



# Patilka

October 1985 No. 11 Newsletter of the Indian Academy of Sciences

## 51st Annual Meeting

At the invitation of the Madurai Kamaraj University, Madurai, the 51st Annual Meeting of the Academy will be held at Madurai from Thursday 7 to Sunday 10 November 1985.

The tentative scientific programme for the meeting consists of scientific symposia, evening lectures and a series of lecture presentations by Fellows and Young Associates of the Academy.

There will be two symposia on 'The genome in flux' (Convener: Prof. K Dharmalingam) and 'Fifth generation computers' (Convener: Prof. V Rajaraman).

The evening lectures are on 'Architecture of the universe' by Prof. R Cowsik, Tata Institute of Fundamental Research, Bombay and on 'A computer study of the Indus script' by Prof. I Mahadevan.

The tentative scientific programme is given below:

### Thursday 7 November 1985

Inaugural function

### Friday 8 November 1985

#### Symposium on The Genome in Flux

Introduction—K Dharmalingam

Some genetic and evolutionary problems posed by sexuality—H Sharat Chandra

Changes in conformation and expression in the genome of a mammal during its life span—M S Kanungo

Mitochondrial DNA repair and replication during anaerobic-aerobic transition of *S. cerevisiae*—D S Pradhan

#### Lecture presentations by Fellows and Young Associates

Molecular biology of cancer—M R Das

Gene expression in the fruitfly *bithorax* as a model—P Babu

Gene fragments: Synthesis, chemistry and biological importance—K N Ganesh

Food nitrogen as a predictor of digestive efficiency—T J Pandian

Nucleic acids sequence analysis—structural and biological implications—A S Kolaskar

#### Business Meeting of Fellows

#### Evening Lecture

Architecture of the universe—R Cowsik

### Saturday 9 November 1985

#### Symposium on Fifth Generation Computers

Introduction—V Rajaraman

Nature of computer applications in the fifth generation—H N Mahabala

Speech and visual input/output to computers—P V S Rao

#### Special lecture

Echolocation in South Indian bats—G Neuweiler

#### Lecture presentations by Fellows and Young Associates

Recursive sequences—T N Shorey

Curves in space—N Mohan Kumar

Black holes are not for ever—B R Iyer

Random walks—V Balakrishnan

#### Evening lecture

A computer study of the Indus script—I Mahadevan

### Sunday 10 November 1985

#### Lecture presentations by Fellows and Young Associates

Theoretical study of an organometallic reaction—E D Jemmis

Applications of super absorbent polymers in the separation process—M G Kulkarni

Zeolite catalysts : promise and performance—R A Rajadhyaksha

Earthquake prediction research—V K Gaur

Synthesis of phase diagrams—P Ramachandrarao

Certain emerging properties of central Himalayan forest ecosystems—J S Singh

As usual, all Fellows and Young Associates attending the Annual Meeting will be paid first class return railway fare from their place of residence to Madurai and back, in case they are unable to get travel support from other sources.

During the period of the Annual Meeting, the editorial boards and sectional committees will also meet at Madurai.

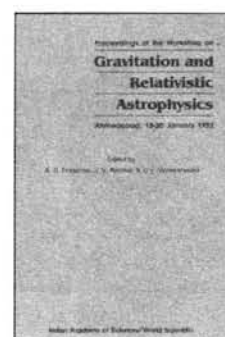
## Special Publications

In addition to the nineteen special publications described in earlier issues of *Patrika*, the following 5 volumes were published during 1984-85.

1. Remote Sensing. Edited by B L Deekshatulu and Y S Rajan. Published in 1984. Price Rs. 60, US \$30, 304 pages

Remote sensing of the earth and the environment is one of the major applications of space technology generated by the progress in space science and technology in the last two decades. Used operationally in many countries, it offers unique possibilities for systematic and timely acquisition of information on the earth's resources, as well as environmental and meteorological data, with a very short turn-around time for use by resource managers, planners, meteorologists and environmental scientists. The remarkable features of satellite remote sensing techniques are their ability to obtain a synoptic view and frequent repetitive coverages of large and inaccessible areas. In India using space platforms and aircraft, remote sensing has been used extensively for obtaining information on the earth's resources and the environmental and technical capabilities to plan, design and build satellites for earth observations, such as Bhaskara I and II have been developed.

The present volume includes articles on various aspects of remote sensing, the Indian remote sensing satellite (IRS) planned to be



launched in 1986, the sensors and data processing techniques to be used and the practical applications in agriculture, forestry, geology, meteorology etc. The volume ends with two review papers on basic research problems and international issues in remote sensing.

2. Gravitation and Relativistic Astrophysics. Edited by A R Prasanna, J V Narlikar and C V Vishveshwara. Published for the Indian Academy of Sciences by World Scientific Publishing Co., Singapore, in 1984. Price US \$24, 151 pages

Gravitation and relativistic astrophysics, two of the most active and exciting fields of research today, brought together scientists from three of the leading research institutes of the country for a second time at a joint workshop held at Ahmedabad from 18 to 20 January 1982. The first occasion when the Physical Research Laboratory, Ahmedabad, the Tata Institute of Fundamental Research, Bombay and the Raman Research Institute, Bangalore sponsored a meeting on gravitation, relativity and allied topics, was at the Einstein Centenary Symposium held in 1979. Both workshops were supported by the Indian National Science Academy and the University Grants Commission. The Indian Academy of Sciences undertook the printing of the proceedings of the second workshop in the present form.

The purpose of the workshop was to offer an overall view of different topics as well as to familiarise the interested scientists, with some of the details of recent developments. The present volume is a record of the lectures presented at the workshop with some of the discussions that followed.

As the articles show, the treatment of the topics is both highly specialised and topical. The main sessions were on Gravitation as a gauge theory, Gravitational collapse, Accretion disk dynamics, Classical cosmology and Quantum cosmology.



3. Water Resources Systems Planning— Some case studies for India. Edited by Mahesh C Chaturvedi and Peter Rogers. Published in 1985. Price Rs. 50, US \$ 40, 356 pages

In view of the arid-monsoon climate of India and the primacy of the agricultural sector in its overall economy, the development of water resources is of particular importance in India's economic development. Great emphasis has therefore been placed on water resources development since independence with almost a quarter of the current development budget invested in this sector and ambitious plans for its rapid development in the next 25 years.

The first step in achieving this task is institutional modernisation and the development of well-trained cadres of professionals with the appropriate concepts, attitudes and capabilities. The Ford Foundation which has been supporting the development of manpower in this sector, started a programme under which Indian faculty and senior officials were invited to work with the Harvard faculty. The present volume contains papers which resulted from this project, carried out at the Centre of Population Studies at Harvard University and elsewhere, and includes case studies of the Ganga basin, Bhakra reservoir, Beas-Sutlej system, Upper Cauvery basin, Rajasthan canal, Damodar water resources and Subarnarekha river system, by both Indian and American authors.

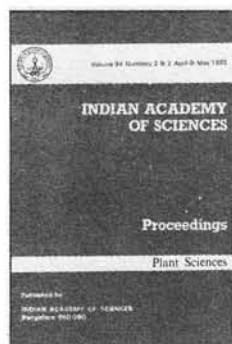
4. Raja Ramanna Sixtieth Birthday Felicitation Volume. Edited by E S Raja Gopal. Published in 1985. 421 pages

Dr Raja Ramanna is well known to the scientific community in India and abroad for his dedicated contributions in various fields of scientific activity and especially to the atomic energy programme of the country. He has been closely associated with the Indian Academy of Sciences, the Indian National Science Academy and the Indian Physics Association and it is therefore most appropriate that a special issue of *Pramāna* jointly published by the three organisations, was brought out to commemorate his sixtieth birthday. The volume was formally presented to Dr Ramanna on 4 May 1985 at Bombay at the Ordinary General Meeting of the Indian National Science Academy, by Prof. C NR Rao, President of INSA and Vice-President of the Academy. The volume contains 31 papers in quantum physics, particle physics, nuclear physics, atomic and molecular physics, solid state physics and materials science.

5. C V Subramanian Sixtieth birthday Felicitation Volume. Edited by H Y Mohan Ram. Published in 1985. 537 pages

Prof. C V Subramanian has been closely associated with the Academy for the last three decades, since his election as a Fellow in 1955. This special volume of the Proceedings—Plant Sciences was published in April-May 1985 to commemorate his sixtieth birthday.

The volume contains 38 papers by scientists from India and abroad, on fungal behaviour and ecology, fungal physiology/morphogenesis, fungal morphology and taxonomy, plant pathology, medical mycology, agriculture, plant physiology, plant genetics, plant ecology and plant morphogenesis.



# Young Associates — 1985

---

- D K Arora, Banaras Hindu University, Varanasi—  
*Mycology and Microbiology*
- B Bagchi, Indian Institute of Science,  
Bangalore—*Statistical Mechanics and  
Chemical Kinetics*
- D Banerjee, Defence Metallurgical Research  
Laboratory, Hyderabad—*Physical Metallurgy*
- S Banerjee, Tata Institute of Fundamental  
Research, Bombay—*Experimental High  
Energy Physics*
- S L Chaplot, Bhabha Atomic Research Centre,  
Bombay—*Structure and Dynamics of Solids*
- G R Desiraju, University of Hyderabad,  
Hyderabad—*Solid State Chemistry,  
Crystallography*
- R M Godbole, University of Bombay,  
Bombay—*Elementary Particle Physics*
- R V Hosur, Tata Institute of Fundamental  
Research Bombay—*Conformation of  
Biomolecules, Magnetic Resonance*
- R Nagaraj, Centre for Cellular and Molecular  
Biology, Hyderabad—*Bioorganic Chemistry*
- G Prathap, National Aeronautical Laboratory,  
Bangalore—*Finite element analysis of  
structures*
- R Ramaswamy, Tata Institute of Fundamental  
Research, Bombay—*Theoretical Chemistry*
- J Samuel, Raman Research Institute, Bangalore—  
*Classical Mechanics*
- A V Shenoy, National Chemical Laboratory,  
Pune—*Chemical Engineering*

# Journal of Genetics

---

## Report by the Editors

*The Journal of Genetics* is the newest addition to the group of journals published by the Academy. Founded in 1910 in the United Kingdom under the editorship of W Bateson and R C Punnett, it is believed to be the oldest journal of genetics in the English language. During the early days of genetics, the Journal published many pioneering papers and enjoyed an important position as an international medium for the publication of original research papers in the general areas of heredity and evolution.

In 1957, when Prof. J B S Haldane, who then owned and edited the journal, moved to India he brought the journal with him. During the next two decades, the journal published many original and lively book reviews and commentaries by Prof. Haldane.

Upon Prof. Haldane's death, the management of the journal passed on to his wife, Dr Helen Spurway Haldane, who continued to publish it until her death seven years ago. The publication of the journal had remained suspended since then.

In view of the distinguished role the journal had played in the early history of genetics, the Academy sounded a number of geneticists on the desirability of resuming publication, bearing in mind that there are already many journals covering this field. The very positive response to this inquiry prompted the Academy to take over the journal and resume publication, permission for which was given by Lady Naomi Mitchison, sister of Prof. Haldane. The Academy is being assisted in this task by an international Advisory Board and an international Editorial Board.

The first number of the revived journal (Volume 64, Number 1) was published in July this year. It is expected that the journal will publish articles in all areas of genetics, including the newer areas of molecular genetics and molecular evolution. The first paper in the revived journal is appropriately on J B S Haldane and the last on Max Delbruck.

# Bulletin of Materials Science

---

## Report of the Editors

With a view to providing Indian scientists with a theme journal for the publication of original and state-of-the-art papers in materials science, the Academy decided in 1978 to publish, in collaboration with the Indian National Science Academy, a new journal devoted to materials science. The first issue of the journal appeared in May 1979 and since then 31 issues totalling more than 3450 pages have appeared. With the strict refereeing system employed, the Bulletin has maintained a consistently high standard, making it the premier scientific journal in materials science in the country.

A considerable part of the Bulletin is devoted to the publication of state-of-the-art reports. About 50 topical reviews have been published on materials processing in space, crystal growth techniques, fine powder technology, high pressure studies of materials, oxide dielectrics, amorphous semiconductors, fast-ion conduction, superconductors, defects in GaAs, use of semiconductors in solar cells, biomaterials, phase transitions and related aspects, composites, ferroics, computer simulation in materials testing, shock wave propagation in solids, super-plasticity etc. Various aspects of phase transitions such as soft-modes, renormalization group techniques, multicritical points, liquid crystal transitions, metal insulator transitions, martensitic transitions, glass transition, magnetic ferroelectric and superconducting transitions, have also been reviewed, re-emphasising the fact that phase transition studies constitute a central feature of materials science activity today. Other reviews are related to novel methods of materials technology needed for the production of new materials such as fine powders, single crystals and materials in states of varying degrees of metastability, and on fast quenching techniques, crystal growth from gels and production of novel phases under pressure. The selected articles published in the Academy's Golden Jubilee Number of the Bulletin represent the current materials activity in the country.

Another major area is the reporting of research and development activities at various research centres, but the published reports cover only a small fraction of the total R & D efforts in the country.

Over 250 original research papers dealing

with various aspects of materials, such as synthesis, characterization and applications, have been published in the Bulletin as well as innovations in techniques related both to the preparation and to the property measurements of materials and investigations employing practically every single characterization technique, whether spectroscopic, electrical, magnetic or mechanical. The contemporaneity of the materials research programmes in the country is evident from the nature of the papers published in the Bulletin, such as those related to the characterization of catalysts using photoelectron spectroscopy, preparation of glassy metals using fast quenching techniques, preparation of amorphous silicon using the glow discharge technique, preparation of single crystals by a variety of techniques including vapour phase transport, study of energy conversion using photoelectrochemical cells and the characterization of defects in solids using high resolution electron microscopy etc.

Another important feature of the Bulletin has been the publication of selected conference reports which have a bearing on current materials research activity, such as those on phase transitions, rare earth materials and materials processing in space, the chemistry and physics of solids etc.

The Bulletin of Materials Science has provided a much needed forum for the dissemination of information on the ever-widening field of materials science and technology, and the number, variety and quality of the papers published indicate how particularly timely the starting of this theme journal has been.

A list of papers published from Vol. 1 (1979) to Vol. 6 (1984) is given in Annexure.

# Obituaries

---

The world has lost a sugar technologist of international repute by the passing away of **S N Gundu Rao**.

After a brilliant career in the Mysore University and a brief term as research scholar at the Department of Biochemistry of the Indian Institute of Science, Bangalore, Gundu Rao passed the Associateship course in the Harcourt-Butler Technological Institute, in the first class with a first rank. His participation in the technical discussions at the Annual Meeting of the Sugar Technologist's Association of India so impressed the authorities that he was offered the post of Chief Chemist by the Ravalgoan Sugar Farms Limited, where he worked for about sixteen years, updating process technology and equipment and carrying out research and developmental work on the utilisation of by-products. He set up a modern plant for the manufacture of sugar candy and a pilot plant for sugarcane wax, and established a modern confectionery plant and Industrial Research Laboratory in the precincts of the sugar factory. He had a keen critical sense of the quantitative assessment of process efficiency in sugar factories. One of the off-shoots was the Gundu Rao formula for Reduced Boiling House Recovery which was internationally recognised and for which he was awarded the Noel Deerr Gold Medal of the Sugar Technologists Association of India.

His contribution as Director of the National Sugar Institute was the introduction of many schemes for improving the working efficiency of sugar factories and the development of the co-operative sector. For over a decade he was the Executive Director and Technical Adviser of the British India Co-operation Group of sugar factories, during which period he carried out the rehabilitation and expansion of the factories. During his term as Adviser-Director of the Deccan Sugar Institute, Pune, he drew up the master plan of the Institute for its comprehensive activity in research, training, and technical coordination of the work of the factories.

He was elected by the Sugar Technologist's Association of India as its president and as Honorary Fellow. He was the Chairman of the Committee of the International Society of Sugarcane Technologists for payment for sugarcane on quality basis. He was also the Regional Chairman of ICUMSA.

In later years, in spite of indifferent health, he continued to work as Director of a number

of sugar factories and to render his advice on sugar factory problems to numerous sugar technologies and engineers.

He is survived by his wife and children.

In **Dr Y Nayudamma's** tragic death in the Air India aircraft disaster over the Atlantic on 22 June 1985, India lost not only a very distinguished scientist and an able administrator, but the unquestioned leader in the field of leather technology in the country and perhaps the world.

Born on 10 September 1922, Yelavarthy Nayudamma graduated in industrial chemistry from the Banaras Hindu University in 1942. He later specialised in leather technology in the United Kingdom and obtained his Master's and Doctoral degrees from Lehigh University, USA. Returning to India in 1951 he helped to establish the Central Leather Research Institute at Madras and served as its Director from 1956-1971. He was Director-General, Council of Scientific and Industrial Research from 1971-1977, and later Vice-Chancellor of the Jawaharlal Nehru University, New Delhi. He was CSIR Distinguished Scientist at the Central Leather Research Institute, Madras, Honorary Professor of Leather Technology at Madras University and Co-ordinator, Centre for Development Alternatives, Madras at the time of his tragic death.

Dr Nayudamma's pioneering work in leather technology related to studies on the physico-chemical properties of raw and tanned collagen, co-ordination complexes of chromium, aluminium and zirconium, combination tannages such as chromo-vegetable tannings and mechanisms of tanning, in particular protein-tanning interactions.

In the catalogue of his achievements at CLRI are the setting up of regional extension centres in Bombay, Rajkot, Jalandhar, Kanpur and Calcutta, a large number of modern tanneries in India run by CLRI trained personnel and the training of personnel from over forty countries. The CLRI under his care and guidance became an internationally recognised centre of excellence in leather research and the largest of its kind in the world.

He was elected a Fellow of the Academy in 1963 and was President of the Indian Institution of Chemists and of COSTED. He was awarded the KG Naik Gold Medal in 1965 and the Padma Shri in 1971 and was the recipient of honorary degrees from many universities.

As President of COSTED and as Governor, International Development Research Centre (IDRC), Canada, he sought the co-operation of

scientists to work for 'Technologies for Humanity'. He helped identify the needs and priorities of developing countries and of individual scientists and organisations willing to work in areas of emerging technologies like biotechnology and genetic engineering. It was due to Nayudamma's perseverance that COSTED decided to establish its headquarters in India in Madras.

According to Nayudamma, a salubrious locale, well equipped laboratories and munificent funding alone, cannot produce good science or technology. He believed in the maxim that one should create centres of excellence in science and recognise excellence, which, after all, resides in the individual scientist.

For all his achievements, Nayudamma was a charming and friendly person, unassuming by nature and readily accessible to those who wanted his help and advice. He leaves behind two sons and a daughter. His wife Dr Pavana Bai lost her life in a tragic accident soon after his death. For his family and for countless number of his friends, colleagues and admirers, his untimely death is an irredeemable loss.

In the passing away of **Kalla Neelakantam** at Jeypore (Orissa), the world of chemistry has lost one of the stalwarts of the classical school of chemistry. Born in Jeypore on 18th December 1911, he graduated from M R College, Vizianagaram, winning the Raja of Kasmanda gold medal and took his Master's degree from the Presidency College, Madras. He was the first to obtain a doctorate in Chemistry on flower pigments, working under the late Prof. T R Seshadri. He joined the faculty of the Andhra University in 1934, from where he was deputed in 1937 to the Imperial College of Science and Technology, London, for training in advanced analytical chemistry. On his return in 1939 to Andhra University he resumed a fruitful period of teaching and research, to rise to a Professorship in 1949. He moved to Annamalai University in 1953 and later joined the Defence Science Organization at New Delhi. But his love for teaching and research brought him to the then newly started Sri Venkateswara University, Tirupati, in 1955 to organize the Department of Chemistry and to build it into one of the foremost schools of its kind. All branches of chemistry, especially, analytical chemistry, made rapid strides under his guidance. As Professor of Chemistry, Head of the Department of Chemistry and as member of the various University Bodies including the syndicate, he served to build and uphold the best of University traditions. But he is better remembered for his many research publications in journals of chemical research,

particularly in the field of organic reagents in chemical analysis. His meticulous and methodical ways and his gentle frankness left an indelible impression on all his colleagues and students. For him 'Every reagent was impure, every analytical operation incomplete... unless proved otherwise'. Retirement from Sri Venkateswara University did not put an end to his zeal for teaching and research, for he returned to them after five years under a U.G.C. assignment, to Annamalai University, where he worked from 1976 to 1979. He is survived by his wife, four sons and two daughters.

In the passing away of **S P Venkiteshwaran**, the Academy has lost a distinguished Fellow and the country a pioneer in the field of instrumentation.

Born on 15 February 1905, Sekharipuram Padmanabhaiyer Venkiteshwaran had his early education in Palghat. He obtained his BA degree in physics from the Victoria College, Palghat and his MA degree from St. Joseph's College, Tiruchirapalli. After a short period of service at Presidency College, Madras, he joined the India Meteorological Department as an Assistant Meteorologist in 1930, working first at the Upper Air Observatory in Agra and later at the Upper Air Section at Poona. His two outstanding contributions during the World War II years were the preparation and publication of the Departmental Memoirs on the upper wind climatology of India and the design, development and introduction at a large number of stations of the first Indian radiosonde, which was in use in India till the 1970's.

As Meteorologist and Director of the Instruments Division for nearly two decades, he was responsible for planning and carrying out an ambitious programme, for the development and manufacture of a wide range of meteorological and geophysical instruments, hitherto imported from abroad. Under his dynamic leadership and with his capacity not only to work hard but extract the best from his younger colleagues, he was able to achieve remarkable success in this field. Poona Instruments Division became well known not only for the range and high quality of the instruments made but for the outstanding research done in cloud physics, instrumentation, atmospheric electricity and radiation climatology. He was responsible for the design and development of atmospheric electricity sondes for the measurement of the electric field and electrical conductivity of air and for the first ever measurement of electrical conductivity in the atmosphere using radiosondes.

After his retirement from the Meteorological Department, he worked with Dr P Neelakantan

in setting up the newly established National Aeronautical Laboratory, at Bangalore. The pioneering work done by NAL in the development of wind as an alternate source of energy was mainly due to him. For the next five years he worked as Technical Adviser of the Radiorefractive Index Project of the Tata Institute of Fundamental Research at Hyderabad and was directly involved with the development of tethered sondes for the measurement of temperature and humidity in the lower troposphere. In appreciation of his original publications on the radio refractive index climatology of India, the Institution of Telecommunication Engineers awarded him the Meghnad Saha and S K Mitra prizes in 1972.

He was elected a Fellow of the Academy as early as 1938. A brilliant and gifted innovator and untiring experimentalist, his scientific researches covered a wide spectrum. His life was one of intense devotion to work, almost to the exclusion of all other interests. Though frank and outspoken by nature, he treated

even the newest of his assistants with patience and consideration. A genial and warm-hearted friend and adviser to his many colleagues, old and young, (he was affectionately known as SPV) he won the respect of all those who came in contact with him by his achievements, and his generosity and uniform kindness.

He passed away at New Delhi on 26th September 1985 and leaves behind three sons and a daughter and a large circle of friends and admirers to mourn his loss.

### Volume 1 (1979)

Processing of materials in space; *S Ramaseshan*. Alphaquartz 1. Crystallography and crystal defects; *Prasenjit Saha, N Annamalai and Tarun Bandyopadhyay*. Glass fibre research at Indian Institute of Technology, Kanpur; *D Chakravorty*. Indigenous development of niobium-based super-conducting materials; *DK Bose, CK Gupta, TS Radhakrishnan, Y Hariharan and G Venkataraman*. Permeability spectrum of garnets; *Om Prakash, RAiyer and CM Srivastava*. Resistance fluctuation spectroscopy; *G Venkataraman and V Balakrishnan*. Electrical transport properties of  $\text{La}_{1-x}\text{Sr}_x\text{FeO}_3$ ; *AK Shukla and PK Basu*.  $\text{LaNi}_{1-x}\text{Co}_x\text{O}_3$  as interconnection materials; *Om Prakash*. Electrical permittivities and subglassy relaxations in sulphate glasses; *PSL Narasimham and KJRao*. Alpha-quartz 2. Crystal chemistry, and nature and distribution of impurities; *Prasenjit Saha and Tarun Bandyopadhyay*. Research in magnetism at Indian Institute of Technology Bombay; *CM Srivastava*. Kinetics of the oxidation of  $\text{CuFeO}_2$  in Cu-Fe-O system; *GC Jain, BK Das and RAvtar*. Growth and characterisation of  $\text{TaS}_2$  single crystals; *MK Agarwal, JV Patel and HB Patel*. Itinerant electron behaviour and long-range ordering in  $\text{La}_{1-x}\text{Sr}_x\text{CoO}_3$ ; *P Ganguly and WH Madhusudan*. Measurement of magnetic properties of single crystal YIG by non-resonant method; *DN Bose, SR Borgaonkar and TS Vedavathy*. Soft modes and structural phase transition; *G Venkataraman*. Some characteristics of first-order phase transformations; *V Raghavan*. The phenomenon of glass transition; *KJRao*. Slow relaxation in spin glasses; *B Srinam Shastry*. Critical properties of random magnetic systems; *Deepak Kumar*. One-dimensional conductors; *SV Subramanyam*. Critical phenomena in solids; *V Shubha*. Order-disorder transition in ammonium copper chloride dihydrate; *VCSahni*. Nonequilibrium phase transitions; *S Dattagupta*.

### Volume 2 (1980)

Fine particle physics and technology; some results; *MS Multani, NG Nanadikar, VR Palkar, AK Pansare, A Gurjar and RV Vijayaraghavan*. Production and characterisation of amorphous alloys at Varanasi; *PRamachandrarao, SRanganathan and TRAnantharaman*. Nucleation and growth of potassium dihydrogen phosphate crystals in silica gels; *MS Joshi and AV Anthony*. Studies on a wear-resistant cast iron; *NRanganathan, Malur N Srinivasan and NRaman*. Microhardness studies in ammonium halide crystals; *KJ Pratap and V Hari Babu*. X-ray study of the air-oxidised  $\alpha\text{-Ga}_2\text{Se}_3$  and  $\text{Ga}_2\text{Te}_3$  powders; *AK Mukherjee, UDhawan, KDKundra and SZ Ali*. Dielectric properties of  $\text{Bi}_4(\text{GeO}_4)_3$  and  $\text{Bi}_4(\text{SiO}_4)_3$ ; *Lalitha Sirdeshmukh and YR Reddy*. Phase transformation studies on pure and doped strontium carbonate; *CRama Mohan Rao and PNMehrotra*. Surface structures on second order prism faces of synthetic quartz crystals; *MS Joshi, KB Saraf and AV Antony*. DC electrical conductivity of  $\text{CoSiF}_6 \cdot 6\text{H}_2\text{O}$  and  $(\text{NH}_4)_2\text{SO}_4$ ; *SS Mitra, SK Ghorai and SK Dutta Roy*. Characterisation of bubble materials; *MJ Patni, Om Prakash and DBahadur*. Alpha-quartz 3. Origin of cellular structure of synthetic quartz; *Prasenjit Saha and Tarun Bandyopadhyay*. Dual anvil high pressure cell; *AK Bandyopadhyay, BS Sivaram and SV Subramanyam*. Growth of single crystals of some complex salts in silica gels; *MS Joshi, PMohan Rao and AV Antony*.  $\text{CuAlMnO}_4$  from two different combinations and their structural and electrical study; *AB Devale, HS Bisht and DK Kulkarni*. Evidence of edge and screw dislocations in gypsum single crystals; *KS Raju*. Studies of defects in  $\text{WSe}_2$  single crystals; *MK Agarwal, HB Patel and TC Patel*. Separation of rare earths by ion exchange; *GS Rao and GM Pathak*. Electrowinning of cerium group metals from fused chloride bath; *Sohan Singh and*

*AL Pappachan*. Preparation of rare earth-cobalt magnet alloy by reduction-diffusion process; *TS Krishnan*. Analytical methods for RE-Co alloys; *TA Padmavathy Shankar, HO Gupta, EC Subbarao, KP Gupta, NR Bonda, DK Goel, SN Kaul, AK Majumdar, RC Mittal, G Sarkar, MV Satyanarayana, K Shankara Prasad, J Subramanyam and EMT Velu*. Magnetic properties of a mischmetal-cobalt alloy; *RA Tewari*. Wave-vector dependence of spin-wave line-width in yttrium iron garnets; *Om Prakash and CM Srivastava*. Exchange constants in ferrimagnetic garnets; *CM Srivastava, CSrinivasan and RAiyer*. Systematics in the electron transport and magnetic properties of  $\text{LnBO}_3$  perovskites; *B Ganguly and CNR Rao*. Solid State studies on rare earth mixed oxide pyrochlores  $\text{Er}_2(\text{V}_{1-x}\text{Fe}_x)_{4/3}\text{W}_{2/3}\text{O}_7$ ; *MA Subramanian, G Aravamudan and GV Subba Rao*. Positron annihilation studies of rare-earth mixed valence compounds; *KP Gopinathan, CSSundar, B Viswanathan and ABharathi*. Higher order elastic constants of rare earth metals: gadolinium, dysprosium and erbium; *CS Menon*. Physics of silver halides and their applications; *DN Bose and PA Govindacharyulu*. Development of roller quenching apparatus for the production of amorphous phases; *ST Lakshmi Kumar, RMMaliya and ESR Gopal*. Structural and dielectric studies of some niobate-titanate systems; *AM Varaprasad, AL Shashi Mohan, DK Chakrabarty and AB Biswas*; Studies on thick films of photoconducting cadmium sulphide; *DP Amalnerkar, MSSetty, (Miss) NR Paraskar and APBSinha*. Effect of an electric field on the oxidation of aluminium at room temperature; *KBhavani and VK Vaidyan*. Charge transfer satellites in the x-ray photoelectron spectra of  $3d^0$  and  $4d^0$  metal oxides; *MS Hegde*. Self-diffusion considerations in  $\omega$ -phase of hard HCP metals; *MNVijayakumar*. Optical constant of  $\text{WSe}_2$  single crystals; *MK Agarwal, PD Patel and O Vijayan*. Electroless deposition of alpha- $\text{PbO}_2$  and  $\text{Ti}_2\text{O}_3$ ; *RNBhattacharya and PPramanik*. Amorphous semiconducting Si:H; *HFritzsche*. Amorphous hydrogenated silicon films prepared from a glow-discharge; *S Guha*. AC conductivity of amorphous semiconductors; *Abhai Mansingh*. Theory of susceptibility of a-Ge and a-Si; *A Mookerjee, and SC Agarwal*. Ionic sulphate glasses; *KJRao*.

### Volume 3 (1981)

Some barium titanate based dielectrics; *AM Varaprasad, DK Chakrabarty and AB Biswas*. Hydrothermal stability of hematite and magnetite; *JAK Tareen and KV Krishnamurthy*. Effect of barium titanate on the unit cell parameter of  $\text{Nd}_{0.5}\text{Li}_{0.5}\text{TiO}_3$ ; *DN Raut, DNBhute and PVPatil*. Thermoelectric behaviour of amorphous magnetic alloys; *BBhanu Prasad and Anil KBhatnagar*. On the defect states in As-Se glasses; *RMohan and KJRao*. Densities, microhardnesses and electron microscopic studies of As-Se glasses; *RMohan, TS Panchapagesan and KJRao*. Computation and application of local solidification times of grey cast iron cast in metallic moulds; *Malur N Srinivasan*. Flux growth and habit modification of  $\text{CaWO}_4$  crystals; *SK Arora, RS Godbole and Tomy Abraham*. Influence of impurities on chemical etch pits in gypsum single crystals; *KS Raju*. Some interesting phase transitions in solids; *CNR Rao*. Critical point phenomena, heat capacities and the renormalization group theory of fluctuations; *ESR Gopal*. Use of linear weight factor in real space renormalization group; *DSengupta and PK Ghosh*. Structural aspects of alpha-omega transformation in group IV transition metals and alloys; *YK Vohra, SK Sikka and RChidambaram*. Statistical theories of nematic liquid crystals; *NVMadhusudana*. The tricritical point—a qualitative overview; *S Dattagupta*. Thermodynamic analysis of the metal-insulator transitions in  $\text{V}_2\text{O}_3$  alloy systems; *JMHonig, HV Keer, GM Joshi and SA Shivashankar*. Investigation on Schottky diodes on amorphous

hydrogenated silicon; *SM Pietruszko, KL Narasimhan and S Guha*. ESCA studies of some mixed-valence rare-earth intermetallics; *BD Padalia, Varsha Prabhawalkar, PD Prabhawalkar, EV Sampathkumaran, LC Gupta and RV Vijayaraghavan*. Oxide dielectrics; *EC Subbarao*. Exchange in insulators; *CM Srivastava*. Correlation between the magnetic properties and the chemical shifts in x-ray absorption spectra of some transition metal compounds; *Chintamani Mande and MY Apte*. Preparation and characterisation of  $\gamma\text{-Fe}_2\text{O}_3$  as tape recording material; *K Seshan, MR Anantharaman, Venkatesh Rao, AL Sashimohan, HV Keer and DK Chakrabarty*. Anti-ferromagnetism in the Heisenberg Hamiltonian; *CK Majumdar*. Mossbauer and magnetic studies on the system  $\text{Fe}_{3-x}\text{Ti}_x\text{O}_4$ ; *R Nagarajan and CRK Murthy*. The influence of  $\text{Cu}^{2+}$  substitution on the magnetic properties of Fe-Zn and Ni-Zn ferrites; *CM Srivastava, MJ Patni, GSrinivasan and TTSrinivasan*. Lattice imaging studies on the structure and non-random disorder in SiC crystals; *SR Singh and GSingh*. Skull melting as a technique in the growth of single crystals; *HR Harrison and JM Honig*. Low-temperature preparation of some perovskites  $\text{La}_3\text{MM}'\text{O}_6$  ( $\text{M}, \text{M}' = \text{Cr, Mn, Fe, Co, Ni, M} \neq \text{M}'$ ); *PGanguly*. Stabilization of unstable oxides; *CE Deshpande and MN Sankarashana Murthy*. Preparation of some transition metal sulphides; *J Gopalakrishnan*. Synthesis and characterization of  $\gamma\text{-Fe}_2\text{O}_3$ —a magnetic tape material; *MR Anantharaman, K Seshan, DK Chakrabarty and HV Keer*. Preparation and characterization of some single, mixed and doped crystals and instrumentation aspects; *R Krishnaswamy*. Preparation and sensitization of tin telluride infrared detectors; *SSanathanam and AK Chaudhurn*. Preparation and characterization of  $\text{Pb}_{1-x}\text{Sn}_x\text{Te}$  pseudo-binary alloy semiconductors; *SC Das, AK Chaudhurn and S Bhattacharya*. Growth and electro-optic studies in mixed  $(\text{NH}_4)_x\text{K}_{1-x}\text{H}_2\text{PO}_4$  single crystals; *KBR Varma and Kollun VRamanaiah*. Preparation and structural characterisation of chemically deposited  $\text{Pb}_{1-x}\text{Cd}_x\text{S}$  films; *BB Nayak, HN Acharya and GB Mitra*. Electron transport in hot pressed  $\text{Y}_{3-x}\text{Gd}_x\text{Fe}_3\text{O}_{12}$ ; *DBahadur, Om Parkash and Devendra Kumar*. Moisture absorption and its effect on the electrical properties of high silica fabric; *BE Rama Chandran, NBalasubramanian, GV Subba Rao and GARavamudan*. Phase transitions in molybdenum sesquisulphide systems between 80 and 600 K; *AK Rastogi and RR Ray*. Characterization of a-Si: H thin films prepared by dc glow discharge of silane; *DS Misra, PNDixit and SC Agarwal*. Inorganic materials for optical data storage; *SK Date*. Characterisation of high purity rare-earth oxides by x-ray fluorescence methods; *RM Dixit*. Elemental characterisation of aluminium used in reactors by optical emission spectroscopic methods; *LC Chandola*. Scanning electron microscopic fractography of permanent moulded cast iron; *SSeetharamu and Malur N Srinivasan*. Dislocation network patterns in tungstenite single crystals; *MK Agarwal, KNagi Reddy, JV Patel and NG Patel*. Thermopower of  $\text{Ag}_{2+\delta}\text{S}$  across the  $\alpha - \beta$  transition; *HN Vasana and AK Shukla*. New chemical methods for the deposition of  $\text{Cu}_{1-\delta}\text{S}$  and TiSe thin film; *RNBhattacharya and PPramanik*. van der Waals coefficients and cohesive energies of lead chalcogenides; *Ch Satyanarayana*. Galvanomagnetic properties of plastically deformed InSb single crystals; *M Nagabhooshanam and VHana Babu*. Dielectric and polarization studies on some organic materials; *B Jagannadh and Lalitha Sirdeshmukh*. Etch pit shape on {110} surfaces of  $\text{CaF}_2$  crystals; *GC Jain, LC Jain and TSMurthy*. On the sintering kinetics of titania doped ceramic lanthanum chromite; *KPBansal, SKumari, BK Das and GC Jain*. Determination of the composition of binary systems by the ratio method employing SEM-EDAX; *GN Subbanna*. SEM studies of tin-iodide whiskers; *CC Desai and JLRai*.

#### Volume 4 (1982)

Structural and electrical properties of the system  $\text{ZnFeMnO}_4\text{-CaCoMnO}_4$ ; *PS Jain and VS Darshane*. Spin-state equilibria in  $\text{YbCoO}_3$ ; *DBahadur*. Dispersion of dielectric constant and resistivity of  $\text{Cu}_2\text{Zn}_{1-x}\text{Fe}_x\text{O}_4$  samples; *SR Sawant and RN Patil*. Dielectric properties of  $\text{K}_2\text{Zn}_2(\text{SO}_4)_3$  and  $(\text{NH}_4)_2\text{Mg}_2(\text{SO}_4)_3$ ; *Prameela Devi and Lalitha Sirdeshmukh*. Temperature dependence of Vickers microhardness and creep of InBi single crystals; *VP Bhatt and CF Desai*. Fracture toughness of cast aluminium alloys; *SRanganatha and Malur N Srinivasan*. Dislocation loops in tungstenite ( $\text{WS}_2$ ) crystals; *MK Agarwal, KNagi Reddy and*

*JV Patel*. A simple technique for interference microtopography; *PBV Prasad and IVKBhagavan Raju*. Structural, magnetic and electrical study of  $\text{MgCoMnO}_4$ ; *SG Jooshi, DK Kulkarni and PVKhandekar*. Materials processing in space—A brief review; *SRamaseshan*. Methods of low gravity simulation; *JM Haynes*. Capillary equilibrium and stability in liquids under microgravity; *JM Haynes*. The Spacelab fluid physics module; *JM Haynes*. Convection phenomena at reduced gravity of importance in space processing of materials; *Simon Ostrach*. Motion induced by surface-tension gradients; *Simon Ostrach*. An experimental study of surface-tension induced convection at reduced gravity; *Simon Ostrach*. Thermal convection induced by g-jitter in space environment; *Simon Ostrach*. Electrochemical experiments in space; *SR Rajagopalan*. Possible studies on adhesion in space; *GVenkataraman*. Vapour phase crystal growth under microgravity environment; *Vikram Kumar*. Crystal growth from melt in space *PGanguly*. Crystal growth from solutions under microgravity environment; *HLBhat*. Eutectic growth in space; *MSriramamurthy and VSArunachalam*. Processing of ceramics and glasses in space; *PRamachandrarao*. Diffusion kinetics and some aspects of solidification under microgravity environment; *PRamachandrarao*. Potential new solidification experiments in space environment; *PK Rohatgi, MRMadhava and MK Surappa*. Potential new experiments on fabrication of cast particulate composites in space; *PK Rohatgi, MK Surappa and MRMadhava*. The onset of transient Marangoni convection in a liquid layer subjected to rotation about a vertical axis; *NRudraiah*. Some remarks concerning near-zero g experiments on living systems; *Vidyanand Nanjundiah*. The design of space vehicles; *KKasturirangan*. Indian sounding rockets for material science experiments; *TMK Marar and KSShyla*. Current materials sciences in space activities in Grenoble; *Yves Malmejac*. Overview of the present status of the European and American rocket activities in the field of materials sciences; *Yves Malmejac*. Some notes on the first Spacelab payload; *JM Haynes*. Amorphous semiconductors: Structural models; *JNag and SP Sen Gupta*. Defects in GaAs; *VSwaminathan*. X-ray topographic analysis of dislocation line defects in calcium fluoride crystals; *CC Desai*. Structural, magnetic and electrical study of  $\text{CoMnAlO}_4$ ; *SG Joshi, DKKulkarni and PVKhandekar*. High temperature resistivity characteristics and nonstoichiometric  $\text{V}_2\text{O}_3$ ; *HJhans and JM Honig*. Optical constants of  $\text{Mo}_x\text{W}_{1-x}\text{Se}_2$  single crystal solid solution; *MK Agarwal, PD Patel and OVijayan*. A note on the composition dependence of elastic properties of Se-P glasses; *VC Padaki, STLakshmi Kumar, AM Jayannavar and ESR Gopal*. Microstructures, thermal diffusion and decomposition studies in the two phase solution grown mixed crystals of NaCl and KCl; *SR Ghadekar and BT Deshmukh*. Semiconductor based photoelectrochemical cells for solar energy conversion — An overview; *AAruchamy, GARavamudan and GV Subba Rao*. Crystal growth in gel media; *AR Patel and AVenkateswara Rao*. Melt-spinning technique for preparation of metallic glasses; *RC Budhani, TC Goel and KL Chopra*. Tetragonal to cubic phase transition in silver chlorate; *Vilas Deshpande, SVSuryanarayana and C Frantz*. Deformation study of anhydrous diglycine sulphate crystal; *GR Pandya, DD Vyas and CF Desai*. A note on ferroelectricity in polymer films containing TGS power; *CSTomar, DCDube and SCMathur*. Thermoelectric properties of the ceramic system  $\text{Pb}_{2-x}\text{La}_x\text{Li}_{0.5}\text{N}_{1.5}\text{O}_6+\delta$ ; *SG Phadnis, RRajan and SK Kulkarni*. Polymeric surface coatings for use as leather finishes — Part I. Studies on synthesis and characterisation of urethane acrylate oligomers; *CSaikumar, SRajadurai and MSantappa*. Surface distortion features on indented  $\text{CaF}_2$  cleavages; *GC Jain and PNRawat*. Flow stress of an aluminium alloy in the warm working range; *SK Pachista, SK Ramalingam and Malur N Srinivasan*.

#### Volume 5 (1983)

Manganous-zinc ferrites synthesized out of  $\text{MnO}$ ; *CE Deshpande, PP Bakare and MN Sankarshana Murthy*. Growth and characterisation of hydrothermally-grown zeolite crystals; *MS Joshi and BT Bhoskar*. Glass formation region and electrical conductivity in the system  $\text{B}_2\text{O}_3\text{-Li}_2\text{O-Li}_3\text{PO}_4$ ; *BBasu, HSMarti and APaul*. Effect of flux content on thermoluminescence yield of BaS phosphors; *RPRao and DRRao*. Development of zinc oxide varistors; *HS Kalsi and BK Das*. Linear electrooptic effect in doped KDP crystals;

KBRVarma, KVRamanaiah and KVeerabhadra Rao. Use of gold palladium surface replicas of high kV (30), SEM examination of low Z materials; RMPradhan. Electron microscopic studies on the effect of Sn addition on the ageing characteristics of Al-0.7% Mg<sub>2</sub>Si alloy; Gouthama and Kishore. Stress relaxation in ferroelectric materials; CSPrasad. Microhardness of rhombohedral crystals; Calcite and sodium nitrate; JRPandya, LJBhagia and A/Shah. Biomaterials research and development; MSValiathan. A blood oxygenator from indigenous materials: Functional evaluation using sheep lung as deoxygenator; VSVenkatesan, G Arthur Vijayan Lal and MSValiathan. Toxicity screening of candidate materials for the fabrication of a bubble oxygenator: A preliminary report; PVVedananarayanan, KRathinam and ACFernandez. Glutaraldehyde proteinated surfaces: blood compatibility; Thomas Chandy and ChandraPSharma. A tilting disc valve — component materials and hydraulic function; GSBhuvaneshwar, AVRamani and MSValiathan. Differential scanning calorimetric studies of polyester fabrics used in sewing ring of an heart valve; KSreenivasan, PrabhaDNair and VVBhujle. Lipid adsorption/absorption on poly carbonate surfaces — an understanding; ChandraPSharma and Thomas Chandy. Dielectric and pyroelectric properties of sintered discs of sodium meta vanadate; AHKhan, DBGhare and PSNarayanan. Dielectric properties of the system Pb<sub>2-x</sub>La<sub>x</sub>Li<sub>0.5</sub>O<sub>6</sub>+δ; SGPhadnis, RRajan and KSKulkarni. Dispersion of photoelastic constants in doped KDP crystals; KVRamanaiah and KBRVarma. Magnetic properties of Ni<sub>1-x</sub>Cu<sub>x</sub>Cr<sub>2</sub>O<sub>4</sub> (0 ≤ x ≤ 1) compounds; BLDubey, NNath, BNTiwari and ATripathi. Structural features of evaporated nickel films on oxide supports; RMPradhan. Effect of annealing and oxygenation on the DC conductivity of amorphous germanium; KKBhale and SSShah. Cavitation damage of titanium in molten lead; AMAbdel Fattah and MASidkey. Raman spectroscopy of intermediate valent (IV) systems: Electron-phonon coupling and charge fluctuation; AJayaraman. Mercury chalcogenides under pressure; TGRamesh, VShubha and PSGopalakrishnan. High pressure studies of liquid crystalline transitions: Recent results; RShashidhar. The kinetics of pressure-induced polymorphic transformations; AKSingh. Hydrothermal synthesis of chromium dioxide powers and their characterisation; VAbdual Jaleel and TSKannan. The Verway transition; CMSrivastava. Anomalous photovoltaic effect and disorder in ZnS crystals; MTSebastian and PKrishna. Electrochemical ways of tapping solar energy: an appraisal; AKShukla, RManoharan and KVRamesh. Optimal properties of bismuth granules in a glass matrix; GCDas, RDas and DChakravorty. Transition metal chalcogenides exhibiting quasi-one-dimensional behaviour; JGopalakrishnan and KSNanjundaswamy. Near-neighbour impurity effect on the spin-state transitions in LaCoO<sub>3</sub> at low temperature (12 < T < 300 K); NYVasanthacharya and PGanguly. Chemical amplification — A novel approach to ultratrace analysis; SRRajagopalan. Electroless and electrodeposition of nickel boron composites; Indira Rajagopal. Hydrodynamics of cholesteric liquid crystals in the coarse-grained limit; GSRanganath. Microcrystals of cooperative-behaviour materials; MSMultani, RVijayaraghavan, MRSrinivasan, P Ayyub, VRPalkar, VSaraswati and AVGurjar. Materials tissue interface; MSValiathan. Materials research at National Aeronautical Laboratory (Contributions of SRamaseshan); S RVallur and SRRajagopalan. Crystal growth of barium molybdate by flux evaporation; SKArora and GSTrivikrama Rao. Crystal growth and electrical properties of CaSO<sub>4</sub>: Dy single crystals; SHJagdale and SHPawar. Growth mechanism of Herring-bone and Hour-glass synthetic gypsum; DJayakumar and KSRaju. ZnS, Sm and ZnS. Cu, Sm electroluminescent phosphors; RCMaheshwari and RKTripathi. Electrical properties of CdS<sub>1-x</sub>Se<sub>x</sub> single crystals; DRaja Reddy, BKReddy and PJReddy. Electrical conductivity, crystallinity and glass transition in vulcanised rubber; NP Daw and RC Bhuniya. Effect of zinc composition on properties of PEC cells based on sprayed Cd<sub>1-x</sub>Zn<sub>x</sub>S films; MDUplane and SHPawar. Time measurement technique for internal friction studies with a torsion pendulum; CN Rao and MKAsundi. Microhardness and interatomic binding in some cubic crystals; KKishan Rao and DBSirdeshmukh. Microhardness studies of Sn<sub>2</sub> Sn<sub>4</sub> single crystals; CCDesai and JLRai. Changes in texture and grain size in hot rolled magnesium and effect on yielded strength; GSambasiva Rao and

YVRKPrasad. Stroboscopic studies of the elastic behaviour of some Indian timbers; MA Kareem and DBSirdeshmukh.

## Volume 6 (1984)

Ferromagnetic resonance in metallic glasses: study of fracture, stress and thermal stability; RSParashar, CSSunandana and AnilKBhatnagar. Influence of the presence of Fe<sup>2+</sup> ion in nickel-zinc ferrite; CMSrivastava, SNShringi, MJPatni and SMJoglekar. Metal-to-ceramic bonding in (Al<sub>2</sub>O<sub>3</sub>+Fe) cermet studied by Mössbauer spectroscopy; CBansal. Mössbauer spectroscopy of titanium-substituted iron garnets; CMSrivastava, SNShringi, B Uma Maheswar Rao, DBahadur and Om Prakash. Magnetic properties of metallic glass Fe<sub>39</sub>Ni<sub>39</sub>Mo<sub>4</sub>Si<sub>6</sub>B<sub>12</sub>; BBhanu Prasad, AnilKBhatnagar, S Venkataraman and MN Chandrasekharaiah. Magnetic structure of zinc ferrite; CMSrivastava, SNShringi and MVijayababu. A Mössbauer study of hyperfine interactions in the boroferrite Fe<sub>3-x</sub>Ga<sub>x</sub>BO<sub>6</sub> (x=0, 0.12); MVithal, RJagannathan and NRavi. Curie temperatures and 0°K magnetic moments of zinc-substituted lithium ferrites; Pran Kishan, DR Sagar, SNChatterjee, LKNagpaul and KKLarola. Preparation of single crystal films of magnetic bubble materials — Rare earth yttrium iron gallium garnets by liquid phase epitaxy and their physical properties; Pragati Mukhopadhyay and B Uma Maheswar Rao. Electron transport in non-crystalline garnet films; DBahadur, DRoy, BSingh and DSaran. Development of pure and doped gamma ferric oxide; MRAnantharaman, KSeshan, SNShringi and HVKeer. Dependence of microstructure on process variables in maganese zinc ferrites; NVenkataramani, RAiyer, PSSekhar and CMSrivastava. High temperature materials for magnetohydrodynamic channels; VKRohatgi. Effect of compositional modifications on the piezoelectric properties of spray dried lead zirconate titanate ceramics; Ramji Lal and PRamakrishnan. Use of coal tar pitch for carbon-carbon composites; RLSeth, KKData, CLVerma, CLal and VPMittal. Amine-cured epoxy/glass fibre composites; DSVarma and RGRaj. Dielectric and pyroelectric studies on tri-glycine sulphate-polymer composites; KSreenivas, TSudersena Rao, Ajay Dhar and Abhai Mansingh. Elevated temperature low cycle fatigue studies on AISI 304 steel; NKSinha and PVasudevan. Structure and properties of an investment — cast austenitic stainless steel; PMJebaraj, MalurNSrinivasan and MRSeshadri. Sophisticated equipment developed for growth and evaluation of perfection of nearly perfect crystals; Krishnan Lal and Ajit Ram Verma. Investigation of hydrogenous materials using neutrons; B A Dasannacharya and PS Goyal. Electrochemical preparation of potassium gold cyanide; Indira Rajagopal and SRRajagopalan. Hydrothermal growth of A<sup>III</sup>B<sup>VI</sup> semiconductors; VAKuznetsov, IPKuzmina and IMSylvestrova. Glass-metal particulate composites; DChakravorty. Fast ion conduction lithium glasses-Review; ARKulkarni, HSMati and APaul. Lithium solid electrolytes and their applications; DN Bose and DMajumdar. Electronic conduction in bulk Se<sub>1-x</sub>Te<sub>x</sub> glasses at high pressures and at low temperatures; GParthasarathy and ESRGopal. Electrical properties of polycrystalline silicon and zinc oxide semiconductors SNSingh, SKumari and BKDas. MnO<sub>2</sub> catalysed carbon electrodes for dioxygen reduction in concentrated alkali; RManoharan and AKShukla. Structural and magnetic investigations of some new boron containing rare earth intermetallic compounds; SKMalik, SKDhar and RVijayaraghavan. On the mechanism of pairing in the BCS theory; CMSrivastava. Structure and superconductivity in ternary systems of compounds; GVSubba Rao and Geetha Balakrishnan. Pyroelectric materials; MRSrinivasan. Amorphous state ferro-electricity, magnon scattering and phase stability in microparticle materials; MSMultani, P Ayyub, VRPalkar, MRSrinivasan, VSaraswati, RVijayaraghavan and DOShah. Radiation effects in nuclear reactor materials-Correlation with structure; PRodriguez, RKrishnan and CVSundaram. Structural disorders and solid state transformations in single crystals of Zn<sub>x</sub>Cd<sub>1-x</sub>S and Zn<sub>x</sub>Mn<sub>1-x</sub>S; MTSebastian and PKrishna. The pressure-volume relation of ytterbium up to 9 GPa; S Usha Devi and AKSingh. Some recent advances in materials technology; SRamaseshan and NBalasubramanian. High resolution electron microscopy of long range ordered alloys; SAmelincks, G Van Tendeloo and J Van Landuyt. High resolution electron microscopy of semiconductors; CSPande. High resolution electron microscopy as a tool

for structural investigations; *G Singh and RS Rai*. Scanning transmission electron microscopy and microdiffraction techniques; *JM Cowley*. Applications of scanning transmission electron microscope; microanalysis in the study of materials; *Gary R Prudy*. X-ray microanalysis in the transmission electron microscope; *GW Lorimer*. Analytical electron microscopy of aluminium alloys; *TR Ramachandran, DC Houghton and JD Embury*. Electron microscopy of defect clusters produced by radiation damage; *SBanerjee*. Electron microscopy of layered single crystals grown by direct vapour transport method; *MK Agarwal, PD Patel, JV Patel and JD Kshatriya*. Details of an imaging atom probe; *VR Seshadri, K Neelakantan, EMohandas and VS Raghunathan*. Field ion microscopic observations of LaB<sub>6</sub> on tungsten; *DB Joag, PL Kanitkar, MM Kanitkar and VM Shukla*. Metallic glasses; *CSuryanarayana*. High voltage electron microscopic irradiation and observations in metallic glasses; *RV Nandekar and AK Tyagi*. High resolution electron microscopic studies of HoAl<sub>3</sub>, Er<sub>0.5</sub>Gd<sub>0.5</sub>Al<sub>3</sub> and Y<sub>0.91</sub>Er<sub>0.09</sub>Al<sub>3</sub> in thin form; *Anand Kumar Singh, Ajay Kumar Singh, MS Gupta and ON Srivastava*. Electron diffraction analysis of antimony films; *PD Prabhawalker and Amarjit Singh*. Formation of lamellar M<sub>23</sub>C<sub>6</sub> on and near twin boundaries in austenitic stainless steels; *B Sasmal*. Observations on the physical basis of mechanical behaviour; *SRamaseshan*. Shocks and high velocity deformation; *RChidambaram*. Computer simulation of tensile testing; *VSndhar*. Instabilities in yielding; *GS Venkataraman*. Serrated plastic flow; *PRodriguez*. Repeated yield drop phenomena as a cooperative effect; *G Ananthakrishna*. Mechanism and empirical equations for deformation and some principles of alloy design; *T Balakrishna Bhat*. Superplasticity; *KSrinivasa Raghavan*. Grain Boundary — dislocation interactions; *SRanganathan*. Instabilities in first order phase transitions; *SBanerjee*. Deformation and martensitic transformation; *VSeetharaman*. Strength and electronic structure; *KGovinda Rajan*. Ferroelasticity; *VK Wadhawan*. Effects of mechanical deformation: Exoemission; *GMukhopadhyay*. Relevance of liquid state to solid state properties; *HR Krishna Murthy and TV Ramakrishnan*. Elastic continuum theories of lattice defects: A review; *Debendranath Sahoo*. Fracture of particulate composites; *SRay*. Experimental study of fluctuations in materials; *KRRao*. Elementary concepts in chaos and turbulence; *Ramakrishna Ramaswamy*. Fractals; *DDhar*. Summary and outlook; *VBalakrishnan*. Phase transformations—a physicist's perception; *G Venkataraman*. Growth of research and development in rare metals extraction in India; *CVSundaram and CKGupta*. Plutonium metallurgy in India; *PRRoy and CGanguly*. Internal friction in hexagonal metals; *MKAsundi and CNRao*. A novel method of RF powder sputtering; *KSolomon Harshavardhan and KNKrishna*. Preparation and characterisation of β'-Al<sub>2</sub>O<sub>3</sub>; *HSKalsi, RPTandon, Balbir Singh, RC Goel and BKDas*. Evidence of screw dislocation on (002) cleavages of lithium carbonate single crystals; *KSRaju, MPalaniswamy, PRamasamy and GSLaddha*. Etch pit observation on the habit faces of gel grown nickel molybdate crystals; *KVKunen and MAIttyachen*. Elastic properties of As-Sb-Se glasses; *A Giridhar, Sudha Mahadevan and AKSingh*. DC electrical conductivity of Na<sub>2</sub>O-ZnO-B<sub>2</sub>O<sub>3</sub> glass system; *RVAnavekar, NDevaraj and JRamakrishna*. Photon, electron and ion beam induced physical and optical densification in chalcogenide films; *KL Chopra, LK Malhotra, KSolomon Harshavardhan and SRajagopalan*. Oxidation of thin films of tin at room temperature in hydrogen sulphide atmosphere, *CI Muneera and VUnnikrishnan Nayar*. Annealing behaviour of electron-beam deposited tin dioxide films; *Arjeesh Gupta, Poonam Gupta and VKSrivastava*. Temperature dependence of microhardness in mixed crystals; *Sankar PSanyal and RKSingh*. Some aspects of dislocation-precipitate interaction in underaged aluminium-germanium alloy; *Kishore*. Evaluation of magnetic hyperfine field distributions from Mossbauer spectra of disordered alloys and metallic glasses; *CBansal*. Spin wave relaxation processes in polycrystalline yttrium iron garnets; *SNBhatia, PB Joshi and CMSrivastava*. Spin-wave excitations in amorphous ferromagnets; *Anil K Bhatnagar, B Bhanu Prasad, NRavi and RJagannathan*. Infrared absorption in spinel ferrites; *TSrinivasan, CMSrivastava, NVenkataramani and MJPatni*. Influence of spin orbit coupling and lanthanide contraction on the exchange interaction in rare earth garnets; *CM Srivastava, CSrinivasan and RAiyar*. Electrical properties of films at microwave frequencies; *D CDube*. Surface modification of polyvinyl chloride towards blood compatibility; *Geetha Kunan and Chandra P Sharma*.