Patrika

June 1995 No. 34 Newsletter of the Indian Academy of Sciences

Mid-Year Meeting 1995

The sixth Mid-Year Meeting of the Academy will be held at the Indian Institute of Science, Bangalore on Friday 28 July and Saturday 29 July 1995. As in the past, there will be lectures by new Fellows and Associates and special lectures by Mr Madhavrao Scindia, Minister of Human Resource Development, Government of India on education and by Prof. N. Kumar, Director, Raman Research Institute, Bangalore on "Light localization in random amplifying medium: mirrorless laser".

The lectures by Fellows and Associates will be:

J. Radhakrishnan, TIFR, Bombay,
"Proofs and computation"

P. Chaudhuri, ISI, Calcutta,
"Exploring patterns and unmasking low-dimensional structures in noisy high dimensional data"

D. Roy Chowdhury, IIT, Kharagpur,
"What cellular automata can do?"

Bhaskar Datta, IIA, Bangalore,
"Matter at extremely high densities"

V. Prakash, CFTRI, Mysore,
"Is there a structural similarity between the various oil seed proteins from the point of view of both high molecular weight and low molecular weight proteins?"

S. E. Hasnain, NII, New Delhi,
"Hyperexpression of the polyhedrin gene: A survival strategy of the baculovirus AcNPV"

H. A. Ranganath, Univ. of Mysore, Mysore,
"Chromosomes and evolution: A study in Drosophila"

Anil Kumar, IISc., Bangalore,
"Reappearing phases"

B. C. Nakra, IIT, New Delhi,
"Vibration control and diagnostics"

R. Sunder, B.I.S.S., Bangalore,
"Fatigue crack closure - The key to understanding notch root fatigue under complex load sequences"

D. S. Ray, IACS, Calcutta,
"Chaos and statistical mechanics"

A. Chandra, IIT, Kanpur,
"Dielectric relaxation and solvation dynamics in electrolyte solutions"

S. W. A. Naqvi, NIO, Goa,
"Nitrogen transformations in suboxic zone of the Arabian Sea"

C. C. Kartha, SCTIMST, Trivandrum,
"An animal model for endomyocardial fibrosis"

N. K. Ganguly, PGIMER, Chandigarh,
"Relationship of T cell macrophage signals and function lymphocyte in response to antigens of intracellular pathogen (*Salmonella typhi*)"

Sri Niwas, Univ. of Roorkee, Roorkee,
"Straightforward inversion of geoelectrical sounding data"

R. Sridharan, PRL, Ahmedabad,
"Optical aeronomy – Recent trends".

61st Annual Meeting

The sixty first Annual Meeting of the Academy will be held in Madras from 10 to 12 November 1995. The meeting is jointly hosted by the University of Madras, the Anna University, the Indian Institute of Technology, the Central Leather Research Institute, the Institute for Mathematical Sciences, the Indira Gandhi Centre for Atomic Research and the Southern Petrochemical Industries Corporation Limited. This would be the first time that so many organizations are involved in hosting the annual meeting.

The scientific programme will consist of symposia, special lectures and lectures by new Fellows and Associates. The programme includes a visit to Kalpakkam and Mahabalipuram. The next issue of *Patrika* will contain the detailed programme.

Fellows and Associates who are unable to obtain travel support from other sources will be paid an equivalent of their return first class train fare to Madras. The organizing committee will also arrange for the accommodation of the delegates in Madras.

New Building

For a long time, the Academy has been functioning without some of the very essential facilities that it ought to have. In order to create some of these facilities, it was decided in 1993 to construct a new building as part of the diamond jubilee celebrations in 1994. A building committee was formally constituted by the president of the Academy and a proposal containing detailed plans and estimates was submitted to the Department of Science and Technology for funding. The construction was started in November 1993 and the building was formally inaugurated on 29 November 1994 by Professor Satish Dhawan, one of the Past-Presidents of the Academy.

The new building situated just behind the existing building, measures about 1300 sq. meters of built-up area and consists of a basement, ground floor and two other floors. The facilities added include a Council chamber, a few guest rooms, a lounge, additional office and storage space.

The building was completed in a remarkably short period of one year. The Academy is grateful to the architects, the contractors and the members of the Building committee for their assistance and co-operation in the completion of this building and to the Department of Science and Technology, New Delhi for financial support.

New Journal on Science Education

The Academy recently released a document on "University Education in Science" based on a report submitted by a panel appointed in 1994. One of the recommendations of the panel is that the Academy should launch a popular science journal devoted to young students and teachers of science. The relevant paragraph from the Academy document is reproduced below:

> Council proposes to launch a journal of science specially intended for science students and educated lay persons interested in science. The editorial, intellectual and financial backing of the Academy will be available to sustain such an effort. The journal will contain expository articles, descriptions of new teaching methods and innovative experiments, science news, historical notes etc. Information on course openings and facilities in various institutions might be included in such a journal as well as advertisements from prospective employers of science graduates.

The Council of the Academy considered and accepted this recommendation. As a follow-up, a planning group was constituted to consider and work out the details of the proposed publication. The planning group wrote to all the Fellows of the Academy and a large number of scientists in India numbering over 3000. There has been a positive response to this proposal.

The planning group is now going ahead with inviting articles for publication and planning the first issue which is expected to come out in January 1996. The planning group will be happy to receive any suggestions in this regard and these may be addressed to the Secretary of the Academy.

Special Issues of Journals

1. *Proceedings Chemical Sciences*, Vol. 106, No. 6, November 1994, pages 1259–1421, Frontiers in Chemistry. 1994 marked the sixtieth year of publication of the Proceedings of the Indian Academy of Sciences; special theme issues on topics of current interest particularly in frontier areas were published to celebrate the diamond jubilee of the founding of the Indian Academy of Sciences. The present issue "Frontiers in Chemistry" comprises interesting work carried out in the country on many important areas in chemistry, molecular spectroscopy, molecular biology, novel organic synthesis and others.

The research articles on diverse topics of chemistry and related areas were written by some of the foremost practitioners of the subject in India. The contents covered by each of the articles are a part of the presentations made at the national symposium on "Frontiers in Chemistry", held in Bangalore during December 17–18, 1993. The symposium was held in honour of Professor C. N. R. Rao to commemorate his attaining the age of sixty and this issue is dedicated to him. He was editor of this journal for over 18 years and is responsible for the high standards it has maintained. The articles span a wide range of interests traversing physical, solid state, inorganic, organic and biochemistries. The editors hope that this issue gives a flavour of the wide cross-section of research in chemistry and allied areas being carried out in leading laboratories in the country.

2. *Bulletin of Materials Science*, Vol. 17, No. 7, December 1994, pages 1194–1495.

This special issue of the *Bulletin of Materials Science* carries the Proceedings of the Fifth Annual General Meeting of the Materials Research Society of India, held at the Research Centre Imarat, Hyderabad from February 7 to 9, 1994. In his MRSI Honour Lecture Professor M. S. Valiathan spoke about "Heparin bonding: then and now" and touched on several fascinating issues such as materials and blood compatibility, heart-lung bypass systems, oxygenators and the artificial heart valve. A bright chapter in biomaterials in India was unfolded by the lecture at this meeting. The twelve medal lectures featured in this issue, cover a wide variety of topics such as characterization techniques, crystal growth, semiconductor films, magnetoelectric interactions, superconducting materials, surfactant materials, polymers, biomaterials, corrosion protection, creep and development of aluminium-lithium alloys. They make a strong impression of the high quality of current materials research done in Indian laboratories. Six lectures by overseas speakers provided an international perspective to the meeting.

Obituaries

Hannes Alfvén died on 9 April 1995 in Stockholm, Sweden at the age of eighty seven after a year-long sickness. He discovered the Alfvén waves in 1942 and was awarded the Nobel Prize in Physics for this discovery in 1970. He can be justifiably considered as the father of space plasma physics and astrophysical plasmas. He originated many key theoretical ideas which opened a new vision in understanding the plasma universe.

He received his Doctorate from the University of Uppsala in 1934 and was appointed professor of electromagnetic theory and electric measurements at the Royal Institute of Technology, Stockholm in 1940, at the age of thirty two. From this date to almost the end of his life, Alfvén was an active scientist of this Laboratory. His vigorous scientific and administrative activities led to the creation of several new departments within the Royal Institute of Technology. Three of these, plasma physics, fusion plasma physics and accelerator technology now constitute a separate entity called the Alfvén Laboratory. His own chair evolved correspondingly into electronics in 1945 and plasma physics in 1963.

From very early age, as a young boy Hannes Alfvén was intrigued by radio sets and radio electromagnetic waves. His vision about magnetic and electric fields and interaction with matter in the universe led him to discover the entirely new kind of waves in conducting fluids interacting with magnetic fields which are now known as Alfvén waves. These waves have become the foundation stone in plasma physics and its applications to space physics, astrophysics and thermonuclear fusion plasma physics. In order to understand the theory of sunspots, in 1942 in a letter to *Nature* he gave a very simple mathematical formulation describing the mutual interaction between electromagnetic fields and conducting fluid motion and found that this interaction can give

rise to a new phenomenon which he called electromagnetic-hydrodynamic waves.

Alfvén waves are low-frequency transverse waves propagating along the magnetic lines of force. Closely related to the Alfvén waves is the concept of "frozen-in magnetic fields", also due to Alfvén. This concept greatly simplifies the physical reasoning of plasma phenomena but has its limitations. Using this concept it was very easy for Alfvén to draw an analogy with the theory of stretched strings. Alfvén himself cautioned plasma physicists in using this concept without proper justification.

Incredibly, it took several years before the results arrived at by Alfvén were taken seriously. The experimental verification of Alfvén waves came still later due to technical difficulties. With the advent of space age now we have numerous satellite and spacecraft observations pointing out the omnipresence of Alfvén waves in space physical systems. The theoretical studies point out how various natural phenomena can be explained as a manifestation of the presence of Alfvén waves.

The other natural phenomenon which attracted his attention was the aurora. Recent space experiments and theoretical developments have shown aurora to be a manifestation of the interaction of solar plasma with the earth's magnetic field. Much before these ideas were established Alfvén knew the key to the problem of understanding auroral phenomena and in his very early years of research began to study the motion of charged particles in electric and magnetic fields.

He developed several other concepts in the interaction of plasmas with magnetic and electric fields. Some of these were not well received initially but have later proved to be highly relevant and useful.

As to the theory of the origin of the Universe Alfvén had his favourite slogan "In the beginning there was plasma". To understand the electricity and magnetism in space and the interaction of electromagnetic fields with conducting ionized matter in the plasma Universe was his passion which did not leave him till the very last days of his life.

He was elected an Honorary Fellow of the Academy in 1972.

Basavapatna Narayana Balakrishna Rao, was born on 21 January 1910. He had a distinguished academic record, starting with B.Sc. (Hons) in Chemistry in the Mysore University and an equally brilliant medical career in the University of Bombay. He passed the conjoint Board examination of England in 1936 and took his FRCS in 1937. He served the Government of Mysore from 1938 to 1947 in several capacities as District Medical and Health Officer, Lecturer and Professor and Chief of Surgery. His fame as a Surgeon and Teacher paved his way to the newly established G.R. Medical College, Gwalior. Between 1954 and 1964 he became the Superintendent of the Hospital and Dean & Professor of Surgery. In 1964, he was appointed as Professor and Head of the Department of Surgery at the All India Institute of Medical Sciences, New Delhi. Towards the last few years he also served as Professor of Hospital Administration and Superintendent of AIIMS Hospital. Even after his retirement in 1972 he worked there as Emeritus Professor. He was also a visiting surgeon and advisor to Northern Railway and Hamdard Hospital, New Delhi. Later, for a period of 3 years, he was Emeritus Scientist of the Indian Council of Medical Research. Apart from being a reputed general surgeon, he inspired several generations of undergraduate and postgraduate students throughout his distinguished career in Mysore, Gwalior and New Delhi. He was known for his surgical skill and above all humanitarian care of his patients. He was the first surgeon in India to perform pre-frontal leucotomy operation on psychiatric patients. Among several notable research contributions, special mention needs to be made of his sustained work on the causation of urolithiasis.

He was either a founder fellow, life or active member of a number of associations such as the Association of Surgeons of India, the Royal Society of Medicine, the Urolithiasis Society of India, the Urological Society of India, Sushruta Society, and the National Academy of Sciences, the Surgical Society and the Gastroenteriology Society of Bangalore. He was elected a Fellow of the Academy in 1945.

He was the recipient of several awards, the Munsiff Oration of the Bombay University, the B. C. Roy lecture in Bhopal, Achanta Lakshmipathi Oration of the NAMS etc. In recognition of his service to the nation he was made Honorary Surgeon to the President of India. He was recipient of R.O. Medal from the Indian Army and was conferred Padma Shri by the President of India.

He passed away on 7 March 1995 leaving his family, friends and colleagues to mourn his loss.

Editor: Anna Mani
Published by V. K. Gaur, Editor of Publications
for the Indian Academy of Sciences, Bangalore 560 080
Typeset by Creative Literati (P) Ltd., Bangalore 560 047