrix.

(iii) Permalloys (NiFe alloys) with additions of 4d & 5d element impurities.

(iv) Magnetic phase diagram of bulk disordered NiMn alloys.

Two Research Associates worked under Prof. Majumdar's supervision.

Kalyan Mandal has worked on three different areas :

(i) Preparation and study of Ni and Co nano-wires.

(ii) Study of Ferrite-SiO_2 core-shell nano-composites.

(iii) Magneto-caloric effect in Ni-Mn-Ga Heusler alloys.

Five publications appeared in journals. Four research students worked under Dr. Mandal's supervision and one more completed his Ph.D. degree.

Abhijit Mookerjee has worked on the following areas :

(i) Inhomogeneous disorder, partial ordering, sub lattice disordering, alloys far from stoichiometric compositions.

(ii) Phase stability in binary alloys.

(iii) Non-collinear magnetism in disordered alloys and clusters.

(iv) Electronic, vibrational and magnetic properties of clusters: doped oxide clusters, metallic and bimetallic transition metal clusters.

Five papers appeared in journals based on this work. Five Research Associates worked under

Prof. Mookerjee's supervision. Three others obtained their Ph.D. degrees during this time.

Pratip K Mukhopadhyay has worked mainly on Shape Memory alloys. He has also worked on Thin-Film batteries and MoO. Six publications appeared in journals based on this work.

Sugata Mukherjee has worked mainly on theoretical study of clusters: energetics and elastic properties of transition and noble metal clusters. He has also probed the dynamical properties of clusters using time-dependent density functional theory.

Arup K Raychaudhuri has worked on two broad areas:

(i) Physics of Manganites

This involved :

(a) Colossal magneto resistance and ferromagnetic insulating states in perovskite manganites.

(b) Charge ordering and its stabilization in manganites.

(c) Ground state of manganites.

(ii) Nano-wires and nano-tubes

This involved :

(a) Fabrication and synthesis of nano-wires and nano-tubes by unconventional methods.

(b) Band-gap engineering in ZnO nano-particles by Mg and Cd doping.

(c) Growth of nano-wires by electro-chemical methods in porous membranes.

(d) Stability of nano-wires against electro-migration.

Apart from these areas he has also worked on :

(iii) Non-linear force effects on dynamical mode AFM and AF spectroscopy.

(iv) Nano-scale organization in DNA-Histone Complexes.

Twelve papers appeared in journals based on this work. Eight Research Associates worked under Prof. Raychaudhuri's supervision.

Tanusri Saha-Dasgupta has worked on three different areas :

(i) Electronic, vibrational,dielectric anomaly and magneto-optics of double perovskites.

(ii) Low energy model Hamiltonians for spin-gapped systems.

(iii) Ferromagnetism is metallic chalco-spinels.

Thirteen publications appeared in journals. Two were in Phys. Rev. Letters and one was an Editor's suggestion. Five Research Fellows worked under Dr. Saha-Dasgupta's supervision and one more completed his Ph.D. degree.

Important Highlights

The average publication per Faculty was 6.0, with a range 0-13. The Faculty supervised 3.2 Research Associates per person on the average.

List of Publications

Please see page 87 for the list of publications in peer reviewed journals.

Conferences/Symposia/Visits

Ranjan Chaudhury

Conference participation / visits :

- *International Conference on Ferromagnetic Shape Memory Alloys*, at SNBNCBS during November 14 -16, 2007.

Priya Mahadevan

Talks / Seminars / Colloquia :

- "Condensed Matter Physics", at Summer School at HRI.
- "Condensed Matter Physics", at Summer School, KTH, Stockholm.
- "A route to magnetism without transition metal atoms. Does it work?" at *ICMM*, Kolkata.
- "Multiferroics" at Indo-Japan workshop.
- "Growth of Nanocrystals" at *ICONSAT*.
- "Making nano Silicon optically active" at *ICONSAT*.
- "Lattice parameters of nanocrystals, role of surface stoichiometry" at *ICONSAT*.

Alak Kumar Majumdar

Conference Participation / Visits :

- *Spring Meeting of The Materials Research Society*, April 9 – 13, 2007, San Francisco, California.
- *3rd Seeheim Conference on Magnetism*, 26-30 August, Frankfurt (2007).
- *Spring Meeting of The Materials Research Society*, March 24- 28, 2008, San Francisco, California.

Talks/ Seminars/ Colloquia :

- Invited talk on "Anomalous magnetization on the way to saturation in Fe/Cr multilayers", at the Awareness Workshop on *Low temperature & high magnetic field facilities* at CSR, Indore, December 10-12 (2007).
- "Structural and Magnetic Characteristics of Self-Assembled Nickel Nanoparticles in CeO2 Thin Films", in *Spring Meeting of The Materials Research Society*, San Francisco, California, April 9 – 13, 2007.
- Invited talk on "High field magnetization in Fe/Cr giant magnetoresistive multilayers", in *3rd Seeheim Conference on Magnetism*, 26-30 August, Frankfurt (2007).
- Invited talk on "Hall effect in Ni-nanocrystallites embedded in TiN matrix on Sapphire" in *Spring Meeting of The Materials Research Society*, March 24- 28, 2008, San Francisco, California.

Kalyan Mandal

Conference participation / visits :

- Visited Leibniz Institute für Festkörper- und Werkstoffforschung Dresden, Germany during 1 October – 30 November 2008.
- *Nanoscience and its impact on society*, at Narasinha Dutt College, Howrah, 27-28 March 2008.
- *CGCRI-SNBNCBS Meeting*, at SNBNCBS on 14 May 2007.

Talks / Seminars / Colloquia :

- "Magnetocaloric effect in Ni2+xMn1-xGa (x=0.16, 0.18, 0.20, 0.22, 0.24, 0.26) alloys" in IFW, at Dresden on 18 October 2007.
- "Magnetic nanomaterials", (Planery lecture) in the conference *Nanoscience and its impact on society* at Narasinha Dutt College, Howrah on 27 March 2008.
- "Activities on magnetism and magnetic materials in SNBNCBS" in *CGCRI-SNBNCBS Meeting* at SNBNCBS on 14 May 2007.

Abhijit Mookerjee

Conference Participation / Cisits :

- *Conference of the Optical Society of India*, at Tezpur University
- *Indo-Swedish Conference on Electronic Structure*, at SNBNCBS
- *Indo-Japanese Conference on Multiferroics*, at IACS

Talks / Seminars / Colloquia :

- "Optical response in random alloys" in Conference of the Optical Society of India, at Tezpur University, Tezpur, 2007.
- "Theoretical study of Materials" in UGC Refresher course for University Faculty, at Burdwan University, Burdwan, 2007.
- "Recent developments in the theory of disordered alloys" in *Indo-Swedish Conference on Electronic Structure*, at SNBNCBS, Kolkata, 2008.

Pratip Kumar Mukhopadhyay

Conference Participation / Visits :

- *International Conference on Ferromagnetic Shape Memory Alloys, 07*, in SNBNCBS, November 14 -16, 2007
- *Workshop cum discussion meeting for utilization of low energy ion beam from ECR ion source for material modification studies*, at VECC, 24th August 2007.
- *Brain Storming Session on National/ Central Facility for Remote Reference Magneto Telluric (RRMT) Network in India*, at SNBNCBS, Kolkata, 26th -28th November 2007.
- *International Conference on Magnetic Materials*, at SINP, Kolkata, 11th -16th December 2007.
- "Advanced School on application of high resolution XRay techniques", at SNBNCBS on 3rd -4th March 2008

Talks / Seminars / Colloquia :

- "Sound velocity studies in an FSMA system", at Condensed Matter Days, 2007.
- "Structural studies on Mn excess and Ga deficient Ni-Mn-Ga:", at *International Conference on Ferromagnetic Shape Memory Alloy* at SNBNCBS, November 14th – 16th, 2007.
- "Magneto-transport and magnetic properties of Ni-Mn-Ga", at *International Conference on Ferromagnetic Shape Memory Alloys* at SNBNCBS, November 14th – 16th, 2007.
- "Magnetoresistance behavior of ferromagnetic shape memory alloy Ni1.75Mn1.25Ga" at *Poster presentation in International Conference on Ferromagnetic Shape Memory Alloys* at SNBNCBS, November 14th – 16th, 2007.
- "Effect of Stress Relaxation on Quenched NiFeAl Ferromagnetic Shape Memory Alloy" at *Poster presentation in International Conference on Ferromagnetic Shape Memory Alloys* at SNBNCBS, November 14th – 16th, 2007.

Arup Kumar Raychaudhuri

Conference Participation / Visits :

- *International Workshop on Nanoceramics and Nanocomposites*, at IIT-Kanpur, September 2007.
- *UGC sponsored School on role of experiment in physics research*, at Andrews College, Kolkata, September 2007.
- *IUMRS -2007, at IISc*, Bangalore, October 2007
- *MRS Fall meetting 2007*, at Boston, November 2007
- *International Winter School on Physics and Chemistry of Materials*, at JNCASR, Bangalore, December 2007
- *First India-Singapore meeting*, at IIT Chennai, February 2008
- *ICONSAT*, at Chennai, February 2008
- *3rd Indo-Japan Conference on Ferroics and Multiferroics*, at Kolkata, February 2008
- *APS March Meeting 2008*, at New Orleans, March 2008
- Visit for 5 days to the Laboratory of Prof.R.Ramesh, Department of Materials Science,UC-Berkeley, at Berkeley, March 2008

Talks / Seminars / Colloquia :

- 18th Annual Day Lecture, at CSR, Indore, December 2007
- 18th Annual Day Lecture, at IUAC, New Delhi, December 2007
- "Growth of anisotropic composites in nanoporous alumina using electrochemical deposition", in *International Workshop on Nanoceramics and Nanocomposites*, at IIT – Kanpur, September 2007.
- "Role of experiment in physics research" in *UGC sponsored School on role of experiment in physics research*, at Andrews College, Kolkata, September 2007
- "Noise as probe of condensed matter", in *IUMRS-2007*, IISc, Bangalore, October 2007.

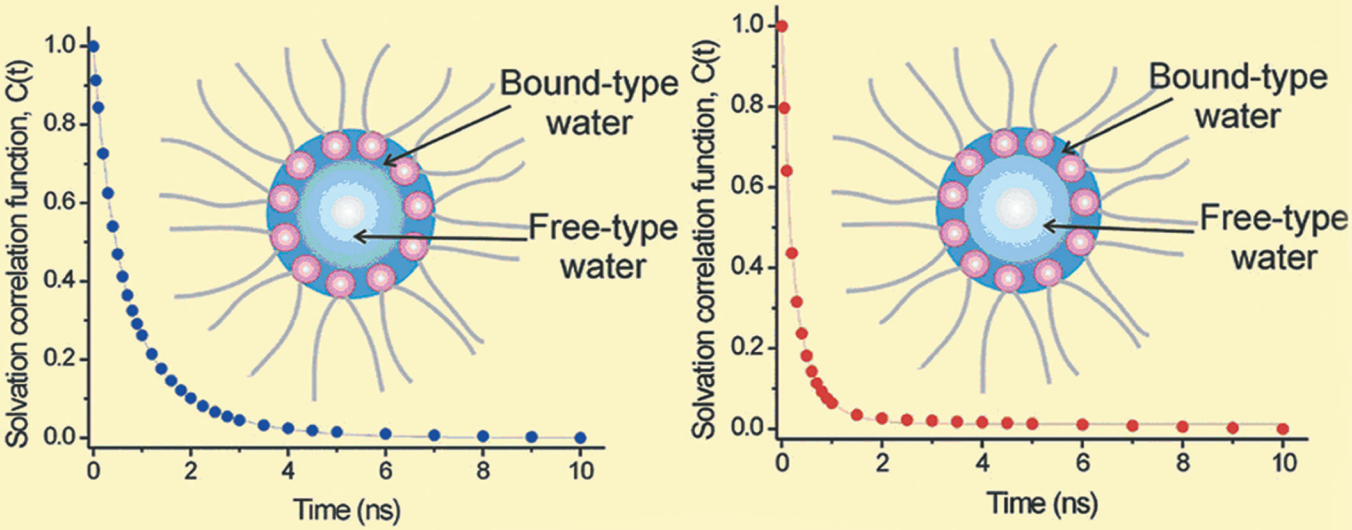
- "Controlled phase separation in charge ordered system", in *MRS Fall meeting 2007* at Boston, November 2007.
- "Electric field and current induced resistance change in oxides and how to create nano sized writing using this phenomena", in *International Winter School on Physics and Chemistry of Materials*, at JNCASR, Banagalore, December 2007.
- "Electric field as a novel tool to fabricate nanomaterials" in *18th Annual Day Lecture*, at CSR, Indore, December 2007.
- "Nanomaterials synthesis - Challenges and some novel routes", *18th Annual Day Lecture*, at IUAC, New Delhi, December 2007.
- "Resistive switching in manganites", in *First India-Singapore meeting*, at IIT Chennai, February 2008.
- "Optical properties of nanostructured ZnO prepared by low temperature route", in *ICONSAT 2008*, at Chennai, February 2008.
- "Ferromagnetic insuating state of manganite", in *3rd Indo-Japan Conference on Ferroics and Multiferroics*, at Kolkata, February 2008
- "Synthesis, structure and properties of nanostructured manganites", in *APS March Meeting 2008* at New Orleans, March 2008

Tanusri Saha Dasgupta

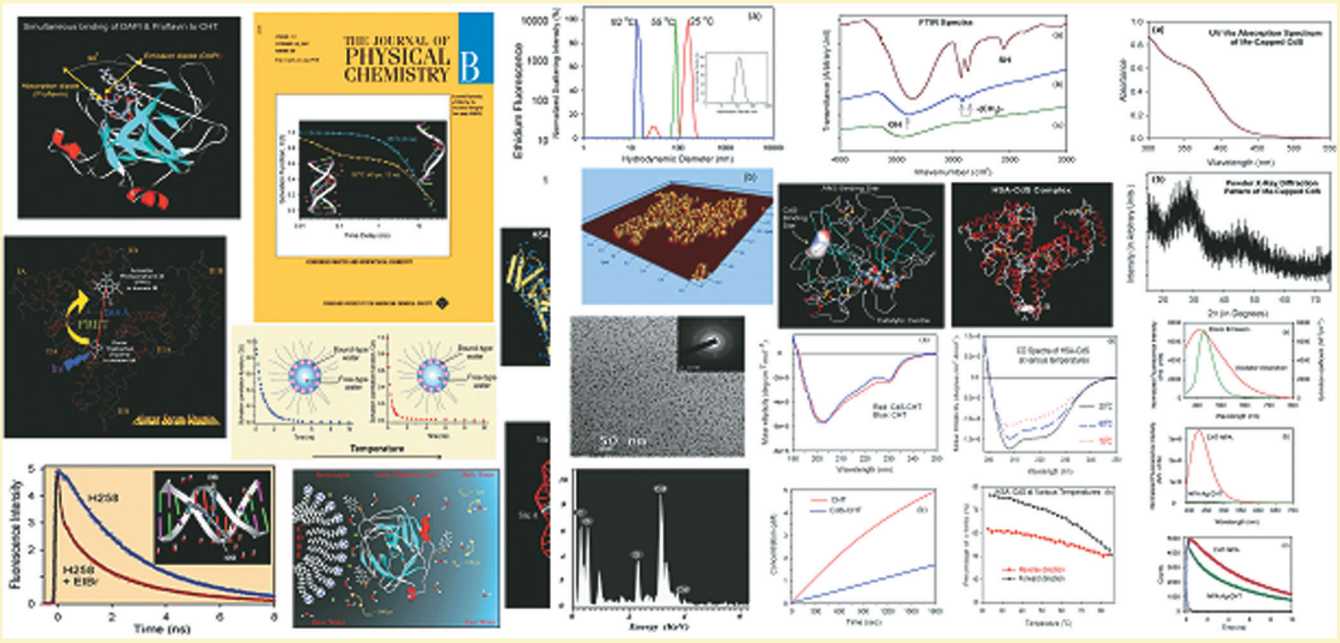
Conference Participation / Visits :

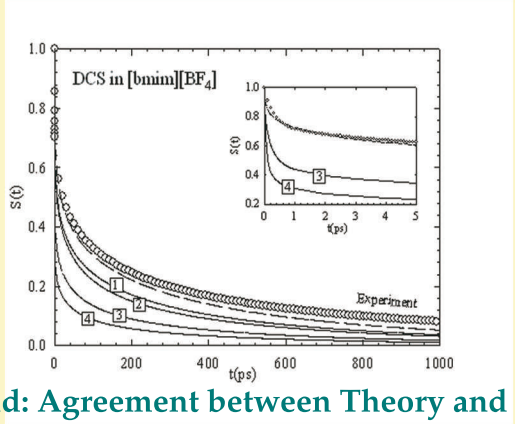
- Visit to University of Frankfurt and MPI, Stuttgart, November 2007.
- Visit to KITP, Santa Barbara, August 2007.
- Visit to University of Rio and Sao-Paulo, March 2008.
- Visit to University of Tennessee, September 2007.
- Visit to ICMR, USCB, July 2008.
- *Correlated Electrons & Frustrated Magnetism*, Goa, December 2007.
- *Indo-Japan Conference*, February, 2008.
- *Joint Indo-Brazil Conference*, Rio, March 2008.
- *Oxide Materials*, at ICMR, Santa Barbara, July, 2008.
- *Indo-Sweden Conference*, January 2008.
- *Research Program on Magnetic Materials*, KITP, Santa Barbara, August 2007.

Department of Chemical, Biological and Macromolecular Sciences



Temperature





Solvation in Ionac Liquid: Agreement between Theory and Experiment

Academic Members

Faculty

Sl. No.	Name	Designation	Specialization
1.	Ranjit Biswas	Reader	Physical Chemistry
2.	Jaydeb Chakrabarti	Associate Professor	Soft Condensed Matter Physics
3.	Gautam Gangopadhyay	Associate Professor	Chemical Physics
4.	Samir Kumar Pal	Reader	Experimental Bio-Physics
5.	Surajit Sengupta	Professor	Soft Condensed Matter Physics
6.	Prosenjit Singha Deo	Associate Professor	Mesoscopic Physics
7.	Subhasis Sinha	Faculty Fellow	Theoretical Condensed Matter Physics

Bose Fellows

Sl. No.	Name	Designation	Specialization
1.	Rajib Kumar Mitra	Bose Fellow	Experimental Physical chemistry

Visiting Faculty and Post Doctoral Fellows

Sl. No.	Name	Designation	Specialization
1.	Sumita Dutta	Visiting Faculty	Computational Condensed Matter Physics
2.	Sheelon Sengupta	PDF	Mesoscopic Physics

Students

Sl. No.	Name	Specialization
1.	Debapriya Banerjee	Biophysics
2.	Kinshuk Banerjee	Chemical Physics
3.	Jayee Bhattacharya	Soft Condensed Matter Physics

Students

Sl. No.	Name	Specialization
4	Snehasis Das Chakrabarti	Simulation & Theoretical Studies of Ion Transports Through narrow channels and Biological Membranes
5	Navin Chandra	Soft condensed matter Physics
6	Debabrata Chattaraj	Area-Soft condensed matter physics; Topic Colloidal interactions
7	Swastika Chatterjee	Soft condensed matter Physics
8	Biswajit Das	Chemical Physics
9	Tamoghna Kanti Das	Soft condensed matter Physics
10	Harun Rasid Gazi	Experimental Studies of Host-Guest Interaction and Role of Medium Dynamics in Molecular Recognition
11	Biswajit Guchhait	Experimental Studies of Ionic Melts and Confined Systems
12	Hemant Kashyap	Theoretical and Simulation Studies of Chemical Events in Complex Liquids & Liquid Mixtures
13	Abhinandan Makhal	Biophysics
14	S. Shanakara Narayanan	Bio-nano Interface
15	Arya Paul	Soft condensed matter Physics
16	Tuhin Pradhan	Spectroscpic Studies of Complex Systems
17	Sudipta Samanta	Area-Biophysics; Topic-Protein-DNA interactions
18	Ankush Sengupta	Soft condensed matter Physics
19	Sudarson S. Sinha	Biophysics/Biomedical Instrumentation
20	Promod Verma	Biophysics

Summary of Academic Activities

Ranjit Biswas

Uses experiments, theory and simulation, Experimental Studies of Solvation Processes and Chemical Reactions in Electrolyte Solution, Binary Solvent Mixtures, Binary Mixtures in Presence of Electrolytes, Confined Environments (Reverse and Regular Micelles), Supercritical Fluids, Ionic Liquids, Molecular Recognition via Host-Guest Chemistry.

Theoretical and Simulation Studies on Solvation in Non-polar Bulk Media, Solvation in Ionic Liquids, Dielectric Relaxation and Diffusion in alcohol-water Mixtures, Ionic Conductivity in Binary Mixtures.

Jaydeb Chakrabarti

Statistical Mechanics at the large length and long time scale phenomena. Solvation in a nonpolar medium. Physics of devices based on nanometer sized systems. Flow Sensor: Flow of dipolar fluid over nano-particle coated surface. Fluorescence : Nanotube-nanoparticle composites.

Gautam Gangopadhyay

Theoretical spectroscopic studies of Molecular Systems:

Studied on the dynamics of vibrational coherence for the various processes, e.g, chemical reaction, energy transfer and electron transfer processes. Other areas of activities are in Quantum dissipative systems, Quantum effects in electron transfer processes, Exact solution of some Quantum models.

Samir Kumar Pal

Structural and functional characterisation of Biophysical systems.

A few examples are :

Activity of Subtilisin Carlsberg in macromolecular crowding, Structural and Functional Characterisation of Enzyme-Quantum Dot Conjugates; Covalent Attachment of CdS Nanocrystal to alpha-Chymotrypsin; Simultaneous Binding of Minor groove Binder and Intercalator to Dodecamer DNA; Importance of Relative Orientation of Donor and Acceptor in FRET.

Surajit Sengupta

Micro-structure selection in solids, Driven phases and non-equilibrium phase transitions, Colloids in external fields, Mechanical properties of small sized objects, Properties of solids in low dimensions and in confinement, Commensurate incommensurate transitions, Statics and dynamics of interfaces.

Prosenjit Singha Deo

Nano-fabricated systems are often so small that quantum coherence of the electron holds over the entire dimension of the sample.

Naturally the properties of these systems are determined by interference and non-local effects.

His focus is on :

(i) Transport across a quantum dot.

(ii) Magnetization of small rings in the quantum regime.

Subhasis Sinha

Dipolar condensate in quasi one dimensional geometry: Analyzed the physics of cold dipolar gases in quasi one-dimensional geometries, showing that the confinement-induced scattering resonances produced by the transversal trapping are crucially affected by the dipole-dipole interaction. Excitation Spectra of Correlated Lattice Bosons in a Confining.

Quantum Dissipative systems: Effect of Interaction on Structural Transition in Bilayer Crystals, Dipolar gases in quasi one-dimensional geometries.

Rajib Kumar Mitra

Ultrafast fluorescence spectroscopy in Biological and Biomimicking systems. The role of hydration on temperature induced unfolding (and refolding) of a well known globular protein. The distance between two domains in human serum albumin has been determined at different temperatures (as the protein unfolds) using Forster resonance energy transfer.

Important Highlights

(a) Workshop on Structure and Dynamics of Biomolecules held on 3-8 Dec. 2007

(b) Ongoing Projects under the supervision of

Dr. Prosenjit Singha Deo	-	DST Project
Dr. Samir Kumar Pal	-	DST Project
Dr. Ranjit Biswas	-	DST Project
Dr. Subhsish Sinha	-	AMRU Project
Dr. Jaydeb Chakrabarti	-	AMRU Project

List of Publications

Please see page 90 for the list of publications in peer reviewed journals.

Conferences/Symposia/Visits

Ranjit Biswas

Talks / Seminars / Colloquia :

- "Dynamics in complex media" in an international mini symposium at IISc, Bangalore on 18th July, 2008.
- Gave FOUR lectures in a workshop on 'Concepts in Chemistry II' during February 01-03, 2008 in Krishnath College, Murshidabad.
- Gave THREE lectures in a workshop on 'Foundations of Chemistry' during March 06-09, 2008 in Durg, Chhatisgarh.
- Gave THREE lectures in a workshop on 'Concepts in Chemistry I' in September, 2007 in Ramananda College, Bishnupur, Bankura

Jaydeb Chakrabarti

Conference participation / visits :

- Visit to Prof. H.Loewen's Group in the University of Duesseldorf, Germany (June, 2007).
- Attended international Conference SOCOBIM at Sicily (July).
- Attended StatPhys, IIT Guwahati (January, 2008).

Samir Kumar Pal

Conference participation / visits :

- Visited Asian Institute of Technology, Bangkok, Thailand.
- Visited National University of Singapore, Singapore.

Surajit Sengupta

Conference participation / visits :

- Statistical Physics Applications in Multidisciplinary Areas, at I.I.T. Guwahati,January 7-13, 2008.
- Indo-Japan Workshop on Manganites, at I.A.C.S. Kolkata, February 4-6, 2008.
- Non-equilibrium Phenomenon in Condensed Matter, at I.N.S.A., New Delhi,m February 21-23, 2008,
- Physics and Mechanics of Advanced Structural Materials, at I.G.C.A.R. Kalpakkam, March 27-29, 2008,

Talks/ Seminars/ Colloquia :

- "Microstructure selection, non-affine variables and shape reversibility in solid state transformations", at Fachbereich Physik, University of Konstanz, 1st October, 2007.
- "Statistical Physics applications in Materials Science", at I.I.T. Guwahati, January 7-13, 2008.
- "Phase separation and pattern formation in rare earth manganites : effect of residual strain on microstructure", at I.A.C.S. Kolkata, February 4-6, 2008.
- "Dynamics of non-affine zones and microstructure selection in solids", at I.N.S.A., New Delhi, February 21-23, 2008.
- "Dynamics of non-affine zones and microstructure selection in solids", at I.G.C.A.R. Kalpakkam, March 27-29, 2008.

Subhasis Sinha

Conference participation / visits :

- Vistied Institute for Theoretical Physics, University of Hannover (Germany) from 17th April - 1st May 2007.
- Attened a workshop on 'Quantum Gases' at Institut Henri Poincare (Paris, France) from 2nd May - 8th June 2007.
- Visited The Institute of Mathematical Sciences (Chennai) from 25th August - 15th September 2007.

Talks/ Seminars/ Colloquia :

- "Ultracold atomic gases and Bose-Einstein condensation" in the workshop , held at SINP on March 7-8 2008,
- "Ultracold atoms in optical lattice", a seminar at The Institute of Mathematical Sciences (Chennai).

Rajib Kumar Mitra

Conference participation / visits :

- Visited the department of Chemistry, Bochum University, Germany for academic discussion and to deliver a talk.

Talks/ Seminars/ Colloquia :

- "Temperature Dependent Solvation Dynamics in AOT/isooctane Reverse Micelles", at the BOSEFEST 2008 on 31st January, 2008.
- "Ultrafast Fluorescence Spectroscopic Studies in Biological and Biomimicking Systems", at the Department of Chemistry, Bochum University, Germany on 9th July, 2008.

Department of Astrophysics and Cosmology

Horse Head Nebula

Academic Members

Faculty

Sl. No.	Name	Designation	Specialization
1.	Sandip K. Chakrabarti	Sr. Professor	Astrophysics
2.	Debashis Gangopadhyay	Associate Professor	Quantum Field Theory, Cosmology, Statistical Field Theory, Quantum Computation
3.	Archan S. Majumdar	Associate Professor	Cosmology

Post Doctoral Fellows

Sl. No.	Name	Designation	Specialization
1.	Kinsuk Acharyya	PDF	Astrochemistry and Astrobiology

Students

Sl. No.	Name	Specialization
1.	H. Ghosh	Astrophysics
2.	Kinsuk Giri	Astrophysics
3.	Cinmay Gupta	Dark energy in Cosmology

Summary of Academic Activities

Main research consists of the following areas :

(a) Accretion processes around compact objects

(b) Spectral and temporal properties of galactic and extragalactic black holes

(c) Formation of bio-molecules during collapse of interstellar clouds

(d) Dark Matter in Cosmology with Primordial Black holes

(e) Quantum information and fundamental concepts

(f) Quantum Computation with Deformed Oscillators

(g) Spacetime Dependent Lagrangians and Electrogravity Duality

(h) Dark matter and dark energy

Important Highlights

Simulations of spectral and temporal properties of galactic and extra-galactic black holes have shown that they agree very well with observed properties. Quasi-Periodic Oscillations of X-rays are explained well with shock oscillation solutions. Production of water and methanol molecules were carried out on the grains and compared with observations (S.K. Chakrabarti).

Primordial black holes in generalised Jordan-Brans-Dicke theories were shown to efficiently accrete radiation in the early universe, and thus survive as components of cold dark matter at present. Protocols for teleportation and broadcasting of continuous variable entanglement were proposed (A.S. Majumdar)

A Lagrangian for the "k-essence" field that incorporates the scaling behaviour of Scherrer is set up with canonical kinetic terms (D. Gangopadhyay).

The two qubit CNOT quantum logic gate has been constructed with q-deformed oscillators thereby establishing that universality of quantum logic gates is also realizable with deformed harmonic oscillators (D. Gangopadhyay).

An International conference on "Second Kolkata conference on the Observational Evidence for Black Holes in the Universe" was organized which was participated by about a hundred scientists from 22 countries. A follow up workshop jointly with ICRANET (Italy) on "Black Holes, Neutron Stars and Gamma Ray Bursts" also took place. The First Chandrasekhar Lecture was delivered by Prof. W.D. Arnett, University of Arizona with a special lecture by Prof. Roy P. Kerr.

List of Publications in Journals

Please see page 93 for the list of publications in peer reviewed journals.

Conferences / Symposia / Visits

Sandip Chakrabarti

Conference participation / visits :

- Visited Moscow Engineering and Physics Institute and Russian Academy of Science (Oct, 2007) in connection with 50th Anniversary of Sputnik Launching.
- Visited University of Palermo (October, 2007) in connection with "Beppo/Scarsi" meeting.
- Visited ICTP, Trieste as a senior Associate (October - November 2007) and attended "Earthquake workshop" and "Astrophysical Fluid Dynamics Workshop.
- Visited International Centre for Relativistic Astrophysics (ICRA), Pescara and University of Rome (October, 2007).
- Visited IIT/Roorkee in connection with an International Workshop on "Chemical Evolution and Origin of Life" (March 2008).

Talks/ Seminars/ Colloquia :

- May, 2007: Mysterious universe', two invited talks at the 14th and 15th Districtwise Space Science Symposium held in Burdwan and Suri.
- May, 2007: Invited talk on `Search for planets with strong magnetic field as a pulsating source' at the Brainstorming session on ESA COSMIC-Vision 2017 project, Bangalore
- June, 2007: Presented a talk on 'VLF Astronomy as Earthquake/Tsunami prediction' at the National Disaster Management meeting in New Delhi.
- August, 2007: Invited talk on Continuous Spectro-photometry of Black Holes at ISRO, Bangalore.
- August, 2007: Invited talk at TIFR on `Zone plates as X-ray imaging device' at the Preliminary Design Review (PDR) of RT-2/CZT payload.
- August, 2007: Invited talk on 'X-ray and Gamma-Ray Astronomy from Moon' at the PLANEX meeting on Chadrayaan-II at PRL, Ahmedabad.
- October. 2007: Invited talk on 'Zone plates as the X-ray Imaging Device' at the 'Space Week' meeting (MePhi, Moscow) at the 50th Anniversary of Sputnik mission.
- October. 2007: 'Correlation Between ionospheric activities with earthquakes by monitoring Very Low Frequency(VLF) signals' at the Earthquake workshop (SMR1864), ICP, Trieste.
- October., 2007: Invited talk on the 'Hydrodynamic and Spectral properties of Transonic Astrophysical Flows Around Black Holes' at the SMR1865 Workshop on 'Astrophysical Fluid Dynamics' at ICTP, Italy.
- October , 2007: 'Spectral Properties of shocked advective flows at high energy' and ' Zone plates as X-ray imaging device', at the BEPPO/SCARSI meeting in Palermo.
- October, 2007: Invited talk on 'Theoretical and Observational Evidence of the Boundary Layer of Black Hole' at ICRA, University of Rome.
- October, 2007: Invited talk on 'Synthesis of Biomolecules at the Interstellar Medium' at the Physics of the Living State, Applied Physics Scientific Section Seminar at ICTP, Trieste.
- November, 2007: Invited talk on "VLF networking in India in collaboration with Indian Centre for Space Physics" at the Brain Storming Session for setting up a common remote reference facility for magnetotelluric studies in the Country", Kolkata.
- December, 2007: Invited talk on 'Do we SEE black holes?' at the Platinum Jubilee Commemorative conference of ISI, Kolkata.
- December, 2007: Invited talk on 'Space Explorations: The Indian Perspective' organized by Paschimbanga Bijnan Mancha at Seoraphuli, Hoogley.
- January, 2008: Invited talks on 'Mysterious Universe' at Districtwise Space Science Symposia in Murshidabad and Nadia Districts.
- February 2008: Invited talk on 'Black Hole Accretion' at the Second Kolkata meeting on 'Observational Evidence for Black Holes in the Universe', Kolkata.
- March, 2008 : Invited talk on 'Can we form biomolecules during Star Formation?' at the 'Astrobiology Conference at IIT/Roorkee.
- March, 2008 : Invited talk on 'Stellar Evolution and Black Hole Formation' at the Taki Govt. College.

Debashis Gangopadhyay

Talks/ Seminars/ Colloquia :

- "Quantum Logic Gates with q-deformed Oscillators"-Centre for Theoretical Chemistry and Physics, Massey University, Albany, New Zealand, 16th May, 2007.
- "Quantum Computation with q-deformed Oscillators"-Department of Physics, University of Auckland, New Zealand, 23rd May, 2007.
- "Quantum Computation with q-deformed Oscillators"-School of Physics Colloquium, University of Sydney, Australia, 4th June, 2007.
- Conducted a workshop (on Invitation) on "Path Integral Methods", jointly sponsored by Department of Mathematics and Statistics , University of Sydney and Sydney Financial Mathematics Workshop, held at Westpac Convention Centre, Sydney, 7th June, 2007.

Archan S. Majumdar

Conference participation / visits :

- 18th *International Symposium on General Relativity and Gravitation*, Sydney Convention Centre, Sydney, July 2007.
- *Field Theoretic Aspects of Gravity*, FTAG-VI,HRI, Allahabad, November 2007.
- *International Conference on recent developments* in Theoretical Physics, ISI Kolkata, December 2007.
- *International Conference in Gravitation and Cosmology*, IUCAA, Pune, December 2007.
- *Current Trends in Cosmology* – UGC DRS Programme, Utkal University, Bhubaneswar, January 2008.
- *Trends and Challenges in Quantum Theory* – UGC DSA Symposium, University of Calcutta, Kolkata, February, 2008.
- *Physics of warped Extra Dimensions*, IIT Kharagpur, February 2008.
- *International School and Symposium on Quantum Information*, IOPB, Bhubaneswar, March, 2008.

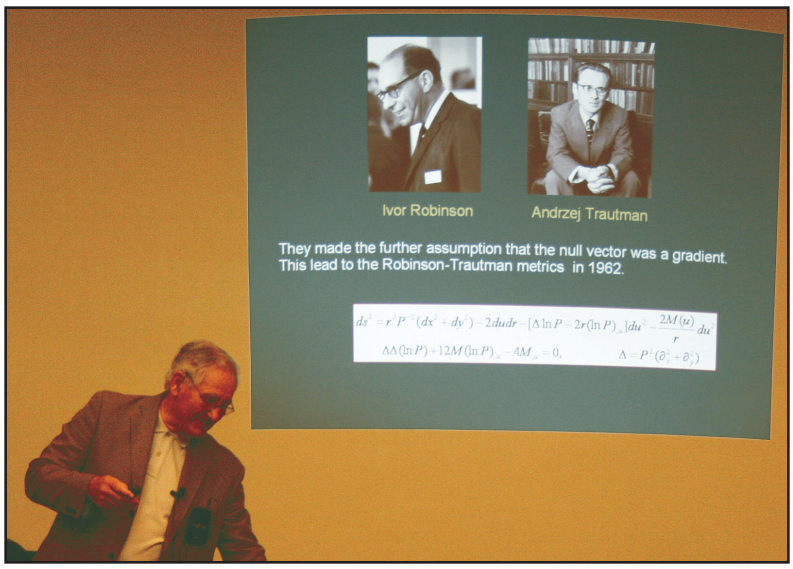
Talks/ Seminars/ Colloquia :

- "Black holes in alternate gravity theories: cosmological consequences and observational signatures", in *18th International Symposium on General Relativity and Gravitation*, Sydney Convention Centre, Sydney, July 2007.
- "Lecture Course on Cosmology", in 3rd AKR School on General Relativity, SINP, Kolkata, October 2007.
- "Primordial Black Holes in Alternate Gravity theories", in Field Theoretic Aspects of Gravity, FTAG-VI, HRI, Allahabad, November 2007.

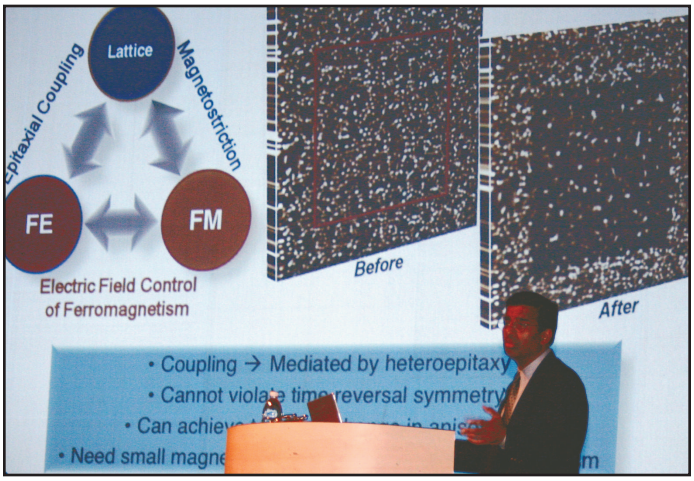
- "Probing Dark matter in Black holes", in International Conference on recent developments in Theoretical Physics, ISI Kolkata, December 2007.
- "Primordial Black Holes in Alternate Gravity theories", in International Conference in Gravitation and Cosmology, IUCAA, Pune, December 2007.
- "Lecture Course on Primordial black holes in Cosmology", in Current Trends in Cosmology – UGC DRS Programme, Utkal University, Bhubaneswar, January 2008.
- "Primordial black holes as dark matter", in Observational evidence for Black Holes in the Universe" SNBNCBS, Kolkata, February 2008.
- "Teleportation and Broadcasting of Continuous variable entanglement", in Trends and Challenges in Quantum Theory – UGC DSA Symposium, University of Calcutta, Kolkata, February, 2008.
- "Black holes in extra-dimensional theories", in Physics of warped Extra Dimensions, IIT Kharagpur, February, 2008.
- "Teleportation and Broadcasting of Continuous variable entanglement", in International School and Symposium on Quantum Information, IOPB, Bhubaneswar, March 2008.

Seminars and Colloquia at the Centre

1. **A. M. Jayannavar**, I.O.P Bhubaneswar, *Fluctuation theorems and orbital magnetism in nonequilibrium state*, 12th April, 2007
2. **Surajit Sen**, Dept. of Phys. Silchar GC College, *Symmetry Breaking In Rabi Oscillation of the Three-Level Systems*, 19th June, 2007
3. **L. P. Singh**, Utkal University, Bhubaneswar, *Cosmological aspects of generalised Brans-Dicke theory*, 22nd June, 2007
4. **P. K. Panigrahi**, PRL, Ahmedabad, *Bose-Einstein Condensates in a trap: Exact Results for Lieb modes and Optical Lattice*, 3rd August, 2007
5. **Krishnendu Sengupta**, SINP, Kolkata, *Aspects of low dimensional and strongly correlated system*, 22nd August, 2007
6. **Sheelan Sengupta Chowdhury**, SNBNCBS, Kolkata, *Large diamagnetic persistent currents*, 5th October, 2007
7. **Joy Mitra**, Queensland University Belfast, *Scanning Tunnelling Microscopy induced Light Emission*, 30th October, 2007
8. **Subhasish Basak**, Dept. of Physics, Indiana University, USA, *Lattice QCD determination of baryon resonances*, 5th November, 2007
9. **Sarathi Kundu**, Laboratoire de Physique des Solides, Universite Paris 11, *Orsay Structures at the Air-Water Interface*, 27th November, 2007
10. **Clas Persson**, Dept. of Materials Science and Engineering Royal Institute of Technology, Sweden, *Thin Film ZnO/CdS/CIGS Solar Cells : Anomalous Material Properties of the CIGS Absorbe*, 30th November, 2007
11. **Jaydeep Majumder**, University of Helsinki, Finland, *Inflationary Universe and String Theory*, 3rd December, 2007
12. **Peter Lemmens**, Institute for Condensed Matter Physics, *TU Braunschweig, Spectroscopy and Control of Correlated Electron Systems*, 10th December, 2007



Prof. Roy Kerr, Guest of Honour at the 1st Chandrasekhar Memorial Lecture, delivering an informal talk "Unveiling Einstein's Secrets".

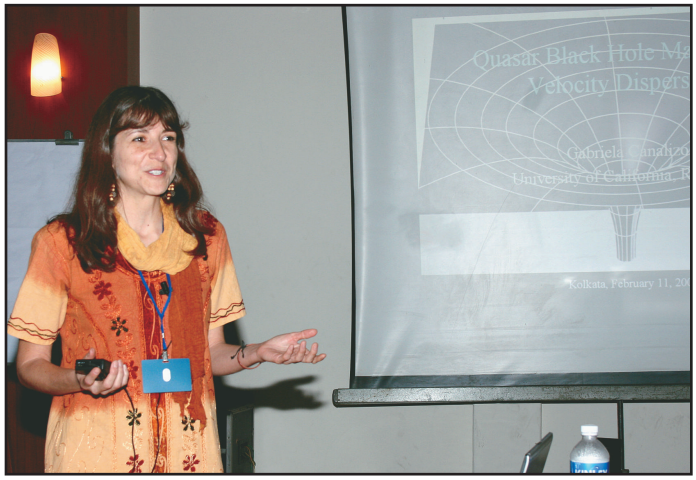


Prof. R. Ramesh elivering the C. K. Memorial Lecture "Whither Oxide Electronics?".

Prof. William Arnett and Prof. Roy Kerr.

13. **Swadeshmukul Santra**, Nanoscience Technology Center, Department of Chemistry and Biomolecular Science Center, University of Central Florida, USA, *Nanomaterials for Biomedical, Energy and Environmental Research*, 17th December, 2007
14. **Ronojoy Adhikari**, The Institute of Mathematical Sciences, Chennai, *Jamming at interfaces : a route to fluid-bicontinuous nano-colloidal gels*, 27th December, 2007
15. **Joydeep Dutta**, Asian Institute of Technology, *Self-organizing colloidal nanoparticles*, 28th December, 2007
16. **Chinmay Das**, Department of Physics and Astronomy, University of Leeds, *Simulation of fully hydrated Stratum Corneum lipid bilayer*, 3rd January, 2008
17. **Swarnali Bandopadhyay**, Max Planck Institute for the Physics of Complex, Systems, Dresden, Germany, *Effect of shell structure on Anderson orthogonality catastrophe*, 21st January, 2008
18. **H. Wanare**, Physics Dept., IIT, Kanpur, *Multicolored effects : From multicolored-coherent-population-trapping to Subharmonic fields*, 1st February, 2008

Prof. Chaitali Mukherjee delevering a tack on Structure and Dynamics of Biomoleculer - 2007



Dr. Gabriella Canabigo 2nd Kolkata Conference on observational Evidence for Black Holes in the Universe

19. **Arnab Mukherjee**, Department of Chemistry and Biochemistry, University of Colorado at Boulder, *On the Molecular Mechanism of Drug Intercalation into DNA : A Computer Simulation Study*, 4th February, 2008
20. **Nicola Spaldin**, Materials Department, University of California, Santa Barbara, *Magnetoelectrics : Fundamentals and new directions*, 7th February, 2008
21. **Raja Paul**, Department of Neurobiology, Physiology and Behavior, Universityof California, Davis, *Mechanical regulation of cell contractility and spontaneous cell patterning*, 7th March, 2008
22. **Tapan Chatterji**, Institut Laue-Langevin, B.P. 156 X, 38042 Grenoble Cedex, France, *Neutron Scattering Investigation of Multiferroic Manganites*, 21th February, 2008
23. **Krishnendu Sengupta**, S.I.N.P, Kolkata, *Quench dynamics and defect production in quantum critical systems*, 25th February, 2008
24. **V. Subrahmanyam**, IIT, Kanpur, *Spin decoherence in Quantum dots*, 17th March, 2008
25. **Sundaram Balasubramanian**, Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore, *Computer Simulations of Ionic Liquids*, 20th March, 2008
26. **B. M. Arora**, T.I.F.R, *Edge states and Quantum Hall Effect*, 25th March, 2008
27. **Sudhansu Mandal**, I.A.C.S, Kolkata, *Spin Hall effect and noncentrosymmetric superconductivity*, 25th March, 2008
28. **M. Vazquez**, Group of Magnetism and Magnetic Nanomaterials, Institute of Materials Science, CSIC. 28049 Madrid, Spain, *Ordered magnetic nanohole and antidot arrays prepared through replication from anodic alumina templates*, 31th March, 2008
29. **Syed Hassan**, Department de Physique, Universite de Sherbrooke, Quebec, Canada, *Slave spin cluster mean field theory away from half-filling : Application to the multiband Hubbard and the extended Hubbard Model*, 8th April, 2008

THEORETICAL PHYSICS SEMINAR CIRCUIT (TPSC)

TPSC Speakers during Aug 2007 - March 2008

1. **S. B. Santra** (IIT Guwahati) *'Self Established Potential Gradient, Phase Separation and Criticality in the Invasion of a Sticky Random Solid'* on 18th June 2007
2. **Nabamita Banerjee** (HRI, Allahabad) *'Phase Transition of Electrically Charged Ricci-flat Black Holes'* on 23rd October 2007
3. **Jean Pierre Gazeau** (Paris, France) *'Delaunay sequences of numbers and non linear coherent states quantization'* on 20th December 2007
4. **Bing-Hong Wang** (Hefei, China) *'Evolutionary Games On Complex Network'* on 14th January 2008
5. **Kamal L. Panigrahi** (IIT, Guwahati) *'Massless Higher Spin theories on AdS space'* on 7th February 2008
6. **T. R.Govindarajan** (IMSC, Chennai) *'Non-commutative Geometry and Quantum Field Theory'* on 11th March 2008
7. **Manga Rao** (Univ Hyderabad) *'Spontaneous Emission of a Single Quantum Dot in a Photonic Crystal Waveguide'* on 13th March 2008.
8. **J. Banerjee** (PRL, Ahmedabad) *'Exploring fractional revivals and sub-Planck structures : A walk in phase space with Wigner and Kirkwood'*, during TPSC Conveners Meeting on 22nd September 2007
9. **S. B. Santra** (IIT Guwahati) *'Rotational sandpile model : a new universality class'*, during TPSC Conveners Meeting on 22nd September 2007
10. **B. Dey** (University of Pune) *'Localizing Energy through Nonlinearity and Discreteness : Energy Transport in Polymers and Bipolymers'*, during TPSC Conveners Meeting on 22nd September 2007
11. **M. Daniel** (Bharatidasan University, Trichy) *'Soliton Excitations in DNA Molecules'*, during TPSC Conveners Meeting on 22nd September 2007
12. **Rahul Basu** (IMSC, Chennai) *'Large Hadron Collider'*, during TPSC Conveners Meeting on 22nd September 2007
13. **Shri Singh** (BHU, Varanasi) *'Phase transitions in liquid crystals'*, during TPSC Conveners Meeting on 22nd September 2007

TPSC Conveners' Meeting

The TPSC Conveners' Meeting was held during 21-22 September 2007, which was attended by seventeen (17) conveners. In this meeting it was resolved that TPSC will hold, in addition to its Cat-A and Cat-B speakers programme,

(a) Topical Research Seminars in places that don't have a TPSC Centre,

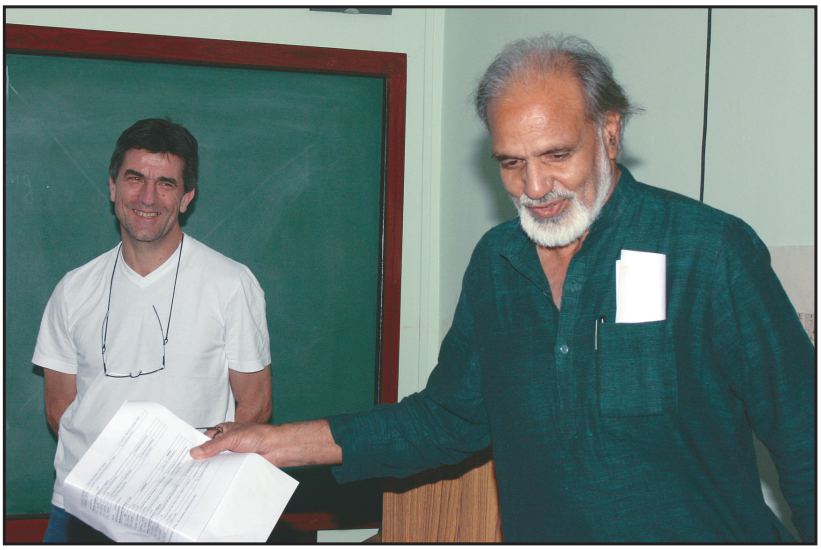
(b) Advanced Research Training Schools at University Physics Departments that are getting FIST support and

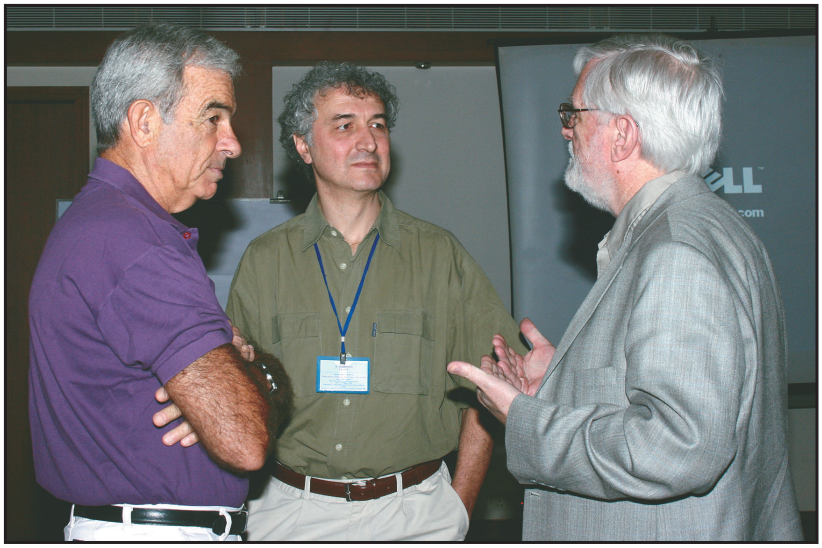
(c) TPSC Lectureship award for Women scientists, below 35 years of age. Enhancement of DA for the Cat-A & B speakers was also suggested.

EXTENDED VISITORS LINKAGE PROGRAMME (EVLP)

The following are the visitors under EVLP

Name of visitor	Period of visit
Dr. H. Wanare	January 29 - February 7 2008
Prof. A. Jayannavar	January 29 - January 31 2008
Prof. Tapan Chatterji	February 4 - February 28 2008
Prof. V.Subrahmanyam	March 15 - March 19 2008
Manuel Vazquez	March 30 & 31 2008





COMMITTEES

Following are members of various Committees

1	**Dr. T. Ramasami** Secretary, Department of Science & Technology Government of India, New Delhi	Chairman
2	**Prof. P. K. Kaw** Director Institute of Plasma Research, Gandhinagar	Member
3	**Prof. N. Kumar** Homi Bhabha Distinguished Professor, Raman Research Institute, Bangalore	Member
4	**Prof. G. K. Mehta** DAE Senior Scientist, Nuclear Science Centre New Delhi	Member
5	**Joint Secretary &** **Financial Adviser** Department of Science & Technology Government of India New Delhi	Member
6	**Chief Secretary** Government of Member West Bengal, Kolkata	Member
7	**Prof. A. K. Raychaudhuri** Director S. N. Bose National Centre for Basic Sciences, Kolkata	Member

Finance Committee		
1	**Prof. A. K. Raychaudhuri** Director, SNBNCBS Kolkata	Chairman
2	**Prof. R. K. Choudhury** Bhabha Atomic Research Centre Mumbai	Member
3	**Prof. Shibaji Raha** Director, Bose Institute	Member
4	**Joint Secretary & Financial** Adviser or his nominee Department of Science & Technology Government of India	Member
5	**Registrar** SNBNCBS Kolkata	Member Secretary

Academic Programme Advisory Committee		
1	**Prof. S. K. Joshi** NPL, New Delhi	Chairman
2	**Prof. D. D. Sharma** IACS, Kolkata	Member
3	**Prof. N. K. Dadhich** IUCAA, Pune	Member
4	**Prof. Deepak Dhar** TIFR, Mumbai	Member
5	**Prof. Siddhartha Roy** IICB, Kolkata	Member
6	**Prof. A. K. Raychaudhuri** Director, SNBNCBS, Kolkata	Member
7	**Prof. R. Banerjee** Dean (Academic Programme) SNBNCBS, Kolkata	Member

Building Committee		
1	**Prof. A. K. Raychaudhuri** Director, SNBNCBS Kolkata	Chairman
2	**Mr. Bipin Chand** Chief Engineer (EZ) I, CPWD	Member
3	**Prof. Sibabrata Halder** Head, Dept. of Architecture Bengal Engineering & Science University, Shibpur	Member
4	**Shri. Ranadhir Dey** Project Manager, (SO/SG), VECC, Kolkata	Member
5	**Registrar** SNBNCBS Kolkata	Member Secretary

S. N. BOSE NATIONAL CENTRE FOR BASIC SCIENCES
BLOCK - JD,SECTOR - III
SALT LAKE. KOLKATA - 700098.

People at The Centre

Faculty

Students

Staff

Faculty

S. No.	Name	Designation	Ph.D from	Year	Area of Research
1.	Arup Kr. Raychaudhuri	Sr. Professor & Director	Cornell University, Ithaca	1980 Physics	Experimental Condensed Matter
2.	Abhijit Mookherjee	Sr. Professor & Dean (Faculty)	University of Cambridge	1973	Physics of Materials
3.	Rabin Banerjee	Professor & Dean (Academic Programme)	S.I.N.P (University of Calcutta)	1988	Quantum Field Theory
4.	Jayanta Kr. Bhattacharya	Sr. Professor [joined on 01.01.2008]	University of Maryland, College Park, USA	1979	Statistical Physics, Non Linear Dynamics
5.	Sandip Kr. Chakrabarti	Professor	University of Chicago	1985	Astrophysics
6.	Sushanta Dattagupta	Professor [retired on 31.12.2007]	Brookhaven National Laboratory	1973	Structure & Dynamics of Condensed matter Physics
7.	Subhrangshu Sekhar Manna	Professor	S.I.N.P (University of Calcutta)	1987	Statistical Mechanics
8.	Anita Mehta	Professor	University of Oxford	1986	Soft Condensed Matter and Complex Systems
9.	Nilakantha Nayak	Professor	I.I.T., Kharagpur	1978	Quantum Information
10.	Subodh Kumar Sharma	Professor	S.I.N.P (University of Calcutta)	1977	Light Scattering
11.	Surajit Sengupta P	Associate rofessor	I.I.Sc. Bangalore	1992	Theoretical Condensed Matter Physics
12.	P. Singha Deo	Associate Professor	I.O.P. (Utkal University)	1996	Mesoscopic Systems

S. No.	Name	Designation	Ph.D from	Year	Area of Research
13.	Manu Mathur	Associate Professor	I.M.Sc. (University of Madras)	1993	Quantum Field Theory & QCD
14.	Amitabha Lahiri	Associate Professor	Syracuse University	1991	Quantum Field Theory
15.	Archan S. Majumdar	Associate Professor	University of Delhi	1994	Foundation of Quantum Theory and Cosmology
16.	Biswajit Chakraborty	Associate Professor	I.M.Sc. (University of Madras)	1993	Quantum Field Theory
17.	Gautam Gangopadhyay	Associate Professor	I.A.C.S. (Jadavpur University)	1993	Chemical Physics
18.	Jaydeb Chakrabarti	Associate Professor	I.I.Sc., Bangalore	1995	Soft Condensed Matter and Complex Systems
19.	Pratip Kr. Mukhopadhyay	Associate Professor	I.I.Sc., Bangalore	1989	Experimental Condensed Matter Physics
20.	Debashis Gangopadhyay	Associate Professor	S.I.N.P (Jadavpur University)	1988	Quantum Field Theory
21.	Tanusri Saha Dasgupta	Reader	SNBNCBS University of Calcutta	1995	Physics of Materials
22.	Kalyan Mandal	Reader	I.I.T., Kharagpur	1994	Experimental Condensed Matter
23.	M. Sanjay Kumar	Reader	University of Hyderabad	1989	Quantum Optics
24.	Partha Guha	Reader	University of Oxford	1996	Mathematics
25.	Priya Mahadevan	Reader	I.I.Sc., Bangalore	1998	Condensed Matter Physics
26.	Ranjan Chaudhury	Reader	T.I.F.R (University of Mumbai)	1988	Condensed Matter Theory

S. No.	Name	Designation	Ph.D from	Year	Area of Research
27.	Ranjit Biswas	Reader	I.I.Sc. Bangalore	1995	Physical Chemistry/ Chemical Physics
28.	Samir Kr. Pal	Reader	Jadavpur University	2000	Biophysics and Spectroscopy
29.	Samir Kr. Paul	Reader	I.O.P. (Utkal University)	1989	Mathematical Physics
30.	Sugata Mukherjee	Reader	Frei Universitat Berlin	1985	Physics of Materials
31.	Anilesh Mohari	Faculty Fellow	I.S.I, Delhi	1992	Mathematics
32.	Subasis Sinha	Faculty Fellow	I.M.Sc. (University of Madras)	2001	Condensed Matter Physics
33.	P. A. Sreeram	Faculty Fellow [resigned on 04.06.2007]	I.O.P. Bhubaneswar	1999	Quantum Many Body Theory
34.	Rina Das	Scientific Officer 'D'			

Visiting Scientists

1	B. B. Bhattacharya	INAE Distinguished Professor
2	Alak K. Majumdar	Reasearch Professor

Bose Fellows

1	Rajib Kumar Mitra	Dept. of Material Sciences

Visiting Faculty Fellows

1	Barnali Ghosh (Saha)	Scientist (WOS-A Scheme)	Experimental study materials
2	Kuntal Chakrabarti	Visiting Faculty Fellow	Experimental study materials
3	Molly De-Raychaudhury	Visiting Faculty Fellow (DST Women Scientist)	Electronic structure of novel materials
4	Sarathi Kundu	Visiting Faculty Fellow	Experimental studies of materials
5	Sumita Datta	Visiting Faculty Fellow (DST Women Scientist)	Analytical and numerical techniques involved in Theoretical Physics

Post Doctoral Scientists

1	Anindya Das	Fellowship NSTI Programme	Experimental studies of materials
2	B. Rajinikanth	Research Associate (Project)	Experimental studies of magnetic materials
3	Kaustuv Das	Post Doctoral Fellow	Experimental studies of materials
4	Kinshuk Acharyya	Post Doctoral Fellow	Astrochemistry and Astrobiology
5	Madhuri Mondal	Post Doctoral Fellow	Synthesis characterization and application of magnetic nano particles
6	Manideepa Mitra	Reasearch Associate (Young Scientist Scheme)	Condensed Matter Physics
7	Satyabrata Adhikari	Post Doctoral Fellow	Quantum Optics
8	Sheelan Sengupta	Post Doctoral Fellow	Mesoscopic Physics

Research Scholars

Extended Senior Research Fellows

Sunandan Gangopadhyay (PBIR-Batch 2001)	Submitted In February '08
Subarna Mitra (Batch 2002)	Submitted In June '07
Ankush Sengupta (Batch 2001)	Submitted In October '07 & Left
Ajay Kumar Shaw (Batch 2005)	Submitted In December '07

Post M.Sc Ph.D Programme

Junior Research Fellows

Batch – 2007 (Mid Term)

Debabrata Chattaraj	Biswajit Das
Kinsuk Giri	Biswajit Guchhait (CSIR)
Ambika Prasad Jena	Debraj Ray
Pramod Kr. Verma (CSIR)	

Batch – 2007

Kinshuk Banerjee (CSIR)
Kapil Gupta
Soumyajit Sarkar
Anindya Das (CSIR) (Left - 3.3.08)
Sachin Srivastava (Left - 15.12.07)
Swastika Chatterjee
Sujoy Modak (CSIR)
Prashant Singh
Niharika Singh (Left - 10.8.07)

Batch - 2006

Ritwik Bhattacharyya
Raka Dasgupta
Himadri Ghosh (Project ISRO)
Rajesh Kumar Neogy
Subrata Khan (Left - 24.7.07)
Manoj Raula (Project CSIR) (Left - 1.6.07)
Hena Das
Chinmay Kumar Gupta
Bibhas Ranjan Majhi
Debrata Pal
Debopam Som (Left - 1.7.07)

Batch - 2005

Sourav Bhattacharya
Harun Al Rashid Gazi
Swarup Saha (Project INDO-GERMAN)
Senior Research Fellows
Roby Cherian (Project DAE)
Moshiur Rahaman, TWAS-BOSE Fellow
Ajay Kumar Shaw (Project UGC)

Batch - 2005

Debapriya Banerjee (Project CSIR)
S Shankara Narayanan (Project CSIR)
Mitali Banerjee (Project UGC)

Batch - 2004

Hemant Kr. Kashyap
Sailesh G. Kulkarni
P. Anil Kumar (Project CSIR) (Left - 1.6.07)
Soumendu Dutta (Project CSIR)
Tuhin Pradhan (Project UGC)
Rupa Sarkar (Project UGC) (Submitted in September 2007) (Left - 21.11.2007)

Batch - 2003

Kunal Bhattacharya
Kartick Tarafdar (Project CSIR)
Saurav Samanta
Manoranjan Ghosh
Anjan Kr. Nandi
Manoj Kr. Yaddav

Badiur Rahman (External-Submitted in March'08)

Arindam Ghosh Hazra (External-Submitted in 2008)

Sudipta Samanta (Project CSIR)

Batch - 2002

Biplab Ghosh (External-Submitted in Sept'07)

Suman Sinha (Left – External)

Malay Kr. Bandopadhyay (Project CSIR) (Submitted in July'07) (Left-01.07.07)

Sudeshna Samanta

Jayee Bhattacharya

Nupur Mukherjee (Left-External)

Batch - 2001

Monodeep Chakraborty (Project Warwick University) (Ph.D – November '07)

Soumen Mandal (External-Submitted in July '07)

Batch - 2000

Ram Narayan Deb (External-Submitted in February '08)

Batch - 1999

Dipankar Rana (Left-External)

Research Scholars in Projects

Junior Research Fellows/Project Assistants

Batch - 2007

Rudra Banerjee (Project DST)

Pampa Pal (Project DST)

Batch - 2006

Arup Ratan Das (Project CSIR) (Left -31.8.07)

Neha Garg (Project UNANST) (Left- -20.6.07)

Pieu Ghoshal (Project DST) (Left -1.10.07)

Anuradha Bhattacharya (Project UNANST) (Left -15.10.07)

Post B.Sc Integrated Ph.D Programme (Physical Sciences)

M.Sc Students

Batch - 2007

Ansuman Dey

Arghya Dutta

Atanu Kumar

Batch - 2006

Amartya Sarkar

Oindrila Ganguly

Deepak S. Jalla

Rajiv Kumar Chouhan

Indrakshi Roychowdhury

Rudranil Basu

Nilok Bose

Sasmita Srichandan

Nirupam Dutta

Sudip Kumar Garain

Junior Research Fellows

Batch - 2005

Abhinav Kumar

Manish Kumar Sahai

Shantanu S. Bagchi

Batch - 2004

Shreemoyee Ganguly

Niraj Kr. Chaubey

Irfan (Left-1.8.07)

Batch - 2003

Sagar Chakraborty

Arya Paul (Project CSIR)

Tamoghna Kanti Das

Arnab Saha

Subrata Sarkar

Bipul Das (Project CSIR)

Saptarshi Mitra (Left - 31.3.07)

Senior Research Fellows

Btch - 2002

Ashis Bakshi
Chandra S. Chatterjee
Saikat Chatterjee
Soma Das
Santosh Roy
Tapati Sarkar (Project UGC)

Batch - 2001

Abhishek Pandey
Mrinal Kanti Bera
Debrabrata Dutta
Navin Chandra (Project CSIR)
M V Kamalakar (Project CSIR)

Post B.Sc Integrated Ph.D Programme (Chemical Sciences)

M.Sc Students

Batch - 2007

Amit Ranjan Matty
Dibakar Kumar Matty
Sabyasachi Bandyopadhyay
Sohini Mukherjee
Biswaaip Chakraborty
Pralok Kumar Samanta
Shekhar Saha
Subhra Samanta

Batch - 2006

Somnath Dawn
Subhamoy Ghosh
Ajoy Kr. Das
Bappaditya Nandi
Padmabati Mondal
Partha Haldar
Indranil Dutta Gupta
Shubhrodeep Pathak
Sritama Bose
Dipshikha Banerjee
Susmita Kar

Junior Research Fellows

Batch - 2005

Sudarson Sekhar Sinha

Administrative and Technical Staff Members

Somesh C Jhingan	Registrar [on lien w.e.f. 03.06.2007]	Gopal Chandra Ghosh	In-charge of General Amenities
V. K. Thomas	Librarian [on lien w.e.f. 03.07.2007]	Aditya Pal Choudhury	Project Assistant
Apurba Kanti Sarkar	Accounts Officer	Shiba Prasad Nayak	Pump Operator
Sunish Kumar Deb	PA to Director	Sushanta Kumar Biswas	Driver
Shohini Majumder	Administrative Assistant (Communications)	Bijoy Kumar Paramanik	Jr. Assistant (Guest House)
Dipti Prakash Banerjee	Office Superintendent	Bhupati Naskar	Library Stack Attendant
Sukanta Mukherjee	Assistant (General)	Arun Kumar Bhattacharya	Library Stack Assistant
Sirsendu Ghosh	Senior Stenographer	Partha Mitra	Attendant
Sanad Kumar Shukla	Assistant [on lien w.e.f. 01.05.2007]	Partha Chakraborty	Attendent
Santosh Kumar Singh	Stenographer	Ratan Acharya	Attendant
Tapan Kumar Sen	Upper Division Clerk	Pradip Kumar Bose	Tradesman 'A'
Jaydeep Kar	Jr. Assistant	Swapan Ghosh	Attendent
Prosenjit Talukdar	Jr. Assistant		

Personnel with Temporary Status

Sudhanshu Chakraborty	Attendant (Accounts)	Rabi Orao	Gardener
Biman Roy	Attendant (Central Registry)	Hiralal Das	Cleaner
Sukamal Das	Attendant (Central Registry)	Ramchandra Das	Cleaner
Dulal Chatterjee	Attendant (Maintenance)	Motilal Das	Cleaner

Somnath Roy	Attendant (Accounts)	Prakash Das	Cleaner
Nimai Naskar	Gardener	Kartick Das	Cleaner
Biswanath Das	Gardener		

Personnel on Contractual Appointment

Sougata Bhattacharyya	Facilitation Officer	Shilpi Mukherjee	Facilitation Officer
J. N. Satpathi	Librarian	Ila Pal	Technical Assistant
Amit Roy	Technical Assistant (Library)	Krishna Karmakar [Left on 27.02.08]	Technical Assistant
Gurudas Ghosh	Techinical Assistant (Library)	Ram Prosad Saha	Technical Assistant
Sudeshna Tripathi [Left on 22.06.07]	Technical Assistant Library)	Subrata Das	Mechanic
Siladitya Jana [Left on 06.07.07]	Technical Assistant (Library)	Shilpi Mukherjee	Facilitation Officer
J. R. Bhattacharya	Campus Engineer	Sutapa Basu	Office Assistant
Debabrata Majumder	Jr. Engineer (Electrical)	Suvodip Mukherjee	Office Assistant
Supriyo Ganguly	Jr. Engineer (Electrical)	Ayon Kumar Paul	Office Assistant
Sourav Choudhury	Jr. Engineer (Civil)	Mitali Pal	Office Assistant
Saikat Ghosh	Jr. Engineer (Civil)	Puspasree Bagchi	Office Assistant
Saswata Mukherjee	Sr. Computer Engineer	Raju Sethi [Left on 01.04.08]	Office Assistant (Admin.)
Dipanwita Das	Jr. Computer Engineer	Rajib Singh [Left on 25.03.08]	Stenographer cum Office Assistant
Anjan Mukherjee	Jr. Computer Engineer	R. N. Mukherjee [Left on 27.02.08]	Stenographer cum Office Assistant

Facilities


WARNING !!
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Journal of GENETICS
Science
SCIENCE AND CULTURE
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LIBRARY

Along with the establishment of S N Bose National Centre for Basic Sciences in 1986, the Library has been playing the most important role providing information support to all the faculty members, researchers and numerous professionals working on basic sciences throughout the country. Considering the Institute's nature and goal, SNB Library has been constantly enhancing its collection with books, printed/online journals, and digital media. In 2007, Library shifted from ground floor to its permanent location on the 1st floor of the same building.

Collection

The Library has a collection of more than 9500 books and more than 8000 bound volumes of journals. Library subscribes to 64 print and more than 300 online journals every year. In addition, the library is equipped with modern resources such as e-books, online/offline databases, audio-visual materials, etc. Apart from books on basic sciences, the library also has a wide collection of books on literature, history, environmental sciences, etc. in different languages, especially in Hindi. Additionally, the library subscribes to 25 popular magazines and 13 daily newspapers in different languages.

Working Hours

The working hours of the Library are as follows :

Week-days : 8:00 am to 8:00 pm.

Saturdays : 9:00 am to 5:30 pm.

Sections and Activities

The library administration consists of the following important units:

Books Section: Looks after the processing and maintenance of books in Library.

Journals Section: Looks after the acquisition of journals and their maintenance.

Reader's Service Section: This section takes care of all the library users and provides adequate services to them.

IT Section: This unit is responsible for maintenance of Library automation system, online journals, computers, scanner, photocopy machines as well as e-documents available in SNB Library.

Administration Unit: This unit looks after the overall library operation i.e. coordination with other sections of the Institute, maintenance of official records, correspondence, purchase etc.

Services

Online Public Access Catalogue (OPAC) : The library has Web OPAC, which is a powerful web based search engine for searching library's holdings database.

Reference Service : SNB Library has a separate Reference Collection enriched with standard reference books like encyclopedia, dictionaries, atlases, year books etc.

Computer, Internet and Printing Services : SNB Library is well equipped with a good number of computers with latest configuration and internet connection. Users can use the computers for any kind of academic purposes.

Library Resource Sharing Activities : The library shares its resources with all important academic/research institutions of West Bengal. The library is also a member of FORSA & INDEST consortia. SNB library has institutional membership of Saha Institute of Nuclear Physics (SINP),Indian Association of Cultivation of Science (IACS) , Library and Information Services, (British Council) and Indian Association of Special Libraries and Information Centres (IASLIC).

Service : Library has three photocopy machines. In addition, there are five laser printers in which one is colour printer.

Multimedia Resources : Library has a collection of "Bose Archives & Digital Media".

Database on Job Opportunities : The library maintains a digital database on job opportunities, fellowships, awards, etc. in various areas of basic sciences.

S N Bose Collection

The family of Prof. S. N. Bose has donated 39 books to SNBNCBS from the personal collection of Prof. Satyendra Nath Bose.

Computer Centre

The Computer Centre continued to serve the computational needs of the Centre, and to expand its scope and services in the academic year 2007-2008. At the end of this academic year, there were about 200 users with accounts in the central file server (NFS), including all faculty, academic staff and students. These accounts were distributed according to departmental affiliations among four SuperMicro servers, each with a 2.2 GHz AMD processor and 3x72 GB hard disk, one for each department. All these users also had email accounts, as did almost all non-academic staff. The email accounts are held in a mail server of the same specifications as above, which also hosts the webpages.

The Centre has The center has a 100 Mbps internal network with a 4 Mbps external (internet) link. A parallel computing cluster built by SuperMicro was installed, containing 32 nodes. Each node has four quad-core processors, 16 GB RAM and 73 GB hard disk. In addition the cluster has a 2 Terabyte Network Access Storage device. Two smaller clusters, bought under individual research projects funded by the DST, were also installed in the Computer Centre.

A senior computer engineer, Mr. Saswata Mukherjee, and two junior computer engineers, Mr. Anjan Mukherjee and Ms. Dipanwita Das, joined on contract during 2007-08 to help in the maintenance of the computers and networking of the Centre.

Guest House & Hostel

The Centre has it's own modern Guest House and cafeteria located within the premises. Apart from serving regular meals to the staff members of the Centre as well as visitors, the cafeteria also serves as a venue for hosting lunches and High Tea on special occasions, seminars, conferences etc. of the Centre. There are 04 fully furnished air-conditioned suites with attached baths kitchenettes, 15 single, 06 double fully air-conditioned furnished rooms and 21 fully furnished non-air-conditioned rooms with attached baths in the Guest House. The Guest House is catered with 24 hrs STD / ISD facilities with attachment conferencing system including continuous attendance by experienced persons manned for the purpose. A new 32 bed single occupancy hostel has been made operational from August 2007 with cafeteria and a Common Room.

Experimental Facilities at the Centre

Name of the Equipment

1. X-ray Diffractometer (XRD)
2. Atomic Force Microscope (AFM)
3. Water Purifier
4. LB Film Maker
5. Network Analyzer
6. Mask Aligner
7. Fourier Transform Infrared Spectrometer (FTIR)
8. Dynamic light Scattering (DLS)
9. Picosecond Fluorimeter
10. Femtosecond Laser facility with Fluorescence up conversion Detection
11. Lyophilizer
12. CD-spectrometer
13. UV-VIS Absorption and Photoluminescence Spectrophotometers
14. Spectroscopic Ellipsometer
15. Thermo Gravimetry and Differential Thermal Analyser (TG-DTA)
16. Environmental-SEM (ESEM)
17. Vibrating Sample Magnetometer (VSM)
18. DC/RF Sputtering Unit
19. Automated high-resolution Densimeter
20. Automated high-resolution Viscometer
21. Automated high-resolution Refractometer
22. DC/RF Sputtering Unit

Publications

List of Publications (in referred journals)

Department of Theoretical Sciences

1. *Quantum Tunneling and Back Reaction*, Rabin Banerjee, Bibhas Ranjan Majhi, Phys.Lett.B662,62-65,2008.
2. *Three-dimensional noncommutative bosonization*, Rabin Banerjee,T. Shreecharan, Subir Ghosh, Phys.Lett.B662,231-236,2008.
3. *Hawking radiation, effective actions and covenant boundary conditions*, Rabin Banerjee, Shailesh Kulkarni, Phys.Lett.B659,827-831,2008.
4. *Hawking radiation and covariant anomalies*, Rabin Banerjee, Shailesh Kulkarni, Phys.Rev.D77,024018,2008.
5. *Gauge Theories on A(dS) space and Killing Vectors*, Rabin Banerjee, Bibhas Ranjan Majhi, Annals Phys.323,705-751, 2008.
6. *Lie algebraic noncommutative gravity*, Rabin Banerjee, Pradip Mukherjee, Saurav Samanta, Phys.Rev.D75,125020,2007.
7. *Gauge generators, transformations and identities on a noncommutative space*, Rabin Banerjee, Saurav Samanta, Eur.Phys.J.C51,207-215,2007.
8. *Gauge theories on de Sitter space and Killing vectors*, Rabin Banerjee, Annals Phys 322,2129-2144,2007.
9. *Standing and traveling waves in the shallow water circular hydraulic jump*, J. K. Bhattacharyya, A. K. Ray, Phys. Lett. A371,241 (2007).
10. *Secular instability in quasi viscous disc accretion*, J. K. Bhattacharyya, A K Ray, Astrophys. Jour, 668,409 (2007).
11. *A symmetry of the work probability distribution, J. K. Bhattacharyya*, A. Saha, Jour. Phys A40, 13269 (2007).
12. *Third order structure factor for rotating three dimensional homogeneous turbulent flow*, J. K. Bhattacharyya, S. Chakraborty, Phys Rev E76, 036304 (2007)
13. *Acoustic perturbations on steady spherical accretion in Schwarzscild geometry*, J. K. Bhattacharyya, T. Naskar, N. Chakrabarty, A. K. Ray, Phys Rev D76, 123002 (2007).
14. *Global persistence exponents in critical dynamics: finite size induced crossover*, J. K. Bhattacharyya, D. Chakrabarty, Phys Rev E76, 031117 (2007).
15. *Perturbative and non perturbative studies with the delta function potential*, J. K. Bhattacharyya, N. Bera, K.Bhattacharyya, Am J Phys 76, 256 (2008).
16. *On the sign of the second order energy shift in Rayleigh Schroedinger perturbation theory for a highly excited state*, J. K. Bhattacharyya, N. Bera and K. Bhattacharyya, J Phys A41, 045301 (2008).
17. *Energy levels of a particle confined in a super circular box*, J. K. Bhattacharyya, N. Bera, S. Mitra and S. Pratik Khastagir, Eur. Phys. J D46, (2008).
18. *Spectrum of the non-commutative spherical well*, F. G. Scholtz, B. Chakraborty, J. Govaerts and S. Vaidya, J.Phys.A40 (2007) 14581.

19. *Hamiltonian and quasi- Hamiltonian systems, Nambu-Poisson structures and symmetries* Partha Guha, J F Carinena and M F Ranada, J. Phys A 41, 335214 (2008).
20. *Supersymmetric Kuper Camassa-Holm equation and geodesic flow: a novel approach*. Partha Guha, Int. J.Geom. Methods, Mod. Phys. 5 (2008), no. 1,1-16.
21. *On the magnetohydmdynamic load and the magnetohydrodynamic metage*, Partha Guha, Sagar Chakraborty, Phys. Plasmas 15,012112 (2008).
22. *Euler-Poincar'e formalism of (two component) Degasperis-Procesi and Holm-Statey type systems,* Partha Guha, J. Nonlinear, Math. Phys. 14 (2007), no. 3, 390-421.
23. *Commensurate anisotropic oscillator, SU (2) coherent states and the classical limit*, M Sanjay Kumar and B Dutta-Roy, J. Phys. A: Math Theor. 41, 075306, 2008.
24. *Black hole no hair theorems for a positive cosmological constant*, Amitabha Lahiri, Sourav Bhattacharya, Phys. Rev. Lett. 99(2007)201101.
25. *The International Trade Network: weighted network analysis and modelling,* K. Bhattacharya, G. Mukherjee, J. Saramaki, K. Kaski and S. S. Manna, J. Stat. Mech., P02002, (2008).
26. *Loop Approach to Lattice Gauge Theories*, Manu Mathur, Nucl. Phys. 6779:32-62, 2007.
27. *Localized bases in Lsp2(0,1) and their use in the analysis of Brownian motion*, Anilesh Mohari, Palte E. T. Jorgensen, J. Approx. Theory 151 (2008), no. 1, 20-41.
28. *Pure inductive limit state and Kolmogorov's property*, Anilesh Mohari, J. Funct Anal. 253 (2007), no. 2,584-604.
29. *Teleportation of two-mode squeezed states,* S. Adhikari, A. S. Majumdar and N. Nayak, Phys. Rev. A, Vol.77, 012337 (2008).
30. *Atomic entanglement mediated by squeezed field*, B. Ghosh, A. S. Majumdar and N. Nayak, Int. J. Theo. Phys. Vol.12, Issue 2 (2007).
31. *Control of entanglement by dynamic Stark effect*, B. Ghosh, A. S. Majumdar and N. Nayak, J. Phys. B vol. 41,065503 (2008).
32. *On the validity of Rayleigh-Gans-Debye approximation in red bllod cell size distribution,* M K Yadav and S K. Sharma, J. Mod. Opt., 55 (2008) 921-929.
33. *Three-dimensional probability tomography of self-potential anomalies of graphite and sulphide mineralization in Orissa and Rajasthan, India,* Bhattacharya B. B.,Shalivahan, Jardani A., and Bera B., 2007, Near Surface Geophysics (European Association of Geoscientists and Engineers (EAGE)), 5,223-230.
34. *Audio Magnetotelluric Studies over Bakreswar Hot Spring, Eastern India: International Association for Gondwana Research*, Sinharay, Rajib K., Shalivahan and Bhattacharya Bimalendu B., 2007, Japan: IAGR Memoir no. 10,243 - 250.
35. *Lineament density modelling to identify high potential aquifers in hard rock areas:* Sikdar, P. Adhikari, S. K., and Bhattacharya, B. B., 2007, Journal of Geological Society of India, 69, 1118-1131.
36. *String non(anti) commutativity for Neveu-Schwarz boundry conditions*, Chandrasekhar Chatterjee, Sunandan Gongopadhyay, Arindam Ghosh Hazra, Int. J. Theor. Phys. 47, 2372-2381,2008.
37. *Hawking radiation in GHS blackhole, Effective action and Covariant Boundary condion*, Sunandan Gangopadhyay, Phy. Rev. D77,064027,2008.

38. *Strings in pp-wave background and background B-field from membrane and its symplectic quantization*, SunandanGangopadhyay, Phys. Lett. B 659,399-406, 2008

39. *Hawking radiation in GHS and non-extremal D1-D5 blackhole via covenant anomalies,* Sunandan Gangopadhyay, Phys. Rev. 077,024038,2008.

40. *Lie algebraic noncommuting structures from reparametrisation symmetry*, Sunandan Gangopadhyay, J. Math. Phys. 48,052302,2007

Department of Material Sciences

41. *Size dependence of lattice constants of semiconductor nanocrystals*,R.Cherian and P. Mahadevan, Appl. Phys. Lett. 92.043130 (2008).
42. *Bulk and nanoscale GaN: Role of Ga d states*, R. Cherian and P. Mahadevan, Phys. Rev. 676,2731(2007).
43. *High temperature ferromagnetism in single crystal dilute magnetic oxide: An intriguing story of intrinsic disorder and magnetism in Fe doped BaTiO3*, S. Ray, P. Mahadevan, S. Mandal, S.R. Krishnakumar, C.S. Kuroda, T. Sasaki, T. Taniyama and M. Itoh, Phys. Rev. B 77,104416 (2008).
44. *Direct evidence for hidden one-dimensional fermi surface of hexagonal* $K_{0.25}WO_3$,S. Raj, T. Sato, S. Souma, T. Takahashi, D.D. Sarma, P. Mahadevan, J.C. Campuzano, M. GreenWatt and W.H. McCarroll, Phys. Rev. B 77,245120 (2008).

45. *Tautomeric mutation: A quantum spin modeling*, Ranjan Chaudhury, Europhys. Lett. 79, 18005 (2007).

46. *Studies of Spin Diffusion Coefficient and Spin Stiffness Constant for the t-J model on Low- dimensional Lattices and Possible Application to Doped Antiferromagnets*, Ranjan Chaudhury, J. Phys. Condensed Matter 19,496203 (2007).

47. *Proposed low-energy model Hamiltonian for the spin-gapped system CuTe2O5*, Hena Das, Tanusri Saha-Dasgupta, Claudius Gros and Roser Vatenti, Phys. Rev. B 77, 224437 (2008)

48. *Moderate to Large magneto-optical Signals in High Tc Double perovskites*, Hena Das, Molly De-Raychaudhury, T. Saha-Dasgupta, Appl. Phys. Lett. 92,201912 (2008)

49. *Ab initio study of optical properties and magneto-optical Kerr effect in the pyrite compound* CoS_2, Swarup Saha, Molly De Raychaudhury, and T. Saha-Dasgupta , Phys. Rev. B 77, 155428(2008)

50. *Electronic Structure, Phonons, and Dielectric Anomaly in Ferromagnetic Insulating Double Pervoskite* La_2NiMnO_6, Hena Das, Umesh V. Waghmare, T. Saha-Dasgupta, and D. D. Sarma, Phys. Rev. Lett. 100,186402 (2008)

51. *Color properties of the model spin chain materials* $VOHPO_4 \ {}^1/_2 \ H_2O$ *and* $(VO)^2P_2O_7$ *: Spectroscopy and electronic structure calculations*, J. Cao, J. L. Musfeldt, D. J. Singh, B. Rahaman, T. Saha-Dasgupta, C. C. Torardi, B. C. Sales, H. M. Christen, and O. Swader, Phys. Rev. B 77,165111 (2008)

52. *First-Principles Study of Structural Stability and Electronic Structure of CdS Nanoclusters*, S. Datta, M. Kabir, T. Saha-Dasgupta, D.D. Sarma, J. Phys. Chem. 112, 8206 (2008).

53. *Ferromagnetism in metallic chalcospinels* $CuCr_2S_4$ *and* $CuCr_2Se$, T. Saha-Dasgupta, Molly De Raychaudhury, and D. D. Sarma, Phys. Rev. B 76, 054441 (2007)

54. Electronic structures and low-dimensional magnetic properties of the ordered rocksalt oxides $Na_3Cu_2SbO_6$ and $Na_2Cu_2TeO_6$, Shahab Derakhshan, Heather L. Cuthbert, John E. Greedan, Badiur Rahaman, and Tanusri Saha-Dasgupta, Phys. Rev. B 76, 104403(2007).

55. Enhanced crystal-field splitting and orbital-selective coherence induced by strong correlations in V_20_3, Alexander I. Poteryaev, Jan M. Tomczak, Silke Biermann, Antoine Georges, Alexander I. Lichtenstein, Atexey N. Rubtsov, Tanusri Saha-Dasgupta, and Ole K. Andersen, Phys. Rev. B 76, 085127 (2007).
56. Cluster dynamical mean-field calculations for TiOCI, T Saha-Dasgupta, A Lichtenstein, M Hoinkis, S Glawion, M Sing, R Claessen and R Valenti, New J. Phys. 9, 380 (2007).
57. Microscopic modeling of a spin crossover transition, Harald O Jeschke, L Andrea Sakjuero, Badiur Rahaman, Christian Buchsbaum, Volodymyr Pashchenko, Martin U Schmktt, Tanusri Saha-Dasgupta and Roser Valenti, New J. Phys. 9,448 (2007).
58. Effects of Two Energy Scales in Weakly Dimerized Antiferromagnetic Quantum Spin Chains, A. Bruhl, B. Wolf, V. Pashchenko, M. Anton, C. Gross, W. Assmus, R. Valenti, S. Glocke, A. Klumper, T. Saha-Dasgupta, B. Rahaman, and M. Lang, Phys. Rev. Lett. 99, 057204 (2007).
59. Electronic structure and microscopic model of $V_2GeO_4F_2$ — a quantum spin system with S = 1, Badiur Rahaman and T Saha-Dasgupta, J.Phys.: Condens. Matter. 19, 296206 (2007).
60. Magnetization dynamics in wire-shaped amorphous magnetic materials as probed by Barkhausen noise measurement, S. Sinha, K. Mandal and B. Das, Journal of Physics D: Applied Physics, 40 2710-2715(2007).
61. Superparamagnetic Behavior in Noninteracting $NiFe_2O_4$ nanoparticles in SIO_2 matrix, S. Mitra and K. Mandal, Materials and Manufacturing Processes, 22 444-449 (2007).
62. Exchange bias in Co-Cr_2O_3 nanocomposites, P. Anil Kumar and K. Mandal, Journal of Applied Physics, 101,113906 (1-5) (2007).
63. Synthesis of alpha-Fe_2O_3 nanocrystal in its different morphological attributes: growth mechanism, optical and magnetic properties, S. Mitra, S. Das, K. Mandal and S. Chaudhuri, Nanotechnotogy, 18, 275608 (2007).
64. *Magnetocaloric effect in reactively-milled* $LaFe_{11.57}Si_{1.43}\ H_y$ *intermetallic compounds,* K. Mandal, D. Pal, O. Gutfteisch, P. Kerschl and K.-H. Mueller, Journal of Applied Physics, 102 053906 (1-5) (2007).
65. *Effect of Aspect Ratio on the Magnetic Properties of Nickel Nanowires*, B. Das, K. Mandal, P. Sen, S. K. Bandopadhyay, Journal of Applied Physics, 103 013908 (1-4) (2008).
66. *Structural studies of* $Ni_{2+x}\ Mn_{1-x}$ *Ga by powder x-ray diffraction and total energy calculations*, S. Banik, R. Ranjan, A. Chakrabarti, S. Bhardwaj, N. P. Lalla, A. M. Awasthi, V. Sathe, D. M. Phase, P. K. Mukhopadhyay, Physical Review B 75,104107 (2007).
67. *Effect of Stress Relaxation on Quenched Ni-Fe-Al Ferromagnetic Shape Memory Alloy,* B. Rajini Kanth , P.K.Mukhopadhyay and S. N. Kaul, Advanced Materials Research 52 129-133(2008).
68. *Dynamic elastic properties and magnetic susceptibility across the austenite-martensite transformation in site-disordered ferromagnetic Ni-Fe-AI alloy*, P. K. Mukhopadhyay and S. N. Kaul, Applied Physics Letters 92,101924 (2008).
69. *Structural studies on Mn excess and Ga deficient Ni-Mn-Ga*, S. Banik, P. K. Mukhopadhyay, A.M.Awasthi and S. R. Barman, Advanced Materials Research 52 109-114 (2008).
70. *Magneto-transport and magnetic properties of Ni-Mn-Ga*, S. Banik, R. Rawat, P. K. Mukhopadhyay, B.L.Ahuja, Aparna Chakrabarti and S. R. Barman, Advanced Materials Research, 52 207-213 (2008).

71. *Magnetoresistance behavior of ferromagnetic shape memory alloy* $Ni_{1.75}Mn_{1.25}Ga$, S. Banik, R. Rawat, P.K.Mukhopadhyay, B. L. Ahuja, Aparna Chakrabarti, P. L. Paulose, Sanjay Singh, Akhilesh Kumar Singh, D. Pandey, and S. R. Barman, Physical Review B 77, 224417 (2008).

72. *A method to quantitatively evaluate Hamaker constant using the jump-into-contact effect in Atomic Force microscopy*, Soma Das, P. A. Sreeram and A. K. Raychaudhuri, Nanotechnology 18, 035501 (2007).

73. *Effect of size reduction on charge ordering in* $La_{0.5}Ca_{0.5}MnO_3$, Tapati Sarkar, Barnali Ghosh and A.K.Raychaudhuri, Journal of Nanoscience and Nanotechnology. 7, 2020 (2007).

74. *Stability of Metal Nanowires (d>15nm) against Electromigration*, Achyut Bora, Aveek Bid and A.K.Raychaudhuri, Journal of Nanoscience and Nanotechnology 7,1831 (2007).

75. *Thermal fluctuations in histones during denaturation*, S.Nagapriya , A.K.Raychaudhuri and GV. Shivashankar, Journal of Nanostience and Nanotechnology 7, 2125 (2007).

76. Distinct levels in the nanoscale organization of DNA-histone complex revealed by its mechanical unfolding, GV.Soni, Loveleen Brar, F.M Hameed, A.K.Raychaudhuri and GV.Shivashankar, Appl. Physics. Letts. 90,163904 (2007).

77. Adhesion behavior of self assembled alkane-thiol monolayers on silver at different stages of growth, Phanindra Sai and A.K.Raychaudhuri, J.T. Phys. D: Appl. Phys. 40, 3182 (2007).

78. Structure, magnetic and transport properties of nanoparticles of the manganite $Pr_{0.5}Ca_{0.5}MnO_3$. Tapati Sarkar, A.K. Raychaudhuri and S. Bannerjee, J. Appl. Phys. 101, 124307 (2007).

79. Colossal etectroresistance in ferromagnetic insulating state of single crystal $Nd_{0.7}Pb_{0.3}MnO_3$, Himanshu Jain, A. K. Raychaudhuri, Nilotpal Ghosh and H. L Bhat, Phys.Rev B 76, 104408 (2007).

80. Band gap variation in Mg and Cd doped Zinc Oxide nanostructres and molecular clusters, Manoj K. Yadav, Manoranjan Ghosh, Ranjit Biswas, A.K.Raychaudhuri, A. Mookerjee and S.Dutta., Phys. Rev B. 76,195450 (2007).

81. Localized reversible nanoscale phase separation in $Pr_{0.63}C_{0.3}MnO_3$ single crystal induced by Scanning Tunneling Microscope Tip, Sohini Kar and A.K. Raychaudhuri, Applied Phys. Letts. 91,143124 (2007).

82. A novel method of synthesis of dense arrays of aligned single crystalline copper nanotubes using etectrodeposition in presence of a rotating electric field, M. Venkata Kamalakar and A.K.Raychaudhuri, Advanced. Mater. 20, 149 (2008).

83. Low frequency resistance fluctuations in metal films under current stressing at low temperatures ($T<0.3\ T_{melting}$) Achyut Bora and A.K.Raychaudhuri, Phys. Rev B 77, 075423 (2008).

84. Emergence of non-collinear magnetic ordering in small magnetic clusters: Mn_n and $As@Mn_n$, Mukul Kabir, D. G Kanhere, and Abhijit Mookerjee, Phys. Rev. B 75, 214433 (2007).

85. Note on : Emergence of non-collinear magnetic ordering in small magnetic clusters: Mn_n and $As@Mn_n$, Mukul Kabir, D. G Kanhere, and Abhijit Mookerjee, Phys. Rev. B 76, 019901 (2007).

86. Structure, bonding, and magnetism of cobalt clusters from first-principles calculations, S. Datta, M. Kabir, S. Ganguly, B. Sanyal, T. Saha-Dasgupta, and A. Mookerjee, Phys. Rev. B 76, 014429 (2007).

87. *Magnetism in small bimetallic Mn-Co clusters*, Shreemoyee Ganguly, Mukul Kabir, Soumendu Datta, Biplab Sanyal, and Abhijit Mookerjee, Phys. Rev. B 78,014402 (2008).

88. *Relaxation of Bimolecular Layer Films on Water Surfaces*, S. Kundu, A. Datta, S. Hazra, Langmuir 24 (2008)9386

Department of Chemical, Biological & Macromolecular Sciences

89. *Molecular Recognition in Partially Folded States of a Transporter Protein: Temperature- Dependent Specificity of Bovine Serum Albumin*, D. Banerjee and S. K. Pal, Photochem. Photobiol. 84 (2008) 750.

90. *Temperature Dependent Simultaneous LJgand-binding in Human Serum Albumin*, S. S. Sinha, R. K. Mitra and S. K. Pal, J. Phys. Chem. B 112 (2008) 4884.

91. *Structural and Functional Characterization of Luminescent Silver-Protein Nanobioconjugates*, S. S. Narayanan and S. K. Pal, J. Phys. Chem. C 112 (2008) 4874.

92. *Interactions of Nile blue with Micelles, Reverse Micelles and a Genomic DNA*, R. K. Mitra, S. S. Sinha and S. K. Pal, J. Fluorescence 18 (2008) 423.

93. *Validation and divergence of the activation energy barrier crossing transition at AOT/tedthin reverse micetaur interface*, S. S. Narayanan, S. S. Sinha, R. Sarkar and S. K. Pal, J. Phys. Chem. B112 (2008) 2859.

94. *Luminescence Depolarization Dynamics of Quantum Dots: Is it Hydrodynamic Rotation or Exciton Migration?*, S. S. Narayanan, R. Sarkar, S. S. Sinha, F. Dias, A. Monkman and S. K. Pal. J. Phys. Chem. C112 (2008) 3423.

95. *Resonance Energy Transfer and ligand binding Studies on pH Induced Folded States of Human Serum Albumin*, A. K. Shaw and S. K. Pal, J. Photochem. Photobiol. B 90 (2008) 187.

96. *Spectroscopic studies on LJgand-Enzyme Interactions: Complexation of alpha-Chymotrypsin with 4',6-diamidino-2-phenylindole (DAPI),* D. Banerjee, S. K. Srivastava and S. K. Pal, J. Phys. Chem. B 112 (2008) 1828.

97. *Picosecond to Nanosecond reorganization of water in AOT/lecithin Mixed Reverse Micelles of different morphology*, S. S. Narayanan, S. S. Sinha, R. Sarkar and S. K. Pal, Chem. Phys. Lett. 452 (2008) 99.

98. *Spectroscopic studies on the effect of temperature on pH-induced folded states of Human Serum Albumin*, A. K. Shaw and S. K. Pal, J. Photochem. Photobiol. B 90 (2008) 69.

99. *Dynamics in the DNA recognition by DAPI: Exploration of the various binding modes*, D. Banerjee and S.K. Pal, J. Phys. Chem. B112 (2008) 1016.

100. *Sorvation dynamics of LDS 750 in micelles, reverse micelles and proteins*, D. Banerjee and S. K. Pal, Chem. Phys. Lett. 451 (2008) 237.

101. *Temperature Dependent Solvation Dynamics of Water in AOT/isooctane Reverse Micelles*, R. K. Mitra, S. S. Sinha and S. K. Pal, Langmuir 24 (2008) 49.

102. *Interplay between Hydration and Electrostatic Attraction in Ligand Binding: Direct Observation of Hydration Barrier at Reverse Micellar Interface*, D. Banerjee, S. S. Sinha and S. K. Pal, J. Phys. Chem. B111 (2007) 14239.

103. *Interaction of Hoechst 33258 and Bhidium with Histone1-DNA Condensates*, R. Sarkar and S. K. Pal, Biomacromotecules 8 (2007) 3332.

104. *Direct Conjugation of semiconductor nanocrystals to a globular protein to study protein- folding intermediates*, R. Sarkar, S. S. Narayanan, L.-O. PA¥lsson, F. Dias. A. Monkman and S. K. Pal, J. Phys. Chem. B111 (2007) 12294.

105. *Hydration in Protein Folding: Thermal Unfolding/Refolding of Human Serum Albumin*, R. K. Mitra, S. S. Sinha and S. K. Pal, Langmuir 23 (2007) 10224.

106. *Direct Observation of Essential DNA Dynamics: Melting and Reformation of the DNA Minor Groove*, D.Banerjeeand S. K. Pal, J. Phys. Chem. B111 (2007) 10833 (Cover Article).

107. *Structural and Functional Characterization of Enzyme-Quantum Dot Conjugates: CovaJent Attachment of CdS Nanocrystal to alpha-Chymotrypsin*, S. S. Narayanan, R. Sarkar and S. K. Pal, J. Phys. Chem. C 111 (2007) 11539.

108. *Temperature Dependent Hydration at Micellar Surface: Activation Energy Barrier Crossing Model Revisited* , R. K. Mitra, S. S. Sinha and S. K. Pal, J. Phys. Chem. B 111 (2007) 7577.

109. *Size and Shape-dependent Electron-Hole Relaxation Dynamics in CdS Nanocrystals*, R. Sarkar, A. K. Shaw, S. S. Narayanan, C. Rothe, S. Hintschich, A. Monkman and S. K. Pal, Optical Materials 29 (2007) 1310.

110. *Nonspecific Protein-DNA Interactions: Complexation of alpha-chymotrypsin with a Genomic DNA*, S. S. Narayanan and S. K. Pal, Langmuir 23 (2007) 6712.

111. *Simultaneous Binding of Minor Groove Binder and Intercalates to dodecamer DNA: Importance of relative orientation of Donor and Acceptor in FRET*, D. Banerjee and S. K. Pal, J. Phys. Chem. B (Letter) 111 (2007) 5047.

112. *Fluorescence Relaxation Dynamics ofAcridine Orange in Nanosized Micellar Systems and DNA*, A. K. Shaw and S. K. Pal, J. Phys. Chem. B111 (2007) 4189.

113. *Activity of Subtilisin Carlsberg in Macromolecular Crowding*, A. K. Shaw and S. K. Pal, J. Photochem. Photobiol. B 86 (2007) 199.

114. *Direct Observation of Protein Residue Sotvation Dynamics*, A. K. Shaw, R. Sarkar, D. Banerjee, S. Hintschich, A. Monkman and S. K. Pal, J. Photochem. Photobiol. A 185 (2007) 76.

115. *Dipolar gases in quasi one-dimensional geometries*, S. Sinha, L Santos, Phys. Rev. Lett. 99,140406, (2007).

116. *On the microscopic basis of Newton's law of cooling and beyond*, M. R. Nath, S. Sen and G. Gangopadhyay, J. Chem. Phys. 127 (2007) 094505.

117. *Effect of field quantization on Rabi oscillation of equidistant cascade four-level system,* M. R. Nath, T. K. Dey, S. Sen and G. Gangopadhyay, Pramana - J of Phys.70(2008) 141.

118. *Quantum electron transfer processes induced by thermo-coherent state*, S. Banerjee and G. Gangopadhyay, J. Chem. Sc.119(2007)357.

119. *Nondispersive backscattering in quantum wires*, P. Singha Deo, Phys. Rev. B 75,235330 (2007).

120. *Visible fluorescence induced by metal semiconductor transition in composite of carton nanotube with noble metal nanoparticles*, C. Subramaniam, T. S. Sreeprasad, T. Pradeep, G.V. Pavankumar, C. Narayanan, T. Yajima, Y. Sugawa, H. Tanaka, T. Ogawa and J. Chakrabarti, Phys. Rev. Lett, 99,167404 (2007).

121. *Transverse electrokinetic effect: Exeperiment and Theory*, C. Subramaniam, T Pradeep & J. Chakrabarti, J. Phys. Chem C, 111,19103 (2007).

122. *A novel approach to salvation time scale in non-polar solvents via instability of solvent density modes*, R. Biswas and J. Chakrabarti, J. Phys. Chem B, 111,13743 (2007).

123. *Spectroscopic Studies of Catankmic Reverse Microemulsion:Correlation with the Superactivity of Horseradish Peroxidase Enzyme in a Restricted Environment*, Ranjit Biswas, Amp R. Das, Tuhin Pradnan, DkJier Touraud, Wemer Kunz and Sekh Mahiuddin, Journal of Physical Chemistry B, 2008,112,6620-6628.

124. *Structural Transition in Alcohol-Water Binary Mixtures: A Spectroscopic Study*, Tuhin Pradhan, Piue Ghoshal and Ranjit Biswas, Journal of Chemical Sciences, 2008, 120, 275 -287.

125. *Excited State Intramolecular Charge Transfer Reaction in Binary Mixtures of Water and Tertiary Butanol (TBA): Alcohol Mole Fraction Dependence*, Tuhin Pradhan, Piue Ghoshal and Ranjit Biswas, Journal of Physical Chemistry A, 2008,112,915-924.

126. *An Integrated and Open-ended Experiment: Study of Chemical Waves in Time and Space*, Mainak Sadhukhan, Sudarson Sekhar Sinha, Sucheta Sengupta, Ranjit Biswas and Bidyendu M. Deb, Resonance, 2008,13,54 - 80.

127. *A Novel Approach to Solvation Time Scale in Non-polar Solvents via Instability of Solvent Density Modes*, Ranjit Biswas and J. Chakrabarti, Journal of Physical Chemistry B, 2007, 111, 13743-13747.

128. *Band Gap Variation in Mg- and Cd-doped ZnO Nanostructures and Molecular Clusters,* Manoj K. Yadav, Manoranjan Ghosh, Ranjit Biswas, Arup K. Raychaudhuri and Abhijit Mookerjee and Soumendu Datta, Physical Review B, 2007, 76, 195450(1)-195450(9).

129. *Ions in a Binary Asymmetric Dipolar Mixture: Mole Fraction Dependent Bom Energy of Solvation and Partial Solvent Polarization Structure*, Hemant Kashyap and Ranjit Biswas, Journal of Chemical Physics, 2007,127,184502(1) -184502(15).

130. *Non-ideality in Bom Free Energy of Solvation in Alcohol-Water and Dimethyl Sulfoxkte- Acetonitrile Mixtures: Solvent Size Ratio and Ion Size Dependence*, Hemant Kashyap and Ranjit Biswas, Journal of Chemical Sciences, 2007,119, 391- 399.

131. *Electrolyte Concentration and Ion-Size Dependence of Excited-State Intramolecular Charge-Transfer Reaction in (Alkylamino)benzonitriles: Time Resolved Fluorescence Emission Studies,* Tuhin Pradhan and Ranjit Biswas, Journal of Physical Chemistry A, 2007, 111,11524-11530.

132. Electrolyte Concentration and Ion-Size Dependence of Excited-State Intramolecular Charge-Transfer Reaction in (Alkylamino)benzonitriles: Time Resolved Fluorescence Emission Studies, Tuhin Pradhan and Ranjit Biswas, Journal of Physical Chemistry A, 2007, 111,11514-11523.

133. Driven Disordered Periodic Media with an Underlying Structural Phase Transition, A. Sengupta, S Sengupta and G. I. Menon, Phys. Rev. B 75,180201(R) (2007).

134. Fluctuations at a Constrained Liquid-Solid Interface, A. Chaudhuri, D. Chaudhuri and S Sengupta, Phys. Rev. E 76, 021603 (2007).

135. Dynamical transitions of a driven Ising interface, Manish K. Sahai and Surajit Sengupta, Phys. Rev. E 77, 032601 (2008).

Department of Astrophysics & Cosmology

136. Desorption rates and sticking co-efficients for CO and O2 interstellar ices, K. Acharyya, G.W. Fuchs, H.J. Fraser, E.F. van Dishoeck and H. Linnartz, 2007, Astronomy and Astrophysics, 466,1005.

137. Teleportation of two-mode squeezed states, S. Adhikari, A. S. Majumdar, N. Nayak, 2008, Phys. Rev. A 77,012337

138. Quasi-periodic oscillations in quasars to nano-quasars, S. K. Chakrabarti, 2007, Bul. Astron. Soc. India. 35,271

139 Spectral properties of shocked accretion flows - a self-consistent study, S. K. Chakrabarti and Samir Mandal, 2007, Astrophysics and Space Science, 309,163

140. Unusual behaviour of D-region lonization time at 18.2 KHz during seismically active days', S. Chakrabarti, S. Sasmal, M. Saha, R. Khan, D. Bhaumik and S.K. Chakrabarti, 2007, Ind. J. Phys. 81, 531

141. Gravitational wave damping from a self-gravitating oscillating ring of matter around a black hole, S K. Chakrabarti and Prasad Basu, 2008, New Astronomy, 13 (6), 451

142. Time evolution of simple molecules during proto-star collapse, Ankan Das, Sandip K. Chakrabarti, K Acharyya and S. Chakrabarti 2008, New Astronomy, 13 (7), 457

143. *Spacetime Dependent Lagrangians and Electrogravity Duality*, D. Gangopadhyay, R.Bhattacharjee, L P Singh, 2007, Gravitation and Cosmology, 13 285

*** (31) *Control of atomic entanglement by dynamic Stark effect*, B. Ghosh, A. S., Majumdar, N Nayak, 2008. J. Phys. B: At. Mol. Opt. Phys. 41,065503.

144. *Aspects of non-ideal Stem-Gertach experiment and testable ramifications*, D. Home, A K Pan, Md. Manirul Ali and A. S. Majumdar. 2007, J. Phys. A. 40,13975.

145. *Broadcasting of continuous variable entanglement,* A S. Majumdar and N. Nayak, 2008. Phys. Rev. A 77,042301

146. *Spectral fit of Cygnus X-1 in high energy - a self-consistent study*, Samir Mandal and S K Chakrabarti, 2007, Astrophysics and Space Science, 309, 305

*** Inter-departmental collaboration, appears twice.

Details of externally funded projects at SNBNCBS

Year	No. of Projects	Amount Received (in Rs.)
2003 – 2004	8	32,55,971
2004 – 2005	16	54,75,340
2005 – 2006	16	65,26,723
2006 – 2007	21	5,10,87,471
2007 – 2008	25	6,07,13,160
		(List given)

Sl. No.	Name of the Project	Sponsoring Agency
1.	Studies on the charge and orbital ordering in rare earth magnaties'	DST
2.	Unit on nano Science & Technology (UNANST-DST)	DST
3.	Analytical Modeling and numerical simulation of the quasi periodic oscillations of black hole candidate	ISRO
4.	Swarnajayanti Fellowship	DST
5.	Understanding Physics Functions	Indo-German
6.	Integrated study of Correlated.... Electrons in Organic and Inorganic Materials	DST
7.	Advanced Research Unit	DST
8.	Development of a nanocalorimeter based on michromachined Si/Si3N4 Membrances	BRNS
9.	J. C. Bose Fellowship	DST
10.	Centre for Nano Technology	DST
11.	Development of Cryostates and electronic measurement units for physical properties measurements using a zero-loss dewar	DST
12.	Utilization of Synchrotron Radiation Sources and Neutron Sources abroad	DST
13.	Elastic Property measurements on Ferro Magnetic shape memory alloy system	DST
14.	Development of a vibrating sample magnetometer using a supercondicting magnet	DST
15.	Study of ferrite Nano Particles	DST
16.	INAE (Emeritus Scheme)	INAE
17.	Energies and relativistic corrections for ground and excited states of atoms and molecules using high quality with trial functions	DST
18.	Electronic Magnetic and magneto-optical properties of surfaces, thin films and multilayers	DST
19.	Solvation in near critical Fluids; Experiments and Simulations	DST
20.	Electronic Structure of dilute magnetic semiconductors	BRNS
21.	Indo-French Promotion : Diluted magnetic semiconductors : Bulk and Nano	Ind-French
22.	Charge and orbital ordering	DST
23.	Magneto-transport in giant magnetoresistive multilayers	DST
24.	To Study the Role of Water Molecules in Protein Function by using steady State and Time-Resolved Emission/Absorption Spectroscopy	DST
25.	High Pressure and High Magnetic field studies of electronic transport in strongly correlated Perovskite oxides showing metal insulator transition and colossal magnetoresistance'	DST
26.	Study of Metallic and Bi-metallic chisters'	DST
27.	Electronic Structure of unconventional colossal magneto resistive materials'	DST
28.	Non-Commutativity in string theory, gauge theory and condensed matter physics	DST

Accounts

AUDITORS' REPORT TO THE GOVERNING BODY OF SATYENDRA NATH BOSE NATIONAL CENTRE FOR BASIC SCIENCES

1. We have audited the attached BALANCE SHEET of Satyendra Nath Bose National Centre for Basic Sciences, as at 31st March, 2008 and also the INCOME AND EXPENDITURE ACCOUNT for the year ended on that date annexed thereto. These financial statements are the responsibility of the Centre's management. Our responsibility is to express an opinion on these financial statements based on our audit.

2. We conducted our audit in accordance with auditing standards generally accepted in India. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audit provides a reasonable basis for our opinion.

3. (i) We have obtained all the information and explanations, which to the best of our knowledge and belief were necessary for the purpose of our audit.

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

   (iii) The Balance Sheet and the Income and Expenditure Account dealt with by this report are in agreement with the books of account.

   (iv) In our opinion, the Balance Sheet and the Income and Expenditure Account dealt with by this report comply with the applicable accounting standards.

4. In our opinion and to the best of our information and according to the explanations given to us, the said accounts give a true and fair view in conformity with the accounting principles generally accepted in India.

   (i) in the case of the Balance Sheet, of the state of affairs of the Centre as at 31st March 2008; and

   (ii) in the case of the Income and Expenditure Account, of the surplus for the year ended on that date.

For **MOOKHERJEE BISWAS & PATHAK**
Chartered Accountants

Kolkata
Dated : 26-08-2008

(S P Mukherjea)
Partner

SATYENDRA NATH BOSE NATIONAL CENTRE FOR BASIC SCIENCES
Block JD, Sector - III, Salt Lake, Kolkata - 700 098

BALANCE SHEET AS AT 31ST MARCH 2008

	Schedule	Current Year	Previous Year
FUNDS AND LIABILITIES		**Rs.**	Rs.
Corpus/Capital Fund	**1**	**389883542.53**	331380596.83
Reserves and Surplus	**2**	**23569710.56**	20848851.88
Earmarked/Endowment Funds	**3**	**128994269.75**	88896750.92
Secured Loans and Borrowings	**4**		
Unsecured Loans and Borrowings	**5**		
Deferred Credit Liabilities	**6**		
Current Liabilities and Provisions	**7**	**16832950.65**	20179240.48
TOTAL		**559280473.49**	**461305440.11**
ASSETS			
Fixed Assets	**8**	**317878553.05**	265397028.35
Investments-from Earmarked/ Endowment Funds	**9**	**14519741.00**	13882630.00
Investments - Others	**10**	**57661359.00**	21455989.00
Current Assets, Loans, Advances etc.	**11**	**169220820.44**	160569792.76
Miscellaneous Expenditure (to the extent not written off or adjusted)			
TOTAL		**559280473.49**	**461305440.11**
Significant accounting policies	**24**		
Contingent liabilities and notes on accounts	**25**		

Per our report of even date

For **MOOKHERJEE BISWAS & PATHAK**
Chartered Accountants

Kolkata
Dated : 26-08-2008

(S P Mukherjea)
Partner

SATYENDRA NATH BOSE NATIONAL CENTRE FOR BASIC SCIENCES
Block-JD, Sector III, Salt Lake City, Kolkata 700 098

INCOME AND EXPENDITURE ACCOUNT
FOR THE YEAR ENDED 31ST MARCH 2008

	Schedule	Current Year Rs.	Previous Year Rs.
INCOME			
Income from Sales/Services	12	**503793.25**	337213.00
Grants/Subsidies	13	**70953923.00**	61575404.00
Fees/Subscriptions	14		
Income from Investments (Income on Investment from earmarked/endowment Funds transferred to Funds)	15		
Income from Royalty, Publication etc.	16		
Interest Earned	17	**3957121.00**	3069383.00
Other Income	18	**1161372.00**	468581.00
Increase/(decrease) in stock of finished goods and works-in-progress	19		
TOTAL (A)		**76576209.25**	**65450581.00**
EXPENDITURE			
Establishment Expenses	20	**26607107.25**	25690677.00
Other Administrative Expenses etc.	21	**48594948.32**	34482838.70
Expenditure on Grants, Subsidies etc.	22		
Interest	23		
TOTAL (B)		**75202055.57**	**60173515.70**
Balance being excess of Income over Expenditure(A-B)		**1374153.68**	5277065.30
Prior period adjustments (Credit)		**1346705.00**	7165.00
Transfer to/from General Reserve			
Balance being surplus/(deficit) carried to General reserve		**2720858.68**	5284230.30
Significant accounting policies	24		
Contingent liabilities and notes on accounts	25		

Per our report of even date

For **MOOKHERJEE BISWAS & PATHAK**
Chartered Accountants

Kolkata
Dated : 26-08-2008

(S P Mukherjea)
Partner

SATYENDRA NATH BOSE NATIONAL CENTRE FOR BASIC SCIENCES
Block-JD, Sector III, Salt Lake City, Kolkata 700 098
RECIPTS AND PAYMENTS ACCOUNT
For the year ended 31st March 2008

RECEIPTS	Current Year	Previous Year	PAYMENTS	Current Year	Previous Year
I. **Opening Balances**			I. **Expenses :**		
a) Cash in hand	**25403.85**	27232.85	a) Establishment Expenses	**21822234.25**	21604143.00
b) Bank Balances :			b) Administrative Expenses	**55297088.40**	39099918.60
i. In current accounts	**13751905.91**	11703212.86	II. **Payments made against**		
ii. In deposit accounts	**32144329.00**		**funds for various Projects**		
Schedule - 10	**21455989.00**		III. **Investments and deposits**		
Schedule - 11A	**18614695.00**		made		
iii. Savings accounts	**61089352.00**	14717764.00	a) Out of Earmarked/	**33646838.00**	10319296.00
iv. Remittance-in-Transit	**22500000.00**	11000000.00	Endowment/Own funds		
II. **Grants Received**			b) CPWD Deposit	**3031212.00**	15000000.00
a) From Government of India			c) Bank Gurantee & LC A/C	**2746862.00**	15140776.00
- For the year	**208350925.00**	186597420.12	IV. **Expenditure on Fixed Assets & Capital Work-in-Progress**		
- For the previous year			a) Purchase of Fixed Assets	**67050236.00**	39082732.00
b) From State Government			b) Expenditure on Capital	**252331.00**	162565.00
c) From Other sources (details) (Grants for capital & revenue			Work-in-Progress		
exp. to be shown separately)			V. **Refund of surplus money**		
III. **Income on Investments from**			/Loans		
a) Earmarked/Endow Funds			a) To the Government of India		
b) Own Funds (Oth. Investment)	**2558532.00**	2333522.00	b) To the State Government		
IV. **Interest Received**			c) To other providers of funds		
a) On Bank deposits	**3366455.00**	1990676.00	VI. **Finance Charges (Interest)**		
			VII. **Other Payments**	**57460530.20**	10054891.57

V.	**Other Income**	**520207.50**	354584.00	VIII.	**Closing Balances**		
VI.	**Amount Borrowed**				b) Bank Balances :		
VII.	**Any other receipts**	**5754794.75**	2399554.10		i. In current accounts	**41889468.16**	13751905.91
	a) Cash in hand	**32217.00**	25403.85		ii. In deposit accounts		
					Schedule - 10	**57661359.00**	21455989.00
VIII.	**Amount transferred to Current**				Schedule - 11A	**15867833.00**	18614695.00
	Account from Deposit Account	**36393700.00**	24633373.00		iii. Savings accounts	**37623751.00**	61089352.00
					iv. Remittance-in-Transit		22500000.00
		394381960.01	287901667.93			394381960.01	287901667.93

For **MOOKHERJEE BISWAS & PATHAK**
Chartered Accountants

Kolkata
Dated : 26-08-2008

(S P Mukherjea)
Partner

SATYENDRA NATH BOSE NATIONAL CENTRE FOR BASIC SCIENCES
Block-JD, Sector III, Salt Lake City, Kolkata 700 098

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31.03.2008

SCHEDULE 1		Current Year		Previous Year
CORPUS/CAPITAL FUND :	**Rs.**	**Rs.**	Rs.	Rs.
Balance as at the beginning of the year	**331380596.83**		280008202.78	
Add : Contributions towards Corpus/Capital Fund	**72746077.00**		37224596.00	
Less : Depreciation for the year	**14243131.30**		8352201.95	
Add : Grant-in-aid in transit	--	**389883542.53**	22500000.00	331380596.83
BALANCE AS AT THE YEAR - END		**389883542.53**		**331380596.83**

SCHEDULE 2		Current Year		Previous Year
RESERVES AND SURPLUS :	**Rs.**	**Rs.**	Rs.	Rs.
1. *Capital Reserve :*				
As per last Account				
Addition during the year				
Less : Deductions during the year				
2. *Revaluation Reserve :*				
As per last Account				
Addition during the year				
Less : Deductions during the year				
3. *Special Reserves :*				
As per last Account				
Addition during the year				
Less : Deductions during the year				
4. *General Reserve :*				
As per last Account	**20848851.88**		15564621.58	
Add : Surplus during the year	**2720858.68**	**23569710.56**	5284230.30	20848851.88
TOTAL		**23569710.56**		**20848851.88**

For MOOKHERJEE BISWAS & PATHAK
Chartered Accountants

Kolkata
Dated : 26-08-2008

(S P Mukherjea)
Partner

SATYEN DRA NATH BOSE NATIONAL CENTRE FOR BASIC SCIENCES
Block-JD, Sector III, Salt Lake City, Kolkata 700 098

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31.03.2008

Amount (Rs.)

SCHEDULE 3

EARMARKED/ENDOWMENT FUNDS

		FUND-WISE BREAK UP				TOTAL	
		Project Fund	Medical Fund	Leave Salary	Gratuity Fund	Current Year	Prev. Year
a)	**Opening balance of the funds**	72323795.92	350592.00	9386609.00	6835754.00	88896750.92	35473462.38
b)	**Additions to the Funds**						
i)	Donations/grants/ Contributions	64367331.80	140269.00	64507600.80	65434089.12		
ii)	Income from investments made on account of funds	2362121.00	794073.00	433561.00	3589755.00	2087207.00	
iii)	Other additions -Provision during the year	584092.00	986690.00	1570782.00	1730537.00		
	TOTAL (a + b)	**139053248.72**	**490861.00**	**10764774.00**	**8256005.00**	**158564888.72**	**104725295.50**
c)	**Utilisation/Expenditure towards** objectives of funds						
i)	Capital Expenditure						
	Fixed Assets	18127477.00				18127477.00	6359066.98
	Others						
	Total						

SCHEDULE 3 (Contd.)

EARMARKED/ENDOWMENT FUNDS

		FUND-WISE BREAK UP				TOTAL	
		Project Fund	**Medical Fund**	**Leave Salary**	**Gratuity Fund**	**Current Year**	**Prev. Year**
ii)	Revenue Expenditure						
	Salaries, Wages and allowances etc.	6559622.00				6559622.00	4416772.00
	Rent						
	Other Administrative expenses					0.00	4571430.60
	Other Payments	4741551.97		100815.00	41153.00	4883519.97	481275.00
	TOTAL (c)	**29428650.97**		**100815.00**	**41153.00**	**29570618.97**	**15828544.58**
	NET BALANCE AS AT THE YEAR-END (a+b-c)	**109624597.75**	**490861.00**	**10663959.00**	**8214852.00**	**128994269.75**	**88896750.92**

For **MOOKHERJEE BISWAS & PATHAK**
Chartered Accountants

(S P Mukherjea)
Partner

Kolkata
Dated : 26-08-2008

SATYENDRA NATH BOSE NATIONAL CENTRE FOR BASIC SCIENCES
Block-JD, Sector III, Salt Lake City, Kolkata 700 098

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31.03.2008

Amount (Rs.)

	Current Year		Previous Year	
SCHEDULE 4				
SECURED LOANS AND BORROWINGS :				
1. Central Government				
2. State Government (Specify)				
3. Financial institutions				
a) Term Loans				
b) Interest accrued and due				
4. Banks:				
a) Term Loans				
Interest accrued and due				
b) Other Loans (Specify)				
Interest accrued and due				
5. Other Institutions and Agencies				
6. Debentures and Bonds				
7. Others (Specify)				
TOTAL	**Nil**	**Nil**	**Nil**	**Nil**

For **MOOKHERJEE BISWAS & PATHAK**
Chartered Accountants

Kolkata
Dated : 26-08-2008

(S P Mukherjea)
Partner

SATYENDRA NATH BOSE NATIONAL CENTRE FOR BASIC SCIENCES
Block-JD, Sector III, Salt Lake City, Kolkata 700 098

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31.03.2008

SCHEDULE 5

	Current Year		Previous Year	
UNSECURED LOANS AND BORROWINGS				
1. Central Government				
2. State Government (Specify)				
3. Financial Institutions				
4. Banks :				
a) Term Loans				
b) Other Loans (Specify)				
5. Other Institutions and Agencies				
6. Debentures and Bonds				
7. Fixed Deposits				
8. Others (Specify)				
TOTAL	**Nil**	**Nil**	**Nil**	**Nil**

SCHEDULE 6

	Current Year		Previous Year	
DEFERRED CREDIT LIABIILTIES :				
a) Acceptances secured by hypothecation of capital equipment and other assets				
b) Others				
TOTAL	**Nil**	**Nil**	**Nil**	**Nil**

For **MOOKHERJEE BISWAS & PATHAK**
Chartered Accountants

Kolkata
Dated : 26-08-2008

(S P Mukherjea)
Partner

SATYENDRA NATH BOSE NATIONAL CENTRE FOR BASIC SCIENCES
Block-JD, Sector III, Salt Lake City, Kolkata 700 098

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31.03.2008

SCHEDULE 7	Current Year	Previous Year
CURRENT LIABILITIES AND PROVISIONS		
A. CURRENT LIABILITIES		
1. Acceptances		
2. Sundry Creditors :		
a) For Capital expenditure	**7035965.00**	12818862.00
b) Others - Revenue expend.	**3499830.00**	3254747.00
3. Advances Received		
4. Interest accrued but not due on :		
a) Secured Loans/borrowings		
b) Unsecured Loans/borrowings		
5. Statutory Liabilities :		
a) Overdue		
b) Others		
6. Other Current Liabilities	**6234890.65**	4043366.48
TOTAL (A)	**16770685.65**	**20116975.48**
B. PROVISIONS		
1. For Taxation		
2. Gratuity		
3. Superannuation/Pension		
4. Accumulated Leave Encashment		
5. Trade Warranties/Claims		
6. Others - Adhoc Bonus	**62265.00**	62265.00
TOTAL (B)	**62265.00**	**62265.00**
TOTAL (A + B)	**16832950.65**	**20179240.48**

For **MOOKHERJEE BISWAS & PATHAK**
Chartered Accountants

Kolkata
Dated : 26-08-2008

(S P Mukherjea)
Partner

SATYENDRA NATH BOSE NATIONAL CENTRE FOR BASIC SCIENCES
Block-JD, Sector III, Salt Lake City, Kolkata 700 098

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31.03.2008

(Amount - Rs.)

SCHEDULE 8

FIXED ASSETS

DESCRIPTION	GROSS BLOCK				DEPRECIATION				NET BLOCK	
	Cost/valuation As at begin. of the year	Additions during the year	Deductions during the year	Cost/valuation at the year-end	As at the beginning of the year	Additions during the year	Depr during the year	Total up to the Year-end	Current year-end	Previous year-end
A. FIXED ASSETS :										
1. LAND :										
a) Freehold										
b) Leasehold	10950694.00			10950694.00				0.00	**10950694.00**	10950694.00
2. BUILDINGS :										
a) On Freehold Land										
b) On Leasehold Land	82257640.07	124865.00		82382505.07	12994926.14	1342393.00		14337319.14	**68045185.93**	69262713.93
c) Ownership Flats/Premises										
d) Superstructures on Land not belonging to the entity										
3. PLANT MACHIENRY & EQUIPMENT	62498492.50	22932636.00		85431128.50	3561612.46	3314862.00		6876474.46	**78554654.04**	58936880.04
4. VEHICLES	363026.00			363026.00	341919.74	2954.96		344874.70	**18151.30**	21106.26
5. FURNITURE, FIXTURES	14144455.19	1963753.00		16108208.19	8782175.13	943106.00		9725281.13	**6382927.06**	5362280.06
6. OFFICE EQUIPMENT	1448401.70	0.00		1448401.70	553440.66	68799.00		622239.66	**826162.04**	894961.04
7. COMPUTER/PERIPHERALS	25520135.90	13065405.00		38585540.90	20160603.38	3982940.00		24143543.38	**14441997.52**	5359532.52
8. ELECTRIC INSTALLATIONS	1744882.00	824600.00		2569482.00	597791.79	104773.00		702564.79	**1866917.21**	1147090.21
9. LIBRARY BOOKS	89592996.61	17273563.00		106866559.61	14192819.71	4479302.34		18672122.05	**88194437.56**	75400176.90
10. TUBEWELLS & W.SUPPLY						0.00		0.00	**0.00**	
11. OTHER FIXED ASSETS	84225.55			84225.55	15043.16	4001.00		19044.16	**65181.39**	69182.39
TOTAL OF CURRENT YEAR	**288604949.52**	**56184822.00**		**344789771.52**	**61200332.17**	**14243131.30**	**0.00**	**75443463.47**	**269346308.05**	**227404617.35**
PREVIOUS YEAR	**243104933.13**	**45500016.39**		**288604949.52**	**52848130.22**	**8352201.95**	**0.00**	**61200332.17**	**227404617.35**	**190256820.91**
B. CAPITAL WORK IN PROGRESS		**48532245.00**							**48532245.00**	**37992411.00**
TOTAL	**288604949.52**	**104717067.00**	**0.00**	**344789771.52**	**61200332.17**	**14243131.30**	**0.00**	**75443463.47**	**317878553.05**	**265397028.35**

For **MOOKHERJEE BISWAS & PATHAK**
Chartered Accountants

Kolkata
Dated : 26-08-2008

(S P Mukherjea)
Partner

SATYENDRA NATH BOSE NATIONAL CENTRE FOR BASIC SCIENCES
Block-JD, Sector III, Salt Lake City, Kolkata 700 098

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31.03.2008

(Amount Rs.)

SCHEDULE 9 INVESTMENTS FROM EARMARKED/ ENDOWMENT FUNDS	Current Year	Previous Year
1. In Government Securities		
2. Other approved Securities		
3. Shares		
4. Debentures and Bonds		
5. Subsidiaries and Joint Ventures		
6. *Others :*		
Fixed Deposit with Nationalised Banks		
Gratuity Fund Investment	**5803355.00**	5319052.00
Leave Salary Fund Investment	**8716386.00**	8563578.00
TOTAL	**14519741.00**	**13882630.00**

SCHEDULE 10 INVESTMENTS - OTHERS	Current Year	Previous Year
1. In Government Securities		
2. Other approved Securities		
3. Shares		
4. Debentures and Bonds		
5. Subsidiaries and Joint Ventures		
6. Others - Fixed Deposit with		
Nationalised Banks	**57661359.00**	21455989.00
TOTAL	**57661359.00**	**21455989.00**

For **MOOKHERJEE BISWAS & PATHAK**
Chartered Accountants

Kolkata
Dated : 26-08-2008

(S P Mukherjea)
Partner

SATYENDRA NATH BOSE NATIONAL CENTRE FOR BASIC SCIENCES
Block-JD, Sector III, Salt Lake City, Kolkata 700 098

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31.03.2008

(Amount Rs.)

SCHEDULE 11	Current Year	Previous Year
CURRENT ASSETS, LOANS, ADVANCES ETC.		
A. CURRENT ASSETS :		
1. Inventories :		
a) Stores and Spares	**221980.28**	283239.00
b) Loose Tools		
c) Stock-in-trade		
Finished Goods		
Work-in-progress		
Raw Materials		
Stock of Books		
2. Sundry Debtors :		
a) Debts Outstanding for a period exceeding six months		
b) Others		
3) Cash balances in hand	**32217.00**	25403.85
4) Bank Balancesn :		
a) *With Scheduled Banks :*		
On Current Accoutns (including Project A/C Rs 40458814.73)	**41889468.16**	13751905.91
On Deposit Accounts (includes Project Rs. 35775450.00)	**51643283.00**	18726090.00
On Savings Accounts (Project A/C)	**37623751.00**	61089352.00
b) *With non-Scheduled Banks :*		
On Current Accounts		
On Deposit Accounts		
On Savings Accounts		
5. Remittance - in - Transit	**0.00**	**22500000.00**
6. Post Office-Savings Accounts		
TOTAL (A)	**131410699.44**	116375990.76

For **MOOKHERJEE BISWAS & PATHAK**
Chartered Accountants

Kolkata
Dated : 26-08-2008

(S P Mukherjea)
Partner

SATYENDRA NATH BOSE NATIONAL CENTRE FOR BASIC SCIENCES
Block-JD, Sector III, Salt Lake City, Kolkata 700 098

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31.03.2008

(Amount Rs.)

SCHEDULE 11 (Contd.)	Current Year	Previous Year
CURRENT ASSETS, LOANS, ADVANCES ETC.		
B. LOANS, ADVACNES AND OTHER ASSETS		
1. Loans :		
a) Staff including HBA,Vehicle & PC Advance	**2960153.00**	2786550.00
b) Other Entitites engaged in activities/objectives similar to that of the Entity		
c) Other - Project A/c & UNANST A/C		
2. Advances and other amounts recoverable in cash or in kind or for value to be received:		
a) On Capital Account - CPWD Deposit Account	**32501426.00**	39646708.00
b) Prepayments		
c) Others (Security Deposits)	**217618.00**	210718.00
d) Contractors & Suppliers	**91941.00**	444651.00
3. Income Accrued :		
a) On Investments from Earmarked/Endowment Funds	**1599164.00**	1059611.00
b) On investmetns - Others	**439819.00**	45564.00
c) On Loans and Advances		
d) Others		
4. Claims Receivable-Grant-in-Aid Receivable	**-**	
TOTAL (B)	**37810121.00**	**44193802.00**
TOTAL (A + B)	**169220820.44**	**160569792.76**

For **MOOKHERJEE BISWAS & PATHAK**
Chartered Accountants

Kolkata
Dated : 26-08-2008

(S P Mukherjea)
Partner

SATYENDRA NATH BOSE NATIONAL CENTRE FOR BASIC SCIENCES
Block-JD, Sector III, Salt Lake City, Kolkata 700 098

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31.03.2008

(Amount Rs.)

SCHEDULE 12 INCOME FROM SALES/SERVICES	Current Year	Previous Year
1) Income from Sales		
a) Sale of Finished Goods		
b) Sale of Raw Material		
c) Sale of Scraps		
2) Income from Services		
a) Labour and Processing Charges		
b) Professional/Consultancy Services		
c) Agency Commission and Brokerage		
d) Maintenance Services (Equipment/Property)		
e) Others	**503793.25**	337213.00
TOTAL	**503793.25**	**337213.00**

SCHEDULE 13 GRANTS/SUBSIDIES (Irrevocable Grants & Subsidies Received)	Current Year	Previous Year
1) Central Government	**70953923.00**	61575404.00
2) State Government (s)		
3) Government Agencies		
4) Institutions/Welfare Bodies		
5) International Organsations		
6) Others		
TOTAL	**70953923.00**	**61575404.00**

For **MOOKHERJEE BISWAS & PATHAK**
Chartered Accountants

Kolkata
Dated : 26-08-2008

(S P Mukherjea)
Partner

SATYENDRA NATH BOSE NATIONAL CENTRE FOR BASIC SCIENCES
Block-JD, Sector III, Salt Lake City, Kolkata 700 098

SCHEDULES FORMING PART OF
INCOME & EXPENDITURE FOR THE YEAR ENDED 31.03.2008

(Amount Rs.)

SCHEDULE 14

FEES/SUBSCRIPTIONS

	Current Year	Previous Year
1) Entrace Fees		
2) Annual Fees/Subscriptions		
3) Seminar/Program Fees		
4) Consultancy Fees		
5) Others		
TOTAL	**Nil**	**Nil**

Note : Accounting Policies towards each item are to be disclosed

(Amount Rs.)

SCHEDULE 15

INCOME FROM INVESTMENTS

	Investment from Earmarked Fund		Investment - Others	
(Income on Invest. From Earmarked/ Endowment Funds transferred to Funds)	**Current Year**	Previous Year	**Currnet Year**	Previous Year
1) Interest				
a) On Govt. Securities				
b) Other Bonds/Debentures				
2) Dividents				
a) On Shares				
b) On Mutual Fund Securities				
3) Rents				
4) Others				
TOTAL	**Nil**	**Nil**	**Nil**	**Nil**
TRANSFERRED TO EARMARKED/ ENDOWMENT FUNDS	**Nil**	**Nil**	**Nil**	**Nil**

For **MOOKHERJEE BISWAS & PATHAK**
Chartered Accountants

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SCHEDULES FORMING PART OF
INCOME & EXPENDITURE FOR THE YEAR ENDED 31.03.2008

(Amount - Rs.)

SCHEDULE 16	Current Year	Previous year
INCOME FROM ROYALTY, PUBLICATION ETC.		
1. Income from Royalty		
2. Income from Publications		
3. Others		
TOTAL	**Nil**	**Nil**

SCHEDULE 17	Current Year	Previous year
INTEREST EARNED		
1) On Term Deposits :		
a) With Scheduled Banks	**3957121.00**	3069383.00
b) With Non-Scheduled Banks		
c) With Institutions		
d) Others		
2) On Savings Accounts:		
a) With Scheduled Banks		
b) With Non-Scheduled Banks		
c) Post Office Savings Accounts		
d) Others		
3) On Loans:		
a) Employees/Staff		
b) Others		
4) Interest on Debtors and Other Receivables		
TOTAL	**3957121.00**	**3069383.00**

For **MOOKHERJEE BISWAS & PATHAK**
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SCHEDULES FORMING PART OF
INCOME & EXPENDITURE FOR THE YEAR ENDED 31.03.2008

(Amount - Rs.)

SCHEDULE 18	Current Year	Previous Year
OTHER INCOME		
1) Profit on Sale/disposal of Assets :		
a) Owned assets		
b) Assets acquired out of grants, or received free of cost		
2) Export Incentives realized		
3) Fees for Miscellaneous Services		
4) Miscellaneous Income	**1161372.00**	468581.00
TOTAL	**1161372.00**	**468581.00**

SCHEDULE 19	Current Year	Previous Year
INCREASE/(DECREASE) IN STOCK OF FINISHED GOODS & WORK IN PROGRESS		
a) Closing stock		
Finished Goods		
Work-in-progress		
b) Less : Opening Stock		
Finished Goods		
Work-in-progress		
NET INCREASE/(DECREASE) [a-b]	**Nil**	**Nil**

For **MOOKHERJEE BISWAS & PATHAK**
Chartered Accountants

Kolkata
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(S P Mukherjea)
Partner

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SCHEDULES FORMING PART OF
INCOME & EXPENDITURE FOR THE YEAR ENDED 31.03.2008

SCHEDULE 20	Current Year	Previous Year
ESTABLISHMENT EXPENSES		
a) Salaries and Wages	**22282719.00**	20871120.00
b) Other Allowances and Bonus	**70065.00**	71451.00
c) Contribution to Provident Fund	**1130260.00**	1174553.00
d) Contribution to Other Fund - Gratuity Fund , Leave Salary Fund etc.	**1730723.00**	2046431.00
e) Staff Welfare Expenses (Medical)	**736766.25**	787078.00
f) Expenses on Employees' Retirement and Terminal Benefits		
g) Others	**656574.00**	740044.00
TOTAL	**26607107.25**	**25690677.00**

(Amount - Rs.)

SCHEDULE 21	Current Year	Previous Year
OTHER ADMINISTRATIVE EXPENSES ETC.		
a) Extended Visitors Programme. (Including Seminars & Workshops)	**6106465.00**	2463272.00
b) Academic Staff Research Expenses		
c) Library General Expenses	**70752.00**	59013.00
d) Electricity and Power	**5087732.00**	4025587.00
e) Laboratory Expenses	**3166983.00**	3164425.00
f) Insurance	**8399.00**	6984.00
g) Repairs and Maintenance	**12884324.72**	9124583
h) Excise Duty		

For **MOOKHERJEE BISWAS & PATHAK**
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Kolkata
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SCHEDULES FORMING PART OF
INCOME & EXPENDITURE FOR THE YEAR ENDED 31.03.2008

SCHEDULE 21	Current Year	Previous Year
OTHER ADMINISTRATIVE EXPENSES ETC. (Contd.)		
i) Rent, Rates and Taxes		
j) Vehicles Hire Charges	**2006881.00**	1566003.50
k) Postage, Telephone and Communication Charges	**2087006.00**	1783911.00
l) Printing and Stationary	**560845.00**	352414.00
m) Travelling and Conveyance Expenses	**750948.00**	549537.00
n) Subscription Expenses		
o) Expenses on Fees		
p) Auditors' Remuneration	**20225.00**	22428.00
q) Hospitality Expenses	**0.00**	1550.00
r) Professional Charges (Legal Charges)	**56358.00**	80290.00
s) Provision for Bad and Doubtful Debts/Advances		
t) Irrecoverable Balances Written-off		
u) Integrated Ph.D.	**10945627.00**	8131981.00
v) Import Clearing Expenses including Custom Duty	**1397608.60**	524456.00
w) Distribution of Books		
x) Advertisement and Publicity	**1121065.00**	812663.00
y) Others	**2323729.00**	1813741.20
TOTAL	**48594948.32**	**34482838.70**

For **MOOKHERJEE BISWAS & PATHAK**
Chartered Accountants

Kolkata
Dated : 26-08-2008

(S P Mukherjea)
Partner

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SCHEDULES FORMING PART OF
INCOME & EXPENDITURE FOR THE YEAR ENDED 31.03.2008

(Amount - Rs.)

SCHEDULE 22	Current Year	Previous Year
EXPENDITURE ON GRANTS, SUBSIDIES ETC.		
a) Grants given to Institutions/Organisations		
b) Subsidies given to Institutions/Organisations		
TOTAL	**Nil**	**Nil**

SCHEDULE 23	Current Year	Previous Year
INTEREST		
a) On Fixed Loans		
b) On Other Loans (including Bank Charges)		
c) Others (specify)		
TOTAL	**Nil**	**Nil**

For **MOOKHERJEE BISWAS & PATHAK**
Chartered Accountants

Kolkata
Dated : 26-08-2008

(S P Mukherjea)
Partner

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Block-JD, Sector III, Salt Lake City, Kolkata 700 098

SCHEDULE 24

SIGNIFICANT ACCOUNTING POLICIES

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. Interest on interest bearing loans/advances granted to the staff and the interest on Fixed Deposits kept as Lien against LC/BG issued by Bank and Guest House Rent are accounted on cash basis.

2. INVENTORY VALUATION

2.1 Stores and Spares (including machinery spares) are valued at cost.

3. INVESTMENTS

3.1 Investments are valued at cost.

4. FIXED ASSETS

4.1 Fixed assets are stated at cost of acquisition inclusive of inward freight, duties and taxes and incidental and direct expenses related to acquisition, if material. Customs Duty & Clearing Charges on imported equipment are not capitalized.

4.2 Fixed Assets received by way of non-monetary grants (other than towards the Corpus Fund), are capitalized at value stated / agreed by corresponding credit to Capital Fund. Incomplete work is shown as Capital-Work- in Progress to be capitalized on completion.

4.3 Library Books are accounted for on receipt basis and Journals are accounted for on payment basis.

5. DEPRECIATION

5.1 Depreciation is provided on straight-line method as per rates specified in the Companies Act, 1956.

5.2 In respect of additions to / deletion from fixed assets during the year, depreciation is considered on pro-rata basis. Depreciation is provided from the date of acquisition of the assets.

For **MOOKHERJEE BISWAS & PATHAK**
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Kolkata
Dated : 26-08-2008

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Partner

5.3 Depreciation arising on Fixed Assets is deducted from Fixed Assets and also from corpus fund out of which Fixed Assets are created.

5.4 Individual items costing Rs. 5000/- or less is not capitalized but charged in Accounts.

6. FOREIGN CURRENCY TRANSACTIONS

6.1 Transactions denominated in foreign currency are accounted at the exchange rate prevailing at the date of transaction.

7. RETIREMENT BENEFITS

7.1 Liability towards gratuity payable on death/retirement of employees is computed on the assumption that employees are entitled to receive the benefit as at each year end.

7.2 Provision for accumulated leave encashment benefit to the employees is accrued and computed on the assumption that employees are entitled to receive the benefit as at each year end.

7.3 Liabilities under above accounts are invested separately in fixed deposit accounts with nationalized bank.

SCHEDULE 25

CONTINGENT LIABILITIES AND NOTES ON ACCOUNTS

1. CONTINGENT LIABILITIES

1.1 Claims against the Centre not acknowledged as debts – Rs. Nil (Previous year Rs. Nil).

1.2 In respect of

- Bank guarantees given by/on behalf of the Centre – Rs. 2034695 against 100% margin money by way of fixed deposit (Previous year Rs. 2034695).
- Letters of Credit opened by Bank on behalf of the Centre – Rs. 49608588 (Previous year Rs. 16580000) against 100% margin money by way of fixed deposit.
- Bills discounted with banks – Rs. Nil (Previous year Rs. Nil).

1.3 Disputed demands in respect of :

Income-tax	Rs. Nil (Previous year Rs.Nil)
Sales-tax	Rs. Nil (Previous year Rs.Nil)
Municipal Tax	Amount indeterminate as no demand has come yet.

Arrear Salary payable on implementation of the recommendations of 6th Pay Commission – Amount indeterminate at present.

1.4 In respect of claims from parties for non-execution of orders, but contested by the Centre – Rs. Nil (Previous year Rs. Nil).

For **MOOKHERJEE BISWAS & PATHAK**
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2. NOTES ON ACCOUNTS

2.1.1 Capital Commitments :

Estimated value of contracts remaining to be executed on capital account and not provided for Rs. 0.54 Crores (Previous year Rs. 0.28 Crores).

2.2.1 Rs. 14243131 being depreciation on Fixed Assets for the year was not passed through Income & Expenditure Account and instead directly debited to Corpus Fund in terms of accounting policy clause 5.3 of Schedule 24.

Value of capital work-in progress as on 31-03-2008 Rs. 48532245 (previous year – Rs. 37992411) of which Rs. 47591914 (previous year Rs. 37415420) has been taken in accounts on the basis of certificate given by C.P.W.D who is carrying out the work on 'DEPOSIT' basis.

2.2.3 Current Assets, Loans and Advances

In the opinion of the Management, the current assets, loans and advances have a value on realization in the ordinary course of business, equal at least to the aggregate amount shown in the Balance Sheet.

2.3 Taxation

In view of there being no taxable income under Income-tax Act 1961, no provision for Income tax has been considered necessary.

2.4 Foreign Currency Transactions

i) Expenditure in foreign currency :

a) Travel	:	Nil
b) Remittances and Interest payment to Financial Institutions/Banks in Foreign Currency	:	Nil
c) Other expenditure	:	Nil
Commission on Sales		
Legal and Professional Expenses		
Miscellaneous Expenses		
Bank Charges		

ii) Earnings :

Value of Exports on FOB basis	:	Nil

2.5 Physical Verification of Fixed Assets and Library Books & Journals was not conducted during the year.

For **MOOKHERJEE BISWAS & PATHAK**
Chartered Accountants

Kolkata
Dated : 26-08-2008

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Partner

2.6 Transfer of Fixed Assets from project to general fund upon completion of project has not been done pending approval from DST, Govt. of India.

2.7 In absence of any specific directions from Appropriate Authority contributions to Medical Fund Rs. 490861 (previous year Rs. 350592) by the employees are appearing under Earmarked & Endowment Fund as on 31-03-2008.

2.8 An amount of Rs. 1081473 is payable to P.F. Account appearing under Current Liabilities (previous year Rs. 586324).

2.9 Information from Vendors regarding their status under Micro, Small & Medium Enterprises Development Act, 2006 has not been received by the Centre and hence disclosures under the above Act like amount unpaid at the end of the year together with interest paid / payable have not been furnished.

2.10 Corresponding figures for the previous year have been re-grouped/re-arranged, wherever necessary.

For **MOOKHERJEE BISWAS & PATHAK**
Chartered Accountants

Kolkata
Dated : 26-08-2008

(S P Mukherjea)
Partner

CENTRE FOR
S. N. BOSE NATIONAL
BASIC SCIENCES 1986
1894-1974
विज्ञानेन परिपश्यन्ति धीराः

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