

The teachers were from Assam, Bhagalpur, Bodinayakanur, Burdwan, Chennai, Cheyyar, Chittoor, Coimbatore, Guwahati, Kannur, Kochi, Kolenchery, Kollam, Kottayam, Madurai, Palakkad, Pattambi, Rajampet, Tiruchirappalli and Thiruvananthapuram.

Foundation course in physics and chemistry of the earth

University of Allahabad, Allahabad
November 7 – 27, 2005

No. of participants: 13

Course Director: A K Gupta (University of Allahabad)

Resource persons: AK Gupta, VK Gaur (C-MMACS, Bangalore); S DasGupta and Nibir Mandal (Jadavpur); Pinaki Majumdar (HCRI, Allahabad).

This course for young faculty and researchers in the field of Earth Sciences was aimed at sharpening the conceptual foundations of young earth scientists towards creating capabilities for understanding and analysing planetary systems and processes generally relating to the earth in particular, in a quantitative manner. It was thus designed to focus on the most basic aspects of physico-chemical principles and their numerical application in calculating the thermodynamic conditions of critical earth processes such as lithospheric stretching leading to development of sedimentary basins, physics and chemistry of melts, amongst other topics. This course focussed on the following three topics and their numerical applications to earth science problems: (a) continuum mechanics, (b) thermodynamics, and (c) physico-chemico mineralogy.

The course consisted of two lectures every day followed by two tutorials, both of 75 minutes. Two theory and practical classes were also conducted on each day.

The teacher participants were drawn from Ahmedabad, Allahabad, Bangalore, Dehra Dun, Kolkata and Tiruchirappalli.

Physics of the Atmosphere

Indian Institute of Science, Bangalore
November 14–25, 2005

No. of participants: 38

Course Director: BN Goswami (IISc, Bangalore)

Resource persons: R Narasimha (JNCASR, Bangalore); J Srinivasan, BN Goswami, Sulochana Gadgil, GS Bhat, R Nanjundiah, SK Satheesh (all of CAOS, Bangalore); D Sengupta, M Venkatachalappa and P Siddheswar



(Bangalore University) PV Joseph (Kochi); BH Subbaraya, V Jayaraman and G Viswanathan (ISRO, Bangalore).

The teacher participants were from Allahabad, Anjar, Bangalore, Chennapatna, Chikballapur, Ernakulam, Guwahati, Hoshiarpur, Jhansi, Jharkhand, Kakinada, Kanchipuram, Kannur, Karaikudi, Malout, Mangalore, New Delhi, Pudukottai, Pune, Rewa, Srinagar, T.Kallikulam, Tirunelveli, Tumkur.

Extracts from the report

As teaching of atmospheric physics is not widespread in the country, the philosophy of this course was to introduce important phenomena in the atmosphere and to give an overview of quantitative aspects of dynamics and thermodynamics that provide physical understanding and predictive capability of these phenomena. Observing techniques, diagnosis of global observations and development of three-dimensional global models for weather and climate predictions were discussed. Recent development in this field was also highlighted as special lectures.

In his inaugural talk J Srinivasan highlighted the recent and exciting developments in atmospheric sciences. The course began with some basics such as composition of the atmosphere, atmospheric general circulation, horizontal and vertical structure of wind and temperature by Goswami followed by atmospheric thermodynamics by GS Bhat and atmospheric radiation by J Srinivasan. With this background PV Joseph and P Siddheswar introduced the synoptic systems, monsoon depression, equation of motion and continuity equation. M Venkatachalappa spoke on atmospheric waves and R Nanjundiah introduced complexities of developing three-dimensional general circulation models for prediction of weather and climate and highlighted the challenges in developing more accurate models for prediction of weather and climate. Satheesh discussed aerosols, clouds and precipitation. Special topics on Indian monsoon and its variability by S Gadgil, El Nino and Southern oscillation (ENSO), global warming, tropical cyclone (TC) and thunderstorms were also discussed in order to provide a flavour of interesting physical processes involved in some

of the important and challenging weather and climatic phenomena.

The afternoon sessions were devoted to demonstrations and laboratory work. Some fluid dynamics movies illustrating some basic fluid dynamics processes (e.g. drag, vorticity etc) were shown to the participants. An introduction to principle involved in remote sensing techniques was given by Satheesh who also demonstrated the working of the automatic weather station and various radiometers and instruments used for measurement of aerosol. Bhat demonstrated how density stratification could lead to certain oscillations in the atmosphere and ocean. A visit to ISRO Satellite Centre to understand various steps of satellite integration was also arranged.

Quantitative aspect of the atmospheric sciences was emphasized throughout the course. In order to carry forward quantitative aspect of the training during the course the participants were given a book entitled 'Meteorology – Understanding the Atmosphere' by Steven A Ackerman and John A Knox. The book covers a wide range of topics covered during the course. It is envisaged that the teacher participants will involve students in their respective places to maintain regular record of these important climatic variables. This is expected to not only provide good records of climatic data over a number of places but also enthuse some young students to get into this field.

Five special lectures on 'Origin and evolution of the atmosphere' by BH Subbaraya; Indian satellite programme for climate studies by V Jayaraman; atmospheric radars by G Viswanathan; ENSO and seasonal prediction by Jerome Vialard and 'palaeoclimate reconstruction' by GB Pant were arranged.

The participants expressed the hope that the course provided them the confidence and excitement to teach introductory atmospheric science course being offered in many institutions.

Applied Stochastic Processes

Indian Statistical Institute, New Delhi

December 5 – 17, 2005

No. of participants: 20

Course Directors: S Ramasubramanian and RL Karandikar

Resource persons: RL Karandikar and Abhay Bhatt (ISI, New Delhi); Siva Athreya and S Ramasubramanian (ISI, Bangalore); Anish Sarkar and Rahul Roy (ISI, New Delhi)

The teacher participants represented institutions from Bangalore, Baroda, Bhimavaram, Burdwan, Chirala,

Cochin, Dehra Dun, Gangtok, Gorakhpur, Kolkata, Narasaropet, Ongole, Pune, Thiruvananthapuram, Vettavalam, Vidisha, Vijayawada.

The aim of the refresher course was to introduce to the participants some aspects of probability theory and stochastic processes applicable in some disciplines without bringing in heavy mathematical machinery. These were illustrated via some simulations. A conscious effort was made to have participants from diverse backgrounds, consequently the mathematical background assumed was minimal. After explaining the basic concepts of probability theory, the lectures quickly went on to cover topics such as Markov chains, Martingales, branching processes and Poisson processes. Monte Carlo methods with reference to Markov chain Monte Carlo were also covered and illustrated.

LECTURE WORKSHOPS

Chemistry for society – Reactions to reality

Sri Sathya Sai Institute of Higher Learning,
Prasanthinilayam

24–26, September 2005

Participants: 108 students and teachers from Sri Sathya Sai Institute

Speakers: V Chandrasekhar (IIT, Kanpur); SS Rajan and P Ramamurthy (Univ. of Madras); S Rengaraj (Hongkong); Surendra Kulkarni (GE Advanced Materials); A Venkateshwarlu (Reddy's Research Foundation); HB Singh (IIT, Mumbai) G Muges and A SriKrishna (IISc, Bangalore); R Venkateswarlu (Andhra University); G Manickam (Biocon, Bangalore); S Sri Hari (Kakatiya University); KV Srinivasan (NCL, Pune); D Basavaiah (Univ. of Hyderabad).

Topics covered included: Stannoxames and phosphonates, crystallography and drug design, scale up of reactions, organochalcogen chemistry, thyroid hormone synthesis, anti-thyroid drugs, development of bioactive lignans, etc

Molecular endocrinology and gamete biology

Daulat Ram College, Delhi

3 – 4 October 2005

Participants: 59 students and teachers from the Daulat Ram and other colleges

Speakers: K Muralidhar, Umesh Rai and Rita Singh (all of Delhi University); Satish Gupta (NII, New Delhi).

Topics of lectures: Mechanism of hormone action, regulation of hormone biosynthesis and secretion, differential gene expression, germ cell apoptosis, hormonal influence on the immune system, molecular mechanisms in reproductive processes, molecular aspects of fertilization, biology of gametes, and gamete antigen based immuno-contraception.

Modern biology: 'Facets and prospects'

M.S. University of Baroda, Vadodara
10 – 11 October 2005

Participants: 220 students and faculty from universities and colleges

Speakers: V Rodrigues (TIFR, Mumbai); RK Rao (Tennessee); Utpal Nath and Annapoorni Rangarajan (IISc, Bangalore); Santha Ramakrishnan (Jubilant Biosystems, Bangalore); BB Chattoo (MS Univ. of Baroda); Sorab Dalal (Tata Memorial Centre, Mumbai); Sunita M DeSouza (Astra Zeneca, Bangalore); Vishwas Sarangadhar (Reliance, Mumbai); Subita Srimal (Mehta Partners, Bangalore).

Topics of lectures: Little fly, genetic control of organ shape in plants, cancer stem cells, peptidoglycan synthesis, pre-clinical and clinical studies, etc

Frontiers in biotechnology

CMS College, Kottayam
14 – 15 October 2005

Participants : 172 students and faculty from CMS and other colleges

Speakers: K Veluthambi and R Usha (MKU, Madurai); Y Annamma Varghese (Rubber Institute, Kottayam); Imran Siddiqi (CCMB, Hyderabad) and Joseph P Varghese (CMS College, Kottayam).

Topics covered: Genetic engineering of rice, genomics and proteomics of plant viruses, molecular markers and plant genetic resources, meiotic chromosome organization in plants, and DNA based molecular markers.

Einstein's legacy

St. Pious College, Hyderabad
28 – 29 October 2005

Participants: 177 students and faculty from universities and colleges

Speakers: N Mukunda (IISc, Bangalore); R Jagannadhan and R Simon (IMSc, Chennai) and V Balakrishnan (IIT, Chennai).

Topics covered: Space, time and matter, Einstein and quantum mechanics, Einstein and brownian motion, and Bose-Einstein condensation.

Experimental physics

Maharani Lakshmi Ammanni College, Bangalore
4 – 5 November 2005

Over the past five years, Academy organized seven Refresher Courses on Experimental Physics at various places in the country which were each attended by 20 to 25 postgraduate teachers. These consisted of lectures and seminars on various aspects of experimental physics and on several electronic kits developed for this purpose. The lectures were followed by the teachers carrying out a number of experiments mainly at the M.Sc level, assembling the kits and using the kits to do experiments. The kits related to: a constant current supply, a temperature controller, a capacitance measurement circuit, a signal generator and audio amplifier, an on-line data collection kit, a furnace and a lock-in-amplifier. The kits, excepting the on-line data collection kit, cost not more than Rs 2500/= each and are sufficient in their technical specifications for student experiments. They are thus cost effective and easily serviceable.

Using these kits a variety of experiments at the M.Sc level were conducted; for example: (a) the constant current source could be used for (i) measuring temperature coefficient of resistance of copper (ii) temperature coefficient of resistivity of a semiconductor and determination of energy band gap (iii) Stefan-Boltzmann constant and emissivity of a surface (iv) measurement of specific heat of copper (v) measurement of the electrical and thermal conductivity of copper to determine its Lorentz number and (vi) thermal diffusivity of brass;

(b) the capacitance measurement circuit could be used for comparison of capacitances, measurement of dielectric constant of a liquid, and measurement of the dipole moment of an organic molecule

(c) the signal generator-cum-audio-amplifier could be used for measurement of self-inductance, study of series and parallel resonant circuits, measurement of relaxation time constant of a serial light bulb, and demonstration of rotating magnetic field. Along with a bridge balance detector the signal generator can be used to study various types of AC bridges;

(d) the lock-in-amplifier could be used for measurement of mutual inductance and measurement of small resistance by AC technique;

(e) the IGCAR kit, namely on-line data collection kit, has been used for acquiring online data on atleast six experiments and for study of a ferroelectric phase transition. Many other experiments were designed and developed based on these kits; additional kits are under development.

Over the two-week period at each Refresher Course, each one of the teachers was provided with four knocked-down kits for assembly, testing and operation. The teachers were guided in gaining hands-on-experience by the

resource persons from Goa University and scientists of IGCAR, Kalpakkam. Starting from rudimentary steps like proper soldering, the teachers were led through the exercise and the programme has worked well to the satisfaction of the participant teachers.

Enthused by the positive response from the nearly 100 participant teachers so far, this two-day demonstration workshop was organized where all the kits and experiments were demonstrated before the nominated teachers with a view to bring these kits and new experiments to the attention of a wider audience.

The morning sessions were devoted to lectures on the details of the kits by KR Priolkar, Efrem D'Sa, Sadique (all from Goa University), J Jay Pandian (IGCAR) and R Srinivasan. Jay Pandian's lecture touched on several aspects of modern experimental support systems that could be configured using currently available PCs and associated software; he dealt at length on embedded systems and virtual experiments. The afternoon sessions were devoted to demonstration of the kits and related physics experiments to groups of teachers. By rotation, all the groups were shown all the kits and experiments. The teachers were provided with a detailed manual on the kits and experiments before the Workshop.

A feed back revealed that the teachers were greatly benefited by the Workshop. Some expressed the view that, although the kits and other aspects covered in the workshop were useful, there may be stumbling blocks in changing existing curricula and introducing such approaches at many colleges and universities due to various reasons. They suggested that the Academy might take up the matter at higher levels in the universities and UGC to make the programme more effective.

Following the workshop, the Academy supported a two-day workshop on New Trends in Teaching Physics, sponsored by the Indian Association for Physics Teachers, and held at the VVS College for Women at Bangalore.

Modern chemistry and biology

Aurora's Degree College, Hyderabad
28 – 29 November 2005

Participants: students from colleges in Hyderabad

Speakers: TP Radhakrishnan, Abhani Bhuyan, MV Rajasekharan and M Periasamy (all of Univ. of Hyderabad); V Nagaraja (IISc, Bangalore); Jagadish Mittur (Monsanto, Bangalore); Nasreen Z Ehtesham (NIN, Hyderabad) and Viji Draviam (Massachusetts).

Topics covered: Nano-materials, perspectives in coordination chemistry, GM feed, agricultural biotechnology, endonuclease and topoisomerase and chromosome segregation.

Fundamental and advanced aspects in spectroscopy

St. Joseph's College, Irinjalakuda
14 – 15 February 2006

Participants: 110 post-graduate students and teachers from universities and colleges in Kerala.

Speakers: E Arunan, BJ Cherayil, PK Das, S Ramakrishnan, KL Sebastian and S Umapathy (all of IISc, Bangalore).

Topics covered: Electronic, vibrational, rotational and NMR spectroscopy.

Frontiers of physics

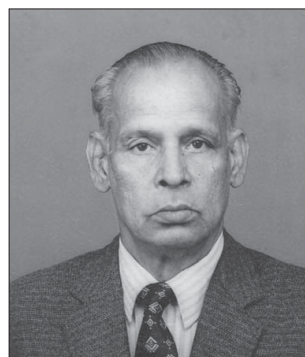
St. Philomena's College, Mysore
17–18 February 2006

Participants: 200 students and teachers from colleges in Mysore.

Speakers: C Sivaram (IIA, Bangalore); GI Menon (IMSc, Chennai); Sreekanth (RRI, Bangalore); V Balakrishnan (IIT, Chennai); P Balaram, AM Umarji and S Ramasesha (IISc, Bangalore).

Topics of lectures: Universe, machines at the molecular scale, quantum computation, non-equilibrium phenomena, experiments at low temperatures, and organic electronic materials.

OBITUARIES



Thamarapu Vedanta Desikachary (elected 1957) an eminent phycologist of India and a legend in algal research passed away on 5 November 2005 at Melbourne, Australia. Desikachary was born in Tirupati into a family of erudite scholars. He was educated at the Hindu High School, Tirupati and at the

Presidency College, Madras. He obtained his BSc. in botany with a first class in 1940 and then joined the University Botany Laboratory at Madras to work under MOP Iyengar, the doyen of algology in India. He obtained his MSc. Degree in 1944 and his Ph.D. in 1951 working on morphology and taxonomy of blue green algae. He served as demonstrator in Andhra University, as assistant professor at Pachaiyappa's College, Madras (1945–1947) and then as junior lecturer, University of Madras (1947–48). Subsequent to his doctorate, he was lecturer at the Saugar University (1951–1957). He rejoined

the University of Madras in 1957 from where he also got a second doctorate (DSc) in 1968. He became a professor at the University in 1964, a post he held till 1975. He played a major role in making Madras one of the centres of Indian phycology and he himself became one of the leaders in phycology in India. He guided the research of over twenty doctoral students, several of whom occupy important positions in India and abroad.

Desikachary published a large number of research papers in diverse groups of algae, and edited many books, co-published volumes on Rhodophyta and Phaeophyta and the monumental "Atlas of Indian diatoms" in five volumes with his colleagues. Desikachary also took up a large amount of unpublished material, left behind by Iyengar and published these as a series, entitled "Contributions to our knowledge of South Indian Algae".

Desikachary keenly nurtured and built the phycological tradition left behind by Iyengar. He established a culture collection of algae at the University of Madras. He was the first Indian algologist to undertake electron microscopic studies of diatom frustules and highlight the implications in taxonomy. He was also the first to initiate use of numerical methods in the taxonomy of blue green algae. His interests in diatoms included study of both living and fossil diatoms. He also made significant contributions (with Sundaralingam) towards elucidation of phylogeny and interrelationships in the Charophytes. His critical studies include the morphology and life histories of red algae (on the Nematiales with Balakrishnan) and on the Coralline red algae (with Ganesan). He established genera for commemorating Iyengar and other illustrious figures in phycology: *Iyengariella* (Cyanophyceae); *Iyengariomonas*; *Pacenfussiomonas*, *Schilleriomonas* and *Mantoniella* (Chlorophyceae, Prasinophyceae) and *Rossiella* (Bacillariophyceae). He strongly put forth Iyengar's hypothesis on the origin and evolution of the filamentous habit and postulated that the development of parenchymatous thalli in many algae is the modification of the palmelloid habit. The observations that in the 'truly' parenchymatous tissues, plasmodesmata between adjacent (and genetically related) cells get dissociated prior to cell division leading to vegetative and sexual reproduction and prior to meiosis, led him (along with BGL Swamy) to postulate that isolation and insulation are key processes in the vital phenomena of sexual reproduction and reduction division in living systems as also the survival of genetically altered cells, such as zygotes meiocytes, in situ mutants, etc. He organized the international symposium on taxonomy and biology of blue green algae in 1970 and taxonomy of algae in 1974 at the University of Madras, thus bringing about an interaction between leading phycologists from abroad with younger Indian phycologists.

Desikachary spent a year at the University of California, Berkeley, in 1953-1954 with GF Papenfuss doing

research on the red algae, followed it up by attending the International Botanical Congress and work at the Cryptogamic Museum, Paris, and two months of research on diatoms at the British Museum of Natural History in London. He also undertook a tour of research and field collection of the marine algae of Indonesia, New Zealand and Australia. He chaired the symposium on the taxonomy of blue green algae at the International Botanical Congress at Edinburgh in 1964.

Desikachary was elected a Fellow of Indian National Science Academy in 1966 and a Foundation Fellow of Phycological Society of India. He was also the Chief Editor of its Journal PHYKOS until 1973. He was also on the editorial boards of several other journals. The University of Madras awarded him the CV Raman Medal in 1959. He was also elected a member of the International Nomenclatural Committee on Algae till 1980. In appreciation of his services to the cause of Indian botany, especially morphology and taxonomy of algae, he was awarded the V.Puri gold medal of the Indian Botanical Society in December 1980. He was associated with the Madras Science Foundation for several years. He was also honoured by the American Phycological Association for his lifetime contribution at the International Phycological Congress, Durban. He leaves behind his wife Chellammal and two sons.



Jaysukhlal Ranchoddas Merchant (elected 1964) was born in Bombay on 14 June 1922. He did his B.Sc (Hons) in 1944 and his M.Sc and Ph.D in organic chemistry in 1946 and 1949 respectively, all from the University of Bombay. At Zurich he completed his D.Sc in organic chemistry working at the Swiss Federal

Institute of Technology with Leopold Ruzicka and V. Prelog, both Nobel Laureates. He joined CSIR as a senior fellow at NCL, Pune in 1953. From 1954 to 1957 he was associate professor of organic chemistry at the Institute of Science in Bombay and then became a full professor at the same institute until 1980. After his formal retirement from Institute of Science, he joined the DG Ruparel College (Mumbai), the SNDT Women's University (Mumbai) and the Royal Institute of Chemistry (London) as visiting professor.

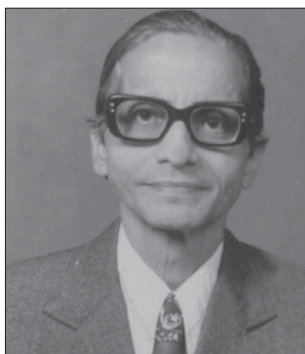
Merchant published over 200 research papers in organic chemistry of natural products as well as synthetic organic chemistry especially heterocyclic components. He worked on Indian medicinal plants; isolation and structure elucidation of alkaloids from *Alangi Lamarki*; isolation of constituents of indigenous plants which were reported as having anti-tumour activity; synthetic work on cyanoethylation of hydroxy and amino compounds;

synthesis of xanthenes acridines; studied action of thionyl and sulphonyl chlorides and flavonones; studied reactions of hexachloropropenes on organic compounds; etc. He made valuable contributions to the chemistry of heterocyclic compounds such as benzopyrones, pyrrolidines and indoles. He contributed to the elucidation of the structures of alkaloids like calycotomine and the Erythrina group of alkaloids. He synthesized several compounds with a possible pharmacological activity and carried out a chemical investigation of different Indian medicinal plants.

He passed away in Mumbai on 8 February 2004 but his death was communicated to the Academy only in December 2005. He remained a bachelor.

Samarendra Nath Sarkar

(elected 1978) was born on 22 April 1920 in Kolkata. After his schooling from Scottish Church School in Kolkata, he joined the Presidency College in Kolkata for his B.Sc (Hons) in 1941 obtaining a first class second rank of the



University. He did even better with a first class first rank in his M.Sc (geology) in 1943. His thesis on Spango granitic complex and its metamorphic aureole in South Scotland fetched him a Ph.D in 1948 from the University of Edinburgh where he was the Government of India overseas fellow. He began his scientific career as a prospecting geologist in 1944 at private companies in Hyderabad for 2 years and then joined the Geological Survey of India in 1949. In 1952 he joined IIT, Kharagpur as a lecturer (1952-56) and became an assistant professor (1956-61). He then moved to the Indian School of Mines in Dhanbad in 1961 as a professor and head of the Department of Applied Geology. He was the Institute's Director from 1969 to 1972 but continued to work at the institute until 1980 and subsequently as a principal scientific officer.

Sarkar investigated the stratigraphy, structure, petromineralogy, and geochronology of the precambrians of (a) Bhandara-Drug-Balaghat Districts of over 6000 sq.km area covering Sausar, Sakoli-dongargarh belts (900 Ma-2500Ma old rock samples); (b) Singhbhum-Keonjhar, Sundergarh region covering 10,000 sq.km (900-3800 Ma old rocks); (c) Crystalline nappe zone in Garhwal and Kumaon Himalayas, Nainital, Ranikhet-Almora-Baijnath-Lansdowne and (d) structural control of copper ore deposits, isotope geology, fluid inclusions, trend surface

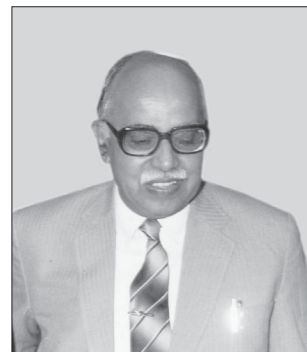
analysis, electron microprobe work, and isotope studies for genesis. As a result of his findings, many text books on stratigraphy had to be revised. His studies on the structures and geochronology of precambrians of Madhya Pradesh and Singhbhum regions as well as parts of the Kumaon Himalaya revealed for the first time the detailed chronology of sedimentary tectonic and igneous events in those difficult regions. His own determination of K-Ar ages of Precambrian rocks along with age data obtained in collaboration with Soviet geochronologists threw much new light on the correlation and geological history of the Indian Precambrian.

Sarkar received numerous honours. These include the Government of India overseas fellowship to work at Edinburgh (1946-48), the Nuffield Foundation Fellowship (1966-67) to work in geochronology in the University of Cambridge, the National Mineral Award of Government of India (1969), the Golden Jubilee Distinguished Service Award of Indian School of Mines (1976) and the PN Dutta Memorial Medal of the Asiatic Society (1981). He was elected to the Indian National Science Academy (1974) and served in its council. He was India's permanent representative in the Subcommission for Precambrian Stratigraphy of IUGS since 1966.

Although Sarkar passed away quite some time ago on 10 September 2004, the Academy was not aware of it. He leaves behind his wife Namita and two sons.

Antapur Venkoba Rao

(elected 1984) was born on 20 August 1927 at Kavutalam in Andhra Pradesh. He did his MBBS from the Madras Medical College in 1949, MD in general medicine from the University of Madras in 1958 and DPM from the University of Mysore in 1961 with a first class first rank.



He obtained his Ph.D in psychiatry from University of Madras in 1969 for his thesis on "a study of depression prevalent in South India". In addition he was also a recipient of a D.Sc degree from University of Madras in 1978 for his study on depression and suicide behaviour. His professional career started in 1954 when he joined as assistant professor first at the Madras Medical College and later at the Madurai Medical College. In 1962 he became a full professor at the Madurai Medical College and headed its Institute of Psychiatry. Between 1985 and 1993, he was the officer-in-charge of the ICMR Centre for Advanced Research on Health and Behaviour.

Venkoba Rao's research interests spanned a wide area in psychiatry such as depressive illness, suicidology,

biological psychiatry, psychophysiology, lithiumology, transcultural psychiatry, history of psychiatry, geropsychiatry and drug addiction. His studies covered epidemiology, clinical profile; the course outcome and cultural influences on depression and its cure with lithium therapy; the nature of suicide behaviour, its causes and especially suicide 'counters'. He pioneered a suicide prevention centre and lithium and geropsychiatric clinics in India. His study in biological psychiatry related to melatonin in depressive disease, the low level of melatonin in depression and its persistence in remission as a predictor of suicide behaviour and relapse. He contributed extensively in the area of transcultural psychiatry and psychiatry of old age. He described psychiatric and organic diseases of the elderly against sociocultural context. He studied the cases of aged people in rural areas at the primary health centre level and evolved a model for a total health care for the rural aged. He has the unique distinction of demonstrating *treponema pallida* in the frontal lobes of these subjects. Venkoba Rao published over 200 research articles and monographs and three books on depressive disease, psychiatry of old age in India and lithium.

He was a recipient of numerous awards some of which are listed below: Sandoz Award (1972), MN Sen Award (1984), MK Sheshadri Award (1986), BV Roy Award (1981), International Research Scholar Award (1989) NN De Award (1992) etc. He was elected to many Academies and Societies including the Indian National Science Academy (1989) and the National Academy of Medical Sciences.

He passed away on 25 October 2005 leaving behind his wife Parvathi Devi, one son and a daughter.



Hermann Bondi (elected 1997), a theoretical astrophysicist best known for having helped to develop the 'steady state' theory of the Universe was born on 1 November 1919, the son of a medical doctor, and was brought up in Vienna where he studied at the Realgymnasium. Having acquired an early interest in mathematics, Bondi entered Cambridge University when his talent was soon recognized and he was awarded an exhibition in his first year. While interned as an 'enemy alien' in 1940, he gained his BA. He returned to Cambridge in 1941, and soon afterwards, met Fred Hoyle, with whom he and Thomas Gold theorized about cosmology, and in particular the origin of the universe. They were not satisfied with the then popular 'big bang' explanation for the origin of the expanding universe, and in 1948 they proposed the alternative 'steady state' theory.

The steady-state theory suggests that the universe is always expanding but maintaining a constant average density, matter being continuously created to form new stars and galaxies at the same rate that old ones become unobservable as a consequence of their increasing distance and velocity of recession. A steady-state universe has no beginning or end in time; and from any point within it, the average density and arrangement of galaxies is the same. Galaxies of all possible ages are intermingled. This hypothesis was first put forward in 1920 by the cosmologist James Jeans.

After the war Bondi – then a fellow of Trinity College, Cambridge, working with Hoyle and Gold – developed the theory further. In 1952 he published a seminal book, *Cosmology*, in which he set out the theory in full. Later, in 1959, with RA Lyttleton, he suggested that the outward movement of galaxies could be due to the action of electrical charges sufficient to cause their repulsion away from one another.

During the 1950s the steady-state theory stimulated a great deal of productive research in cosmology. However, it fell out of favour when it was discovered, from research into radio galaxies and quasars in the far universe, that the universe had been more dense, and hotter, in the past. At the time it was consistent with practically all that was known about the Universe, and during more than a decade of heated controversy, astronomers were unable to decide which of the two theories was the more credible. In 1965, however, Penzias and RW Wilson discovered the universal background radiation predicted by George Gamow which could readily be accounted for as a consequence of the 'big bang'. Since then, almost all the advances in our understanding of the universe have pointed firmly towards a 'big bang', of one kind or another, as its origin.

Coming back to his career, after his education in Vienna, Bondi felt drawn to England and joined Trinity College in 1937 with the help of Arthur Eddington. In 1940, shortly before the 'Battle of Britain' Bondi was interned on the Isle of Man and later in Canada. By 1945, Bondi was back at Trinity on a research scholarship, and scientific papers started flowing. He wrote not only on the steady-state theory, but also on fluid motion and electromagnetism, the sun's corona and geophysics. So wide ranging were Bondi's scientific interests that after he was elected a Fellow of the Royal Society in 1959, he was made to work by the British government on a range of projects about which, he confessed, he knew very little. These included feasibility studies for the Thames Barrier, the Anglo-Australian telescope, rocket launchers, communications satellites, ecology, and energy policy. He continued to publish prolifically on subjects ranging from the origin of the universe to the exponential growth of algae on the Norfolk Broads.

In 1967 Bondi became Director General of the European Space Research Organization, and in 1971, took over as the chief scientific adviser to the Ministry of Defence where he was a staunch supporter of Britain's independent nuclear deterrent. In 1977, he became the Chief Scientific Adviser at the Department of Energy and three years later was made the Chairman and Chief Executive of the Natural Environment Research Council, and a further three years later in 1983 was elected Master of Churchill College in Cambridge.

Bondi held visiting professorships at a number of universities throughout the world and won many international prizes and medals. In 1983 he became only the second British scientist to win the Einstein gold medal.

Bondi was a Raman Visiting Professor of the Academy and was in India between December 1995 and February 1996. During a period of eight weeks, Sir Hermann Bondi and Lady Bondi had a busy schedule visiting and lecturing at various scientific institutions in Bangalore, Chennai, Trivandrum, Cochin, Goa, Pune

and Mumbai. The topics of his lectures ranged from "why is it dark at night?" to the theory of gravitation from "energy in the world" to "positive atheism". He delivered an Academy public lecture on "Science: its philosophy and spirit" and his Gandhi Memorial Lecture was on "Scientific temper".

Bondi also visited Vijaywada to take part in the World Atheist Conference. Before returning to England he donated the entire proceeds of the travel money the Academy paid to him to a Gandhian Service organization in Vijaywada known as "Arthik Samata Mandal" which helps over 150 villages in Andhra Pradesh through integrated socio-economic activities.

A humanist throughout his life, he claimed never to have felt the need for religion. He was president of the British Humanist Association and of the Rationalist Press Association. Bondi was knighted in 1973.

He married Christine Stockman, whom he met when she was working as an astrophysics research student with Fred Hoyle. They had two sons and three daughters. Bondi died in Cambridge on 10 September 2005.

Contributions from Fellows to Patrika are welcome – brief articles of general interest, news, views, interesting anecdotes, etc.



House at Thiruvanaikkaval in Tiruchirappalli where C. V. Raman was born on 7 November 1888.



Pictures taken in front of the house when delegates of the Academy Annual Meeting in Tiruchirappalli visited the house in November 2005. According to recent newspaper reports, this house was “demolished” by the present owner of the house.

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