

V SCHOOL OF PHYSICAL SCIENCES

The School of Physical Sciences comprises the departments of Chemistry, Physics and Mathematics and the Centre for Applied Statistics. It offers one of the best opportunities in North Eastern India for the study of physical sciences. The School has a little over thirty faculty members and approximately a hundred new students each year. This provides an excellent faculty to student ratio. Each department in the School has a good library, well-equipped laboratories, computer and Internet facilities. Its departments have been granted special assistance programmes of the UGC, DST as well as individual research projects funded by agencies like the DST, DAE, CSIR, DBT and NEC. Its faculty members have the ability to generate resources through research grants, publications in national and international journals of high repute, and receive invitations to speak at important national and international seminars. In addition to research and teaching at M.Sc./M.Phil. levels, the School provides diploma courses in statistics, refresher courses for college teachers, and training for the Mathematics Olympiad. A section of the faculty has also played a key role in running various service centres of the University like the Computer Centre, USIC and RSIC.

CENTRE FOR APPLIED STATISTICS

The Centre for Applied Statistics was established in 1984. Its main objective was to conduct teaching, research and training programmes in the field of Applied Statistics.

Head: Dr. M K Das

Faculty:

Reader M K Das, M.Sc., Ph.D (Dib.)
Lecturers G Das, M.Sc. (Delhi), Ph.D (NEHU)
B K Gupta, M.Sc (Alig. & Agra)

Student intake:

a) Enrolment capacity: 20
b) Actual admission: SC/ST/Genl. Male/Female Total
15 - 11 4 15

Degrees awarded: P.G. Diploma in Statistics.

Courses conducted:

Mathematics and Descriptive Statistics, Computational Technique & Elementary Probability Theory, Probability distribution and Vital Statistical Method, Economics Statistics and Indian Official Statistics and the Practical Problems on the above topics. Descriptive Statistics & Sampling distribution, Statistical Methods, Sampling Techniques and Quality Control, Analysis of Variance and Experimental Design and

the Practical problems on the above topics. Biometrics (for M.Sc. IVth Semester students of Zoology).

Seminars/Conferences:

Dr. M.K.Das participated in the School on "Recent Trends in Intelligent Computing Techniques", March 11-15, 2002 sponsored by the Indian Statistical Institute, Kolkata.

Dr. G.Das participated in the School on "Recent Trends in Intelligent Computing Techniques", March 11-15, 2002, sponsored by the Indian Statistical Institute, Kolkata, and the workshop on Statistical Techniques in Health Sciences, March 23-25, 2002, sponsored by the Indian Statistical Institute, Kolkata.

Thrust area of research: Applied Statistics, Sample Survey and Techniques, Statistical Inferences.

Research Programme/Projects:

(a) New: DST sponsored project titled "Application of Statistical Modelling on Management of Bamboos" (Dr.Gitasree Das. Principal Investigator) for 36 months from November 2001.

(b) Mr. B.K. Gupt joined the Indian Statistical Institute, Kolkata as a UGC teacher fellow from 7.9.2001 to 31.3.2002.

(c) Ongoing: Minor research project on "Contribution of Survey Sampling under Super Population Model" (Mr. B.K. Gupt).

DEPARTMENT OF CHEMISTRY

Established in 1976, the Department of Chemistry has M.Sc. and Ph.D. programmes. The academic programmes of the Department are so designed as to enable the students to acquire a good understanding of Chemistry at the molecular level. The instrumentation and library facilities of the Department have been utilized not only by the members of the Department but also by members of various other educational institutions. The Department has been receiving special assistance (DRS) from the UGC since 24th October 2000.

Head: Professor K Ismail.

Faculty:

Professors	S.N. Bhat, M.Sc. (Karn.), Ph.D (IIT Kanpur) (upto 31 July 2001) M.K. Mahanti, M.Sc. (Madr.), Ph.D (Berh.) K. Ismail, M.Sc., Ph.D (AMU) R.K. Poddar, M.Sc., Ph.D (IIT Kanpur)
Readers	B. Myrboh, M.Sc., Ph.D (NEHU) R.H. Duncan Lyngdoh, M.Sc. (NEHU), Ph.D (IIT Madr.)
Lecturers	S. Aravamudhan, M.Sc. (S.V. Univ.), Ph.D (IIT Kanpur) A. Lemtur, M.Sc., Ph.D (NEHU) K. Mohan Rao, M.Sc. (S.V. Univ.), Ph.D (IIT Kanpur)

Student intake: a) Enrolment Capacity: 30

b) Actual Admission: SC/ST/Genl Male/Female Total

20	10	18	12	30
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Degrees Awarded:

Ph.D

Prashant Sarkhel. "Synthesis, Characterization and Reactivity Studies of Some Mixed Ligand Complexes of Ruthenium (II) and Rhodium (III) and Novel Synthesis and Crystal Structure of Hydrotris (3,5 Dimethylpyrazolyl)Borate 1-Iminomethyl -3, 5-dimethylpyrazole Copper (II) Perchlorate". Supervisor: Prof. R.K. Poddar, Joint Supervisor: Dr. K.M. Rao.

K. Gunaseelan. "A Study on the Transport Behaviour of Micelles and Microemulsions". Supervisor: Prof. K. Ismail.

Funds received from agencies other than NEHU/UGC:

DST, New Delhi – Rs. 16,06,388/= (for research project of Prof. K. Ismail)

CSIR, New Delhi – Rs. 5,38,750/= (for research project of Dr. S. Aravamudhan).

CSIR, New Delhi - Rs. 1,00,000/= (for the national conference organized by the Department).

DST, New Delhi – Rs. 30,000/= (for the national conference organized by the Department).

DAE, Mumbai – Rs. 25,000/= (for the national conference organized by the Department).

Courses conducted:

Inorganic chemistry-I, Organic Chemistry-I, Physical Chemistry-I, Quantum Chemistry, Laboratory Course in Physical Chemistry, Inorganic Chemistry-II, Organic Chemistry-II, Physical Chemistry-II, Chemical Binding and Molecular Spectroscopy, Laboratory Course in Organic Chemistry, Inorganic Chemistry-III, Organic Chemistry-III, Physical Chemistry-III, Applications of Spectroscopic Methods, Laboratory Course in Inorganic Chemistry, Environmental Chemistry, Analytical Chemistry and Computers.

Optional Courses: Inorganic Chemistry-IV/Organic Chemistry-IV/Physical Chemistry-IV, Project work (Inorganic/Organic/Physical).

Seminars/Conferences/Symposia/Extension Programmes, etc:

Organized

The Department in collaboration with the Indian Society for Surface Science and Technology, Kolkata organized the Tenth National Conference on Surfactants, Emulsions and Biocolloids during October 3-5, 2001.

Attended

All the members of the faculty attended the 10th National Conference on Surfactants, Emulsions and Biocolloids organized by the Department during October 3-5, 2001.

Prof. K. Ismail: (i) Delivered the plenary lecture on "Free Energy Terms of Micellization Process of Ionic Surfactants through Conductance Measurement" at the national conference on Recent Advances in Thermodynamics of Chemical and Biological Systems organized by the departments of Chemistry and Pharmaceutical Sciences, GND University, Amritsar (May 7-9, 2001). (ii) Delivered a lecture on "Conductance Behaviour of Ionic Surfactant Solutions: The Mixed Electrolyte Model and the Ionic Strength Problem" at the 10th national conference on Surfactants, Emulsions and Biocolloids organized by the Department of Chemistry, NEHU (October 3-5, 2001). (iii) Contributed a research paper entitled "Electrical Conductance Behaviour of Binary Mixtures of Calcium Nitrate Tetrahydrate Melt and Methanol in the Temperature Range from 45 to - 75°C" to the 6th Asian Thermophysical Properties Conference organized by the Department of Physics, Gauhati University, Guwahati (October 8-11, 2001). (iv) Presented a paper on "Conductance Behaviour of Microemulsions Stabilized by Sodium Dodecylsulphate and 1-Butanol" at the international conference on Progress in Disperse Systems organized by the Department of Chemistry, Calcutta University, Kolkata and the Indian Society for Surface Science and Technology, Jadavpur (January 16-18, 2002).

Dr. S. Aravamudhan: (i) Presented a poster entitled "Induced Fields due to Magnetized Specimen" at the 2nd Alpine Conference on Solid State NMR held at Chamonix-Mont Blanc, France (September 9-13, 2001). (ii) Presented a paper entitled "Shielding and Demagnetization Factor Calculations: Molecular Fragments making-up the whole molecule; close-packed volume elements making-up the whole specimen at the 8th NMRS meeting held at SGPGI, Lucknow (January 23-24, 2002). (iii) Presented a poster entitled "Applicability of a Reported Simple Method of Calculating Induced Fields to Calculate Contour-Maps of Ring-Current Effect Shielding Values for Macro-(Bio-)Molecular Structure Determinations" at the discussion meeting on Structural Biology and Symposium on Biophysics held at the Department of Crystallography and Biophysics, University of Madras, Chennai (January 21-22, 2002).

Visiting Professor/Fellows:

Prof. N. Kumar, retired Professor of Chemistry, Jammu University, was a Visiting Professor during 12 May to 30 June 2001 and 1 October to 19 December 2001. He delivered lectures on Inorganic Chemistry to the M.Sc. students.

Dr. O.M. Singh, Department of Chemistry, Manipur University, Imphal, was a Visiting Fellow during June 4-30, 2001. He delivered lectures on Organic Chemistry to the M.Sc. students.

Prof. H.K. Das, Department of Chemistry, Gauhati University, Guwahati visited the Department during July 17-18, 2001 in connection with the viva-voce examination of M.Sc. project work.

Prof. P.J. Das, Department of Chemistry, Gauhati University, Guwahati delivered lectures on (i) Asymmetric synthesis, and (ii) solid phase organic synthesis, to the participants of the 17th refresher course in Chemistry conducted by the Department.

Prof. D.C. Mukherjee, Department of Chemistry, Calcutta University, Calcutta visited the Department during July 17-21, 2001 in connection with the viva-voce examination of M.Sc. project work.

Prof. M.P. Mahajan, Department of Pharmaceutical Science, GND University, Amritsar visited the Department during July 17-21, 2001 in connection with the viva-voce examination of M.Sc. project work.

Prof. B. Dinda, Department of Chemistry, Tripura University, Agartala visited the Department during June 25-29, 2001 in connection with the practical examination of Organic Chemistry. He delivered lectures on (i) Pericyclic reactions, and (ii) Applications of spectroscopic methods in Chemistry, to the participants of the 17th refresher course in Chemistry Department.

Prof. H. Ila, Department of Chemistry, IIT, Kanpur visited the Department on 18 October 2001 and gave a seminar on "From Synthons to Bioactive Molecules: Efficient Strategies for Heterocycle Synthesis".

Prof. D.K. Hazra, Department of Chemistry, North Bengal University, Darjeeling visited the Department in connection with practical examination of Physical Chemistry and also delivered lectures on (i) Chemical potential, activity and activity coefficient, and (ii) Molecular Spectroscopy, to the participants of the 17th refresher course in Chemistry Department.

Prof. Premraj, Department of Chemistry, Lucknow University, Lucknow visited the Department in connection with practical examination of Inorganic Chemistry and also delivered lectures on Toxicity of Metals, to participants of the 17th refresher course in Chemistry Department.

Prof. R.C. Sharma, Department of Chemistry, Dr. B.R. Ambedkar University, Agra visited the Department on September 22, 2001 in connection with the Advisory Committee meeting of the DRS programme of the Department. He delivered lectures on (i) Synthesis & characterization of macrocyclic complexes of transition metal ions of biological importance, (ii) Metal ions in biological systems, their excess and deficiency, causing and curing diseases, and (iii) Ozone depletion, its causes and cures, to the participants of the 17th refresher course in Chemistry Department.

Prof. Saswati Bag, Retired Professor of Chemistry, Jadavpur University, Kolkata visited the Department on September 22, 2001 in connection with the Advisory Committee meeting of the DRS Programme of the Department.

Dr. Dulal C. Ghosh, Department of Chemistry, Kalyani University, Kalyani delivered lectures on (i) Quantum Chemistry and (ii) Applications of group theory, to the participants of the 17th refresher course in Chemistry conducted by the Department.

Publications:

Jayasree, V and S.N. Bhat. 2001. Host-Guest Complexes: Spectroscopic and Thermodynamic studies of Cyclodextrins-dyes. *J. Indian. Chem. Soc.*, 78: 3.

Kharnaor, G.G., S. Das and M.K. Mahanti. 2001. Kinetics of oxidation of 2-furfural by quinolinium dichromate. *Oxidation Communications*, 24: 377-381.

Lyngdoh, C.B., S. Das and M.K. Mahanti. 2001. Kinetics of oxidation of pyruvic acid by quinolinium dichromate. *Oxidation Communications*, 24: 382-387.

Mahanti, M.K. and K.K. Banerji. 2002. Synthetic and mechanistic aspects of reactions of complexed chromium (VI) compounds. *J. Indian Chem. Soc.*, 79: 31-44.

Malhotra A and R.K.Poddar. 2001. Reactivity studies of $[Ru(L-L_2Cl_2)](L-L=2,2'$ -bipyridine or 1,10-phenanthroline) with $Ag NO_3$ in different media. *Indian. J. Chem.*, 40A: 630-32.

Mandal, K.D, L. Behera and K. Ismail. 2001. Characterization of $La_{1-x}Ba_xCoO_3$ synthesised at low temperature. *J. Alloys Comp.*, 325: 17-19.

Mandal, G.C., P. Sarkhel, R.K. Poddar, Bermehjo, P. Sevillano and A. Castineiras. 2001. Synthesis and characterization of a new copper(II) amidine complex. *Indian. J. Chem.*, 40A: 630-32.

Nongkhaw, R.L., R. Nongrum and B. Myrboh. 2001. Synthesis of substituted hexa-3,5-dienoic acid methyl esters from conjugated dienones. *J. Chem. Soc., Perkin Trans. I*: 1300-1303.

Singh P.M. and R.H.D. Lyngdoh. 2001. Symmetrical transitions in thermoneutral reactions: an AM1 SCF-MO study. *Indian J. Chem.*, 40A: 682-686.

Ulen Mangang, S and R.H.D. Lyngdoh. 2001. Wobbler base-pairing in codon-anticodon interactions: A theoretical modeling study. *Indian J. Biochem. Biophys*, 38: 115-119.

Study Tour/Field Trips:

The Department organized a study tour for the M.Sc. students during 13th January to 7th February 2002 and Dr. R.H. Duncan Lyngdoh led it. The team visited the Department of Chemistry, IIT Powai, Mumbai, Cancer Research Institute, Parel, Mumbai, Indian Institute of Science, Bangalore, Raman Research Institute, Bangalore and Science City, Kolkata.

Thrust Areas of Research:

Chemical Dynamics, Natural Product Chemistry, Coordination Chemistry and Homogeneous Catalysis, Theoretical Organic and Bio-organic Chemistry, Chemistry of Porphyrins and Related systems, Chemistry of Surfactants, Transport Behaviour of Supercooling systems, Organometallic Chemistry.

Research Project:

New

(i) Co-ion Effect on Micellization of Ionic Surfactants (Principal Investigator: Prof. K. Ismail) sponsored by the DST, New Delhi.

(ii) Shielding Parameters on Nuclei: Facilities for the Experimental Determination and Calculation by Theoretical Procedures – to Obtain Information on Crystal Structures and Molecular Electronic Structures (Principal Investigator: Dr. S. Aravamudhan) sponsored by the CSIR, New Delhi.

Ongoing

Synthetic and Structural Studies on (Cyclopentadienyl and Azacyclopentadienyl) Ruthenium (II) bisphosphine complexes (Principal Investigator: Dr. K.M. Rao) sponsored by the DST, New Delhi.

Biodiversity of North East – An interdisciplinary Research Project (Coordinator: Dr. B. Myrboh) sponsored by the NEC, Shillong.

Other activities:

The Department conducted its 17th refresher course in Chemistry for university and college teachers during November 20th to December 10th 2001. 27 teachers attended this course. Prof. R.K. Poddar was the Course Coordinator. Dr. R.H.D. Lyngdoh and Dr. K.M. Rao attended it. Prof. M.K. Mahanti, Prof. R.K. Poddar and Dr. B. Myrboh were resource persons.

Prof. M.K. Mahanti has been elected as a Council Member of Chemical Research Society of India for the period March 2002 to February 2004.

Prof. R.K. Poddar was a resource person for a refresher course conducted by the Department of Chemistry, Assam University, Silchar during December 3-23, 2001 and delivered 6 lectures. Prof. R.K. Poddar was also a resource person for a refresher course conducted by the Department of Chemistry, Manipur University, Imphal during December 27, 2001 to January 17, 2002 and delivered 5 lectures.

Dr. A. Lemtur was a guest lecturer at the Department of Chemistry, Nagaland University during 23rd July to 4th August 2001 and delivered lectures on “Chemical Binding & Molecular Spectroscopy” to the M.Sc. students.

Prof. K. Ismail was re-elected as an executive committee member of the Indian Society for Surface Science and Technology, Kolkata from December 2001 to December 2003. Prof. K. Ismail was a resource person for the refresher course conducted by the Department of Chemistry, Manipur University, Imphal and gave 5 lectures on Quantum Chemistry and Thermodynamic Concepts during January 7-10, 2002.

DEPARTMENT OF MATHEMATICS

The Department offers M.Sc., M.Phil and Ph.D programmes in different fields like algebra, analysis, differential equations, topology/geometry, number theory, theory of relativity and cosmology and oceanography. It gives two computer courses in M.Sc. and also pursues research in computer aided approach to mathematical research in number theory, cosmology, algebraic and differential topology and oceanography.

Head: Prof. S K Srivastava

Faculty:

Professors S.S.Khare, M.Sc., Ph.D (Alld.)
M.B. Rege, M.Sc., Ph.D (Bom.)
S.K. Srivastava, M.Sc., Ph.D (Gorak)
H.K. Mukerjee, M.Sc., Ph.D (Alld.)
Reader P.K. Saikia, M.Sc. (Delhi), Ph.D (Wiscn.)
Lecturers S.L.Marbaning, M.Sc (Gau.)
C.R. Mondal, M.Sc., Ph.D (VB)
A.K. Das, M.Sc., Ph.D (NEHU)
R.P. Shukla, M.Sc., Ph.D (Alld)

Student Intake: a) Enrolment capacity: 30

b) Actual Admission: SC/ST/Genl. Male/Female Total

28	02	23	07	30
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Degrees awarded:

M.Phil

Irdeline Mary Buhphang. "Regularity and Normality In Algebraic Structures".
Supervisor: Prof. M B Rege.

Fund received from agencies other than NEHU/UGC:

DST, New Delhi (Rs.6.6 lakhs approx. for three years) and National Board of Higher Mathematics (Rs. 3.2 lakhs per year).

Courses conducted:

Linear algebra, Analysis I, O.D.E., Classical Mechanics, Application of Mathematics in Environmental Studies. Analysis II, Topology, P.D.E., Algebra I., C.F.T., Computer Programming, Topics in Algebra, Theory of Relativity, E.N.T, Computer Numerical Analysis, Differential Geometry, Functional Analysis.

Seminars/Conferences/Symposia/Extension Programmes attended:

S S Khare: (i) Gave a talk on "On Grassmanian manifolds and height of its stiefel-whitney classes" at the Conference on Algebraic and Geometric Topology, University of Delhi, Delhi (January 2002). (ii) Delivered 4 lectures in the Refresher Course organized by Tezpur University in September 2001.

H K Mukerjee gave 4 lectures on Algebraic Topology as a resource person in the refresher course organized by Gauhati University in December 2001.

A K Das gave a talk on "Bordism classes of Grassmanian manifolds" at the conference on Algebraic and Geometric Topology, University of Delhi, Delhi in January 2002.

P K Saikia gave 4 lectures in the refresher course organized by Tezpur University in September 2001.

Visiting Professor/Fellows:

Prof. D.K. Bhattacharjee of Calcutta University, Kolkata, and
Dr. N.J. Dev from Shillong.

Publications:

Srivastava, S.K., S. Kumar, et al. 2002. Hopf bifurcation and stability analysis. *Appl. Math. & Comp.*, 129: 107-118.

Mondal, C.R. 2001. *Classical Mechanics*. New Delhi: Prentice-Hall of India.

Study Tour/Field Trips:

Students visited Punjab University, Delhi University, JNU, Chandigarh University, Agra and Kolkata (18 to 26 March 2002).

Thrust Areas of Research:

Theory of Relativity and Cosmology, Algebraic and Differential Topology, Algebra, Number Theory and Oceanography.

Research Programme/Project:

Ongoing

D.S.T. project entitled "Application of Computer Technique in Homology" sanctioned jointly to Prof. S.S. Khare and Dr. A.K. Das.

D.S.T. Project entitled "Quantization of fields in curved space-time physical aspect of Ricci scalar and the Early Universe" sanctioned to Prof. S.K. Srivastava.

Other activities:

M B Rege conducted a training programme for college and schoolteachers for the Mathematics Olympiad. In addition, Mathematics Olympiad at regional and national levels has been conducted and the necessary training has been given to the students.

S S Khare was a member of the national core committee for developing curriculum in Mathematics for undergraduate and postgraduate courses during May-June 2001.

DEPARTMENT OF PHYSICS

The Department of Physics was established in 1976 with a view to build scientific manpower in this part of the country consistent with the NEHU Act.

Over the years, the Department has identified Nuclear Physics (Experimental and Theoretical), Laser Physics (Experimental), Solid State Physics (Experimental and Theoretical) and High Energy/Particle Physics (Theoretical) as the thrust areas in its teaching and research programmes. These are also among the thrust areas declared by the Department of Science and Technology, Government of India. The Department has been selected under DST-FIST programme since July 2001.

Head: Professor Y.S.T. Rao (upto 30 April 2001)
Professor M.K. Parida (30 April 2001 onwards)

Faculty:

Professors A.L.Verma, M.Sc. (L.now), Ph.D (IIT Kanpur)*
C.S. Shastry, M.Sc. (Karn.), D. Phil (Calc.)
Y.S.T. Rao, M.Sc. (Andh.), Ph.D (Maryland)
P. Shukla, M.Sc. (IIT Delhi), Ph.D (Temple)
K. Kumār, M.Sc. (Agra), Ph.D (IIT Kanpur)
Y.S. Jain, M.Sc. (Agra), Ph.D (IIT Kanpur)
P.N.Pandita, M.Sc., Ph.D (Kashmir)
D.T. Khathing, M.Sc. (Delhi), D. Phil (Calc.)**
M.K.Parida, M.Sc., Ph.D (Utkal)

Readers B.M. Jyrwa, M.Sc., Ph.D (NEHU)
P. Nongkynrih, M.Sc., Ph.D (NEHU)

* On deputation as Director, NERIST, Itanagar.

**On deputation as Registrar, NEHU, Shillong.

Student Intake: a) Enrolment capacity: 26

b) Actual Admission		SC/ST/Genl.	Male	Female	Total
22	4	20	6	26	

Degrees Awarded:

Ph.D

Awalendra Kumar Thakur. "Sodium ion conducting composite polyelectrolyte and their application in solid state batteries". Supervisor: Prof. A.L. Verma, Joint Supervisor: Dr. S.A. Hashmi.

Rosaline Misra. "Electron induced modifications in some polymers". Supervisor: Prof. D.T. Khathing, Joint Supervisor: Dr. K.K. Dwivedi.

Shyama Prasanna Tripathy. "Modification of polymeric materials by energetic protons". Supervisor: Prof. D.T. Khathing, Joint Supervisor: Dr. K. K. Dwivedi.

Funds received from agencies other than UGC/NEHU:

DST-FIST project from the Department of Science and Technology, New Delhi: Rs.25.00 lakhs.

Courses conducted: Classical Mechanics, Quantum Mechanics I, Mathematical Physics, Laboratory I, Electrodynamics, Electronics, Quantum Mechanics II, Laboratory II, Atomic and Molecular Physics, Solid State Physics, Nuclear Physics, Laboratory III, Thermal Physics, Manybody Theory, Experimental Techniques, Environment, Special papers on High Energy Physics, Solid State Physics, Nuclear Physics, Laser Physics, Project Works.

Seminars/Conferences:

Prof. P.N. Pandita attended the workshop on "Physics at TeV Colliders," Les Houches, France, May 21-June 1, 2001 and gave a talk entitled "An Overview of the Nonminimal Supersymmetric Standard Model."

Prof. C.S. Shastry attended the DAE-BRNS symposium on Nuclear Physics at SINP, Kolkata (December 2001) and gave a talk on "Methods of Fusion and Resonance Calculations."

Dr. P. Nongkynrih organised the XVIth ISAS national symposium on "An Integrated Approach to Pollution Control and Preservation of Environment (AIA-PPE)" March 8-9, 2002 at Shillong, Meghalaya.

Visiting Professors:

Prof. S.K. Gupta, a retired scientist from the Bhabha Atomic Research Centre, Mumbai continued as a Visiting Professor since September 2001 and is actively participating in the teaching and research activities. He is also currently President of the Indian Physics Association.

Professor S.N. Behera, Institute of Physics, Bhubaneswar visited the Department and gave a seminar on "High Temperature Superconductivity" on 20 October, 2001.

Dr. S. Mohran, Indian Space Research Organisation, Ahmedabad, visited the Department and gave a lecture on "Applications of Space Science Research" on 21 August, 2001.

Publications:

Ananthanarayan, B. and P.N. Pandita. 2002. Reply to comment on infrared fixed point structure in the minimal supersymmetric standard model with baryon and lepton number violation. *Phys. Rev.*, D65: 058902.

Balaji, K.R.S., R.N. Mohapatra, M.K. Parida and E.A. Paschos. 2001. Large neutrino mixing from renormalisation group evolution. *Phys. Rev.*, D63: 113002.

Das, C.R. and M.K. Parida. 2001. New formulas and predictions for running fermion masses at higher scales in SM, 2HDM and MSSM. *Eur. Phys. J.*, C20: 121-137.

Jain, Y.S. 2002. Untouched aspects of the wave mechanics of two particles in a many body quantum system. *Journal of Scientific Exploration*, 16(1): 67-75.

_____. 2002. Microscopic theory of a system of interacting bosons: A unifying new approach. *Journal of Scientific Exploration*, 16: 77-115.

_____. 2002. Unification of the physics of interacting bosons and fermions through (q,-q) pair correlation. *Journal of Scientific Exploration*, 16(1): 117-124.

Khathing, D.T., S.P. Tripathy, R. Mishra, B. K. Verma and K. K. Dwivedi. 2001. Range and energy loss rate of 118 MeV ^{28}Si in some polymers using PADC as detector. *Radiation Measurements*, 34: 305-308.

Menon, G.I., P. Ray and P. Shukla. 2001. Persistence in one-dimensional Ising Models with parallel dynamics. *Phys. Rev.*, E64: 046102.

Mishra, R., S.P. Tripathy, K.K. Dwivedi, D.T. Khathing, S. Ghosh, M. Muller and D. Fink. 2001. Electron induced modification in polyethylene terephthalate. *Radiation Effects and Defects in Solids*, 153: 257-269.

Mishra, R., S.P. Tripathy, A. Kulshreshtha, D.T. Khathing, S. Ghosh, M. Muller and D. Fink. 2001. Electron induced modification in polypropylene. *Radiation Measurements*, 33: 845-850.

Mishra, R., S.P. Tripathy, A. Kulshreshtha, D.T. Khathing, K.K. Dwivedi, S. Ghosh and D. Fink. 2001. Electron induced modification in polyallyl glycol carbonate. *Radiation Effects and Defects in Solids*, 154: 11-22.

Mishra, R., S.P. Tripathy, K.K. Dwivedi, D.T. Khathing, S. Ghosh and D. Fink. 2001. Modifications in etching characteristics and surface topology of some electron irradiated polymers. *Radiation Measurements*, 34: 95-98.

Pandita, P.N. 2001. Nonminimal supersymmetric standard model with baryon and lepton number violation. *Phys. Rev.*, D64: 056002.

Parida, M.K., C.R. Das and G.R. Rajasekaran. 2002. Radiative stability of neutrino-mass textures. *Los Alamos National Laboratory Archives*, hep-ph/0203097.

Shukla, P. 2002 Hysteresis in random field Ising model at zero temperature. *Indian J. Phys.*, 76A: 51-55.

Tripathy, S.P., R. Mishra, K.K. Dwivedi, D.T. Khathing, S. Ghosh and D. Fink. 2001. Modification induced by proton irradiation in polyallyl diglycol carbonate. *Radiation Measurements*, 34: 15-17.

Tripathy, S.P., R. Mishra, A. Kulshreshtha, D.T. Khathing, K.K. Dwivedi, A. Srivastava, S. Ghosh and D. Fink. 2001. Optical absorption studies in heavy ion irradiated polymers. *Radiation Effects and Defects in Solids*, 153: 335-341.

Study tours/field trips:

A study tour of M.Sc. Physics students to educational institutions including the Bhabha Atomic Research Centre, Mumbai was successfully completed during January – February 2002.

Thrust areas of research: (i) Solid State Physics (ii) High Energy Physics (iii) Nuclear Physics (iv) Laser Physics.

Research programme/projects:

New

- (i) FIST (Fund for Infrastructure in Science and Technology) programmes have been sanctioned and implemented with a total grant of Rs.25.00 lakhs for a

period of five years (2001-2006) sponsored by the Dept. of Science and Technology, Government of India.

- (ii) M.K. Parida, "Radiative stability of neutrino mass textures" under the Senior Associateship Scheme of the Institute of Mathematical Sciences, Chennai.

Ongoing

- (i) DAE sponsored project entitled "Neutrino Masses and Mixings in Unified Theories" (Prof. M.K. Parida).
(ii) DST sponsored project entitled "Prospects of Fermion Masses and Mixings in Unified Theories" (Prof. M.K. Parida).
(iii) DAE sponsored project entitled "Higgs bosons in supersymmetric models" (Prof. P.N. Pandita).
(iv) UGC Research Award Scheme entitled "Baryogenesis in supersymmetric models," (Prof. P.N. Pandita).

Other activities:

Prof. P. Shukla: (i) Visited the S.N. Bose National Centre for Basic Sciences, Kolkata, Dec. 21, 2001 – Jan. 21, 2002 as Senior Associate. (ii) Delivered lectures in refresher courses in Physics at Assam University, Silchar (December 2001) and at Dibrugarh University (January 2002).

Prof. M.K. Parida visited the Institute of Mathematical Sciences, Chennai, as Senior Associate (January 2002).

Prof. Y.S. Jain gave a series of lectures in refresher courses in Physics at Aligarh Muslim University (May 2001) and at Assam University, Silchar (December 2001).

Prof. P.N. Pandita was reappointed as Visiting Associate by the Inter-University Centre for Astronomy and Astrophysics, Pune for a period of three years and was a Visiting Scientist at the (ii) Abdus Salam ICTP, Trieste, Italy during June – July 2001, (iii) Helsinki Institute of Physics, Finland during Sept. – Nov. 2001, and (iv) SISSA, Trieste, Italy during Nov. – Dec. 2001.

Prof. S.K. Gupta, Visiting Professor, was a member of the National Advisory Committee of DAE symposium on Nuclear Physics, Kolkata, Dec. 26-30, 2001.