

## SCHOOL OF PHYSICAL SCIENCES

The School of Physical Sciences was established in 1973 with the Mathematics Department (established in 1973), Physics Department (established in 1976) and Chemistry Department (established in 1976). Recently Centre for Applied Statistics has also been associated this School.

The Centre for Applied Statistics has been successfully running Certificate/Diploma Course in Applied Statistics. In addition to this, the Centre has been helping some other departments also by giving required capsule of statistics.

The departments of Physics, Chemistry and Mathematics in the School have been extremely active and the faculty members in these three departments have received significant recognition in their respective fields at National and International level. Further, some faculty members are and have been in collaboration with prestigious foreign institutions. The detailed activities and achievements of the respective departments in the School are given below :

### 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

**Courses conducted :** Mathematics & Descriptive Statistics, Computational Techniques & Elements of Probability Theory, Probability Distributions & Vital Statistics Methods, Economic Statistics & Indian Official Statistics, Descriptive Statistics & Sampling Distributions, Statistical Methods & Practical Problems on the topics covered in Statistical Methods, Sampling Techniques & Statistical Quality Control, Analysis of Variance & Experimental Designs.

**Students in-take :** a) Enrolment Capacity : 20

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

SC/ST	Genl.	Male	Female	Total
1	1	2		2

**Faculty :**

**Reader :** M K Das, M.Sc., Ph.D. (Dib)

**Lecturers :** G Das, M.Sc.(Delhi), Ph.D. (NEHU)

B K Gupt, M.Sc. (Alig. & Agra)

**Other activities :** Dr. (Mrs) G Das was appointed as referee for the journal "Communication in Statistics : Theory & Methods" Published from U.S.A.

## DEPARTMENT OF CHEMISTRY

Established in the year 1976, the Department of Chemistry has been imparting higher education in Chemistry by training students through its ongoing M.Sc. and Ph.D. programmes. The academic and research programmes of the Department have been designed 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 extensively utilized by members of various other educational institutions. The first phase of the Special Assistance Programme (SAP) given to the Department by the UGC for five years, was successfully completed in July 1999.

The Department started shifting from the Bijni Campus to its building on the Permanent Campus during November 1999. The Department has been functioning from its Permanent Building since February 22nd, 2000.

**Head :** (i) Professor M.K. Mahanti (upto 17 December 1999)  
(ii) Professor K. Ismail (from 18 December 1999).

### Faculty :

**Professors :** S.N. Bhat, M.Sc.,(Karn.), Ph.D. (IIT Kanpur)

M.K. Mahanti, M.Sc., (Madr.), Ph.D. (Berh.)

K. Ismail, M.Sc., Ph.D. (AMU)

**Readers :** R.K. Poddar, M.Sc., Ph.D. (IIT Kanpur)

H. Chandra, M.Sc. (L.now), Ph.D. (Punj.)(on lien)

B.Myrboh, M.Sc., Ph.D. (NEHU)

**Lecturers :** S. Aravamudhan, M.Sc., (S.V. Univ.), Ph.D. (IIT Kanpur)

A. Lemtur, M.Sc., Ph.D. (NEHU)

R.H. Duncan Lyngdoh, M.Sc. (NEHU), Ph.D. (IIT Madr.)

K. Mohan Rao, M.Sc., (S.V. Univ.), Ph.D. (IIT Kanpur)

**Student intake:** a) Enrolment Capacity : 30

b) Actual Admission:		SC/ST/	General	Male/Female	Total
24	06			14	16
					30

### Degrees Awarded:

**Ph.D. :**

Jayasree V., "Spectroscopic and Thermodynamic Studies of Host-Guest Complexes". Supervisor: S.N. Bhat

Kaushal Kishore, "New Synthetic Routes to Carbocycles and Heterocycles Via  $\alpha$ -Oxoketene Dithioacetals". Supervisor: M.K. Mahanti, Joint Supervisor : H. Junjappa.

Paramita Das (Dey), "Heterocyclic Synthesis involving 1,3-diazabuta-dienes and related systems". Supervisor: M.K. Mahanti Joint Supervisor : M.P. Mahajan.

Amrita Roy, "Part-I. Synthetic Investigation on Aromatic Annelation Reaction. Part-II. Hydrogen peroxide//Boric Acid Oxidations of Organic Substrates". Supervisor: Dr. R.H.D. Lyngdoh, Joint Supervisor : H. Junjappa.

**Courses conducted :**

Compulsory : Inorganic Chemistry, Organic Chemistry, Physical Chemistry, Quantum Chemistry, Laboratory Course in Physical Chemistry, Chemical Binding and Molecular Spectroscopy, Laboratory Course in Organic Chemistry., Applications of Spectroscopic Methods, Laboratory Course in Inorganic Chemistry, Environmental Chemistry, Analytical Chemistry and Computers.

Optional : Inorganic Chemistry, Organic Chemistry, Physical Chemistry, Project Work (Inorganic/Organic/Physical/Chemistry).

**Seminars /Conferences :****Organised :**

National Symposium on "Highlights of Recent Chemical Research" was organised by the Department on 10<sup>th</sup> and 11<sup>th</sup> June 1999. This Symposium was sponsored by the UGC through the Special Assistance Programme (SAP). Participants from Osmania University, Jai Narain Vyas University, Manipur University and RSIC, Shillong, took part in this Symposium besides those from the Department of Chemistry. 14 invited Lectures were delivered in this Symposium.

**Attended :**

The following invited lectures were delivered by the faculty members of the Department in the National Symposium on "Highlights of Recent Chemical Research" organised on June 10-11, 1999:

Prof. S. N. Bhat - "Spectroscopic and Thermodynamic Investigations of Host Guest Complexes"

Prof. M.K. Mahanti - "Quinolinium Dichromate Oxidation of Some Organic Substrates"

Prof. K. Ismail - "Estimation of Micellization Parameters of Ionic Surfactants from Conductivity Data"

Dr. R.K. Poddar - "Reaction of Coordinated Acetonitrile : Formation of a New Copper(II) Imine Complex Through the Copper(II) Activated Condensation of 3,5-Dimethylpyrazole and Acetonitrile"

Dr. B. Myrboh - "Syntheses of Substituted 3,5- Hexadienoic Acid Methyl Ester from Conjugated Dienones and Substituted Cyclopropane Acetic Acid Ethyl Esters from Cyclopropyl Alkyl Ketones"

Dr. A. Lemtur - "ESR and Electrochemical Studies on the Oxidation Products of Oxovanadium Porphyrins"

Dr. R.H.D. Lyngdoh - "Wobble Base-Pairs in Codon Pairing : A PM3 SCF-MO Study"

Dr. K.M. Rao - "Synthesis and Characterization of Pentamethylcyclopentadienyl and Cyclopentadienyl Complexes of Platinum Group Metals"

Prof. K. Ismail (i) delivered an invited lecture on the topic "A Mixed Electrolyte model for Estimating Micellization Parameters of ionic Surfactants from Conductivity Data", (ii) chaired a Session and (iii) contributed a paper entitled "Viscosity Behaviour of Microemulsions" (presented by the co-author Mr. K. Gunaseelan) in the 9<sup>th</sup> National Conference on "Surfactants, Emulsions and Biocolloids" held at the University of Kalyani on November 2-4, 1999.

Prof. S.N. Bhat delivered a lecture on the topic "Science and Society", in the Dr. A.V. Baliga College of Arts and Science, Kumta on January 20, 2000.

#### Visiting Professors/Fellows:

Prof. B. Sethuram, Department of Chemistry Osmania University, Hyderabad visiting fellow, during the period June 1 to July 31, 1999 gave a few lectures on Reaction Kinetics to the M.Sc. students, and also delivered a Seminar talk on the topic, "Some Exciting Moments in my Chemical Research".

Prof. K.K. Banerjee, Department of Chemistry, Jai Narain Vyas University, Jodhpur visiting fellow May 1 to June 30, 1999 delivered lectures in the M.Sc. II Semester organic Chemistry Course.

Dr. L. Warjeet Singh, Department of Chemistry, Manipur University, Imphal visiting fellow, May 15 to July 31, 1999, delivered lectures in the M.Sc. IV Semester Organic Chemistry Course.

Dr. Balu P. Maliakel (AKAY Flavours and Aromatics Ltd., Pathanamthitta) delivered a Seminar talk titled "Natural Flavours and Colours as Food Ingredients" 8<sup>th</sup> April 1999.

#### Publications:

Debroy, A., Mahanti, M.K. and Thangkhiew, N. (1999). Kinetics of Oxidative Coupling of Amines, Oxidation of Anilines by Quinolinium Dichromate, *Oxidation Communications*, 22, 136-141.

Mahanti, M.K. (1999). Kinetics of Oxidation of Aromatic Aldehydes by Quinolinium Dichromate, *Oxidation Communications*, 22, 142-145.

Dev, S. and Ismail, K. (2000). Micellization of Surfactants in Acetamide Melt, *Indian J. Phys.*, 74A, 315-320

Ismail, K. and Paul, B.C. (2000). Acid-Base Equilibrium of Neutral Red in Benzene-in-water Microemulsions, *Indian J. Chem.*, 38A, 496-500

Bhat, S.N., Dwivedi, K.K., Ghosh, S., Singh, S., Sinha, D., Srivastava, A. and (1997). Determination of Critical Micelle Concentration (CMC) of Surfactants by a Nuclear Track Microfilter, *J. Surf. Sci. Technol.* 13, 53.

Paul, B.C., Sarkhel, P. and Poddar, R.K. (1999). Rhodium(III) Complexes Containing Acetylacetonate and Mono or Bidentate Ligands, *Indian J. Chem.*, 38A, 150.

Gupta, A.K. and Poddar, R.K., (1999). Mixed Ligand Ruthenium(III) Complexes with Acetylacetonates, *Indian J. Chem.* 38A, 1228.

Gupta, A.K. and Poddar, R.K. (2000). Improved Synthesis and Reactivity of Tris(acetylacetonato)ruthenium(III), *Indian J. Chem.* 39A.

**Study Tour/Field Trips of Students:** The Department organised a study tour for the M.Sc. students during the period 26<sup>th</sup> December 1999 to 21st January 2000, led by R.H.D.Lyngdoh. The team visited BARC, TIFR, IIT, and some Chemical laboratories in Mumbai, and the IISc and Raman Research Institute, Bangalore.

**Thrust Area 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 Programme/Project :**

The ongoing research projects in the Department have been sponsored by the North Eastern Council and by the Department of Science and Technology.

**Other activities :** The permanent building of the Chemistry Department was inaugurated by the Vice-Chancellor, Prof. M. Miri on 6<sup>th</sup> March 2000. A UGC Review committee visited the Department during March 2-3, 2000 to assess the final progress report of the Department under SAP-DSA. M.Sc. IV Semester students of Assam University visited the Department for one week in the month of July 1999 and utilized the instrumentation and library facilities of the Department for their project work. M.Sc. IV Semester students of Nagaland University also visited the Department during February 2000 to utilize the library facility of the Department. Dr. A. Lemtur was invited to the Department of Chemistry, Nagaland University during April 3-18, 1999 and gave lectures on Chemical Binding and Molecular Spectroscopy to M.Sc. students. Professor K. Ismail was invited to the Department of Chemistry, Dibrugarh University, Dibrugarh during September 6-11, 1999 and gave lectures on Computer Applications in Chemistry to the M.Sc. students. Professor S.N. Bhat was invited to the Department of Chemistry, Tripura University, Agartala during February 1-15, 2000 and gave lectures on Spectroscopy to M.Sc. students. Professor S.N. Bhat continued to be the Member of the UGC Chemistry Panel and the Chancellor's Nominee to the West Bengal College Service Commission and was a Member of the Advisory Committee for National Symposium on "Surfactants, Emulsions and Biocolloids" held in University of Kalyani during November 2-4, 1999.

Professor K. Ismail has been elected as a Member of the Executive Committee of the Indian Society for Surface Science and Technology for the term 2000-2002, and as a Member of National Advisory Committee for the 6<sup>th</sup> International Asian Thermophysical Properties Conference to be held at the Department of Physics, Gauhati University during October 8-11, 2001.

## DEPARTMENT OF MATHEMATICS

The Department gives quality and rigorous M.Sc./M.Phil and Pre Ph.D. courses of different subjects of mathematics like algebra, analysis, differential equations, topology/geometry, number theory, theory of relativity and cosmology and oceanography. The Department has been pursuing fundamental research and has emphasized the quality of the research output. It has also adapted itself to the present scenario of aiding basic research by computers. 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. (Allhd.),

M.B. Rege., B.Sc., Ph.D. (Bom.)

S.K. Srivastava, M.Sc., Ph.D. (Gorak.)

H.K. Mukerjee, M.Sc., Ph.D. (Allhd.)

**Readers :** P.K. Saikia, M.Sc. (Delhi), Ph.D. (Wis.)

**Lecturers :** Ms. C.R. Mondal, M.Sc., Ph.D. (V.B.)

A.K. Das, M.Sc., Ph.D. (NEHU)

R.P. Shukla, M.Sc., Ph.D. (Allhd.)

**Student Intake :** (a) Enrolment capacity : 31

(b) Actual Admission	SC/ST	Gen.	Male/Female	Total
	22	9	17	14
				31

**Fund received from agencies other than NEHU/UGC :** Department of Science and Technology National Board of Higher Mathematics.

**Courses conducted :** Linear algebra, Analysis I, Ord..Diff.Equations, Mechanics, Analysis II, Topology, Partial Diff. Equations. , Algebra I, Complex Function Theory, Computer Programming, Topics in Algebra, Theory of Relativity, Elementary Number Theory, Computer Numerical Analysis, Ring Theory.

**Seminars/Conferences :**

**Attended :**

Prof. S.S. Khare gave 3 invited talks on "Vector field on manifolds" in February-March 2000 at Allahabad University.

Prof. H.K. Mukerjee (1) delivered 3 invited lectures on "Manifolds with positive scalar curvature" at Allahabad University in January-February 2000.(2) delivered an invited lecture on "Gromov-Lawson-Rosenberg conjecture" in February 2000 at Mehta Research Institute, Allahabad. (3) delivered a talk entitled "On the level of spaces" in the golden jubilee International Conference of Bharat Ganit Parishad held at Lucknow University in January 2000.

Dr. R.P. Shukla visited Mehta Research Institute Allahabad during January-February 2000 and delivered a lecture on "The code of the regular generalised quadrangle of even order".

**Visiting Professor/Fellows :** Prof. A. Mann, Hebrew University of Jerusalem, Israel.

**Publications :**

Srivastava, S.K. "Riccion, Instanton and Primordial Inflation", *Int. J. Mod. Phys. A* 14, 1999. 875-884.

Srivastava, S.K. "Dual nature of Ricci scalar and models of the early universe" *Mod. Phys. Lett. A* 14, 1021-1031

Das, A.K. (1999) Bordism of stable vector bundle with small cobcat, *J. Indian Math. Soc.* Vol 66 .

**Thrust Areas of Research :** Theory of Relativity and cosmology, Algebraic topology, Algebra, Number theory and Oceanography.

**Research Programme/Research Project :** Professor S.K. Srivastava, "Quantum fields in curved-space time, physical aspects of the Ricci scalar and the early universe", by the Department of the Department of Science and Technology, New Delhi.

**Other activities :** Prof. H.K. Mukerjee reviewed an article entitled " The heritage of Emmy Noether" (Ramat-Gan, 1996), 57-65, Israel math. Conf. Proc. (1999), by Fridrich Hirzebruch, for the Mathematical Review of the American Mathematical Society.

The Department of Mathematics conducted training programmes for college and school teachers for orienting them for the mathematics olympiad. In addition Mathematical Olympiad at regional and National level have been conducted and also training has also been given to students for the same.

Computing facilities in the Department have helped M.Sc. students to perform practicals for the computer courses.

## 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.

In the course of several years the Department could attract a wide spectrum of talented faculty and 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 areas are included in the list of thrust areas by the Department of Science and Technology, Government of India.

**Head :** Prof. C.S.Shastry (upto Feb. 22<sup>nd</sup> 2000)  
Prof. Y.S.T. Rao (Feb., 2000 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. Kumar, M.Sc. (Agra), Ph.D. (IIT Kanpur)  
**Readers** : Y.S.Jain, M.Sc. (Agra), Ph.D. (IIT Kanpur)  
 \*: D.T.Khathing, M.Sc. (Delhi), D.Phil. (Calc.)  
 : P.N.Pandita, M.Sc., Ph.D. (Kashmir)  
 : P.N. Ram, M.Sc., D.Phil. (Alld) (on lien)  
 : M.K. Parida, M.Sc., Ph.D. (Utkal)  
 : B.M.Jyrwa, M.Sc., Ph.D. (NEHU)  
**Lecturer** : P.K. Bajpai, M.Sc., Ph.D. (NEHU) (on lien)

\*On deputation from the Department, as Head, Regional Sophisticated Instrumentation Centre (R.S.I.C.) NEHU, Shillong.

**Student intake** : a) Enrolment capacity : 26  
 b) Actual admission : 20

SC/ST	Genl. Male	Female	Total
14	6	14	6
			20

**Degrees awarded :**

Ph.D :

Sudipta Dey "Search for Mass Scales Beyond the Standard Model and their Low-Energy Signatures". Supervisor : Dr. M.K. Parida.

S.K. Dash "Structural and Phase Transition Studies on Liquid Crystals". Supervisor : Prof. A.L.Verma, Joint Supervisor : Dr. P.R. Alapati (NERIST).

S.Lotha "Heavy Ion Irradiation Induced Effects on Polymers and C/60". Supervisor : Dr. D.T.Khathing, Joint Supervisor : Dr. D.K. Awasthi (NSC-New Delhi).

E.M.L. Buam "Parametrisation of the Optical Model". Supervisor : Dr. B.M. Jyrwa.

**Funds received from agencies other than UGC/NEHU** : Department of Science and Technology : Rs. 15,81 lakhs.

**Courses conducted** : Classical Mechanics, Quantum Mechanics 1 & 2, Mathematical Physics, Classical Electrodynamics, Electronics Atomic & Molecular Physics; Solid State Physics, Nuclear Physics; Laboratory I,II,III, Thermal Physics; Experimental Techniques; Many Body Theory, Optional Laser Physics; Solid State Physics; Nuclear Physics; High Energy Physics; Environment Project Work.

**Seminars/Conferences :**

Attended :

Professor C.S.Shastry presented a paper (co-author: B.Sahu) titled "The Threshold Anomaly and Barrier Distribution in Heavy Ion Fusion", at the DAE Symposium in Nuclear Physics held in Chandigarh (December 1999).

Dr.P.N. Pandita attended: (i)the Mini Workshop on Linear Collider Physics held at the Tata Institute of Fundamental Research, Mumbai (2-4 November 1999) and delivered

an Invited Lecture titled "Higgs Physics at the Linear Collider", (ii) the VIth Workshop on High Energy Physics held at the Institute of Mathematical Physics, Chennai (3-14 January 2000) and was a member of the National Organising Committee for this workshop.

Dr. M.K. Parida attended: (i) the High Energy Physics Seminar held at the Institute of Physics, Dortmund University, Germany, and delivered one talk titled "Renormalization Effects on Neutrino Mixing : Analytic Formula and Fixed Point" (April 1999), (ii) the High Energy Physics Seminar held at the Institute of Physics, University of Vienna, Austria, and delivered a talk titled "New Formulas and Predictions for Running Masses at Higher Scales in MSSM" (May 1999), (iii) the High Energy Physics Meeting held at Calcutta University and gave a talk titled "Generation of Large Neutrino Flavour Mixing by Radiative Corrections" (February 2000), (iv) the VIth Workshop on "High Energy Physics Phenomenology (WHEPP-6)" held at the Institute of Mathematical Sciences, Chennai (3-15 January 2000) and delivered two talks. (a) "New Formulas and Predictions of running Masses" and (b) "Renormalisation effects on neutrino mixing".

#### Visiting Professors/Fellows :

Professor G. Rasasekaran, Distinguished Professor, Institute of Mathematical Sciences, Chennai gave seminar talks and did collaborative work in the research project of DAE entitled "Neutrino Masses and Mixings in Unified Theories" (October 1999).

Professor A Datta, Jadavpur University, Calcutta, gave a seminar talk titled "SUSY Particle Searches at the Colliders" (October 1999).

Guest Lecturers : Dr. V.R.Rao, Department of Physics, St.Edmund's College, Shillong & Dr. T.K.Sinha, Computer Centre, NEHU, were teaching some portions of the M.Sc. courses.

#### Publications :

Dash, S.K., Singh, R.K., Asthana, B.P., Alapati, P.R. and Verma, A.L. 1999. A New Phase Transition in supercooled TBDA Probed by Low-Temperature Raman Study, *J. Raman spectro.* 30 : 81-84.

Thakur, A.K., Upadhyaya, H.M. and Verma, A.L. 1999. Polyethylene Oxide Based Sodium Ion Conducting Composite Polymer Electrolytes Dispersed with  $\text{Na}_2\text{SiO}_3$ , *Ind. J. Pure & Appl. Phys.* 37 : 302-305.

Verma, A.L., Zhao, B., Terauchi, H. and Ozaki, Y. 1999. Delayed Response of the Alkyl Chains During Dynamical Switching in the Electric-Field-Induced Ferroelectric Phase of a Chiral, Antiferroelectric Liquid Crystal Probed by Dynamic and Polarized Infrared Spectroscopy, *Phys.Rev.* E59 : 1868-1872.

Chakraborty, T., Bajpai, P.K. and Verma, A.L. 1999. Room Temperature Spectroscopic Investigations on  $\text{K}^{14}\text{NO}_3$  and  $\text{K}^{15}\text{NO}_3$ ,  $\text{K}^{14}\text{N}^{16}\text{O}_{3-x}^{18}\text{O}_x$  and 1 : 1 Mixture of  $\text{K}^{14}\text{NO}_3$  : Intermolecular Coupling revealed in the Vibrational Spectra, *J. Raman Spectr.* 30 : 189 - 194.

Sahu, B. and Shastry, C.S. 1999. Asymmetric parabolic effective barrier model for heavy ion fusion and its relation to coupled channel effects, *J. Phys. G* 25 : 1909-1926.

Sahu, B. and Shastry, C.S. 1999. Asymmetric barrier model for heavy ion fusion and its relation to channel couplings *Pramana J. Phys.* 53 : 545-548.

Sabhapandit, Shukla and Dhar 2000. Distribution of avalanche sizes in the hysteretic response of random field Ising model on a Bethe lattice at zero temperature, *J Stat Phys. Jan*; Posted on the internet as cond-mat 9905236.

Das, A. and Kumar, K. 1999. Solvent-dependent study of Anisotropy shift in the C=O stretching mode of Benzaldehyde, *J. Raman Spectr.* 30 : 503-565.

Das, A. and Kumar, K. 1999. Raman Anisotropic linewidth Dependence on the Van der Waals volume of the interacting system, *J. Raman Spectr.* 30: 547-549.

Parida, M.K. and Singh, N.N. 1999. Low-energy formulas for neutrino masses with  $\tan \beta$  B-Dependent hierarchy; *Phys. Rev. D* 59: 032005.

Singh, A.K., Nongkynrih, P., Sachdev, P. and Sachdev, M.S. 1999. Adsorption and Desorption of zinc in wetland rice soils of Meghalaya; *J. Nuclear Agric Biol* 28(1): 17-24.

Singh, A.K., Khan, S.K. and Nongkynrih, P. 1999. DTPA-extractable Zn, Cu, Mn, and Fe in wetland rice soils and their availability to rice under submergence, *J. Indian Soc Soil Sci* 47 (2).

Singh, A.K., Khan, S.K. and Nongkynrih, P. 1999. Distribution and transformation of Zinc in wetland rice soils and their availability to rice plant, *J. Indian Soc. Soil Sci.* 47 (2).

Anantanarayanan, B. and Pandita, P.N. 1999. Infrared stable Fixed Points of Yukawa couplings in Non-minimal supersymmetric Standard Model R-Parity violation; *Phys. Letts. B* 454: 84-91.

Pandita, P.N. and Paulraj, P. 1999. Infrared stable Fixed Points of Yukawa couplings in Non-minimal supersymmetric Standard Model R-Parity violation; *Phys. Letts. B* 462: 294-301

Parida, M.K. and Purkayastha, B. 2000. New formulas and predictions of running masses in MSSM: hep-ph/9902374, *Euro. Phys. J. C*

Balaji, K.R.S., Dighe, A.S., Mohapatra, R.N. and Parida, M.K. 2000. Radiative Magnification of Neutrino Mixing and Natural Explanation of Neutrino Anomalies; hep Phy 000217 *Phys. Lett. B*.

**Thrust area of research :** Nuclear Physics, Laser Physics, Solid State Physics and High Energy Physics.

**Research Projects :** The Department has several ongoing Research Projects, sponsored by different funding agencies. New Research Project initiated during the period under report, are :

Professor A.L.Verma, "Molecular Dynamics of Some Ferroelectric and Model Dimeric Liquid Crystals", by the Department of Science and Technology, New Delhi.

Dr. P.N. Pandita, "Higgs Bosons in Supersymmetric Models", by the Department of Atomic Energy.

**Other activities :** Dr. P.N.Pandita (i) was selected for the UGC Research Award for the year 1999, (ii) visited the Inter-University Centre for Astronomy and Astrophysics, Pune, as a Senior Associate (Nov.-Dec. 1999). Prof.A.L.Verma acted as a member of the National Organizing Committee for the National Laser Symposium held at the University of Hyderabad, Hyderabad from December 14-17, 1999 and chaired one session in the symposium. Prof. C.S.Shastry was a member (a) National Advisory Committee of the DAE symposium in Nuclear Physics held in Dec. 1999 at Chandigarh, and (b) Governing body and governing Council of Nuclear Science Centre, New Delhi. Dr. M.K.Parida was awarded the Associateship of the Institute of Mathematical Sciences Chennai, 1999-2001. He was recommended as TPSC speaker (Category - B) 2000-2002. Dr. M.K.Parida visited (i) Institute of Physics, Dortmund University, Germany as visiting Fellow to carry out collaboration research work on Neutrino Physics (Feb-April, 1999), (ii) Institute of Physics, Vienna University, Austria, (May 1-5, 1999) for collaboration research work in High Energy, (iii) Institute of Mathematical Sciences, Chennai to carry out research work in High Energy Physic(January 2000) to carry out research work in High Energy Physics.

Head : Professor Helen Giri

Faculty :

Professor : Helen Giri, M.A., Ph.D. (Gau.)

Reader : Soumen Sen, M.A. (Cal.), Ph.D. (Gau.)

Lecturers : Desmond I. Khamawphlang, M.A. (NEHU)

M.H. Barhuja, B.Fine (NB)

P. Jhingran, M.A. (IU)

Courses conducted : Diploma Course in Folkloristics

Student intake : SCST Genl. Male/Female Total  
19 - 2 17 19

Extension Lectures :

Parabodh Jhingran, (i) "Language and Culture" to the M.A. Final Year Students for the course understanding of Tribal Cultures in the Department of Philosophy, NEHU.