



Professor M Vijayan, FNA, takes over as President

Dr R A Mashelkar, FNA, handed over the Presidentship to Prof M Vijayan, FNA, Molecular Biophysics, Indian Institute Science, Bangalore at a solemn function organized during the 73rd Anniversary General Meeting of the Academy at National Institute of Oceanography (NIO), Goa on December 23, 2007. Dr Mashelkar profusely thanked the members of the Council for their continued support to him in carrying out the programmes. He emphasized again that INSA must not only make a difference to Indian science and scientists but to the nation as a whole. To this extent, it must be proactive. He illustrated this by saying as to how within a month of Tsunami striking India, INSA got together with the other agencies and organized a national discussion on Tsunami, which was even attended by foreign experts. The recommendations of this meeting (such as installation of Tsunami warning systems) and many subsequent meetings led to a set of concrete recommendations, which have been implemented by the Government. Similarly, the action plan on Higher Education and Research, jointly prepared by all the three Academies have been taken up by the Planning Commission while formulating eleventh Five Year Plan. Many such joint activities by



the three Academies have already been initiated. Many positive changes have been brought in the election process both for Indian and Foreign Fellowship. The nomination process has been made much simpler

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PLATINUM JUBILEE
2009-10



where as the scrutiny is much stricter. The entire issue of INSA awards and the ICSU programme in India were reviewed. The Academy signed a large number of MoUs with other cooperating academies and many leading international personalities visited the Academy. He expressed confidence that this good work will be carried forward with full enthusiasm by Prof Vijayan and the Council.

After taking over the Presidentship Professor M Vijayan presented to Dr Mashelkar an album of photographs containing select moments during his three years of Presidentship. Professor Vijayan profusely thanked Dr Mashelkar for the role he played as President of the Academy. He further expressed hope that Dr Mashelkar will be a constant source of

advice and help for furthering the cause of science and will also be available for guidance as and when he is required by the Academy.

Professor Vijayan mentioned that the Academy will be celebrating Platinum Jubilee year in 2009-10 and emphasized that lots of initiatives are to be immediately taken up. A special meeting of the Council is to be convened primarily to chalk out the programmes to be undertaken during Platinum Jubilee year. He further stressed the need to strengthen national programmes especially Publications, Senior Scientist and Honorary Scientist and the History of Science programmes. There is a need to reorganize the secretariat of the Academy. He added that we have to work hand-in-hand with the Government

Council 2008

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science departments and scientific agencies in furthering our objectives. There is a need to develop ways and means to establish better communication channels so that voice of the Academy is taken seriously by the policy planners and decision makers. The most important strength of the Academy is the intellectual pool of over 750 fellows and around 100 foreign fellows. On one hand, the Academy has to safeguard their interests and on the other hand represent their scientific aspirations at national and international fora. The Academy has been playing an active role in many international bodies such as ICSU, TWAS, IAP, IAC, FASAS etc., there is still scope for improvement in such bilateral/ multilateral relationships. He is sincerely looking forward suggestions and views to achieve these goals and hope that he will have whole hearted support of the Fellowship.

Fellows Elected (2008)

The Annual General Meeting held on 4 October 2007 at INSA premises elected the following twenty one fellows and 5 foreign fellows to the Academy (list of elected Fellows with their brief citation separately enclosed). These fellows were admitted to the fellowship on December 23, 2007 at NIO, Goa.

Tapan Kumar Adhya (Cuttack), Manindra Agrawal (Kanpur), Faizan Ahmad (New Delhi), Soumitro Banerjee (Kharagpur), Vinod Bhakuni (Lucknow), Somendra Mohan Bhattacharjee (Bhubaneswar), Vadapalli Chandrasekhar (Kanpur), Pratim Kumar Chattaraj (Kharagpur), Krishnaswamy

Krishnamoorthy (Thiruvananthapuram), Gattamraju Ravindra Kumar (Mumbai), Narinder Kumar Mehra (New Delhi), Rabindra Nath Mukherjee (Kanpur), Javaregowda Nagaraju (Hyderabad), Ramakrishna Ramaswamy (New Delhi), Brindaban Chandra Ranu (Kolkata), Saurabh Dilsukhray Rindani (Ahmedabad), Manmohan Sarin (Ahmedabad), Chandrima Shaha (New Delhi), Umesh Varshney (Bangalore), Karuppannan Veluthambi (Madurai), Usha Vijayraghavan (Bangalore).

Foreign Fellows (2008)

Philip Warren Anderson, Professor, Department of Physics, Princeton University, Princeton NJ 08544, USA

Professor Anderson is the leading condensed matter physicist of the second half of the twentieth century. His work has started a number of areas e.g. localization of electronic states in disordered systems (Anderson localization); magnetism in insulators (Kramers-Anderson super-exchange) and metals (Anderson impurity and lattice); spin glasses (Edwards Anderson model); superfluidity in He^3 ; broken symmetry and its quantum implications; weak localizations prebiotic evolution; quantum magnetism, resonating valence bond and high temperature superconductivity.

David J Gross, Director and Federick W Gluck Professor of Theoretical Physics, Kalvi Institute for Theoretical Physics, University of California at Santa Barbara, CA 93106-4030, USA

Professor Gross is one of the chief architects of the fundamental theory of the strong force which provides the basis for understanding the properties of strongly interacting particles and all of nuclear physics. He is also one of the discoverers of the “heterotic string theory”, which has the potential to incorporate all observed elementary particles and their interactions in a unified framework.

Robert Harry Purcell, Co-Chief, Laboratory of Infectious Diseases, National Institute for Allergy and Infectious Diseases, National Institute of Health, Bethesda, MD, USA

Dr Purcell’s research on the aetiology of hepatitis has contributed to the discovery of every single hepatitis virus we know today. He has developed animal models to study the basic biology of these viruses



Dr R A Mashelkar & Prof M Vijayan with the newly elected Fellows (2008)



and has developed blood tests for each of these viruses. His work has also contributed to the development of vaccines against hepatitis A, B and E.

Katepalli R Sreenivasan, Abdus Salam Research Professor and Director, International Centre for Theoretical Physics, Strada Costiera, 11, 34014, Trieste, Italy

For his significant contributions to fluid dynamics, condensed matter and statistical physics and allied areas.

SR Srinivasa Varadhan, Professor of Mathematics and Frank J Gould Professor of Science, Courant Institute of Mathematics, New York 10012, USA

Professor Varadhan is an outstanding probabilist and a leading mathematician in the world today. He has provided unusual insights into probability theory and created powerful methods for a number of general problems; in particular for solutions of diffusion equations with non-Lipschitz coefficients and estimates for large deviation probabilities.

Anniversary General Meeting

The Anniversary General Meeting of the Academy was hosted by the National Institute of Oceanography (NIO), Dona Paula, Goa and held during December 21-23, 2007. A seminar on “*Climate Change and its Implications to India*” was organized by Dr S.R. Shetye, Director, NIO, Goa. It included topics such as *The Health of the Ocean in the Anthropocene* (Professor Victor Smetacek, Germany), *Luminescence Dating in Quantitative Reconstruction of Continental Paleoclimates and Earth Surface Processes* (Professor AK Singhvi, FNA, PRL, Ahmedabad), *Effects of Climate Change on the Himalayan Cryosphere* (Dr A.V. Kulkarni, Space Application Centre, Ahmedabad), *Global Warming, Aerosols and Monsoons* (Professor J Srinivasan, FNA, Indian Institute of Science, Bangalore), *Water Policy in India : A Brief Overview* (Professor A Vaidyanathan, Centre for Development Studies, Thiruvananthapuram) and *On Powering India* (Dr V.S. Arunachalam, FNA, Centre for Study of Science, Technology & Policy, Bangalore).

In addition to the seminar, the following Medals/Award lectures were delivered during the Anniversary General Meeting :

Professor K Naha Memorial Medal (2007) Lecture on “*Luminescence Dating in Quantitative Reconstruction of Continental Paleoclimates and Earth Surface Processes*” by Professor AK Singhvi, FNA on December 21, 2007

Professor Brahm Prakash Memorial Medal (2007) Lecture on “*Powering India*” by Dr VS Arunachalam, FNA on December 21, 2007

The Satyendranath Bose Medal (2007) Lecture on “*Basic Constituents of Matter-Visible and Invisible*” by Professor DP Roy, FNA, on December 22, 2007

The Golden Jubilee Commemoration Medal for Chemical Sciences (2007) Lecture on “*Synthetic Studies on Glycosidase Inhibitors*” by Professor S Chandrasekaran, FNA on December 22, 2007

The INSA Prize for Materials Science (2007) Lecture on “*The Structure-Property-Performance Correlation in Detonation Sprayed WC-Co Coatings*” by Professor G Sundararajan, FNA on December 22, 2007

The Golden Jubilee Commemoration Medal for Biological Sciences (2007) Lecture on “*Research towards Development of Products of Relevance to the Country : from Lab to Land*” by Professor GP Talwar, FNA on December 22, 2007

CV Raman Medal (2007) Lecture on “*Biofortification of Crops for reducing malnutrition*” by Prof GS Khush, FNA on December 22, 2007

Jawaharlal Nehru Birth Centenary Lecture (2007) on “*Constancy and Change in Brain Circuits*” by Professor K Vijayraghavan, FNA on December 23, 2007

SS Bhatnagar Medal (2007) Lecture on “*Global and Indian Scenario of H5N1 Status, Issues and Challenges*” by Professor NK Ganguly, FNA on December 23, 2007

The Anniversary address was delivered by Dr R A Mashelkar, President, INSA on “*Transport in Macromolecular Systems: Some New Insights*” during the Anniversary General Meeting.

INSA Medals/Awards Announced for Year 2008

- Jawaharlal Nehru Birth Centenary Lectures to Professor Biman Bagchi, FNA and Professor A Surolia, FNA

- The Indira Gandhi Prize for Popularization of Science to Shri Arvind Gupta, IUCCA, Pune.
- The INSA Medal for promotion and Service to Science to Professor M M Sharma, FNA
- The Daulat Singh Kothari Memorial Lecture to Professor Yash Pal, FNA

INSA Senior Scientists (2008)

Following Fellows of the Academy were offered the Senior Scientist positions.

Ajit Iqbal Singh, Aloke Dey, Anil Kumar, K Nag, Amarnath Maitra, GS Lakhina, Indra Bir Singh, RN Singh, Alok K Gupta, S Bhattacharya, Kasturi Datta, Sita Ram Singh, Pawan Kumar Singh.

INSA Honorary Scientists (2007)

Following Fellows of the Academy were offered the Honorary Scientist positions.

DK Chatteraj, SK Jain, RP Rastogi, Archana Sharma, R Raghavarao, DVS Jain, SV Kessar, SS Bir, RP Gandhi, Rajendra Prasad, P Mohanty, HS Randhawa, BN Das, SP Moulik, IB Chatterjee, Mahdi Hasan, KP Sinha, ES Rajagopal, HY Mohan Ram, AS Gupta, S Sriramachari, SC Maheshwari, Prem Narain, YP Abrol, KN Agarwal, Narendra Bhandari, RN Saxena, RS Sharma, D Chakravorty, PS Ramakrishnan, T Ramasarma, P Krishna, SM Chitre, PK Gupta, PL Sachdev, J Nanda, RG Rastogi.

INSA Medal for Young Scientists (2007)

The Academy selected the following 25 scientists below the age of 35 years for INSA Medal for Young Scientists (2007) namely, Avinash Kumar Agarwal (Kanpur), Santanu Banerjee (Philadelphia, USA), Naveen Chandra Bisht (New Delhi), L Sunil Chandran (Bangalore), Sangeeta Dhawan (California at Los Angeles), Subhash Ghosh (Hyderabad), Amita Gupta (New Delhi), Mukesh Jain (New Delhi), Tushar Jana (Hyderabad), Pawan Laxminarayan Kulwal (Akola), Anish Kumar (Kalpakkam), Ramaswamy Manimekalai (Tsukuba Ibaraki, Japan), Mohan Mondal (Nagaland), Sunil Nair (Dresden), Priya Panjabi (New Delhi), Subramaniam Anantha Ramakrishna (Kanpur), Anand Ranganathan (New Delhi), Majeti Naga Venkata Ravi Kumar (SAS



Dr R A Mashelkar & Prof M Vijayan with Young Scientist Awardees (2007)

Nagar, Punjab), Arvinder Singh Sandhu (Boulder), PS Satheshkumar (Bethesda), Dhruv Kam Sethi (Boston), Navdeep Singh Sodhi (Amritsar), Vishwanath Sriram (Bangalore), Parinda Vasa (Ilmenau, Germany), TNC Vidya (Stellenbosch, South Africa). In addition, Anil Kumar Bose memorial medal (2007) to Suman Chakraborty (Kharagpur). These young scientists were presented the award by President, INSA Dr RA Mashelkar during the Anniversary General meeting on December 23, 2007 (list of Young scientist awardees with their brief citation separately enclosed).

Mementoes to Retiring Council Members

The President, Dr R.A. Mashelkar, presented mementoes to : Professor Anupam Varma, Vice President (Resource Management), M Vijayan, Vice President (Fellowship Affairs) and Members Professors Ashima Anand, Srikumar Banerjee, Alok Bhattacharya, M Lakshmanan, T Padmanabhan, SR Shetye, HK Gupta and VP Kamboj.

Award lectures were delivered during October-December, 2007

1. Professor KS Bilgrami Memorial Medal (2007) lecture was delivered by Professor SK Apte, FNA at Indian Institute of Science, Bangalore on October 28, 2007
2. The Chandrakala Hora Medal (2007) lecture entitled "*Molecular Regulation of Oocyte Maturation in an Indian Percgh Anabas Testudineus*" was



delivered by Professor Samir Bhattacharya, FNA at National Institute of Ocean Technology, Chennai on November 12, 2007.

3. Dr TS Tirumurti Memorial (2007) lecture was delivered by Professor UC Chaturvedi, FNA at Indian Institute of Science, Bangalore on November 23, 2007.
4. Professor V V Narlikar Memorial Lecture (2006) lecture was delivered by Professor M Lakshmanan, FNA at Indian Institute of Science, Bangalore on December 19, 2007.

Excerpts of the lectures delivered during Anniversary Meeting at National Institute of Oceanography, Goa

Professor Brahm Prakash Memorial Medal (2007)

Dr VS Arunachalam, FNA, Center for Study of Science, Technology and Policy (CSTEP), Bangalore. delivered the Medal Lecture entitled “*Powering India*”. The excerpts of the lecture are as follows:

The growth and prosperity of human society depends on energy. Its availability, accessibility and affordability determines the level and sophistication of human development and economic prosperity. Among various forms of energy, electric power continues to be the preferred one. It is versatile, easily transportable and can be generated from different energy sources. India’s electricity generation and consumption continues to be modest. The installed capacity amounts to 135 giga-watts and annual per capita consumption is modest 1000 kilo-watt hours (kWh). Compared with United States consumption of 14,000 kWh and China’s 1600 kWh. For India to improve its per capita consumption to at least 1000 kWh, it must increase its generation capacity by 1200 MW per month, for every month for the coming ten years.

What then should be its options?. Add to this, the increasing concerns about green house gas emission that threaten the very life on our planet, and energy security. But powering India is a must to meet the growing aspirations of its people. The presentation also discussed various challenges and opportunities in the world of energy that are sustainable and environmentally acceptable.

The Golden Jubilee Commemoration Medal for Chemical Sciences (2007)

Professor S Chandrasekaran, FNA, Department of Organic Chemistry, Indian Institute of Science, Bangalore delivered the lecture entitled “*Synthetic Studies on Glycosidase Inhibitors*”. The excerpts of the Lecture are given as under:

α -Mannosidases are key enzymes that process carbohydrates which are crucial for many biological processes in health and disease and hence are important drug targets. Compounds that selectively inhibit these glycosidases have tremendous potential in the treatment of infectious diseases, cancer, AIDS and diabetes. Synthesis of glycomimics with enhanced potency towards the inhibition of α - Mannosidase is an important issue because of the significance of such inhibition to both viral expression and tumor growth. Although there are many inhibitors reported (mainly aza sugars) showing potency towards mannosidases, they are synthetically challenging and conformationally unstable.

In this lecture the synthesis of novel thiosugar (thiolevomannosan) derivatives that have unique, conformationally locked structures which exhibit higher inhibition of α -1, 2 mannosidase compared to the well known inhibitors of the enzyme were presented.

The advantage of thiolevomannosan over other inhibitors is the locked 1C_4 conformation, which is required of the inhibitor and it obviates the need for the calcium ion binding in the active site of the enzyme. Results of docking studies and biochemical studies were discussed.

The Satyendranath Bose Medal (2007)

Professor DP Roy, FNA, Homi Bhabha Centre for Science Education, TIFR, Mumbai, delivered the Satyendranath Bose Medal Lecture entitled “*Basic Constituents of Matter - Visible and Invisible*”. The excerpts of the lecture are given as follows:

Our understanding of the basic constituents of matter has progressed from protons and neutrons to the underlying quarks and leptons, which have all been seen by now. But the story is not complete yet. A consistent theory of their mass implies the existence of Higgs bosons and Supersymmetric particles, which

are yet to be seen. The discovery of these particles will shed light on the nature of phase transition the Universe went through after a few picoseconds of its creation, and the nature of invisible matter that permeates throughout the Universe today as relic of that early history.

INSA Prize for Materials Science (2007)

Professor G Sundararajan, FNA International Advanced Research Centre for Powder Metallurgy and New Materials, Hyderabad delivered lecture entitled “*The Structure-Property-Performance Correlation in Detonation Sprayed WC-Co Coatings*” The excerpts of the lecture are given as under:

Detonation Spray Coating (DSC) technique, belonging to the family of thermal spray coatings, is capable of depositing thick and dense coatings of metallic, cermet and selected ceramic material. Prof Sundararajan went on with a brief description of the DSC process, applications developed, upscaling of the technology and subsequent transfer of the technology to Indian industries. However, bulk of the presentation concentrated on WC-Co coatings obtained by DSC and in particular, examine the influence of coating process parameters and feedstock characteristics on the microstructure, properties and performance of the coating. The presentation concluded with future directions in respect of detonation spray coatings and DSC technology.

The Golden Jubilee Commemoration Medal for Biological Sciences (2007)

Professor GP Talwar FNA, Talwar Research Foundation, New Delhi delivered lecture entitled “*Research towards Development of Products of Relevance to the Country: From Lab to Land*”. The excerpts of the lecture is given as under:

In early 1970's, India had the world's largest number of lepers. The causative organism, *M. leprae* was identified by A. Hansen in 1874, but till date is not cultivable in any medium. Neither was it known why only few of those exposed to *M.leprae* contracted leprosy and why only a percentage of them develop the worst form of multibacillary disseminated disease, the *lepromatous leprosy (LL)*. These patients offer a fertile “soil” for multiplication of *M.leprae* and for its transmission to others in the community.

Our initial studies showed that the immune deficit in LL patients was the inability of their T cells to react to key *M.leprae* antigens and generate appropriate cytokines to activate macrophages to kill the bacilli. The defect was innate, a “hole” in the repertoire over and above the suppression acquired from a load of *M.leprae*. Homologous vaccination was unlikely to boost immunity as LL was not an auto-regressive disease. We searched for a *heterologous mycobacteria*, cross-reactive with *M.leprae* and competent to generate signals from T cells of LL patients for killing of *M.leprae* by the phagocytic cells.

Five short-listed mycobacteria from the above studies were taken through animal models and delayed hypersensitivity skin test in both Tuberculoid and Lepromatous leprosy patients to zero-in to an atypical non-pathogenic Mycobacteria coded as *w*. After preclinical toxicology and approval of the Drugs Controller General of India and Ethics Committees, Phase II /III efficacy trials were conducted in LL patients. The vaccine given every 3 months as adjunct to standard multidrug regime caused a faster clearance of bacilli shortening significantly the recovery time. The vaccine cleared also granulomas and disfiguring lesions. It was effective in ‘slow’ or drugs-non-responsive patients. Field studies in Kanpur Dehat confirmed the immunotherapeutic potential of the vaccine in addition to prophylaxis in household contacts.

The vaccine received the New Drugs Authorization from the Drugs Controller General of India and of USFDA, the only one of its type in the world. It is manufactured and marketed by Cadilla Pharma.

Besides leprosy, it is effective in category II tuberculosis. It is also under clinical trials in Crohns disease and some cancers.

A National consortium of three laboratories has sequenced its genome by which it is considered as the saprophytic ancestor of *M.leprae*, *M.tuberculosis* & *M.paratuberculosis*. It has been assigned a new name, *Mycobacterium indicus pranii*.

Professor Talwar also described briefly the development of a Polyherbal vaginal tablet which is effective in curing up to 95% of women suffering from



reproductive tract infections due to a variety of aerobic, anaerobic micro-organisms. Three hundred million women suffer from vaginosis /vaginitis every year. Praneem inhibits also the transmission *in-vivo* of *Herpes simplex -2* and *Chlamydia trachomatis* and has potent inhibitory effect on HIV and N.gonorrhoea *in vitro*. An ongoing clinical trial at the Institute of Cytology & Preventive Oncology indicates the highly interesting therapeutic action of Praneem in elimination of *HPV-16/18* in women with early cervical dysplasia and reversion to normal cervical cytology. Six million women get infected with HPV 16/18 every year, leading to carcinoma of cervix, the major cancer of women in India. Praneem is licensed to Panacea Biotech.

CV Raman Medal (2007)

Professor Gurdev S. Khush, FNA, University of California Davis, California USA delivered lecture entitled “*Biofortification of Crops for Reducing Malnutrition*”. The excerpts of the lecture given as under:

Access to healthy diet is a fundamental right of every human being on this planet. Yet 800 million people, mostly in developing countries go to bed hungry everyday. Micronutrient deficiencies affect three billion people. Malnutrition hinders the development of human potential and the nation’s social and economic development. Deficiencies of iron (Fe), zinc (Zn) and vitamin A are most acute. Rice which feeds half the world population is low in Fe and Zn and is completely devoid of vitamin A. Progress is being made in increasing the level of Fe and Zn in rice through conventional breeding methods. Introduction of three transgenes into rice resulted in establishment of biosynthetic pathway leading to production of beta-carotene in rice endosperm. Beta-carotene is converted into vitamin A in human digestive system. It is hoped rice varieties with improved micronutrient content will become available for commercial production in 4-5 years. Rice with dense micronutrients will benefit the poor rice consumers. Similar efforts are underway to enhance the micronutrient content of other staple crops through the Harvest Plus Program of Consultative Group on International Agricultural Research (CGIAR). For optimum results linkage between agriculture and nutrition programs is essential.

Jawaharlal Nehru Birth Centenary Lecture (2007)

Professor K. Vijayraghavan, FNA National Centre for Biological Sciences, TIFR, Bangalore delivered the lecture entitled “*Constancy and Change in Brain Circuits*” during the Anniversary meeting. The excerpts of the lecture are given as under:

The brain is a complex network of many millions of nerve cells. The ‘wiring’ that underlies brain function is built during development of the embryo. Although—because of its striking ramifications—the assembly of this ‘wiring’ appears impossible to understand, in fact many aspects have been deciphered remarkably clearly using a range of molecular and genetic approaches. Once assembled, this wiring has two apparently contradictory tasks: It needs to remain constant during life if it is to perform its function, yet it needs to change and adapt if it is to function when confronted with stress, damage or the need to learn and remember. How do nerve cells manage this? Using examples from the olfactory circuit of the fruitfly, Prof Vijayraghavan illustrated genetics can be used to decipher the mechanisms that underlie constancy and change.

SS Bhatnagar Medal (2007)

The lecture was delivered by Professor N. K. Ganguly, FNA, former Director General, ICMR New Delhi entitled “*Global and Indian Scenario of H5N1: Status, Issues and Challenges*”. Excerpts of the lecture are given as under:

Influenza A viruses undergo major antigenic shift at unpredictable intervals causing worldwide epidemics/pandemics with high morbidity and mortality. The present outbreak of H5N1 Avian Influenza in the South – East Asian countries merits attention because of increasing evidence to suggest that the avian strains are getting more virulent, capable of causing severe disease. As of now, it has already caused illness in 336 humans with 207 deaths (as on December 4, 2007), the virus being entrenched in many parts of Indonesia and Vietnam and some parts of Cambodia, China, Thailand, and possibly also the Laos People of Democratic Republic. H5 viruses are understood to be introduced to poultry flocks in their low pathogenic form and when allowed to circulate in poultry populations, can mutate, usually within a few

months into a highly pathogenic form, a change marking the start of a pandemic. Today, the concerns of H5N1 are high as studies demonstrate continued evolution. Considerable circumstantial evidences suggest that migratory birds can introduce low pathogenic H5 viruses to poultry flocks, which then mutate to the highly pathogenic form.

India saw two outbreaks of highly pathogenic avian influenza A (H5N1) virus in poultry in Nandurbar and Jalgaon districts of Maharashtra and adjoining areas of Uchhal in Gujarat and Burhanpur in Madhya Pradesh from January to April, 2006, and subsequently during July, 2007 in Manipur. The full genome of two previously uncharacterized strains of H5N1 viruses isolated at the National Institute of Virology (NIV), Pune, from post-mortem tissues of chicken collected from Navapur, Nandurbar district during the outbreak, has been presented. All the genes belong to clade 2.2 of the Z genotype and are close to the 2006 isolates from Iran, Afghanistan, Mongolia, Italy and Krasnodar. The Navapur isolates are closer to the isolate reported from Jalgaon than that from Navapur which does not support the earlier hypothesis of Pradhan et al. according to which the viruses in Jalgaon and Navapur caused outbreaks 12 days apart and were introduced at different times from different sources, based on the partial gene sequences of HA. Molecular markers suggest that the isolates are sensitive to both drugs Oseltamivir and Amantadine. Mapping of amino acid residues responsible for pathogenesis, glycosylation and receptor binding have been studied. The relationship between the Indian viruses and those in the East Africa/ West-Asia flyway of migratory birds and the position of Nandurbar in this route suggests that the viruses in India may have been introduced through migratory birds. The sequence of Manipur strain is a distinct offshoot of clade 2.2.

World Health Assembly in May 2006 called for immediate, voluntary implementation of the provisions of the revised International Health Regulations (IHR 2005), relevant to a possible pandemic influenza, including rapid and transparent notification of outbreaks and the sharing of epidemiological data and samples. Implementation of the IHR will require that countries have the capacity to reliably detect, confirm and contain influenza-like illness that might herald the start of a human pandemic. Integrated and coordinated animal

and public health multi-sectoral strategies are essential at local, national, regional and global levels. Ensuring and intensive sustained response as well as maintaining strong, continued political and financial commitments, apart from improvements in governance and legislation and strengthened public-private partnership are some of the short and medium term actions and challenges before us for control and mitigation of H5N1.

Hindi Fortnight

Hindi fortnight was observed in the Academy during September 14-27, 2007 to promote use of official language. During the fortnight, various programmes such as Hindi Sulekh Competition, Hindi documentary film, Hindi Essay Competition, Hindi Quiz Competition, Hindi Dictation Competition, Hindi Poem Competition and Hindi Typing Competition were arranged. Staff members with great enthusiasm participated in these programmes. Shri A K Tagore, Deputy Executive Secretary gave an update of the official language position in the Academy. A lecture on “*The Journey of Materials*” by Dr Anil K Gupta, NFAE, Scientist “G” Head, Division of Engineering Materials and Metals and Alloys Group, National Physical Laboratory, New Delhi was organised on September 14, 2007. An exhibition of Hindi books was also arranged which was opened by Dr Anil K Gupta following the lecture. Prizes were distributed to the winners of various competitions on September 27, 2007. During the concluding function a special appeal was made to the staff members to maximize the secretarial work in the official language.





International Activities

INSA-DFG Joint Seminar on 'Immunology in Health and Disease' Held at Max Planck Institute for Infection Biology, Berlin, Germany during July 2 – 3, 2007

The Indo-German Workshop on 'Immunology in Health and Disease' was held at Max Planck Institute for Infection Biology (MPIIB) and Deutsches Rheumaforschungszentrum (DRFZ) Berlin, Germany during July 2-3, 2007. The meeting was co-ordinated by Prof. Stefan H. E. Kaufmann, Director Max-Planck Institute, Germany and Dr. Shubhada Chiplunkar, Head, Immunology ACTREC, Mumbai. The focus of the meeting was on areas related to basic immunology, immunology of infectious diseases, transplantation, immunology, immunodeficiencies, vaccine design, dendritic cell based vaccines, innate immunity, host-virus interaction and tumor immunology. There were seven presentations by the Indian scientists and 16 from German scientists. The presentations were on Basic Immunology which addressed areas of T cell dysfunctions and T cell signaling. The major focus was on immunology of tuberculosis which addressed issues of survival of *M.tuberculosis* within macrophages and defective dendritic cell functions. The tumor and transplantation immunology addressed areas of crosstalk between regulatory T cells and NKT cells in cancer patients, providing a novel strategy for immunotherapy. Presentation on infectious disease were in areas of Leishmaniasis, Filariasis and Tuberculosis where unique antigens on the pathogens,

role of TOLL-Like receptors and viruses in immunosuppressed patients were discussed. New technologies related to gene expression profiling and proteomics were discussed in detail. The workshop provided a forum to project and understand the expertise in Immunology available with both the countries. The workshop has certainly provided a good platform to develop future collaborative projects, and promote exchange of technology and young talent from both the countries.

2nd Indo-Russian Symposium on Organic Chemistry held at the Zelinsky Institute of Organic Chemistry, Moscow during September 25-26, 2007

The first Indo-Russian Symposium on Organic Chemistry was held in Indian Institute of Science, Bangalore during November 7-8, 2005 and the second Bilateral Symposium in the series was held at the Zelinsky Institute of Organic Chemistry, Moscow at the invitation of the Russian Academy of Sciences during September 25-26, 2007 as a satellite symposium of 100th Anniversary of Mendeleev Congress.

The Indian delegation led by Professor S. Chandrasekaran, Indian Institute of Science, Bangalore consisted of the following members: Professors G Mehta and U Maitra, IISc, Bangalore, Dr. J.S.Yadav, IICT, Hyderabad, Dr.G.Pandey, NCL,Pune, Prof.V.K.Singh and Prof.Y.D.Vankar IIT, Kanpur, Prof.A.Basak, IIT, Kharagpur, and Prof.V.S.Parmar, Delhi University. The Russian side was led by Prof.O.M.Nefedov and a number of leading organic chemists drawn from different academic institutions in Russia participated in the symposium. The symposium was organized and coordinated by Prof. N. Nifantiev and it was attended by over 100 Russian organic chemists.

The Indian delegation attended the inauguration and lectures of the Mendeleev Congress on September 24. Prof.G. Mehta who was elected as a Member of the Russian Academy of Sciences last year was felicitated and the membership diploma was presented to him during the Congress.

The lectures delivered in the symposium encompassed many facets of organic chemistry



Delegates of DFG Seminar at Max Planck Institute, Berlin



Delegates of organic chemistry symposium

including organometallic chemistry, new synthetic methodologies, carbohydrate chemistry, organofluorine chemistry, biologically active natural products, new chemical technologies and materials.

A round table discussion of all the invited speakers (from India and Russia) was held to identify a few important areas where there is commonality of interest for collaboration and cooperation in the future.

As one of priority fields of science and technology collaboration in the field of organic chemistry, the following research areas were identified: 1) Novel methodologies of organic synthesis, 2) Catalysis in organic chemistry, 3) Functional materials (sensors, devices etc.), 4) Chemistry of natural compounds and bioactive molecules, 5) Green chemistry and 6) Chemistry of organofluorine compounds.

Taiwanese delegation visit INSA

A five member Taiwanese delegation led by Dr. Wen-Hsiung Huang, Deputy Minister, National Research Council, Taiwan visited INSA on October 22, 2007 and had meeting with Prof. T.P. Singh, Vice-President, INSA on the existing bilateral cooperation.

INSA delegation visit Taiwan

A three member INSA delegation led by Professor M Vijayan, President (Elect), Professor T P Singh, Vice-President, (International Affairs) and Dr Krishan Lal, President, CODATA attended the Asian Crystallography Association meeting at Taipei from November 4-7, 2007 and extended their visit for a day



Taiwanese delegates with Prof T P Singh and Prof N K Gupta

on 8th November 2007 and had discussions with Professor Chi-Huey Wong, President Academia Sinica and Professor Yuan T Lee, Nobel Laureate and President Emeritus, Academia Sinica on the scientific cooperation between INSA and the Academia Sinica, Taipei.

Both, Professors Vijayan and Wong agreed to organize three meetings in India on the topics given below:

Crystal Growth and Characterization (to be coordinated by Dr Krishan Lal, FNA)

Supermolecular Chemistry (to be coordinated by Dr G R Desiraju, FNA)

Structural Biology and Drug Development (to be coordinated by Prof T P Singh, FNA)



Professor M Vijayan with Dr Wen-Hsiung Huang, Deputy Minister of National Research Council, Taiwan



The delegation also visited the National Science Council (a major funding organization in Taiwan) and had very fruitful discussion with Minister and Dy. Minister of the Foundation.

12th Jawaharlal Nehru Birth Centenary Lecture

Sir David King, FRS, Chief Scientific Adviser & Head of the Government Office for Science, UK delivered the 12th Jawaharlal Nehru Birth Centenary Medal Lecture for the year 2007 on *'The Challenge of Sustainability: the aim for the 21st Century'* at INSA on November 20, 2007. Sir David King in his lecture outlined the challenges faced by the human being imposed by the sustainable use of natural resources, reversing environmental degradation, defeating infectious diseases and tackling climate change. Sir David mentioned: "Population growth is the biggest driver behind these challenges. Today there are around six billion people on the planet and by 2050 the population is expected to reach a peak of nine billion. With this pressure on our diminishing natural resources comes, perhaps, the biggest challenge we face globally: climate change". After the lecture, the President INSA Dr RA Mashelkar presented the plaque to Sir David.



Dr David King receiving Jawahar Lal Nehru Centenary Plaque from Dr RA Mashelkar

Science & Technology Agreement renewed between INSA and the Chinese Academy of Sciences

The Agreement with the Chinese Academy of Sciences, Beijing was reviewed and revised agreement

was signed on December 20, 2007 at INSA during the visit of 15 member Chinese delegation led by their Vice- President, Prof Jinghai Li. The delegation participated in INSA-CAS Workshop on "Structural Biology" from December 21-24, 2007 at Indian Institute of Science, Bangalore. Both the sides decided to have next INSA-CAS Workshop on "Information and Communication Technology" in China during 2008. The revised Agreement will further promote scientific cooperation between the two Academies by supporting the bilateral seminar/symposia and workshops in the identified frontier areas alternately in India and China in addition to the exchange of Scientific Publications and visit of senior and junior level scientists.



Prof TP Singh and Prof J Li signing INSA-CAS agreement of Scientific Cooperation

2nd Etienne Wolf-Ramanujan Lecture in France delivered by Dr. R.A. Mashelkar

Dr R A Mashelkar, President INSA delivered the 2nd Etienne Wolf-Ramanujan Lecture in the French Academy of Science and signed the revised agreement with the French Academy of Sciences on November 27, 2007. The first Lecture was delivered by Prof. Jules Hoffman, Vice-President, French Academy of Sciences on January 25, 2006 at INSA.

INSA signed MoU with the Royal Society of Edinburgh

Dr RA Mashelkar, President INSA and Sir Michael Atiyah, President Royal Society of Edinburgh signed a MoU between INSA and the Royal Society of Edinburgh (RSE) for scientific and academic exchanges



Dr RA Mashelkar and Sir Michael Atiyah exchanging the agreement of scientific cooperation

at the Head Quarters of the RSE on December 10, 2007. Both the Presidents were happy to express that this MoU would soon gather momentum to strengthen and intensify the scientific and academic exchanges between India and Scotland.

Cooperation with the German Academy of Sciences, Leopoldina

The Academy hosted the Indo-German Joint Symposium on ‘Antimicrobial Drug Resistance and the Development of New Antibiotics’ held at INSA during November 21-25, 2007. The Symposium was organized by Prof SE Hasnain, Vice-Chancellor, University of Hyderabad and was co-sponsored by the German Academy of Sciences Leopoldina. Eighteen



Prof M Vijayan and Prof VT Meulen exchanging the agreement of scientific cooperation

German scientists in addition to a large number of Indian scientists participated in this event. During the Symposium, a MoU between INSA and German Academy of Sciences Leopoldina was signed on November 22, 2007 at INSA to promote cooperation in all fields of Science & Technology between Indian and German scientists. Professor M. Vijayan, President (elect), INSA and Dr. Volker Ter Meulen, President, German Academy of Sciences Leopoldina signed the MoU.

Sustainable Energy “Road Map” – Inter Academy Council Report

Many of the world’s leading scientists, including those from major emerging economics, have set out a road map for a future of sustainable energy for all, highlighting energy requirements. This includes providing energy to the two billion people who are currently without it, and responding to growing environmental and energy security risks.

“*Lighting the way: toward a sustainable energy future*”, published by the Inter Academy Council (IAC) calls for greater energy efficiency, the development of renewable energy technologies and carbon capture and storage and a price to be put on carbon emissions by all governments. The report also highlights the need for at least a doubling of private and public sector investment in energy research and development.

“We face massive challenges on energy and it is now time to start addressing them”, Martin Rees, the President of the Royal Society said. He further added “Some countries, including the UK, are making a little progress in areas such as investment in new technologies, but a sustainable energy future is not a problem that will be solved by individual countries. The stakes are high-the world spends trillions of dollars each year on energy. It is time more of that was invested in developing a sustainable future”.

The main actions recommended in the report cover energy demand and supply solutions, and include:

- the transfer of appropriate technologies to the developing world to ensure that energy is delivered to those living without it;
- energy-efficiency standards to be applied to all new appliances and equipment and regularly updated;



- all governments to introduce a clear carbon price signal for reducing carbon emissions, promote investments in improved energy efficiency, and reduce or eliminate distorting subsidies (especially for fossil fuel consumption);
- technology improvements and infrastructure investments to tap the full potential of renewable energy resources;
- government should facilitate the development of carbon capture and storage technologies by making funds available.
- carbon capture and storage should be installed in all new energy plants; and
- unlinking of profits from energy sales to encourage energy efficiency.

Lord Rees continued “Science and industry can help provide solutions, but it has to be within a framework put in place by governments, and it has to be supported by changes in the behaviour of individuals. There is unlikely to be a ‘silver bullet’ solution. A sustainable energy future will require the investment of time and resources, an ability to learn from past mistakes and a willingness to cooperate internationally”.

Local Chapters Activities

Allahabad Local Chapter (Convener: Professor Amitava Raychaudhuri, FNA, Director, Harish-Chandra Research Institute, Allahabad)

Guru Prasad Chatterjee Memorial Lecture Award (2006)

Professor Manohar Lal Munjal, FNA, Mechanical Engineering Department, Indian Institute of Science, Bangalore, delivered the Guru Prasad Chatterjee Memorial lecture entitled “*Towards Quieter Technologies*” on September 19, 2007 at Motilal Nehru National Institute of Technology (MNNIT), Allahabad.

The Award Function was chaired by Professor A.B. Samaddar, Director, MNNIT and was attended by Fellows of INSA based in Allahabad as well as a large number of faculty and students of MNNIT. At the beginning of the programme, Professor Samaddar welcomed Professor Munjal and also outlined the plan



Prof ML Munjal delivering the GP Chatterjee Memorial Lecture

to hold a series of lectures at the interface of science and engineering in collaboration with the Allahabad Chapter of the Indian National Science Academy. On behalf of the Academy, Professor Amitava Raychaudhuri, Convener, Allahabad Chapter, expressed his support for the lecture series at MNNIT. He also spoke about the background of the Guru Prasad Chatterjee Memorial Lecture Award of INSA, listed the previous awardees, and read out the Award Citation of Professor Munjal. Professor Munjal then delivered the Award lecture which starting from the very basics of human auditory response, gradually moved into different methods of reducing noise and their industrial applications.

Lucknow Local Chapter (Convener: Professor Rakesh Tuli, FNA, Director, National Botanical Research Institute, Lucknow)

The following initiatives were taken by the INSA Local Chapter, Lucknow under Science Education Programme during the year 2007 at the National Botanical Research Institute (NBRI), Lucknow. The programmes were attended by local school/college and University students, teachers, scientists and several INSA Fellows.

1. Inspiring Youth for Developing Leadership in Plant Sciences

INSA Lucknow Local Chapter and NBRI organized a lecture programme during May 10-11, 2007 at NBRI, Lucknow. Meritorious students



INSA Lucknow local chapter meeting

from local schools were invited along with their parents. Prof H Y Mohan Ram, FNA delivered the inaugural address on “*Plant Life: Wonders and Challenges*” on May 10, 2007. Twelve INSA Fellows, 15 toppers of higher secondary boards and 20 toppers of local schools attended the function.

2. Seminar on “Revisiting Linnaean Thoughts for Plant Diversity and Phylogenetic Analysis”

This event was jointly organised at NBRI under the aegis of Science Education Programme, INSA Local Chapter, Lucknow during May 23-24, 2007. Prof V L Chopra, FNA inaugurated the function and Prof S S Bir delivered the Key Note address on “*The species concept: Paradox of the present day plant taxonomy, nomenclature and phylogeny*”. Eminent scientists and INSA local Fellows attended the seminar. Some of them gave detailed lectures on taxonomy and phylogeny in plant diversity. Academicians from Lucknow University, teachers from local degree colleges alongwith students and scientists from NBRI attended the deliberations.

3. Environmental Awareness Programme on Climate Change

The programme was held on July 19, 2007 at NBRI, Lucknow. Dr Nitya Anand, FNA chaired the function and Prof C K Varshney delivered the guest lecture on “*Global Climate Change*”. Prof Varshney said that climate changes are a complex and rapidly advancing catastrophe with long-term consequences and emphasized upon the need to control green house gases emission at global level. Dr P K Seth, FNA also highlighted major issues in

climate change. Many INSA local Fellows and around 100 students from local colleges attended this programme. A debate competition on “Global Climate Change: a reality or myth’ was organized on this occasion in which the students participated very enthusiastically. Three best performers were given prizes. INSA fellows present on the occasion were gifted the book “Climate Change and India: Vulnerability Assessment and Adaptation” edited by P R Shukla *et al.*

4. Meetings of Local Chapter and screening of the film “An Inconvenience Truth” by Al Gore, Nobel Laureate.

A meeting of the INSA Lucknow Chapter inviting local fellows was organized on November 19, 2007 at NBRI, Lucknow with assistance from the International Society of Environmental Botanists. A documentary film, “*An inconvenient Truth*” by Mr Al Gore, Nobel Laureate was screened which was attended by INSA Fellows (Lucknow Chapter), distinguished scientists of Lucknow and more than 60 students of environmental sciences from neighbourhood schools and colleges. The screening of the film was preceded by a brief introductory talk on “*climate change and plant diversity*” by Dr S K Jain, FNA, Former Director, Botanical Survey of India, Kolkata. It was attended by INSA Local Fellows and others as well.

P C Mahalanobis Medal Lecture (2002)

Professor J Nanda, FNA, INSA Honorary Scientist, Department of Electrical Engineering, Indian Institute of Technology, Delhi delivered the P C Mahalanobis Medal Lecture (2002) entitled “*Overview of Indian Power System and Challenges Ahead*” on December 26, 2007 at Silicon Institute of Technology, Bhubaneswar. The summary of the lecture is given below:

At the dawn of independence, power generation, transmission and distribution were mostly confined to metropolitan cities, and big towns, which were controlled by the private sector. The country then had no technology base in electrical power engineering and practically all equipment for the power sector was imported. However, over the span of 60 years since independence, India has achieved spectacular strides in the power field. Today, the country has large-scale



Prof J Maharana handing over the citation and medal to Prof J Nanda after the lecture

interconnected operation of power systems and infrastructural facilities to indigenously manufacture power equipment and accessories both for the country's need and for export.

Professor Nanda touched in brief several aspects of Indian Power System such as chronological growth, five year plans, resources, regional grids and national grid, communication, indigenous capacity, renovation and modernization, power transmission, HVDC Technology, EHV 765 KV transmission and discussed some challenges facing our power system such as grid problems, FACTS, power quality, energy conservation privatization, dispersed generation, demand side management, SMES, distribution automation and CIA etc.

Syed Husain Zaheer Medal Lecture (2004)

Professor J Nanda, FNA, INSA Honorary Scientist, Department of Electrical Engineering, Indian Institute of Technology, Delhi delivered the Syed Husain Zaheer Medal Lecture (2004) entitled "*On Energy and Environment*" on December 26, 2007 at Silicon Institute of Technology, Bhubaneswar. The summary of the lecture is given below:

The tempo of industrialization in India is steadily growing on all fronts covering energy intensive activities like the development of automobiles, petrochemicals, pharmaceuticals, fertilizers, textile, steel, aluminium, bio-technology etc. A constantly growing energy demand has to be met through an adequately planned electrical power generation

programmes. Though electrical energy is environmentally the most benign form of energy, its production is mainly routed through conventional fossil fuel burning or through nuclear energy and wherever possible through hydro resources. All of these give rise to environmental issues of a varied nature. The production, transportation, and usage of energy must be designed in an environmentally benign manner and at costs allowing for economically healthy growth.

The crux of the problem is to resolve the 3-E issue viz energy, environment and economy. While endeavouring to analyse and resolve the balance of trade off between energy and environment and between energy and economy, "*Sustainable Growth*" would be the final goal to achieve.

The speaker elucidated the real threat to nature because of environmental degradation of air, water, soil, forests etc. and apprises about green house effect, global warming, and climate change. He discussed three problems in some detail and highlighted the tremendous importance of combined cycle thermal plants, nuclear power plants, advanced combustion technology, fluidized bed combustion, wind generation and another non-conventional energy sources so as to achieve "*Sustainable Growth*".

Awards and Honours

Professor CNR Rao, FNA, FRS, has been elected Distinguished Research Professor of Materials at the University of Cambridge. He has also been declared Laureate of the Khwarizmi International Award by the Government of Iran. Northwestern University (US) has also decided to award him the Doctor of Science (*honoris causa*).

Professor M Shamim Jairajpuri, FNA was conferred with "The Life-Time Achievement Award in Parasitology" by the Indian Society for Parasitology in its 19th National Congress of Parasitology organized at Visakhapatnam during October 26-28, 2007.

Change of Address

Professor Dhruba Mukhopadhyay, FNA
E-mail: dhruba_38@yahoo.co.uk

Professor M S Bamji, FNA
E-mail: msbamji@gmail.com

Obituary
Professor K D Abhyankar

(b. June 21, 1928; d. November 8, 2007)

Professor K D Abhyankar, Indian Astrophysicist, teacher and well known populariser of astronomy, passed away in Hyderabad on November 8, 2007 at the age of 79. He was born on June 21, 1928. Since childhood he showed signs of brilliance since his childhood.



He procured gold medals at high school and colleges. After completion of his M.Sc. from Agra University, he worked for a short period at Holkar College, Indore. He obtained a Government of India senior research fellowship and worked at Kodaikanal Observatory during 1952-1954. He was awarded a scholarship for doctoral studies at the University of California at Berkeley. He worked for his Ph.D. thesis, under the supervisorship of Otto Struve, and studied several close binary stars with a view to understanding stellar evolution. He discovered a short period variable AD CMi. The work done by him for his PhD thesis was a masterpiece and has been well quoted.

On his return from US he worked for a short while at Kodaikanal Observatory before joining Osmania University. Prof K D Abhyankar was solely responsible for introducing Astronomy at the graduate and post graduate levels. He was singularly responsible for establishing the Astronomical Society of India (ASI) –this organization is playing a very important role, to this day, in bringing together professional astronomer of the country to share ideas and coordinate programs in astronomy & astrophysics. He had served ASI in several capacities including its Presidentship. In 1963 Prof K D Abhyankar worked for a year at David Dunlap Observatory, Canada on NRC post-doctoral fellowship and in 1967 as a senior post-doctoral resident research associateship of NRC-NASA of USA at Jet Propulsion Laboratory, Pasadena. Where he

worked in collaboration with A.L. Fymat on problems of radiative transfer.

Prof Abhyankar has played a critical role in establishing the Japal Rangapur Observatory (JRO). He served as the director of JRO and as a head of the Department of Astronomy, during 1961-63 (incharge), 1973-81, 1986-88, till he retired in 1988. He also served the faculty of science of Osmania University in the capacity of Dean during 1977-80.

He had been elected Fellow of Royal Astronomical Society, Indian Academy of Science, Indian National Science Academy, Member of Sigma Xi of USA, Member of stronomical Society of the Pacific, American Astronomical Society, International Astronomical Union. Prof Abhyankar had been the Chairman of the Advisory committee of the Positional stronomy Centre, Calcutta. He is the founder member of ASI, Andhra Pradesh Academy of Sciences and Maharashtra Academy of Sciences. He had been awarded the best teachers award by the Andhra Pradesh Government, NSSA award for Patent Rights on a new technique of measuring optical polarization, INSA Vainu Bappu Award and M.P.Birla Award.

He had written two books and more than 150 research papers in reputed scientific journals. His scientific work may be divided into three main categories (i) Solar Physics (ii) Binary & variable stars and (iii) Radiative Transfer & Planetary Atmospheres. Prof. Abhyankar had deep interest and phenomenal in Indian Astronomy.

Professor K D Abhyankar was passionately devoted to astronomy. He worked throughout his life with the zeal of a missionary to teach and spread Astronomy. He was amongst the few people who are good at both observations and theoretical Astronomy. He was not only a successful teacher but also a great research enthusiast.

(Contributed by Dr JS Yadav, FNA)



News about Secretariat

Welcome

Shri Khopunema Nelson James joined as Assistant on September 27, 2007.

Km. Varsha Sexena joined as Assistant on October 15, 2007.

Farewell

Shri Jagdish Prasad Dhyani joined the Academy on June 3, 1978 and retired on October 31, 2007 as Assistant II on superannuation.



Shri JM Gupta offering a Bouquet of Flowers to Shri JP Dhyani

Shri Pratap Singh Rawat joined the Academy on May 31, 1983 and retired on October 31, 2007 as Helper I on superannuation.



Mr AK Tagore presenting the momento to Mr PS Rawat

Shri Satya Pal Popli joined the Academy on September 9, 1969 and retired on November 30, 2007 as Assistant I on superannuation.



Dr Alok Moitra presenting the momento to Mr SP Popli

ANNOUNCEMENTS

Invitation for Contribution in the Proceedings of the Indian National Science Academy

Proceedings of the Indian National Science Academy is an inter-disciplinary journal devoted to publication of review papers, original research articles, short communications, commentaries, lateral thinking and emerging techniques in the areas of Physical, Biological, Applied Sciences and also Engineering. Four issues March, June, September and December are published.

Three copies of the manuscript complete with figures, tables and any other material (one original and two copies) may be submitted to the Editor-in-Chief, *Proc. INSA*, Indian National Science Academy, Bahadur Shah Zafar Marg, New Delhi 110002. An advance copy of the manuscript may be submitted in the electronic form also at procinsa@insa.nic.in.

Invitation to scholars for Research Proposal for support under History of Science Programme

Research proposals are invited from researchers interested in taking up source and theme oriented studies by compiling important sources for study, translation of important scientific and technical works and making critical assessment in the areas like mathematics, astronomy medicine, architecture, product, life and works of eminent scientists, institutions, science and societies etc. relating to Indian science and technology in proper historical perspective.

Application form can be obtained from History of Science Unit of the Indian National Science Academy.

Special Thematic issues on ‘Wootz Steel’ in Indian Journal of History of Science

Indian Journal of History of Science (IJHS) Vol. 42 No. 3 & 4 (September & December issues) 2007 are devoted to a theme “*History and Characteristics of Wootz Steel in India and Abroad*”. The issues contain the following topics:

September issue

Chinese Steel Making Techniques – With a note on Indian Wootz Steel in China; Production and Trade of Crucible Steel in Central Asia; On the Question of Possible Transfer of Steel Technology from India to Europe through the Muslim Middle East; On the origin of the Term; *Wootz, Hinduwani and Pulad*; From Wrought Iron to Steel : Beginning of Steel Making in Eastern India; Towards the Wootz : Iron and Steel Technology in India; New Insights on Classification of Iron-Carbon alloys; specially high Carbon Steels in *Rasaratnasamuccaya*; Survey of Iron and Wootz Steel Production Sites in Northern Telangana; Material Evidences of Wootz Steel Production in Northern Telangana; Social aspects of Wootz Steel Manufacture in Northern Telangana; On the Varied Applications of Wootz Steel; On Wootz Steel Received; Crucible Steel in Sri Lanka in the first Millennium AD and the early Twentieth century; Swords of Sirrohi; Recreating Wootz Steel outside India (Historical Notes).

December issue

Damascus Steels : History, Processing, Properties and Carbon Dating; Pattern Formation in Wootz Damascus Steel Swords and Blades; Wootz Decarburization during the Forging of a Sword; Cast Iron : The Elusive Feedstock of Crucible Steel; Microstructural Characterization along the Length of a Wedge Shaped Wootz Steel Implement; New Insights on the Mechanism of Carbide Banding in Thermomechanically Processed Wootz Steel obtained using Electron Back Scattering Diffraction; Analysis of Wootz Steel Crucibles from Northern Telangana; On Higher Carbon and Crucible Steels in Southern India : Further Insights from Mel-siruvalur; Kodumanal and Pattinam, Konosamudram – A Forgotten Medieval Wootz Steel Centre in Nizamabad district (AP); Interview with Wootz Steel worker from Konapuram Village in North Telangana (Historical Notes); *Persian Steel; The Tanavoli Collection* (Book Review).

Khadgalaksana Siromani of Navanappa — A Treatise on Swords written in 18th Century (with Eng. Exposition) (Supplement)

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INSA - NIGHT VIEW