HANDBOOK OF
SHANTI SWARUP BHATNAGAR
PRIZE WINNERS
(1958 - 1998)

HUMAN RESOURCE DEVELOPMENT GROUP

COUNCIL OF SCIENTIFIC & INDUSTRIAL RESEARCH

NEW DELHI

1999

Compiled By

Dr Sukumar Mallick

Dr Saguna Dewan

Mr S C Dhawan

FOREWORD

The Human Resource Development Group of the Council of Scientific & Industrial Research (CSIR) has been actively involved in promoting and recognising talent research in various disciplines of science and technology.

The Shanti Swarup Bhatnagar Prize for Science & Technology was instituted in 1957 in the name of our founder Director General and the principal architect of CSIR. The Prize has now become the most coveted national recognition for scientists and engineers. In the last forty years (between 1958 to 1998) a total of 334 scientists and technologists from all over India have won this prestigious award in their own disciplines of research work.

The information in this book pertains to all the Bhatnagar Laureates, with respect to their areas of specialization, personal details, contact addresses, and their scientific contributions.

I am sure that this compilation will be useful to the scientific community and can be readily used as source of information as well as inspiration.

I greatly appreciate the work done by the members of HRDG in putting together the details of the Bhatnagar awardees till 1998.

(R A MASHELKAR)
Director General, CSIR

Date : September 1, 1999
Place : New Delhi

PREFACE

The Shanti Swarup Bhatnagar (SSB) Prize has been awarded to three hundred and thirty four Indian scientists between 1958 to 1998. These winners (Bhatnagar Laureates) exemplify the best of talents in Science & Technology. A need was felt to consolidate particulars of these awardees for ready reference by the CSIR and other organisations. This book presents details of their areas of interest, present contact address and the citations. The current address includes e-mail address wherever available for faster communication. Scientists who have retired or are not associated with any institution have given their residential address for correspondence.

Documentation of this kind will be useful in establishing contact and obtaining information from such elite scientists. At present an adequate database for providing information about the SSB awardees till 1998 - their areas of specialization, contact addresses and significant contributions put in a concise form does not exist. Keeping in view this situation - this compilation was prepared.

The basic objective is to provide the user with a comprehensive view of the 334 SSB Prize winners. We hope to present, in a clear and organised manner, the available details to provide an opportunity for personal and official correspondence and sharing mutual interests and information.

I am grateful to the many people who contributed to this compilation.

I wish to express my appreciation to all those with whom we interacted and whose thoughts and insights helped us in improving the quality of the book.

It is earnestly hoped that this publication will be well received by all concerned and the information contained in it would be of immense help and vital use.

DR SUKUMAR MALLICK
Head, HRDG

CONTENTS

SPECIALIZATION INDEX

Applied and Clinical neurophysiology; Electroencephalography	Maiti, Ajit Kumar	1971
Applied mathematics; Nonlinear phenomena	Malik, Surender Kumar	1985
Applied theoretical chemistry	Jemmis, Eluvathingal Devassy	1994
Astronomy; Space science; Satellite technology	Kasturirangan, Krishnaswamy	1983
Astrophysics	Vainu, Bappu Manali Kallat	1970
Atmospheric sciences	Goswami, Bhupendra Nath	1995
Autonomic pharmacology	Gulati, Om Dutt	1971
Bio deterioration of cellulose materials in aquatic environment; Conservation and management of aquatic resources	Nair, Narayana Balakrishan	1971
Bio-organic chemistry; Chemistry of natural products; Nucleosides; Medicinal chemistry	Bhakuni, Dewan Singh	1975
Biochemical endocrinology; Reproductive biology	Moudgal, Nuggehalli Raghuveer	1976
Biochemistry and molecular biology of M.tuberculosis	Tyagi, Anil Kumar	1995
Biochemistry of lipids and vitamin A	Ganguly, Jagannath	1963
Biochemistry of Tubercle bacilli	Venkitasubramanian Tathamangam Ananthanarayanan.	1968
Biochemistry; Molecular biology	Kanungo, Madhu Sudan	1971
Biochemistry; Neurochemistry; Liposomes; Immunology	Bachhawat, Bimal Kumar	1962

Biological crystallography; Molecular biophysics	Vijayan, Mamannamana	1985
Biology of reproduction; Comparative endocrinology	Saidapur, Srinivas Kishanrao	1991
Biology; Animal energetics and genetics; Aquaculture; Fish genetics and breeding	Pandian, Thavamani Jegajothivel	1984
Biomedical Research; Eye lens protection; Biophysical chemistry; Spectroscopy	Balasubramanian, Dorairajan	1981
Biometry; Genetics;Radiation genetics	Murty, Bhyravabhotla Radhakrishna	1973
Biomolecular structure; Chemical Physics; Quantum chemistry; Biochemistry	Sasisekharan, Visvanathan	1978
Bioorganic chemistry; Molecular biophysics; Proteins	Balaram, Padmanabhan	1986
Biophysical chemistry	Podder, Sunil Kumar	1982
Biophysical chemistry; Molecular biology	Chatterjee, Dipankar	1992
Biophysics; Membrane biochemistry	Nagaraj, Ramakrishnan	1994
Boundary layer theory; Hydrodynamics and hydromagnetic stability; Heat & Mass transfer in fluid flows	Gupta, Anadi Sankar	1972
Cardiology	Vakil, Rustam Jal	1966
Cardiothoracic and Vascular surgery	Talwar, Janak Raj	1970
Cardiovascular pharmacology; Therapeutics clinical cardiology	Arora, Ram Behari	1961
Catalysis	Ratnasamy, Paul	1984
Cell surface carbohydrates and biological recognition; Biophysical chemistry; Chemistry of proteins	Surolia, Avadhesha	

Cellular immunology. Immunology	Sainis, Krishna Balaji	1994
Chemical engineering	Khakhar, Devang Vipin	1997
Chemical engineering; Fluid mechanics; Reactor design	Joshi, Jyeshtharaj Bhalchandra	1991
Chemical Physics; Magnetic resonance spectroscopy and Imaging ; Spin dynamics as well as hardware and software development	Chandrakumar, Narayanan	1996
Chemical physics; Nuclear magnetic resonance	Khetrapal, Chunni Lal	1982
Chemical reaction engineering; Applied mathematics; Transport phenomena	Kulkarni, Bhaskar Dattatraya	1988
Chemistry of heterocyclic compounds; Dyestuff chemistry; Rural development through science and technology	Tilak, Bal Dattatraya	1963
Chemistry of natural products; Development of drugs from natural sources	Chatterjee, Asima	1961
Chemistry of natural products; Synthetic organic chemistry; Organometallic chemistry	Subba Rao, Ganugapati Sree	1982
Chemistry of plant products; Synthesis of natural products	Govindachari, Tuticorin	1960
Chronobiology field ethology; Animal behaviour and neurophysiology	Chandrashekaran, Maroli Krishnayya	1979
Circuits; Systems and Signal processing	Dutta Roy, Suhash Chandra	1981
Classical and quantumdynamic formalisms; Polarization optics	Mukunda, Narasimhaiengar	1980
Clinical pharmacology	Sheth, Uttamchand Khimchand	1968

Combinatorial mathematics	Singhi, Navinkumar Madhavprasad	1993
Complex analytical geometry moduli of Riemann surfaces; Mathematical physics (string theory)	Nag, Subhashis	1998
Computational chemistry	Chandrasekhar, Jayaraman	1995
Computer science; Information systems	Rajaraman, Vaidyeswaran	1976
Condensed matter physics, Theoretical physics	Sinha, Krityunjai Prasad	1974
Condensed matter physics; Light scattering; Superlattices and Super conductors	Sood, Ajay Kumar	1990
Condensed matter physics; Localization in Disordered Systems; High temperature superconductivity	Kumar, Narendra	1985
Condensed matter physics; Material science; Energy materials; Thin films	Srivastava, Onkar Nath	1988
Condensed matter physics; Statistical mechanics	Kumar, Deepak	1988
Condensed matter physics; Statistical mechanics	Ramakrishnan, Tiruppattur Venkatachalamurti	1982
Condensed Matter Physics; stochastic Processes	Jayannavar, Arun Mallojirao	1998
Condensed matter statistical physics	Chakrabarti, Bikas Kanta	1997
Condensed matter theory	Shenoy, Subodh	1992
Control systems	Seshadri, Sekharipuram Narayaniyer	1978
Cosmic ray physics; Elementary particle high energy physics	Menon, Mambillikalathil Govind Kumar	1960
Cosmic rays; Interplanetary	Sarabhai, Vikram	1962

phenomena	Ambalal	
Cosmic rays; Nuclear physics; Geophysics; Oceanography; Glaciology	Lal, Devendra	1967
Cosmology; Theoretical astrophysics	Narlikar, Jayant Vishnu	1978
Crystal growth; Optical interferometry; X-ray diffraction; Defects in Crystalline solids	Verma, Ajit Ram	1964
Crystallography; Optics; Material science	Ramaseshan, Sivaraj	1966
Cytogenetics and plant breeding	Jain, Hari Krishna	1966
Cytogenetics; Cytochemistry;Cell biology	Sharma, Arun Kumar	1967
Cytogenetics; Molecular biology	Lakhotia, Subhash Chandra	1989
Deep seismic sounding; Earthquake seismology; Seismic exploration for oil	Kaila, Krishna Lal	1977
Developmental Genetics	Vijay Raghavan, Krishnaswamy	1998
Earthquake Engineering	Krishna, Jai	1966
Ecology; Ecosystems analysis; Ecophysiology	Singh, Jamuna Sharan	1980
Ecology; Environment and development	Gadgil, Madhav Dananjaya	1986
Electrical and electromagnetic methods; Remote sensing; Seismics	Mallick, Kumarendra	1986
Electrical engineering / Communication networks; Surface acoustic waves devices; Optical communication	Jhunjhunwala, Ashok	1998
Electronics; Radiation protection	Rao, Ayyagari Sambasiva	1965

Elementary particle theory; Quantum field and many body theory	Rajaraman, Ramamurti	1983
Endocrine biochemistry & Reproductive biology	Adiga, Perdur Radhakantha	1980
Endocrine pharmacology; Reproductive and Contraceptive endocrinology	Chaudhury, Ranjit Roy	1969
Enzymology; Metabolic regulation; Bioenergetics; Tumor biochemistry	Ray, Manju	1989
Enzymology; Parasite biochemistry; Parasitology	Bhaduri, Amar Nath	1979
Ergodic theory;Dynamics; Lie groups; Probability measures on groups	Dani, Shrikrishna Gopalrao	1990
Eukaryotic gene expression	Padmanaban, Govindarajan	1983
Evolution of planetary bodies; Isotope geochronology; Lunar surface; Cosmic rays	Goswami, Jitendra Nath	1994
Experimental atomic and molecular collision physics; Mass spectrometry	Mathur, Deepak	1991
Experimental mineralogy and petrology	Gupta, Alok Krishna	1986
Experimental physical chemistry; Laser spectroscopy; Biophysical chemistry	Bhattacharyya, Kankan	1997
Experimental Solid State Physics; Instrumentation Development; Cryogenics	Raychaudhuri, Arup Kumar	1994
Fertilizer Science and Technology; Catalysis; Engineering science and fundamental science	Chakravorty, Kshitish Ranjan	1968
Fiber and integrated optics	Ghatak, Ajoy Kumar	1979
Field theory (QCD) and	Mitra, Asoke Nath	1969

quark physics; Particles and nuclei		
Finite element methods; Optimum design of structures; Non-linear analysis of structures	Rao, Gundabathula Venkateswara	1989
Fluid mechanics; Aerospace engineering; Atmospheric sciences	Narasimha, Roddam	1974
Fluid-film lubrication; Dynamics of mechanical systems; Stress analysis; Tyre mechanics and Tyre pavement interaction	Singh, Dig Vijai	1978
Game theory and mathematical programming	Parthasarathy, Thiruvenkatachari	1986
Genetics & Plant Breeding	Athwal, Dilbagh Singh	1964
Genetics and cytogenetics; Plant breeding; Agricultural research and development	Swaminathan, Monkombu Sambasivan	1961
Genetics; Chromosomes; Genetic toxicology	Sharma, (Mrs) Archana	1975
Genetics; Lymphocyte biology; Medical Education Research Co-ordination; Administration	Agarwal, Shyam Swarup	1986
Genetics; Neurobiology	Siddiqi, Obaid	1975
Geochemistry; Geochoronology; Oceanography; Magnetic stratigraphy	Somayajulu, Bhamidipati Lakshmidhara Kanakadri	1978
Geochemistry; Precambrian geology	Naqvi, Syed Mahmood	1983
Geochronology; Isotope geology	Gopalan, Kunchithapadam	1982
Geology	Ghosh, Subir Kumar	1977
Geophysical modelling	Singh, Rishi Narain	1985
Geophysics Seismology	Rai, Shyam Sundar	1996
Geophysics; Antarctic	Gupta, Harsh Kumar	1983

sciences		
Geophysics; Seismology; Oceanography	Gaur, Vinod Kumar	1979
Gravitation & Cosmology	Padmanabhan, Thanu	1996
Heat transfer; Solar energy	Sukhatme, Suhas Pandurang	1983
High energy physics; Foundation of quantum theory	Roy, Shasanka Mohan	1981
High energy astrophysics; Neutrinos; Dark matter; Elementary particles; Experimental gravitation; cosmology	Cowsik, Ramanath	1984
High pressure physics; Liquid crystals	Shashidhar, Ranganathan	1984
Histocompatibility and Immunogenetics	Mehra, Narinder Kumar	1992
Homogeneous catalysis; Asymmetric catalysis	Choudary, Boyapeti Manoranjan	1990
Hydrodynamic and Hydromagnetic stability	Banerjee, Mihir Baran	1988
Igneous petrology; Mineralogy; Geochemistry	Bose, Mihir Kumar	1976
Immunocontraceptive vaccine design; Monoclonal antibody and synthetic peptides; Recombinant protein based immuno diagnostics	Gupta, Satish Kumar	1997
Immunology; Pathology; Infectious diseases; Leprosy	Nath, Indira	1983
Inorganic and organometallic chemistry; Sol-gel process for ceramic materials	Mehrotra, Ram Charan	1965
Inorganic and physical chemistry	Ramasami, Thirumalachari	1993
Inorganic Chemistry	Chakravarty, Akhil Ranjan	1998

Inorganic chemistry	Chaudhuri, Mihir Kanti	1989
Inorganic chemistry; Cement, Catalyst and Management	Bhaduri, Sumit	1992
Inorganic chemistry; Structure and function of metal complex in living systems	Chakravorty, Animesh	1975
Inorganic photochemistry; Fast reaction kinetics; Photoelectro chemistry; Radiation chemistry	Natarajan, Paramasivan	1984
Insect sociobiology and the Evolution of social life in Animals	Gadagkar, Raghavendra	1993
Integrated powerpack with reverse governing techniques for diesel engine superimposed on a hydro-mechanical transmission called Suri-Transmission	Suri, Man Mohan	1962
Internal medicine; Clinical Immunology	Das, Undurti Narasimha	1992
Inversion of geophysical data	Sri, Niwas	1991
Isotope Geochemistry	Ramesh, Rengaswamy	1998
Laser and Nonlinear optics	Bhawalkar, Dillip Devidas	1984
Liquid crystals	Madhusudana, Nelamangala Vedavyasachar	1989
Liquid crystals & condensed matter; Optics and X-ray diffraction	Chandrasekhar, Sivaramakrishna	1972
Low temperature and high pressure phenomena; Condensed matter physics; Experimental techniques and instrumentation	Raja Gopal, Erode Subramanian	1978
Low temperature geochemistry; Nuclear methods in earth surface processes	Krishnaswami, Sethunathasarma	1984

Macromolecular crystallography	Murthy, Mathur Ramabhadrashastry Narasimha	1993
Magnetic resonance phenomena	Srinivasan, Ramanujan	1981
Magnetochemistry; Bio-organic chemistry; Magnetic resonance; Inorganic biochemistry	Mitra, Samaresh	1983
Marine geology	Siddiquie, Hassan Nasiem	1978
Marine nitrogen cycle and biogeochemistry of oxygen-deficient environments; Paleoceanography	Naqvi, Syed Wajih Ahmad	1996
Mass transfer with or without chemical reaction; Multiphase reactions; Phase transfer catalysis; Catalysis by ion exchange resins; Separations through reactions	Sharma, Man Mohan	1973
Material science	Sinha, Akhoury Purnendu Bhusan	1972
Material Science & Technology; Physical; mechanical and Powder metallurgy	Arunachalam, Vallampadugai Srinivasaraghavan	1980
Mathematical analysis; Linear Operators	Bhatia, Rajendra	1995
Mathematical modelling	Karmeshu	1993
Mathematical modelling in Earth Science	Sahu, Basanta Kumar	1980
Mathematical modelling of ecological environmental physiological and engineering systems	Shukla, Jang Bahadur	1982
Mathematical Modelling; Biofluid Mechanics	Sharan, Maithili	1992
Mathematical Statistics	Prakasa Rao, Bhagavatula Lakshmi Surya	1982

Mathematical statistics and its applications in biology	Rao, Calympudi Radhakrishna	1959
Mathematical theory of scattering and spectral theory of schrodinger operators; algebra of operators; Quantum stochastic process	Sinha, Kalyan Bidhan	1988
Medical microbiology; Virology and Immunology	Chaturvedi, Umesh Chandra	1981
Medicinal chemistry; Pesticide chemistry; Heterocyclic synthesis; Application of NMR spectroscopy	Nagarajan, Kuppuswamy	1974
Medicine; Gastroenterology; Hepatology	Sarin, Shiv Kumar	1996
Membrane and molecular genetics; Physiology and gene regulation	Gupta, Chhitar Mal	1985
Metallurgical engineering; R & D for metallurgical industries	Nijhawan, Bal Raj	1964
Microbial and molecular genetics; Physiology and gene regulation	Gowrishankar, Jayaraman	1997
Microbial/ Molecular genetics	Jayaraman, Ramamirtha	1982
Microbiology	Nair, G Balakrish	1998
Microbiology; Experimental medicine	Dutta, Nirmal Kumar	1965
Microwave engineering; Vacuum devices; Quality & reliability; Measurements education	Wadhwa, Rajinder Pal	1972
Mineral chemistry and extractive metallurgy; Atomic energy and space programme	Brahm, Prakash	1963
Modelling of multiphase phenomena	Kumar, Rajinder	1976

Molecular & general genetics; Plant microbe interaction; Genetic engineering Plant breeding; Human Resource Development	Kumar, Sushil	1981
Molecular biology	Datta, Asis	1980
Molecular Biology	Hasnain, Seyed Ehteshan	1995
Molecular biology and Hepatitis	Kumar, Vijay	1997
Molecular Biology of Malaria	Sharma, Yagya Dutta	1994
Molecular biology; Biochemistry; genetic engineering; Protein phosphorylation; Signal transduction	Swarup, Ghanshyam	1996
Molecular biophysics; Bioengineering; Theoretical chemistry	Govil, Girjesh	1978
Molecular biophysics; Crystal physics; Mathematical philosophy	Ramachandran, Gopalasamudram Narayana	1961
Molecular biophysics; Magnetic resonance spectroscopy	Easwaran, Kalpathy Ramaier Katehap	1984
Molecular evolution	Barnabas, John	1974
Molecular genetics and Biochemistry	Rao, Manchalhalli Rangaswami Satyanarayana	1988
Molecular genetics/ Molecular biology	Muniyappa, Kallapa	1995
Molecular genetics; Biotechnology	Srivastava, Brahm Shanker	1984
Molecular Genetics; Genetic Engineering	Dharmalingam, kuppamuthu	1992
Molecular parasitology.	Bhattacharya, Alok	1994
Molecular plant physiology; Photoreceptor biology; Nitrogen metabolism; Plant	Sopory, Sudhir Kumar	1987

tissue culture. Plant Molecular Biology		
Molecular scattering of light; Magnetism related to physics; Physics and chemistry of crystalline solids	Krishnan, Kariamanikkam Srinivasa	1958
Molecular virology; Cell biology; Immunology; Model membrane & Drug targeting	Sarkar, Debi Prasad	1998
Mycology; Microbiology; Chemotherapeutic control	Thirumalachar, Mandayam Jeersannidhi	1967
Neotectonics, Sedimentology & Environmental Geology.	Valdiya, Khadg Singh	1976
Neurobiology; Nuclear medicine	Mukherjee, Sarashi Ranjan	1968
Neuropharmacology	Sinha, Jagdish Narain	1984
Neurophysiology; Human movement disorders; Neuropharmacology	Ganguly, Dilip Kumar	1985
Neurophysiology; Neuroscience; Psychobiology	Desiraju, Turaga	1980
Neurosciences	Ravindranath, Vijayalakshmi	1996
Neurosurgery	Kalyanaraman, Subramanian	1969
Non-linear stability in magnetohydro-dynamics	Trehan, Surindar Kumar	1976
Nonlinear plasma theory	Kaw, Predhiman Krishan	1986
Nonlinear wave; Partial differential equations; Fluid mechanics	Prasad, Phoolan	1983
Nuclear physics; Accelerator physics; Energy dispersive X-ray analysis of materials; Heavy ion physics	Kapoor, Shyam Sunder	1983
Nuclear Physics; Reactor Physics and design	Ramanna, Raja	1963
Nuclear physics; Solid state physics; Nuclear technology	Iyengar, Padmanabha Krishnagopala	1971

Number theory	Balasubramanian, Ramachandran	1990
Number theory; Automorphic functions	Raghavan, Srinivasacharya	1979
Numerical solutions of partial differential equations	Jain, Padam Chand	1975
Numerical weather prediction; Tropical meteorology, Monsoon dynamics & climate modelling	Mohanty, Uma Charan	1993
Nutritional anaemias and Haemoglobino pathies	Chatterjea, Jyoti Bhusan	1966
Open heart surgery	Basu, Ajit Kumar	1967
Optical physics; Group Theory	Simon, Rajiah	1993
Organic & biological chemistry of peptides; Medicinal chemistry & pharmaceutics	Dhar, Manojit Mohan	1971
Organic / bio-organic chemistry; Chemical simulation of information transfer process in life system; Reaction mechanism; Protein engineering	Ranganathan, Subramania	1977
Organic chemistry	Mehta, Goverdhan	1978
Organic chemistry	Yadav, Jhillu Singh	1991
Organic chemistry, Chemistry of natural products; Perfumery chemicals	Bhattacharyya, Sasanka Chandra	1962
Organic chemistry; Bio-organic chemistry	Jain, Amolak Chand	1969
Organic chemistry; Developed radical cyclisation and annulation based strategies for construction of a variety of bridged compounds and natural products of contemporary	Srikrishna, Adusumilli	1997

interest		
Organic chemistry; Natural products	Sukh, Dev	1964
Organic chemistry; Organo-metallics and chiral reagents	Periasamy, Mariappan	1996
Organic; Bio-Organic Chemistry	Ganesh, Krishnarajanagar Nagappa	1998
Paediatric gastro-enterology	Bhan, Maharaj Krishan	1990
Parallel & Distributed computing; Information systems design and Software design	Krishnamurthy, Edayyathu Mangalam Venkatarama	1978
Pathology; Nutrition; Medical education & research	Ramalingaswami, Vulimiri	1965
Pattern recognition; Image processing and vision neural network and fuzzy	Pal, Sankar Kumar	1990
Peptide-based vaccines for viral infections and peptide-based immunodiagnostics	Rao, Kanury Venkata Subba	1997
Phase transformations; Structural imperfections; Rapid solidifications; Quasicrystals	Lele, Shrikant	1987
Photochemistry; Laser chemistry; Organic chemistry	George, Manapurathu Verghese	1973
Photonics / Optical electronics (Fiber optics and integrated optics) Applied optics	Sharma, Anurag	1998
Photonics, Applied optics	Singh, Kehar	1985
Physical chemistry of amorphous solids; Phase transformation of solids	Rao, Kalya Jagannath	1984
Physical chemistry; Solution dynamics	Bagchi, Biman	1991
Physical Metallurgy	Banerjee, Dipankar	1993

Physical metallurgy	Banerjee, Srikumar	1989
Physical metallurgy	Rama Rao, Palle	1979
Physical Metallurgy and Material Engineering	Chattopadhyay, Kamanio	1995
Physical metallurgy; Structural changes and imperfections in metals and alloys; Microcrystalline materials and quasi crystals	Anantharaman, Tanjore Ramachandra	1967
Physical metallurgy; Thermodynamics of alloys	Rao, Patcha Ramachandra	1985
Physical Oceanography; Geophysical fluid dynamics	Shetye, Satish Ramnath	1992
Physics of condensed matter	Majumdar, Chanchal Kumar	1976
Physiological plant pathology; Soil microbiology	Sadasivan, Toppur Seethapathy	1960
Physiology; Neurophysiology; Neuro endocrinology	Anand, Bal Krishan	1963
Plant Biochemistry; Molecular Biology; Genetic Engineering	Biswas, Birendra Bijoy	1972
Plant biochemistry; Photosynthesis	Sane, Prafullachandra Vishnu	1981
Plant breeding and genetics	Prasada Rao, Neelamraju Ganga,	1966
Plant pathology; Phytonematology; Plant protection in sugarcane	Singh, Kishan	1976
Plant physiology; Biochemistry; Plant Molecular biology	Maheshwari, Satish Chandra	1972
Plasmas; Semiconductors; Optics;Energy	Sodha, Mahendra Singh	1974
Polymer chemistry; Combustion chemistry	Kishore, Kaushal	1988
Polymer chemistry; Quantum chemistry; Molecular	Basu, Sadhan	1965

spectroscopy		
Polymer science & engineering; Connective diffusion; Non-Newtonian fluid mechanics	Mashelkar, Raghunath Anant	1982
Power system dynamics; Stability and control; Parallel computation in power system	Pai, Mangalore Anantha	1974
Probability and Statistics	Ghosh, Jayanta Kumar	1981
Probability theory; Quantum stochastic calculus	Parthasarathy, Kalyanapuram Rangachari	1976
Production engineering; Management science; Education; Rural technovation	Bhattacharyya, Amitabha	1971
Protein chemistry; Molecular biology	Pandey, Virendra Nath	1991
Protein chemistry; structure and functions of proteins; Fluroscence spectroscopy in proteins	Bhattacharyya, Bhabatarak	1988
Protozoology; Cell biology; Malaria; Amoebiosis; Leishmaniasis; Immunology	Dutta, Guru Prakash	1976
Quadratic form; Modular functions and discontinuous groups work on Ramanujan's notes	Ramanathan, K Gopala	1965
Quantum chemistry; Quantum dynamics; Theoretical spectroscopy	Mukherjee, Debashis	1987
Quantum optics; Non-linear optics; Statistical mechanics; Surface optics	Agrawal, Girish Saran	1982
Quantum theory of extended many body systems	Ramasesha, Suryanarayanasastry	1992
Radio astronomy	Gopal, Krishna	1993

Radio astronomy; Extragalactic radio sources; Cosmology	Kapahi, Vijay Kumar	1987
Reaction and transport processes in porous media; Catalytic and non-catalytic fluid-solid reactions; Precipitation; Mathematical modelling	Bhatia, Suresh Kumar	1993
Reactor engineering; Research administration; Atomic energy	Sethna, Homi Nusserwanji	1960
Representation theory of Lie groups and algebras	Parthasarathy, Rajagopalan	1985
Reproductive biology & fertility regulation; Neuroendocrinology; Primate biology; electron microscopy	Anand Kumar, Trichnopoly Chelvaraj	1977
Reproductive physiology; Cell and development biology	Guraya, Sardul Singh	1973
Satellite-Meteorology; Oceanography & Polar science	Pandey, Prem Chand	1989
Science & Technology of Polymers; Physical chemistry; Organic chemistry	Santappa, Mushi	1967
Sedimentology; Geomorphology and quaternary geology	Tandon, Sampat Kumar	1988
Semiconductor devices	Jain, Suresh Chand	1966
Semiconductor physics and technology	Kumar, Vikram	1992
Signal processing; Statistics; Transform techniques; Pattern recognition; Time series analysis; Pedagogy	Moharir, Pramod Sadasheo	1987
Solar radio emission; Pulsars; Interplanetary scinitillations; Radio astronomy instrumentation; Extragalactic radio sources and cosmology	Swarup, Govind	1972

Solid state chemistry; Surface science; Chemical spectroscopy; Molecular structure	Rao, Chintamani Nagesa Ramachandra	1968
Solid state physics	Joshi, Shri Krishna	1972
Solid state physics & chemistry; Photoemission; Surface science	Sarma, Dipankar Das	1994
Solid state physics & technology of thin films; Amorphous semiconductors; Surface science and techniques; Solar cells;Selective surfaces	Chopra, Kasturi Lal	1975
Solid state physics; Magnetism; Material science; Superconductivity.	Vijayaraghavan, Ramanuja	1976
Space physics and Ultrasonics	Ramachandra, Rao Barry	1965
Space science & technology; Avionics; Electronics; Astronomy; Satellite and rocket technology	Rao, Udipi Ramachandra	1975
Spectroscopic properties of radioactive isotopes; Thermodynamics; Solid state diffusion of metals	Mathur, Hirdaya Behari	1973
Spectroscopy; Photodynamics.	Chowdhury, Mihir	1977
Spine; Clinical anatomy	Pal, Gaya Prasad	1993
Statistical and Digital signal processing; Application to communications; Speech geophysics; Radar & Sonar	Prasad, Surendra	1988
Statistical physics and condensed matter physics	Barma, Mustansir	1995
Stochastic control	Borkar, Vivek Shripad	1992
Structural and metamorphic geology; Precambrian geology	Naha, Kshitindramohan	1972
Structural biology & Physical biochemistry of proteins and enzymes	Prakash, Vishweshwaraiah	1996

Structural geology; Precambrian geology	Sengupta, Sudipta	1991
Structural mechanics; Composite material; Finite element method	Prathap, Gangan	1990
Structuralbiology; Biophysical chemistry; Molecular biology	Brahamchari, Samir Kumar	1990
Studies on Ionosphere; Space research	Mitra, Ashesh Prosad	1968
Subfactors; Operator algebra	Sunder, Vaikalathur Shankar	1996
Sugar chemistry and technology	Ramaiah, Nanduri Atchuta	1966
Supersymmetry; Z-boson physics; Higgs particles and Astroparticle physics	Raychaudhuri, Amitava	1997
Surface engineering, High temperature deformation behaviour	Sundararajan G	1994
Synthesis of natural products; Organometallic chemistry	Chandrasekaran, Srinivasan	1989
Synthetic and mechanistic organic chemistry	Kessar, Satinder Vir	1972
Synthetic organic chemistry; Stereochemistry	Ghatak, Usha Ranjan	1974
Taxonomy and biology of fungi; History and physiology of science	Subramanian, Chirayathumadom Venkatachalier	1965
Tectonics & Geodynamics; Stratigraphy; Himalayan geology; Ophiolites; Gondwana geology	Acharyya, Subhrangsu Kanta	1984
Theoretical (computational) molecular reaction dynamics	Sathyamurthy, Narayanasami	1990
Theoretical (Computational) molecular reaction dynamics	Satyamurthy, Narayanasami	1980
Theoretical and	Gadre, Shridhar	1993

Computational Chemistry	Ramachandra	
Theoretical chemistry	Deb, Bidyendu Mohan	1981
Theoretical chemistry	Sebastian, Kizhakeyil Lukose	1995
Theoretical chemistry; Computer application in chemistry	Ray, Naba Kishore	1983
Theoretical chemistry; Magnetic resonance	Narasimhan, Palliakaranai Thirumalai	1970
Theoretical condensed matter physics; Magnetism; Strongly correlated electron systems; Statistical mechanics & quantum field theory; Science of complexity	Baskaran, Ganapathy	1990
Theoretical geophysics; Philosophy of science	Negi, Janardan Ganpatrao	1980
Theoretical high energy particle physics	Roy, Probir	1987
Theoretical high energy physics	Das, Sumit Ranjan	1998
Theoretical Physics; High energy physics	Sen, Ashoke	1994
Theoretical physics; High energy physics; Nonlinear dynamics	Singh, Virendra	1973
Theoretical physics; Non linear dynamics	Lakshmanan, Muthusamy	1989
Theoretical solid state physics; Superconductivity; Nonlinear optics; Photonics; and Raman spectroscopy	Jha, Sudhanshu Shekhar	1979
Theoretical statistical mechanics	Dhar, Deepak	1991
Theory of equations of zeta-functions	Chandrasekharan, Komaravolu	1959
Theory of Lie groups and Algebraic groups	Prasad, Gopal	1989

Theory of numbers	Shorey, Tarlok Nath	1987
Toxicology; Pathology	Zaidi, Sibte Hasan	1963
Viral hepatitis; Molecular Virology	Panda, Subrat Kumar	1995

Biological Sciences

Virology	Seth, Pradeep	1986

1977 **Anand Kumar, Trichnopoly Chelvaraj (**DOB: 18 June 1936), *Sp: Reproductive biology & fertility regulation; Neuroendocrinology; Primate biology; electron microscopy.* Hope Clinic Pvt. Ltd., 12, Aga Abbas Ali Road, Bangalore 560 042. Tel (080) 5599607, Fax 5598286, **Email : anand @ giasbg01.vsnl.net.in**

Citation Dr Anand Kumar has to his credit major contributions in the area of neuro-endocrinology of primate reproduction. He has demonstrated the presence of gonadal hormones in the cerebro-spinal fluid (csf) and their transport to the brain. His work on fertility regulation, especially the administration of contraceptive steroids through the nasal route which results in their preferential transfer into the csf, is of distinct advantage in developing newer approaches to contraception.

1964 **Athwal, Dilbagh Singh (**DOB: 12 October 1928*)*, *Sp: Genetics & Plant Breeding.* 2206 TIIU Court, Toms River, NJ 08755, USA.

Citation Dr Athwal, Prof.essor of Plant Breeding, Punjab Agricultural University, Ludhiana, has made important contributions to knowledge on genetics of rust resistance in wheat. His recent contributions relate to the genetics and breeding of pearl millet, gram, wheat and tobacco, the most outstanding being the development of the first commercial hybrid in *bajra*. Hybrid Bajra No. 1 developed by him has demonstrated its potential to give nearly double the yield obtained from the traditional variety and heralds a new era in the cultivation of this important foodgrain. The cytoplasmic male sterile lines and a large number of genetic stocks developed by him will make a significant contribution in future research on *bajra* breeding and genetics.

1962 **Bachhawat, Bimal Kumar (**DOB: 16 August 1925*)*, *Sp: Biochemistry; Neurochemistry; Liposomes; Immunology*. **Expired.**

Citation Dr Bachhawat has contributed to knowledge on the metabolism of mucopolysaccharides, gangliosides and cerebrosulphatides, especially in relation to brain function.

1974 **Barnabas, John (**DOB: 12 October 1929), *Sp: Molecular evolution*. **Expired.**

Citation Prof. Barnabas has made important contributions in the field of evolutionary genetics through his studies on the sequences of amino acids in haemoglobin of mammals. His work has contributed to having a deeper understanding of evolution. Prof. Barnabas has developed methods which make it possible to use molecular structure to measure evolutionary distance as well as rates of evolutionary change. His work is marked by experimental ingenuity and incisiveness.

1979 **Bhaduri, Amar Nath (**DOB: 11 November 1935), *Sp : Enzymology; Parasite biochemistry; Parasitology*. Indian Institute of Chemical Biology, 4 Raja S C Mullick Road, Calcutta 700 032. Tel (033) 4733491,4375197 (O), 4735832,4178424(R), Fax 4730284, **Email : iichbio @ giascl01.vsnl.net.in**

Citation Prof. Bhaduri has made significant contributions to the study of the enzyme UDP glucose 4-epimerase. He has thrown new light on the regulatory properties of enzymes catalyzing freely reversible reactions. His work has led to a deeper understanding of the molecular mechanism of allostericity. It constitutes a notable contribution to our understanding of enzymology.

1994 **Bhattacharya, Alok (**DOB: 2 February 1951*), Sp: Molecular parasitology.* School of Life Sciences, Jawaharlal Nehru University, New Delhi-110 067. Tel 6560016, 6133295 (R), Fax 6865866

Citation Dr Bhattacharya has done pioneering work on the identification and characterization of lipophosphoglycan and its modulation by bacterial flora, and a novel species-specific calcium binding protein and its gene, in *Entamoeba histolytica*. Identification of these molecules has opened up avenues to understand pathogenesis at the molecular level.

1988 **Bhattacharyya, Bhabatarak (**DOB: 2 December 1944*), Sp: Protein chemistry; structure and functions of proteins; Fluroscence spectroscopy in proteins*. Department of Biochemistry, Bose Institute, Centenary Building, P- 1/12 CIT Scheme VII M, Calcutta-700 054. Tel (033) 3379416/ 9544/ 9219, Fax 3343886, **Email:bablu@ boseinst.ernet.in**

Citation Dr Bhattacharyya has made significant contributions to the understanding of tubulin-microtubule system. His studies on colchicine-tubulin interaction indicate that the irreversible binding of colchicine is possibly due to the carbonyl group on the side chain of B-ring.

1972 **Biswas, Birendra Bijoy (**DOB: 1 March 1928*), Sp: Plant Biochemistry; Molecular Biology; Genetic Engineering*. Department of Biophysics, Calcutta University, 92, Acharya Prafulla Chandra Road, Calcutta-700 009. Tel (033) 3510359 (O), 3348649 (R), Fax 3510360, **Email : bbbiswas @ cubmb.ernet.in**

Citation Prof. Biswas has done significant work on regulation of RNA and protein synthesis in the cell, particularly plant cell. He has contributed to understanding the metabolic cycle involving glucose-6-P and myoinositol phosphates during the formation and germination of seeds. His studies have opened up new vistas in the transcription process in higher organisms as well as in the regulation of some of the enzyme functions in relation to biosynthesis of inositol phosphates.

1990 **Brahmachari, Samir Kumar (**DOB: 1 January 1952)*, Sp: Structural biology; Biophysical chemistry; Molecular biology*. Centre for Biochemical Technology, Mall Road, Delhi-110 007. Tel (011) 7257298, 7257578(O), 6832601(R), Fax 7257471, **Email : csircbt@del2.vsnl.net.in;skb @ cbt.res.in**

Citation Dr Brahamchari has made contributions in regard to functional interactions of DNA. His work has helped to elucidate the sequence dependence of the conformation of Z-DNA. He and his associates have shown that the action of certain restriction endonucleases is sensitive to local conformational alterations and the Z-conformation blocks the action of *Escherichia coli* DNA polymerase-1.

1979 **Chandrashekaran, Maroli Krishnayya (**DOB: 4 January 1937)*, Sp: Chronobiology field ethology; Animal behaviour and neurophysiology*. Department of Animal Behaviour, Jawaharlal Nehru Centre for Advanced Scientific Research, Jakkur P.O., Bangalore-560 064. Tel (080) 8462750-7(O), 640700 (R), Fax 8462766, **Email : mkc @ jncasr.ac.in**

Citation Prof. Chandrashekaran has done significant work on biological rhythms in plants and animals. His work on the circadian rhythms of tropical mammals, especially the bats which exchange ultrasonic sound information in the cave environment, has led to an understanding of the existence of social synchronization of these rhythms. Another notable contribution of Prof. Chandrashekaran is elucidation of 'eclosion clock' in the fruit-fly *Drosophila*.

1992 **Chatterji, Dipankar (**DOB: 20 April 1951), *Sp: Biophysical chemistry; Molecular biology.*

Molecular Biophysics Unit, Indian Institute of Science, Bangalore - 560 012. Tel (080) 3092612 (O), Fax 3341683, 3342085

Citation Dr Chatterji has studied the mechanism by which RNA polymerase of *Escherichia coli* gets switched from the initiation to elongation mode and also mapped the active site geometry of the enzyme. He has shown that the sigma subunit is released from RNA polymerase after it has transcribed a short transcript of 3-7 nucleotides.

1980 **Datta, Asis** (DOB: 2 February 1944), *Sp: Molecular biology*. Jawaharlal Nehru University, New Delhi-110 067. Tel (011) 6162016 (O), 6167557 Ext 2001 (VC,O), 6862623 Ext 2701(R), Fax 6198234, 6165886, **Email: adatta @jnuniv.ernet.in**

Citation Prof. Datta has done significant work in the field of molecular biology. His work on gene regulation in yeast using an inducible N-acetylglucosamine catabolic pathway is a notable contribution and has advanced knowledge on the mechanism of gene expression in eukaryotes.

1992 **Dharmalingam, Kuppamuthu** (DOB: 3 January 1949), *Sp: Biotechnology; Molecular Genetics; Genetic Engineering*. School of Biotechnology, Madurai Kamaraj University, Madurai-625 001. Tel (0452) 859115, 859280 (O), 85448 (R), Fax 895105, **Email : dhar % bic-mku @ imtech.in**

Citation Dr Dharmalingam was the first to discover the induction of mutagenic DNA repair during restriction of nonglucosylated T4 DNA in *Escherichia coli*. He also discovered in this system the alleviation of restriction by SOS functions. He has characterized the *rgl*A (*mcr*A) and *rgl*B (*mcr*B) components of the *rgl (mcr)* restriction system.

1976 **Dutta, Guru Prakash** (DOB: 19 November 1933)*, Sp: Protozoology; Cell biology; Malaria; Amoebiosis; Leishmaniasis; Immunology*. Division of Microbiology, Central Drug Research Institute, Post Box No. 173, Chattar Manzil, Lucknow-226001. Tel (0522) 32411 (O), 331932 (R)

Citation Dr Dutta's work has been aimed at getting an understanding of the functional morphology of the various components of the protozoa. He has developed new techniques for their culture. He has also elucidated the metabolic and growth responses of several micro-organisms, including *Entamoeba histolytica*, to various physico-chemical factors. Dr Dutta's main field of activity has been experimental protozoology.

1984 **Easwaran, Kalpathy Ramaier Katehap** (DOB: 7 July 1939), *Sp: Molecular biophysics; Magnetic resonance spectroscopy.* Molecular Biophysics Unit, Indian Institute of Science, Bangalore-560 012. Tel (080) 3344411, 3092611, 3092713(O), 3415221(R), Fax 3341683, **Email : krke @ mbu.iisc.ernet.in**

Citation Dr Easwaran has made important contributions in respect of conformational, mechanistic and kinetic aspects of transmembrane ion transport mediated by carrier ionophores which have led to a possible model at molecular level for transmembrane cation transport.

1993 **Gadagkar, Raghavendra** (DOB: 28 June 1953), *Sp: Insect sociobiology and the Evolution of social life in Animals*. Centre for Ecological Sciences, Indian Institute of Science, Bangalore-560 012. Tel (080) 3314463, 3092340 (O), 3319758 (R), Fax 3315429, 3341683, **Email : ragh @ ces.iisc.ernet.in**

Citation Dr Gadagkar has discovered the phenomena of behavioural caste differentiation and pre-imaginal caste bias in eusocial insects. He has demonstrated that differential larval nutrition is a major determinant of social differentiation.

1986 **Gadgil, Madhav Dhananjaya** (DOB: 24 May 1942), *Sp: Ecology; Environment and development*. Centre for Ecological Sciences, Indian Institute of Science, Bangalore-560 012. Tel (080) 3315453, 3340985 (O), 3346376 (R), Fax 3315428, 3341683, **Email : madhav @ ces.iisc.ernet.in**

Citation Prof. Gadgil has made significant contributions to ecology, population biology and the theory of evolution of social behaviours.

1963 **Ganguly, Jagannath** (DOB: 1 April 1921), *Sp: Biochemistry of lipids and vitamin A.* 281 Raja Mahal Vilas Extension, Bangalore-560 080. Tel (080) 3341304 (R)

Citation Prof. Ganguly is internationally known for his work on the metabolism of vitamin A, biosynthesis of fatty acids and intestinal absorption of lipids.

1997 **Gowrishankar, Jayaraman** (DOB: 24 March 1956), *Sp: Microbial and molecular genetics; Physiology and gene regulation.* Centre for Cellular and Molecular Biology, Uppal Road, Hyderabad-500 007. Tel (040) 7172241, 7172513 (O), Fax 7171195, **Email : shankar @ ccmb. ap.nic.in**

Citation Dr Gowrishankar has made significant contributions in elucidating the molecular genetics of osmoregulation in *Escherichia coli* with important biotechnological applications. This work has led to the development of a salt inducible expression vector. Recently, he has developed an imaginative bacterial system to demonstrate that mutations can arise in stationary state bacteria.

Gupta, Chhitar Mal (DOB: 1 September 1944), *Sp: Membrane and molecular genetics; Physiology and gene regulation*. Central Drug Research Institute, Chattar Manzil, P.O.-173, Lucknow-226 001. Tel (0522) 223286, 214219, 210932 (O), 321625, 322552 (R), Fax 223405, 223938, **Email: root %**
1985 **cdrilk@ sirnetd.ernet.in**

Citation Dr Gupta has made significant work aimed at gaining understanding of the basis of phospholipid asymmetry in biological membranes.

1973 **Guraya, Sardul Singh** (DOB: 12 October 1930*), Sp: Reproductive physiology; Cell and development biology*. Department of Zoology, Punjab Agricultural University, Ludhiana-141 004. Tel (0161) 401960 Extn 240(O), 452434 (R), Fax 400945

Citation Dr Guraya's main contributions have been in the fields of cell biology and reproduction. Dr Guraya's work on histology and ultra-structure of the mammalian ovary has thrown light on folliculogenesis and steroidogenesis. His research on follicular atresia has enabled gaining understanding of the buiding up of interstitial tissue and the latter's part in hormone formation.

1995 **Hasnain, Seyed Ehtesham** (DOB: 13 April 1954), *Sp: Molecular Biology*. National Institute of Immunology, H-8, NII Campus, Aruna Asaf Ali Marg, New Delhi - 110 067. Tel (011) 6189622, 6162231, 6167623 (O), 6184753 (R), Fax 6162125, 6177626, **Email : ehtesham @ nic.ernet.in**

Citation Dr Hasnain has made pioneering contributions to understanding the fundamental process involved in gene expression in the baculovirus system. His discovery of an unusual host protein factor that binds to previously unknown DNA sequence motifs of the baculovirus polyhedrin gene producer opens up a new horizon in the regulation of transcription of very late viral genes.

1966 **Jain, Hari Krishan** (DOB: 28 May 1930), *Sp: Cytogenetics and plant breeding*. 40, Surya Niketan, Vikas Marg Extn., Delhi-110 092. Tel (011) 2152560, 2143451 (R), Fax 5754640, 5753678

Citation Dr Jain has made extensive contributions in the field of genetic recombination, including its mechanism and regulation, more particularly its control at interchromosome level. A new hypothesis on such a control has been developed and considerable experimental evidence has been obtained in support of it. Dr Jain's work on tomato and later on *Drosophila* has provided what is regarded as perhaps the first convincing evidence in support of the phenomenon of mutagen specificity. Manipulation of mutation rates and spectrum has been one of the main objectives of contemporary mutation research. Dr Jain's work has been an important contribution in this direction. His other studies relate to the synthesis of RNA in plant cells, more particularly the demonstration of hyperactive nature of the nucleolus-organizing in this synthesis.

1982 **Jayaraman, Ramamirtha** (DOB: 10 October 1937), *Sp: Microbial/ Molecular genetics*.

Department of Molecular Biology, School of Biological Sciences, Madurai Kamaraj University, Madurai-625 021. Tel (0452) 858210 (O), 858469 (R), Fax 859105, **Email : molbio % bic.mku @ imtech.ernet.in**

Citation Dr Jayaraman has done significant work on the genetics of bacteria in relation to control of transcription. His studies have provided direct genetic evidence for the participation of accessory factors in transcription. His contributions include interactions of these factors with RNA polymerase.

1971 **Kanungo, Madhu Sudan (**DOB: 1 April 1927), *Sp: Biochemistry; Molecular biology*. Department of Zoology, Banaras Hindu University, Varanasi-221 005. Tel (0542) 316801 Extn 354 (O), 316540 (R), Fax 317074, **Email : kanungo @ banaras.ernet.in**

Citation Dr Kanungo has to his credit certain new approaches to the study of the changes in some key enzymes of the brain, heart, muscle and liver of the rat in relation to ageing processes. He has been able to identify the changes in the qualitative nature of enzymes, their modulation by various regulators, and induction and repression of their syntheses by hormones as the function of age.

1981 **Kumar, Sushil** (DOB: 14 December 1940)*, Sp: Molecular & general genetics; Plant microbe interaction; Genetic engineering; Plant breeding; Human Resource Development*. Central Institute of Medicinal & Aromatic Plants, Lucknow-226 015. Tel (0522) 342683 (O), 389609 (R), Fax 342666**, Email : root @ cimap.sirnetd.ernet.in**

Citation Dr Sushil Kumar has made significant contributions in the broad area of gene expression in *Escherichia coli* and its phage lambda. His principal contributions involve the demonstration that the dispensable cAMP-receptor protein complex determines adaptation in bacteria by controlling the structure of cell wall. His recent contribution on mutants of *Rhizobium* having high nitrogen fixing ability has far-reaching implications in agriculture.

1989 **Lakhotia, Subhash Chandra (**DOB: 4 October 1945), *Sp: Cytogenetics; Molecular biology*. Department of Zoology, Banaras Hindu University, Varanasi-221 005. Tel (0542) 316145 (O), 312012 (R) Fax 317457, **Email : lakhotia @ banaras.ernet.in**

Citation Prof. Lakhotia has made outstanding contributions to the fields of cytogenetics and cell biology. His work has shed important light on chromosome organization and replication in *Drosophila* and heat shock response at the 93D locus of *Drosophila melanogaster.*

1972 **Maheshwari, Satish Chandra (**DOB: 4 October 1933), *Sp: Plant physiology; Biochemistry; Plant Molecular biology*. International Centre for Genetic Engineering & Biotechnology, Aruna Asaf Ali Road, New Delhi-110 067. Tel (011) 6181242 (O), Fax 6162316 **Email : maheshwari @ icgebnd.ernet.in**

Citation Prof. Maheshwari has made significant contributions in plant and cell physiology, particularly in the physiology and biochemistry of growth and differentiation in plants. His researches have led to isolation of cytokinins and gaining understanding of their role in flowering.

Prof. Maheshwari and his group have recently discovered the technique of raising haploid plants by anther culture. Development of haploids by anther and pollen culture technique makes possible the establishment of homozygous lines in plants and opens the area of biochemical genetics of higher plants.

1995 **Muniyappa, Kallapa (**DOB: 8 September 1952*), Sp: Molecular genetics; Molecular biology*. Department of Biochemistry, Indian Institute of Science, Bangalore-560 012. Tel (080) 3092235, 3092309 (O), 3378192 (R), Fax 3341683, 3341814, **Email : kmbc @ biochem.iisc.ernet.in**

Citation Dr Muniyappa has made outstanding contributions to the elucidation of the molecular basis of homologous genetic recombination. In particular, he has used RecA paradigm to understand the effects of chromatization of DNA on homologous pairing and strand exhange which has opened up new vistas to discern this complex phenomenon at the cellular context, which has implications for

robust gene targeting.

1993 **Murthy, Mathur Ramabhadrashastry Narasimha (**DOB: 27 April 1950), *Sp: Structural biology; Macromolecular crystallography*. Molecular Biophysics Unit, Indian Institute of Science, Bangalore-560 012. Tel (080) 3092612 (O), 3372981 (R), Fax 3341683, 3342085, **Email : mrn @ mbu.iisc.ernet.in**

Citation Dr Murthy and his group have worked out the three-dimensional structure of *Sesbania* mosaic virus at 2.9Å resolution by X-ray diffraction technique. His contributions have sharpened the understanding of how the complex molecular assemblies are put together in viruses.

1973 **Murty, Bhyravabhotla Radhakrishna (**DOB: 4 April 1928), *Sp: Biometry; Genetics; Radiation genetics*. 5087, B-7, Vasant Kunj, New Delhi-110 070. Tel 6897856 (R)

Citation Dr Murty, an outstanding biometrical geneticist, has developed a new school of thought utilizing multivariate analysis for assessment of genetical divergence of crops with different breeding systems. His basic approach on the selection of developmental traits in both self- and cross-pollinated crops has helped considerably in the improvement of grain quality, disease resistance and productivity of agricultural crops.

1994 **Nagaraj, Ramakrishnan (**DOB: 10 February 1953), *Sp: Biophysics; Membrane biochemistry; Protein biochemistry.* Centre for Cellular and Molecular Biology, Hyderabad - 500 007, 12-13-483/5, Nagarjunanagar, Tarnaka, Hyderabad-500 007. Tel (040) 7172241 (O), 7019882 (R), Fax 7171195 **Email : nraj @ ccmb.ap.nic.in**

Citation Dr Nagaraj has made contributions towards delineating structure-activity relationships for membrane targeting signal peptides and peptide antibiotics. His work has successfully established the separation of hemolytic and antibacterial properties in synthetic analogs of bacterial toxins leading to possibilities in rational design of antibiotic peptides.

1971 **Nair, Narayana Balakrishnan (**DOB: 6 July 1927), *Sp: Ecology; Marine biology; Fisheries; Conservation and management of aquatic resources.* Department of Aquatic Biology and Fisheries, University of Kerala, Thiruvananthapuram-695 007. Tel (0471) 500138 (O), 323746 (R)

Citation Prof. Balakrishnan Nair has carried out extensive researches on marine fouling organisms. During the past five years, he has made outstanding contributions to our knowledge on the wood-boring molluscs, particularly the mechanism of boring of timber by them.

1983 **Padmanaban, Govindarajan (**DOB: 20 March 1938), *Sp: Eukaryotic gene expression.*. Department of Biochemistry, Indian Institute of Science, Bangalore-560 012. Tel (080) 3092213, 3092540, 3341690(O), 3342223 (R), Fax 3341683/936, **Email : diroff @ admin.iisc.ernet.in; geopee @ biochem.iisc.ernet.in**

Citation Prof. Padmanaban has to his credit significant work on haemoprotein biosynthesis. His work has helped in gaining understanding of the regulation of the biosynthesis of cytochrome P-450 and cytochrome oxidase. His work is of importance in elucidating the molecular basis of drug metabolism.

1991 **Pandey, Virendra Nath (**DOB: 8 October 1947)*, Sp: Protein chemistry; Molecular biology.* Biochemistry Division, Bhabha Atomic Research Centre, Bombay-400 085.

Citation Dr Pandey has demonstrated the presence of a DNA recombinase enzyme complex associated with the thymic nuclear matrix of young rats. The complex specifically occurs in prelymphocytes and is presumably involved in the rearrangement and recombination of genes for the generation of immunodiversity in vertebrates.

1984 **Pandian, Thavamani Jegajothivel (**DOB: 15 June 1939), *Sp: Biology; Animal energetics and genetics; Aquaculture; Fish genetics and breeding.* School of Biological Sciences, Madurai Kamaraj University, Madurai-625 021. Tel (0452) 858212, 858230 (O), 640139 (R), Fax 859139, 531056,

Email : tjp % bic-mku @ dbt.ernet.in; mathavan @ pronet.xlweb.com

Citation Prof. Pandian has done significant work in the fields of bioenergetics and animal ecology and has developed a prediction model for transformation of food energy into growth and metabolism.

1982 **Podder, Sunil Kumar (**DOB: 1 February 1939), *Sp: Biophysical chemistry*. Department of Biochemistry, Indian Institute of Science, Bangalore-560 012. Tel (080) 3092213 (O), Fax 3341683/936

Citation Prof. Podder has made notable contributions on the chemical specificity of the recognition process in biological systems. He has demonstrated that specificity can be expressed quantitatively in terms of free energy of association of amino acids of proteins with nucleic acid bases. He has also studied protein-carbohydrate interaction in a model membrane system.

1996 **Prakash, Vishweshwaraiah (**DOB: 23 November 1951), *Sp: Structural biology & Physical biochemistry of proteins and enzymes*. Central Food Technological Research Institute, Mysore-570 013. Tel (0821) 517760 (O), 510054 (R), Fax 516308, **Email : prakash @ nicfos.ernet.in**

Citation Dr Prakash for his work encompassing structure-function relationship and structural homology of seed proteins bearing on ligand binding, association-dissociation and denaturation profiles of these proteins. His work has been fundamental to understanding the behaviour of a number of seed proteins and enzymes in many diverse solvents from the point of view of their stabilisation and destabilisation. The above work has generated an in-depth knowledge and signifies deep understanding of the structural biology of seed proteins from the biophysical angle.

1997 **Rao, Kanury Venkata Subba (**DOB: 27 September 1958), *Sp: Peptide-based vaccines for viral infections and peptide-based immunodiagnostics.* International Centre for Genetic Engineering and Biotechnology, NII Campus, Aruna Asaf Ali Marg, New Delhi-110 067. Tel (011) 6176680 (O), (0124) 367332 (R), Fax 6162316, **Email : kanury @ icgeb.res.in**

Citation Dr Subba Rao has made outstanding contributions in the design of synthetic peptide vaccines based on the regeneration of conformational epitopes and self association of such peptides to give high immunogenicity in humans. He has also contributed significantly to the understanding of the antigen-specific B cell selection and amplification. He has also been involved in the development of HIV diagnostics.

1988 **Rao, Manchalhalli Rangaswami Satyanarayana (**DOB: 21 January 1948), *Sp: Molecular genetics and Biochemistry.* Department of Biochemistry, Indian Institute of Science, Bangalore-560 012. Tel (080) 3092547 (O), 3303236 (R), Fax 3341683, **Email : mrsrao@biochem.iisc.ernet.in**

Citation Prof. Rao has made vital contributions towards our understanding of the molecular mechanism of meiosis during spermatogenesis. He has identified several testis-specific proteins which may be involved in modulating the chromatin structure.

1966 **Rao, Neelamraju Ganga Prasada** (DOB: 5 September 1927), *Sp: Plant breeding and genetics*. HIG(OG), Block 10, Plot 4, Baghlingampally, Hyderabad - 500 044. Tel (040) 7618184 (R)

Citation Dr Rao has made important contributions in the field of sorghum breeding, leading to the release of the first commercial sorghum hybrids, CSH-1 and CSH-2 in India. Subsequently, a high yielding variety, *Swarna*, that equalled the commercial hybrid CSH-1 in yield levels, was developed and released for general cultivation. The performance of the first hybrids, following their release, demonstrated that the average yields of this rain-fed crop could be stablized at 2000-2500 kg/hectare as against the national average of only 400-500 kg/hectare. Maximum yields of the order of 7000 kg/hectare were recorded under optimum conditions. These hybrids also performed well in several African, South East Asian and Latin American countries. The advent of the hybrids has given rise to an organized hybrid sorghum seed industry in both public and private sectors.

1989 **Ray, Manju (**DOB: 1 January 1947), *Sp: Enzymology; Metabolic regulation; Bioenergetics; Tumor*

biochemistry. Department of Biological Chemistry, Indian Association for the Cultivation of Science, Jadavpur, Calcutta-700 032. Tel (033) 4734971, Fax 4732805, **Email : bcmr@iacs.ernet.in**

Citation Dr Ray has firmly placed methylglyoxal, a biochemical enigma for a long time, as an integral component of carbohydrate and intermediary metabolism by isolation, purification and characterization of a series of enzymes involved in its anabolism and catabolism.

1960 **Sadasivan, Toppur Seethapathy (**DOB: 22 May 1913), *Sp: Physiological plant pathology; Soil microbiology.* "Gokulam", 86/1 MK Amman Koil Street, Mylapore, Chennai - 600 004. Tel (044) 4980181 (R)

Citation Dr Sadasivan is well known for his work in mycology and plant pathology. His work on fungal wilts has attracted wide attention. His research work has considerable bearing on such fundamental concepts as production of toxins and antibiotics in soil and in the rhizosphere of plants and the changes in the physiology of the host. His recent studies concern the occurrence of blast disease of rice and its relationship with night temperatures. This has explained the hitherto unsolved problems of the causes of breakdown of resistance in rice to blast.

1991 **Saidapur, Srinivas Kishanrao (**DOB: 7 March 1947), *Sp: Biology of reproduction; Comparative endocrinology.* Department of Zoology, Karnatak University, Dharwad-580 003. Tel (0836) 348047 (O), 744857 (R), Fax 348047, 347884, **Email : unikard@renbak.delhi.nic.in**

Citation Dr Saidapur has contributed to comparative endocrinology of amphibians. He has elucidated the diverse patterns of reproductive processes and their control mechanisms in tropical anurans.

1981 **Sane, Prafullachandra Vishnu (**DOB: 24 December 1937), *Sp: Plant biochemistry; Photosynthesis*. National Botanical Research Institute, Lucknow-226 001. Tel (0522) 271031-35 (O), 372201 (R), Fax 282849, 282881, **Email : manager @ nbri.sirnetd.ernet.in**

Citation Dr Sane has done significant work in the area of structure and function of the cellular organelle chloroplast involved in photosynthesis. This has been achieved by proposing the most likely locations of certain important enzymes in the thylakoid system. His suggestion of the role of proton translocating proteins in the chloroplast membranes has wide significance in proton movement across the membrane. His studies on light emission from photosynthetic membranes have contributed to the understanding of energy storage during electron transport.

1998 **Sarkar, Debi Prasad (**DOB: 15 January 1958), *Sp: Molecular virology; Cell biology; Immunology; Model membrane & Drug targeting.* Department of Biochemistry, University of Delhi South Campus, Benito Juarez Marg, Dhaula Kuan, New Delhi-110 021. Tel (011) 6881967/6112150 (O), 5544371 (R), Fax 6886427, 6885270

Citation Dr Sarkar has made outstanding contribution in developing reconstituted sendai viral envelops containing only the fusion protein for efficient gene delivery for therapeutic application.

1978 **Sasisekharan, Visvanathan (** DOB: 28 June 1933), *Sp: Biomolecular structure; Chemical Physics; Quantum chemistry; Biochemistry.* Department of Chemical Engineering, Massachusettes Institute of Technology, Cambridge, MA 02139, USA. Tel (001-617) 3543510 (R), (001-617) 3542455, **Email:sasi@mit.edu**

Citation Prof. Sasisekharan, has done significant work on the conformation of biopolymers, specially polynucleotides and polypeptides. He has developed incisive methods for arriving at optimal conformations of macromolecules. These methods have led him to suggest an alternative model for the Watson-Crick double helical structure of DNA. This model permits separation of polynucleotides without uncoiling and provides a novel solution to an unsolved paradox in biology.

1975 **Sharma, Archana (**DOB: 16 February 1932), *Sp: Genetics; Chromosomes; Genetic toxicology*. Department of Botany, Calcutta University, 35, Ballygunge Circular Road, Calcutta-700 019. Tel (033) 4753681/2 (O), 4405802 (R), Fax (033) 4748490

Citation Prof. (Mrs) Sharma has done significant work on chromosomes of plant and human systems, with special reference to differentiation and mechanisms of evolution. New techniques developed by her for studies on chromosomes have had a significant impact in the field of plant and human genetics.

1967 **Sharma, Arun Kumar** (DOB: 31 December 1924), *Sp: Cytogenetics; Cytochemistry;Cell biology.* Centre for Advanced Studies in Botany, Calcutta University, 35, Ballygunge Circular Road, Calcutta -700 019. Tel (033) 4753682 (O), 4405802 (R), Fax 4748490

Citation Prof. Sharma has built up an active school of research on cytogenetics and cytochemistry. He and his colleagues have developed a number of new techniques for the study of detailed chromosome strucutre of plants. A new concept of speciation in plants reproducing through sexual means has been developed and established by his group. He was able to induce division in adult nuclei through the application of chemicals and this has importance in cell rejuvenescence.

1975 **Siddiqi, Obaid** (DOB: 7 January 1932), *Sp: Genetics; Neurobiology.* National Centre for Biological Sciences, T I F R Centre, Indian Institute of Science Campus, Bangalore-560 012. Tel (080) 3343035(O), 3411372 (R), Fax 3343851, **Email : osiddiqi @ ncbs.tifrbng.res.in**

Citation Prof. Siddiqi has done significant work in molecular biology with special reference to transfer and recombination of DNA in micro-organisms and genetic regulation of protein synthesis. His studies have helped in clarifying the relationship between DNA replication and recombination.

1980 **Singh, Jamuna Sharan** (DOB: 26 December 1941), *Sp: Ecology; Ecosystems analysis; Ecophysiology*. Department of Botany, Banaras Hindu University, Varanasi-221 005. Tel (0542) 317099 (O), 317593 (R), Fax 317074, **Email : jssingh @ banaras.ernet.in**

Citation Dr Singh has done pioneering work in the field of ecology with reference to grassland ecosystems, enunciating new concepts on trophic biomass relations, eco-physiology, energy flow, diversity and mathematical modelling of tropical grasslands. His contributions have added substantially to knowledge on the structure and function of grassland ecosystems in general and tropical grasslands in particular, which have important implications in their management.

1976 **Singh, Kishan** (DOB: 10 July 1931), *Sp: Plant pathology; Phytonematology; Plant protection in sugarcane*. 9 D, MIG Flats, Sheikh Sarai Part-I, New Delhi-110 017.

Citation Dr Singh has to his credit major contributions in sugarcane pathology and has organized under his leadership active teams of applied research in the field of sugarcane cultivation. His work in crop pathology covers a wide canvas, including viruses, mycoplasmas, fungi and nematodes. Of special significance are his contributions on epidemiology and control of sugarcane diseases, association of mycoplasma with grassy shoot disease and its control by hot air therapy.

1987 **Sopory, Sudhir Kumar** (DOB: 7 January 1948), *Sp: Molecular plant physiology; Photoreceptor biology; Nitrogen metabolism; Plant tissue culture. Plant Molecular Biology.* International Centre for Genetic Engineering and Biotechnology, Aruna Asaf Ali Marg, New Delhi-110 067. Tel (011) 6189358-61, 6175102 (R), Fax 6162316, **Email : sopory@hotmail.com**

Citation Prof. Sopory has done important work in the field of physiology of plant growth and development. His researches have led to a better understanding of the mode of action of phytochrome, and the possible involvement of calcium as a second messenger in higher plant cells.

1965 **Subramanian, Chirayathumadom Venkatachalier** (DOB: 11 August 1924), *Sp: Taxonomy and biology of fungi; History and physiology of science.* 19, Conran Smith Road, Gopalapuram, Chennai-600 086. Tel (044) 8234941(R)

Citation Prof. Subramanian has made significant contributions on taxonomy of *Fungi imperfecti*. His systematic exploration of the hyphomycete flora of India led to the discovery of many new and interesting genera. He has proposed a new system of classification of Hyphomycetes based on

conidium ontogeny. His studies on and original interpretations of conidium ontogeny based on cell-wall relationships have led to the formulation of a terminology based on new concepts. Prof. Subramanian is well known for his work on soil mycology and soil-borne plant diseases, and for his contributions to knowledge on the systematics, distribution and ecological behaviour of soil Fusaria, and on the nutritional physiology, mainly nitrogen utilization of plant pathogenic species of *Fusarium* and *Drechslera*.

1987 **Surolia, Avadhesha** (DOB: 3 December 1947), *Sp: Cell surface carbohydrates and biological recognition; Biophysical chemistry; Chemistry of proteins.* Molecular Biophysics Unit, Indian Institute of Science, Bangalore-560 012. Tel (080) 3092714, 3092389 (O) 3347149 (R), Fax 3341683**, Email : surolia @ mbu.iisc.ernet.in**

Citation Prof. Surolia has made important contributions to our understanding of the biological activities of lectins. He has elucidated the steps involved in the recognition of carbohydrates by lectins, by studying the molecular forces, thermodynamics and specificities involved in the interaction. His findings have enhanced our understanding of carbohydrate-mediated recognition processes in biological systems.

1961 **Swaminathan, Monkombu Sambasivan** (DOB: 7 August 1925), *Sp: Genetics and cytogenetics; Plant breeding; Agricultural research and development.* MS Swaminathan Research Foundation, 3rd Cross Street, Taramani Institutional Area, Chennai-600 113. Tel (044) 2351229, 2351698(O), 4345312 (R), Fax 2351319, **Email : mssrf.madras @ sm8.sprintrpg.sprint.com**

Citation Dr Swaminathan has set up a well-known school of research in the field of radiation genetics and mutation research at the Institute. His original contributions (1948-58) include elucidation of the origin of potato, dwarf coconut and bread wheat, nuclear cytology of yeasts, classification and genetics of polyploid plants, monosomic analysis in wheat, elucidation of the role of infection in heredity, relationship between chromosome associations and seed fertility in autopolyploids and standardization of techniques for overcoming interspecific incompatibility barriers. His later contributions (1959-64) relate to experimental manipulation of genes in a purposeful direction. This work has involved the introduction, selection and hybridization of a wide range of dwarf material by wheat containing the "Norin" dwarfing genes from Mexico and the use of a wide array of mutagens, both physical (X-rays, gamma-rays, fast and thermal neutrons, and β particles) and chemical (alkylating agents and free radicals).

1996 **Swarup, Ghanshyam** (DOB: 23 November 1953), *Sp: Molecular biology; Biochemistry; genetic engineering; Protein phosphorylation; Signal transduction.* Centre for Cellular and Molecular Biology, Uppal Road, Hyderabad-500 007. Tel (040) 7172241, (011) 7151836 (R), Fax 7171195, **Email : gshyam @ ccmb.ap.nic.in**

Citation Dr Swarup has made important contributions in the area of cell biology. Notably, he has discovered a novel nuclear protein tyrosine phosphatase and shown that this protein is a positive regulator of cell proliferation.

1968 **Venkitasubramanian Tathamangam Ananthanarayanan** (DOB: 1 January 1924), *Sp: Biochemistry of Tubercle bacilli.* Centre for Biochemical Technology, University of Delhi, Delhi-110 007.

Citation Dr Venkitasubramanian has done pioneering systematic investigations in India on the lipid metabolism of different strains of *Tubercle bacilli*. His researches on experimental tuberculosis have added significantly to knowledge on the biochemical pathology of the disease. These investigations help in early diagnosis of tuberculosis and in evolving effective chemotherapeutic agents. Studies carried out by him on cheap and commonly available plant proteins have useful implications in tackling the problem of protein malnutrition. He has developed several new and simple laboratory techniques for the analysis of biologically important compounds.

1998 **Vijay Raghavan, Krishnaswamy (**DOB: 3 February 1954), *Sp: Developmental Genetics*. National Centre for Biological Sciences, TIFR Centre, IISc Campus, Bangalore-560 012. Tel (080) 3345615, 3442133 (O), 3418504 (R), Fax (080) 3343851, **Email : vijay@ncbs.tifrbng.res.in ; vijay @ tifr.res.in**

Citation Dr Vijayraghavan has made outstanding contributions to the understanding of the role of homeotic genes in muscle development. His work on *Drosophila* flight muscle has been extremely incisive and makes a major contribution to our understanding of myogenesis.

Chemical Sciences

1985 **Vijayan, Mamannamana (**DOB: 16 October 1941), *Sp: Biological crystallography; Molecular biophysics.* Molecular Biophysics Unit, Indian Institute of Science, Bangalore-560 012. Tel (080) 3092459 (O), 3346765 (Lab), 3340031 (R), Fax 3341683, **Email : mv @ mbu.iisc.ernet.in**

Citation Prof. Vijayan has done significant crystallographic studies on proteins and complexes of amino acids and other small molecules.

1991 **Bagchi, Biman** (DOB: 1 January 1954*), Sp: Physical chemistry; Solution dynamics.* Solid State and Structural Chemistry Unit, Indian Institute of Science, Bangalore - 560 012. Tel (080) 3092795, 3092568, 3092336 (O), 3345236 (R), Fax 3341683, 3311310, **Email : bbagchi @ sscu.iisc.ernet.in**

***Citation* :** Dr Bagchi has made contributions in statistical mechanics, especially in the area of relaxation in salvation dynamics. Some of his thoeretical predictions have been experimentally established.

1986 **Balaram, Padmanabhan** (DOB: 19 February 1949*), Sp: Bioorganic chemistry; Molecular biophysics; Proteins.* Molecular Biophysics Unit, Indian Institute of Science, Bangalore - 560 012. Tel (080) 3092337, 3348535 (O), 3340962 (R), Fax 3341683, **Email : pb @ mbu.iisc.ernet.in**

Citation Prof. Balaram has done significant work on transmembrane peptide channels. He has employed NMR spectroscopy and other modern techniques for studying conformations of a variety of novel peptides. The work carried out by him is of value not only in peptide chemistry but also has considerable biological significance. Prof. Balaram has done extensive work on peptide synthesis.

1981 **Balasubramanian, Dorairajan** (DOB: 28 August 1939*), Sp: Biomedical Research; Eye lens protection; Biophysical chemistry; Spectroscopy.* L V Prasad Eye Institute, Road No. 2, Banjara Hills, Hyderabad - 500 034. Tel (040) 248098, 248267 (O), 7174787 (R), Fax 248271, **Email : dbala @ lveye.stph.net**

Citation Prof. Balasubramanian has made significant contributions in biophysical chemistry. His major studies pertain to peptide conformation, ion-peptide bonding, water structure and hydrophobic interactions, biomembrane models and photoregulation of membrane processes. He has effectively employed modern spectroscopic methods in solving problems of biological interest. His researches are characterized by their originality and interdisciplinary nature.

1965 **Basu, Sadhan** (DOB: 2 January 1922*), Sp: Polymer chemistry; Quantum chemistry; Molecular spectroscopy.* **Expired.**

Citation Dr Basu has established the geometry of molecular complexes in solution by detecting, analysing and assigning experimentally the vibrational structure of the charge transfer band which has given an additional support to Mulliken's quantum mechanical model for these systems.

1992 **Bhaduri, Sumit** (DOB: 22 October 1948*), Sp: Inorganic chemistry; Cement, Catalyst and Management*. Reliance Industries Limited, 9th Floor, Maker Chamber IV, Nariman Point, Mumbai - 400 021. Tel (022) 2847937 (O), Fax 2852228, 2045570, **Email : sumit_bhaduri @ ril.com**

Citation Dr Bhaduri has made important contributions to the synthesis and structure of certain new metal-carbonyl clusters and to the polymer-supported catalysis.

1975 **Bhakuni, Dewan Singh** (DOB: 30 December 1930*), Sp: Bio-organic chemistry; Chemistry of natural products; Nucleosides; Medicinal chemistry.* C-132, Nirala Nagar, Lucknow - 226 020. Tel (0522) 244273, 32411/12 (O), 322354 (R), Fax 223405, **Email : root cdrilk @ sirnet.ernet.in**

Citation Dr Bhakuni has done important work on several aspects of natural product chemistry. He has systematically examined a number of indigenous plants for biologically active compounds, determined their structures and stereochemistry and also synthesized them. His studies have uncovered biological activity in a number of new natural products. Particularly, notable is his work on the biogenesis of alkaloids.

1997 **Bhattacharyya, Kankan** (DOB: 17 November 1954*), Sp: Experimental physical chemistry; Laser spectroscopy; Biophysical chemistry.* Department of Physical Chemistry, Indian Association for the Cultivation of Science, Jadavpur, Calcutta - 700 032. Tel (033) 4735374 (O), 4359188 (R) Fax 4732805, **Email : pckb@mahendra.iacs.ernet.in**

Citation Dr Bhattacharyya has made outstanding contributions to unravel the ultrafast processes in complex biological and supramolecular assemblies using laser spectroscopy.

1962 **Bhattacharyya, Sasanka Chandra** (DOB: 31 August 1918) *Sp. Organic chemistry, Chemistry of natural products; Perfumery chemicals.* 35 C, Bagmari Road, Calcutta - 700 054. Tel (033) 3590520 (R)

Citation Dr Bhattacharyya has established a school of research which is recognized for its contributions on terpenes and related natural products, macrocyclic musk compounds and analytical chemistry. His work has led to the elucidation of structures and absolute configurations of many new terpenoids with unusual structural features. Methods for the synthesis of naturally occurring musk odorous compounds, including muscone, civetone dihydrocivetone, exaltone, exaltolide and ambrettolide developed by him are of considerable economic value. By adopting an "organic approach" he has contributed considerably towards the development of new organic reagents for inorganic analysis.

1998 **Chakravarty, Akhil Ranjan** (DOB: 20 May 1953*), Sp: Inorganic Chemistry*. Department of Inorganic & Physical Chemistry, Indian Institute of Science, Bangalore- 560 012. Tel (080) 3092382 / 3092533 (O), 3345407 (R), Fax 3341683, **Email : arc @ ipc.iisc.ernet.in**

Citation Dr Akhil Ranjan Chakravarty has made significant contributions to the understanding of reactivity and bonding in multicentered systems and demonstrated some core conversion processes in such compounds.

1975 **Chakravorty, Animesh** (DOB: 30 June 1935*), Sp: Inorganic chemistry; Structure and function of metal complex in living systems.* Department of Inorganic Chemistry, Indian Association for the Cultivation of Science, Calcutta - 700 032. Tel (033) 4724436, 4734971 (O), 4750010 (R), Fax 4732805, **Email : icac@mahendra.iacs.ernet.in**

Citation Prof. Chakravorty has been an active research worker in modern structural coordination chemistry. He has effectively employed a variety of modern physical methods like NMR spectroscopy, optical spectroscopy and magnetic measurements to solve several difficult problems. His work on paramagnetic contact shifts is well recognised. Under the broad heading of stereochemical phenomena, Prof. Chakravorty has investigated anomalous isomorphism, halo-coordination, penta-coordination and polytopal equilibria. Prof. Chakravorty has done notable work on magnetic exchange in coordination compounds.

1996 **Chandrakumar, Narayanan** (DOB: 25 November 1951*), Sp: Chemical Physics; Magnetic resonance spectroscopy and Imaging ; Spin dynamics as well as hardware and software development.* Physical Sciences Division, Central Leather Research Institute, Chennai - 600 020. Tel (044) 4420413 (O), 4413165 (R), Fax 4911589, 4912150, **Email : ilango @ md3.vsnl.net.in**

Citation Dr Chandrakumar has done significant experimental and theoretical researches in rotating frame coherence transfer and multiple NMR, high resolution spin-1 NMR and spin-1 connectivity mapping, especially in solution state. He has invented a novel technique for NMR imaging and diffusion measurements.

1989 **Chandrasekaran, Srinivasan** (DOB: 15 November 1945*), Sp: Synthesis of natural products; Organometallic chemistry.* Department of Organic Chemistry, Indian Institute of Science, Bangalore - 560 012. Tel (080) 3092402 /4 (O), 3311269 (R), Fax 3341683, 3443529, **Email : scn @ orgchem.iisc.ernet.in**

Citation Prof. Chandrasekaran has made significant contributions in the domain of organic reaction mechanisms, in the development of novel reagents for organic synthesis and in the blending of these two facets to the creation of the carbon constellations in a very imaginative fashion.

1995 **Chandrasekhar, Jayaraman** (DOB: 23 October 1952*), Sp: Computational chemistry*. Department of Organic Chemistry, Indian Institute of Science, Bangalore - 560 012. Tel (080) 3092578, 3415663 (R) Fax 3443529, 3341683 **Email : jc@orgchem.iisc.ernet.in**

Citation Dr Chandrasekhar has made outstanding contribution towards understanding the structure and bonding of organic molecules with implications on chemical reactivity.

1961 **Chatterjee, Asima** (DOB: 23 September 1917*), Sp: Chemistry of natural products; Development of drugs from natural sources.* Department of Chemistry, Calcutta University, 92, Acharya Prafulla Chandra Road, Calcutta - 700 009. Tel (033) 3508386, 3506396, 3506387 (O), 3370011 (R). Fax 2413222

Citation Dr (Mrs) Chatterjee has built up an active school of advanced study and research in the chemistry of natural products, especially in the chemistry of alkaloids and coumarins, including furanolactones isolated from medicinal plants indigenous to India. She has investigated 50 plant species of 12 botanical families from which she isolated 20 new alkaloids, 5 polyphenolics, of which 3 are coumarins and two dianthraquinones, besides several furanoid bitter principles and an antiepileptic long chain ester. These researches are characterized by novel techniques for the isolation of organic compounds from plant sources, elucidation of their molecular architecture and stereochemistry by classical and modern methods, including spectroscopy, their synthesis, biogenesis and chemotaxonomy, the latter study being undertaken to trace the path of biological evolution. The alkaloids isolated by her are of novel structural patterns belonging to monomeric and dimeric indole groups, to quinoline, isoquinoline, pyridine, diterpene and steroidal series. She has also made notable contribution to organic reactions by postulating a new mechanism. She and her colleagues have conducted intensive physiological, pharmacological and clinical studies on natural and synthetic organic chemicals. Their work on the tranquillising alkaloids of *Rauvolfia*, particularly *Rauvolfia canescens*, in the treatment of insomnia and hypertension, and on Alstonia alkaloids in curing cardiac disorder, deserves special mention.

1989 **Chaudhuri, Mihir Kanti** (DOB: 21 July 1947*), Sp: Inorganic chemistry*. Department of Chemistry, Indian Institute of Technology, Institute of Engineers Building, Panbazar, Guwahati - 781 001. Tel (0361) 630353, 521915 (O), 563817 (R), Fax 521916, **Email : mkc@iitg.ernet.in**

Citation Prof. Chaudhuri has made outstanding contributions for developing new reagents and innovative methods for the synthesis of dioxygen complexes and fluorine compounds of metals and non - metals.

1990 **Choudary, Boyapeti Manoranjan** (DOB: 10 August 1946*), Sp: Homogeneous catalysis; Asymmetric catalysis.* Indian Institute of Chemical Technology, Uppal Road, Tarnaka, Hyderabad - 500 007. Tel (040) 7173874, 7170512 (O), 7170921(R), Fax 7173387, **Email : iict @ ap.nic.in**

Citation Dr Choudary's major contribution has been anchored intercalated catalysts showing high selectivity and activity. He has done notable work on homogeneous catalysis using transition metal complexes.

1977 **Chowdhury, Mihir** (DOB: 15 July 1937*), Sp: Spectroscopy; Photodynamics*. Department of Physical Chemistry, Indian Association for the Cultivation of Science, Jadavpur, Calcutta - 700 032. Tel (033) 4735374 (O), 4757425 (R), Fax 4732805, **Email : pcmc @ mahendra.iacs.ernet.in**

Citation Prof. Chowdhury's work has enabled better understanding of electronic structure of molecules through optical, magneto-optical and quantum-mechanical methods. He has fabricated sophisticated experimental facilities for spectroscopic and fast kinetic studies. His studies on single crystal spectra throw light on spin-forbidden crystal-field bands in transition metal complexes, exciton transitions in bimolecules, CT transitions in diazines and parity-forbidden transitions in rare earth complexes. Other areas of work done by Prof. Chowdhury include CD/ORD/MCD/MORD/Zeeman. Effect of rare earth complexes and physico-chemical aspects of laser.

1981 **Deb, Bidyendu Mohan,** (DOB: 27 September 1942*), Sp: Theoretical chemistry.* Department of Chemistry, Panjab University, Chandigarh - 160 014. Tel (0172) 541435, 541441 Extn 1014 (O), 778135 (R), Fax 541409, **Email : bmdeb @ panjabuniv.chd.nic.in**

Citation Prof. Deb has made significant contributions in theoretical chemistry. He has developed a versatile model of molecular geometry highlighting the role of electronuclear attractive force and the highest occupied molecular orbital in determining molecular shapes. He has investigated the applicability of the concept of internal stresses for studying molecules and solids and has related it to the other fundamental approaches such as density-functional theory and quantum fluid dynamics.

1976 **Devaprabhakara, Devadas** (DOB: 13 November 1932*), Sp: Alicyclic chemistry; Synthesis of novel cyclic hydrocarbons.* **Expired.**

Citation Prof. Devaprabhakara has made significant contributions in the alcyclic chemistry, especially cyclic allenes and medium-ring dienes. He has carried out in-depth studies on reduction, hydroporation and isomerization of these substrates. He has synthesized a number of highly strained and novel cyclic hydrocarbons. His work has led to rationalization of the reactions observed in these systems and has considerable predictive value.

1971 **Dhar, Manojit Mohan** (DOB: 13 January 1927*), Sp: Organic & biological chemistry of peptides; Medicinal chemistry & pharmaceutics.* Central Drug Research Institute, Lucknow - 226 001. Tel (0522) 224198 (O), 384874 (R), Fax 223405

Citation Dr Dhar has examined the constituents of a large number of indigenous plants and elucidated their chemistry, revealing a variety of new structures. In a systematic programme of screening Indian plants for biological activity, he has uncovered many active constituents worthy of further pursuit and exploitation. He has achieved significant results from his work on the mode of action of antibiotics carrying a heterocyclic moiety linked to a peptide sequence. He has developed a new synthesis of the internucleotide bond involving the use of pyrimidine and purine anhydronucleosides.

1993 **Gadre, Shridhar Ramachandra** (DOB: 20 May 1950*), Sp: Theoretical and Computational Chemistry.* Department of Chemistry, University of Pune, Pune - 411 007. Tel (020) 356061 Extn 2080, 2138 (O), 514664 (R), Fax 351728, **Email : gadre @ univpune.ernet.in**

Citation Dr Gadre has made theoretical and computational contributions towards understanding of relationships among complementary space electron densities, molecular properties and reactivity.

1998 **Ganesh, Krishnarajanagar Nagappa** (DOB: 25 May 1953), *Sp: Organic; Bio-Organic Chemistry.*

Organic Chemistry Division, National Chemical Laboratory, Pune - 411 008. Tel (020) 393153 (O), 336320 (R), Fax 330233/ 335153. **Email kng @ ems.ncl.res.in; ganesh @ bioinfo.ernet.in**

Citation Dr Ganesh has made outstanding contributions towards the understanding of the chemical principles of DNA molecular recognition. His work on various facets of DNA structure and its interaction with drugs and proteins has importance in both chemistry and biology.

1973 **George, Manapurathu Verghese,** (DOB: 3 October 1928*), Sp: Photochemistry; Laser chemistry; Organic chemistry.* Photochemistry Research Unit, Regional Research Laboratory, Thiruvananthapuram - 695 019. Tel (0471) 490392 (O), 436452 (R), Fax 490186, **Email : mvg @ csrrltrd.ren.nic.in**

Citation Prof. George has made significant contributions in several areas of organic chemistry, notably the mechanism of organic reactions in general and their use as effective synthetic tools. He has also done important work in organo-metallic chemistry. He has achieved the synthesis of interesting hetero-systems. His work on the photochemistry of various hetero-aromatic systems, such as sydnones, xanthates and photochemical cyclo-additions has attracted considerable attention and is marked by original approach.

1974 **Ghatak, Usha Ranjan** (DOB: 26 February 1931*), Sp: Synthetic organic chemistry; Stereochemistry.* Indian Institute of Chemical Biology, 4, Raja S C Mullick Road, Jadavpur, Calcutta - 700 032. Tel (033) 4730492, 4736793 Extn. 193 (O), 411404 (R), Fax 4730284, 4735197

Citation Dr Ghatak has done important work on the development of methods for stereoselective synthesis of diterpenoids. This work is marked by a deep understanding of conformation of organic molecules and steric factors which control bond formation in organic synthesis. His work on intramolecular alkylation reactions using ketocarbenoid or diazoketone intermediates is of importance in relation to synthesis of gibberellin-like compounds, an important group of plant growth promoting factors.

1978 **Govil, Girjesh** (DOB: 25 September 1940*), Sp: Molecular biophysics; Bioengineering; Theoretical chemistry.* Chemical Physics Group, Tata Institute of Fundamental Research, Homi Bhabha Road, Mumbai - 400 005. Tel (022) 2152971 Extn 2371(O), 2152625 (R), Fax 2152110, **Email : govil @ tifr.res.in**

Citation Prof. Govil has to his credit significant applications of semi-empirical quantum chemical theories relating to the conformational aspects of several biological molecules namely, peptides, nucleotides, saccharides, lipids, etc. An important contribution of his, has been in the area of structure of nucleotides based on calculations of conformational energy maps and rotational energy states. He has made precise calculations on the non-bonded and hydrogen-bonded interactions in several important biomolecules. The work of Prof. Govil showed the relative contribution of "stacking" and "base pairing" in ordered nucleic acids. Prof. Govil has done important work in respect of the role of ordered structure of lipids in biomembranes and consequences of structural flexibility and transport properties.

1960 **Govindachari, Tuticorin Raghavachari** (DOB: 30 July 1915*), Sp: Chemistry of plant products; Synthesis of natural products.* 24, Crescent Park Street, T'Nagar, Chennai - 600 017. Tel (044) 2351903 (O), 4344349 (R), Fax 2352163

Citation The main thrust of work of Dr Govindachari has been on elucidation of the structure of plant constituents like carpaine, gentianine, tylophorine, tylophorinine, tiliacorine, tylocrebrine, echitamine, kopsine, wedelolactone, cedrelone, polyalthic acid, valeranone, veprisone, etc. He has also carried out extensive research on the synthesis of isoquinolines and phenanthridines.

1969 **Jain, Amolak Chand** (DOB: 27 December 1928*), Sp: Organic chemistry; Bio-organic chemistry.* Centre for Biochemical Technology (CSIR), Mall Road, Delhi - 110 007. 13 Vaishali, Pitampura, New Delhi 110 034. Tel (011) 7257439, 7257602 (O), 7425594 (R), Fax 7410008

Citation Prof. Jain's early research work relates to the chemistry of natural products, especially polyphenolics. His approach has been largely synthetic, though he has also examined a number of important plants for their chemical components and elucidated their structures. In recent years, he has evolved new methods for the synthesis of polyphenols. Among these are important isoflavonoids occurring in nature and the related group of 3-phenyl 4 hydroxycoumarins found in many Derris roots in place of the earlier well-known and more toxic rotenoids. They include several compounds that contain terpenoid side chains and rings. The serious difficulties involved in their synthesis have been effectively solved.

1994 **Jemmis, Eluvathingal Devassy** (DOB: 31 October 1951*), Sp: Applied theoretical chemistry.* School of Chemistry, University of Hyderabad, Hyderabad-500 046. Tel (040) 3010917, 3010500 Extn 4830 (O), 3010515 (R), Fax 3010917, 3010120, **Email : jemmis @ uohyd.ernet.in**

Citation Dr Jemmis has with exceptional effect demonstrated the application of theoretical methods to structure and reactivity of organic, inorganic and organometallic molecules, towards the comprehension of electronic and geometric structure of metallocene oligomers, metal mediated C-C bond formation, polyhedral structural constellations and concerted organic reactions. His novel findings have already made impact on the experimental design of unusual structures.

1972 **Kessar, Satinder Vir** (DOB: 9 June 1932*), Sp: Synthetic and mechanistic organic chemistry.* Department of Chemistry, Panjab University, Chandigarh - 160 014. Tel (0172) 541435 (O), 541729 (R)

Citation Dr Kessar has made important contributions in steroidal and heterocyclic chemistry. He has been able to build the whole infrastructure of some solanum alkaloids through a single operation. A number of total syntheses of azasteroids have been accomplished by him using an elegant and original pathway. He has developed a novel method of linking aromatic rings based on an intramolecular reaction between benzene and aromatic ring leading to the direct cyclisation of haloanils of known unfavourable geometry. This synthetic route has been used by him for the synthesis of the phenthridine ring system and several new heterocyclic systems. Using the same cyclisation principle, but with phenoxide activation, he accomplished the synthesis of aporphine and related alkaloids.

1982 **Khetrapal, Chunni Lal** (DOB: 25 August 1937*), Sp: Chemical physics; Nuclear magnetic resonance.* Vice Chancellor, University of Allahabad, Allahabad - 211 002. Tel (0532) 608089, 608157 (O), 641002, 642827 (R), Fax 642827, **Email : clk @ triveni.mnrec.ernet.in**

Citation Prof. Khetrapal has done pioneering work on NMR spectroscopy of molecules oriented in the nematic phase of liquid crystals. He has done significant work on non-planar distortions in peptides in the liquid phase. Also notable is his spectroscopic investigation of weak molecular interactions like those involved in hydrogen bonding.

1988 **Kishore, Kaushal** (DOB: 31 December 1942*), Sp: Polymer chemistry; Combustion chemistry.* **Expired.**

Citation Prof. Kishore has done significant work in polymer chemistry with special reference to thermochemistry and combustion of polymers.

1973 **Mathur, Hirdaya Behari** (DOB: 27 May 1928*), Sp: Spectroscopic properties of radioactive isotopes; Thermodynamics; Solid state diffusion of metals.* **Expired.**

Citation Dr Mathur has made significant contributions in the study of beta and gamma spectroscopic properties of radioactive isotopes in the closed shell region. He has been applying the Mössbauer spectrometer technique to study the structures of various molecules. His recent contributions have been on the thermodynamics of complex ions in solution, kinetics of high temperature oxidation of metals, and solid state diffusion in metals.

1965 **Mehrotra, Ram Charan** (DOB: 16 February 1922*), Sp: Inorganic and organometallic chemistry;*

Sol-gel process for ceramic materials. 4/682, Jawahar Nagar, Jaipur - 302 004. Tel (0141) 510866, 511557 (O), 650800 (R)

Citation Prof. Mehrotra has enunciated the chemical theory of indicators, apart from suggesting the applicability of universal type of indicators with both acidic and basic functions. In the field of redox titration, he has extended the applicability of ceramic salts and of hypobromites in the estimation of a large number of organic and inorganic constituents. He has made a detailed study of alkoxides and carboxylates of a number of elements. This work is now being extended to the corresponding sulphur analogues and also to organometallic derivatives.

1978 **Mehta, Goverdhan** (DOB: 26 June 1943*), Sp: Organic chemistry.* Indian Institute of Science, Bangalore - 560 012 . Tel (080) 3341690 (O), 3341254 (R), Fax 3341936, 3341683, **Email : diroff @ admin.iisc.ernet.in**

Citation Prof. Mehta has devised novel and ingenious methods for the synthesis of complex terpenoids. He has been successful in synthesising highly strained polycyclic molecules such as bird-cage compounds, cubanes and homocubanes, pentaprismane and Dewar benzene using unusual electrophilic and photochemical reactions. He has unraveled many new and fascinating molecular reorganisations of isoprenoids and strained polycyclic systems. He has also successfully introduced new reagents for dehydrohalogenation.

1983 **Mitra, Samaresh** (DOB: 17 March 1940*), Sp: Magnetochemistry; Bio-organic chemistry; Magnetic resonance; Inorganic biochemistry.* Chemical Physics Group, Tata Institute of Fundamental Research, Homi Bhabha Road, Colaba, Mumbai - 400 005. Tel (022) 2152971 Extn 2363(O), 2152084 (R), Fax 2152110, 2152181 **Email : smitra @ tifrvax.tifr.res.in**

Citation Prof. Mitra has distinguished himself through his original work on inorganic paramagnetic complexes like metalloporphyrins and low-symmetry transition metal complexes using the technique of single crystal magnetic anisotropy and NMR. These studies have provided a better understanding of the electronic structure of these systems. He has contributed significantly to the measurement of single crystal susceptibilities and in general to magnetochemistry.

1987 **Mukherjee, Debashis** (DOB: 17 December 1946), *Sp: Quantum chemistry; Quantum dynamics; Theoretical spectroscopy.* Department of Physical Chemistry, Indian Association for the Cultivation of Science, Jadavpur, Calcutta - 700 032. Tel (033) 4735374 (O), 4125890 (R), Fax 4732805, **Email : pcdm @ mahendra.iacs.ernet.in**

Citation Prof. Mukherjee has done significant work in theoretical chemistry, particularly in the pioneering development of open- shell coupled- cluster theory of molecular electronic structure.

1974 **Nagarajan, Kuppuswamy** (DOB: 15 September 1930*), Sp: Medicinal chemistry; Pesticide chemistry; Heterocyclic synthesis; Application of NMR spectroscopy.* R & D Centre, Recon Limited, 32/1, Kalena Agrahara Village, 9th mile, Bannerghatta Road, Bangalore - 560 076. Tel (080) 646401, 640195, 640557 (O), 6681115 (R), Fax 6633890, 6610407, 646402, **Email : recolina @ giasbg01.vsnl.net.in; n_kuppuswamy @ hotmail.com**

Citation Dr Nagarajan has done significant work relating to the synthesis of new heterocyclic systems and to elucidation of structures of novel natural products. His work is marked by a deep understanding of reaction mechanisms and conformation of organic molecules. His novel synthesis of dibenzoxazepines has resulted in the development of a new antidepressant drug.

1970 **Narasimhan, Palliakaranai Thirumalai** (DOB: 28 July 1928*), Sp: Theoretical chemistry; Magnetic resonance.* Beckman Institute MC 139-74, California Institute of Technology, Pasadena, CA 91125, USA. Tel (0818) 3952863, **Email : ptn @ druggist.gg.caltach.edu**

Citation Prof. Narasimhan has made original and significant contributions in the area of chemical physics, especially quantum-mechanical interpretation of magnetic resonance data for the study of

molecular structure and properties. He has also contributed to the study of principles of chemical bonding, conformation, chemical reactivity as well as electrical and magnetic properties of simple and complex molecules using molecular orbital and valence bond theoretical methods. His contributions in these areas have led to the ushering in the era of "Computer Chemistry" in India. He has combined his theoretical abilites with experimental skills, as evidenced by his indigenous fabrication of a number of spectrometers needed in his work. Prof. Narasimhan has established an active and composite research group which draws workers from both Chemistry and Physics Department.

1984 **Natarajan, Paramasivan** (DOB: 17 October 1940*), Sp: Inorganic photochemistry; Fast reaction kinetics; Photoelectro chemistry; Radiation chemistry.* Department of Inorganic Chemistry, University of Madras and National Centre for Ultrafast Processes, Guindy Campus, Chennai - 600 025. Tel (044) 2351137, 2351269 (O), 4412332 (R), Fax 2352494, **Email : pnrajan @ unimad.ernet.in**

Citation Prof. Natarajan has made significant contributions to the photochemistry of co-ordination compounds, particularly notable are his studies on excited states by transient techniques. His work on the utilisation of macromolecular dye coatings for stabilization of electrodes in photoelectrochemical cells is noteworthy.

1996 **Periasamy, Mariappan** (DOB: 6 October 1952*), Sp: Organic chemistry; Organo-metallics and chiral reagents.* School of Chemistry, University of Hyderabad, Hyderabad - 500 046. Tel (040) 3010500 (O), 3010904 (R), Fax 3010120, 3010145, **Email : mpsc @ uohyd.ernet.in**

Citation Dr Periasamy for devising innovative and practical experimental procedures of synthetic interest. He has advantageously used carbon metal bonds to construct diverse types of molecular structures.

1966 **Ramaiah, Nanduri Atchuta** (DOB: 26 August 1923), *Sp: Sugar chemistry and technology.* 14, Ocean View Layout, Visakhapatnam - 530 003. Tel (0891) 561225 (R)

Citation Dr Ramaiah did work providing solutions for many of the problems faced in sugar manufacture. His prominent contributions relate to (i) colour problems of the sugar industry and physical methods for assessment of colour, and (ii) manufacture of active carbon and chemicals for improvement of sugar house products. As a result, sugar manufacture has been made more economical with considerable savings in sulphur, a scarce chemical in India.

1993 **Ramasami, Thirumalachari** (DOB: 15 April 1948), *Sp: Inorganic and physical chemistry*. Central Leather Research Institute, Chennai - 600 020. Tel (044) 4910846, 4910897 (O), 4915822 (R), Fax 4911589, 4912150, **Email : clrim @ giasmd01.vsnl.net.in**

Citation Dr Ramasami has made important contributions to the understanding of the structure and reaction mechanisms of electron transfer and substitution reactions of chromium complexes.

1992 **Ramasesha, Suryanarayanasastry** (DOB: 16 January 1950), *Sp: Quantum theory of extended many body systems.* Solid State and Structural Chemistry Unit, Indian Institute of Science, Bangalore - 560 012. Tel (080) 3092336 (O), 3415648 (R), Fax 3311310, **Email : ramasesh @ sscu.iisc.ernet.in**

Citation Dr Ramasesha has innovatively used the valence-bond technique for studying the electronic structure and nonlinear properties of conjugated organic systems and low-dimensional solids.

1977 **Ranganathan, Subramania** (DOB: 2 Feburary 1934), *Sp: Organic / bio-organic chemistry; Chemical simulation of information transfer process in life system; Reaction mechanism; Protein engineering.* Indian Institute of Chemical Technology, Uppal Road, Hyderabad - 500 007. Tel (040) 7173874 - 77 (O), Fax 7173387, 7173757, **Email : root @ csiict.ren.nic.in**

Citation Prof. Ranganathan has made valuable contributions in synthetic and mechanistic organic chemistry. He has devised novel routes to prostaglandins, an important group of biologically active compounds. He has studied several interesting reactions involving bond reorganisations and put forward convincing rationalization for them. Those involving bridged bicyclic systems deserve special

mention.

1968 **Rao, Chintamani Nagesa Ramachandra** (DOB: 30 June 1934*), Sp: Solid state chemistry; Surface science; Chemical spectroscopy; Molecular structure.* Jawaharlal Nehru Centre for Advanced Scientific Research, Indian Institute of Science Campus, Bangalore- 560 012. Tel (080) 3345491, 3340580 (O), 3346438, 3311310 (R), Fax 3442468, 8462766, **Email : cnrrao @ sscu.iisc.ernet.in; cnrao @ jnc.iisc.ernet.in**

Citation Prof. Rao's research work is related to the application of spectroscopic methods for the study of chemical compounds, the main emphasis being of UV and IR spectra. His recent research work relates to solid state chemistry and constitutes a valuable contribution to this important field.

1984 **Rao, Kalya Jagannath** (DOB: 7 December 1940), *Sp: Physical chemistry of amorphous solids; Phase transformation of solids.* Solid State and Structural Chemistry Unit, Indian Institute of Science, Bangalore - 560 012. Tel (080) 3092583 (O), 3411129 (R), Fax 3311310, **Email : kjrao @ sscu.iisc.ernet.in**

Citation Prof. Rao has made notable achievements in the field of physical chemistry of glasses. He has provided novel structural models for ionic glasses and has investigated a variety of glass systems employing sophisticated techniques, including EXAFS. He has proposed a model for glass transition. He has recently done important work on fast ion conducting glasses.

1983 **Ray, Naba Kishore** (DOB: 5 December 1940), *Sp: Theoretical chemistry; Computer application in chemistry.* Department of Chemistry, University of Delhi, Delhi - 110 007. Tel (011) 7257725 Extn. 325 (O), 7257855 (R), **Email : nkray.chemdu @ axcess.net.in; nkray @ ndb.vsnl.net.in**

Citation Prof. Ray has made major contributions in Quantum Chemistry. His studies using molecular orbital and floating spherical gaussian orbital methods have provided a better understanding of the structures and reactivities of several interesting molecules. Prof. Ray's theoretical studies have related to the nature of electron density and momentum distribution in atoms and molecules. His studies on reactivities of molecules on surfaces have thrown considerable light on the details of the interactions involved.

1967 **Santappa, Mushi** (DOB: 2 October 1923), *Sp: Science & Technology of Polymers; Physical chemistry; Organic chemistry.* Advanced Environmental Laboratory, No. 100 Anna Salai, Guindy, Chennai - 600 032. Tel (044) 2353154 (O), 4415163 (R), Fax 2353068, **Email : tnpcbeti @ giasmd05.vsnl.net.in**

Citation Prof. Santappa's main areas of work relate to synthesis of graft copolymers by a simple chain transfer process and studies on the properties of macromolecules by light scattering and osmotic techniques. Syntheses and kinetic studies of condensation polymers involving tetra - and trialkyl phenols and formaldehyde have yielded valuable information. Complementary to the polymerization studies, oxidation of various organic substrates has also been investigated.

1994 **Sarma, Dipankar Das** (DOB: 15 September 1955), *Sp: Solid state physics & chemistry; Photoemission; Surface science.* Solid State and Structural Chemistry Unit, Indian Institute of Science, Bangalore - 560 012. Tel (080) 3092614, 3378512 (R), Fax 3341683, 3311310, **Email : sarma @ sscu.iisc.ernet.in**

Citation Dr Sarma has made outstanding contributions towards the understanding of electronic structures, metal-insulator transitions and establishing the existence of a new phase in solid state materials through high-energy spectroscopies and theory.

1990 **Sathyamurthy, Narayanasami** (DOB: 10 July 1951), *Sp: Theoretical (computational) molecular reaction dynamics.* Department of Chemistry, Indian Institute of Technology, Kanpur - 208 016. Tel (0512) 590572, 597367 (O), 590313, 598435 (R), Fax 597436, 590007, **Email : nsath @ iitk.ac.in**

Citation Prof. Sathyamurthy has done theoretical work in molecular reaction dynamics especially on

exchange and dissociation reactions. He has also conducted time dependent quantum mechanical study of reactive scattering.

1995 **Sebastian, Kizhakeyil Lukose** (DOB: 18 November 1950), *Sp: Theoretical chemistry.* Department of Applied Chemistry, Indian Institute of Science, Bangalore - 560 012. Tel (080) 3092385 (O), 3315166 (R), Fax 3316552, 3341683, **Email : kls @ ipc.iisc.ernet.in**

Citation Dr Sebastian has excelled with his brilliant analytical approach to the area of statistical mechanics and electronic structure as related to chemical problems, such as electrode processes, barrierless reactions, adsorption of polymers and maximum hardness principle.

1972 **Sinha, Akhoury Purnendu Bhusan** (DOB: 27 December 1928), *Sp: Material science.* C/o Morris Research Inc., 1918, University Avenue, Berkeley, CA 94704, USA. Tel (001-510) 7041014 (O), 5257263 (R)

Citation Dr Sinha's major contributions lie in the field of Solid State Chemistry. He has made extensive studies on the synthesis of new manganites and their structural, electrical and magnetic properties. He has developed theories for thermoelectrical power and mobility in such semiconductors. His studies on electron lattice interaction have furnished a new basis for the theory of ferro-electricity. From his studies on thin film of heterojunctions, Dr Sinha has discovered interesting properties which throw new light on the mechanism of conduction in semiconductors. The products developed by him have found practical application in the electronics industry.

1997 **Srikrishna, Adusumilli** (DOB: 1 January 1955), *Sp: Organic chemistry; Developed radical cyclisation and annulation based strategies for construction of a variety of bridged compounds and natural products of contemporary interest.* Indian Institute of Science, Bangalore - 560 012. Tel (080) 3092215 (O), Fax 3341683, **Email : ask @ orgchem.iisc.ernet.in**

Citation Dr Srikrishna has contributed significantly to the area of organic synthesis. His contributions in the area of radical cyclisation and annulation based strategies for the synthesis of natural products are noteworthy.

1982 **Subba Rao, Ganugapati Sree Rama** (DOB: 21 August 1937), *Sp: Chemistry of natural products; Synthetic organic chemistry; Organometallic chemistry.* Department of Organic Chemistry, Indian Institute of Science, Bangalore - 560 012. Tel (080) 3092524 (O), 3346482 (R), Fax 3367789, 3341683, **Email : gsrs @ gchem.iisc.ernet.in**

Citation Prof. Subba Rao has developed new syntheses of natural products based on dihydroaromatics obtained through Birch reduction of aromatic compounds. He has made ingenious use of these for the synthesis of steroids and polyketides. He has also investigated the mechanistic aspects of dissolving metal reductions.

1964 **Sukh, Dev** (DOB: 17 June 1923*), Sp: Organic chemistry; Natural products.* C-600, New Friends Colony, New Delhi - 110 065. Tel (011) 6847119 (R)

Citation Dr Sukh Dev has studied a large number of terpenoids, isolated from indigenous materials. He has elucidated the structures of several of them and has made notable contributions to the understanding of their chemistry. During these investigations, he discovered several new skeletal types in sesqui-and diterpenoids.

1963 **Tilak, Bal Dattatraya** (DOB: 28 September 1918), *Sp: Chemistry of heterocyclic compounds; Dyestuff chemistry; Rural development through science and technology.* 101, Aradhana, Anand Park, Aundh, Pune - 411 007. Tel (020) 341654 (O), 386153 (R), Fax 335239

Citation Dr Tilak's work has led to the synthesis of new heterocyclic quinonoid dyestuffs of considerable academic and practical value. His studies on hydride transfer and steric factors that control it have enabled elucidation of the mechanism of formation on cyanine and triphenylmethane dyes and have led to the synthesis of a new class of cationoid dyes of potential commercial value and

hitherto unknown bicyclic sulphonium salts. Dr Tilak is also well known for his contribution towards the establishment and development of dyestuff industry in India. He has made significant contributions to elucidation of the chemistry of thiophene and its polycyclic derivatives. This work has led to the total synthesis of heterocyclic steroids and a few sulphur-containing compounds which show significant anti-cancer properties.

Earth Sciences

1991 **Yadav, Jhillu Singh** (DOB: 4 August 1950), *Sp: Organic chemistry.* Division of Organic Chemistry, Indian Institute of Chemical Technology, Uppal Road, Hyderabad - 500 007. Tel (040) 7170512, 7173874 (O), 7173434 (R), Fax 7173757, 7173387, **Email : jsy @ csiict.ren.nic.in**

Citation Dr Yadav has developed several new methodologies useful in organic syntheses, especially for allylic and acetylenic alcohols and for spiroacetals. He has also shown insight and skill in executing synthesis of complex natural products.

1984 **Acharyya, Subhrangsu Kanta** (DOB: 27 November 1940), *Sp: Tectonics & Geodynamics; Stratigraphy; Himalayan geology; Ophiolites; Gondwana geology.* Geological Survey of India, 27 Chowringhee Road, Calcutta - 700 016, 15 Dr Sarat Banerjee Road, Calcutta - 700 029.

Citation Dr Acharyya has the distinction of developing an integrated model of evolution of the Himalaya and Indo-Burmese mobile belt, particularly a concept of thin-skin overthrusting of premetamorphosed rocks over Mesozoic-Tertiary arc-trench sediments of the Indian plate. His work has provided impetus to concept-oriented exploration for hydrocarbon and other mineral resources in the Himalaya.

1976 **Bose, Mihir Kumar** (DOB: 1 September 1933), *Sp: Igneous petrology; Mineralogy; Geochemistry.* B D 393, Sector I, Salt Lake City, Calcutta - 700 064. Tel (033) 3349002, 3212462 (R)

Citation Dr Bose has done significant work in the area of chemical petrology, particularly of alkaline rocks and anorthosites in different geological environments in India. He has conducted innovative studies on rock forming minerals derived from different chemical millieus under various pressure-temperature conditions. He employed geochemical criteria for understanding magmatic differentiation and for discriminating between different ultramafic rocks of Singhbhum. His contributions to petrologic nomenclature and classification are well recognised.

1979 **Gaur, Vinod Kumar** (DOB: 11 July 1936), *Sp: Geophysics; Seismology; Oceanography.* Indian Institute of Astrophysics, Sarjapur Road, Koramangala, Bangalore - 560 034. Tel (080) 5274662 (CMMACS) 5530672-6 (IIA) (O), 3437410 (R), Fax 5260392 (CMMACS), 5534019, 5534019 (IIA), **Email : gaur @ cmmacs.ernet.in; vgaur @ iiap.ernet.in**

Citation Prof. Gaur has made significant contributions in the fields of geodesy, seismology and electromagnetics. His research work relating to measurement of the rate of movement along a major Himalayan fault and studies on micro- earthquakes have enabled a better understanding of the tectonics of the Himalayas.

1977 **Ghosh, Subir Kumar** (DOB: 1 March 1932), *Sp: Geology.* Department of Geological Sciences, Jadavpur University, Calcutta - 700 032. Tel (033) 4734044 (O), 4665309 (R), Fax 4731484

Citation Dr Ghosh has made significant contributions in theoretical and experimental structural

geology. Through ingeniously designed experiments, he established the geometrical relationships of the axial surfaces of folds with the principal planes of deformation and elucidated different types of fold interferences. He carefully analysed the variation of strains in superposed folds and explained the mechanism of rotation of early lineations by later folding. Dr Ghosh has developed a theory on the fundamental aspects of conglomerate deformation utilizing the principles of deformation of non-homogeneous materials. His analysis of the mechanism of distortion of planar structure around rigid bodies is of significance in structural geology.

1982 **Gopalan, Kunchithapadam** (DOB: 12 August 1938), *Sp: Geochronology; Isotope geology*. National Geophysical Research Institute, Uppal Road, Hyderabad - 500 007. Tel (040) 7171957 (O), 7170446 (R), Fax 7171564, **Email : postmast @ csngri.ren.nic.in**

Citation Dr Gopalan has done pioneering work leading to establishment of the chronologies of several critical rock suites of the Indian subcontinent through indigenous development of high precision mass spectrometer facilities, and meticulous design of experiments. Establishment of the ages of solid bodies in the solar system, of basaltic volcanism in the sea of Tranquility on the moon, and of granite activity in three distinct phases in the Precambrians of Rajasthan, and elucidation of the stratigraphic relations of the Precambrians of Madhya Pradesh are some of the significant contributions made by him.

1995 **Goswami, Bhupendra Nath** (DOB: 1 August 1950), *Sp: Atmospheric sciences.* Centre for Atmospheric and Oceanic Sciences, Indian Institute of Science, Bangalore - 560 012. Tel (080) 3340450 (O), 3416690 (R), Fax 2447865, 3341683, **Email : goswamy @ caos.iisc.ernet.in**

Citation Dr Goswami has made original contributions to our understanding of the Monsoon Dynamics by providing the first quantitative measure at predictability of the tropical climate, involving the coupled ocean-atmosphere system.

1994 **Goswami, Jitendra Nath** (DOB: 18 November 1950), *Sp: Evolution of planetary bodies; Isotope geochronology; Lunar surface; Cosmic rays.* Physical Research Laboratory, Navrangpura, Ahmedabad - 380 009. Tel (079) 6462129 (O), 6742060 (R), Fax 6560502, **Email : goswami @ prl.ernet.in**

Citation Dr Goswami has made pioneering contributions in earth and planetary sciences, especially the formation of early solar system solids and high precision dating of single zircon crystals by an ion microprobe.

1986 **Gupta, Alok Krishna** (DOB: 4 December 1942), *Sp: Experimental mineralogy and petrology* Department of Earth and Planetary Sciences, University of Allahabad, Allahabad - 211 002. Tel (0532) 641840 (O), 540549 (R), **Email : alok.gupta@earth.wiprobt.ems.vsnl.net.in; ncemp @ nde . vsnl.net.in**

Citation Prof. Gupta has made significant contributions in the field of petrology, especially in respect of understanding of the genesis of alkaline rocks. He has done pioneering work in the field of experimental petrology in India.

1983 **Gupta, Harsh Kumar** (DOB: 28 June 1942), *Sp: Geophysics; Antarctic sciences*. National Geophysical Research Institute, Uppal Road, Hyderabad - 500 007. Tel (040) 7171124 (O), 7171618 (R), Fax 7171564, **Email : harsh @ csngri.ren.nic.in**

Citation Dr Gupta has done significant work in Seismology, notably Reservoir-induced Seismicity. He has done pioneering work on crustal structure of the Himalayan region using surface wave dispersion, giving a crustal thickness of 70 km.

1977 **Kaila, Krishna Lal** (DOB: 7 September 1932), *Sp: Deep seismic sounding; Earthquake seismology; Seismic exploration for oil.* 2-16-106 Prashantinagar, Uppal Road, Hyderabad - 500 039.

Citation Dr Kaila has done pioneering work in India on deep seismic soundings (DSS) technique. He

was involved in the technical organization and management of this ambitious project. The DSS profiles in India with which he was concerned were laid in a variety of geological environments such as Cuddapahs and Dharwars in South India, the Deccan Traps in Maharashtra, the sedimentary basins in Gujarat and the Himalayas in the North. Dr Kaila interpreted the DSS data in terms of geological setting of the areas concerned and brought to light surface manifestations of the deep-seated structures.

1984 **Krishnaswami, Sethunathasarma** (DOB: 21 May 1945), *Sp: Low temperature geochemistry; Nuclear methods in earth surface processes.* Earth Science & Solar System Division, Physical Research Laboratory, Navrangpura, Ahmedabad - 380 009. Tel (079) 6462129 Extn 4045 (O), 6562640 (R), Fax 6560502, **Email : swami @ prl.ernet.in**

Citation Dr Krishnaswami has the credit of establishing the accretion rate and growth history of ocean-floor ferromanganese nodules through the application of radionuclides. Using this method, he has successfully determined the recent history of sedimentation in lakes and coastal environments.

1986 **Mallick, Kumarendra** (DOB: 21 December 1941), *Sp: Electrical and electromagnetic methods; Remote sensing; Seismics.* National Geophysical Research Institute, Uppal Road, Hyderabad - 500 007. Tel (040) 7170141 (O), Fax 7171564, **Email : postmast @ csngri.ren.nic.in**

Citation Dr Mallick has done vital work by developing interpretational aids for analysing geoelectromagnetic data, particularly in the time domain

1993 **Mohanty, Uma Charan** (DOB: 29 June 1948), *Sp: Numerical weather prediction; Tropical meteorology, Monsoon dynamics & climate modelling.* Centre for Atmospheric Sciences, Indian Institute of Technology, New Delhi - 110 016. Tel (011) 6861977 Extn 6023 (O), 6515706 (R),Fax 6862037, **Email : mohanty @ cas.iitd.ernet.in**

Citation Dr Mohanty has contributed to understanding of the onset and maintenance of summer monsoon over India and development of appropriate numerical weather prediction models for simulation of the monsoon.

1987 **Moharir, Pramod Sadasheo** (DOB: 21 April 1943), *Sp: Signal processing; Statistics; Transform techniques; Pattern recognition; Time series analysis; Pedagogy.* National Geophysical Research Institute, Uppal Road, Hyderabad - 500 007.

Citation Prof. Moharir has done important work related to problems of geophysical signal processing, modelling of earthquake sequences and design of numerical algorithms for modelling some earth systems.

1972 **Naha, Kshitindramohan** (DOB: 2 January 1932), *Sp: Structural and metamorphic geology; Precambrian geology.* **Expired.**

Citation Dr Naha has made significant contributions in the fields of structural geology of Precambrian geology. By combining the tectonic methods developed in the eastern and western Alps, he has traced an integrated geological history of Precambrian rocks around Ghatsila in Singhbhum, Bihar. Dr Naha's work in some of the oldest rocks in the Precambrian of Rajasthan has led to a revision of the structure and stratigraphy of the Aravalli-Raialo-Delhi rocks and the Banded Gneissic Complex. He has worked out the methods of elucidating the large-scale structure of migmatites. The geometry and kinematics of folds in general and superposed folds in particular have been worked out and the principles applied for elucidating the structure of the Precambrian terrain of Rajasthan and the Jutogh-Chail sequence in the Simla Himalayas.

1983 **Naqvi, Syed Mahmood** (DOB: 28 August 1941), *Sp: Geochemistry; Precambrian geology.* National Geophysical Research Institute, Uppal Road, Hyderabad - 500 007. Tel (040) 7170141, 7150548 (O), 7170305 (R), Fax 7171564, **Email : postmast @ scngri.ren.nic.in**

Citation Dr Naqvi has made important contributions to Precambrian Geology of South India through sustained field and laboratory studies. He demonstrated the importance of basic and ultrabasic rocks in

the formation of the primitive crust in South India. He has drawn attention to the presence of lunar-type anorthosite in the terrain His geological-geochemical research work will help in obtaining a better understanding of the evolution of the South Indian Arachaean Craton.

1996 **Naqvi, Syed Wajih Ahmad** (DOB: 10 August 1954), *Sp: Marine nitrogen cycle and biogeochemistry of oxygen-deficient environments; Paleoceanography.* National Institute of Oceanography, Dona Paula - 403 004 Goa. Tel (0832) 226253, 226256, Fax 223340, 229102

Citation Dr Naqvi has made sustained and significant contributions to biogeochemical cycling in the Arabian Sea.

1980 **Negi, Janardan Ganpatrao** (DOB: 1 August 1936), *Sp: Theoretical geophysics; Philosophy of science.* National Geophysical Research Institute, Uppal Road, Hyderabad - 500 007. Tel (040) 7170272 (O), 7172427 (R), Fax 7171564

Citation Dr Negi has made significant contributions in theoretical geophysics, particularly in geoelectromagnetics and geomagnetism. His work has led to the development of important conceptual frameworks for delineating the earth's internal features from the distribution of its gravity, heat flow and electromagnetic fields at the surface.

1989 **Pandey, Prem Chand** (DOB: 10 August 1945), *Sp: Satellite-Meteorology; Oceanography & Polar science.* Antarctic Study Centre, D.O.D, Headland Sada, Vasco-da-Gama, - 403 804, Goa. Tel (0834) 512313, 512316 (R), Fax 512322.

Citation Dr Pandey has made significant contributions to the development of the technique of microwave remote sensing from satellites for obtaining atmosphere and ocean surface parameters. His concept of combining microwaves with infrared derive cloud parameters has been widely acclaimed.

1996 **Rai, Shyam Sundar** (DOB: 16 March 1954), *Sp: Geophysics Seismology.* National Geophysical Research Institute, Uppal Road, Hyderabad - 500 007. Tel (040) 7170141 Extn 2323 (O), 7170746 (R), Fax 7171564, **Email : postmast @ csngri.ren.nic.in**

Citation Dr Rai has made significant contributions to studies of the deep seismic structure of Indian continental lithosphere and its geotectonic evolution.

1998 **Ramesh, Rengaswamy** (DOB: 2 June 1956), *Sp: Isotope Geochemistry.* 265, Physical Research Laboratory, Navrangpura, Ahmedabad - 380 009. Tel (079) 462129 Extn 4265, Fax 6560502, **Email : ramesh @ prl.ernet.in**

Citation Dr Ramesh has made outstanding contributions to reconstruction of paleo-climatic and paleo-oceanographic conditions on different time scales based on stable isotopic systematics in carefully selected natural archives.

1980 **Sahu, Basanta Kumar** (DOB: 19 February 1937), *Sp: Mathematical modelling in Earth Science.* Department of Earth Sciences, Indian Institute of Technology, Mumbai - 400 076. Tel (022) 5767266 (O), 5780469 (R), Fax 5783480, **Email : bksahu @ geos.iitb.ernet.in**

Citation Prof. Sahu has done pioneering work in mathematical geology in India and his contributions have both basic and applied values. His attempts to introduce mathematical and quantitative approaches in a descriptive science like geology represent useful breakthroughs and are marked by excellence and originality. He has developed statistical and mathematical models in geology (sediments and ore deposits) and devised computer-aided techniques for their geological interpretations using multivariate and time series procedures.

1991 **Sengupta, Sudipta** (DOB: 20 August 1946), *Sp: Structural geology; Precambrian geology.* Department of Geological Sciences, Jadavpur University, Calcutta - 700 032, Flat No. 27, Fifth Floor, 12/1, Swinhoe Street, Calcutta - 700 019. Tel (033) 4734044 (O), 4405471 (R), Fax 4731484, **Email : sudipta @ jugeo.clibϕ.ernet.in**

Citation Dr Sengupta has made contributions in interpreting deformation of boudinaged layers as well as pebbles in conglomerates by application of theoretical and experimental modelling and field testing.

1992 **Shetye, Satish Ramnath** (DOB: 25 October 1950), *Sp: Physical Oceanography; Geophysical fluid dynamics.* Physical Oceanography Division, National Institute of Oceanography, Dona Paula - 403 004, Goa. Tel (0832) 221322, 226253 Extn 4310 (O), 226460 (R), Fax 223340, 229102, **Email : shetye @ csnio.ren.nic.in**

Citation Dr Shetye has characterized for the first time the monsoon-driven currents along the Indian coast and proposed mechanisms for their existence. He has also developed a mixed-layer model for annual variations in the sea surface temperature in the Arabian Sea.

1978 **Siddiquie, Hassan Nasiem** (DOB: 20 July 1934), *Sp: Marine geology.* **Expired.**

Citation Dr Siddiquie has contributed to the marine geology of the Bay of Bengal and the Arabian Sea and prepared a sediment distribution map of the seas around India. His studies have shed new light on the origin of the Laccadive Ridge and its relationship with the Western continental margin of India. His success in locating nad proving large resources of calcareous sediments in offshore areas of Laccadive islands and in the delineation of the submarine oil pipeline route is of considerable importance in the context of proper utilization of the offshore resources.

1985 **Singh, Rishi Narain** (DOB: 17 July 1943), *Sp: Geophysical modelling.* CSIR Centre for Mathematical Modelling and Computer Simulation (C-MMACS), Bangalore - 560 037. Tel (080) 5274667 (O), 5277435 (R), Fax 5260392, **Email : rnsingh @ cmmacs.ernet.in**

Citation Dr Singh has made significant contributions towards quantification of geological processes, notably in modelling of the thermomechanical structure of the Indian lithosphere and of fluid transport in the crust.

1978 **Somayajulu, Bhamidipati Lakshmidhara Kanakadri** (DOB: 5 March 1937), *Sp: Geochemistry; Geochoronology; Oceanography; Magnetic stratigraphy.* Physical Research Laboratory, Navrangpura, Ahmedabad - 380 009. Tel (079) 6462129 (O), 6747807 (R), Fax 6560502, **Email : soma @ prl.ernet.in**

Citation Dr Somayajulu has made significant contributions towards the basic understanding of a number of ancient and contemporary marine processes. A number of nuclear methods developed by him for the determination of the growth rates of manganese nodules, large scale advection-diffusion mixing of ocean waters, accumulation rates of sediments, and for the study of geochemistry of reactive elements in sea water, have provided new means for studying complex physico-chemical reactions within the oceans and in the water-sediment interface. His beryllium-10 studies on manganese nodules led to a definitive conclusion about their slow rates of growth.

1991 **Sri Niwas** (DOB: 4 July 1946), *Sp: Inversion of geophysical data.* Department of Earth Sciences, University of Roorkee, Roorkee- 247 667. Tel (01332) 72349 Extn 5570 (O) 65579, 75739 (R), Fax 73560, **Email : snes @ rurkiu.ernet.in**

Citation Dr Sri Niwas has made contributions in the field of forward and inverse solutions of geophysical problems, particularly for electrical exploration of groundwater in alluvial terrains.

1988 **Tandon, Sampat Kumar** (DOB: 13 August 1945), *Sp: Sedimentology; Geomorphology and quaternary geology.* Department of Geology, University of Delhi, Delhi - 110 007. Tel (011) 7256342 (O) 2924538 (R), Fax 7257336, 6886427, **Email : rajeevk @ giasdl.vsnl.net.in**

Citation Dr Tandon has done pioneering work on magneto-stratigraphy of the Siwalik rocks, and on sedimentary tectonics, including paleodrainage systems of the late orogenic sedimentary basins.

Engineering Sciences

1976 **Valdiya, Khadg Singh** (DOB: 20 March 1937), *Sp: Neotectonics, Sedimentology & Environmental Geology.* Jawaharlal Centre for Advanced Scientific Research, Jakkur P.O. Bangalore - 560 064. Tel (080) 8462750 - 57 (O), 3412026 (R), Fax 8462766, **Email : nehrucen @ jnc.iisc.ernet.in; admin @ jncasr.ac.in**

Citation Prof. Valdiya has made notable contributions to Himalayan Geology through a sustained and comprehensive study of the Kumaun Himalaya. He has done pioneering work on algal stromatolites in the Lesser Himalaya leading to the fixation of the age of an important rock formation. He has also carried out systematic investigation of the economically rich magnesite deposits and lithological and palaeocurrent study of its flysch sediments. He has done significant work on tectonic synthesis and evolutionary history of this part of the Himalayas.

1967 **Anantharaman, Tanjore Ramachandra** (DOB: 25 November 1927), *Sp: Physical metallurgy; Structural changes and imperfections in metals and alloys; Microcrystalline materials and quasi crystals.* Metals & Alloys Group, National Physical Laboratory, New Delhi - 110 012. Tel (011) 5787857 (O), (0124) 350088 (R), Fax 5752678, 5714189

Citation Prof. Anantharaman is among the few metallurgical engineers in the country to have undertaken the dual responsibility of teaching as well as research at an academic institution. He has made important contributions to the theory of plastic deformation, to the understanding of precipitation stages in supersaturated solid solutions, and to the use of refined low-angle X-ray scattering techniques.

1980 **Arunachalam, Vallampadugai Srinivasaraghavan** (DOB: 10 November 1935), *Sp: Material Science & Technology; Physical; mechanical and Powder metallurgy.* Department of Materials Science & Engineering, Engg. and Public Policy and Robotics Institute, Carnegie Mellon University, Pittsburgh PA 15213-3890, USA. Tel (412) 2682709 (O), 6813010 (R), Fax 2681513, **Email : vsa @ andrew.cmu.edu**

Citation Dr Arunachalam has done valuable applied and fundamental work in the area of materials technology. His work on ordered alloys, strength of two materials, creep behaviour and mechanism of pore closure is well recognized. Under his leadership, the country has become self-reliant in respect of certain strategic materials.

1993 **Banerjee, Dipankar** (DOB: 15 February 1952), *Sp: Physical Metallurgy.* Defence Metallurgical Research Laboratory, Kanchanbagh, Hyderabad - 500 058. Tel (040) 4440681, 4440233 (O), 4440080 (R), Fax 4440683, 4441439, **Email : db @ dmrl.ernet.in**

Citation Dr Banerjee's contributions to the characterisation of structure and properties of titanium alloys using advanced techniques of electron microscopy have greatly enriched the scientific knowledge in this field. His work on the physical metallurgy of newer generation titanium aluminides has laid the basis for significant improvements in this alloy system for applications in gas turbine engines.

1989 **Banerjee, Srikumar** (DOB: 25 April 1946), *Sp: Physical metallurgy.* Materials Science Division, Bhabha Atomic Research Centre, Mumbai - 400 085. Tel (022) 5519949 (O), 5568791 (R), Fax 5560750, **Email : sbanerji @ magnum.barc.ernet.in**

Citation Dr Banerjee has made significant contribution to phase transformation and structure-property correlations in titanium, zirconium and shape-memory alloys. His contributions to devitrification in zirconium base glasses have been highly creative. His work on irradiation-induced order-disorder transformation and phase separation in nickel-molybdenum alloys is highly original.

1993 **Bhatia, Suresh Kumar** (DOB: 8 September 1952), *Sp: Reaction and transport processes in porous media; Catalytic and non-catalytic fluid-solid reactions; Precipitation; Mathematical modelling.* Department of Chemical Engineering, University of Queensland, St Lucia, Brisbane, QLD 4072, Australia. Tel (+61-7) 33654263 (O), 38784574 (R), Fax 33654199, **Email : sureshb @ cheque.uq.edu.au**

Citation Dr Bhatia has made original contributions in engineering analysis of reaction and transport processes in porous media and catalytic and non-catalytic solid fluid reactions. His ideas concerning vapour-liquid and reaction equilibria accompanying catalytic reaction in small pores are innovative. His work has led to an elucidation of experimental rate multiplicities an hysteresis and demonstrated the existence and consequence of partial internal wetting states, for multiphase reaction in catalyst particles.

1971 **Bhattacharyya, Amitabha** (DOB: 12 November 1931), *Sp: Production engineering; Management science; Education; Rural technovation.* **Expired.**

Citation Dr Bhattacharyya has made valuable contributions, both applied and fundamental, in developing cutting tools technology for metal removal. His work has brought in new and original ideas in the design of cutting tools and several new types of cutting tools, such as (i) tangential-split modified point drill, (ii) retraced type Kolosov high production tools, and (iii) core drill with clamped inserts. Some of his noteworthy contributions are : (1) development of a new ceramic cutting tool material, tantalum nitrate-zirconium diboride, in collaboration with Carborundum Universal, Niagra Falls and Pennsylvania State University; (2) design and commercial development of an OPTOSCOPE for chip analysis in metal cutting research; (3) stochastic modelling of wear of cutting tools; (4) diffusion wear of cutting tools - the basic modelling; and (5) adhesion wear analysis at temperature sensitive regions.

1984 **Bhawalkar, Dilip Devidas** (DOB: 19 October 1940), *Sp: Laser and Nonlinear optics.* Centre for Advanced Technology, Indore - 452 013. Tel (0731) 481626 (O), 481162 (R), Fax 481625, **Email : ddb @ cat.ernet.in**

Citation Dr Bhawalkar has done significant work in the area of high power glass lasers and their applications in laser produced plasmas. This work is of importance in the advancement of fusion research in the country.

1992 **Borkar, Vivek Shripad** (DOB: 19 September 1954), *Sp: Stochastic control.* Department of Computer Science and Automation , Indian Institute of Science, Bangalore - 560 012. Tel (080) 3092368 (O), 3311358 (R), Fax 3341683, **Email : borkar @ csa.iisc.ernet.in**

Citation Dr Borkar has made fundamental contributions to the stochastic optimal control processes using a new convex analytical paradigm based upon occupation measures. He has resolved some of the open issues about long-run-average-cost control and control under partial observations. He has proved asymptotic optimality of certain adaptive control schemes and analysed stochastic games with noisy observations.

1963 **Brahm, Prakash** (DOB: 21 August 1912), *Sp: Mineral chemistry and extractive metallurgy; Atomic energy and space programme.* **Expired.**

Citation Dr Prakash has been specially concerned with development of the fabrication technology for nuclear fuel elements for research and power reactors. The Fuel Element Fabrication Plant at Trombay, designed and built under his direction, provides fuel elements to meet the full requirements of the natural uranium reactors, CIRUS and ZERLINA, at Trombay.

1968 **Chakravorty, Kshitish Ranjan** (DOB: 1 February 1916), *Sp: Fertilizer Science and Technology; Catalysis; Engineering science and fundamental science.* 6/12 Central Park, Jadavpur, Calcutta - 700 032.

Citation Dr Chakravorty has made pioneering contributions in the development of indigenous process know-how and products, leading to import substitution and building up of indigenous capacity and expertise for planning, design and engineering of large-scale fertilizer and heavy chemical plants. Particularly notable among these is the development of know-how for the entire range of fertilizer catalysts and their manufacture in the country. These catalysts have been developed on the basis of a new theory on the mechanism of catalysis propounded by him, and the integration of this know-how in the design and engineering of fertilizer plants. This breakthrough has led to the establishment of the fertilizer industry on a technologically self-reliant basis and has, in its wake, given an impetus to increased indigenous fabrication of machinery and equipment for fertilizer plants.

Dr Chakravorty has been responsible for building up the Planning & Development Division of the Fertilizer Corporation of India into a comprehensive and integrated multi-functional organization. It encompasses the various interrelated and interlinked functions of not only laboratory research, pilot plants, project planning, design engineering, procurement, installation and commissioning of fertilizer plants but also agronomical research, application and promotional activities for finished fertilizers in the country; this has rendered possible self-sufficiency in the fertilizer industry in its entirety.

1995 **Chattopadhyay, Kamanio** (DOB: 3 March 1950), *Sp: Physical Metallurgy and Material Engineering.* Department of Metallurgy, Indian Institute of Science, Bangalore - 560 012. Tel (080) 3092678 (O), 3317660 (R), Fax 3341683, **Email : kamanio @ metalrg.iisc.ernet.in**

Citation Dr Chattopadhyay has made pioneering contributions towards synthesis and characterization of new classes materials incuding quasicrystals and namocomposites through his sustained experimental and theoretical investigations.

1981 **Dutta Roy, Suhash Chandra** (DOB: 1 November 1937), *Sp: Circuits; Systems and Signal processing.* Indian Institute of Technology, New Delhi - 110 016. Tel (011) 6963749, 6861977-84 Extn 2213 (O), 6561619 (R), Fax 6862037, **Email : scdroy @ ee.iitd.ernet.in**

Citation *Prof.* Dutta Roy has done significant work in the field of signal processing-digital as well as analog. His work on charge coupled devices has important applications in a wide variety of industries. His other notable contributions include a simple and elegant method for sensitivity calculation in active and passive filters and a network synthetic approach to variable frequency oscillators. His work in the area of distributed RC networks is of importance in respect of analog integrated circuit.

1998 **Jhunjhunwala, Ashok** (DOB: 22 June 1953), *Sp: Electrical engineering / Communication networks; Surface acoustic waves devices; Optical communication.* Department of Electrical Engineering, Indian Institute of Technology, Chennai - 600 036. Tele Fax (044) 2352120, **Email : ashok @ mango.ee.iitm.ernet.in**

Citation Dr Ashok Jhunjhunwala has made outstanding contributions to the development of wireless local loop technology at the internationally cutting edge level. Of equal significance are his contributions in the area of Surface Acoustic Wave Theory.

1991 **Joshi, Jyeshtharaj Bhalchandra** (DOB: 28 May 1949), *Sp: Chemical engineering; Fluid mechanics; Reactor design*. Department of Chemical Technology, University of Mumbai, Mumbai - 400 019. Tel (022) 4145616 (O), 5226370 (R), Fax 4145614, **Email : jbj @ udct.ernet.in**

Citation Dr Joshi has innovatively combined incisive theoretical analysis with outstanding

experimental work for the development of unified design procedures for multiphase reactors. Some of the procedures have been validated for large scale operations. A unique blend of theory, modelling and intuition has resulted in more efficient design of bubble columns and mechanically agitated two and three phase reactors.

1983 **Kasturirangan, Krishnaswamy** (DOB: 24 October 1940), *Sp: Astronomy; Space science; Satellite technology.* Department of Space, Antariksh Bhawan, New BEL Road, Bangalore - 560 094. Tel (080) 3415241, 3416181 (O), 3432475 (R), Fax 3415328, **Email : krangan @ isro.ernet.in**

Citation Dr Kasturirangan has made original contributions to the development of Satellite Technology. He has done significant work on the design and development of the two experimental remote sensing satellites which have become the forerunners for the semi-operational sensing satellite IRS. He has made original contributions in the field of high energy astronomy, particularly in the areas of X-ray and gamma-ray astronomy using satellite and rocket based instrumentation.

1997 **Khakhar, Devang Vipin** (DOB: 7 April 1959), *Sp: Chemical engineering.* Department of Chemical Engineering, Indian Institute of Technology, Powai, Mumbai - 400 076. Tel (022) 5767212 (O), 5787446 (R), Fax 5783480, **Email : khakhar @ che.iitb.ernet.in**

Citation Dr Khakhar has done pioneering work on the polymerization of rod-like molecules and shear flow induced enhancement of the rates of polymerization.

1966 **Krishna, Jai** (DOB: 14 February 1912), *Sp: Earthquake Engineering.* 61, Civil Lines, Roorkee - 247 667. Tel (01332) 72338 (R)

Citation Dr Krishna has made valuable contributions in the field of Earthquake Engineering. He has contributed original ideas in the design and construction of earth quake resistance structures, leading to the evolution of economic design and construction practices. Some of his noteworthy contributions in this field are : (i) methods for strengthening brick buildings to resist earthquake forces, (ii) design, construction and installation of structural response recorders and accelerographs in India to collect seismic data for the design of structures, (iii) earthquake resistant design of water towers and other structures of post-earthquake importance, (iv) earthquake resistant design of dams, bridges and other major structures, and (v) the concept of iso-acceleration lines indicative of earthquake forces in epicentral tracts for the study of distribution and attenuation of energy from earthquake source.

1988 **Kulkarni, Bhaskar Dattatraya** (DOB: 5 May 1949), *Sp: Chemical reaction engineering; Applied mathematics; Transport phenomena.* Chemical Engineering Division, National Chemical Laboratory, Pune - 411 008. Tel (020) 367295, 333941 (O), 336872 (R), Fax 330233, 333941, **Email : bdk @ ems.ncl.res.in**

Citation *Prof.* Kulkarni has done important work in the field of chemical reaction engineering. His novel concept of delayed diffusion has explained the unexpected feature of reaction starting at the centre of the pellet. Based on his work on fluidised bed reactors and stability of chemical reactors, he has introduced new concepts in these areas. He has introduced new ideas on noise-induced transitions. His novel integer solution approach is highly general and will be equally applicable to problems in basic and applied sciences.

1976 **Kumar, Rajinder** (DOB: 9 September 1934), *Sp: Modelling of multiphase phenomena.* Department of Chemical Engineering, Indian Institute of Science, Bangalore - 560 012. Tel (080) 3344411/2320 (O), 3346394 (R), Fax 3341683, **Email : kumar @ chemeng.iisc.ernet.in**

Citation Prof. Kumar has done significant work in the fields of hydrodynamics and mass transfer in multiphase systems. The two-stage model of Prof. Kumar for bubble of drop formation is now used widely. Prof. Kumar has successfully utilized his basic research work in the design and operation of a large scale fluidized bed reactor for the manufacture of copper sulphate directly from chalcopyrites.

1987 **Lele, Shrikant** (DOB: 24 January 1943), *Sp: Phase transformations; Structural imperfections; Rapid*

solidifications; Quasicrystals. Department of Metallurgical Engineering, Institute of Technology, Banaras Hindu University, Varanasi - 221 005. Tel (0542) 316136 (O), 361589 (R), Fax 316925, 317074, **Email : slele @ banaras.ernet.in**

Citation Prof. Lele's work has led to advancement of knowledge in structural metallurgy. He has done notable original work on the calculation of X-ray diffraction effects from faulted close-packed crystals, the understanding of solid state transformations amongst small period modifications of silicon carbide, martensitic transformations and spinodal decomposition in alloys and the analysis of electron diffraction from quasicrystals.

1982 **Mashelkar, Raghunath Anant** (DOB: 1 January 1943), *Sp: Polymer science & engineering; Connective diffusion; Non-Newtonian fluid mechanics.* Council of Scientific & Industrial Research, Anusandhan Bhawan, Rafi Marg, New Delhi - 110 001. Tel (011) 3710472, 3717053 (O), 4649359, 4618851 (R), Fax 3710618, **Email : dgcsir @ csirhq.ren.nic.in; csirhq @ sirnetd.ernet.in**

Citation Dr Mashelkar has done significant work in several areas of polymer science and engineering. He has done original and pioneering work on transport phenomena in macromolecular media. His work in reaction engineering, particularly for polycondensation reactors, is novel and has been applied in an imaginative way in industry.

1986 **Munjal, Manohar Lal** (DOB: 4 April 1945), *Sp: Acoustics of ducts and mufflers; Computer simulation of engine processes; Industrial noise control.* Department of Mechanical Engineering, Indian Institute of Science, Bangalore - 560 012. Tel (080) 3092302 (O), 3349326 (R), Fax 3341648, **Email : munjal @ mecheng.iisc.ernet.in**

Citation *Prof.* Munjal has done significant work in the field of vibration and noise. His work in aeroacoustics and finite wave analysis of exhaust systems with complex elements is of significance in the design and optimization of flow passages for engineering applications.

1974 **Narasimha, Roddam** (DOB: 20 July 1933), *Sp: Fluid mechanics; Aerospace engineering; Atmospheric sciences.* National Institute of Advanced Studies, Indian Institute of Science Campus, Bangalore - 560 012. Tel (080) 3310969, 3344351(O), 3412705 (R), Fax 3346634, **Email : roddam @ caos.iisc.ernet.in**

Citation Dr Narasimha who has had a distinguished academic career has made significant contributions in the broad field of fluid mechanics. In particular, his studies relating to turbulence, boundary layers and rarefied gas dynamics have opened new horizons and helped in obtaining a better understanding of these phenomena. His main forte is to extract simple physical models from complex engineering problems and apply sophisticated mathematical tools to obtain a better understanding of them. Typical examples of his versatility are his studies related to satellite vehicles applying rarefied gas dynamics theories, statistical analysis of the relationship between performance and maintenance of aircraft, studies related to flow-induced oscillations in nuclear reactor Calandria, and the structure of turbulent and transitional fluid flows.

1964 **Nijhawan, Bal Raj** (DOB: 22 September 1915), *Sp: Metallurgical engineering; R & D for metallurgical industries.* 2805, Raintree Court, Kokomo-IN 46902, USA. Tel (765) 4551273, Fax 4551273, 4521511

Citation Dr Nijhawan has made notable contributions in iron-making and pneumatic steel-making techniques, austenitic grain size control and abnormality in steels. He has developed several substitute families of ferrous and non-ferrous alloys, including stainless steels. He has been responsible for the setting up of heavy integrated pilot plants at the National Metallurgical Laboratory. Dr Nijhawan has also done valuable work for ferrous and non-ferrous metallurgical industries in the public and private sectors.

1974 **Pai, Mangalore Anantha** (DOB: 5 October 1931), *Sp: Power system dynamics; Stability and control; Parallel computation in power system.* Department of Electrical and Computer Engineering,

Illinois University, 1406 W Green Street, Urbana, IL 61801 USA. Tel (217) 3336790 (O), 3440977 (R), Fax 3331162, **Email : pai @ ece.uiuc.edu**

Citation *Prof.* Pai has made important contributions in the areas of power stability, large scale power system analysis, system security and optimal control of nuclear reactors. He has developed a power system software which will be of direct use to most Electricity Boards. The most significant contribution of Prof. Pai has been in the area of industrial consultation. In this area of work, he has been actively associated with State Electricity Boards and leading private and public sector undertakings.

1990 **Pal, Sankar Kumar** (DOB: 13 September 1950), *Sp: Pattern recognition; Image processing and vision neural network and fuzzy.* Machine Intelligence Unit, Indian Statistical Institute, 203, B T Road, Calcutta - 700 035. Tel (033) 5778085 Extn. 3101 (O), 5578030 (R), Fax 5776680, 5776925, **Email : sankar @ isical.ac.in**

Citation *Prof.* Pal's contributions comprise a balanced mixture of theory, algorithms and applications using an equally balanced mixture of classical and modern concepts in the field of pattern recognition. His work is particularly significant in respect of image processing problems where the pattern ambiguity is due to inherent vagueness rather than randomness. He has developed various new fuzzy set theoretical tools for the analysis and recognition of patterns which include a new definition of image entropy.

1988 **Prasad, Surendra** (DOB: 10 July 1948), *Sp: Statistical and Digital signal processing; Application to communications; Speech geophysics; Radar & Sonar.* Department of Electrical Engineering, Indian Institute of Technology, New Delhi - 110 016. Tel (011) 6861977 (O), 6965369, 6861977 Extn. 8397 (R), Fax 6862037, **Email : sprasad @ ee.iitd.ernet.in**

Citation *Prof.* Prasad has done significant work in the field of signal processing, including development of new techniques, algorithms and hardware. His notable achievements include design of optimum signals and receivers, techniques for array pattern synthesis, adaptive algorithm for optimum MTI filters, important results for time delay estimation and underwater data communication, and innovations in deconvolution of seismic signals. His recent work on silicon compilation is of particular significance in the context of VLSI design.

1990 **Prathap, Gangan** (DOB: 6 June 1951), *Sp: Structural mechanics; Composite material; Finite element method.* Structures Division, National Aerospace Laboratories, Bangalore - 560 017. Tel (080) 5086209 (O), 5086398 (R), Fax 5260862, 5262989, **Email : gp @ css.cmmacs.ernet.in**

Citation Dr Prathap has made contributions to gaining fundamental understanding of finite element formulations. He addressed himself to a problem confounding the community of researchers and practitioners in computational mechanics, namely, obtaining entirely robust formulations. He has resolved the problem by evolving the concept of field consistency and field consistent elements. He has validated the concept by applying it to a range of structural problems.

1976 **Rajaraman, Vaidyeswaran** (DOB: 8 September 1933), *Sp: Computer science; Information systems.* SERC, Indian Institute of Science Campus, Bangalore - 560 012. Tel (080) 3341805, 3341811, 3092532 (O), 3419672 (R), Fax 3341683, **Email : rajaram @ serc.iisc.ernet.in**

Citation *Prof.* Rajaraman is a pioneer in the education, research and applications of computer science in the country. His significant research work in the area of decision tables is widely used. He has made a unique contribution in the application of the computers in real time process control in industry, in particular, in the steel industry.

1979 **Rama Rao, Palle** (DOB: 30 June 1937), *Sp: Physical metallurgy.* Atomic Energy Regulatory Board, Niyamak Bhawan, Anushakti Nagar, Mumbai - 400 094. Tel (022) 5562343 (O), 3637027 (R), Fax 5562344, **Email : ramarao @ suraksha.aerb.gov.in**

Citation *Prof.* Rama Rao has done significant work in physical metallurgy, notably structural

imperfections and mechanical behaviour. His contributions on X-ray diffraction broadening in deformed metals are well recognized. His work on stacking faults has been used in the development of alloy theories. His work provides the scientific base for the design of alloys with improved mechanical properties.

1984 **Ratnasamy, Paul** (DOB: 11 June 1942), *Sp: Catalysis* National Chemical Laboratory, Pune - 411 008. Tel (020) 336151 (O), 333906 (R), Fax 330233, **Email : prs @ ncl.ernet.in; prs @ ncl.res.in**

Citation Dr Ratnasamy has discovered novel zeolite catalysts having applications in major processes for the production of hydrocarbons such as a para-xylene, ethyl benzene and light olefins. Dr Ratnasamy's research in applied catalysis has both proven and potential application in petroleum refining and petrochemical industry.

1965 **Rao, Ayyagari Sambasiva** (DOB: 20 September 1914), *Sp: Electronics; Radiation protection.* 1-32, Snehapuri, Nacharam Post, Hyderabad - 500 076. Tel (040) 7170584

Citation Shri Rao was reponsible for the design, construction and commissioning of the control systems of the two reactors built at Trombay -- Apsara and Zerlina. The work done by the Electronics Division has resulted in a wide variety of electronic equipment and components, such as reactor control instruments, nuclear electronic instruments, industrial equipment, test equipment, analogue computer, thermoelectric coolers, semiconductor devices, servo components and magnetic amplifiers being made available indigenously. Shri Rao organized a countrywide network of monitoring stations for determining the extent of environmental radioactive contamination resulting from nuclear explosions.

1989 **Rao, Gundabathula Venkateswara** (DOB: 9 November 1944), *Sp: Finite element methods; Optimum design of structures; Non-linear analysis of structures.* Structural Engineering Group, Vikram Sarabhai Space Centre, Thiruvananthapuram - 695 022. Tel (0471) 563584 (O), Fax 460511, **Email : gv_rao @ vssc.org**

Citation Dr Rao has made outstanding original contributions in the field of structural mechanics. These include properties of finite elements and non-linearities due to large deformations and material characteristics. He led a team which was responsible for developing a medium-sized general purpose programme designated, the FEAST (finite element analysis of structures) suitable for a spectrum of applications in research laboratories and industries. Its use has enabled efficient design and analysis of series of rocket system in India.

1985 **Rao, Patcha Ramachandra** ((DOB: 21 March 1942) *Sp: Physical metallurgy; Thermodynamics of alloys* National Metallurgical Laboratory, Jamshedpur - 831 007. Tel (0657) 431131, 426097 (O), 223864 (R), Fax 426527, Email : **drml @ csnml.ren.nic.in; nml @ csnml.ren.nic.in**

Citation Prof. Rao has made significant theoretical and experimental contributions in the field of rapid solidification of metals. He developed a number of innovative techniques for the preparation, characterisation and modelling of metastable products, including the first ever predesigned quasicrystalline alloy.

1975 **Rao, Udipi Ramachandra** (DOB: 10 March 1932), *Sp: Space science & technology; Avionics; Electronics; Astronomy; Satellite and rocket technology.* Department of Space, Antariksh Bhawan, New BEL Road, Bangalore - 560 094. Tel (080) 3416406 (O), 5269523 (R), Fax 3410705, **Email : urrao @ isro.ernet.in**

Citation *Prof.* Rao's major contributions have been in the area of satellite technology. To him goes the credit for systems engineering from conception to design, fabrication and operational phase of satellite systems. He was the chief architect behind India's first satellite 'Aryabhatta'. The technological spin-offs of this system will enable the development of more sophisticated spacecraft systems for national development in the coming decades.

1978 **Seshadri, Sekharipuram Narayaniyer** (DOB: 15 March 1937), *Sp: Control systems.* **Expired.**

Citation Shri Seshari has made significant contributions in the field of control engineering as applied to nuclear research reactors. He has also done useful work on control systems for satellite communication, earth station antennas, tracking and telemetering of rockets, and traction motors for high power locomotives. His designs have been successfully exploited by several agencies and industries.

1960 **Sethna, Homi Nusserwanji** (DOB: 24 August 1923), *Sp: Reactor engineering; Research administration; Atomic energy.* Tata Electric Companies, Bombay House, 24, Homi Mody Street, Fort, Mumbai - 400 001. Tel (022) 2041047 (O), 3640812, 3649723 (R), Fax 2851870, 3642018

Citation Dr Sethna is responsible for design, construction and erection of the plutonium plant for the processing of spent fuel. He is also responsible for supervision and construction of a waste treatment plant for the safe management of radioactive wastes. Dr Sethna and his group have obtained valuable extraction data for the dissolve fuel containing fission products and plutonium.

1998 **Sharma, Anurag** (DOB: 7 May 1955), *Sp: Photonics / Optical electronics (Fiber optics and integrated optics) Applied optics.* Fiber Optics Group, Department of Physics, Indian Institute of Technology, New Delhi - 110 016. Tel 6861977 Extn 7409 (O), 6867022 (R), Fax 6862037, 6865039, **Email : asharma @ physics.iitd.ernet.in**

Citation Dr Sharma has made pioneering contributions in the emerging field of optoelectronics and optical communications by developing efficient analytical and numerical methods for dielectric optical wave guides, single-mode fibers, GRIN devices and optical imaging systems.

1973 **Sharma, Man Mohan** (DOB: 1 May 1937), *Sp: Mass transfer with or without chemical reaction; Multiphase reactions; Phase transfer catalysis; Catalysis by ion exchange resins; Separations through reactions.* 502, Saurabh, Plot No. 39, Kunder Marg, Swastik Park, Chembur, Mumbai - 400 071. Tel (022) 5291539, 5296876 (O), **Email : mmsharma @ bom3.vsnl.net.in**

Citation Prof. Sharma's researches over the years have been of industrial importance and concerned with chemical reactions and mass transfer characteristics of fluid-fluid contactors. He has carried out detailed studies on the kinetics of gas-liquid and liquid-liquid reactions where mass transfer is accompanied by chemical reaction, viz. oxidation of cuprous chloride, dithionite and aldehydes, absorption of isobutylene in aqueous sulphuric acid; alkylation of phenols with isobutylene; and reactions between carbon disulphide and aqueous amines; cyclohexanone and hydroxylamine sulphate. All these reactions are of industrial relevance. A simple method for studying the kinetics of fast reactions has been devised by him.

1978 **Singh, Dig Vijai** (DOB: 11 December 1934), *Sp: Fluid-film lubrication; Dynamics of mechanical systems; Stress analysis; Tyre mechanics and Tyre pavement interaction.* All India Council for Technical Education, Indira Gandhi Sports Complex, I P Estate, New Delhi - 110 002. Tel (011) 3378491 (O), 2440415 (R), Fax 3379044, 3353806, **Email : dvs @ aicte.ernet.in**

Citation *Prof.* Singh has done significant work on the dynamics of single track vehicles. The results of his studies on tyre-pavement interaction and dynamic analysis of the frames of such vehicles have been used by industry to improve the design of scooters and utilize indigenous materials in their fabrication. He has also made significant contributions in the field of hydrostatic and hydrodynamic lubrication. Prof. Singh has effectively linked his basic research interest to real industrial problems.

1983 **Sukhatme, Suhas Pandurang** (DOB: 5 November 1938), *Sp: Heat transfer; Solar energy.* Indian Institute of Technology, Mumbai - 400 076. Tel (022) 5783488, 5786530 (O), 5783738, 5781740 (R), Fax 5783546, **Email : mespsia @ me.iitb.ernet.in**

Citation *Prof.* Sukhatme has done significant work in the area of heat transfer. He has developed and tested an original theory of interfacial resistance for heat transfer during film condensation of liquid

metal vapours. He has studied local and average heat transfer around circular tubes and various fin arrays under the influence of free and forced convection. He has developed rapid methods for measuring the thermal conductivity of slab insulations.

1994 **Sundararajan G** (DOB: 11 December 1953), *Sp: Surface engineering, High temprature deformation behaviour.* International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI), Balapur PO Village, RCI Road, Hyderabad - 500 005. Tel (040) 4443167, 4441082 (O), 4444934 (R), Fax 4442699, 4443168, **Email : arcint @ hd1.vsnl.net.in**

Citation Dr Sundararajan has made outstanding contributions to experimental and theoretical aspects of materials engineering, with special emphasis on tribological behaviour, high strain rate and high temperature deformation and fracture, impact dynamics and ballistic penetration resistance of materials.

1962 **Suri, Man Mohan** (DOB: 13 January 1928), *Sp: Integrated powerpack with reverse governing techniques for diesel engine superimposed on a hydro-mechanical transmission called Suri-Transmission.* **Expired.**

Citation Shri Suri has developed a new concept of an integrated power pack involving reverse-governing techniques for the diesel engine superimposed on a hydromechanical transmission called Suri-Transmission. This has resulted in substantially increasing the efficiency of diesel locomotives. Suri-Transmission achieves the mathematical peak of efficiency in transmission of power and provides means for changeover from one gear step to another, under full load and speed, without causing shock or interruption of Suri-Transmission and its various improvements are covered by 36 patent specifications in eleven major countries. The first transmission built and tested for 650 horse power in now in successful operation.

1972 **Swarup, Govind** (DOB: 23 March 1929), *Sp: Solar radio emission; Pulsars; Interplanetary scinitillations; Radio astronomy instrumentation; Extragalactic radio sources and cosmology.* National Centre for Radio Astrophysics, Tata Institute of Fundamental Research, Pune University Campus, Post Bag No. 3, Ganeshkhind, Pune, 411 007. Tel (020) 356111(O), 351632 (R), Fax 355149, **Email : gswarup @ ncra.tifr.res.in; gswarup @ gmrt.ernet.in**

Citation Dr Swarup guided and supervised the establishment of the Ooty Radio Telescope from the basic concept to detailed design and fabrication. The construction in all its aspects. i.e. mechanical, structural, microwave and electronics, has been entirely indigenous. This work has had considerable technological spin-offs for the development of microwave antennas in India. Dr Swarup has also investigated solar emission, in India. Dr Swarup has also investigated solar emission, pulsars and lunar occultations of extragalactic radio sources.

1972 **Wadhwa, Rajinder Pal** (DOB: 3 September 1932), *Sp: Microwave engineering; Vacuum devices; Quality & reliability; Measurements education.* 17, Deshbandhu Apartments, Kalkaji, New Delhi - 110019.

Citation Dr Wadhwa has guided research and development work in such areas as Indicator, X-ray, TV and transmitting tubes. His earlier work related to design of Crossed Field Devices which helped indigenisation of production of components in such diverse fields as Delay Lines, Pulse Transformers, Transistor Circuits, Magnetron Injection Guns, Beam Plasma and Crossed Field Interaction. His work has helped in the achievement of self-reliance through development of technical competence in areas of sophisticated technology.

Mathematical Sciences

1990 **Balasubramanian, Ramachandran** (DOB: 15 March 1951), *Sp: Number theory.* The Institute of Mathematical Sciences, CIT Campus, Taramani, Chennai - 600 113. Tel (044) 2351856 (O), 2453926 (R), Fax 2350586, **Email : balu @ imsc.ernet.in**

Citation Prof. Balasubramanian has done significant work on analytic number theory. He is particularly known for a substantial improvement of a long standing result of E.C.Titchmarsh and his contributions in settling Waring's problem for fourth powers.

1988 **Banerjee, Mihir Baran** (DOB: 29 March 1943), *Sp: Hydrodynamic and Hydromagnetic stability.* Department of Mathematics, Himachal Pradesh University, Shimla - 171 005

Citation Prof. Banerjee has to his credit significant contributions on the theory of hydrodynamic and magnetohydrodynamic stability. He has done notable work on magnetoconvection and thermohaline convection.

1995 **Bhatia, Rajendra** (DOB: 8 May 1952), *Sp: Mathematical analysis; Linear Operators.* Indian Statistical Institute, 7 SJS Sansanwal Marg, New Delhi - 110 016. Tel (011) 664741 (O), 6867942 (R), Fax 6856779, **Email : rbh @ isid1.isid.ac.in**

Citation Dr Bhatia obtained several sharp and powerful results in the perturbation theory of matrices, for introducing new techniques from differential geometry and Fourier analysis into numerical linear algebra and for formulation and proofs of operator versions of several classical inequalities.

1959 **Chandrasekharan, Komaravolu** (DOB: 21 November 1920), *Sp: Theory of equations of zeta-functions.* 8092, Zurich, Switzerland. Tel (+41-1-) 6324199 (O), 3819686

Citation Prof. Chandrasekharan's original contributions to the theory of functional equations of zeta-functions have earned him international repute. These researches are characterized by a combination of analytical and arithmetical methods of approach and belong to the classical tradition of analytical theory of numbers.

1990 **Dani, Shrikrishna Gopalrao** (DOB: 3 June 1947), *Sp: Ergodic theory;Dynamics; Lie groups; Probability measures on groups.* Tata Institute of Fundamental Research, Homi Bhabha Road, Mumbai - 400 005. Tel (022) 2152971 Extn. 2218 (O), 2151760 (R), Fax 2152110, 2152181, **Email : dani@math.tifr.res.in**

Citation Dr Dani's contributions are in the field of ergodic theory in general and properties of orbits of Lie group actions on homogeneous spaces in particular. His work in the fields of dynamical systems, number theory and topology has made a notable impact. He and his collaborators have achieved important progress in respect of the problem of embedding an infinitely divisible probability distribution on a group in a continuous one parameter convolution semigroup.

1981 **Ghosh, Jayanta Kumar** (DOB: 22 May 1937), *Sp: Probability and Statistics.* Stat-Math Division, Indian Statistical Institute, 203, Barrackpore Trunk Road, Calcutta - 700 035. Tel (033) 526694, 4752071, **Email : jkg @ www.isical.ernet.in**

Citation Prof. Ghosh has made significant contributions to theoretical statistics in several directions. He has extended the results of Fisher and Rao on the second order efficiency of maximum likelihood estimators. Using refined analytical tools he has obtained useful results in the asymptotic expansion of the distribution of sample statistics. In the matter of applications of probabilistic methods, he has made an excellent contribution to the understanding of sediment transport in fluid flows through stochastic models. Earlier, he had proved under very general conditions that in reducing a problem through sufficiency and invariance, the order in which these criteria are applied is immaterial.

1972 **Gupta, Anadi Sankar** (DOB: 1 November 1932), *Sp: Boundary layer theory; Hydrodynamics and hydromagnetic stability; Heat & Mass transfer in fluid flows.* Department of Mathematics, Indian Institute of Technology, Kharagpur - 721 302. Tel (03222) 4875 (O), Fax 55303, **Email : shakti ! iit kgp ! sys 320 ! <usersid>**

Citation Prof. Gupta has made significant contributions in the field of fluid dynamics and magnetohydrodynamics, notably on heat transfer in free convection flow in the presence of magnetic field. His work on the stability of a layer of rotating electrically conducting liquid in the presence of uniform magnetic field, oriented parallel to the axis of rotation is important, as it discusses the finite amplitude disturbances.

1975 **Jain, Padam Chand** (DOB: 30 September 1930), *Sp: Numerical solutions of partial differential equations.* 3389, Sector D/3, Vasant Kunj, New Delhi 110 070. Tel (011) 6894048 (R)

Citation Prof. Jain has done important work on the development of algorithms for solving non-linear problems involving irregular boundaries. Algorithms based on finite difference technique, finite element technique and quasilinearization and invariant embedding have been developed and applied to various problems in fluid dynamics. These techniques have added to the existing knowledge on fluid dynamics and its applications and hold promise of enabling applied mathematicians and scientists to solve still more difficult non-linear problems. His work is likely to be of value in finding solutions for problems of stability and turbulence in fluid dynamics, numerical weather forecasting and magneto-hydrodynamic power generation.

1993 **Karmeshu** (DOB: 30 May 1949), *Sp: Mathematical modelling.* School of Computer & Systems Sciences, Jawaharlal Nehru University, New Delhi - 110 067. Tel (011) 6107676 Extn. 396 (O), 7273793 (R), Fax 6865886

Citation Dr Karmeshu has developed mathematical models for the dynamics of social and technical systems with special emphasis on their stochastic evolution. His contribution towards the understanding of the unity of structure and dynamics of diverse apparently unconnected systems is highly significant.

1978 **Krishnamurthy, Edayyathu Mangalam Venkatarama** (DOB: 18 June 1934), *Sp: Parallel & Distributed computing; Information systems design and Software design.* Research School of Information Sciences and Engineering, Australian National University, Canberra ACT 0200, Australia. Tel (61-6)2798640 (O), 2497140 (R), Fax 2798651, **Email : abk @ cslab.anu.edu.au; evk. krishnamurthy @ anu.edu.au**

Citation Prof. Krishnamurthy has made fundamental contributions to the design of error-free arithmetic unit using p-adic numbers. The computer science research group headed by Prof. Krishnamurthy has developed new algebraic techniques for the reconstruction of three-dimensional objects using two-dimensional projections at different angles. He has developed a new computer language for storing and retrieving chemical information. Prof. Krishnamurthy has made significant contributions to the design of algorithms for computer vision, pattern and shape analysis. He has developed an algorithm for automatic phonetic transcription of Tamil in Roman script.

1994 **Kumar, Neithalath Mohan** (DOB: 12 May 1951), *Sp; Algebra; Algebraic Geometry.* School of Mathematics, Tata Institute of Fundamental Research, Homi Bhabha Road, Mumbai - 400 005. Tel (022) 2152971 (O), Fax 2152181, 2152110

Citation Dr Kumar has made profound and original contributions to commutative algebra and algebraic geometry. He is well known for his beautiful contribution settling the Eisenbud-Evans conjectures. Another piece of work that has received much acclaim, is his paper on Rational Double Points on Rational Surface. His recent work on complete intersection curves settles a question of great interest.

1985 **Malik, Surender Kumar** (DOB: 8 September 1942), *Sp: Applied mathematics; Nonlinear*

phenomena. CAS in Mathematics, Panjab University, Chandigarh - 160 014. Tel (0172) 541132, 541441 Extn 1163,1183 (O), 742423 (R), Fax 541132, 541409, **Email : staff % maths @ puniv.chd.nic.in; skm % maths@ puniv.chd.nic.in**

Citation Prof. Malik has done pioneering work on nonlinear dispersive waves in self-gravitating media, electrohydrodynamics and magnetohydrodynamics. In particular his theory on nonlinear breakup of a self-gravitating column throws light on the phenomenon of condensation in astronomical bodies. His work on nonlinear self-focussing in magnetic fluids if noteworthy and is likely to have industrial applications.

1991 **Mehta, Vikram Bhagvandas** (DOB: 15 August 1946), *Sp: Algebraic geometry; Vector bundles.* School of Mathematics, Tata Institute of Fundamental Research, Homi Bhabha Road, Mumbai - 400 005. Tel (022) 2152971 Extn 2282 (O), 3612725 (R), Fax 2152181, 2152110, **Email : vikram @ math.tifr.res.in**

Citation Dr Mehta has made contributions to algebraic geometry, especially in problems related to homogeneous spaces of algebraic groups and the theory of vector bundles. The notion of Frobenius split varieties introduced by him and Dr Ramanathan has led to rapid developments in the study of Schubert varieties.

1998 **Nag, Subhashis** (DOB: 14 August 1955), *Sp: Complex analytical geometry moduli of Riemann surfaces; Mathematical physics (string theory).* Institute of Mathematical Sciences, CIT Campus, Taramani, Chennai - 600 113. Tel (044) 2352267, 2351856 (O), Fax 2350586, **Email : nag @ imsc.ernet.in**

Citation Dr Nag has made significant contributions to complex analytic theory of Teichmuller Space. His work on Universal Teichmuller Space of compact Riemann surfaces is very important.

1975 **Narasimhan, Mudumbai Seshachalu** (DOB: 7 June 1932), *Sp: Analysis; Algebraic and Differential geometry.* International Centre for Theoretical Physics, PO Box 586, 34100 Trieste, Italy. Tel (39-040) 2240272 (O), 314264 (R), Fax 2240490, **Email : narasim @ ictp.trieste.it**

Citation Prof. Narasimhan has made significant contributions in the fields of differential equations, differential geometry and algebraic geometry. Working jointly with Dr C S Seshadri, he gave a characterization of stable vector bundles on an algebraic curve in terms of unitary representation of certain discrete groups. In a joint study of the moduli varieties of these vector bundles with S Ramanan, he has determined the singularities of these varieties and in the case of low ranks their desingularisation. Apart from relating the moduli of these varieties with moduli of the curve, he has contributed to the study of their cohomology.

1987 **Parimala, Raman** (DOB: 21 November 1948), *Sp: Algebra.* School of Mathematics, Tata Institute of Fundamental Research, Homi Bhabha Road, Mumbai - 400 005. Tel (022) 2152971 Extn 2392 (O), 2152853 (R), Fax 2152110, **Email : parimala @ math.tifr.res.in**

Citation Dr Parimala's major areas of interest have been quadratic spaces over polynomial rings, classification and composition theory of quaternary quadratic modules over arbitrary commutative rings and determination of wittgroup. Her work represents much of the front edge of our present knowledge in this area.

1976 **Parthasarathy, Kalyanapuram Rangachari** (DOB: 25 June 1936), *Sp: Probability theory; Quantum stochastic calculus*. Indian Statistical Institute, 7 SJS Sansanwal Marg, New Delhi - 110 016. Tel (011) 664741 (O), 2494197 (R), Fax 6856779, **Email : krp @ isid1.isid.ac.in**

Citation Prof. Parthasarathy has done significant work on the application of probability theory to locally compact groups. Working in collaboration with K Schmidt, he has derived infinitely divisible projective representations, the Levy-Khinchine-Araki formula on locally compact groups and limit theorems for uniformly infinitesimal families of positive definite Kernels. His work has had a significant impact in the area of theoretical quantum mechanics associated with names of Araki and

Woods.

1985 **Parthasarathy, Rajagopalan** (DOB: 6 October 1945), *Sp : Representation theory of Lie groups and algebras.* School of Mathematics, Tata Institute of Fundamental Research, Homi Bhabha Road, Mumbai - 400 005. Tel (022) 2152971 Extn 2246 (O) 2152762 (R), Fax 2152181, 2152110, **Email : sarathy @ math.tifr.res.in**

Citation Prof. Parthasarathy is one of the leading workers on the theory of unitary representations of semi-simple Lie groups. In a profound work published in Proceedings of the Indian Academy of Sciences, he obtained a criterion for the unitarizability of certain highest weight modules, which was a work of great significance and originality. This has had considerable influence on later work.

1986 **Parthasarathy, Thiruvenkatachari** (DOB: 1 March 1941), *Sp: Game theory and mathematical programming.* Indian Statistical Institute , 7 SJS Sansanwal Marg, New Delhi - 110 016. Tel (011) 6514741 (O), 6868114 (R), Fax 6856779, **Email : tps @ isid1.isid.ac.in**

Citation Prof. Parthasarathy has made significant contributions in the field of stochastic games. In particular, he has given a (partial) solution to the classification problem and has successfully identified two major classes of stochastic games where the order field property holds. This is a significant breakthrough in the field of finite algorithms.

1983 **Passi, Inder Bir Singh** (DOB: 20 August 1939), *Sp: Algebra.* Centre for Advanced Study in Mathematics, Panjab University, Chandigarh - 160 014. Tel (0172) 541156, 541441 Extn 1165 (O), 691283 (R), Fax 541132, **Email : passi @ koel.imtech.ernet.in**

Citation Prof. Passi, a noted group-theorist in India, has made significant contribution to certain aspects of theory of groups specially to the study of group-rings in which he ia leading expert. His results on the dimension subgroups, augmentation powers in group-rings, and related problems have received wide recognition. His 1979 monograph summarizing the state of the subject is a basic reference source.

1982 **Prakasa Rao, Bhagavatula Lakshmi Surya** (DOB: 6 October 1942), *Sp: Mathematical Statistics.* Indian Statistical Institute , 7 SJS Sansanwal Marg, New Delhi - 110 016. Tel (011) 6516200 (O), 6969748 (R), Fax 6856779, **Email : blsp @ isid1.isid.ac.in**

Citation Prof. Prakasa Rao has made significant contributions on statistical inference in stochastic processes. In his earlier work, he had extended the Bernstein-von-Mises rates of convergence for independent variables to discrete parameter stationary Markov processes. He has developed the theory of large sample tests and estimation for general stochastic processes, and has investigated large sample properties of maximum probability, maximum likelihood and Bayes, estimates for diffusion processes. In recent years, Prof. Prakasa Rao has obtained significant results with regard to the asymptotic theory of statistical inference in stochastic processes and non-parametric density estimation.

1989 **Prasad, Gopal** (DOB: 31 July 1945), *Sp: Theory of Lie groups and Algebraic groups.* Department of Mathematics, Michigan University, Ann Arbor, MI 48109, USA. Tel (+1-734) 7640372 (O), 7618470 (R), Fax 7630937, **Email : gprasad @ math.lsa.umich.edu**

Citation Prof. Prasad is a leading expert in the theory of algebraic groups and their arithmetic. Among his significant contributions are strong approximation for semi-simple groups over function field, study of central extensions of p-adic and adelic groups and the computation of the covolume of all principal S-arithmetic subgroups. His work reveals his mastery over the most intricate aspects of arithmetic groups and has led to important developments in the field.

1983 **Prasad, Phoolan** (DOB: 1 January 1944), *Sp: Nonlinear wave; Partial differential equations; Fluid mechanics.* Department of Mathematics, Indian Institute of Science, Bangalore - 560 012. Tel (080) 3092264 /65/67 (O), 3371039 (R), Fax 3341683, 3342085, **Email : prasad@math.iisc.ernet.in**

Citation Prof. Phoolan Prasad has done significant work in the area on non-linear hyperbolic equations. He has succeeded in assessing the basic properties of the equations of various physical phenomena, generalized these mathematical properties and then used his theory to explain new results in the field of non-linear waves. He has given the proof of the existence of a new type of wave on the interface of a clear liquid and a mixture in a sedimentation process; this has been confirmed by recent experiments.

1977 **Raghunathan, Madabusi Santanam** (DOB: 11 August 1941), *Sp: Algebraic groups; Lie groups and discrete subgroups.* Tata Institute of Fundamental Research, Homi Bhabha Road, Mumbai - 400 005. Tel (022) 2152971, 2188654 (O), 2152466 (R), Fax 2152181, 2152110, **Email : msr@math.tifr.res.in**

Citation Prof. Raghunathan, an eminent mathematician, has been responsible in the past decade for advancements in the area of Lie groups, particularly discrete subgroups of Lie groups. In his earlier work he proved the rigidity of "non-uniform" arithmetic lattices connected with Selberg's conjecture. Later, he essentially solved Selberg's conjecture for non-uniform lattices before the complete solution of the conjecture by G.A. Margulis. Through his recent work he has made significant contributions to Serre's conjecture on the "Congruence Sub-group Problem" and generalisations of Quillen's solution of Serre's problem on vector bundles on the affine space.

1979 **Raghavan, Srinivasacharya** (DOB: 11 April 1934), *Sp: Number theory; Automorphic functions.* A 1, Ashok Ganapathim, 25 Fourth Main Road, R A Puram, Chennai - 600 028. Tel (044) 4364869 (R)

Citation Prof. Raghavan has made significant contributions on number theory. His work on modular forms of several variables has been considered basic and extends in a non-trivial way the ideas of Hecke and Siegel. He has proved important results in analytic continuation of Eisenstein-Siegel series. His characterization of singular Siegel modular forms answers a long standing question of Maass. His work on Diophantine approximation is a significant improvement on the earlier work of Davenport and Heilbronn.

1998 **Ramadas, Trivandrum Ramakrishnan** (DOB: 30 March 1955), *Sp: Algebraic and Differential geometry; Mathematical physics.* School of Mathematics, Tata Institute of Fundamental Research, Homi Bhabha Road, Mumbai - 400 005. Tel (022) 2152971 (O), 2152882 (R), Fax 2152181, 2152110, **Email : ramadas @ math.tifr.res.in**

Citation Dr Ramadas has made significant contributions to algebraic geometry and related models in mathematical physics. His contributions to generalised theta functions on moduli spaces of vector bundles and the Verlinde formula are very important.

1979 **Ramanan, Sundararaman** (DOB: 20 July 1936), *Sp: Algebraic geometry; Differential geometry.* Tata Institute of Fundamental Research, Homi Bhabha Road, Mumbai - 400 005. Tel (022) 2152971 Extn 2220 (O), 2152308 (R), Fax 2152110, **Email : ramanan @ math.tifr.res.in**

Citation Prof. Ramanan has made significant contributions in differential geometry and algebraic geometry, some in collaboration with Prof. M S Narasimhan. In differential geometry, his work with Prof. Narasimhan proving the existence of universal connections has been of relevance in the context of Yang-Mills theory in physics. In algebraic geometry, Prof. Ramanan's work concerns the study of the moduli space of vector bundles on an algebraic curve. The result that the moduli space of vector bundles on an algebraic curve has the same local deformation space as that of the curve, gives an elegant generalization of moduli spaces of vector bundles on a hyper-elliptic curve and on the non-existence of Poincare families for certain moduli varieties of vector bundles on curves has been widely acclaimed.

1991 **Ramanathan, Annamalai** (DOB: 29 August 1946), *Sp: Algebraic geometry.* **Expired.**

Citation Dr Ramanathan has made contributions to algebraic geometry. His joint work with Dr Mehta, where the notion of Frobenius split varieties was introduced, has led to the solution of a host of

problems on Schubert varieties and related topics. He has also made important contribution to the study of stable principal bundles and related areas.

1965 **Ramanathan, K Gopala** (DOB: 13 November 1920), *Sp: Quadratic form; Modular functions and discontinuous groups work on Ramanujan's notes.* **Expired.**

Citation Dr Ramanathan's work concerns mainly three aspects of Number Theory: Study of arithmetical groups, Diophantine inequalities and Automorphic functions related to quadratic forms. The work on arithmetical groups, relates to the solution of some important problems concerning their finite generation, commensurability and maximality. The work on Diophantine inequalities is related to problems of Davenport on the density of values of quadratic and other arithmetical forms. His recent work on automorphic functions is related to Siegel formula and is a notable contribution to Analytic Number Theory.

1959 **Rao, Calympudi Radhakrishna** (DOB: 10 September 1920), *Sp: Mathematical statistics and its applications in biology*. Department of Statistics, Penn State University, 326, Thomas Building, University Park, PA 16802, USA. Tel (814) 8653194 (O), 2346209 (R), Fax 8637114 (O); 2340372 (R), **Email : crr1 @ psu.edu**

Citation Prof. Radhakrishna Rao is internationally known for his contributions to statistical theory and biometric methods, and as the principal author of several major statistical theorems which are incorporated in modern books on statistics. He has formulated the concept of second order efficiency in the theory of estimation; developed new combinatorial arrangements of importance in experimental design in agriculture and animal husbandry; introduced the concept of orthogonal arrays which provided an essential component in disproving Euler's conjecture on orthogonal Latin squares; made significant contributions to the theory and application of multivariate analysis which are incorporated in his book, "Advanced Statistical Methods in Biometric Research", published in New York.

1972 **Seshadri, Conjeevaram Srirangachari** (DOB: 29 February 1932), *Sp: Algebraic geometry; Algebraic groups.* SPIC Mathematical Institute, 92, G N Chetty Road, Chennai - 600 017. Tel (044) 8284232, 8284251 (O), 4951198 (R), Fax 8256842, **Email : css @ smi.ernet.in**

Citation Dr Seshadri's significant contribution lies in algebraic geometry, mainly the moduli problems for vector bundles on curves and the construction of quotient spaces modulo-reductive algebraic groups. In a joint paper with Prof. M S Narasimhan, he gave a characterization of the stable bundles of D Mumford in terms of unitary representation of certain discrete groups. Using the result, he succeeded in constructing the module varieties as normal projective varieties. This work is regarded as basic in the field. Another important work of Dr Seshadri which has found wide application in many moduli problems relates to the quotient of the space of stable points under a reductive algebraic group.

1992 **Sharan, Maithili** (DOB: 4 January 1953), *Sp : Mathematical Modelling; Biofluid Mechanics*. Centre for Atmospheric Sciences, Indian Institute of Technology, New Delhi - 110 016. Tel (011) 6861977 Extn. 6024 (O), 6515480 (R), Fax 6862037, **Email : mathilis @ cas.iitd.ernet.in**

Citation Dr Sharan has developed innovative mathematical models for the transport of oxygen, carbon dioxide and carbon monoxide in living systems. He has thereby laid the foundation for understanding of physiological processes underlying the gas transport.

1987 **Shorey, Tarlok Nath** (DOB: 30 October 1945), *Sp: Theory of numbers.* School of Mathematics, Tata Institute of Fundamental Research, Homi Bhabha Road, Colaba, Mumbai - 400 005. Tel (022) 2152971 Extn 2222 (O), 2151802 (R), Fax 2152110, **Email : shorey @ math.tifr.res.in**

Citation Prof. Shorey has done significant work on Transcendental Number theory, in particular best estimates for linear forms in logarithms of algebraic numbers. He has to his credit ingenious and original applications of Baker's method to Diophantine equations and Ramanujan's T-function.

1982 **Shukla, Jang Bahadur** (DOB: 13 January 1937), *Sp: Mathematical modelling of ecological environmental physiological and engineering systems.* Department of Mathematics, Indian Institute of Technology, Kanpur - 208 016.

Citation Prof. Shukla had proposed a new deterministic theory regarding the effect of surface roughness in lubrication which was considered a breakthrough. He has done significant work on Biofluid dynamics, in particular peristaltic transport of faeces in intestines and on interaction of biorheological aspects of blood flow and arterial stenosis. Prof. Shukla has also made important contributions in the area of population dynamics of interacting species and mathematical theory of epidemics by taking into account environmental effects. His work on mathematical models on air-pollution is well recognized.

1993 **Singhi, Navinkumar Madhavprasad** (DOB: 19 March 1949), *Sp: Combinatorial mathematics.* School of Mathematics, Tata Institute of Fundamental Research, Homi Bhabha Road, Colaba, Mumbai - 400 005. Tel (022) 2152971 Extn 2590 (O), 2151814 (R), Fax 2152110, **Email : singhi @ tifr.res.in**

Citation Dr Singhi has made a breakthrough in the field of combinatorial mathematics, particularly in the areas of embedding of residual designs in symmetric designs, λ-design conjecture and t-designs and codes.

1988 **Sinha, Kalyan Bidhan** (DOB: 3 June 1944), *Sp: Mathematical theory of scattering and spectral theory of schrodinger operators; algebra of operators; Quantum stochastic process.* Indian Statistical Institute, 7, SJS Sansanwal Marg, New Delhi - 110 016. Tel (011) 6516200 (O), 6512086 (R), Fax 6856779, **Email : kbs @ isid1.isid.ernet.in**

Citation Prof. Sinha has done significant work on the mathematical theory of quantum scattering, spectral theory of Schrodinger operators and quantum stochastic calculus.

1980 **Sridharan, Ramaiyengar** (DOB: 4 July 1935), *Sp: Algebra.* School of Mathematics, Tata Institute of Fundamental Research, Homi Bhabha Road, Colaba, Mumbai - 400 005. Tel (022) 2152971 Extn 2217 (O), 2152131 (R), Fax 2152110, **Email : sridhar @ math.tifr.res.in**

Citation Prof. Sridharan has made significant contributions through his studies on projective modules over polynomial extensions of divison rings, which provided understanding of problems on quadratic forms. His collaborative work with S Parimala and M Ojanguren had led to important developments in the quadratic analogue of Serre's conjecture. Prof. Sridharan's earlier work on Lie algebras and projectivities over rings has attracted wide attention.

1996 **Sunder, Vaikalathur Shankar** (DOB: 6 April 1952), *Sp: Subfactors; Operator algebra.* Institute of Mathematical Sciences, CIT Campus, Taramani, Chennai - 600 113. Tel (044) 2351856 (O), 8583343 (R), Fax 2350586, **Email : sunder @ imsc.ernet.in**

Citation Dr Sunder discovered integral hypergroups which describe the fusion rules governing the irreducible bimodules coming from a subfactor in the theory of von Neumann algebras. This has led to the important conclusion that certain graphs cannot arise as principal graphs of subfactors, thereby settling a well-known conjecture of Ocneanu.

1986 **Tewari, Udai Bhan** (DOB: 18 June 1944), *Sp: Abstract harmonic analysis*. Department of Mathematics, Indian Institute of Technology, Kanpur - 208 016. Tel (0512) 597500 (O), Fax 597500, **Email : ubtewari @ iitk.ernet.in**

Citation Prof. Tewari's main contributions have been in the area of Harmonic Analysis. He has been particularly concerned with Segal Algebras. His work proving the existence of Segal Algebras on non-compact locally compact abelian groups, with multiplier algebras different from the measure algebra, is essentially a significant contribution to this field. His extension of F and M Riesz Theorems to operators on certain Segal Algebras is another important contribution. His work on the multiplier algebra as well as the algebra of translation invariant operators on the group algebra of vector valued function is also of considerable importance.

1976 **Trehan, Surindar Kumar** (DOB: 4 April 1931), *Sp: Non-linear stability in magnetohydrodynamics.* Department of Mathematics, Punjab University, Chandigarh - 160 014. Tel (0172) 742683 (R)

Citation Prof. Trehan has done significant work on stability of force-free magnetic fields, stability of jets and cylinders and stability of inhomogeneous plasmas. His recent work on the mathematical treatment of gaseous polytropes in the presence of a magnetic field may prove a breakthrough in this important area. He has also done important work on hydromagnetic waves and rotating gaseous masses.

Medical Sciences

1980 **Adiga, Perdur Radhakantha** (DOB: 5 May 1935), *Sp: Endocrine biochemistry & Reproductive biology*. Department of Molecular Reproduction, Development and Genetics, Indian Institute of Science, Bangalore - 560 012 . Tel (080) 3092574 (O), 3491240 (R), Fax 3341683, 3345999, **Email : adiga @ serc.iisc.ernet.in**

Citation Prof. Adiga has done significant work on the purification of carrier proteins for the water-soluble vitamins, thiamin and riboflavin Their induction under hormonal influence has been demonstrated. Evidence has been presented for the role of these proteins in transport of vitamins to the foetus and the possibility of pregnancy termination through antibodies in rodents.

1986 **Agarwal, Shyam Swarup** (DOB: 5 July 1941), *Sp: Genetics; Lymphocyte biology; Medical Education Research Co-ordination; Administration*. Department of Medical Genetics & Immunology, Sanjay Gandhi Post Graduate Institute of Medical Sciences, Raibareli Road. Lucknow - 226 014. Tel (0522) 440732, 440700 (O), 322505, 371387 (R), Fax 440973, 440017, **Email : ssa @ sgpgi.ren.nic.in**

Citation Prof. Agarwal has to his credit significant contributions in the field of genetics and molecular biology.

1963 **Anand, Bal Krishan** (DOB: 19 September 1917), *Sp: Physiology; Neurophysiology; Neuro endocrinology*. B-9/21, Vasant Vihar, New Delhi - 110 057. Tel (011) 6864851 Extn 3263 (O), 6881617 (R)

Citation Dr Anand has made significant contributions in the field of physiology, especially neurophysiology. One of his main interests has been the study of nervous regulatory mechanisms for various internal activities of the body which enable it to maintain homeostatic conditions. He has been instrumental in the discovery of 'feeding centre' in the hypothalamus. He has elucidated various nervous mechanisms regulating food intake.

1961 **Arora, Ram Behari** (DOB: 31 March 1917), *Sp: Cardiovascular pharmacology; Therapeutics clinical cardiology*. **Expired.**

Citation Dr Arora has been conducting and guiding research in various fields of biological and medical sciences, with special reference to cardiovascular pharmacotherapeutics. He has a large number of research publications to his credit.

1967 **Basu, Ajit Kumar** (DOB: 7 December 1912), *Sp: Open heart surgery*. **Expired**.

Citation Dr Basu has made significant contributions to the understanding of the problem of liver disease through a multidisciplinary approach. He has done notable work on non-cirrhotic portal hypertension. He has also played an important role in the development of surgical science as also post-graduate education in surgery, in India.

1990 **Bhan, Maharaj Krishan** (DOB: 9 November 1947), *Sp: Paediatric gastro-enterology.* Division of Gastroenterology, Department of Paediatrics, All India Institute of Medical Sciences, New Delhi - 110 029. Tel (011) 6864851 Extn. 4792, 6963822, 6594792 (O), 6493883, 6493058 (R), Fax 6862663, **Email : bhanmk @ medinst.ernet.in; mkbhan @ giasdl01.vsnl.net.in**

Citation Dr Bhan's main areas of activity have been aetiology, pathophysiology and treatment of persistent intestinal injury in children. His work has led to the identification of the aggregative *Escherichia coli* as a major causative organism of diarrhoeal disease in India. He has developed starch-based oral rehydration solutions for control of diarrhoea.

1966 **Chatterjea, Jyoti Bhusan** (DOB: 16 February 1919), *Sp: Nutritional anaemias and Haemoglobino pathies*. **Expired.**

Citation Dr Chatterjea elucidated the aetiopathogenetic aspects of the common disorders of the

human red cells, unfolding the spectrum of hereditary disorders of human haemoglobin as prevailing in India. His discovery of haemoglobin-E in Bengalis and comprehensive studies on haemoglobin-E thalassaemia disease from clinical, haematological, biochemical, biophysical and genetical points of view have provided new information and greatly enriched the relevant areas of contemporary medical sciences.

1981 **Chaturvedi, Umesh Chandra** (DOB: 2 March 1939*), Sp: Medical microbiology; Virology and Immunology.* Faculty of Medicine, University of Kuwait, PB No. 24923, Safat 13110, Kuwait. Tel (0965) 5312300 Extn 6560 (O), 4820724 (R), Fax 5332719, 5318454, **Email : chaturvedi @ hsc.kuniv.edu.kw**

Citation Dr Chaturvedi has made original contributions to our knowledge of the immune response to Dengue virus infection. Starting with the epidemic of Dengue fever in Kanpur, Dr Chaturvedi extended his studies in the animal model and worked out the precise mechanism of immune-suppression mediated by factors induced by Dengue virus, thus opening up a new field of investigation using other virus models. These studies are valuable for obtaining a better understanding of Dengue Haemorrhagic Fever and Shock Syndrome prevalent in several parts of South-East Asia.

1969 **Chaudhury, Ranjit Roy** (DOB: 4 November 1930), *Sp: Endocrine pharmacology; Reproductive and Contraceptive endocrinology*. Y-85, Hauz Khas, New Delhi - 110 016. Tel (011) 6856524 (R)

Citation Dr Chaudhury has made a significant contribution by demonstrating that interference in the release of histamine from most of the cells may be one of the modes of action of the intra-uterine contraceptive devices.

1992 **Das, Undurti Narasimha** (DOB: 28 June 1950), *Sp: Internal medicine; Clinical Immunology*. Division of Internal Medicine, Immunology & Biochemistry, LV Prasad Eye Institute, Road No. 2, Banjara Hills, Hyderabad - 500 034. Tel (040) 238262, 248267 (O), 3747656 (R), Fax 232714

Citation Dr Das has shown that *cis*-unsaturated fatty acids are tumoricidal *in vitro*. He has demonstrated that gamma linolenic acid arrests human gliomas. This observation has possible clinical applications.

1980 **Desiraju, Turaga** (DOB: 26 May 1935), *Sp: Neurophysiology; Neuroscience; Psychobiology*. **Expired.**

Citation Prof. Desiraju's work on the intricate and complex neurophysiological activities of the cerebral cortex related to the states of sleep and waking has led to further understanding of the principles of organisation of the highly evolved areas of the cerebral cortex. The experimental techniques employed by him have enabled a better understanding of the mechanisms of transmission of neuronal signals for conscious behaviour.

1965 **Dutta, Nirmal Kumar** (DOB: 1 December 1913), *Sp: Microbiology; Experimental medicine*. **Expired.**

Citation Dr Dutta introduced a new and highly effective laboratory model for the study of human cholera in animals, namely, the use of infant rabbits for the replication of human cholera. This has enabled laboratories throughout the world to undertake studies of cholera even though cholera is not prevalent in their countries. His discovery that *Cholera vibrios* produces a toxin which causes intense diarrhoea in the animal, is a major breakthrough in cholera research since Koch isolated the vibrio. He has developed a method for evaluating cholera vaccines and antisera, and has discovered a remedy against choleric diarrhoea.

1985 **Ganguly, Dilip Kumar** (DOB: 4 November 1940), *Sp: Neurophysiology; Human movement disorders; Neuropharmacology*. Indian Institute of Chemical Biology, 4 Raja SC Mullick Road, Jadavpur, Calcutta - 700 032. Tel (033) 4735197, Fax 4735197, 4735112, 4730350, **Email : root @ csiicb.ren.nic.in**

Citation Dr Ganguly has to his credit the significant demonstration of direct involvement of spinal and peripheral motor control mechanisms in the genesis of certain clinical features of Parkinsonism.

1971 **Gulati, Om Dutt** (DOB: 31 January 1927), *Sp: Autonomic pharmacology*. 4, Shivani Society, Vasana Road, Vadodara - 390 015, Gujarat.

Citation Dr Gulati has made notable contributions in the field of Autonomic Pharmacology. His work on adrenergic mechanisms is widely acclaimed.

1997 **Gupta, Satish Kumar** (DOB: 20 April 1953), *Sp: Immunocontraceptive vaccine design; Monoclonal antibody and synthetic peptides; Recombinant protein based immuno diagnostics*. Gamete Antigen Laboratory, National Institute of Immunology, Aruna Asaf Ali Marg, New Delhi - 110 067. Tel (011) 6162281, 6183004 Extn 351 (O), Extn 220 (R), Fax 6162125, **Email : skgupta @ nii.res.in**

Citation Dr Gupta has contributed to the development of indigenous diagnostic reagents of medical importance and has done outstanding work on the possible use of zona pellucida proteins in designing immunocontraceptive measures.

1969 **Kalyanaraman, Subramanian** (DOB: 1 January 1934), *Sp: Neurosurgery*. Apollo Hospital, 2 Central Street, Kilpauk Garden Colony, Chennai - 600 010. Tel (044) 6440442 (O), 6442667 (R), **Email: achel @ gems.vsnl.net.in; manidr @ md2.vsnl.net.in**

Citation Prof. Kalyanaraman was able to establish the position occupied by the pyramidal tract in the internal capsule and has successfully used stereotaxic surgery in the treatment of Parkinsonism. He was also successful in producing bilateral stereotaxic lesions and in demonstrating that these mirror lesions are not harmful.

1997 **Kumar, Vijay** (DOB: 7 November 1954), *Sp: Molecular biology and Hepatitis*. International Centre for Genetic Engineering and Biotechnology, P.O. Box 10504, Aruna Asaf Ali Marg, New Delhi - 110 067. Tel (011) 6176680, 6177357 (O), Fax 6162316, **Email : vijay @ icgebnd.ernet.in**

Citation Dr Kumar has contributed to basic understanding of the transactivator domain of the 'X' protein of the hepatitis B virus. He has been instrumental in technically assembling the multiepitope protein gene for hepatitis B virus. These have led to significant understanding of the basic immunology and biology of hepatitis B virus.

1971 **Maiti, Ajit Kumar** (DOB: 26 April 1928), *Sp: Applied and Clinical neurophysiology; Electroencephalography*. Department of Physiology, 92, Acharya Prafulla Chandra Road, Calcutta - 700 009.

Citation Dr Maiti has done pioneering work aimed at understanding the autonomic and viscero-vegetative functions of spinal cord physiology. He has organised and co-ordinated research in neuro-physiology, electrophysiology, histochemistry, with reference to the role of spinal cord in blood pressure and carbohydrate metabolism regulations.

1992 **Mehra, Narinder Kumar** (DOB: 4 November 1949), *Sp: Histocompatibility and Immunogenetics*. Histocompatibility and Immunogenetics Department, All India Institute of Medical Sciences, New Delhi - 110 029. Tel (011) 6954924 (O), 6859185 (R), Fax 6862663, **Email : nkmehra @ medinst.ernet.in**

Citation Dr Mehra has made significant contributions in the subject of 'histocompatibility and immunogenetics' and has identified the role of HLA-linked genes in the important diseases of India. He has shown that susceptibility to leprosy and tuberculosis is associated with a subtype of HLA-DR2 carried on a unique class II haplotype. He has further shown that Indian patients show a pattern of DR and DQ association in rheumatoid arthritis and insulin dependent diabetes mellitus quite distinct from that of the Western Caucasian patients.

1976 **Moudgal, Nuggehalli Raghuveer** (DOB: 4 March 1931), *Sp: Biochemical endocrinology; Reproductive biology.* Centre for Reproductive Biology & Molecular Endocrinology, Indian Institute of Science, Bangalore - 560 012. Tel (080) 3092490 (O), 3496117 (R), Fax 3341683, **Email : rmoudgal @ hotmail.com**

Citation Prof. Moudgal's work on the elucidation of gonadotropin action using immunological methods has been of a pioneering nature. The unfolding of LH binding to LH receptors in the target cell and the biochemical reactions elicited is of significance in exploring the molecular mechanism of action of the hormone concerned. He has conducted systematic studies on follicular maturation and the role of FSH and LH in this. The extensive work done by Prof. Moudgal's school on reproductive endocrinology based on his findings in experimental animals has provided a possible approach for devising fertility control processes by passive immunization technique.

1968 **Mukherjee, Sarashi Ranjan** (DOB: 24 November 1919), *Sp: Neurobiology; Nuclear medicine*. **Expired.**

Citation Dr Mukherjee has to his credit studies on homeostasis of blood pressure, hypothermia, iodine metabolism and thyroid gland functions, Marsiline, epilepsy, Brahmi, healing of fractures, and Prasarani.

1998 **Nair, G Balakrish** (DOB: 5 January 1954), *Sp: Microbiology*. National Institute of Cholera and Enteric Diseases, (ICMR) P-33, CIT Road, Scheme XM, Beliaghata, Calcutta - 700 010. Tel (033) 3501176, 3500448, 3504598, 3508493, Fax 3505066, **Email : krishgb @ giascl01.vsnl.net.in; icmrnicd @ ren.nic.in**

Citation Dr Nair has done outstanding work for characterizing a novel toxin in *Vibrio cholerae* and identifying and characterizing a new serogroup 0139 causing a cholera pandemic.

1983 **Nath, Indira** (DOB: 14 January 1938), *Sp: Immunology; Pathology; Infectious diseases; Leprosy*. Department of Biotechnology, All India Institute of Medical Sciences, New Delhi - 110 029. Tel (011) 6965463, 6594609, 6864851 Extn 3306 (O), 6851504, 6565977 (R), Fax 6862663, **Email : inath @ aiims.ernet.in; indiran @ giasdl01.vsnl.net.in**

Citation Dr Nath has studied the immunological mechanisms involved in various types of leprosy and contributed to basic understanding of the cellular mechanisms regulating natural immunity in human form of the disease. Development of a new *in vitro* radiometric assay using macrophages has provided a rapid method for screening anti-leprosy drugs, drug resistance and immunologically-mediated microbiocidal activity.

1993 **Pal, Gaya Prasad** (DOB: 7 June 1950), *Sp: Spine; Clinical anatomy*. Department of Anatomy, MP Shah Medical College, Jamnagar - 361 008, Gujarat. Tel (0288) 550204 Extn 237 (O), 551435 (R), Fax 540036

Citation Dr Pal has made original contributions in the field of biomechanics and load transmission of human spine. He has shown that besides vertebral bodies and intervertebral discs, the vertebral arches and their zygapophyseal joints also play an important role in weight transmission. Dr Pal's studies on the biomechanics of the thoracic skeleton have helped to understand the mechanism of idopathic scoliosis.

1995 **Panda, Subrat Kumar** (DOB: 18 November 1954), *Sp: Viral hepatitis; Molecular Virology* Department of Pathology, All India Institute of Medical Sciences, New Delhi - 110 029. Tel (011) 6594924 (O), 6492882 (R), Fax 6862663, **Email : skpanda @ medinst.ernet.in; pandask @ hotmail.com**

Citation Dr Panda has made outstanding contributions in the field of viral hepatitis. In particular, he has demonstrated the transmission of Hepatitis E virus in Rhesus monkeys and its association with severe liver disease and protracted viremia.

1965 **Ramalingaswami, Vulimiri** (DOB: 8 August 1921), *Sp: Pathology; Nutrition; Medical education &*

research. Department of Pathology, All India Institute of Medical Sciences, New Delhi - 110 029;. Tel (011) 6593364 (O), 6856719 (R), Fax 4622707, 6863522.

Citation Prof. Ramalingaswami is well known for his work on protein malnutrition in India. He was one of the first investigators who discovered and described the syndrome of Kwashiorkor or protein malnutrition in the young growing Indian children and reproduced it successfully in experimental animals.

1996 **Ravindranath, Vijayalakshmi** (DOB: 18 October 1953), *Sp: Neuroscience*. Department of Neurochemistry, National Institute of Mental Health and Neuro Sciences (NIMHANS), Bangalore - 560 029. Tel (080) 6642121 Extn 380, Fax 6631830, **Email : vijaravi @ nimhans.ren.nic.in**

Citation Dr Ravindranath is known for her pioneering work on the xenobiotic metabolizing capability of the brain, with special reference to environmental toxins and psychoactive drugs.

1994 **Sainis, Krishna Balaji** (DOB: 2 October 1949), *Sp: Cellular immunology*. Immunology Section, Molecular Biology & Agriculture Division, Modular Laboratories, Bhabha Atomic Research Centre, Trombay, Mumbai - 400 085. Tel (022) 5563060 Extn. 2289 (O), 5517059 (R), Fax 5560750.

Citation Dr Sainis has made outstanding contributions to immunobiology. He has studied the role of subsets of T cells and their receptors in influencing immune response to DNA in lupus nephritis and mycobacterial antigens.

1996 **Sarin, Shiv Kumar** (DOB: 20 August 1952), *Sp : Medicine; Gastroenterology; Hepatology*. Department of Gastroenterology, GB Pant Hospital, New Delhi - 110 002. Tel (011) 6873563 (R), Fax 6918068.

Citation Dr Sarin has done original extensive work, clinical and experimental, in the field of liver diseases, especially portal hypertension.

1986 **Seth, Pradeep** (DOB: 26 April 1943), *Sp: Virology*. Department of Microbiology, All India Institute of Medical Sciences, New Delhi - 110 029. Tel (011) 6864851, Fax 6862663

Citation Dr Seth has done notable work aimed at gaining an understanding of the role of herpes simplex virus infection in etiopathogenesis of cancer of uterine cervix which is the dominant cancer in Indian women.

1994 **Sharma, Yagya Dutta** (DOB: 22 July 1951), *Sp: Molecular Biology of Malaria*. Department of Biotechnology, All India Institute of Medical Sciences, New Delhi - 110 029. Tel (011) 6593617, Fax 6862663, **Email : yds @ aiims.ernet.in**

Citation Dr Sharma has made outstanding contributions to molecular biology of malaria. He has constructed a genomic library of a noncultivable parasite - *P. vivax* - which is an important pathogen for India. He has isolated and characterized immunologically relevant recombinant antigens of *P.vivax* and *P.falciparum* which are important for the understanding of host-parasite interaction and for the development of immunotherapeutic reagents.

1968 **Sheth, Uttamchand Khimchand** (DOB: 29 October 1920), *Sp: Clinical pharmacology*. 14, Modern Villa, 7th Road, Santa Cruz (East), Mumbai - 400 055.

Citation Dr Sheth has made notable contributions in the field of clinical pharmacology. He is also deeply interested in undergraduate education in pharmacology.

1984 **Sinha, Jagdish Narain** (DOB: 15 January 1939), *Sp: Neuropharmacology*. Department of Pharmacology, KG Medical College, Lucknow - 226 003.

Citation Dr Sinha has done important work on the delineation of the neurochemical modulation of medullary "baroreceptor reflex" by studying the nature and function of the receptors and the primary pathways involved.

1984 **Srivastava, Brahm Shanker** (DOB: 1 June 1943), *Sp: Molecular genetics; Biotechnology*. Microbiology Division, Central Drug Research Institute, Chattar Manzil Palace, Post Box - 173, Lucknow 226 001. Tel (0522) 212411-18, 212439 (O), Fax 223405, 223938, **Email : root @ cscdri.ren.nic.in**

Citation Dr Srivastava has done important work in the field of microbial genetics using strains of *Vibrio cholerae*. He developed bacterial mutants using genetic techniques and got plasmid-induced loss of virulence and characterised antigens for adherence. The strains thus obtained have potential for use in vaccine development.

1970 **Talwar, Janak Raj** (DOB: 1 January 1931), *Sp: Cardiothoracic and Vascular surgery*. New Delhi Poly Clinic, K-35, Connaught Circus, New Delhi - 110 001.

Citation Dr Talwar has done extensive work on the experimental production of various types of cold injury and on evaluation of the efficacy of various drugs and physiologically active substances in the management of cold injuries. His work has led to some practical ameliorative measures for the prevention and treatment of cold injury.

1967 **Thirumalachar, Mandayam Jeersannidhi** (DOB: 22 September 1914), *Sp: Mycology; Microbiology; Chemotherapeutic control*. Research & Technology, Jeersannidhi Anderson Institute, PO Box 506, Locust Street Walnut Creek, CA 94596 USA. Tel (415) 9232568, 9326676 (O)

Citation Dr Thirumalachar has done considerable work in the fields of medical mycology and plant disease control. Studies carried out under his guidance have led to the discovery of a new antiparasitic antibiotic, antiamoebin, which is being used by the Armed Forces for deworming military dogs.When fed with animal feed, it increases the yield of milk in cows, and enhances egg production in poultry. In the field of antibiotics, he has developed the antifungal antibiotics Hamycin, Dermostatin, Aureofungin, MYc-4 and Tetraenenin

1995 **Tyagi, Anil Kumar** (DOB: 2 April 1951), *Sp: Biochemistry and molecular biology of m.tuberculosis*. Department of Biochemistry, University of Delhi, South Campus, Benito Juarez Road, New Delhi - 110 021. Tel (011) 678876, 601955 (405) (O), 6492215 (R), Fax 6885270

Citation Dr Tyagi has made outstanding contributions towards characterization of mycobacterial transcriptional signals and developing several vectors for studying molecular genetics and gene expression. In addition, his work on the identification of a new gene from *M. tuberculosis* and its association with pathogenesis of the disease is of great importance.

1966 **Vakil, Rustam Jal** (DOB: 17 July 1911), *Sp: Cardiology.* **Expired.**

Citation Dr Vakil has made notable contributions to the discovery of the uses of *Rauvolfia serpentina.*

1991 **Wadhwa, Shashi** (DOB: 30 July 1948), *Sp: Anatomy; Neuroanatomy*; *Developmental neurobiology*. Department of Anatomy, All India Institute of Medical Sciences, New Delhi - 110 029. Tel (011) 6594875, 6593216 (O), 6858687 (R), Fax 6862663, **Email : swadhwa @ medinst.ernet.in**

Citation Dr Wadhwa has made outstanding contributions in the area of human development neurobiology. Her work is responsible for a description of the chronology of proliferation, migration, synaptogenesis and organisation of neurons as well as of the neurotransmitter profiles of GABA and substance P in the lateral geniculate body in the visual pathway.

1963 **Zaidi, Sibte Hasan** (DOB: 15 April 1918), *Sp: Toxicology; Pathology.* B - 85 Nirala Nagar, Lucknow - 226 007. Tel (0522) 71371 (O & R)

Citation The work of Dr Zaidi on experimental silicosis has shown that in spite of the same chemical nature, the various forms of free silica differ in their fibrogenic action and that the optimum particle size of silica dust to cause maximum damage to the lung is in 1-2 μ diameter range. Dr Zaidi

experimentally established the pathogenesis and etiology of progressive massive fibrosis of the coal workers, lungs. He has established that the combined action of *Tubercle bacilli* and coal-mine dust produces an extensive pulmonary disease.

1982 **Agrawal, Girish Saran** (DOB: 7 July 1946), *Sp: Quantum optics; Non-linear optics; Statistical mechanics; Surface optics.* Physical Research Laboratory, Navrangpura, Ahmedabad - 380 009. Tel (079) 6568550, 6462129 (O), 6561527 (R), Fax 6420374, 6560502. **Email : gsa @ prl.ernet.in**

Citation Prof. Agarwal's work in optics and the master equation approach for laser theory have attracted international attention. His recent major contributions are in respect of the effect of temporal laser fluctuations on resonance fluorescence, theory of optical bistability, strong field effects on resonant Raman scattering and light scattering from rough surfaces. He has also contributed significantly to the quantum theory of optical Hanle Effect, subnatural line-width spectroscopy and to the theory of phase transitions in systems far from equilibrium.

1995 **Barma, Mustansir** (DOB: 27 December 1950*), Sp: Statistical physics and condensed matter physics.* Theoretical Physics Group, Tata Institute of Fundamental Research, Homi Bhabha Road, Mumbai - 400 005. Tel (022) 2152971 Extn 2425 (O), 2021154 (R), Fax 2152110, **Email : barma @ theory.tifr.res.in**

Citation Dr Barma has made outstanding contributions to the physics of stochastic deposition-evaporation phenomena and disordered non-equilibrium systems.

1990 **Baskaran, Ganapathy** (DOB: 22 August 1948*), Sp: Theoretical condensed matter physics; Magnetism; Strongly correlated electron systems; Statistical mechanics & quantum field theory; Science of complexity.* Institute of Mathematical Sciences, Chennai - 600 113. Tel (044) 2351856, 2351281 (O), 4927304 (R), Fax 2350586, **Email : baskaran @ imsc.ernet.in**

Citation Prof. Baskaran has done significant work on the development of the resonating valence bond (RVB) theory of high temperature superconductivity in strongly correlated electron systems. His reformulation of RVB as a local gauge theory has opened new directions in this field. Of his other wide ranging contributions to condensed matter physics, the most notable have been on fractional quantum Hall effect and the optimization problem.

1997 **Chakrabarti, Bikas Kanta** (DOB: 14 December 1952), *Sp: Condensed matter statistical physics.* Saha Institute of Nuclear Physics, 1/AF Bidhan Nagar, Calcutta - 700 064. Tel (033) 3375345-9(O), 3509377 (R), Fax 3374637, **Email : bikas @ cmp.saha.ernet.in**

Citation Dr Chakrabarti has made outstanding contributions to the current understanding of the physics of the dielectric breakdown and fracture phenomena in the disordered solids, quantum Ising glass models, and dynamic phase transitions in the Ising systems.

1972 **Chandrasekhar, Sivaramakrishna** (DOB: 6 August 1930*), Sp: Liquid crystals & condensed matter; Optics and X-ray diffraction.* Centre for Liquid Crystal Research, P.B. No. 1329, Bangalore - 560 013. Tel (080) 8382924 (O), 3417123 (R), Fax 8382044, **Email : uclcr @ giasbg01.vsnl.net.in**

Citation Prof. Chandrasekhar's major contributions lie in the field of crystallography, especially in the field of liquid crystals. He has proposed a new type of quadratic formula for the optical rotary dispersion of crystals which proved to be a great improvement over the formula that had been in vogue. He has proposed and developed a method for estimating extinction effects experimentally in crystal analysis by the use of polarized X-rays.

1975 **Chopra, Kasturi Lal** (DOB: 31 July 1933), *Sp: Solid state physics & technology of thin films; Amorphous semiconductors; Surface science and techniques; Solar cells;Selective surfaces.* Thin Film Laboratory, Department of Physics, Indian Institute of Technology, New Delhi - 110 016. Tel 6857645, 6861977 Extn 7304 (O), 5154114 (R), Fax 6851169, 6862037, 6855227, **Email : klchopra @ physics.iitd.ernet.in**

Citation Prof. Chopra's work has been related to gaining an understanding of the structure and growth of thin films, and the electron transport processes, in crystalline and amorphous films of metals and semiconductors, with particular emphasis on the effect of geometrical scattering, structural defects, and spatial and electronic disorders. He has developed novel techniques for growing thin films with special properties and useful industrial applications.

1984 **Cowsik, Ramanath** (DOB: 29 August 1940), *Sp: High energy astrophysics; Neutrinos; Dark matter; Elementary particles; Experimental gravitation; cosmology.* Indian Institute of Astrophysics, Sarjapur Road, Bangalore - 560 034. Tel (080) 5530583, 5530672 (O), 6650784, 6636626 (R), Fax 5534019, **Email : cowsik @ iiap.ernet.in**

Citation Prof. Cowsik has done significant work in theoretical astrophysics. He obtained useful bounds on important particle physics parameters such as neutrino masses and their radiative decays by means of cosmological considerations. He has also worked on the theory of cosmic ray propagation.

1998 **Das, Sumit Ranjan** (DOB: 11 December 1955), *Sp: Theoretical high energy physics.* Department of Theoretical Physics, Tata Institute of Fundamental Research, Homi Bhabha Road, Colaba, Mumbai - 400 005. Tel (022) 2152971 Extn. 2423 (O), 2151406 (R) Fax 2152110, **Email : das @ theory.res.in**

Citation Dr Das has made landmark contributions to string theory. He showed that for a special class of black holes a microscopic calculation in string theory reproduces not only the black hole entropy but also the exact expression for the Hawking radiation thus going a long way towards resolving the Information Paradox associated with Black Holes.

1991 **Dhar, Deepak** (DOB: 30 October 1951*), Sp: Theoretical statistical mechanics.* Theoretical Physics Group, Tata Institute of Fundamental Research, Homi Bhabha Raod, Colaba, Mumbai - 400 005. Tel (022) 2152971 Extn 2427 (O), 2186835 (R), Fax 2152110, **Email : ddhar @ theory.tifr.res.in**

Citation Dr Dhar has made contributions to theoretical understanding of statistical mechanics and kinetics on random lattices. His highly original researches have led to several insightful and exact results on fractals, directed lattice-animals directed percolation, and on self-organized criticality.

1979 **Ghatak, Ajoy Kumar** (DOB : 9 November 1939), *Sp: Fiber and integrated optics.* Physics Department, Indian Institute of Technology, New Delhi - 110 016. Fax 6862037

Citation Prof. Ghatak has done significant work in the field of inhomogeneous optical wave-guides, theory of aberrations for optical systems comprising inhomogeneous media and self-focussing of laser beams. His earlier contributions to neutron transport theory have attracted considerable attention.

1993 **Gopal, Krishna** (DOB: 12 March 1948*), Sp: Radio astronomy.* National Centre for Radio Astrophysics, Tata Institute of Fundamental Research, GMRT Project, Post Bag No. 3, Pune University Campus, Pune - 411 007. Tel (020) 357107, 356105 (O), 355087 (R), Fax 355149, 357257, **Email : krishna @ ncra.tifr.res.in**

Citation Dr Gopal has developed the relativistic-beam model to understand the cosmological evolution of linear sizes, and luminosity of radio galaxies and quasars, and their unification schemes, and has discovered galaxies and clusters at high redshifts.

1971 **Iyengar, Padmanabha Krishnagopala** (DOB : 29 June 1931), *Sp: Nuclear physics; Solid state physics; Nuclear technology.* 33, Saras Baug, Deonar, Mumbai - 400 088. Tel (022) 5563959,

5564702 (R), Fax 5563959, **Email : skrishna @ tifr.vax.tifr.res.in**

Citation Dr Iyengar has built up at Trombay a group dealing with various aspects of neutron scattering completely based on locally designed and fabricated equipment. In this process, he has introduced widely recognized innovations in experimental techniques for neutron beam research and has made notable contributions to the basic understanding of vibrations of atoms in crystal lattices, internal motions of molecules and magnetic ordering and magnetic interactions in solids. He has promoted the growth of neutron crystallography and studies on the liquid state using neutrons. He is an acknowledged international authority on research reactor utilization.

1966 **Jain, Suresh Chand** (DOB : 1926), *Sp: Semiconductor devices.* IMEC, Kapeldreef 75, B 3001 Leuven, Belgium.

Citation Dr Jain's main field of research has been defects and colour centres in polar crystals; high temperature properties of solids; Raman infrared and electronic spectra of crystals; thin films; and ultrapurification of semiconductors and semiconductor devices. Some of the experimental techniques developed by. Dr Jain have been used in many laboratories in the United States and in West European countries. In recent years, Dr Jain has been involved in designing and developing sophisticated electronic items to meet the requirements of Armed Forces.

1998 **Jayannavar, Arun Mallojirao** (DOB: 22 July 1956) *Sp : Condensed Matter Physics; Stochastic Processes.* Institute of Physics, Bhubaneswar - 751 005. Tel (0674) 581158, 581203 (O), 581770 (R) Fax 581142, **Email : jayan @ iop.ren.nic.in; jayan @ iopb.stpbh.soft.net**

Citation Dr Jayannavar has made outstanding and original contributions to a variety of problems in quantum transport, mesoscopic phenomena, disordered systems, tunnelling times and stochastic resonance. Along with his students he has approached a remarkably rich set of phenomena which is at the forefront of contemporary research in condensed matter physics.

1979 **Jha, Sudhanshu Shekhar** (DOB: 25 December 1940), *Sp: Theoretical solid state physics; Superconductivity; Nonlinear optics; Photonics; and Raman spectroscopy.* Tata Institute of Fundamental Research, Homi Bhabha Road, Colaba, Mumbai - 400 005. Tel (022) 2152971, 2152680 (O),2152184 (R), Fax 2152110, 2152181, **Email : ssjha @ theory.tifr.res.in**

Citation Prof. Jha has to his credit significant contributions in solid state and plasma physics. He did pioneering work on non-linear optics. He has made significant contributions to the application of theory of Raman scattering from electronic exs in solids to the study of resonant Raman scattering of an intense laser beam and to the investigation of ex and electron-hole sound exchange mechanisms for superconductivity in semi-metals and excitonic insulators. In plasma physics, Prof. Jha has contributed to the theory of interaction of waves in a plasma and the generation of laser-induced parametric instabilities, connected with the inertial confinement scheme for a thermonuclear fusion reactor.

1972 **Joshi, Shri Krishna** ((DOB: 6 June 1935), *Sp: Solid state physics.* Recruitment and Assessment Centre, DRDO, Lucknow Road, Timarpur, Delhi-110 054. Tel (011) 2944278, (O), 2942394 (R), Fax 2912690. **Email : root @ skj.ren.nic.in; drrac @ nda.vsnl.net.in**

Citation Prof. Joshi has made important contributions in the areas of electronic states in disordered systems, electron correlation in narrow band solids and the related problem of Mott transition. He has proposed a number of models for the study of disordered materials; these models have been used to study the spectral functions and density of states for electrons in a number of binary alloys. He has also studied the problems of electrons in liquid metals and in amorphous semiconductors. He has studied excitation and ionization processes in atoms, ions and molecules due to impact of charged projectiles, such as electrons and protons. These collision processes are of interest in the study of plasma confinement, astrophysical problems and the upper atmosphere.

1987 **Kapahi, Vijay Kumar** (DOB: 21 January 1944*), Sp: Radio astronomy; Extragalactic radio sources; Cosmology.* National Centre for Radio Astrophysics, TIFR, P O Box 3, Pune University Campus,

Ganeshkhind, Pune - 411 007. Tel (020) 356105, 357107, 351384/5 (O), 355036 (R), Fax 357257, **Email : vijay @ ncra.tifr.res.in**

Citation Prof. Kapahi has done significant work on extragalactic radio sources and observational cosmology, in particular, structures of radio sources and angular size cosmology, structure of hot spots in extended radio galaxies and quasars. He is credited with discovery of steep-spectrum compact radio sources, and the phenomenon of relativistic beaming in quasar nuclei.

1983 **Kapoor, Shyam Sunder** (DOB: 14 June 1938), *Sp: Nuclear physics; Accelerator physics; Energy dispersive X-ray analysis of materials; Heavy ion physics.* Physics and E & I Group, Bhabha Atomic Research Centre,Mumbai - 400 085. Tel (022) 5505296 (O), 5567383 (R), Fax 5519613, **Email : sskapoor@magnum.barc.ernet.in**

Citation Dr Kapoor has made significant experimental contributions to the field of fission and heavy ion physics. He has studied light charged particles emitted in fission to probe the characteristics of large scale nuclear motion. He has obtained important correlations between the fragment mass, charge and total kinetic energy in binary fission. He has established a new type of nuclear splitting process which proceeds on a fast time scale.

1986 **Kaw, Predhiman Krishan** (DOB: 15 January 1948), *Sp: Nonlinear plasma theory.* Institute for Plasma Research, Bhat, Gandhinagar - 382 428. Tel (079) 2864686 (O), 6741273, 6747574 (R), Fax 2864310, **Email: kaw @ plasma.ernet.in**

Citation Prof. Kaw has made vital contributions to our present understanding of (i) nonlinear collective effects in plasmas, especially those that are inertially and magnetically confined, and (ii) instabilities and current maintenance in tokamaks.

1958 **Krishnan, Kariamanikkam Srinivasa** (DOB: 4 December 1898*), Sp: Molecular scattering of light; Magnetism related to physics; Physics and chemistry of crystalline solids.*__Expired.__

Citation Dr Krishnan has carried out valuable researches in crystal physics, thermionics of metals and semiconductors, and generally in the physics of the solid state. His work on the lattice dynamics of ionic crystals is of fundamental significance.

Dr Krishnan's investigation on the distribution of temperature along filaments and tubes electrically heated *in vacuo* have brought orderly thinking into a complex but practical subject, and made the way smooth for further advances in the field.

1988 **Kumar, Deepak** (DOB: 1 April 1946*), Sp: Condensed matter physics; Statistical mechanics.* School of Physical Sciences, Jawaharlal Nehru University, New Delhi - 110 067. Tel (011) 6189701 (O), 6109903 (R), Fax 6865886, **Email : deepak @ jnuniv.ernet.in**

Citation Prof. Kumar has made significant contributions to condensed matter physics, especially to the theory of disordered magnetic systems. He was one of the first to realize and develop the idea of the fractal nature of spin clusters near the percolation threshold, and to predict experimentally observed consequences. His recent contributions to the theory of hierarchical systems bring out their novel features.

1985 **Kumar, Narendra** (DOB: 1 February 1940), *Sp: Condensed matter physics; Localization in Disordered Systems; High temperature superconductivity.* Raman Research Institute, Bangalore - 560 080. Tel (080) 3311012 (O), 3410549 (R), Fax 3340492, **Email : nkumar @ rri.ernet.in**

Citation Prof. Kumar has done important work in a wide range of areas in condensed matter physics, especially in the field of disordered systems. Particularly noteworthy are his stimulating ideas and results on configurational excitations in glasses diffusion in dynamically disordered media and non-self averaging nature of electron transport in random systems.

1992 **Kumar, Vikram** (DOB: 8 July 1947), *Sp: Semiconductor physics and technology.* Solid State Physics Laboratory, Lucknow Road, Timarpur, Delhi - 110 054. Tel (011) 2942041, 2518930 (O), Fax 2913609, **Email : sspl@del2.vsnl.net.in iuk**

Citation Dr Kumar has investigated electronic and optical properties of deep level defects in silicon and gallium arsenide and related materials and elucidated the nature of DX centres and EL2 defects.

1989 **Lakshmanan, Muthusamy** (DOB: 25 March 1946), *Sp: Theoretical physics; Non linear dynamics.* Department of Physics & Centre for Nonlinear Dynamics, Bharathidasan University, Tiruchirapalli - 620 024. Tel (0431) 660393, 660357 (O), 459386 (R), Fax 466840, 660245, **Email: lakshman @ bdu.ernet.in**

Citation Prof. Lakshmanan has done outstanding work in the area of nonlinear dynamical systems. He has pioneered the use of group theoretic and differential geometric methods exploiting among other Painleve, Lie and Lie-Backlund analyses for exploring integrability and the existence of chaotic regimes. He has shown remarkable ability in inventing unsuspected transformations and finding new variables to expose hidden structures. His work on solitons in one dimensional Heisenberg spin chains in well-known. Prof. Lakshmanan's many faceted investigations in nonlinear dynamics have enriched the subject and have made a significant impact in the field.

1967 **Lal, Devendra** (DOB: 14 February 1929), *Sp: Cosmic rays; Nuclear physics; Geophysics; Oceanography; Glaciology.* Scripps Institution of Oceanography, University of California, San Diego, GRD 0220. La Jolla, CA 92093-0220 USA. Tel (+1-619) 5342134 (O), 5871535 (R), Fax 5340784, **Email : dlal @ ucsd.edu**

Citation Dr Lal's special interest in recent years has been in studying isotopic changes induced by cosmic rays on the earth and in extraterrestrial objects. He has extensively developed this broad area, which encompasses several fields in earth sciences and astrophysics. Utilizing sensitive low-level radiation counting techniques, radioisotopes produced by cosmic radiation in the earth's atmosphere were detected and used as tracers for studies in meteorology, hydrology and oceanography. He has been responsible for setting up two laboratories at the Tata Institute of Fundamental Research as national facilities, one for archaeological studies based on cosmic ray produced radiocarbon and the other for hydrological studies using natural and artificial tritium activity. He has shown that the results of studies of cosmic ray produced radioactivities in meteorites were indicative of the fact that cosmic ray intensity during the last few million years has been the same as it is today.

1989 **Madhusudana, Nelamangala Vedavyasachar** (DOB: 9 May 1944), *Sp: Liquid crystals.* Raman Research Institute, C V Raman Avenue, Bangalore - 560 080. Tel (080) 3311015, 3340124 (O), 3333407 (R), Fax 3340492, **Email : nvmadhu@rri.ernet.in**

Citation Prof. Mudhusudana has made outstanding contributions to the physics of liquid crystals. He has observed a number of interesting phenomena for the first time including electromechanical coupling effects in cholesterics and curvature induced suppression of the smectic A phase. He has also made significant theoretical contributions on the importance of antiferroelectric correlations in smectics, relevance of flexoelectricity for a number of striking electrohydrodynamical instabilities and a molecular mechanism for the re-entrant nematic phase.

1976 **Majumdar, Chanchal Kumar** (DOB: 11 August 1938) *Physics of condensed matter.* S N Bose National Centre for Basic Sciences, J D Block, Sector III, Salt Lake, Calcutta - 700 091. Tel (033) 3585709 (O), 3376073 (R), Fax 3343477, 3376290, **Email : ckm@bose.ernet.in; ckm@ boson.bose.res.in**

Citation Prof. Majumdar has done valuable work on problems of finite Heisenberg chains, critical parameters in phase transitions and positron annihilation. The calculations of effective magnetic moment, specific heat and other physical quantities for finite Heisenberg chains constitute important contribution. These calculations showed the existence of violation of the non-crossing and non-degeneracy rules. He has determined the critical parameters of ferromagnetic Ising model and gas-

liquid transition. His work on positron annihilation has provided a theoretical basis for the measurement of the Fermi momentum of metals. His pioneering study of bound magnon states using techniques borrowed from scattering theory enables one to compute bound magnon states. Such bound magnon states were verified experimentally.

1991 **Mathur, Deepak** (DOB: 8 April 1952*), Sp: Experimental atomic and molecular collision physics; Mass spectrometry.* Tata Institute of Fundamental Research, Homi Bhabha Road, Colaba, Mumbai - 400 005. Tel (022) 2152971 Extn 2381 (O), 2151502 (R), Fax 2152110, **Email : atmol1 @ spectrum.tifr.res.in**

Citation Dr Mathur has made experimental studies of low energy electronic and ionic collisions which explore the transformation of multi- particle collidants from one quantal state to another. For this purpose Dr Mathur has developed a state-of-the art energy spectrometric technique and various other related instrumentation in his laboratory. He has recently discovered a new class of isolated metastable multiply-charged molecular ions which dissociate much less rapidly than would be expected from the conventional perturbative single-particle theories of atomic collisions.

1960 **Menon, Mambillikalathil Govind Kumar** (DOB: 28 August 1928), *Sp: Cosmic ray physics; Elementary particle high energy physics.* C - 63, Tarang Apartments, 19, I P Extn., Mother Dairy Road, Delhi -110 092. Tel (011) 2725010 (R), Fax 6959456, **Email : mgkmenon @ ren02.nic.in**

Citation Prof. Menon has made notable contributions with regard to the nuclear emulsion technique, and the physics of elementary particles, particularly strange particles. He has conducted significant cosmic ray investigations in India at high altitudes and at great depths underground. He, in collaboration with his colleagues, has demonstrated the existence of muons of varying energies, of monoenergetic high energy, pions and of electrons of varying energies, as secondaries in the decay of K-particles, thus establishing the $K\mu$ 3, $K\pi$ 2 and Ke3 decay modes.

1968 **Mitra, Ashesh Prosad** (DOB: 21 February 1927), *Sp: Studies on Ionosphere; Space research.* National Physical Laboratory, Dr K S Krishnan Road, New Delhi - 110 012. Tel (011) 5745298 (O), 6212218, 6474018, 6218531(R), Fax 5752678, 5714189, **Email : apmitra @ doe.ernet.in**

Citation Dr Mitra is one of the acknowledged authorities on ionosphere and on some aspects of space research. His pioneering work on the use of cosmic radio noise for upper atmosphere studies resulted in a whole series of scientific discoveries in ionosphere, solar physics and cosmic rays. He has carried out comprehensive studies on the ionospheric effects of solar flares and has established one of the most extensive radio flare systems at the National Physical Laboratory. He developed an atmospheric model from observations of satellite drag and initiated new D region rocket experiments. Dr Mitra's work on ion and neutral chemistry in the upper atmosphere, especially on the minor constituent nitric oxide, provided the basis for much of our present knowledge about the lower ionosphere. He has contributed substantially to the establishment and operation of the International Spacewarn System and the International Ursi-gramme and World Day Service.

1969 **Mitra, Asoke Nath** (DOB: 15 April 1929), *Sp: Field theory (QCD) and quark physics; Particles and nuclei.* 244, Tagore Park, Delhi - 110 009. Tel (011) 7444731 (R), Fax 7257336 (DU), **Email : anmitra @ csec.ernet.in; gamitra @ nde.vsnl.net.in**

Citation Dr Mitra has done pioneering work on the nuclear three-body problem providing an exact solution in terms of separable potentials. This work of Dr Mitra has generated a good deal of interest in the nuclear physics world.

In the field of hadron physics, Dr Mitra showed the incompatibility of Fermi statistics for quarks with the observed monotonic behaviour of the proton form factor with momentum transfer. He gave a new classification of hadron resonances in terms of s-wave quark-quark forces, in conformity with the observed pattern of 56 (even) and 70 (odd) representations of the group SU(6) x 0(3), and their Regge recurrences. He has developed a comprehensive phenomenological theory of relativistic interactions of hadron resonances with vector and pseudoscalar mesons in terms of the quark model.

1980 **Mukunda, Narasimhaiengar** (DOB: 25 January 1939), *Sp: Classical and quantumdynamic formalisms; Polarization optics.* Centre for Theoretical Studies & Physics Department, Indian Institute of Science, Bangalore - 560 012. Tel (080) 3092266 (O), 3348657 (R), Fax 3341683, **Email : nmukunda@cts.iisc.ernet.in**

Citation Prof. Mukunda has made significant contributions to the study of symmetry structure in dynamics, in particular, of singular systems and to the representation theory of the Lorentz and Poincare groups. His work has clarified the inter-relationship between classical and quantum dynamics and is fundamental to the understanding of kinematical aspects of relativistic physical systems.

1975 **Nag, Biswa Ranjan** (DOB: 1 October 1932), *Sp: Analog computers; Nonlinear oscillations; Microwave electronics; Solid state electronics; Electron transport.* Institute of Radiophysics & Electronics, 92 Acharya Prafulla Chandra Road, Calcutta - 700 009. Tel (033) 3509115 (O), 3372696 (R), Fax 3515828, **Email : brn @ cucc.ernet.in**

Citation Dr Nag has done important work in the area of electrical transport phenomena in semiconductors. His work has enabled a better understanding of miniband parameters of semiconductor superlattices and magnetic quantization in nonparabolic energy bands. These studies have bearing on microwave semiconductor devices, which are important in the fields of microwave communications and radar.

1978 **Narlikar, Jayant Vishnu** (DOB: 19 July 1938*), Sp: Cosmology; Theoretical astrophysics*. Inter-University Centre for Astronomy and Astrophysics, (IUCAA), Post Bag No. 4, Ganeshkhind, Pune University Campus, Pune - 411 007. Tel (020) 351414, 351513 (O) 350669 (R), Fax 350760, 356417, **Email : jayant @ iucaa.ernet.in**

Citation Prof. Narlikar has proposed, together with Fred Hoyle, the conformal theory of gravity. He has investigated non-standard cosmologies based on this theory as well as the steady state model of the universe and thus made a significant contribution to astronomy. He gave the concept of white holes, and applied it to various explosive and transient phenomena in astrophysics.

1996 **Padmanabhan, Thanu** (DOB: 10 March 1957), *Sp: Gravitation & Cosmology*. Inter-University Centre for Astronomy and Astrophysics, IUCAA, Post Bag 4, Ganeshkhind, Pune - 411 007. Tel (020) 359415, 351414 (O), 354922 (R), Fax 350760, **Email : paddy @ iucaa.ernet.in**

Citation Dr Padmanabhan has made outstanding contributions in several areas of modern astrophysics and cosmology, notably in the fields of quantum gravity and structure formation in the universe. His work has provided a simple and consistent interpretation for the semiclassical limit of quantum cosmology based on the concept of decoherence. His recent work has led to a better understanding of nonlinear gravitational clustering in the formation of structure in the early universe.

1978 **Raja Gopal, Erode Subramanian** (DOB: 12 May 1936), *Sp: Low temperature and high pressure phenomena; Condensed matter physics; Experimental techniques and instrumentation.* Department of Physics, Indian Institute of Science, Bangalore - 560 012. Tel (080) 3092529 (O), 3347449 (R), Fax 3341683, 3342085, **Email : gopal @ physics.iisc.ernet.in**

Citation Prof. Raja Gopal has contributed significantly to knowledge on the critical point phenomena in condensed matter with milli-degree control and fine resolution. This work led to the discovery of the breakdown of the rectilinear diameter law. His studies on the unusual behaviour of electrical resistivity bear out the universality of the non-equilibrium critical point phenomena.

1983 **Rajaraman, Ramamurti** (DOB: 11 March 1939), *Sp: Elementary particle theory; Quantum field and body theory.* School of Physical Sciences, Jawaharlal Nehru University, New Mehrauli Road, New Delhi - 110 067. Tel (011) 6189701, 6107676 Extn 2785 (O), 6102035 (R), Fax 6165886, **Email : doug @ jnuniv.ernet.in**

Citation Prof. Rajaraman has had a consistent record of achievements in many areas of theoretical physics ranging from nuclear theory through statistical mechanics to particle physics and quantum field theory. His work on three and n-body clusters in nuclear matter and liquid He-3, and on nonperturbative methods in quantum field theory, is particularly well known. He has also shown great skill as an expositor of newly emerging concepts, such as solitons and instantons.

1965 **Ramachandra, Rao Barry** (DOB: 21 November 1922), *Sp: Space physics and Ultrasonics.* Flat No. 101, My home Madhuban, Srinagar Colony Road, Hyderabad - 400073.

Citation Prof. Ramachandra Rao has built up a flourishing school of research in ionosphere and radio physics. He has studied diffraction of light up to 400 Mc/sec, and verified the theoretical expectations. He has developed new and simple methods for measuring some of the physical parameters of diffusion and drift transistors, as also for studying ultrasonic velocity, absorption and their temperature variation in liquids and solids. He has studied exhaustively the characteristics of horizontal ionospheric winds over a sunspot cycle and obtained several new results.

1961 **Ramachandran, Gopalasamudram Narayana** (DOB: 8 October 1922), *Sp: Molecular biophysics; Crystal physics; Mathematical philosophy.* B-1, Navdeep Apartments, Navjot Complex, Near A-one School, Subhash Chowk, Memnagar, Ahmedabad - 380 052. Tel (079) 7437122

Citation Dr Ramachandran is internationally known for his contribution to the study of protein structure and in particular for his well-known triple - helical structure of collagen. Together with his colleagues, he has developed a number of new methods in X-ray crystallography, the most important of which is the so-called beta synthesis, finding increasing application in crystal structure analysis. He has established a recognized school of research in molecular biology at Madras University.

1982 **Ramakrishnan, Tiruppattur Venkatachalamurti** (DOB: 14 August 1941), *Sp: Condensed matter physics; Statistical mechanics.* Department of Physics, Indian Institute of Science, Bangalore - 560 012. Tel (080) 3092579, 3092581 (O), 3340591 (R), Fax 3341683, **Email : tvrama @ physics.iisc.ernet.in**

Citation Prof. Ramakrishnan has done important work in the theory of liquid to solid transition and of mixed valence systems. His theory of freezing is a simple and quantitative treatment of the phenomenon as a first order structural transition in dense classical systems and has stimulated a lot of further work. He has made significant contributions to the well-known scaling theory of electron localization.

1963 **Ramanna, Raja** (DOB: 28 January 1925), *Sp: Nuclear Physics; Reactor Physics and design.* National Institute of Advanced Studies, Indian Institute of Science, Bangalore - 560 012; 407 II Block, 9th Cross Road, Rabindranath Tagore Nagar, Bangalore - 560 032. Tel (080) 3344351, 3346594 (O), 3330815 (R), Fax 3346634 (O), 3434799 (R), **Email : rr @ hamsadvani.scrc.iisc.ernet.in; ramanna @ sansad.nic.in**

Citation Dr Ramanna is well known for his work on nuclear fission phenomena and neutron thermalization. Dr Ramanna has propounded a new theory of fission of heavy nuclei which explains many hitherto unconnected facts. He has played an active role in the design of the reactors at Trombay and is responsible for utilization of these reactors for researches in many fields.

1966 **Ramaseshan, Sivaraj** (DOB: 10 October 1923), *Sp: Crystallography; Optics; Material science.* Raman Research Institute, C V Raman Avenue, Bangalore - 560 080. Tel (080) 3311016 (O), 3369108 (R), Fax 3340492(O), 3342489 (R), **Email : sivaraj @ rri.ernet.in**

Citation Dr Ramaseshan established a prominent school of research in the field of X-ray crystallography in India. His major work relates to anomalous scattering X-rays and neutrons and their application to the understanding of the structure of matter. This technique has been employed by him and others for elucidating the structures of many large molecules, including insulin Recently it has been extended to the study of stregthening mechanisms in solids and to the study of liquid and

amorphous states. he was also associated with the development of instrumentation for high and low temperature X-ray crystallography.

In recent years, Dr Ramaseshan has been involved in the application of science to technology. He has also worked on composites and unconventional fabrication processing of materials.

1997 **Raychaudhuri, Amitava** (DOB: 17 March 1952), *Sp: Supersymmetry; Z-boson physics; Higgs particles and Astroparticle physics.* Department of Physics, University of Calcutta, 92, Acharya Prafulla Chandra Road, Calcutta - 700 009. Tel (033) 3508386 (O), 4737519 (R), Fax 2486604, **Email : amitava @ cubmb.ernet.in**

Citation Dr Raychaudhuri has made outstanding contributions to the physics, beyond and alternative, to the standard model of particle physics, including the processes involving supersymmetry and electroweak interactions with the right handed currents.

1994 **Raychaudhuri, Arup Kumar** (DOB: 1 March 1952), *Sp: Experimental Solid State Physics; Instrumentation Development; Cryogenics.* National Physical Laboratory, Dr K S Krishnan Marg, New Delhi - 110 012 **.** Tel (011) 5741440, 5782721 (O), 5819726 (R), Fax 5752678, 5764189, **Email : arup @ csnpl.ren.nic.in**

Citation Dr Raychaudhuri has done pioneering experimental work in the field of low temperature quantum transport in oxides near metal-insulator transition elucidating the interplay of disorder and interaction. For this and other tunneling studies, Dr Raychaudhuri has indigenously developed state-of-the-art low temperature scanning tunneling microscope and other related experimental facilities.

1987 **Roy, Probir** (DOB: 4 October 1942*), Sp: Theoretical high energy particle physics.* Theoretical Physics Group , Tata Institute of Fundamental Research, Homi Bhabha Road, Mumbai - 400 005. Tel (022) 2152971, 2152979 Extn 2432 (O), 2152611 (R), Fax 2152181, 2152110, **Email : probir @ theory.tifr.res.in**

Citation Prof. Roy has made significant contributions in theoretical high energy physics, especially the phenomenology of deep inelastic lepton-hadron-photon processes, ultralight neutrinos in supersymmetric grand unified theories and of Higgs meson signals and mass limits in supergravity theories. His sum rule on two photon processes is important.

1981 **Roy, Shasanka Mohan** (DOB: 2 September 1941), *Sp: High energy physics; Foundation of quantum theory.* Theoretical Physics Group, Tata Institute of Fundamental Research, Homi Bhabha Road, Mumbai - 400 005. Tel (022) 2152971 Extn 2215 (O), 2152757 (R), Fax 2152181, **Email : shasanka @ theory.tifr.res.in**

Citation Dr Roy has done significant work on pion dynamics and high energy hadron interactions. His work on pion-pion dynamics that led to an integral equation , now known as Roy's Equation, has revolutionized the subject and is fundamental to all subsequent work in the field. Dr Roy's studies on high energy theorems and violations of Pomeranchuk theorem are important contributions.

1962 **Sarabhai, Vikram Ambalal** (DOB: 12 August 1919), *Sp: Cosmic rays; Interplanetary phenomena.* **Expired.**

Citation Prof. Sarabhai has worked on the astrophysical implicatios of cosmic ray time variations. Work done by him in collaboration with his students at the research stations established at Ahmedabad, Gulmarg, Kodaikanal, Trivandrum and Chacaltaya in Bolivia (South America) has led to the discovery of new solar relationships of cosmic ray variations. He has demonstrated the significance of the study of anisotropy, within the solar system, of cosmic rays from the galaxy. This led him to an accurate experimental study of the variations of a few parts in a thousand which occur in the cosmic ray intensity arriving on the earth. He uses these cosmic ray variations to probe the electromagnetic state of the earth and thus to study the emission of a plasma wind from the sun and the configuration and movements of magnetic fields in the solar systems.

1980 **Satyamurthy, Narayanasami** (DOB: 10 July 1951) *Sp: Theoretical (Computational) molecular reaction dynamics.*. **Expired.**

Citation Dr Satyamurthy has done pioneering work using thermal neutron beams to study magnetic materials. He set up neutron spectrometer facilities and used them to study ferromagnetic, antiferromagnetic and ferrimagnetic materials. He elucidated the magnetic structures of a number of alloy systems. Dr Satyamurthy's exhaustive neutron diffraction work on ferrites led to the discovery of the non-collinear spin structure, also known as Yafet-Kittel type of ferrimagnetism. He developed the polarized neutron technique for structure and spin density measurements in magnetite and a number of other compounds and alloys.

1994 **Sen, Ashoke** (DOB: 15 July 1956), *Sp: Theoretical Physics; High energy physics.* Mehta Research Institute, Chhatnag Road, Jhunsi, Allahabad - 211 019. Tel (0532) 667511 Extn. 2002 (O), 667511 Extn 4002 (R), Fax 667576, **Email : sen @ mri.ernet.in**

Citation Dr Sen has done pioneering work which established the connection between string theory and the conformally-in-variant field theories and for his recent work on the strong-weak duality which is an important breakthrough and provides a basis for further work in supersymmetric Yang-Mills theories.

1984 **Shashidhar, Ranganathan** (DOB: 1 January 1946), *Sp: High pressure physics; Liquid crystals.* Centre for Biomedical Science & Engineering, Naval Research Laboratory, Washington DC 20375 - 5320 USA. Tel (+1-202) 4046005 (O), (+1-703) 8665034 (R), Fax 4048426, **Email : rns @ cbmsc.nrl.navy.mil**

Citation Prof. Shashidhar has made significant contributions to experimental physics of liquid crystals, especially at high pressures. He has studied a variety of new phenomena like re-entrant polymorphism, and universality of multi-critical points, which are of considerable significance in modern condensed matter physics.

1992 **Shenoy, Subodh Raghunath** (DOB: 16 October 1947), *Sp: Condensed matter theory*. Condensed Matter Group, International Centre for Theoretical Physics, Trieste- 34100, Italy. Tel (+ 39 -040) 2240111 (O), 4211286 (R), Fax 224163, **Email : shenoy @ ictp.trieste.it**

Citation Dr Shenoy has contributed to generalizing topological defect-mediated phase transitions to three dimensions, proposed a vortex dynamics and considered decay kinetics of metastability, leading to definitive predictions confronting experiments.

1993 **Simon, Rajiah** (DOB: 4 August 1948), *Sp: Optical physics; Group Theory.* Institute of Mathematical Sciences, CIT Campus, Taramani, Chennai - 600 113. Tel (044) 2351856 (O), 4413270 (R), Fax 2350586, **Email : simon @ imsc.ernet.in**

Citation Dr Simon has made outstanding contributions to topological phases; vectorial theory of beams; Gouy effect for squeezed light and applications of group theoretical ideas to optical problems.

1985 **Singh, Kehar** (DOB: 3 July 1941), *Sp: Photonics, Applied optics*. Department of Physics, Indian Institute of Technology, New Delhi - 110 016. Tel (011) 6857784, Fax 6862037, **Email : kehars @ physics.iitd.in**

Citation Prof. Singh has done significant work in applied optics, in particular, on coherent & partially coherent imaging of diffuse objects and incoherent imaging. His work has direct applications in the areas of adaptive optics, holography, optical testing and microlithography.

1973 **Singh, Virendra** (DOB: 8 June 1938), *Sp: Theoretical physics; High energy physics; Nonlinear dynamics.* Theoretical Physics Group, Tata Institute of Fundamental Research, Homi Bhabha Road, Mumbai - 400 005. Tel (022) 2152796, 2152971 Extn 2260 (O), 2152269 (R), Fax 2152181, 2152110, **Email : vsingh @ theory.tifr.res.in**

Citation Dr Singh has made significant contributions in respect of various theories connected with particle physics, particularly formulation of the analytic S-matrix theory, elucidation of exact results from such formulations, and symmetry theories of hadrons, and the use of such concepts for calculations on scattering amplitudes. These theories and calculations have thrown light on the recent experimental data on high energy total cross-sections in hadronic processes.

1974 **Sinha, Krityunjai Prasad** (DOB: 5 July 1929*), Sp: Condensed matter physics, Theoretical physics.* Department of Physics, Indian Institute of Science, Bangalore - 560 012. Tel (080) 3092725 (O), 3345553 (R), **Email : sinha @ physics.iisc.ernet.in**

Citation Dr Sinha has made vital contributions to theoretical solid state physics, particularly in the area of crystal magnetism. His work has added considerably to our knowledge of the mechanism of exchange and other interactions in solids in relation to transport properties and the origin of giant moments; and also to excitonic and electronic phase transitions in doped semiconductors. His proposal of the non-equilibrium mechanism with regard to high temperature superconductivity has been of considerable theoretical and experimental values.

1974 **Sodha, Mahendra Singh** (DOB: 8 February 1932), *Sp: Plasmas; Semiconductors; Optics;Energy.* B 113, Nirala Nagar, Lucknow - 226 020. Tel (0522) 380009 (R)

Citation Prof. Sodha has made important theoretical contributions in the broad area of interaction of fields with matter. His work on self-focussing in plasmas is significant with possible important applications in laser fusion. Following a new approach, he has obtained interesting results on self-focussing in optical fibres which will be useful for optical communication. He has made important theoretical contributions in the field of harmonic generation in plasmas and semiconductors. His work on plasmas has a bearing on magneto-hydrodynamic (MHD) power generation.

1990 **Sood, Ajay Kumar** (DOB: 26 June 1951), *Sp: Condensed matter physics; Light scattering; Superlattices and Super conductors.* Department of Physics, Indian Institute of Science, Bangalore - 560 012. Tel (080) 3092725 (O), 3373963 (R), Fax 3341683, **Email : asood @ physics.iisc.ernet.in**

Citation Prof. Sood has, through his experiments on the colloidal aqueous suspension of charged polystyrene balls with tunable interaction, obtained results on the types of short and intermediate range order possible in condensed matter, including the glassy state. His other major area of activity has been the study of confined and interface optical phonons in semiconductor superlattices.

1981 **Srinivasan, Ramanujan** (DOB: 21 April 1938), *Sp: Magnetic resonance phenomena.* **Expired.**

Citation Prof. Srinivasan developed novel experimental techniques to study magnetic resonance phenomena at high pressures and low temperatures. Using ESR, NMR and ENDOR techniques, he established unequivocally the role played by hydrogen atoms and ammonium ions in ferroelectric systems. His contributions to the study of phase transitions and magnetic interactions in solids are very significant.

1988 **Srivastava, Onkar Nath** (DOB: 31 December 1942), *Sp: Condensed matter physics; Material science; Energy materials; Thin films.* Department of Physics, Banaras Hindu University, Varanasi - 221 005. Tel (0542) 317468 (O), 361937 (R), Fax 317468, 317074, **Email : ons @ banaras.ernet.in**

Citation Prof. Srivastava has distinguished himself through his work on local structural variation in high temperature oxide superconductors, growth, characterization and application of hydrogen storage materials.

1970 **Vainu, Bappu Manali Kallat** (DOB: 10 August 1927), *Sp: Astrophysics* **Expired.**

Citation In collaboration with Wilson, Dr Vainu Bappu showed that there is a unique relationship between the width of the ionized calcium K emission line and the absolute luminosity of a star. More recently, he has made significant contributions towards a proper understanding of this phenomenon, which has now come to be known as the Wilson-Bappu effect. His other noteworthy results relate to

topics such as the behaviour of sodium emission in comets near perihelion passage as influenced by solar wind effects and the nature and growth of magnetic fields associated with the appearance of sunspots in active regions of the sun.

1964 **Verma, Ajit Ram** (DOB: 20 September 1921), *Sp: Crystal growth; Optical interferometry; X-ray diffraction; Defects in Crystalline solids.* 160, Deepali, Pitampura, New Delhi - 110 034. Tel (011) 5782721 (O), 7023574 (R)

Citation Dr Verma has made significant experimental contributions towards the theory of growth, in particular, the dislocation theory of crystal growth. He is credited with precise measurement of the molecular steps of the growth spirals by the application of Tolansky's multiple-beam interferometric methods and correlating these with the X-ray unit cell size. Dr Verma has also conducted experimental work on polytypism, and optical and X-ray diffraction methods.

1976 **Vijayaraghavan, Ramanuja** (DOB: 3 January 1931), *Sp: Solid state physics; Magnetism; Material science; Superconductivity.* Indian Institute of Technology Campus, Powai, Mumbai - 400 076. Tel (022) 2152971, 5784694 (O), 7667554 (R), Fax 2152110,5783254, **Email : rv @ tifrvax.tifr.res.in**

Citation Dr Vijayaraghavan has made significant contributions in the study of metals and alloys by the nuclear magnetic resonance technique. His studies on the oscillatory character of conduction, electron polarisation in rare earth alloys, Kondotype behaviour in concentrated cerium alloys, and crystal field effects on the magnetism and the hyperfine fields in samarium alloys are well known. Dr Vijayaraghavan and his group are working on spin glasses, Heusler alloys and other magnetic materials.

SSB Prize Winner Index

1995 Bhatia, Rajendra

1993 Bhatia, Suresh Kumar

1994 Bhattacharya, Alok

1971 Bhattacharyya, Amitabha

1988 Bhattacharyya, Bhabatarak

1997 Bhattacharyya, Kankan

1962 Bhattacharyya, Sasanka Chandra

1984 Bhawalkar, Dilip Devidas

1972 Biswas, Birendra Bijoy

1992 Borkar, Vivek Shripad

1976 Bose, Mihir Kumar

1963 Brahm, Prakash

1990 Brahmachari, Samir Kumar

1997 Chakrabarti, Bikas Kanta

1998 Chakravarty, Akhil Ranjan

1975 Chakravorty, Animesh

1968 Chakravorty, Kshitish Ranjan

1996 Chandrakumar, Narayanan

1989 Chandrasekaran, Srinivasan

1995 Chandrasekhar, Jayaraman

1972 Chandrasekhar, Sivaramakrishna

1959 Chandrasekharan, Komaravolu

1979 Chandrashekaran, Maroli Krishnayya

1966 Chatterjea, Jyoti Bhusan

1961 Chatterjee, Asima

1992 Chatterji, Dipankar

1995 Chattopadhyay, Kamanio

1981 Chaturvedi, Umesh Chandra

1989 Chaudhuri, Mihir Kanti

1975 Chopra, Kasturi Lal

1990 Choudary, Boyapeti Manoranjan

1977 Chowdhury, Mihir

1984 Cowsik, Ramanath

1990 Dani, Shrikrishna Gopalrao

1998 Das, Sumit Ranjan

1992 Das, Undurti Narasimha

1980 Datta, Asis

1981 Deb, Bidyendu Mohan,

1980 Desiraju, Turaga

1976 Devaprabhakara, Devadas

1991 Dhar, Deepak

1971 Dhar, Manojit Mohan

1992 Dharmalingam, Kuppamuthu

1981 Dutta Roy, Suhash Chandra

1976 Dutta, Guru Prakash

1965 Dutta, Nirmal Kumar

1984 Easwaran, Kalpathy Ramaier Katehap

1993 Gadagkar, Raghavendra

1986 Gadgil, Madhav Dhananjaya

1993 Gadre, Shridhar Ramachandra

1998 Ganesh, K N

1985 Ganguly, Dilip Kumar

1963 Ganguly, Jagannath

1979 Gaur, Vinod Kumar

1973 George, Manapurathu Verghese

1979 Ghatak, Ajoy Kumar

1974 Ghatak, Usha Ranjan

1981 Ghosh, Jayanta Kumar

1977 Ghosh, Subir Kumar

1993 Gopal, Krishna

1982 Gopalan, Kunchithapadam

1995 Goswami, Bhupendra Nath

1994 Goswami, Jitendra Nath

1978 Govil, Girjesh

1960 Govindachari, Tuticorin Raghavachari

1997 Gowrishankar, Jayaraman

1971 Gulati, Om Dutt

1986 Gupta, Alok Krishna

1972 Gupta, Anadi Sankar

1985 Gupta, Chhitar Mal

1983 Gupta, Harsh Kumar

1997 Gupta, Satish Kumar

1973 Guraya, Sardul Singh

1995 Hasnain, Seyed Ehtesham

1971 Iyengar, Padmanabha Krishnagopala

1969 Jain, Amolak Chand

1966 Jain, Hari Krishan

1975 Jain, Padam Chand

1966 Jain, Suresh Chand

1998 Jayannavar, Arun M

1982 Jayaraman, Ramamirtha

1994 Jemmis, Eluvathingal Devassy

1979 Jha, Sudhanshu Shekhar

1998 Jhunjhunwala, Ashok

1991 Joshi, Jyeshtharaj Bhalchandra

1972 Joshi, Shri Krishna

1977 Kaila, Krishna Lal

1969 Kalyanaraman, Subramanian

1971 Kanungo, Madhu Sudan

1987 Kapahi, Vijay Kumar

1983 Kapoor, Shyam Sunder

1993 Karmeshu

1983 Kasturirangan, Krishnaswamy

1986 Kaw, Predhiman Krishan

1972 Kessar, Satinder Vir

1997 Khakhar, Devang Vipin

1982 Khetrapal, Chunni Lal

1988 Kishore, Kaushal

1966 Krishna, Jai

1978 Krishnamurthy, Edayyathu Mangalam Venkatarama

1958 Krishnan, Kariamanikkam Srinivasa

1984 Krishnaswami, Sethunathasarma

1988 Kulkarni, Bhaskar Dattatraya

1988 Kumar, Deepak

1985 Kumar, Narendra

1994 Kumar, Neithalath Mohan

1976 Kumar, Rajinder

1981 Kumar, Sushil

1997 Kumar, Vijay

1992 Kumar, Vikram

1989 Lakhotia, Subhash Chandra

1989 Lakshmanan, Muthusamy

1967 Lal, Devendra

1987 Lele, Shrikant

1989 Madhusudana, Nelamangala Vedavyasachar

1972 Maheshwari, Satish Chandra

1971 Maiti, Ajit Kumar

1976 Majumdar, Chanchal Kumar

1985 Malik, Surender Kumar

1986 Mallick, Kumarendra

1982 Mashelkar, Raghunath Anant

1991 Mathur, Deepak

1973 Mathur, Hirdaya Behari

1992 Mehra, Narinder Kumar

1965 Mehrotra, Ram Charan

1978 Mehta, Goverdhan

1991 Mehta, Vikram Bhagvandas

1960 Menon, Mambillikalathil Govind Kumar

1968 Mitra, Ashesh Prosad

1969 Mitra, Asoke Nath

1983 Mitra, Samaresh

1993 Mohanty, Uma Charan

1987 Moharir, Pramod Sadasheo

1976 Moudgal, Nuggehalli Raghuveer

1987 Mukherjee, Debashis

1968 Mukherjee, Sarashi Ranjan

1980 Mukunda, Narasimhaiengar

1995 Muniyappa, Kallapa

1986 Munjal, Manohar Lal

1993 Murthy, Mathur Ramabhadrashastry Narasimha

1973 Murty, Bhyravabhotla Radhakrishna

1975 Nag, Biswa Ranjan

1998 Nag, Subhashis

1994 Nagaraj, Ramakrishnan

1974 Nagarajan, Kuppuswamy

1972 Naha, Kshitindramohan

1998 Nair, G Balakrish

1971 Nair, Narayana Balakrishnan

1983 Naqvi, Syed Mahmood

1996 Naqvi, Syed Wajih Ahmad

1974 Narasimha, Roddam

1975 Narasimhan, Mudumbai Seshachalu

1970 Narasimhan, Palliakaranai Thirumalai

1978 Narlikar, Jayant Vishnu

1984 Natarajan, Paramasivan

1983 Nath, Indira

1980 Negi, Janardan Ganpatrao

1964 Nijhawan, Bal Raj

1983 Padmanaban, Govindarajan

1996 Padmanabhan, Thanu

1974 Pai, Mangalore Anantha

1993 Pal, Gaya Prasad

1990 Pal, Sankar Kumar

1995 Panda, Subrat Kumar

1989 Pandey, Prem Chand

1991 Pandey, Virendra Nath

1984 Pandian, Thavamani Jegajothivel

1987 Parimala, Raman

1976 Parthasarathy, Kalyanapuram Rangachari

1985 Parthasarathy, Rajagopalan

1986 Parthasarathy, Thiruvenkatachari

1983 Passi, Inder Bir Singh

1996 Periasamy, Mariappan

1982 Podder, Sunil Kumar

1982 Prakasa Rao, Bhagavatula Lakshmi

1996 Prakash, Vishweshwaraiah

1989 Prasad, Gopal

1983 Prasad, Phoolan

1988 Prasad, Surendra

1990 Prathap, Gangan

1979 Raghavan, Srinivasacharya

1977 Raghunathan, Madabusi Santanam

1996 Rai, Shyam Sundar

1978 Raja Gopal, Erode Subramanian

1983 Rajaraman, Ramamurti

1976 Rajaraman, Vaidyeswaran

1979 Rama Rao, Palle

1965 Ramachandra, Rao Barry

1961 Ramachandran, Gopalasamudram Narayana

1998 Ramadas, Trivandrum Ramakrishnan

1966 Ramaiah, Nanduri Atchuta

1982 Ramakrishnan, Tiruppattur Venkatachalamurti

1965 Ramalingaswami, Vulimiri

1979 Ramanan, Sundararaman

1991 Ramanathan, Annamalai

1965 Ramanathan, K Gopala

1963 Ramanna, Raja

1993 Ramasami, Thirumalachari

1992 Ramasesha, Suryanarayanasastry

1966 Ramaseshan, Sivaraj

1998 Ramesh, Rengaswamy

1977 Ranganathan, Subramania

1965 Rao, Ayyagari Sambasiva

1959 Rao, Calympudi Radhakrishna

1968 Rao, Chintamani Nagesa Ramachandra

1989 Rao, Gundabathula Venkateswara

1984 Rao, Kalya Jagannath

1997 Rao, Kanury Venkata Subba

1988 Rao, Manchalhalli Rangaswami Satyanarayana

1966 Rao, Neelamraju Ganga Prasada

1985 Rao, Patcha Ramachandra

1975 Rao, Udipi Ramachandra

1984 Ratnasamy, Paul

1996 Ravindranath, Vijayalakshmi

1989 Ray, Manju

1983 Ray, Naba Kishore

1997 Raychaudhuri, Amitava

1994 Raychaudhuri, Arup Kumar

1969 Roy, Chaudhury Ranjit

1987 Roy, Probir

1981 Roy, Shasanka Mohan

1960 Sadasivan, Toppur Setthapathy

1980 Sahu, Basanta Kumar

1991 Saidapur, Srinivas Kishanrao

1994 Sainis, Krishna Balaji

1981 Sane, Prafullachandra Vishnu

1967 Santappa, Mushi

1962 Sarabhai, Vikram Ambalal

1996 Sarin, Shiv Kumar

1998 Sarkar, Debi Prasad

1994 Sarma, Dipankar Das

1978 Sasisekharan, Visvanathan

1990 Sathyamurthy, Narayanasami

1980 Satyamurthy, Narayanasami

1995 Sebastian, Kizhakeyil Lukose

1994 Sen, Ashoke

1991 Sengupta, Sudipta

1972 Seshadri, Conjeevaram Srirangachari

1978 Seshadri, Sekharipuram Narayaniyer

1986 Seth, Pradeep

1960 Sethna, Homi Nusserwanji

1992 Sharan, Maithili

1975 Sharma, Archana

1998 Sharma, Anurag

1967 Sharma, Arun Kumar

1973 Sharma, Man Mohan

1994 Sharma, Yagya Dutta

1984 Shashidhar, Ranganathan

1992 Shenoy, Subodh Raghunath

1968 Sheth, Uttamchand Khimchand

1992 Shetye, Satish Ramnath

1987 Shorey, Tarlok Nath

1982 Shukla, Jang Bahadur

1975 Siddiqi, Obaid

1978 Siddiquie, Hassan Nasiem

1993 Simon, Rajiah

1978 Singh, Dig Vijai

1980 Singh, Jamuna Sharan

1985 Singh, Kehar

1976 Singh, Kishan

1985 Singh, Rishi Narain

1973 Singh, Virendra

1993 Singhi, Navinkumar Madhavprasad

1972 Sinha, Akhoury Purnendu Bhusan.

1984 Sinha, Jagdish Narain

1988 Sinha, Kalyan Bidhan

1974 Sinha, Krityunjai Prasad

1974 Sodha, Mahendra Singh

1978 Somayajulu, Bhamidipati Lakshmidhara Kanakadri

1990 Sood, Ajay Kumar

1987 Sopory, Sudhir Kumar

1991 Sri, Niwas

1980 Sridharan, Ramaiyengar

1997 Srikrishna, Adusumilli

1981 Srinivasan, Ramanujan

1984 Srivastava, Brahm Shanker

1988 Srivastava, Onkar Nath

1982 Subba Rao, Ganugapati Sree Rama

1965 Subramanian, Chirayathumadom Venkatachalier.

1964 Sukh, Dev

1983 Sukhatme, Suhas Pandurang

1994 Sundararajan G

1996 Sunder, Vaikalathur Shankar

1962 Suri, Man Mohan

1987 Surolia, Avadhesha

1961 Swaminathan, Monkombu Sambasivan

1996 Swarup, Ghanshyam

1972 Swarup, Govind

1970 Talwar, Janak Raj

1988 Tandon, Sampat Kumar

1986 Tewari, Udai Bhan

1967 Thirumalachar, Mandayam Jeersannidhi

1963 Tilak, Bal Dattatraya

1976 Trehan, Surindar Kumar

1995 Tyagi, Anil Kumar

1970 Vainu, Bappu Manali Kallat

1966 Vakil, Rustam Jal

1976 Valdiya, Khadg Singh

1968 Venkitasubramanian Tathamangam Ananthanarayanan

1964 Verma Ajit Ram

1998 Vijay Raghavan, Krishnaswamy

1985 Vijayan, Mamannamana

1976 Vijayaraghavan, Ramanuja

1972 Wadhwa, Rajinder Pal

1991 Wadhwa, Shashi

1991 Yadav, Jhillu Singh

1963 Zaidi, Sibte Hasan

Chronological Index

Year	*Discipline*	*Prize Winner*
1958	Physical Sciences	Krishnan, Kariamanikkam Srinivasa
	Award for the year 1958 was presented by Shri Jawaharlal Nehru, Prime Minister & President of CSIR on 24 March 1961 at NPL, New Delhi.	
1959	Mathematical Sciences	Chandrasekharan, Komaravolu
	Mathematical Sciences	Rao, Calympudi Radhakrishna
	Award for the year 1959 was presented by Shri Jawaharlal Nehru, Prime Minister & President of CSIR on 23 March 1963 at NPL, New Delhi.	
1960	Biological Sciences	Sadasivan, Toppur Setthapathy
	Chemical Sciences	Govindachari, Tuticorin Raghavachari
	Engineering Sciences	Sethna, Homi Nusserwanji
	Physical Sciences	Menon, Mambillikalathil Govind Kumar
1961	Biological Sciences	Swaminathan, Monkombu Sambasivan
	Chemical Sciences	Chatterjee, Asima
	Medical Sciences	Arora, Ram Behari
	Physical Sciences	Ramachandran, Gopalasamudram Narayana
1962	Biological Sciences	Bachhawat, Bimal
	Chemical Sciences	Bhattacharyya, Sasanka Chandra
	Engineering Sciences	Suri, Man Mohan
	Physical Sciences	Sarabhai, Vikram Ambalal
	Awards for the years 1960-62 were presented by Shri M C Chagla, Minister for Education & Vice President CSIR on 14 January 1965 at NPL, New Delhi.	
1963	Biological Sciences	Ganguly, Jagannath
	Chemical Sciences	Tilak, Bal Dattatraya
	Engineering Sciences	Brahm, Prakash
	Medical Sciences	Anand, Bal Krishan
	Medical Sciences	Zaidi, Sibte Hasan
	Physical Sciences	Ramanna, Raja

1964	Biological Sciences	Athwal, Dilbagh Singh
	Chemical Sciences	Dev, Sukh
	Engineering Sciences	Nijhawan, Bal Raj
	Physical Sciences	Verma Ajit Ram

Awards for the years 1963-64 were presented by Shrimati Indira Gandhi, Prime Minister & President CSIR on 29 July 1966 at NPL, New Delhi.

1965	Biological Sciences	Subramanian, Chirayathumadom Venkatachalier.
	Chemical Sciences	Basu, Sadhan
	Chemical Sciences	Mehrotra, Ram Charan
	Engineering Sciences	Rao, Ayyagari Sambasiva
	Mathematical Sciences	Ramanathan, K Gopala
	Medical Sciences	Dutta, Nirmal Kumar
	Medical Sciences	Ramalingaswami, Vulimiri
	Physical Sciences	Ramachandra, Rao Barry

Award for the year 1965 was presented by Shrimati Indira Gandhi, Prime Minister & President CSIR on 28 July 1969 at NPL, New Delhi.

1966	Biological Sciences	Jain, Hari Krishan
	Biological Sciences	Rao, Neelamraju Ganga Prasada
	Chemical Sciences	Ramaiah, Nanduri Atchuta
	Engineering Sciences	Krishna, Jai
	Medical Sciences	Chatterjea, Jyoti Bhusan
	Medical Sciences	Vakil, Rustam Jal
	Physical Sciences	Jain, Suresh Chand
	Physical Sciences	Ramaseshan, Sivaraj
1967	Biological Sciences	Sharma, Arun Kumar
	Chemical Sciences	Santappa, Mushi
	Engineering Sciences	Anantharaman, Tanjore Ramachandra
	Medical Sciences	Basu, Ajit Kumar

	Medical Sciences	Thirumalachar, Mandayam Jeersannidhi
	Physical Sciences	Lal, Devendra
1968	Biological Sciences	Venkitasubramanian Tathamangam Ananthanarayanan
	Chemical Sciences	Rao, Chintamani Nagesa Ramachandra
	Engineering Sciences	Chakravorty, Kshitish Ranjan
	Medical Sciences	Mukherjee, Sarashi Ranjan
	Medical Sciences	Sheth, Uttamchand Khimchand
	Physical Sciences	Mitra, Ashesh Prosad
1969	Chemical Sciences	Jain, Amolak Chand
	Medical Sciences	Kalyanaraman, Subramanian
	Medical Sciences	Roy, Chaudhury Ranjit
	Physical Sciences	Mitra, Asoke Nath

Awards for the years 1966-69 were presented by Shri C Subramanium, Minister for Planning, Science & Technology & Vice President CSIR on 27 April 1972 at Vigyan Bhavan, New Delhi.

1970	Chemical Sciences	Narasimhan, Palliakaranai Thirumalai
	Medical Sciences	Talwar, Janak Raj
	Physical Sciences	Vainu, Bappu Manali Kallat
1971	Biological Sciences	Kanungo, Madhu Sudan
	Biological Sciences	Nair, Narayana Balakrishnan
	Chemical Sciences	Dhar, Manojit Mohan
	Engineering Sciences	Bhattacharyya, Amitabha
	Medical Sciences	Gulati, Om Dutt
	Medical Sciences	Maiti, Ajit Kumar
	Physical Sciences	Iyengar, Padmanabha Krishnagopala

Awards for the years 1970-71 were presented by Shri Subramanium, Minister for Industrial Development, Science & Technology & Vice President CSIR on 13 December 1973 at Vigyan Bhavan, New Delhi.

1972	Biological Sciences	Biswas, Birendra Bijoy
	Biological Sciences	Maheshwari, Satish Chandra
	Chemical Sciences	Kessar, Satinder Vir
	Chemical Sciences	Sinha, Akhoury Purnendu Bhusan.
	Earth Sciences	Naha, Kshitindramohan
	Engineering Sciences	Swarup, Govind
	Engineering Sciences	Wadhwa, Rajinder Pal
	Mathematical Sciences	Gupta, Anadi Sankar
	Mathematical Sciences	Seshadri, Conjeevaram Srirangachari
	Physical Sciences	Chandrasekhar, Sivaramakrishna
	Physical Sciences	Joshi, Shri Krishna
1973	Biological Sciences	Guraya, Sardul Singh
	Biological Sciences	Murty, Bhyravabhotla Radhakrishna
	Chemical Sciences	George, Manapurathu Verghese
	Chemical Sciences	Mathur, Hirdaya Behari
	Engineering Sciences	Sharma, Man Mohan
	Physical Sciences	Singh, Virendra

Awards for the years 1972-73 were presented by Shrimati Indira Gandhi, Prime Minister & President CSIR on 27 October 1975 at Vigyan Bhavan, New Delhi.

1974	Biological Sciences	Barnabas, John
	Chemical Sciences	Ghatak, Usha Ranjan
	Chemical Sciences	Nagarajan, Kuppuswamy
	Engineering Sciences	Narasimha, Roddam
	Engineering Sciences	Pai, Mangalore Anantha
	Physical Sciences	Sinha, Krityunjai Prasad
	Physical Sciences	Sodha, Mahendra Singh
1975	Biological Sciences	Sharma, Archana

	Biological Sciences	Siddiqi, Obaid
	Chemical Sciences	Bhakuni, Dewan Singh
	Chemical Sciences	Chakravorty, Animesh
	Engineering Sciences	Rao, Udipi Ramachandra
	Mathematical Sciences	Jain, Padam Chand
	Mathematical Sciences	Narasimhan, Mudumbai Seshachalu
	Physical Sciences	Chopra, Kasturi Lal
	Physical Sciences	Nag, Biswa Ranjan

Awards for the years 1974-75 were presented by Shri B D Jatti, Acting President of India on 6 April 1977 at NPL, New Delhi.

1976	Biological Sciences	Dutta, Guru Prakash
	Biological Sciences	Singh, Kishan
	Chemical Sciences	Devaprabhakara, Devadas
	Earth Sciences	Bose, Mihir Kumar
	Earth Sciences	Valdiya, Khadg Singh
	Engineering Sciences	Kumar, Rajinder
	Engineering Sciences	Rajaraman, Vaidyeswaran
	Medical Sciences	Moudgal, Nuggehalli Raghuveer
	Mathematical Sciences	Parthasarathy, Kalyanapuram Rangachari
	Mathematical Sciences	Trehan, Surindar Kumar
	Physical Sciences	Majumdar, Chanchal Kumar
	Physical Sciences	Vijayaraghavan, Ramanuja
1977	Biological Sciences	Anand Kumar, Trichnopoly Chelvaraj
	Chemical Sciences	Chowdhury, Mihir
	Chemical Sciences	Ranganathan, Subramania
	Earth Sciences	Ghosh, Subir Kumar
	Earth Sciences	Kaila, Krishna Lal
	Mathematical Sciences	Raghunathan, Madabusi Santanam

Awards for the years 1976-77 were presented by Shri Morarji Desai, Prime Minister & President CSIR on 8 February 1979 at NPL, New Delhi.

1978	Biological Sciences	Sasisekharan, Visvanathan
	Chemical Sciences	Govil, Girjesh
	Chemical Sciences	Mehta, Goverdhan
	Earth Sciences	Siddiquie, Hassan Nasiem
	Earth Sciences	Somayajulu, Bhamidipati Lakshmidhara Kanakadri
	Engineering Sciences	Seshadri, Sekharipuram Narayaniyer
	Engineering Sciences	Singh, Dig Vijai
	Mathematical Sciences	Krishnamurthy, Edayyathu Mangalam Venkatarama
	Physical Sciences	Narlikar, Jayant Vishnu
	Physical Sciences	Raja Gopal, Erode Subramanian
1979	Biological Sciences	Bhaduri, Amar Nath
	Biological Sciences	Chandrashekaran, Maroli Krishnayya
	Earth Sciences	Gaur, Vinod Kumar
	Engineering Sciences	Rama Rao, Palle
	Mathematical Sciences	Raghavan, Srinivasacharya
	Mathematical Sciences	Ramanan, Sundararaman
	Physical Sciences	Ghatak, Ajoy Kumar
	Physical Sciences	Jha, Sudhanshu Shekhar

Awards for the years 1978-79 were presented by Shrimati Indira Gandhi, Prime Minister & President CSIR on 25 July 1980 at NPL New Delhi.

1980	Biological Sciences	Datta, Asis
	Biological Sciences	Singh, Jamuna Sharan
	Earth Sciences	Negi, Janardan Ganpatrao
	Earth Sciences	Sahu, Basanta Kumar

	Engineering Sciences	Arunachalam, Vallampadugai Srinivasaraghavan
	Mathematical Sciences	Sridharan, Ramaiyengar
	Medical Sciences	Adiga, Perdur Radhakantha
	Medical Sciences	Desiraju, Turaga
	Physical Sciences	Mukunda, Narasimhaiengar
	Physical Sciences	Satyamurthy, Narayanasami

Award for the year 1980 was presented by Shrimati Indira Gandhi, Prime Minister & President CSIR on 21 April 1981 at NPL, New Delhi.

1981	Biological Sciences	Kumar, Sushil
	Biological Sciences	Sane, Prafullachandra Vishnu
	Chemical Sciences	Balasubramanian, Dorairajan
	Chemical Sciences	Deb, Bidyendu Mohan,
	Engineering Sciences	Dutta Roy, Suhash Chandra
	Mathematical Sciences	Ghosh, Jayanta Kumar
	Medical Sciences	Chaturvedi, Umesh Chandra
	Physical Sciences	Roy, Shasanka Mohan
	Physical Sciences	Srinivasan, Ramanujan

Award for the year 1981 was presented by Prof. S Nurul Hasan, Vice President CSIR on 31 March 1982 at NPL, New Delhi.

1982	Biological Sciences	Jayaraman, Ramamirtha
	Biological Sciences	Podder, Sunil Kumar
	Chemical Sciences	Khetrapal, Chunni Lal
	Chemical Sciences	Subba Rao, Ganugapati Sree Rama
	Earth Sciences	Gopalan, Kunchithapadam
	Engineering Sciences	Mashelkar, Raghunath Anant
	Mathematical Sciences	Prakasa Rao, Bhagavatula Lakshmi
	Mathematical Sciences	Shukla, Jang Bahadur
	Physical Sciences	Agrawal, Girish Saran

	Physical Sciences	Ramakrishnan, Tiruppattur Venkatachalamurti
1983	Biological Sciences	Padmanaban, Govindarajan
	Chemical Sciences	Mitra, Samaresh
	Chemical Sciences	Ray, Naba Kishore
	Earth Sciences	Gupta, Harsh Kumar
	Earth Sciences	Naqvi, Syed Mahmood
	Engineering Sciences	Kasturirangan, Krishnaswamy
	Engineering Sciences	Sukhatme, Suhas Pandurang
	Mathematical Sciences	Passi, Inder Bir Singh
	Mathematical Sciences	Prasad, Phoolan
	Medical Sciences	Nath, Indira
	Physical Sciences	Kapoor, Shyam Sunder
	Physical Sciences	Rajaraman, Ramamurti
1984	Biological Sciences	Easwaran, Kalpathy Ramaier Katehap
	Biological Sciences	Pandian, Thavamani Jegajothivel
	Chemical Sciences	Natarajan, Paramasivan
	Chemical Sciences	Rao, Kalya Jagannath
	Earth Sciences	Acharyya, Subhrangsu Kanta
	Earth Sciences	Krishnaswami, Sethunathasarma
	Engineering Sciences	Bhawalkar, Dilip Devidas
	Engineering Sciences	Ratnasamy, Paul
	Medical Sciences	Sinha, Jagdish Narain
	Medical Sciences	Srivastava, Brahm Shanker
	Physical Sciences	Cowsik, Ramanath
	Physical Sciences	Shashidhar, Ranganathan

Awards for the years 1982-84 were presented by Shri Rajiv Gandhi, Prime Minister & President CSIR on 27 February 1986 at Vigyan Bhavan, New Delhi.

1985	Biological Sciences	Gupta, Chhitar Mal
	Biological Sciences	Vijayan, Mamannamana
	Earth Sciences	Singh, Rishi Narain
	Engineering Sciences	Rao, Patcha Ramachandra
	Mathematical Sciences	Malik, Surender Kumar
	Mathematical Sciences	Parthasarathy, Rajagopalan
	Medical Sciences	Ganguly, Dilip Kumar
	Physical Sciences	Kumar, Narendra
	Physical Sciences	Singh, Kehar
1986	Biological Sciences	Gadgil, Madhav Dhananjaya
	Chemical Sciences	Balaram, Padmanabhan
	Earth Sciences	Gupta, Alok Krishna
	Earth Sciences	Mallick, Kumarendra
	Engineering Sciences	Munjal, Manohar Lal
	Mathematical Sciences	Parthasarathy, Thiruvenkatachari
	Mathematical Sciences	Tewari, Udai Bhan
	Medical Sciences	Agarwal, Shyam Swarup
	Medical Sciences	Seth, Pradeep
	Physical Sciences	Kaw, Predhiman Krishan

Awards for the years 1985-86 were presented by Shri P V Narasimha Rao, Minister for Human Resource Development on 20 April 1987 at Vigyan Bhavan, New Delhi.

1987	Biological Sciences	Sopory, Sudhir Kumar
	Biological Sciences	Surolia, Avadhesha
	Chemical Sciences	Mukherjee, Debashis
	Earth Sciences	Moharir, Pramod Sadasheo
	Engineering Sciences	Lele, Shrikant
	Mathematical Sciences	Parimala, Raman

	Mathematical Sciences	Shorey, Tarlok Nath
	Physical Sciences	Kapahi, Vijay Kumar
	Physical Sciences	Roy, Probir

Award for the year 1987 was presented by Shri Rajiv Gandhi, Prime Minister & President CSIR on 17 October 1988 at Vigyan Bhavan, New Delhi.

1988	Biological Sciences	Bhattacharyya, Bhabatarak
	Biological Sciences	Rao, Manchalhalli Rangaswami Satyanarayana
	Chemical Sciences	Kishore, Kaushal
	Earth Sciences	Tandon, Sampat Kumar
	Engineering Sciences	Kulkarni, Bhaskar Dattatraya
	Engineering Sciences	Prasad, Surendra
	Mathematical Sciences	Banerjee, Mihir Baran
	Mathematical Sciences	Sinha, Kalyan Bidhan
	Physical Sciences	Kumar, Deepak
	Physical Sciences	Srivastava, Onkar Nath

Award for the year 1988 was presented by Shri V P Singh, Prime Minister & President CSIR on 28 March 1990 at Vigyan Bhavan, New Delhi.

1989	Biological Sciences	Lakhotia, Subhash Chandra
	Biological Sciences	Ray, Manju
	Chemical Sciences	Chandrasekaran, Srinivasan
	Chemical Sciences	Chaudhuri, Mihir Kanti
	Earth Sciences	Pandey, Prem Chand
	Engineering Sciences	Banerjee, Srikumar
	Engineering Sciences	Rao, Gundabathula Venkateswara
	Mathematical Sciences	Prasad, Gopal
	Physical Sciences	Lakshmanan, Muthusamy
	Physical Sciences	Madhusudana, Nelamangala Vedavyasachar

Award for the year 1989 was presented by Shri Chandra Shekhar, Prime Minister & President CSIR on 10 January 1991 at NPL, New Delhi.

1990	Biological Sciences	Brahmachari, Samir Kumar
	Chemical Sciences	Choudary, Boyapeti Manoranjan
	Chemical Sciences	Sathyamurthy, Narayanasami
	Engineering Sciences	Pal, Sankar Kumar
	Engineering Sciences	Prathap, Gangan
	Medical Sciences	Bhan, Maharaj Krishan
	Mathematical Sciences	Balasubramanian, Ramachandran
	Mathematical Sciences	Dani, Shrikrishna Gopalrao
	Physical Sciences	Baskaran, Ganapathy
	Physical Sciences	Sood, Ajay Kumar
1991	Biological Sciences	Pandey, Virendra Nath
	Biological Sciences	Saidapur, Srinivas Kishanrao
	Chemical Sciences	Bagchi, Biman
	Chemical Sciences	Yadav, Jhillu Singh
	Earth Sciences	Sengupta, Sudipta
	Earth Sciences	Sri, Niwas
	Engineering Sciences	Joshi, Jyeshtharaj Bhalchandra
	Mathematical Sciences	Mehta, Vikram Bhagvandas
	Mathematical Sciences	Ramanathan, Annamalai
	Medical Sciences	Wadhwa, Shashi
	Physical Sciences	Dhar, Deepak
	Physical Sciences	Mathur, Deepak

Awards for the years 1990-91 were presented by Shri Arjun Singh, Minister for Human Resource Development on 13 December 1991 at NPL, New Delhi.

1992	Biological Sciences	Chatterji, Dipankar
	Biological Sciences	Dharmalingam, Kuppamuthu
	Chemical Sciences	Bhaduri, Sumit
	Chemical Sciences	Ramasesha, Suryanarayanasastry

	Earth Sciences	Shetye, Satish Ramnath
	Engineering Sciences	Borkar, Vivek Shripad
	Mathematical Sciences	Sharan, Maithili
	Medical Sciences	Das, Undurti Narasimha
	Medical Sciences	Mehra, Narinder Kumar
	Physical Sciences	Kumar, Vikram
	Physical Sciences	Shenoy, Subodh Raghunath

Award for the year 1992 was presented by Dr S K Joshi, Director General, CSIR on 7 December 1992 at NPL, New Delhi.

1993	Biological Sciences	Gadagkar, Raghavendra
	Biological Sciences	Murthy, Mathur Ramabhadrashastry Narasimha
	Chemical Sciences	Gadre, Shridhar Ramachandra
	Chemical Sciences	Ramasami, Thirumalachari
	Earth Sciences	Mohanty, Uma Charan
	Engineering Sciences	Banerjee, Dipankar
	Engineering Sciences	Bhatia, Suresh Kumar
	Mathematical Sciences	Karmeshu
	Mathematical Sciences	Singhi, Navinkumar Madhavprasad
	Medical Sciences	Pal, Gaya Prasad
	Physical Sciences	Gopal, Krishna
	Physical Sciences	Simon, Rajiah

Award for the year 1993 was presented by Shri Bhuvnesh Chaturvedi, Minister of State for Science & Technology on 10 December 1993 at NPL, New Delhi.

1994	Biological Sciences	Bhattacharya, Alok
	Biological Sciences	Nagaraj, Ramakrishnan
	Chemical Sciences	Jemmis, Eluvathingal Devassy
	Chemical Sciences	Sarma, Dipankar Das
	Earth Sciences	Goswami, Jitendra Nath

	Engineering Sciences	Sundararajan G
	Mathematical Sciences	Kumar, Neithalath Mohan
	Medical Sciences	Sainis, Krishna Balaji
	Medical Sciences	Sharma, Yagya Dutta
	Physical Sciences	Raychaudhuri, Arup Kumar
	Physical Sciences	Sen, Ashoke

Award for the year 1994 was presented by Shri Bhuvnesh Chaturvedi, Minister of State for Science & Technology and Vice President CSIR on 13 February 1995 at NPL, New Delhi.

1995	Biological Sciences	Hasnain, Seyed Ehtesham
	Biological Sciences	Muniyappa, Kallapa
	Chemical Sciences	Chandrasekhar, Jayaraman
	Chemical Sciences	Sebastian, Kizhakeyil Lukose
	Earth Sciences	Goswami, Bhupendra Nath
	Engineering Sciences	Chattopadhyay, Kamanio
	Mathematical Sciences	Bhatia, Rajendra
	Medical Sciences	Panda, Subrat Kumar
	Medical Sciences	Tyagi, Anil Kumar
	Physical Sciences	Barma, Mustansir

Award for the year 1995 was presented by Prof Y K Alagh, Minister of State for Science & Technology & Vice President CSIR on 26 September 1996 at NPL, New Delhi.

1996	Biological Sciences	Prakash, Vishweshwaraiah
	Biological Sciences	Swarup, Ghanshyam
	Chemical Sciences	Chandrakumar, Narayanan
	Chemical Sciences	Periasamy, Mariappan
	Earth Sciences	Naqvi, Syed Wajih Ahmad
	Earth Sciences	Rai, Shyam Sundar
	Mathematical Sciences	Sunder, Vaikalathur Shankar

	Medical Sciences	Ravindranath, Vijayalakshmi
	Medical Sciences	Sarin, Shiv Kumar
	Physical Sciences	Padmanabhan, Thanu

Award for the year 1996 was presented by Shri H D Deve Gowda, Prime Minister & President CSIR on 20 December 1996 at NPL, New Delhi.

1997	Biological Sciences	Gowrishankar, Jayaraman
	Biological Sciences	Rao, Kanury Venkata Subba
	Chemical Sciences	Bhattacharyya, Kankan
	Chemical Sciences	Srikrishna, Adusumilli
	Engineering Sciences	Khakhar, Devang Vipin
	Medical Sciences	Gupta, Satish Kumar
	Medical Sciences	Kumar, Vijay
	Physical Sciences	Chakrabarti, Bikas Kanta
	Physical Sciences	Raychaudhuri, Amitava

Award for the year 1997 was presented by Shri Atal Behari Vajpayee, Prime Minister & President CSIR on 25 May 1998 at NPL, New Delhi.

1998	Biological Sciences	Sarkar, Debi Prasad
	Biological Sciences	Vijay Raghavan, Krishnaswamy
	Chemical Sciences	Chakravarty, Akhil Ranjan
	Chemical Sciences	Ganesh, K N
	Earth Sciences	Ramesh, Rengaswamy
	Engineering Sciences	Jhunjhunwala, Ashok
	Engineering Sciences	Sharma, Anurag
	Mathematical Sciences	Nag, Subhashis
	Mathematical Sciences	Ramadas, Trivandrum Ramakrishnan
	Medical Sciences	Nair, G Balakrish
	Physical Sciences	Das, Sumit Ranjan
	Physical Sciences	Jayannavar, Arun Mallojirao

Regulations Governing the Award of "The Shanti Swarup Bhatnagar Prize for Science and Technology"

Preamble

1. The Award is named after the founder Director of the Council of Scientific and Industrial Research (CSIR), the late Dr (Sir) Shanti Swarup Bhatnagar and is known as the "Shanti Swarup Bhatnagar (SSB) Prize for Science and Technology".

2. The Prize is given each year for outstanding contributions to science and technology.

Nature of the Prize

3. SSB Prizes, each of the value of Rs 1,00,000 (Rupees one lakh only), are awarded annually for notable and outstanding research, applied or fundamental, in the following disciplines: (1) Biological, (2) Chemical, (3) Earth, Atmosphere, Ocean and Planetary, (4) Engineering, (5) Mathematical, (6) Medical, and (7) Physical Sciences.

Purpose

4. Recognition of outstanding work in science and technology.

Eligibility

5. Any citizen of India engaged in research in any field of science and technology up to the age of 45 years as reckoned on 31st December of the year preceding the year of the Prize.

6. The Prize is bestowed on a person who, in the opinion of CSIR, has made conspicuously important and outstanding contributions to human knowledge and progress -- fundamental or applied -- in the particular field of endeavour, which is his/her specialization.

7. The Prize is awarded on the basis of contributions made through work done primarily in India during the five years preceding the year of Prize. (For this purpose 'primarily' will mean 'for the most part')

Award of the Prize

8. In awarding the Prize, the Governing Body of CSIR is guided by the recommendations of the Advisory Committees constituted under clause 10.

Nominations

9.(a) Names of candidates may be proposed by a member of the Governing Body (CSIR); Presidents of approved scientific societies and academies of all-India character; Vice-Chancellors of Universities; deemed Universities and Institutions of national importance; Deans of Science, Engineering, Medical, Agriculture and Technology Faculties; Directors of Indian Institutes of Technology (IIT), Directors-General of the major R&D Organizations, such as the Defence Research & Development Organization, the Indian Council of Agricultural Research, the Indian Council of Medical Research, India Meteorological Department; Chairmen of Atomic Energy Commission, Space Commission, Oil & Natural Gas Corporation, etc.; Directors of CSIR Laboratories, Bhabha Atomic Research Centre, Tata Institute of Fundamental Research, Physical Research Laboratory, Indian Association for the Cultivation of Science, etc.; Secretaries of the

Department of Environment, the Department of Science & Technology, the Department of Scientific & Industrial Research, the Department of Electronics, the Department of Atomic Energy; the Department of Space; the Department of Biotechnology, etc., Member in-charge (Science) in the Planning Commission; and the Bhatnagar Prize Awardees.

University Faculties can recommend scientists working in their institutions only and route nominations through their respective Vice-Chancellors, while the Faculties in IITs are required to send their nominations through their Directors. Directors-General of the R&D Organizations and Chairmen of Commissions may sponsor names of scientists working in their respective organizations. The Directors of CSIR Laboratories can nominate candidates in disciplines of their interest irrespective of the fact whether they are working in CSIR laboratories or outside. A Bhatnagar Prize Awardee can send nomination of one person only for each year's award in his/her own discipline. Nominations from other individuals sponsoring their own names or of others **are not acceptable**. Each nomination should be accompanied by a detailed statement of work and attainments of the nominee and a critical assessment report (not more than 500 words) bringing out the importance of significant research and development contributions of the nominee made during the five years preceding the year of the Prize. **Nominations not made as per the format are unacceptable.**

9.(b) **A candidate once nominated would be considered for a total period of three years, if otherwise eligible**. Once such a nomination has been received, CSIR can correspond directly with the candidate for supplementary information, if necessary. In case a nominee has resigned from his present position in India and has gone abroad, his nomination would become invalid immediately.

Advisory Committees

10. The Advisory Committees for each year's award are constituted with the approval of the Chairman of Governing Body of CSIR. The Committees consist of at least six experts including at least one former SSB awardee in the respective discipline. On receipt of nominations for a particular year, CSIR circulates the list of nominees along with the detailed statement of work and attainments of each candidate to all members of the Advisory Committee related to the concerned discipline. CSIR convenes meetings of the various Committees in consultation with the Chairmen, for selecting the recipients of the SSB Prizes. The compositions of various Committees, the information submitted for their scrutiny, the proceedings of the meetings and procedure for the consideration of the nominations, other than as detailed herein, are kept confidential.

11. Where the recommendation for the Prize is unanimous or not less than 2/3rd of the members of the Advisory Committees have agreed to one name (or maximum two names in case they are judged to be of equivalent merit), the recommendations are submitted to CSIR.

12. The award of the Prize in a specific discipline may be withheld by CSIR in any year, if, in the opinion of the Advisory Committee, no sufficiently meritorious candidate is forthcoming in that year.

Presentation

13. The names of the recipients as per the recommendations of the Advisory Committees are made public on 26 September, the CSIR Foundation Day.

14. The Prizes are awarded at a formal presentation ceremony arranged by CSIR. At the ceremony, a suitable citation on the work of the recipient of the Prize is read out.

15. The recipient may deliver an address on the subject in which he/she has made notable contributions at any institution of his/her choice. The awardee may get the address published in one of the CSIR journals.

16. In all matters of award of SSB Prizes, the decision of CSIR shall be final**.**