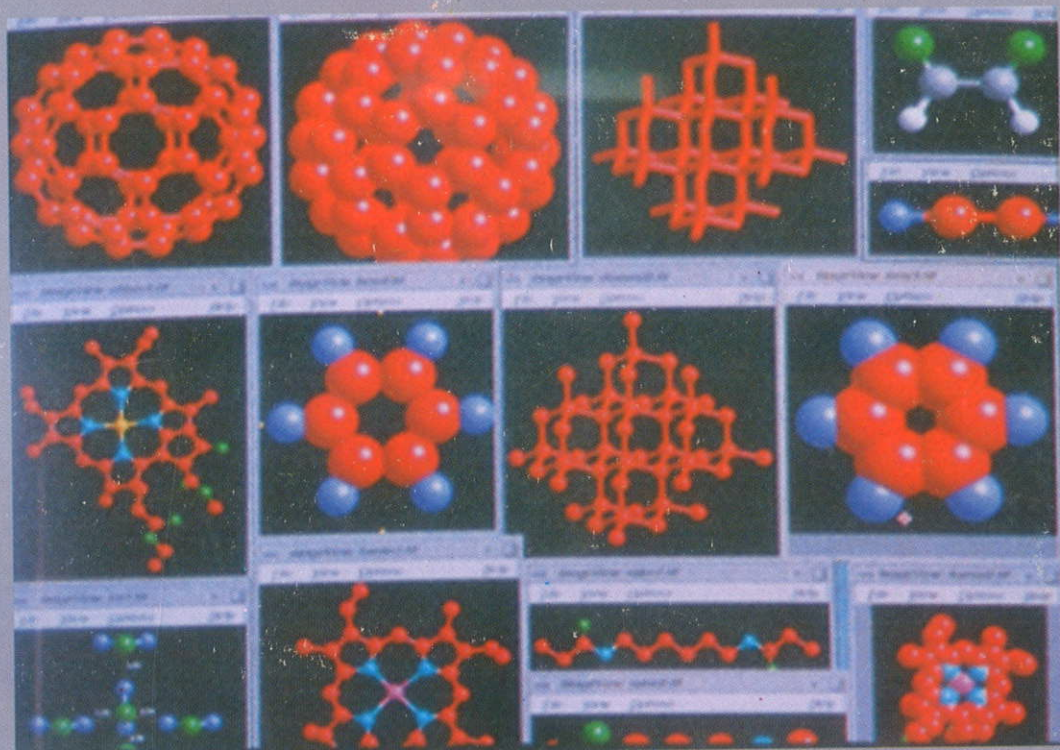




ANNUAL REPORT 1998 - 1999

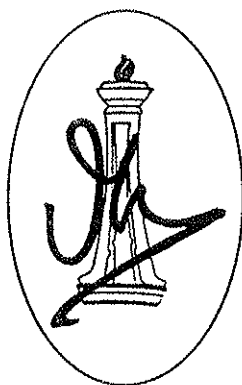


JAWAHARLAL NEHRU CENTRE

**FOR ADVANCED SCIENTIFIC RESEARCH
JAKKUR, BANGALORE - 560 064.**

ANNUAL REPORT

1998-1999



**JAWAHARLAL NEHRU CENTRE FOR
ADVANCED SCIENTIFIC RESEARCH**

Jakkur, Bangalore - 560 064.

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CHAPTER I

1. FOREWORD

I have great pleasure in presenting the Annual Report of the Centre for the year 1998-99.

This year is of special significance to the Centre since it will shortly be completing ten fruitful years of existence. The Centre has been able to enter into new research areas and build up necessary infrastructure. With increased contributions of students, faculty members, visitors and post-doctoral research fellows, the Centre hopes to consolidate its research activities on an increased scale in the future.

The Centre greatly values its interaction with academics in various universities and other research institutions in India and abroad. It is in the process of establishing new bridges to take up more challenging R&D work in different areas of interest. The Summer Research Fellowship Programme for the students is turning out to be a unique medium for introducing the culture of research at an early stage to them.

With rapid changes occurring in science and technology, it has become necessary for research institutions to attract highly motivated young graduates to science. By organising topical programmes, the Centre is striving to be a unique medium for promoting excellence in science education, so that quality science education is within the reach of all strata in the society. With this end in view, the Centre is constantly looking for new ways to strengthen the Ph.D programme so that a larger number of bright research scholars can be motivated to join the Centre every year.

The Centre has entered into a joint research programme with the NIMHANS. The existing arrangements with the Manipal Academy of Higher Education, (MAHE), Manipal have been extended; a new programme of M.Sc (by research) providing opportunities for highly motivated science graduates to take up interdisciplinary research in the areas of engineering and medicine is being introduced from the coming academic year .

With a view to co-ordinate the work carried out in the Biodiversity and Animal Behaviour Units, these have been integrated into a new Evolutionary and Organismal Biology Unit. Similarly, the Molecular Parasitology, Gene Therapy and Gene Targetting Unit and Genetics Unit have been merged into a Molecular Biology and Genetics Unit. New faculty to strengthen these Units have been recruited. Efforts are also on to get qualified scientists at higher levels in different areas of research.

The concept of Honorary Faculty of the Centre to promote a large networking of eminent scientists in the country has proved immensely useful in the promotion of research activity and training of young scientists.

Work to set up an Advanced Materials Laboratory and HIV Laboratory is nearing completion and it is hoped that newer research programmes will be of greater benefit to the country.

The excellent atmosphere that prevails in the Centre is the result of the fine work of the students, the faculty, the honorary faculty and other members. I would like to acknowledge the help that the Centre has received from its well wishers and friends. Their support has kept us going despite various limitations.

C.N.R. RAO

President

2. INTRODUCTION

The Jawaharlal Nehru Centre for Advanced Scientific Research was established in 1989 by the Department of Science and Technology, Government of India, to commemorate the centenary (1989) of Pandit Jawaharlal Nehru, with the main objective of promoting scientific research at the highest level in chosen frontier and inter-disciplinary areas of science and engineering. The Centre is registered as a Society under the Karnataka Societies Registration Act and is an autonomous national institution.

The Centre maintains close links and has a special relationship with the Indian Institute of Science (IISc) a renowned institution of advanced training and research. The Centre has its main Campus in Jakkur on the Bangalore-Hyderabad highway, about 11 kms from the Indian Institute of Science campus. Infrastructural facilities established by the Centre at the Indian Institute of Science are used by scientists of both the institutions.

The campus in Jakkur with a congenial atmosphere for research is on a 17.50 acre plot gifted by the Government of Karnataka. At the Indian Institute of Science Campus, the Centre has a Lecture hall, Visitors' House (JAWAHAR) and Guest Rooms catering to the academic visitors to the Centre and to the Indian Institute of Science.

The Centre has recruited Fellows and full-time faculty in various areas of interest and has distinguished honorary faculty from all over India. Students have been admitted for the Master's and the Ph.D degree Programmes. A programme M.Sc. (By Research) is being introduced from the Academic year 1999 - 2000 for the benefit of highly talented & motivated professional course students.

The Council of Management of the Centre meets twice a year. The General Body meets annually. The Academic Advisory Committee of the Centre meets at least twice a year.

3. OBJECTIVES

The objectives of the Centre are:

- To carry out front-line research in selected areas of science and engineering;
- To promote collaborative research with scientists at the Indian Institute of Science and other institutions in the country;
- To provide a national and international forum for in-depth discussions on important scientific topics in areas of vital interest to scientists of the Centre and in the country at large;
- To organize periodic winter and summer schools in certain areas, where young talented scholars would be associated;
- To provide opportunities for talented young students to carry out research projects;
- To provide facilities to visiting scholars and faculty from all over India and abroad, to work for extended periods with the faculty of the Centre;
- To publish monographs and reports on frontier and futuristic areas of science as well as monographs of educational value.

4. PROGRESS

During the last nearly ten years of its operation, the Centre has been able to fulfil its objectives for promotion of active research at the highest level in chosen areas by expanding various research activities.

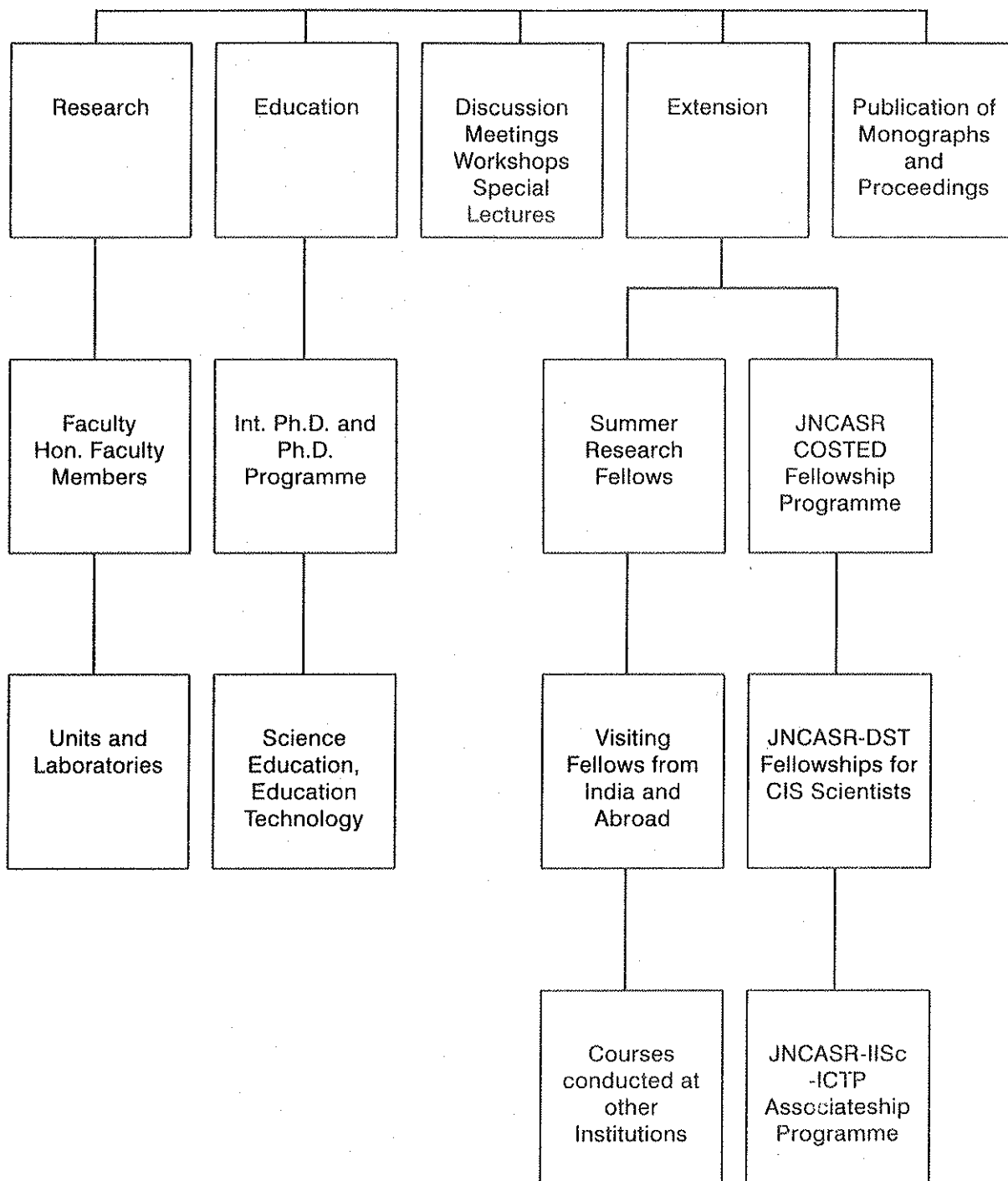
The post-graduate teaching and training programme of the Centre has research scholars for Ph.D. and talented junior scholars for Integrated Ph.D. Programmes. A special programme of M.Sc. (By Research) is being started from the next academic year for those from the professional areas. Faculty have been recruited recently in the Chemistry & Physics of Materials, Brillouin Scattering, Theoretical Sciences, Fluid Dynamics and Molecular Biology and Genetics areas to strengthen the academic and research activities.

A Molecular Biology & Genetics Unit has been established to comprise research activities carried out in the Units of Molecular Parasitology, Gene Targetting and Gene Therapy and Genetics. Evolutionary and Organismal Biology Unit has been started to give a focus on research work of the Animal Behaviour and Biodiversity Units.

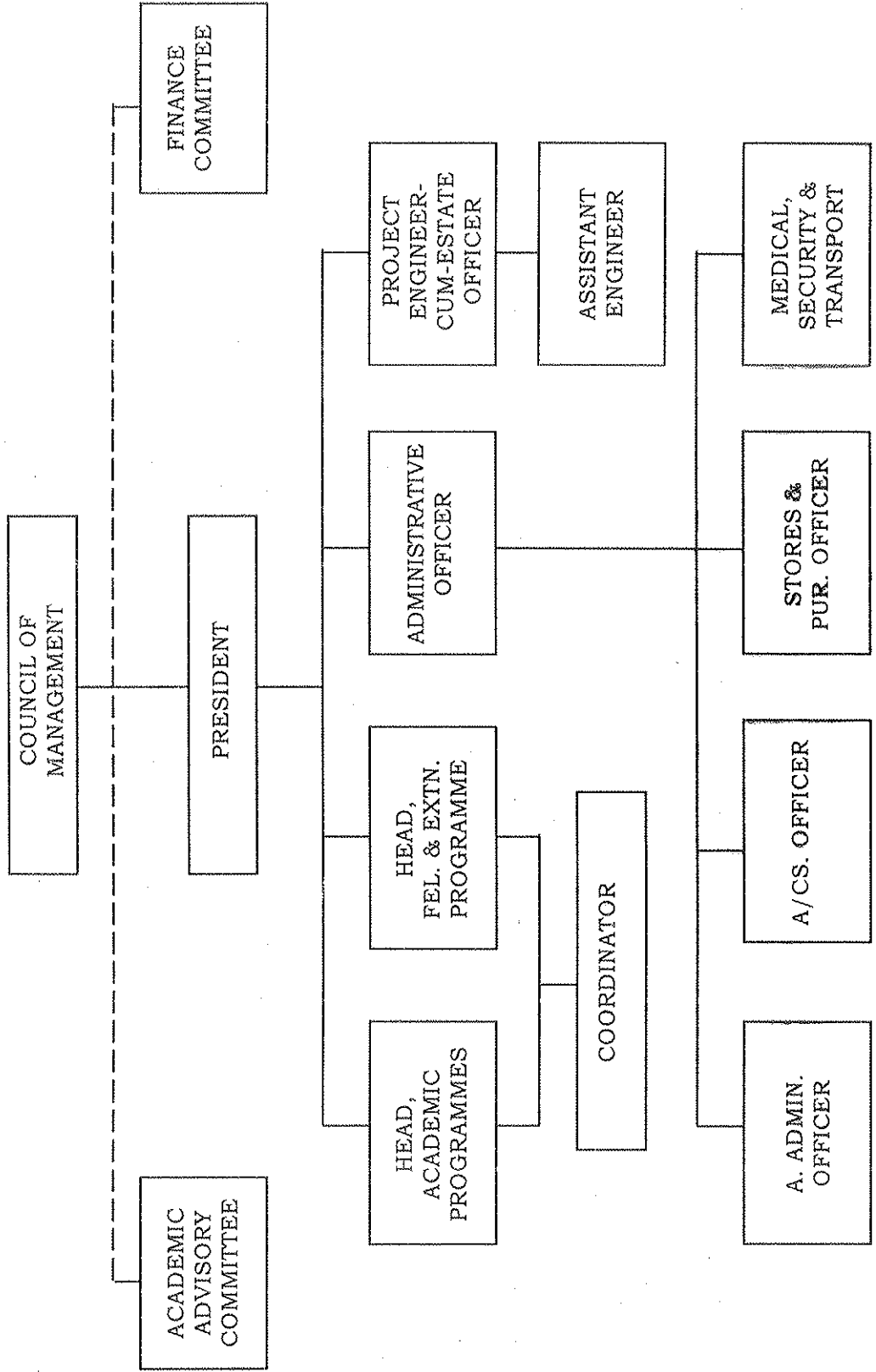
The extension programmes of the Centre during the year include thirty Discussion Meetings, fourteen Colloquia and thirty one Seminars. Under the JNCASR-COSTED International Fellowships Programme, four fellowships were offered to scientists in developing countries to work with the faculty of the Centre / Indian Institute of Science and other research organisations. Two scientists availed the Fellowships under the DST-JNCASR Co-ordinated Programme for scientists from the CIS. Two scientists were awarded Fellowships under the ICTP-IISc-JNCASR Associateship Programme.

The Centre has upgraded its computer facilities, augmented acquisition of books for the library and also increased subscription to new journals in specified topics of research that are of interest to the faculty.

5. ACTIVITIES OF JAWAHARLAL NEHRU CENTRE FOR ADVANCED SCIENTIFIC RESEARCH



6. ORGANISATION CHART



CHAPTER II

1. ORGANISATION

1. Council of Management

The administration and management of the affairs & finances of the Centre are conducted by the Council of Management. The Council of Management of the Centre meets twice a year.

During the year under review, Prof. G. Mehta, Director, IISc. was appointed as a member of the Council, Vice Prof. G. Padmanabhan, Director, IISc, retired.

The following are the members of the Council.

Raja Ramanna Chairman Council of Management JNCASR, Bangalore	Chairman
C.N.R. Rao President, JNCASR	Member
V.S. Ramamurthy Secretary Department of Science and Technology New Delhi	Member
S.K. Joshi Chairman, Recruitment and Assessment Centre, DRDO Complex, Delhi	Member
Rahul Sarin, I.A.S. Joint Secretary & Financial Adviser Department of Science and Technology New Delhi	Member

G. Mehta
Director
Indian Institute of Science,
Bangalore

Member

M.M. Sharma
Mumbai

Member

T.V. Ramakrishnan
Indian Institute of Science
Bangalore

Member

S. Varadarajan
President, Indian National
Science Academy, New Delhi

Member

N. Nagaraja Rao
Administrative Officer, JNCASR

Secretary

2. The Finance Committee

The Finance Committee of the Centre scrutinizes all financial proposals, and makes recommendations to the Council of Management.

The constitution of the Finance Committee is as follows:

C.N.R. Rao
President, JNCASR

Chairman

V. Krishnan
Head, Academic Programmes,
JNCASR

Member

Rahul Sarin, I.A.S.
Jt. Secretary & Financial Adviser,
DST

Member

T.V. Ramakrishnan
Indian Institute of Science

Member

G.K.N. Shastry
Accounts Officer,
JNCASR

Member

N. Nagaraja Rao
Administrative Officer,
JNCASR

Secretary

3. The Academic Advisory Committee

The functions of the Academic Advisory Committee include planning execution and coordination of research & other academic activities of the Centre. It also regulates the courses of study, procedure for admission of students, examination etc. It meets at least twice a year. The Committee makes its recommendations to the Council of Management.

During the year under review, Prof. G. Mehta, Member, ceased to be a member of the committee since he became a Member of Council of Management by virtue of his appointment as Director of the Indian Institute of Science, Prof. V. Krishnan was appointed as a Member of the Committee.

The members of the Committee are :

C.N.R. Rao
President,
JNCASR

Chairman

Madhav Gadgil
IISc, Bangalore

Member

S.S. Jha
Director, TIFR
Bombay

Member

N. Kumar
Director,
Raman Research Institute
Bangalore

Member

P. Rama Rao Chairman, Atomic Energy Regulatory Board Mumbai	Member
R.A. Mashelkar Director-General, CSIR New Delhi	Member
R. Narasimha Director, NIAS Bangalore	Member
H. Sharat Chandra Honorary Professor, JNCASR	Member
M.K. Chandrashekar Professor, JNCASR	Member
V. Krishnan Head, Academic Programmes JNCASR	Member
N. Nagaraja Rao Administrative Officer, JNCASR	Secretary

The faculties are involved in the academic activities of the Centre and assist the Academic Advisory Committee in the discharge of its functions. The last Annual Faculty Meeting was held in November 1998 which included lectures by the faculty on the advances made in various research areas. A local faculty meeting was also held in August 1998 to review the progress and provide inputs wherever required.

4. **Administration & Supporting Staff**

President

C.N.R. Rao, D.Sc. (Mysore), Ph.D. (Purdue),
D.Sc. (h.c.), Hon. F.R.S.C., F.A.Sc., F.N.A., F.R.S.

Head, Academic Programmes

V. Krishnan, Ph.D. (IISc), F.A.Sc., F.N.A.

Head, Fellowships and Extension Programmes

N. Mukunda, Ph.D. (Rochester), F.A.Sc., F.N.A.

Administrative Officer

N. Nagaraja Rao, M. A. (Mysore), M.B.A. (IGNOU)
LL. B., (Bangalore)

Co-ordinator

W.H. Madhusudan, Ph.D. (IISc)

Accounts Officer

G.K.N. Sastry, B.Sc.(Mysore)

A. Administrative Officer

P.N. Rajappa, B.A., PGDBA (Bangalore)

Secretary to President

D.V. Seetharaman

Stores & Purchase Officer

Sripathy Tirupathy, M.Com. (Osmania), M.A. (Kakatiya)

Project Engineer - cum - Estate Officer

S. Chikkappa, B.E. (Mysore)

Consulting Medical Officer

Dr. B.S. Subba Rao, M.B.B.S. (Mysore)

Consulting Lady Medical Officer
Dr. Kavitha Sridhar, M.B.B.S.

Honorary Librarian
N.M. Malwad, M.Lib.Sc.(Bombay), A.D.R.(INSDOC)

Honorary Security Officer
M.R. Chandrasekhar, B.Sc., LL.B.

CHAPTER - III

1. Units and Laboratories

Units

1. Chemistry and Physics of Materials

The major thrust of Research in this Unit is mainly concerned with the study of phenomena, structure-property relations and materials design. The main activities relate to electronic and optical phenomena in organic materials, nanomaterials and clusters, electronic and magnetic properties of oxides, new forms of carbon, thin films etc., acquisition of excellent equipment infrastructure for carrying out sophisticated investigations. The unit employs state-of-art probes to study interesting properties and phenomena in novel materials.

The following are the members of the Unit:

- C.N.R. Rao, F.A.Sc., F.N.A., F.R.S.	Chair
- A.K. Sood, F.A.Sc., F.N.A.	Hon. Faculty Member
- D.D. Sarma, F.A.Sc.	Hon. Faculty Member
- K.S. Narayan, Ph.D.	Faculty Fellow
- G.U. Kulkarni, Ph.D.	Faculty Fellow
- S. Natarajan, Ph.D.	Faculty Fellow
- A.R. Raju, Ph.D.	Faculty Fellow
- S. Balasubramian, Ph.D.	Faculty Fellow
- N. Chandra Bhas, Ph.D.	Faculty Fellow
- V.R. Pedireddi, Ph.D.	Sr. Research Officer
- R.T. Yadav, Ph.D.	Research Officer
- M. Eswaramoorthy, Ph.D.	Research Associate
- P. Kumaradhas, Ph.D.	Research Associate
- R.S. Singh, Ph.D.	Research Associate
- M. Sugantha, Ph.D.	Research Associate
- E. Balasubramaniam, Ph.D.	Research Associate
- Geetha K. Varier, Ph.D.	Research Associate
- M. Chandra Sekhar, Ph.D.	Research Associate
- Rahul Sen, Ph.D.	Research Associate
- P.N. Santosh, Ph.D.	Research Associate

- V. Sreenath, B.E.	Technical Assistant
- M.K. Renganathan, M.Sc.	Technical Assistant
- S. Srinivas, B.E.	Technical Assistant
- H.M. Gurulinga Murthy, B.E.	R & D Assistant
- R. Charusheela, M.Sc.	R & D Assistant
- S.J. Divakar, M.Sc.	R & D Assistant
- C.P. Vinod, M.Sc.	R & D Assistant
- Usha Govinda Tumkurkar, M.Sc.	R & D Assistant
- G. Sudeendra, M.Sc.	R & D Assistant
- Arounaguiri S, M.Sc.	R & D Assistant
- Anil Kumar J, D.E.E.	Lab Assistant
- Vasudev B.S., D.E.E.	Lab Assistant

2. Condensed Matter Theory (located at IISc)

The unit is engaged in Theoretical research on a variety of topics in the general area of Physics and Chemistry of Condensed Matter systems. Some of the research topics being pursued relate to Quantum Monte Carlo study of Hubbard models with application to doped fullerenes, Laser-induced freezing in colloidal systems, Modeling of the growth of thin films under chemical vapour deposition and molecular beam epitaxy.

The following are the members of the unit:

- Chandan Dasgupta, F.A.Sc.	Chair
- T.V. Ramakrishnan, F.A.Sc., F.N.A.	Hon. Professor
- N. Kumar, F.A.Sc., F.N.A.	Hon. Professor
- H.R. Krishnamurthy, F.A.Sc., FNA	Hon. Faculty Member
- G. Ananthakrishna, F.A.Sc.	Hon. Faculty Member
- Biman Bagchi, F.A.Sc., F.N.A.	Hon. Faculty Member
- S. Ramasesha, F.A.Sc.	Hon. Faculty Member
- B. Sriram Shastry, F.A.Sc.	Hon. Faculty Member
- Sriram Ramaswamy, F.A.Sc.	Hon. Faculty Member
- Rahul Pandit, F.A.Sc.	Hon. Faculty Member
- D.D. Sarma, F.A.Sc.	Hon. Faculty Member
- K.L. Sebastian, F.A.Sc.	Hon. Faculty Member
- S. Yashonath, F.A.Sc.	Hon. Faculty Member
- Binny J. Cherayil, Ph.D.	Hon. Faculty Member
- Diptiman Sen, Ph.D.	Hon. Faculty Member
- Sanjay Jain, Ph.D.	Hon. Faculty Member

- Pragya Shukla, Ph.D.	Research Associate
- S.S. Mandal, Ph.D.	Research Associate
- S. Sarkar, Ph.D.	Research Associate
- Rajeev Ahluwalia, Ph.D.	Research Associate
- Amlan Kusum Roy	Research Associate (P)
- E.W.B. Dias	Research Associate (P)
- Aldrin Denny	Research Associate (P)
- Abhishek Dhar	Research Associate (P)
- Sitabra Sinha	Research Associate (P)
- S.J. Naronha, M.Sc.	R & D Assistant
- Amit Ram Puniyani, B.Tech.	R & D Assistant
- Anirban Sain, M.Sc.	R & D Assistant
- Abhijit Das, M.E.	R & D Assistant

3. Chemical Biology (located at IISc)

The primary emphasis of the unit is devoted to the studies of diverse aspects and science at the interface of Chemistry and Biology. The unit employs state-of-the-art methodologies and techniques to investigate a variety of topics.

The following are the members of the Unit:

- K.M. Madyastha, F.A.Sc.	Chair
- G.. Mehta, F.A.Sc., F.N.A.	Hon. Professor
- V. Krishnan, F.A.Sc., F.N.A.	Hon. Professor
- P. Balaram, F.A.Sc., F.N.A.	Hon. Faculty Member
- Raghavan Varadarajan, Ph.D.	Hon. Faculty Member
- Santanu Bhattacharya, Ph.D.	Hon. Faculty Member
- Uday Maitra, Ph.D.	Hon. Faculty Member
- Shital K. Chattopadyay, Ph.D.	Research Associate
- Avijit Sen	Research Associate (P)
- Girish S. Ratnaparki	Research Associate (P)
- K.K. Namitha, M.Phil.	R & D Assistant
- V. Prasanna, M.Sc.	R & D Assistant
- M.V. Uma, M.Sc.	R & D Assistant
- G.R. Sridhar, M.Sc.	R & D Assistant

4. Education Technology

The unit was established in 1996 with the primary objective of improving science education in schools/colleges through exposure of multimedia packages and low cost equipment kits. Multimedia laboratory is equipped with low cost equipment for its work. The unit conducts workshops on Macrochemistry with Microkits for schools/colleges and develop Curriculum-based multimedia packages in chemistry, biology, physics and general science for schools/colleges.

The Following are the Members of the unit:

- | | |
|----------------------------------|---------------------|
| - V. Krishnan, F.A.Sc., F.N.A. | Chair |
| - Jayanthi Chandrasekaran, Ph.D. | Programme Scientist |
| - Jatinder Kaur, M.Sc. | Technical Assistant |
| - D.K. Bhaskar, B.E. | Technical Assistant |

5. Evolutionary and Organismal Biology

The Unit conducts research in the areas of Chronobiology, Behavioural Ecology and Sociobiology, Evolutionary Genetics, Population Ecology and Biodiversity. It has a Biodiversity Documentation Centre which conducts theoretical, experimental, field and policy research on biodiversity of India.

The following are the members of the unit :

- | | |
|---------------------------------------|---------------------|
| - M.K. Chandrashekar, F.A.Sc., F.N.A. | Chair |
| - Madhav Gadgil, F.A.Sc., F.N.A | Honorary Professor |
| - R. Gadagkar, F.A.Sc., F.N.A. | Hon. Faculty Member |
| - V. Nanjundiah, F.A.Sc. | Hon. Senior Fellow |
| - Amitabh Joshi, Ph.D. | Faculty Fellow |
| - Vijay Kumar Sharma, Ph.D. | Fellow |
| - P. Pramod, Ph.D. | Fellow |
| - Suri Venkatachalam, Ph.D. | Research Associate |
| - Hans Raj Negi, Ph.D. | Research Associate |

- M.D. Kolatkar, M.Sc.	R & D Assistant
- V.A. Abraham, M.Sc.	R & D Assistant
- M. Rajamani, M.Sc.	R & D Assistant
- S. Ravikumar, M.Sc.	R & D Assistant
- K. Shankaramurthy, M.Sc.	R & D Assistant
- Divakar N. Belawadi, B.E.	R & D Assistant
- Jyothi N. Belawadi, M.Sc.	R & D Assistant
- A.V. Nagarathnamma, M.Sc.	Jr. Scientific Asst.
- Swarnalatha Ramdas, B.Sc.	Lab. Assistant

6. Fluid Dynamics

The main activities lie in the analysis and interpretation of the extensive micro meteorological data taken during the national experiment known as MONTBLEX in 1990. The present focus is to investigate the possibility of manipulating coherent structures by exercising flow control through selective heating of the jet. Research is going on flow instability and transition, apart from a dynamical systems approach to obtain an understanding of the process of mixing in the vicinity of vortical structures.

The following are the members of the unit :

- R. Narasimha, F.A.Sc, F.N.A., F.R.S.	Chair
- Amit J. Basu, Ph.D	Faculty Fellow
- Rama Govindarajan, Ph.D.	Faculty Fellow
- K.R. Srinivas, Ph.D.	Faculty Fellow
- S.V. Raghurama Rao, Ph.D.	Research Associate
- Vignesh Jayanth, M.Sc.	R & D Assistant

7. Geodynamics

The main thrust of research endeavours in this units is of studies on tectonic movements that have taken place in the late quaternary time. The neotectonic studies aim at gaining insight into the mechanism of

recent movements - and obtaining information on climate changes in the past 50,000 years.

The following are the members of the unit :

- | | |
|---------------------------------|------------------------|
| - K.S. Valdiya, F.A.Sc., F.N.A. | Chair |
| - G.C. Suresh, Ph.D. | Research Associate (P) |

8. Molecular Biology and Genetics :

The Unit focuses into diverse aspects of research which includes bio-chemistry, cell and molecular biology of plasmodium, design of anti-malarial drugs, screening of natural products for anti-malarial activity, designing and evaluation of DNA vaccines for HIV/AIDS, etc. It is proposed to strengthen the existing research group by adding a small number of new laboratories for taking care of research.

The following are the members of the unit :

- | | |
|--------------------------------------|--------------------|
| - G. Padmanaban, F.A.Sc., F.N.A. | Chair |
| - H. Sharat Chandra, F.A.Sc., F.N.A. | Honorary Professor |
| - Namita Surolia, Ph.D. | Faculty Fellow |
| - Hemalatha Balaram, Ph.D. | Faculty Fellow |
| - Anuranjan Anand, Ph.D. | Faculty Fellow |
| - Ranga Uday Kumar, Ph.D. | Faculty Fellow |
|
 | |
| - K. Sumathy, Ph.D. | Research Associate |
|
 | |
| - C.V. Yogaraje Gowda, M.Sc. | R & D Assistant |
| - Christopher Dinesh Raj, M.Sc. | R & D Assistant |
| - V.S. Srividya, M.Sc. | R & D Assistant |
| - Pankaj Kumar Mishra, M.Sc. | R & D Assistant |
| - M.S. Shivayogi, M.Sc. | R & D Assistant |
| - V. Vijaya Baskar, M.Sc. | R & D Assistant |
| - Valsala Neyyan, M.Sc. | R & D Assistant |
| - N.R. Ashok, M.Sc. | R & D Assistant |
| - Swathi Aiyer, M.Phil. | R & D Assistant |
| - T.R. Nagaraja, M.Sc. | R & D Assistant |
| - Kamalapriya D, M.Sc. | R & D Assistant |

9. Theoretical Sciences

The work on ab-initio calculations in condensed matter systems, computer simulation study of slow dynamics in liquids and different kinds of random matrix models are being studied. These studies have applications for surface properties, and formation of realistic inter-atomic potentials, understanding glassy dynamics and the glass transition in supercooled dynamics; random matrix models can be applied to mesoscopic conductors, structural glasses, etc.

The following are the members of the unit :

- | | |
|-------------------------------|----------------|
| - N. Mukunda, F.A.Sc., F.N.A. | Chair |
| - Shobhana Narasimhan, Ph.D. | Faculty Fellow |
| - Srikant Sastry, Ph.D. | Faculty Fellow |
|
 | |
| - Nivedita Deo, Ph.D. | Fellow |
| - Janaki Balakrishnan, Ph.D. | Fellow |

Laboratories

1 Computer

This laboratory embarked upon major expansion which includes Silicon Graphics Power Challenge with R 10000 Processors, with a total shared memory of one Giga Byte. The facilities of the lab. have been extensively used by the research units and uptime of the facility has been above 99%.

The following are the members of the unit :

- | | |
|---------------------------|-------------------------|
| - G.U. Kulkarni, Ph.D. | Head |
| - K.H. Gowranga, M. Tech. | Hon. Computer Scientist |
|
 | |
| - Sanjay Shukla, B.E. | R & D Assistant |
|
 | |
| - S. Vinayak, B.Sc. | Lab. Assistant |
| - K. Ramya Rao | Trainee |

Senior Associates:

- N.R. Moudgal, F.N.A, F.A.Sc.
- M.A. Viswamitra, F.N.A, F.N.A.Sc.
- K.P. Sinha, F.A.Sc., F.N.A.
- S.N. Balasubrahmanyam, Ph.D.

Endowed Research Professorships:

1. Astra Research Centre India
 - Astra Chair in Life Sciences
 - M.K. Chandrashekar, F.A.Sc., F.N.A.
2. Defence Research and Development Organisation
 - D.S. Kothari Chair
 - M.M. Sharma, F.R.S., F.A.Sc., F.N.A.
3. Council of Scientific and Industrial Research
 - S.S. Bhatnagar Chair
 - K.S. Valdiya, F.A.Sc., F.N.A.
4. IBM World Trade Corporation
 - IBM Information Technology Chair
 - V. Rajaraman, F.A.Sc., F.N.A.
5. Hindustan Lever Ltd.
 - Hindustan Lever Chair
 - M.V. George, F.A.Sc., F.N.A.
6. Gharda Chemicals
 - Gharda Chair
 - R. Kumar, F.A.Sc., F.N.A.
7. UNESCO
 - UNESCO-Nehru Chair
 - K.V. Sane, Ph.D.
 - (up to July 1998)

CHAPTER IV

1. ACADEMIC PROGRAMMES

Part - I : Academic Activities

1. Research Admissions:

The Centre has signed a Memorandum of Understanding with the Manipal Academy of Higher Education (MAHE) (a deemed university) which enables the Centre to conduct an integrated Ph.D. programme as well as regular Ph.D. programme in science and engineering. The Centre selects candidates on an all-India basis, offers course work (in collaboration with IISc), provides research facilities and administers the programme, while MAHE awards the degrees. The regular Ph.D. programme in science and engineering is available to post-graduates who have successfully completed the GATE/CSIR/UGC/JRF examination.

The following two students with chemistry background have been admitted for the integrated Ph.D. Programme in Chemistry and Physics of Materials for the year 1998-99.

Gautam Gundiah
K. Siva Shankar

For the regular Ph.D programme, seven students were admitted for the year 1998-99 to work in the areas indicated against their names:

R. Jayalakshmi	- Molecular Biology and Genetics
N. G. Prasad	- Evolutionary & Organismal Biology
P. Raghavendra	- Molecular Biology & Genetics
Sanjeeva Nayaka	- Biodiversity
V. Smita	- Molecular Biology & Genetics
K.A. Subramanian	- Biodiversity
S. Swarnalatha	- Genetics

2. Discussion Meetings:

The Following discussion meetings took place since the last Annual Report:

1. Short Term Programme on Economics for Development : Research Issues, (1 - 5 June 1998), Convener : M.H. Balasubramanya (IISc.)
2. Farming Strategies for rainfed groundnut in Anantapur Region, (23 June 1998), Convener : J. Srinivasan
3. Frontiers of Genetics and Development (7 - 8, July 1998),
Conveners : Ushavaradarajan, A. Anand
4. Frontiers in Inorganic Chemistry (8 -10, July 1998),
Convener : K. Kishore
5. National Conference on Mathematical Modelling and Computer Simulation (6-7 August 1998) at Indira Gandhi Inst. Of Dev. Res., Mumbai, Conveners : R. Narasimha (NIAS), R. Ramanathan (IGIDR), Jyoti K. Parikh (IGIDR)
6. Sixth UGC Course - An Integrated approach to knowledge and information (1-19 Sep. 1998), Sponsors : NIAS & JNCASR
7. Workshop on Engineering Practice in Black Cotton Soils (5, Sept. 1998), Convener : K.S. Subba Rao (IISc.)
8. Workshop on Small-Scale Chemistry experiments (7-11, Sept. 1998),
Sponsor : JNCASR
9. Quantum Magnetism and Correlated Electrons (14-16 Sept.1998),
Conveners: T.V. Ramakrishnan(IISc), B. Sriram Shastry (IISc)
10. Seminar on Landmarks in the development of Physical and Chemical Sciences (5-9 Oct. 1998), Conveners : B.V. Subbarayappa (IWC), R. Narasimha (NIAS), Sundar Sarukkai (NIAS), M.G. Narasimhan (NIAS), N. Mukunda (JNCASR)
11. Fifth IUMRS Intl. Conf. in Asia (13-16 Oct. 1998)
Convener : S.V. Subramanyam (IISc)

12. Workshop on Tropical Oceans and Climate (3-6, November 1998),
Convener : J. Srinivasan (IISc)
13. One day Symposium on Biodiversity (4 Nov. 1998),
Convener : Nagesh S. Kini (IISc)
14. Discussion Meeting on Advanced Materials, (15-22 Nov. 1998),
Sponsors : JNCASR, University of California, Santa Barbara, IISc
15. Digital Filter Design and Implementation & Multirate Signal Processing
(20 Nov. 1998), Convener : V.U. Reddy (IISc)
16. Second National Doctoral Consortium in Management - 1998
(23 - 24, Nov. 1998), Convener : N.J. Rao (IISc)
17. IBRO Seminar on Neuroscience/ Modern Biology (6-13 Dec. 1998)
At Mahabaleswar, Sponsors : TIFR, Mumbai & JNCASR
18. Second Workshop on Small Scale Chemistry Experiments
(7-9 Dec. 1998), Sponsor : JNCASR
19. Third Asian Computational Fluid Dynamics Conference
(7-11 Dec. 1998), Convener : T.S. Prahlad (NAL)
20. Workshop on Making, Shaping and Damage Mechanisms in Ceramics
(8-10 Dec. 1998), Convener : Satish V. Kailas (IISc)
21. Workshop on Numerical Weather Forecasting and Damage Mechanisms
in Ceramics (12-15 Dec. 1998), Convener : R. Narasimha (JNCASR)
22. Workshop on Molecular Genetics of some blinding diseases
(14-22 Dec. 1998), Convener : H. Sharat Chandra (IISc)
23. Frontier Lectures in Chemistry at Trichy (16-18 Dec. 1998),
Sponsor : JNCASR & Bharathidasan Univ.
24. Biennial DM in Theoretical Chemistry (26-28 Dec. 1998),
Convener : Kalidas Sen, Univ. of Hyderabad
25. International Symposium on Biochemical Roles of Eukaryotic Cell
Surface Macromolecules (4-8 Jan. 1999), Convener : A. Surolia (IISc)

26. National Symposium in Chemistry (27-30, Jan. 1999),
Sponsor : JNCASR & IISc
27. Scientific and Philosophical Studies on Consciousness
(1-6 Feb. 1999), Convener : B.V. Sreekantan (NIAS)
28. Seminar on Landmarks in the development of Physical and Chemical
Sciences (15-17, Feb. 1999), Conveners : B.V. Subbarayappa (IIWC),
R. Narasimha (NIAS), Sundar Sarukkai (NIAS) M.G. Narasimhan
(NIAS), N. Mukunda (JNCASR)
29. Centenary Celebrations of Late Prof. K.R. Rao at Andhra Univ.,
Vishakapatnam (18-20 Feb. 1999), Convener : J. Ramakrishna (IISc)
30. Third Workshop on Small Scale Chemistry Experiments
(23-25 Feb. 1999), Sponsor : JNCASR

3. Lectures and Colloquia :

Special Lectures

The Centre organized the following prestigious lectures :

1. **The Michael Faraday Lecture** : Fourth Lecture delivered by Professor Michael Sela on "From Synthetic antigens to Synthetic vaccines against infectious and autoimmune diseases", October 28, 1998.
2. **The Issac Newton Lecture** : Third lecture delivered by Professor Phillip A. Griffiths on "Mathematics at the Turn of the Millennium", March 12, 1999.

Lectures

1. What neurology can tell us about human nature; lessons from phantom limbs, denial and Capgraf syndrome, **Prof. V.S. Ramachandran, Director, Centre for Brain and Cognition, University of California, San Diego and Salk Institute**, May 14, 1998.
2. Recent Advances in Heart care, **Dr. K.G. Nair, Medical Director, Breach Candy Hospital and Research Centre, Mumbai**, August 17, 1998.

3. From the Double Helix to the Human Genome Project, **Prof. James D. Watson (Nobel Laureate), Cold Spring Harbor Laboratory, USA,** January 8, 1999.
4. Recent computer modelling of studies of inorganic materials, **Prof. C.R.A. Catlow, Royal Institution, London,** January 14, 1999.
5. Theories and models of the interactions in synthetic metals, **Dr. Laurent Ducasse, University of Bordeaux, France,** January 22, 1999.

Colloquia

The following colloquia were held since the last Annual Report:

1. Prof. N. Balakrishnan (IISc.) - Y2K and Software Issues beyond 2000, October 9, 1998.
2. Dr. Uriel Frisch (Observatoire de la Cote d'Azur, Nice, France) - Lagrangian method for multiple correlations of passive scalars, October 15, 1998.
3. Prof. V. Ramjee (IIT, Chennai) - Confined jets and related problems, November 11, 1998.
4. Dr. Hans Bippes (DLR Institute of Fluid Mechanics, Gottingen, Germany) - Transition control in flows dominated by crossflow instability, November 18, 1998.
5. Prof. M. Gaster (Queen Mary and Westfield College, London) - Active control of boundary layer instabilities, November 18, 1998.
6. Dr. Ruby Krishnamurthi (Florida State University, Florida) - Double Diffusive Convection, December 9, 1998.
7. Prof. Andreas Acrivos, Director (Levich Institute, New York) - Shear induced particle diffusion in concentrated suspensions. Variations on a theme by Albert Einstein, December 14, 1998.
8. Dr. JSB Gajjar (University of Manchester, UK) - The absolute instability of flow near wedge-shaped and cusped-shaped trailing-edges and compressible wakes, December 31, 1998.

9. Prof. Balu Nadiga (University of New Mexico, USA) - On mesoscale eddy parametrization for the ocean, January 5, 1999.
10. Dr. Sudarsh Kailas (NAL) - Eduction of structures from turbulent flow imagery using wavelets, January 13, 1999.
11. Dr. J. Ravi Prakash (IIT, Chennai) - Molecular Rheology of Polymer Solutions, February 10, 1999
12. Prof. Bruce Berndt (University of Illinois, USA) - A Survery on Ramanujan's Life, Notebooks, and Mathematical Influence, February 17, 1999.
13. Prof. V. Vasanta Ram (Institut fur Thermo and Fluid dynamik, Ruhr University, Bochum, Germany) - The effect of a wave - like excitation of the channel walls on the spatial growth/decay of disturbances, February 24, 1999.
14. Prof. Ajay K. Prasad (University of Delaware, USA) - Overview of Research, March 17, 1999.

Seminars

The Centre conducted the following seminars during the period under Report.

1. Targetting spatiotemporal dynamical states using constant pinnings, Dr. Nita Parekh, CCMB, Hyderabad, June 24, 1998.
2. Green beard in a red ant!, Prof. Raghavendra Gadagkar, EOBU, JNCASR & CES, IISc, Bangalore, August 20, 1998
3. Foraging squirrels: quo vadis?, Dr. Renee Borges, CES, IISc, Bangalore, August 27, 1998
4. Development time and eclosion rythms in *Drosophila melanogaster* populations reared in constant light for over 600 generations, Ms. Sheeba V., EOBU, JNCASR, Bangalore. September 3, 1998
5. Life-history evolution in laboratory populations of *Drosophila Melanogaster*, Dr. Amitabh Joshi, EOBU, JNCASR, Bangalore, September 10, 1998.

6. Inordinate fondness for beetles: new explanations, Dr. P. Pramod, EOBU, JNCASR, Bangalore, September 17, 1998.
7. Phase adjustment in the locomotor activity rhythm of the field mouse *Mus Booduga*, Dr. Vijay K. Sharma, EOBU, JNCASR, Bangalore, September 24, 1998
8. Covariation of abundance and diversity across taxa in the Garhwal Himalaya, Mr. Hans Raj Negi, EOBU, JNCASR, Bangalore, October 8, 1998.
9. Circadian resonance in Cyanobacteria enhances fitness, Ms. Sheeba, V., EOBU, JNCASR, Bangalore, October 22, 1998.
10. Effects of habitat fragmentation on species richness and diversity, Prof. K. N. Ganeshiah, Dept. of Plant Breeding & Genetics, U. A. S., and EOBU, JNCASR, Bangalore, November 26, 1998.
11. Just a little oxygen, Prof. David Lloyd, University of Wales, Cardiff, December 2, 1998.
12. Tumor protection by breaking Tolerance using DNA immunization with xenogeneic melanosomal Antigens and cytokines, Dr. Roopa Srinivasan, Sloan-Kettering Cancer Center, New York, December 3, 1998.
13. Analysis of Vascular Development in Mouse, Dr. Maneesha S. Inamdar, December 28, 1998.
14. Spatial effects on the coexistence of species, Dr. Narayan Behera, Dept. of Ecology, Univ. of Kyoto, Japan, December 10, 1998.
15. More on circadian resonance in *Drosophila*, Dr. Amitabh Joshi, EOBU, JNCASR, Bangalore, December 17, 1998.
16. Can Statistical Physics Contribute to the Science for Economics?, Prof. H.E. Stanley, Boston University, December 28, 1998
17. Effect of different light regimes on adult fitness components in *Drosophila melanogaster* populations reared in constant light for over 600 generations, Ms. Sheeba, V., EOBU, JNCASR, Bangalore, January 14, 1999.

18. Laboratory evolution of faster development in *Drosophila melanogaster*: How do the flies do it? Mr. N. G. Prasad, EOBU, JNCASR, Bangalore, January 21, 1999.
19. Hydrogen Bonding in Ionic Complexes of Proton Sponges, Dr. Krzysztof Wozniak, Warsaw University, Poland, January 21, 1999.
20. Chandra and Nakshtra : The Story of Stellar X-Ray Astronomy, Dr. Vinay L Kashyap, Harvard-Smithsonian Center for Astrophysics, Cambridge, Mass., U.S.A., February 2, 1999
21. Deposition of size selected metal clusters on bare and covered metal surfaces, Prof. Jean Buttet, IPE, Lausanne, France, February 4, 1999.
22. Effect of restricted feeding on the locomotor activity rhythm of the nocturnal field mouse *Mus booduga*, Dr. Vijay Kumar Sharma, EOBU, JNCASR, Bangalore, February 4, 1999.
23. Transcription, elongation and regulation of gene expression, Dr. Subir Ghosh, Geraldine Brush Cancer Research Institute, California Pacific Medical Centre, San Fransisco, February 5, 1999
24. New Developments in Boundary Layer Stability, Dr. Rama Govindarajan, February 9, 1999.
25. Mycorrhizal fungal diversity determines plant biodiversity, ecosystem variability and productivity, Mr. K. A. Subramaniam, EOBU, JNCASR, Bangalore, February 11, 1999 .
26. Mixed hunting parties of birds in Western Ghats, Dr. P. Pramod, EOBU, JNCASR, Bangalore, February 18, 1999
27. Targeting SNF/SWI DNA-dependent ATPases with Phosphoaminoglycosides, Dr. Rohini Muthuswamy, University of Colorado Health Sciences Center, Colorado, USA., February 23, 1999
28. Dynamics of Clusters, Prof. Joshua Jortner, School of Chemistry, Tel Aviv University, Israel, February 24, 1999.
29. Flocking behaviour in Mynahs, Dr. Veena Ganeshaiyah, Veterinary College, March 4, 1999.

30. Recent findings in the genetics of Schizophrenia, Prof. Wolfgang Maier, Rheinische Freidrich-Wilhelms Universitat Bonn, Germany, March 5, 1999.
31. Current Issues of Solid State Fullerenes : Exo-and Endohedral Doping and Polymerization, Prof. Yoshihiro Iwasa, Japan Advanced Institute of Science & Technology, Ishikawa, Japan, March 11, 1999.
32. Possible evidence of two oscillators controlling the circadian locomotor activity rhythm in mammals, Dr. Vijay Kumar Sharma, EOB, JNCASR, Bangalore, March 11, 1999.

PART - II - EXTENSION ACTIVITIES

1. Summer Research Fellowships/Rajiv Gandhi Science Talent Research Fellowships

The Centre offers these fellowships for two summer months to bright undergraduate and graduate students. For the year 1998-99, 122 students were offered Summer Research Fellowships. Out of this, 10 students were awarded Rajiv Gandhi Science Talent Research Fellowships.

Scientists in nearly 40 institutions across the country listed below have guided these students:

1. Abasaheb Garware College, Pune
2. Astra Research Centre, Bangalore
3. Bhabha Atomic Research Centre, Mumbai
4. Bose Institute, Calcutta
5. Cancer Research Institute, Mumbai
6. Centre for Biochemical Technology, New Delhi
7. Centre for Cellular & Molecular Biology, Hyderabad
8. Central Drug Research Institute, Lucknow
9. Central Leather Research Institute, Chennai
10. Central Scientific Instruments Organisation, Chandigarh
11. Defence Metallurgical Research Laboratory, Hyderabad
12. Delhi University, New Delhi
13. GKVK, Bangalore
14. Indian Association for Cultivation of Sciences, Calcutta
15. Indian Institute of Chemical Technology, Hyderabad
16. Indian Institute of Science, Bangalore
17. Indian Institute of Technology, Chennai
18. Indian Institute of Technology, Kanpur

19. Indian Institute of Technology, Mumbai
20. Indian Statistical Institute, Bangalore
21. Indian Statistical Institute, Calcutta
22. Institute of Mathematical Sciences, Chennai
23. Institute of Microbial Technology, Chandigarh
24. Inter-University Centre for Astronomy & Astrophysics, Pune
25. Jawaharlal Nehru University, New Delhi
26. Kasturba Medical College, Manipal
27. Kerala Forest Research Institute, Trichur
28. M.S. University, Baroda
29. Madurai Kamaraj University, Madurai
30. National Aerospace Laboratories, Bangalore
31. National Institute of Immunology, New Delhi
32. National Institute of Mental Health and Neuro Sciences, Bangalore
33. National Physical Laboratory, New Delhi
34. Pondicherry University, Pondicherry
35. Rajiv Gandhi Centre for Biotechnology, Trivandrum
36. Regional Research Laboratory, Trivandrum
37. Tata Institute of Fundamental Research, Bangalore
38. Tata Institute of Fundamental Research, Mumbai
39. University of Hyderabad, Hyderabad
40. University of Poona, Pune

2. Academic Exchange Programme:

As part of the academic exchange programme, the following scientists/scholars carried out collaborative work with scientists of the Centre and the Indian Institute of Science for varying period during the year under report:

Visiting Scientists :

Dr. Ajay K. Prasad
Univ. of Delaware
Newark

Dr. Narayan Behera
Kyoto University
Japan.

Dr. T.R. Anantharaman
National Physical Laboratory
New Delhi

Dr. N. Nayak
SN Bose National Centre for
Basic Sciences, Calcutta

Dr. A. Das
DLR Institute of Design Aerodynamics
Germany

Dr. S. Ragothaman
Geocentrum
Sweden

Dr. Febrice Thalmaan
LEPES, Grenoble
France

Dr. Rajagopalan G
Birbal Sahni Inst. of Palebotany
Lucknow

Prof. M. Gaster
University of London, U.K.

Prof. Ruby Krishnamurthy
Florida State University, USA

Prof. V. Kannan
University of Hyderabad
Hyderabad

Dr. Shreekumar
Karnataka Regional Engg. Collage
Surathkal

Dr. C.C. Kartha
SCTIMST
Thiruvanthpuram

Dr. Silvio Franz
The Abdus Salam International
Centre for Theoretical Physics, Italy.

Dr. Lareef M. Zubair
Inst. Of Fundamental Studies
Sri Lanka

Dr. V.K. Singh
University of Hyderabad
Hyderabad

Prof. Laurent Ducasse
Univ. of Nordeaux
France

Dr. Subir Sarkar
Jawaharlal Nehru University
New Delhi

Dr. Shankar Balasubramanian
Cambridge University
Cambridge.

Dr. V. Vasanta Ram
Ruhr Universitat of Bochum
Germany.

Visiting Fellows:

Mr. Eno E. Ebenso
Univ. of Calabar
Nigeria

Dr. M Rajeevan
India Meterological Dept
Pune.

Dr. E. M. Rabai
Mu'tah University
Jordan

Mr. Richard Holzwarth
(Student visitor)
Germany

3. Visiting Fellowships:

The Centre offers Visiting Fellowships to research scientists in educational institutions and R&D Laboratories, tenable for 2-3 months, to work with the faculty of the Centre. The following were offered Visiting Fellowships during 1998-99 to work at the institutions as indicated below:

G.V. Vijayagovindan
Mahatma Gandhi University
Kottayam

Raman Research Institute
Bangalore

M.R. Prathapachandra Kurup
Cochin University of Science & Technology
Kochi

Indian Institute of Science
Bangalore

R.B. Sharma
Naval College of Engineering
INS Shivaji, Lonavala

Jawaharlal Nehru Centre for
Advanced Scientific Research

4. International Programmes:

i) ICTP-IISc-JNCASR Associateship Programme

The Centre is an Associate Regional Centre along with the Indian Institute of Science under ICTP, Trieste, Italy's Associate Programme which offers opportunity to scientists from developing countries to visit ICTP for 6-12 weeks at a time, three times over a period of six years.

The following scientists were awarded the Associateship during the year:

Dr. Chao-Shang Huang
Institute of Theoretical Physics
Academia Sinica
BEIJING, China

Prof. Shaoping Wu
Dept. of Mathematics
Zhejiang University
HONGZHOU, China

ii) JNCASR-COSTED International Fellowships Programme

Under this programme International Fellowships are awarded to scientists from developing countries in Asia (other than India), Africa and Latin America. This enables scientists to participate in short term research programmes in Physical, Chemical and Biological sciences. The fellowships are of three months duration and for a maximum of ten participants in a year, of which six will carry travel grants.

The following were awarded fellowships during the year:

Dr. Vu Quang Manh
Faculty of Agro-Biology
VNU Hanoi Pedagogical Univ.
Vietnam

Dr. M. Soliman Selim
National Research Centre
Cairo, Egypt.

Dr. B.R. Pant
Royal Nepal Academy
Nepal

Dr. (Ms.) Esmat Mohamed Abd El-All
NRIAG, Helwan
Cairo, Egypt

Dr. O.A. Akinkunmi
University of Ibadan
Nigeria

iii) JNCASR-DST Coordinated Programme with National Academy of Sciences, Kazakhstan and Uzbekistan

Under this programme, scientists from various Kazakh and Uzbek Institutions are offered three month placements in chosen Indian institutions to enable them to work under the guidance of scientists/faculty.

The following scientist participated in this programme during the year:

Serzhan Amanov
Kazakhstan

CHAPTER V

1. RESEARCH PROGRAMMES

1. Research Areas

There are ongoing research programmes in several frontier, inter-disciplinary areas of science and engineering. The main areas of research interest at present are :

- ❖ Atmospheric Sciences and Theoretical Fluid Mechanics
- ❖ Condensed Matter Theory
- ❖ Ecology and Biodiversity
- ❖ Physics and Chemistry of Materials including Surface Science, Molecular Electronics, Nanomaterials and Carbon Structures
- ❖ Emerging areas of Computer Science
- ❖ Gene Targeting, Gene Therapy and Molecular Parasitology
- ❖ Human Genome
- ❖ Geodynamics
- ❖ Theoretical Sciences
- ❖ Chemical Biology

2. Research Facilities

The Centre has the following state-of-art facilities in some focused areas in science and engineering. The following major equipments are functional:

- Scanning Electron Microscope (LEICA)
- X-ray Diffractometer (SEIFERT)
- Scanning Tunneling Microscope/Atomic Force Microscope
- High Resolution 300 KV Transmission Electron Microscope (JEOL).
- A custom built high resolution electron spectrometer with ultra high-vaccum ESCA, VEELS, LEED and STM/AFM attachments (OMICRON)
- Esterline Augus A620 x 20 channel Event Recorder

- Photomultiplier Unit
- Monochromator with interference filters, neutral density filters
- Thermohygrograph and field binoculars
- TGA/DTA (Metlar)
- A custom built cluster unit
- Single crystal X-ray diffractometer with CCD Camera
- 15 tesla Cryocooled Superconducting Magnet (Cryo Industries of America)
- Floating Zone Melting Crystal Growths (NEC, Japan)
- Indigenously built Cluster Source Apparatus
- Brillouin Spectrometer
- Magnetometer (VSM) and Faraday Balance
- Mossbauer Spectrometer
- Computational facilities that include Silicon Graphics Power Challenger with 4 parallel processors, a Hewlett-Packard Kclass-II with 4 CPUs and a large number of Silicon Graphics Workstations and Indy and O₂.

3. Research Support

The following are some of the areas, for which research support has been provided by the Centre since the last annual report.

- | | |
|---|-----------------------|
| Theoretical & pragmatic aspects of
Computer Science | : Prof. Veni Madhavan |
| Time-dependent density-functional theory and
excited-state density-functional theory | : Prof. B.M. Deb |
| Turbulent Rayleigh Benard Convection | : Prof. J.H. Arakeri |
| Heme Acquisition Mechanism in Leighmania
Donovani | : Prof. S.K. Basu |

4. Sponsored Research

1. Investigator : **R. Narasimha**
Title : Structure and Control of Turbulance
Funding Agency : Office of the Naval Research, USA
Duration : 2 years
2. Investigator : **K.S. Narayan**
Title : Electronic and Optical Properties of
Ladder Type Polymers
Funding Agency : Airforce Office of Scientific Research, USA
Duration : 2 years
3. Investigator : **K.S. Narayan and S. Ramasesha**
Title : Photogenerated Carriers in Conjugated Polymers
Funding Agency : Department of Science & Technology
Duration : 2 years
4. Investigator : **Namita Surolia**
Title : Characterisation, Cloning and Regulation of
eIF-2a, And its kinase from Plasmodium
falciparum
Funding Agency : Department of Science & Technology
Duration : 3 years
5. Investigator : **C.N.R. Rao**
Title : Fabrication of a Smalley - Type Molecular
Beam apparatus for cluster studies.
Funding Agency : Department of Science and Technology
6. Investigator : **K.S. Narayan**
Title : Absorption, Photoconduction and Emission
in certain Polymeric Systems
Funding Agency : Council of Scientific and Industrial Research
7. Investigator : **K.S. Narayan**
Title : Preparation and Characterization of Novel
Electro-optic polymers for Sensor
Application
Funding Agency : Department of Science & Technology

8. Investigator : **M.K. Chandrasekaran**
 Title : Light Relations of the Circadian Rhythms in
 the Locomotor Activity of *Drosophila*
Melanogaster and in a few sympatric
 species of ants.
 Funding Agency : Department of Science and Technology
9. Investigator : **R. Narasimha**
 Title : Direct Numerical Simulation of Flow
 Funding Agency : Pratt & Whitney Group, USA
 Duration : 3 years
10. Investigator : **Anuranjan Anand**
 Title : Genetic Variations in Neurotransmitter
 Genes in Schizophrenia
 Funding Agency : Council of Scientific and Industrial Research
 Duration : 3 years
11. Investigator : **G. Ananthakrishna**
 Title : IPSC / Indo-French Project.
12. Investigator : **S. Balasubramanian**
 Title : Molecular Modelling of Discoid Amphiphilic
 Aggregates
 Funding Agency : Council of Scientific and Industrial Research
 Duration : 3 years
13. Investigator : **Educational Technology Unit**
 Title : Multimedia & Science Education Projects
 Funding Agency : Department of Space
 Duration : 2 years
14. Investigator : **Hemalatha Balaram**
 Title : Development of plasmodium falciparum
 hypoxathine Phosphoribosyl transferase and
 haemoglobinase as targets
 Funding Agency : Council of Scientific and Industrial Research
 Duration : 1 year

CHAPTER VI

1. PUBLICATIONS

1. Research Publications:

SECTION I

UNITS :

i) Chemical Biology Unit:

1. A novel pathway for the metabolism of Caffeine by a mixed culture consortium, **Madyastha, K.M.** and Sridhar, G.R., Biochem. Biophys.Res.Commun, 249, 178-181(1998)
2. Biocatalyst-mediated efficient functionalization of ring A in Salannin, a tetranortriterpene from *Azadirachta indica*, Venkatakrisnan, K. and **Madyastha, K.M.**, J. Chem. Soc. Perkin Trans 1, 1183-84 (1998)
3. Metabolic fate of S-(-)-pulegone in rat, **Madyastha, K.M.** and Gaikwad, N.W., Xenobiotica, 28, 723-734(1998)
4. 11-Epi-Azadirachtin D: An epimeric azadirachtin analogue from *Azadirachta indica*, Ramji, N., Venkatakrisnan, K. and **Madyastha, K.M.**, Phytochemistry, 49, 265-267(1998).
5. Hepatoprotective effect of C-phycoyanin:Protection for carbon tetrachloride and R-(+)-pulegone - Mediated hepatotoxicity in rats, Bhat B., Vadiraja, Gaikwad, N.W. and **Madyastha, K.M.**, Biochem. Biophys.Res.Commun. 249, 428-431(1998)
6. Transformations of morphine, codeine and their analogues by *Bacillus* sp., **Madyastha, K.M.**, Reddy G.V.B. and Sridhar, G.R., Indian J: of Chemistry, 37B, 749-753(1998)
7. Transformation of a monoterpene ketone, R-(+)-pulegone, a potent hepatotoxin, in *Mucor piriformis*, **Madyastha, K.M.** and Thulasiram, H.V., J. Agric. Food. Chem, 47, 1203-1207(1999)

8. Metabolic disposition of a monoterpene ketone, piperitenone, in rats: Evidence for the formation of a known toxin, p-Cresol, **Madyastha, K.M.**, Gaikwad, N.W., Drug. Metab. Dispos, 27, 74-80(1999)
9. Highly efficient C-8 oxidation of substituted xanthenes with substitution at the 1-,3-, and 7- positions using biocatalysts, **Madyastha, K.M.** and Sridhar, G.R., J. Chem. Soc. Perkin Trans, 1, 677-680(1999)

ii) **Chemistry and Physics of Materials Unit:**

10. Novel Open-framework Tin(II) Phosphate Materials containing Sn-O-Sn linkages and Three-coordinated Oxygens, **Natarajan, S.**, Ayyappan, S., Cheetham, A.K., and **Rao, C.N.R.**, Chem. Mater., 10, 1627-1631(1998).
11. A Three Dimensional Open-Framework Tin(II) Phosphate Exhibiting Reversible Dehydration and Ion-exchange Properties, **Natarajan, S.**, Eswaramoorthy, M., Cheetham, A.K. and **Rao, C.N.R.**, Chem. Commun., 1561-1562(1998).
12. Synthesis and Structure of a new Open-framework Zinc Phosphate: $[Zn_3(PO_4)_2(HPO_4)] \cdot 0.5[NH_3(CH_2)_2NH_3]^{2+} \cdot H_2O$, Chidambaram. D. and **Natarajan, S.**, Mater. Res. Bull., 33, 1275-1281(1998).
13. Distinction between two types of charge-ordered states in the rare earth manganates, $Ln_{0.5}A_{0.5}MnO_3$, based on chemical melting, Vanitha, P.V., Singh, R.S., **Natarajan, S.** and **Rao, C.N.R.**, J. Solid State Chem., 137, 365-368(1998).
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- b) Fractional Revivals and Cat-like states in Systems with Two Time Scales, Banerji, J. and **Agarwal G.S.**, in Nonlinear Dynamics and Computational Physics, ed. V.B. Sheorey, Narosa, pp. 147-158(1999).
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| Supramolecular assemblies for molecular scale information transport processes | - V. Krishnan |
| Investigation of bonding in the solid state using experimental charge density | - G.U. Kulkarni |
| Spiral turbulence: from the oxidation of CO on Pt(110) to ventricular fibrillation | Ashiwin Pande,
- Sitabhra Sinha &
- Rahul Pandit |
| Ploughing a lonely furrow: the curious case of the P1 promoter in the osmotically regulated proU operon of Escherichia coli | - J. Gowrishankar |
| Tinkering with enzymes | - Hemalatha Balaram and
I.N. Sujay Subbayya |

3. Proceedings of the Discussion Meetings :

1. Proceedings of the 5th IUMRS International Conference in Asia Bangalore, India (13-16 October 1998), organised by Materials Research Society and JNCASR.
2. Proceedings of the Third Asian Computational fluid dynamics conference (7 - 11 December 1998), Editors : T.S. Prahlad, S.M. Deshpande and S.K. Saxena.
3. Proceedings of the Workshop on Engineering practice in Black Cotton Soils (5th September 1998), organised by Karnataka Geotechnical Centre of Indian Geotechnical Society and sponsored by JNCASR.

AWARDS/DISTINCTIONS

The following Faculty and Honorary Faculty Members of the Centre have won various distinctions and awards both at the national and international level in recognition of their research and developmental work:

Awards

- | | |
|---|--|
| <p>Prof. G.S. Agarwal
Hon. Professor</p> | <p>: R.D. Birla Award Lecture Award, Indian Physics Association, 1998
Shymadas Chatterjee Endowment Lecture Award, 1998 - 99.</p> |
| <p>Prof. D. Balasubramanian
Hon. Professor</p> | <p>: O P Bhasin Award in Life Sciences</p> |
| <p>Prof. Biman Bagchi
Hon. Professor</p> | <p>: 7th G.D. Birla Award
Third World Academy of Sciences Award in Chemistry, 1998</p> |
| <p>Prof. S. Chandrasekhar
Hon. Professor</p> | <p>: Padma Bhushan, 1998 (conferred on 10 April 1998)</p> |
| <p>Dr. K.N. Ganeshiah
Hon. Faculty Member</p> | <p>: State Environment Award (Parisara Prashasthi)</p> |
| <p>Prof. Jayant V. Narlikar
Hon. Professor</p> | <p>: Karveer Bhushan Award, Bhalji Pendharkar Foundation Kolhapur, 1998
Punjabhushan Award from Tridal, Pune, 1998
N.C. Kelkar Award for literary work, Pune, 1998
Pune's Pride Award for excellence in academics by the Residency Club, Pune, 1998
R.D. Birla Award of Indian Physics Association, 1999</p> |

- Prof. **Kalyan B. Sinha** : Distinguished Scientist, Indian Statistical Institute,
Hon. Professor 1998
- Prof. **N. Kumar** : Goyal Award in Physics, 1998
Hon. Professor
- Prof. **Madhav Gadgil** : Pandit Iswarchandra Vidyasagar Gold Plaque and
Hon. Professor Lectureship, Asiatic Society, Calcutta
- Prof. **R.A. Mashelkar** : JRD Tata Award for Corporate Leadership by All
Hon. Professor India Management Association, 1998
- Golden Jubilee Award by Bank of India, Mumbai, for
excellence in R&D Management, 1998
- Atur Sangtani Award for excellence in science
& technology, Atur Foundation, Pune, 1998
- Shri Guruji Puraskar for excellence in Science by
Jankalyan Samiti, Pune, 1998
- Doctorate of Science (honoris causa), University of
Delhi, 1998
- Prof. **P. Rama Rao** : Jawaharlal Birth Centenary Award of Indian
Hon. Professor Science Congress Association, 1999
- Distinguished Materials Scientist of the year by the
Materials Research Society - India, 1998
- Prof. **C.N.R. Rao** : President, Elect of Third World Academy of
President, JNCASR Sciences, 1999
- Shatabdi Puraskar of the Indian Science Congress,
1999
- Prof. **B. Sriram Shastry** : TWAS Award in Physics, 1998
Hon. Professor
- Prof. **A. Surolia** : Alumni Award, Indian Institute of Science, 1999
Hon. Professor

Prof. K.S. Valdiya : National Mineral Award of Excellence from
Head Geodynamics unit : Ministry of Steel and Mines, GOI, 1998

Editorial Boards

Dr. Gangan Pratap : Editor, SADHANA
Hon. Faculty Member : Member, Editorial Board, Int. J. Computational
Engineering Science

Prof. Mustansir Barma : Editorial Board of the Journal of Statistical Physics
Hon. Faculty Member : Editorial Working Committee of Physics News
Basic Sciences Committee, Board of Research
in Nuclear Sciences.

Prof. B. Sriram Shastry : Member, Physical Review B, 1998 - 2000
Hon. Professor

Dr. R. Uma Shankar : Member, Editorial Board of Journal of Plant
Hon. Faculty Member : Biology, New Delhi , 1998

Fellowships

Prof. S.M. Deshpande : Fellow of Aeronautical Society of India
Hon. Professor

Prof. R. Gadagkar : Elected Fellow, Indian Academy of Entomology
Hon. Professor

Dr. Gangan Prathap : Indian National Science Academy, 1999
Hon. Faculty Member

Prof. Jayant V. Narlikar : Asiatic Society of Bombay, 1998
Hon. Professor

Prof. R.A. Mashelkar : Fellow of Royal Society (FRS), London, 1998
Hon. Professor : Institute of Electronics and Telecommunication
Engineers (IETE), 1998

- Prof. Mustansir Barma** : National Academy of Sciences, Allahabad , 1998
Hon. Faculty Member
- Prof. Spenta R. Wadia** : Fellow, The New York Academy of Sciences,
Hon. Faculty Member 1998
- Prof. B. Sriram Shastry** : Indian National Science Academy, 1998
Hon. Professor
- Prof. M. Vijayan** : Jawaharlal Nehru Birth Centenary Visiting
Hon. Professor Fellowship, Indian National Science Academy, 1999

Memberships

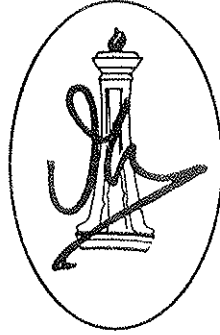
- Dr. Amit J. Basu** : Member, AIAA.
Faculty Fellow Visiting Associate, CalTech.
- Prof. S. Chandrasekhar** : Honoured Membership of International Liquid Hon.
Professor Crystal Society for outstanding contributions to
liquid crystal science, June 1998
- Prof. R. Gadagkar** : Expert Group on Inter-Institutional Program
Hon. Professor Development on Microbial Biodiversity, DBT,
Govt. of India.
- Prof. J. Gowrishankar** : Elected Member of A-IMBN, 1998
Hon. Faculty Member
- Prof. Madhav Gadgil** : Chairman, Scientific and Technical Advisory Hon.
Professor Panel of Global Environment Facility
- Member, Research Council, National Institute
of Science and Technology and Development
Studies, New Delhi.
- Prof. R. A. Mashelkar** : Elected President, Indian Science Congress
Hon. Professor Association for the year 2000
- Prof. C.N.R. Rao** : Honorary Member of the Japan Academy
President, JNCASR

- Dr. Sandip K. Basu** : Governing Council, Centre for DNA
Hon. Professor Fingerprinting and Diagnostics, Hyderabad
- Governing Body, National Centre for Plant
Genome Research, New Delhi.
- Prof. A. Surolia** : Member, International Glycoconjugate Hon. Professor
Professor Organisation 1998
- Member, International Molecular Biologists
Network, 1998
- Dr. Vijay Kumar Sharma** : Young Associate, Indian Academy of Sciences.
Fellow

Prizes and Medals

- Prof. D. Balasubramanian** : Goyal Prize in Biological Sciences
Hon. Professor INSA JC Bose Lecture and Medal, 1998
- Prof. S. Chandrasekhar** : The Niels Bohr-UNESCO Gold Medal for
Hon. Professor outstanding contributions to the development
of liquid crystals, May 1998
- Prof. Jayant V. Narlikar** : Visiting Professor's Medal, College de France, Hon.
Professor, Paris
- Dr. G.U. Kulkarni** : Materials Research Society of India Medal, 1999
Faculty Fellow
- Prof. N. Kumar** : Mahendralal Sircar Prize in Physics for 1997
Hon. Professor (Awarded in 1998)
- Dr. S. Natarajan** : Material Research Society of India Medal,
Faculty Fellow 1998 - 99
- Prof. V. Rajaraman** : Syed Hussain Zaheer Medal
IBM Research Professor Indian National Academy, 1998

CHAPTER VIII
FINANCIAL STATEMENTS



NAME : **JAWAHARLAL NEHRU CENTRE FOR
ADVANCED SCIENTIFIC RESEARCH**

ADDRESS : **JAKKUR POST, BANGALORE 560 064**

YEAR ENDED : **31ST MARCH 1999**

ASSESSMENT YEAR : **1999-2000**

P. V. PRABHU & CO.,
CHARTERED ACCOUNTANTS
Panduranga Nilaya
No. 91/1, 1st Floor, 2nd Main,
Venkataramappa Block, Govindarajnar,
BANGALORE 560 040

M/s P. V. PRABHU & CO.
CHARTERED ACCOUNTANTS
"Panduranga Nilaya"
No. 91/1, I Floor,
II Main, Venkatramappa Block
Govindarajnar
Bangalore 560 040

AUDIT REPORT

We have examined the Balance Sheet of JAWAHARLAL NEHRU CENTRE FOR ADVANCED SCIENTIFIC RESEARCH, Jakkur Campus, Jakkur, Bangalore 560 064, as on 31st March 1999 and the Income and Expenditure Account for the year ended on that date which are in agreement with the Books of Account maintained by the said Centre.

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 in addition the certificate from the bankers regarding the cash balance obtained and verified. In our opinion, proper books of accounts have been kept by the Centre, so far as it appears from our examination of the books of accounts.

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:

- (i) In the case of Balance Sheet of the state of affairs of Jawaharlal Nehru Centre for Advanced Scientific Research as at 31st March 1999

AND

- (ii) In the case of the Income and Expenditure Account of the excess of Expenditure over Income for the year ended on that date.

For **P. V. Prabhu & Co.,**
CHARTERED ACCOUNTANTS

Sd/-
(Nagaraja)
Partner

BALANCE SHEET AS ON 31st MARCH 1999

1997-98		1998-99		1997-1998		1998-1999	
Rs.	Ps.	Rs.	Ps.	Rs.	Ps.	Rs.	Ps.
LIABILITY		ASSETS					
CAPITAL FUND		FIXED ASSETS :					
<u>FIXED ASSETS: AS PER CONTRA</u>		<u>AS PER SCHEDULE 2 AS PER CONTR</u>					
23,31,68,023	66	28,20,17,590	66	23,31,68,023	66	28,20,17,590	66
3,41,79,930	00	3,41,79,930	00	3,41,79,930	00	3,41,79,930	00
98,78,095	00	98,78,095	00	98,78,095	00	98,78,095	00
25,32,346	00	26,20,413	00	25,32,346	00	26,20,413	00
<u>SURPLUS: AS PER INCOME & EXPENDITURE ACCOUNT</u>		<u>ADVANCES & DEPOSITS</u>					
4,49,834	00	3,02,636	00	2,06,90,558	95	10,92,194	00
<u>PROFESSORSHIP ENDOWMENT FUND</u>		<u>PROFESSORSHIP ENDOWMENT DEPOSIT</u>					
1,45,54,256	67	3,02,636	00	1,44,94,650	00	1,68,92,000	00
<u>SUNDRY CREDITORS:</u>		<u>DEFICIT: AS PER INCOME & EXPENDITURE ACCOUNT- JN CENTRE</u>					
2,49,45,336	45			9,74,837	83	48,421	87
<u>AS PER SCHEDULE 1</u>		<u>CASH AND BANK BALANCE:</u>					
31,97,07,821	78	<u>BY CANARA BANK SB.A/c 13474</u>				2,93,083	51
Total Rs.		TOTAL Rs.		36,90,375	92	25,695	00
		<u>BY CANARA BANK SB.A/c 15889</u>		59,606	67	8,02,441	05
		<u>BY SBI C & I A/C 58</u>		3,819	75		
		<u>BY CASH BOOK</u>		35,578	00		
		<u>BY CANARA BANK SB.A/c 18520</u>		-----	--		
		TOTAL Rs.		1,18,48,005	50		
				31,97,07,821	78		
				35,80,31,753	67		

As per our report of even date
for M/s P V Prabhu & Co.
Chartered Accountants

Sd/-
(Nagaraja)
Partner

C N R Rao
President

G K N Sastry
Accounts Officer

Place: Bangalore
Date: 10.06.99

INCOME & EXPENDITURE ACCOUNT FOR THE YEAR ENDING 31.03.99

1997-98		EXPENDITURE		1998-99		1997-1998		INCOME		1998-1999	
Rs.	Ps.	Rs.	Ps.	Rs.	Ps.	Rs.	Ps.	Rs.	Ps.	Rs.	Ps.
		To OP - BALANCE - JNC		9,74,837	83	1,10,14,749	11	BY OP - BALANCE - JNC			
		<u>RECURRING EXPENDITURE</u>				6,27,00,000	00	BY G-I-A DST - JNC	7,77,00,000	00	
85,41,739	00	TO SALARY & HONORARIA	1,05,49,409			70,00,000	00	BY G-I-A DST MAGNET			7,77,00,000
1,81,383	00	TO MEDICAL REIMBURSEMENT	4,38,783					INTEREST			
93,534	00	TO BONUS	1,07,040			10,58,992	00	BY INT. ON TERM DEPOSIT JNC	14,05,524	00	
8,997	00	TO STAFF TRAINING	94,364	00		1,20,764	48	BY INT. ON SB ACCOUNT JNC	63,458	25	
37,474	00	TO RETIREMENT BENEFITS	30,113	00							
20,944	00	TO L T C	14,500								
1,865	00	TO LEAVE ENCASHMENT		1,12,34,209	00						14,68,982
1,075	00	TO UNIFORMS	40,845	00							25
6,73,670	00	TO PRINTING & STATIONARY	7,11,760	00		5,95,910	00	<u>OTHER RECEIPTS</u>			
2,08,208	00	TO POSTAGE	3,01,787	00		36,097	00	BY JAWAHAR RECEIPTS	5,62,805	00	
4,71,960	00	TO TELEPHONE, TELEX & FAX	5,15,126	00		41,586	00	BY GUEST ROOM RECPTS	28,367	00	
5,047	00	TO BANK CHARGES	12,109	00		16,220	00	BY GUEST ROOM CONSUMABLES RCPT	47,021	00	
12,79,558	00	TO CONVEYANCE & TRANSPORT	13,50,701	50		52,323	00	BY TUITION FEES	74,320	00	
47,638	00	TO PETROL, OIL & LUBRICANT	63,272	00		92,987	00	BY MISC. RECPTS	85,169	50	
4,527	00	TO BOOK BINDING	59,417	00		60,868	00	BY LICENCE FEES	1,23,462	00	
15,015	00	TO NEWS PAPER & MAGAZINES	15,988	00		95,960	00	BY MEDICAL CONTRIBUTIONS	59,113	00	
10,212	00	TO MISC EXPENSES	11,536	00		39,030	00	BY ELEC & WATER CHARGE RCPTS	63,316	00	
3,66,703	00	TO COUNCIL & OTHER MEETINGS	3,62,528	00				BY ANNUAL FEES - PHD	23,765	00	
6,35,922	00	TO SECURITY SERVICES	8,70,185	00							10,67,338
1,814	00	TO T A TO CANDIDATES	-----	--							50
15,000	00	TO AUDIT FEES	16,000	00							
22,265	00	TO MEMBERSHIP FEES	92,907	00							
52,312	00	TO GUEST HOUSE CONSUMABLES	53,260	00							
57,920	00	TO FREIGHT & CLEARING CHARGES	41,644	00							
43,716	00	TO CANTEEN SUBSIDY	28,225	00							
59,057	00	TO INSURANCE	1,43,027	00	50						
30,81,096	00	TO ELECTRICITY & WATER CHARGES	57,14,006	00							
5,49,596	00	TO CPF CONTRIBUTION	4,13,513	00							
4,00,000	00	TO GRATUITY FUND	3,00,000	00							

INCOME & EXPENDITURE ACCOUNT FOR THE YEAR ENDING 31.03.99

1997-98		EXPENDITURE		1998-99		1997-1998		INCOME		1998-1999	
Rs.	Ps.	Rs.	Ps.	Rs.	Ps.	Rs.	Ps.	Rs.	Ps.	Rs.	Ps.
50,288	00	TO INT ON SUBSCRIPTION	35,398	00	7,48,911	00					
3,99,471	00	TO ADVERTISEMENTS	89,905	00	89,905	00					
1,35,440	00	TO DOMESTIC TRAVEL ALLOWANCES	2,35,913	00							
43,466	00	TO FOREIGN TRAVEL EXPENSES	1,61,419	00	3,97,332	00					
16,30,523	00	TO BUILDING MAINT	25,38,794	00							
5,77,613	00	TO GARDEN MAINT	4,94,388	00							
13,85,776	00	TO EQUIPMENT MAINT	21,59,900	00							
1,22,739	00	TO GUEST HOUSE MAINT	3,85,277	00							
55,290	00	TO VEHICLE MAINT	23,090	00							
49,813	00	TO OFFICE MAINT	50,240	00							
59,396	50	TO CANTEEN MAINT	48,781	00							
9,12,989	00	TO ELECTRICITY & WATER MAINT	9,88,005	00	66,88,475	00					
3,97,756	00	TO COSTED PROGRAMME	3,24,687	00							
29,43,480	00	TO DISCUSSION MEETINGS	17,87,790	00							
4,64,805	00	TO RESEARCH SUPPORT	15,000	00							
13,748	00	TO PUBLICATIONS	1,38,789	00							
3,01,228	00	TO SRFP 1997									
15,789	00	TO CTSSSP 1997									
8,84,990	00	TO PHD PROGRAMME	19,30,915	00							
14,170	00	TO SHORT TERM COURSE									
1,57,914	00	TO SRFP 98	3,06,844	00							
		TO CTSSSP 98	18,888	00	47,03,357	00					
		TO SRFP 1999	1,80,444	00							
50,73,303	42	TO CONSUMABLES LAB	63,18,279	00							
		TO CONSUMABLES ADV.TECH LAB	7,534	00	63,25,813	00					
5,02,89,230	67	TO SURPLUS C/O	3,86,69,177	42							
8,29,27,466	59	TOTAL Rs			8,02,36,320	75	8,29,27,466	59	TOTAL Rs	8,02,36,320	75

INCOME & EXPENDITURE ACCOUNT FOR THE YEAR ENDING 31.03.99

1997-98		EXPENDITURE		1998-99		1997-1998		INCOME		1998-1999	
Rs.	Ps.	Rs.	Ps.	Rs.	Ps.	Rs.	Ps.	Rs.	Ps.	Rs.	Ps.
		<u>NON RECURRING EXPENDITURES</u>									
39,30,643	50										
		TO INFRA STRUC FACILITY	17,32,117	00							
3,51,075	00	TO OFF.EQUIP. & APPLIANCES	43,294	00							
1,14,99,967	00	TO SCI.EQUIPMENTS	1,26,25,531	00							
5,41,134	00	TO FURNITURE	4,52,807	00							
3,55,966	00	TO VEHICLES	-----	--							
7,60,015	00	TO LIBRARY BOOKS	4,58,457	00							
31,42,098	00	TO LIBRARY JOURNALS	25,26,280	00							
68,39,611	00	TO BUILDING-JNC/HOSTEL BLOCK	21,76,433	00							
41,41,335	00	TO BLDG. CONST. - NEW LAB	1,12,83,142	00							
57,07,557	00	TO COMPUTER	4,87,772	00							
-----	--	TO BLDG.CONSTN. ANIMAL HOUSE	24,75,144	00							
-----	--	TO STAFF HOUSING	13,82,135	00							
69,94,607	00	TO SC EQUIP.ADV TECH LAB	1,32,07,955	00							
70,00,000	00	TO SCI.EQUIPMENT MAGNET									
5,12,64,068	50	TOTAL Rs			4,88,51,067	00	9,74,837	83	BY EXCESS OF EXPOVER INCOME	1,01,81,889	58
					4,88,51,067	00	5,12,64,068	50	TOTAL Rs	4,88,51,067	00
										3,86,69,177	42

As per our report of even date
for M/s P V Prabhu & Co.
Chartered Accountants

Sd/-
(Nagaraja)
Partner

C N R Rao
President

G K N Sastry
Accounts Officer

Place: Bangalore
Date: 10.06.99

INCOME & EXPENDITURE ACCOUNT FOR THE YEAR ENDING 31.03.1999

CLUSTER STUDIES

1997-98		EXPENDITURE		1998-99		1997-1998		INCOME		1998-1999	
Rs.	Ps.	Rs.	Ps.	Rs.	Ps.	Rs.	Ps.	Rs.	Ps.	Rs.	Ps.
		<u>RECURRING EXPENDITURE</u>									
17,820	00	TO CONSUMABLES CS	59,131	00	59,131	00					
17,82,180	00	TO SURPLUS C/O			3,90,703	00	18,00,000	00	BY OP - BALANCE - CS	4,49,834	00
18,00,000	00	TOTAL Rs.			4,49,834	00	18,00,000	00	TOTAL Rs.	4,49,834	00
		<u>NON RECURRING EXPENDITURE</u>									
13,32,346	00	TO SC. EQUIP. CLUSTER STUDIES			88,067	00					
4,49,834	00	TO EXCESS OF INCOME OVER EXPAND			3,02,636	00	17,82,180	00	BY SURPLUS B/F	3,90,703	00
17,82,180	00	TOTAL Rs.			3,90,703	00	17,82,180	00	TOTAL Rs.	3,90,703	00

As per our report of even date
for M/s P V Prabhu & Co.
Chartered Accountants

Sd/-
(Nagaraja)
Partner

C N R Rao
President

G K N Sastry
Accounts Officer

Place: Bangalore
Date: 10.06.99

SCHEDULE No. 1 SUNDRY CREDITORS

No.	Particulars	Rupees	Ps.	Rupees	Ps.
A	<u>SECURITY DEPOSIT & EMD</u>				
1	R MUNISWAMY	23,819	00		
2	HARISH KUMAR	7,775	00		
3	DODDAMANE BROS	6,575	00		
4	KUMAR ELECTRICALS	2,94,852	00		
5	TOMS & CO	19,019	00		
6	WCI SHIPPING CORPN	10,000	00		
7	N M SRINIVASAMURTHY	1,375	00		
8	BABU TRADERS	1,000	00		
9	M P CHANDRASHEKAR	10,800	00		
10	H N VIJAYARAGHAVA REDDY & CO.	3,66,074	00		
11	Y RAMESH	3,500	00		
12	N. DIVAKAR	9,45,021	00		
13	K R MURALIDHARAN	30,000	00		
14	K BABU RAJU	1,86,155	00		
15	VINAYAKA ENTERPRISES	2,700	00		
16	INDIRA ELECTRICALS	18,000	00		
17	M S MAINTENANCE	19,419	00		
18	V V KRISHNA KUMAR	1,16,364	00		
19	BIT BYTE COMPUTERS	5,948	00		
20	DIESELTECH ENGINEERS	120	00		
21	Y S VENKATA REDDY	5,875	00	20,74,391	00
B	<u>OUTSTANDING LIABILITIES</u>				
1	IT - TDS PAYABLE	55,499	00		
2	ELE/WATER MAINT. PAYABLE	30,000	00		
3	SALARY/HON PAYABLE	84,809	00		
4	BUILDING MAINT. PAYABLE	1,27,553	00		
5	CONVEYANCE TRANS. PAYABLE	86,928	00		
6	SECURITY SERVICE PAYABLE	78,757	00		
7	GARDEN MAIN. PAYABLE	35,500	00		
8	AUDIT FEES PAYABLE	16,000	00		
9	ELE/WATER CHARGES PAYABLE	3,27,169	00	8,42,215	00
C	<u>OTHERS FOR SPECIFIC AREAS</u>				
1	USIF(S&T) USA - R NARASIMHA	1,42,628	00		
2	R G F INNOVATIVE IDEAS	1,59,337	00		
3	R G F SUMMER PROGRAMME	83,879	00		
4	CSIR - K S VALDIA	15,830	05		
5	INSA	42,054	00		

SCHEDULE No. 1 SUNDRY CREDITORS

No.	Particulars	Rupees	Ps.	Rupees	Ps.
6	NAL - R NARASIMHA	69,874	00		
7	IIM - V NANJUNDAIAH	23,815	00		
8	IISC - CEMENT	8,09,508	45		
9	AIRFORCE OFFICE-K S NARAYAN	17,763	00		
10	MONTBLEX\DSTR NARASIMHA	1,577	00		
11	IAS - LIFESCAPE	52,045	00		
12	DST/ELF-2/NS	3,46,935	00		
13	CAUTION MONEY DEPOSIT	1,17,970	00		
14	CSIR GRANT-SAJI VARGHESE	68,505	00		
15	R G F - HEMALATHA BALARAM	52	00		
16	E M R - NAMITA SUROLIA	23,692	00		
17	JNC/CSIR/98/K S NARAYAN	78,050	00		
18	DST/INDO/ISRAEL/K S N	3,84,823	00		
19	BOEING - R NARASIMHA	3,43,955	00		
20	DST/SRFP - 98	3,65,000	00		
21	JNC/CSIR/98/HEMALATHA BALARAM	33,995	00		
22	DST\HB\EPSPPF/98	2,48,800	00		
23	N S CHEMISTRY	1,00,000	00		
24	CSIR - LAKSHMI R	50,400	00		
25	CSIR - SUJAYA SUBBAIAH	55,429	00		
26	CSIR - N G PRASAD	46,670	00		
27	CSIR/GVNGS/A.ANAND	3,66,479	00		
28	UTC/P&W/USA-R NARASIMHA	2,10,996	00		
29	UGC - AG MANOJ	36,500	00		
30	INFOSYS - RAJARAMAN	5,00,250	00		
31	IND FRENCH CPAR	39,375	00	48,36,186	50
D	<u>L/C CREDITORS</u>				
1	SUNDRY CREDITORS - JNC	38,78,185	00		
2	SUNDRY CREDITORS - OTHERS	92,904	00		
3	SUNDRY CREDITORS - EMD/SD	1,24,124	00	40,95,213	00
	TOTAL			1,18,48,005	50

As per our report of even date
for M/s P V Prabhu & Co.
Chartered Accountants

Place: Bangalore
Date: 10.06.99

G K N Sastry
Accounts Officer

C N R Rao
President

Sd/-
(Nagaraja)
Partner

SCHEDULE No 2 FIXED ASSETS

S.No.	Name of the Asset	As on 31.03.98		Additions during the year		As on 31.03.99	
		Rs.	Ps.	Rs.	Ps.	Rs.	Ps.
A	JNCASR						
1	Land at Jakkur (granted by Government of Karnataka free of cost, vide order No.RD.174-LGB-87(P)/21.9.89) & RD/4 AQB/94/18.8.96, 15.55 & 1.37 Acres respectively						
2	BUILDINGS	7,96,58,165	26			7,96,58,165	26
3	INFRA STRUC FACILITY	2,32,00,828	32	17,32,117	00	2,49,32,945	32
4	OFFEQUP.& APPLIANCES	35,56,201	63	43,294	00	35,99,495	63
5	SCI.EQUIPMENTS	7,51,48,625	47	1,26,25,531	00	8,77,74,156	47
6	FURNITURE	44,07,387	87	4,52,807	00	48,60,194	87
7	VEHICLES	7,72,304	10			7,72,304	10
8	LIBRARY BOOKS	35,48,057	21	4,58,457	00		
	LESS LOSS OF BOOKS			1,500	00	40,05,014	21
9	LIBRARY JOURNALS	95,72,547	80	25,26,280	00	1,20,98,827	80
10	BUILDING-JNC/HOSTEL BLOCK	80,82,141	00	21,76,433	00	1,02,58,574	00
11	BLDG. CONST - NEW LAB	55,19,601	00	1,12,83,142	00	1,68,02,743	00
12	COMPUTER	57,07,557	00	4,87,772	00	61,95,329	00
13	BLDG.CONSTN. ANIMAL HOUSE			24,75,144	00	24,75,144	00
14	STAFF HOUSING			13,82,135	00	13,82,135	00
15	SC EQUIPADV TECH LAB	69,94,607	00				
16	SCI.EQUIPMENT MAGNET	70,00,000	00	1,32,07,955	00	2,02,02,562	00
	TOTAL	23,31,68,023	66	4,88,49,567	00	28,20,17,590	66

SCHEDULE No 2 FIXED ASSETS

S.No.	Name of the Asset	As on 31.03.98		Additions during the year		As on 31.03.99	
		Rs.	Ps.	Rs.	Ps.	Rs.	Ps.
B	CORE GROUP ON CARBON & NANO MATERIALS						
1	SCI.EQUIPMENTS CNIM	3,41,79,930	00	-----	--	3,41,79,930	00
	TOTAL B	3,41,79,930	00	-----	--	3,41,79,930	00
C	UNIT OF PHYSICS AND CHEMISTRY OF MATERIALS						
1	SCI.EQUIPMENTS PCM	98,69,295	00	-----	--	98,69,295	00
2	FURNITURE PCM	8,800	00	-----	--	8,800	00
	TOTAL C	98,78,095	00	-----	--	98,78,095	00
D	CLUSTER STUDIES						
1	SC. EQUIPCLUSTER STUDIES	25,32,346	00	88,067	00	26,20,413	00
	TOTAL D	25,32,346	00	88,067	00	26,20,413	00

As per our report of even date
for M/s P V Prabhu & Co.
Chartered Accountants

Sd/-
(Nagaraja)
Partner

C N R Rao
President

G N Sastry
Accounts Officer

Place: Bangalore
Date: 10.06.99

SCHEDULE No 3 ADVANCES & DEPOSITS

No.	Particulars	Rupees	Ps.	Rupees	Ps.
A	<u>DEPOSITS</u>				
1	S.CRS. DEPOSIT	2,06,258	00		
2	LC DEPOSITS JNC	2,60,000	00	4,66,258	00
B	<u>LOANS AND ADVANCES</u>				
1	DST/MKC/LCRD	20,715	00		
2	ASIATIC INDL GASES	13,500	00		
3	G U KULKARNI	5,500	00		
4	CHANDAN DAS GUPTA	2,000	00		
5	CYLINDER DEPOSIT	10,000	00		
6	MIGA GASES (P) LTD.	2,000	00		
7	R GADAGKAR	5,000	00		
8	R NARASIMHA	79,575	00		
9	N R MOUDGAL	5,000	00		
10	ANURANJAN ANAND	5,000	00		
11	M.A. ITTYACHEN	15,000	00		
12	SAJI VARGHESE	6,000	00		
13	S UMAPATHY	5,000	00		
14	ASIATIC AIR-O-GAS ENGG.CO. LTD	5,000	00		
15	K B SINHA	15,000	00		
16	SAC (C) CNR	26,834	00		
17	CHANDRASHAKAR S	4,881	00		
18	JNC STUDENTS RESIDENCE ADVANCE	22,648	00		
19	KALIDAS SEN	25,000	00		
20	M K PAUL	2,00,000	00		
21	ISRO K R RAMANATHAN PROF.R N	63,485	00		
22	VEHICLE ADVANCE	940	00		
23	LTC ADVANCE	3,658	00	5,41,736	00
C	<u>PERMANENT IMPREST</u>				
1	PERM.IMPREST	15,500	00	15,500	00
D	<u>FESTIVAL ADVANCE</u>				
1	FESTIVAL ADVANCE	68,700	00	68,700	00
	TOTAL			10,92,194	00

As per our report of even date
for M/s P V Prabhu & Co.
Chartered Accountants

Place: Bangalore
Date: 10.06.99

G K N Sastry
Accounts Officer

C N R Rao
President

Sd/-
(Nagaraja)
Partner

SCHEDULE No 4 PROFESSORSHIP ENDOWMENT FUND

S. No.	Particulars	Rupees	Ps.	Rupees	Ps.
1	IBM PROFESSORSHIP FUND	10,33,055	46		
2	HLL PROF.SHIP FUND	16,08,516	68		
3	GHARDA PROF.SHIP FUND	7,27,472	38		
4	ASTRA RES.CEN.PROF.SHIP FUND	6,51,684	00		
5	DAE VIKRAM SARABHAI FUND	6,98,777	70		
6	DRDO D S KOTHARI P.SHIP FUND	10,39,016	00		
7	CSIR BHATNAGAR P.SHIP FUND	10,76,018	00		
8	SHANTHA SEETHARAMAIAH ST.FUND	1,44,845	12		
9	JNC CORPUS FUND	66,73,315	27		
10	JNC CNR CORPUS FUND	1,63,560	00		
11	JNC ROYALTY FUND	81,621	90		
12	BAPU NARAYANASWAMY PRIZE	56,929	00		
13	DEPARTMENT OF SPACE	15,26,846	00		
14	A V RAMARAO EF LECTURES	5,03,426	00		
15	ISRO MULTIMEDIA PACKAGE	8,00,000	00		
16	ISRO DHAWAN LECTURE	4,00,000	00		
	Total			1,71,85,083	51
	DEPOSITS ENDOWMENT PROF.SHIP F				
1	ICICI	25,90,000	00		
2	IDBI	20,00,000	00		
3	HDFC	38,50,000	00		
4	BEML	5,00,000	00		
5	CRB CAPITAL	12,000	00		
6	ENDOWMENT DEPOSIT CANARA BANK	39,40,000	00		
7	I F C I	4,00,000	00		
8	STEEL AUTHORITY OF INDIA	8,00,000	00		
9	U T I	20,00,000	00		
10	IDBI FLEXIBONDS	6,00,000	00		
11	N T P C LTD	2,00,000	00		
	Total			1,68,92,000	00

As per our report of even date
for M/s P V Prabhu & Co.
Chartered Accountants

Place: Bangalore
Date: 10.06.99

G K N Sastry
Accounts Officer

C N R Rao
President

Sd/-
(Nagaraja)
Partner

CPF AND GRATUITY FUND STATEMENT AS ON 31.03.1999

Particulars	Rs.	Particulars	Rs.
<u>Subscription</u>		<u>Deposits</u>	
Opening Balance : 9,71,608		Canara bank : 12,65,000	
Additions during the year : 6,91,164		ICICI : 1,00,000	
Interest on subscription : 1,49,871		IFCI : 1,00,000	
Less : Withdrawal during the year : 11,321	18,01,322	IDBI Flexi Bonds : 8,00,000	
<u>Contribution :</u>		KBJNL Bonds : 2,00,000	
Opening Balance : 8,01,334		UTI : 4,00,000	
Additions during the year : 4,13,513		SB A/c 17513	
Interest during the year : 96,379	13,11,226	Canara Bank	
<u>Gratuity Fund :</u>		IISc Branch : 10,84,548	39,49,548
Opening Balance : 5,37,000			
Additions during the year : 3,00,000	8,37,000		
Total	39,49,548	Total	39,49,548

As per our report of even date
for M/s P V Prabhu & Co.
Chartered Accountants

Sd/-
(Nagaraja)
Partner

C N R Rao
President

G K N Sastry
Accounts Officer

Place: Bangalore
Date: 10.06.99

TRIAL BALANCE as on 31/03/99

No.	Code	Description	Debit		Credit	
1	101	CANARA BANK SB.A/c 13474	48421	87		
2	202	CANARA BANK SB.A/c 15889	293083	51		
3	404	CASH BOOK	25695	00		
4	505	CANARA BANK SB.A/c.18520	802441	05		
5	1001	OP - BALANCE - JNC	974837	83		
6	1002	CAPITAL FUND - JNC			233168023	66
7	1003	G-I-A DST - JNC			77700000	00
8	2501	TERM DEPOSIT CANARA BANK			260000	00
9	2502	S.CRS. DEPOSIT			206258	00
10	3001	R MUNISWAMY			23819	00
11	3002	HARISH KUMAR			7775	00
12	3003	DODDAMANE BROS			6575	00
13	3004	KUMAR ELECTRICALS			294852	00
14	3005	TOMS & CO			19019	00
15	3006	WCI SHIPPING CORPN			10000	00
16	3007	N M SRINIVASAMURTHY			1375	00
17	3008	BABU TRADERS			1000	00
18	3009	M P CHANDRASHEKAR			10800	00
19	3011	H N VIJAYARAGHAVA REDDY & CO.			366074	00
20	3013	Y RAMESH			3500	00
21	3018	N. DIVAKAR			945021	00
22	3024	K R MURALIDHARAN			30000	00
23	3025	K BABU RAJU			186155	00
24	3026	VINAYAKA ENTERPRISES			2700	00
25	3027	INDIRA ELECTRICALS			18000	00
26	3028	M S MAINTENANCE			19419	00
27	3032	V V KRISHNA KUMAR			116364	00
28	3034	BIT BYTE COMPUTERS			5948	00
29	3035	DIESELTECH ENGINEERS			120	00
30	3037	Y S VENKATA REDDY			5875	00
31	3520	CPF CONTRIBUTION	413513	00		
32	3525	GRATUITY FUND	300000	00		
33	3529	INT ON SUBSCRIPTION	35398	00		
34	4001	USIF(S&T) USA - R NARASIMHA			142628	00
35	4002	R G F INNOVATIVE IDEAS			159337	00
36	4003	R G F SUMMER PROGRAMME			83879	00
37	4004	CSIR - K S VALDIA			15830	05
38	4006	INSA			42054	00
39	4007	NAL - R NARASIMHA			69874	00
40	4008	IIM - V NANJUNDAIAH			23815	00
41	4009	IISC - CEMENT			809508	45
42	4010	AIRFORCE OFFICE-K S NARAYAN			17763	00
43	4013	MONTBLEX\DST\R NARASIMHA			1577	00
44	4014	IAS - LIFESCAPE			52045	00
45	4017	DST/ELF-2/NS			346935	00
46	4022	CAUTION MONEY DEPOSIT			117970	00

TRIAL BALANCE as on 31/03/99

No.	Code	Description	Debit		Credit	
47	4024	CSIR GRANT-SAJI VARGHESE			68505	00
48	4025	R G F - HEMALATHA BALARAM			52	00
49	4026	E M R - NAMITA SUROLIA			23692	00
50	4030	JNC/CSIR/98/K S NARAYAN			78050	00
51	4031	DST/INDO/ISRAEL/K S N			384823	00
52	4032	BOEING - R NARASIMHA			343955	00
53	4033	DST/SRFP - 98			365000	00
54	4034	JNC/CSIR/98/HEMALATHA BALARAM			33995	00
55	4035	DST\HB\EPSPPF/98			248800	00
56	4036	N S CHEMISTRY			100000	00
57	4037	DST/MKC/LCRD	20715	00		
58	4038	CSIR - LAKSHMI R			50400	00
59	4039	CSIR - SUJAYA SUBBAIAH			55429	00
60	4040	CSIR - N G PRASAD			46670	00
61	4041	CSIR/GVNGS/A.ANAND			366479	00
62	4042	UTC/P&W/USA-R NARASIMHA			210996	00
63	4043	UGC - AG MANOJ			36500	00
64	4044	INFOSYS - RAJARAMAN			500250	00
65	4501	IT - TDS			55499	00
66	5001	ASIATIC INDL GASES	13500	00		
67	5010	G U KULKARNI	5500	00		
68	5031	CHANDAN DAS GUPTA	2000	00		
69	5032	CYLINDER DEPOSIT	10000	00		
70	5033	MIGA GASES (P) LTD.	2000	00		
71	5038	R GADAGKAR	5000	00		
72	5040	R NARASIMHA	79575	00		
73	5041	N R MOUDGAL	5000	00		
74	5043	ANURANJAN ANAND	5000	00		
75	5049	M.A. ITTYACHEN	15000	00		
76	5055	SAJI VARGHESE	6000	00		
77	5058	S UMAPATHY	5000	00		
78	5064	ASIATIC AIR-O-GAS ENGG.CO.LTD	5000	00		
79	5074	K B SINHA	15000	00		
80	5076	SAC (C) CNR	26834	00		
81	5082	CHANDRASHAKAR S	4881	00		
82	5085	JNC STUDENTS RESIDENCE ADVANCE	22648	00		
83	5088	IND FRENCH CPAR			39375	00
84	5092	KALIDAS SEN	25000	00		
85	5097	M K PAUL	200000	00		
86	5098	ISRO K R RAMANATHAN PROF.R N	63485	00		
87	5501	SUNDRY CREDITORS - JNC			3878185	00
88	5502	SUNDRY CREDITORS - OTHERS			92904	00
89	5503	SUNDRY CREDITORS - EMD/SD			124124	00
90	5520	FESTIVAL ADVANCE	68700	00		
91	5525	PERM.IMPREST	15500	00		
92	5530	VEHICLE ADVANCE	940	00		

TRIAL BALANCE as on 31/03/99

No.	Code	Description	Debit		Credit	
93	5531	LTC ADVANCE	3658	00	1033055	46
94	6001	IBM PROFESSORSHIP FUND			1608516	68
95	6002	HLL PROF.SHIP FUND			727472	38
96	6003	GHARDA PROF.SHIP FUND			651684	00
97	6004	ASTRA RES.CEN.PROF.SHIP FUND			698777	70
98	6005	DAE VIKRAM SARABHAI FUND			1039016	00
99	6006	DRDO D S KOTHARI P.SHIP FUND			1076018	00
100	6007	CSIR BHATNAGAR P.SHIP FUND			144845	12
101	6009	SHANTHA SEETHARAMAIAH ST.FUND			6673315	27
102	6010	JNC CORPUS FUND			163560	00
103	6011	JNC CNR CORPUS FUND			81621	90
104	6012	JNC ROYALTY FUND			56929	00
105	6014	BAPU NARAYANASWANY PRIZE			1526846	00
106	6015	DEPARTMENT OF SPACE			503426	00
107	6016	A V RAMARAO EF LECTURES			800000	00
108	6017	ISRO MULTIMEDIA PACKAGE			400000	00
109	6018	ISRO DHAWAN LECTURE				
110	6502	ICICI	2590000	00		
111	6503	IDBI	2000000	00		
112	6504	HDFC	3850000	00		
113	6505	BEML	500000	00		
114	6508	CRB CAPITAL	12000	00		
115	6509	ENDOWMENT DEPOSIT CANARA BANK	3940000	00		
116	6510	I F C	400000	00		
117	6511	STEEL AUTHORITY OF INDIA	800000	00		
118	6512	U T I	2000000	00		
119	6513	IDBI FLEXIBONDS	600000	00		
120	6514	N T P C LTD	200000	00		
121	7001	SALARY & HONORARIA	10549409	00		
122	7002	MEDICAL REIMBUREMENT	438783	00		
123	7003	BONUS	107040	00		
124	7005	RETIREMENT BENEFITS	94364	00		
125	7006	L T C	30113	00		
126	7007	UNIFORMS	40845	00		
127	7008	LEAVE ENCASHMENT	14500	00		
128	7015	PRINTING & STATIONARY	711760	00		
129	7016	POSTAGE	301787	00		
130	7017	TELEPHONE, TELEX & FAX	515126	00		
131	7018	BANK CHARGES	12109	00		
132	7019	ELECTRICITY & WATER CHARGES	5714006	00		
133	7020	CONVEYANCE & TRANSPORT	1350701	50		
134	7021	PETROL, OIL & LUBRICANT	63272	00		
135	7022	BOOK BINDING	59417	00		
136	7023	NEWS PAPER & MAGAZINES	15968	00		
137	7024	MISC.EXPENSES	11536	00		
138	7025	ADVERTISEMENTS	89905	00		

TRIAL BALANCE as on 31/03/99

No.	Code	Description	Debit		Credit	
139	7026	COUNCIL & OTHER MEETINGS	362528	00		
140	7027	SECURITY SERVICES	870185	00		
141	7030	DOMESTIC TRAVEL ALLOWANCES	235913	00		
142	7031	AUDIT FEES	16000	00		
143	7032	MEMBERSHIP FEES	92907	00		
144	7033	GUEST HOUSE CONSUMABLES	53260	00		
145	7034	FREIGHT & CLEARING CHARGES	41644	00		
146	7035	CANTEEN SUBSIDY	28225	00		
147	7036	INSURANCE	143027	00		
148	7037	LOSS OF LIBRARY BOOKS	1500	00		
149	7050	BUILDING MAINT	2538794	00		
150	7051	GARDEN MAINT	494388	00		
151	7052	EQUIPMENT MAINT	2159900	00		
152	7053	GUEST HOUSE MAINT	385277	00		
153	7054	VEHICLE MAINT	23090	00		
154	7055	OFFICE MAINT	50240	00		
155	7056	CANTEEN MAINT	48781	00		
156	7057	ELECTRICITY & WATER MAINT	988005	00		
157	7058	COSTED PROGRAMME	324687	00		
158	7059	FOREIGN TRAVEL EXPENSES	161419	00		
159	7101	DISCUSSION MEETINGS	1787790	00		
160	7102	RESEARCH SUPPORT	15000	00		
161	7103	PUBLICATIONS	138789	00		
162	7108	PHD PROGRAMME	1930915	00		
163	7110	CONSUMABLES LAB	6318279	00		
164	7111	SRFP 98	306844	00		
165	7112	CTSSSP 98	18888	00		
166	7113	SRFP 1999	180444	00		
167	7201	BUILDINGS	79658165	26		
168	7202	INFRA STRUC FACILITY	24932945	32		
169	7203	OFF.EQUIP. & APPLIANCES	3599495	63		
170	7204	SCI.EQUIPMENTS	87774156	47		
171	7205	FURNITURE	4860194	87		
172	7206	VEHICLES	772304	10		
173	7207	LIBRARY BOOKS	4005014	21		
174	7208	LIBRARY JOURNALS	12098827	80		
175	7210	BUILDING-JNC/HOSTEL BLOCK	10258574	00		
176	7211	BLDG. CONST - NEW LAB	16802743	00		
177	7212	COMPUTER	6195329	00		
178	7213	BLDG.CONSTN. ANIMAL HOUSE	2475144	00		
179	7214	STAFF HOUSING	1382135	00		
180	7302	CAPITAL FUND - CNM			34179930	00
181	7304	SCI.EQUIPMENTS CNM	34179930	00		
182	7402	CAPITAL FUND - PCM			9878095	00
183	7404	SCI.EQUIPMENTS PCM	9869295	00		
184	7405	FURNITURE PCM	8800	00		

TRIAL BALANCE as on 31/03/99

No.	Code	Description	Debit		Credit	
185	7501	OP - BALANCE - CS			449834	00
186	7503	SC. EQUIP.CLUSTER STUDIES	2620413	00		
187	7505	CAPITAL FUND - CS			2532346	00
188	7506	CONSUMABLES CS	59131	00		
189	7601	SC EQUIP.ADV TECH LAB	20202562	00		
190	7603	CONSUMABLES ADV.TECH LAB	7534	00		
191	7701	SCI.EQUIPMENT MAGNET	7000000	00		
192	8001	INT. ON TERM DEPOSIT JNC			1405524	00
193	8002	INT. ON SB ACCOUNT JNC			63458	25
194	8010	JAWAHAR RECEIPTS			562805	00
195	8011	GUEST ROOM RECEIPTS			28367	00
196	8012	GUEST ROOM CONSUMABLES RCPTS			47021	00
197	8013	TUITION FEES			74320	00
198	8014	MISC. RECPTS			85169	50
199	8015	LICENCE FEES			123462	00
200	8016	MEDICAL CONTRIBUTIONS			59113	00
201	8017	ELEC & WATER CHARGE RCPTS			63316	00
202	8018	ANNUAL FEES - PHD			23765	00
203	8050	ELE/WATER MAINT. PAYABLE			30000	00
204	8051	SALARY/HON PAYABLE			84809	00
205	8052	BUILDING MAINT. PAYABLE			127553	00
206	8053	CONVEYANCE TRANS. PAYABLE			86928	00
207	8054	SECURITY SERVICE PAYABLE			78757	00
208	8055	GARDEN MAIN. PAYABLE			35500	00
209	8056	AUDIT FEES PAYABLE			16000	00
210	8058	ELE\WATER CHARGES PAYABLE			327169	00
		Total	389477638	42	389477638	42

As per our report of even date
for M/s P V Prabhu & Co.
Chartered Accountants

Place: Bangalore
Date: 10.06.99

G K N Sastry
Accounts Officer

C N R Rao
President

Sd/-
(Nagaraja)
Partner