

ACADEMY NEWS

INSA MEETINGS

Several meetings were held during April 25-27, 2018 in the Academy premises. These included meetings of the different Sectional Committees for recommending names of Young Scientist Awardees and for the first round of short-listing of nominations for INSA Fellowship. The Advisory Boards for the various INSA Awards also met. These were followed by meetings of the Council and General Body on April 27, 2018.

The committee for Science Promotion also met and decided to offer the position of INSA Distinguished Professor to Professor S Chandrasekaran, FNA, IISc, Bengaluru and Professor Sankar K Pal, FNA, ISI, Kolkata.

INSA Medal for Young Scientists 2018

The Council at its meeting on April 27, 2018 approved the award of INSA Medal for Young Scientist 2018 to 30 young researchers below the age of 35. The Academy had received 629 nominations out of which 30 were selected. The award carries a medal, a certificate and a cash prize of Rs. 25,000. In addition, the recipient may be considered for research support of Rs. 5 lakh per year for three years. The awardees can be considered, within five years of receipt of award, for a visit abroad with full support for presenting research work at conferences, and/or participating in collaborative/training research project. Those young scientists who have been unable to obtain suitable placement, may also be considered for an Interim Fellowship (amount depending on the qualification and research experience) and contingency of Rs. 25,000/- per year.

The following 30 young scientists were selected for the INSA Medal for Young Scientists.

1. **Dr Hafsa Ahmad** (b 26.05.1986), PhD, CSIR-

National Botanical Research Institute, Lucknow.

For developing novel formulations using Withanolides that have shown significantly improved potency in the experimental model of ischaemic stroke. Considering the limitations of the current medications for stroke, it has substantial translational value.

2. **Dr Sushmee Badhulika** (b 13.05.1985), PhD, Department of Electrical Engineering, Indian Institute of Technology Hyderabad, Hyderabad.

For the development of layered materials and electronic devices for biomedical applications.

3. **Dr Mousomi Bhakta** (b 09.05.1983), PhD, Department of Mathematics, Indian Institute of Science Education and Research, Pune.

For establishing results on Hardy equations with critical and super critical non-linearities and obtaining significant regularity results on bounded and unbounded domains.

4. **Dr Mainak Das Gupta** (b 20.05.1984), PhD, Department of Comparative Development and Genetics, Max Planck Institute for Plant Breeding Research, Germany.

For unravelling the role of microRNA and their target genes in leaf pattern development.

5. **Dr Mehak Gupta** (b 20.09.1988), PhD, Oilseeds Section, Department of Plant Breeding and Genetics, Punjab Agricultural University, Ludhiana.

For her outstanding contribution in developing synthetic Brassicas and their evaluation.

6. **Dr Neha Gupta** (b 27.01.1986), PhD, Protein Conformation and Enzymology Laboratory,

Department of Biosciences, Faculty of Natural Sciences, Jamia Millia Islamia, New Delhi.

For demonstrating a novel mechanism of hypoxia-induced venous thrombosis that acts via NLRP3 inflammasome that has implications for high altitude medicine.

7. **Dr Dhananjay Huilgol** (b 08.09.1983), PhD, Cold Spring Harbor Laboratory, New York, USA.

For his study on neuronal migration during mammalian development leading to the characterization of two novel migratory streams that form the posterior accessory olfactory bulb and the nucleus of the lateral olfactory tract which provide evolutionary insights into the development of the olfactory system.

8. **Dr Biman Jana** (b 14.01.1983), PhD, Department of Physical Chemistry, Indian Association for the Cultivation of Science, Jadavpur.

For theoretical understanding of molecular locomotion in motor proteins and mechanistic aspects of anti-freeze protein activity.

9. **Dr Somnath Jha** (b 11.07.1983), PhD, Department of Mathematics and Statistics, Indian Institute of Technology Kanpur, Kanpur.

For establishing a basic twisting lemma in non-commutative Iwasawa theory and obtaining duality results for Selmer groups of ordinary Hida families of modular forms.

10. **Dr Charanpreet Kaur** (b 06.07.1985), PhD, Stress Physiology and Molecular Biology Laboratory, Jawaharlal Nehru University, New Delhi.

For significantly contributing in understanding biochemical, molecular and functional properties of glyoxylase I and II enzymes, and demonstrating that methyl glyoxal acts as a stress-inducible signal molecule in plants.

11. **Dr Ujjwal Koley** (b 21.05.1983), PhD, Centre

for Applicable Mathematics, Tata Institute of Fundamental Research, Bengaluru.

For obtaining higher order numerical schemes for KdV equations with an L^2 initial data that gave a new theoretical framework for stochastic PDE's, and proved explicit continuous dependence estimates on entropy solutions in the presence of noise.

12. **Dr M Muthamilarasan** (b 02.12.1986), PhD, ICAR-National Research Centre on Plant Biotechnology, New Delhi.

For his outstanding contributions in developing genomic resources in foxtail millet.

13. **Dr Ratnesh Chandra Mishra** (b 11.05.1984), PhD, Laboratory of Functional Plant Biology, Ghent University, Belgium.

For experimentally validating rice Hsp101 gene using *Arabidopsis* Hsp101 null mutant and demonstrating that its expression provides complementation and thermotolerance.

14. **Dr Mukesh** (b 24.09.1984), PhD, Centre for DNA Taxonomy, Molecular Systematics Division, Zoological Survey of India, Kolkata.

For his important contributions in understanding of *Hangul* (Kashmir deer) population status, ecology and conservation issues and setting the appropriate critically endangered species status for *Hangul* and establishing in situ and ex situ management and conservation.

15. **Dr Budhaditya Mukherjee** (b 26.08.1984), PhD, Department of Microbiology and Molecular Medicine, University of Geneva, Switzerland.

For understanding the mechanism of immune modulation of host cells during *Leishmania* infection and establishing the molecular basis of the resistance to the anti-Leishmania drug antimony.

16. **Dr Aseem Sudhir Paranjape** (b 26.01.1983),

PhD, Inter-University Centre for Astronomy and Astrophysics, Pune.

For his demonstration that the dark energy problem in cosmology cannot be eliminated by averaging over fluctuations and for his development of new techniques to study the growth of large-scale structures in the Universe.

17. **Dr R Vinu** (*b* 08.10.1984), PhD, Department of Chemical Engineering, Indian Institute of Technology Madras, Chennai.

For his contributions to the development of low power microwave assisted pyrolysis of a wide range of municipal solid waste mixture of e-wastes, micro- and macro-algae, and coal biomass blends to produce valuable oils and blendstocks.

18. **Dr Ketan Rajawat** (*b* 14.02.1984), PhD, Department of Electrical Engineering, Indian Institute of Technology Kanpur, Kanpur.

For his contributions in the area of optimization in signal processing and communications, on topics related to asynchronous algorithms, distributed, online, and stochastic optimization.

19. **Dr Satya Brata Routh** (*b* 11.08.1985), PhD, Structural Biology Laboratory, CSIR-Centre for Cellular and Molecular Biology, Hyderabad.

For revealing structural and mechanistic features of the chiral specificity of D-aminoacyl-tRNAdeacylase, which operates based on L-chiral reject mechanism but not on D-selection thus have brought to the fore the glycine misediting phenomenon in the cellular scenario.

20. **Dr S Vijayan** (*b* 11.01.1983), PhD, Planetary Science Division, Physical Research Laboratory, Ahmedabad.

For finding of recent fluvial activities on Mars at location unknown before.

21. **Dr Sumit Sen Santara** (*b* 16.02.1985), PhD, Boston Children's Hospital, Harvard Medical

School, Boston, USA.

For reporting a globin coupled heme containing adenylate cyclase in a unicellular eukaryotic organism, *Leishmania* since this enzyme plays an essential role in the parasite survival and could be an important drug target.

22. **Dr Sakya Singha Sen** (*b* 02.03.1983), PhD, Inorganic Chemistry and Catalysis Division, CSIR-National Chemical Laboratory, Pune.

For stabilization of low valent main group compounds and their utilization as catalyst for cyanosilation of carbonyl compounds.

23. **Dr Mahak Sharma** (*b* 23.04.1983), PhD, Department of Biological Sciences, Indian Institute of Science Education and Research, Mohali.

For her outstanding work showing the role of small GTP-binding proteins in lysosome positioning and cargo trafficking in Salmonella.

24. **Dr Prerna Sharma** (*b* 20.09.1985), PhD, Department of Physics, Indian Institute of Science, Bengaluru.

For her innovative experimental approach to problem solving in soft matter physics using colloidal particles as model systems and to the quantitative understanding of adhesion of rheological properties of the stress-coupling medium.

25. **Dr Mayank Shrivastava** (*b* 14.09.1984), PhD, Department of Electronic Systems Engineering, Indian Institute of Science, Bengaluru.

For his contributions to the development, enablement, and integration of nano-scale CMOS and power MOSFET devices in System-on-Chip and power ASIC applications.

26. **Dr Sanjay Singh** (*b* 15.09.1983), PhD, School of Materials Science and Technology, Indian Institute of Technology, Varanasi.

For his contributions to the fundamental understanding of magnetic shape memory

materials.

27. **Dr Kumar Somyajit** (b 24.05.1986), PhD, The Novo Nordisk Foundation, Centre for Protein Research, University of Copenhagen, Copenhagen.

For unravelling important novel roles of RAD51 paralogs in mammalian replication fork stability control biology which have significant implications in cancer genome instability.

28. **Dr Shallu Thakur** (b 03.02.1985), PhD, Division of Plant Biotechnology, Indian Institute of Pulse Research, Kanpur.

For her outstanding contributions in allele mining for blast resistance in rice.

29. **Dr Vishvanath Tiwari** (b 15.09.1983), PhD, Department of Biochemistry, SLS Central University of Rajasthan, Ajmer.

For using proteomic and bioinformatics approaches to develop insights and strategies to control antibiotic-resistant strains of *Acetobacter baumannii*.

30. **Dr Chandra MR Volla** (b 10.07.1983), PhD, Department of Chemistry, Indian Institute of Technology Bombay, Mumbai.

For development of cost-effective catalyst using cobalt for C-H functionalization reactions.

INSA Medal/Lecture Awards 2018

The Academy announced the following 10 medal/lecture Awards for 2018.

Subjectwise Medals/Lectures/Awards

(A) Medals Instituted by the Academy

1. **Satyendranath Bose Medal** to **Professor Chandan Dasgupta, FNA**, Department of Physics, Indian Institute of Science, Bengaluru.
2. **Darashaw Noshervanji Wadia Medal** to **Professor Somnath Dasgupta, FNA**, Department of Geography, Faculty of Natural Sciences, Jamia Millia Islamia, New Delhi.

3. **Golden Jubilee Commemoration Medal (for Animal Sciences)** to **Professor PP Majumder, FNA**, Director, National Institute of Biomedical Genomics, Kalyani.

(B) Endowed Medals

4. **Vishwakarma Medal** to **Professor AK Shukla, FNA**, Solid State and Structural Chemistry Unit, Indian Institute of Science, Bengaluru.
5. **Professor GN Ramachandran 60th Birthday Commemoration Medal** to **Professor DN Rao, FNA**, Department of Biochemistry, Indian Institute of Science, Bengaluru.
6. **Professor Krishna Sahai Bilgrami Memorial Medal** to **Dr Tilak Raj Sharma, FNA**, Executive Director, National Agri-Food Biotechnology Institute, Mohali.
7. **Professor Har Swarup Memorial Medal** to **Dr Usha Vijayraghavan, FNA**, Department of Microbiology & Cell Biology, Indian Institute of Science, Bengaluru.
8. **Professor Subramania Ranganathan Memorial Medal** to **Professor VK Singh, FNA**, Director, Indian Institute of Science Education and Research Bhopal, Bhopal.

(C) Endowment Lectures

9. **Dr Nitya Anand Endowment Lecture:** No Award
10. **Professor Vishnu Vasudeva Narlikar Memorial Lecture** to **Professor S Thangavelu, FNA**, Department of Mathematics, Indian Institute of Science, Bengaluru.
11. **Professor Vishwa Nath Memorial Lecture** to **Dr SK Apte, FNA**, Bhabha Atomic Research Centre, Mumbai.

AWARD LECTURE DELIVERED UNDER LOCAL CHAPTERS

Indira Gandhi Prize for Popularization of Science (2017): Dr Narottam Sahoo, Senior Scientist, Gujarat Council of Science City, Ahmedabad delivered Indira Gandhi Prize for Popularization of Science lecture on *Joy of Science* at Indian Institute of Teachers Education, Gandhinagar on March 16, 2018.



Dr Narottam Sahoo receiving a medal and citation of the award lecture from Dr MM Sarin, FNA

The Sisir Kumar Mitra Memorial Lecture (2015): Dr SWA Naqvi, FNA, Director, CSIR-National Institute of Oceanography, Goa delivered the Sisir Kumar Mitra Memorial lecture on *Ocean Deoxygenation* at National Geophysical Research Institute, Hyderabad on April 22, 2018.

INTERNATIONAL ACTIVITIES

Nominations/Election of Indian scientists for various positions at International Council for Science (ICSU) and its different Unions

- Professor AK Sood, President, INSA, has been nominated for the position of Ordinary Member of International Science Council (ISC).
- Professor RB Singh, Department of Geography, Delhi School of Economics, University of Delhi, Delhi has been elected as Secretary-General and Treasurer of International Geographical Union (IGU).

Workshop/Symposia/Conferences supported by the Academy

- A three day international conference on history of science entitled “Emergence of Modern Science in Colonial India” was organized during March 14-16, 2018. The conference was coordinated by Professor Arnab Rai Choudhuri, FNA and partially supported by SERB. During the seminar forty research papers were presented by scholars from India and four overseas experts. The conference aimed to identify important gap areas in history of science during the colonial period and to chalk out strategies to fill up these. It also highlighted the relevance of poorly preserved source materials and make an inventory, ways of preserving these by setting up an archive. The areas covered included the colonial institutions of the British rule and path-breaking contributions of several pioneering Indian scientists like J.C. Bose, P.C. Ray, C.V. Raman, M.N. Saha, S. N. Bose during the closing years of the nineteenth century. The conference presented extraordinary case studies of the transplantation of science from one society to another – a topic of considerable interest to historians of science.

- Dr Paruchuri Gangadhar Rao, Former Vice-Chancellor, University of Science & Technology, Meghalaya has been nominated for the membership of IUFoST Governing Council 2018.



A group picture of the participants of the three day international conference on history of science

Visit of Overseas Delegates to INSA

• INSA Chair Awardee

➤ Dr DS Kothari Chair Award (2017-18)

Professor Yuri Shtanov, Bogolyubov Institute for Theoretical Physics, Kiev, Ukraine, awardee of Dr DS Kothari Chair of INSA visited India during December 27, 2017 to January 16, 2018 as distinguished overseas scientist, nominated by Professor Varun Sahni, Distinguished Professor, Inter-University Centre for Astronomy and Astrophysics (IUCAA), Pune.

➤ Dr V Ramalingaswami Chair Award (2017-18)

Professor Ross D. King, School of Computer Science, University of Manchester, London, UK, awardee of Dr V Ramalingaswamy Chair of INSA, visited India during February 8-18, 2018 as middle level outstanding scientist, nominated by Professor Ashwin Srinivasan, School of Computer Science and Information Systems, BITS Pilani, Goa. Professor King visited IIT Delhi, BITS Pilani, Pilani and BITS Pilani, Goa. During his visit to IIT Delhi, Professor King had a discussion meeting with Professor Sanjiva Prasad, Department of Computer Science and Engineering, IIT Delhi;

Professor Ashwin Srinivasan, BITS Pilani, Goa and Dr Gautam Shroff, Head of Research, TCS.

- Dr Olivier Pironneau, Vice-President Foreign Affairs, French Academy of Sciences visited INSA on March 9, 2018 and had scientific discussion for enhancing the bilateral cooperation between INSA and French Academy of Sciences.
- Ms Hilda Farkas, Counsellor for Science and Technology, Embassy of Hungary, New Delhi visited INSA on April 20, 2018 and had a discussion meeting with Dr Chandrima Shaha, Vice-President (International Affairs), INSA to enhance the scientific bilateral cooperation between INSA and Hungarian Academy of Sciences. During the meeting, both the academies decided to explore the possibilities for organising joint seminars/symposia on topics of mutual consent.

Support for Visiting Scientists during March – April 2018

Dr Neelesh Kumar, Principal Scientist, Biomedical Instrumentation Unit, CSIR-Central Scientific Instruments Organization, Chandigarh visited Hungary under INSA-Hungary Bilateral Exchange Programme.

SCIENTIFIC MEETINGS DURING MARCH - APRIL 2018

- A Memorandum of Understanding was signed between DST and INSA on March 6, 2018 for implementation of “India-UK Water Quality Research Programme” representing India’s Department of Science & Technology (DST) and the UK’s Natural Environment Research Council (NERC) and Engineering and Physical Sciences Research Council (EPSRC).
- A review meeting of the National Organizing Committee (NOC) for organising 19th International Union of Food Science & Technology (IUFoST) World Congress which is to be held at Mumbai during October 2018 was held at INSA on April 12, 2018.
- The 14th Project Investigators’ Meet and Joint Meeting of the Research Council and Indian National Commission for History of Science was held during April 12-13, 2018 to assess the progress of 21 ongoing and to consider 11 new projects for funding during the year 2018-19. Presentations were made by the project investigators in the areas of mathematics & astronomy, metals & metallurgy, ayurveda and medicine, archaeology & epigraphy and science & technology during the colonial period. Out of 11 new proposals, three were approved by the Commission.



A view of 14th Project Investigators’ Meet and Joint Meeting of the Research Council and Indian National Commission for History of Science

SCIENCE & SOCIETY PROGRAMME

- The Asiatic Society in collaboration with Indian National Science Academy organized a one day national seminar on *The Lost River Saraswati: Geodynamic Context* delivered by Professor KS Valdiya, FNA, Honorary Professor, JNCASR, Bengaluru on October 12, 2017 at Asiatic Society, Kolkata. A report on the seminar follows:

River *Saraswati* is considered as one of the most sacred and mighty rivers of India. Several verses in the *Rig Veda* described this river as a mighty one and provided some crucial geographical details of its tributaries as well as the terrain, the river system drained. The *Mahabharata*, on the other hand, mentioned *Saraswati* as a river that disappeared in sand. Such geographical details evoked high interest of modern scientific communities on the river, notably since the 19th Century. Asiatic Society, the oldest (founded in 1784) and a highly reputed academic institution of the Indian sub-continent, played a pivotal role in acquiring and dissemination of knowledge on this legendary river, especially during the early years. Indian National Science Academy (INSA), which had its birth at the Asiatic Society, also took initiatives in this knowledge dissemination through holding academic discourses.

Considering the continued interest of the scientific communities in India on this lost river and keeping in view the explosion of new knowledge on this river system since the 1970s, the Asiatic Society and INSA organised a joint one-day seminar on “The lost river *Saraswati*: Geodynamic context” on 12 October 2017 in Kolkata.

The seminar was convened jointly by Dr SK Acharyya, former Director General of the Geological Survey of India, and Professor Kunal Ghosh, Fellow of both INSA and the Asiatic Society. It was held at the historical Vidyasagar Hall of Asiatic Society and attended by about 200 learned knowledge-seekers. The short inaugural session was presided over by Professor Isha Mahammad, President of the Asiatic Society while the Chief Guest was Professor D Mukhopadhyay, a senior distinguished Earth Scientist. Professor KS Valdiya, another senior distinguished Earth Scientist from Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore, delivered the key-note address. The Welcome address and the Vote of thanks were moved by Dr. Satyabrata Chakrabarti and Dr Sujit Kumar Das, Secretary and Treasurer of the Asiatic Society, respectively. This was followed by regular sessions where the speakers were: Professor Rajiv Sinha (Indian Institute of Technology, Kanpur), Dr. Amal Kar (formerly of Central Arid Zone Research Institute, Jodhpur), Dr. Anil K Gupta (formerly of Regional Remote Sensing Service Centre, Jodhpur) and Professor Michel Danino (Indian Institute of Technology, Gandhinagar). The valedictory session was presided by Professor Valdiya and all the speakers participated in it.

Professor D Mukhopadhyay, in his address as the Chief Guest, stated that the subject is truly interdisciplinary and this Seminar is focused to look at the problem from a geodynamic point of view. As far as the location of the old *Saraswati* is concerned there have been two contrasting views. In one view, *Saraswati* must lie between the Yamuna and the Sutlej. The present day seasonal stream Ghaggar-Hakra with its tributaries flows in this region. The other view is that *Saraswati* is to be equated with the ancient river Harakhwati in the Helmand River basin in Afghanistan. The first hypothesis received a boost when Landsat imagery analysis revealed the location of paleochannels. Geological history of the Sutlej-Yamuna interfluvium suggests that Ghaggar has a wide channel but what is remarkable is the lack of incision in the river channels in this region. Study of subsurface deposits has led to identification of ancient channels. Provenance studies of the channel sediments along with the paleochannels in imageries, suggests that the old river which flowed along the Ghaggar channel was fed by old Sutlej from the north and the old Yamuna from the east. The cumulative evidence suggests the presence of an ancient river in the Ghaggar-

Hakra region, though more detailed work is necessary. There were drastic changes in the river system in this region in the past, but these were pre-Harappan, possibly in Pleistocene. The river was in a declining stage during the acme of the Harappa civilization.”

Professor KS Valdiya, in his keynote address, provided an overview of recent research on the *Saraswati* and re-confirmed the existence of the *Saraswati*, as mentioned in the ancient Indian literature, and its demise. He explained through numerous illustrations how systematic scientific research since the late-1970s, involving remote sensing and field- and laboratory-based investigations on the geomorphic, geophysical, structural, sedimentological and isotopic properties of the landscape elements re-confirmed the existence of the ‘lost’ *Saraswati*, and also described the river’s broad evolutionary stages as well as its contribution to the evolution of human settlements and culture in the basin area. According to him, the enormous sediment volume laid down in the reaches of the present-day Ghaggar River in the Himalayan foothills to the deltaic part of the Nara River in Sind and Great Rann of Kachchh represent the work of two large Himalayan rivers, Tons in the east and the Sutlej in the west. Repeated tectonic activities since then led to the shifting away of these two rivers from the Ghaggar River valley, i.e., Tons to meet Yamuna in the east and Sutlej to meet Indus in the west, causing the Ghaggar to dry out. Late Quaternary changes in climate also had a role to play in the demise of the river and subsequent migration to more hospitable environment.

Professor Rajiv Sinha, in his presentation on “The lost *Saraswati*: River morphodynamics as an alternative model for development of ancient urban settlements in NW India” showed through an analysis of numerous deep sedimentary sections across the dry valley of the Ghaggar River and across some palaeochannels of the Sutlej, the reconstructed palaeo-valleys of the erstwhile Sutlej over time. The old channels, dated between ~4 thousand years before present (ka BP) and ~80 ka BP, when stacked over time and the sediments analysed in terms of river dynamics, revealed a typical episodic and abrupt migratory behaviour of alluvial streams, called ‘avulsion’, which typically take place at century to millennial time-scale and leads to diversion of river flow into new or abandoned channels. Based on a knowledge of the wide swinging behaviour of the present-day Kosi River during avulsion, computer simulation modelling of the fluvial processes leading to avulsion, and optical simulation dating of the sedimentary sequences in the Ghaggar valley, he suggested that the Sutlej’s flow through the Ghaggar valley terminated considerably before the discovered pre-Harappan and Harappan settlements (~4.8 - ~3.9 ka BP) and that the diversion to Sutlej’s present course was completed shortly after ~8 ka. He argued that the early settlements discovered along the dry valley of the Ghaggar were established along a relict valley rather than on an active Himalayan river like the Sutlej, mainly to avoid the risk of large damages due to unpredicted avulsion and flooding, and at the same time to derive benefits of its water sources. Confinement of the Sutlej to its present incised course since the shifting away from the Ghaggar valley likely reduced its propensity to re-route frequently into the abandoned channels, thus enabling long-term stability to the early settlements along the Ghaggar valley.

Dr. Amal Kar spoke about “Research paradigms on the mapping and understanding of *Saraswati* River system”. Citing old map records he informed that James Rennell (1788) and his Survey of India (SoI) team should get the credit for first unambiguous mapping of the remnants of a large Himalayan river flowing independent of the Indus to the sea, which was marked by them in the sub-Himalayan plains as the Sursooty, the Caggar and the Kenkar, and then as a dotted line through Cholistan and Sind. Over the next one century SoI accurately mapped the abandoned streams in the area and the dry valley of the Ghaggar. CF Oldham (1874) named the Ghaggar-Hakra-Nara as the “*Saraswati*”, and argued that its survival depended on the supply from the Sutlej. This Rennell-Oldham discovery provided the foundation

for future studies on civilization and environmental changes in the region, especially along the dry valley of the Ghaggar. Recent provenance studies through zircon dating and isotopic composition pattern of sediments reveal overwhelming contribution of the Sutlej River in the alluviation process. The first satellite-based discovery of some buried courses of the *Saraswati* and one of its tributaries, the Drishadvati, in the Punjab Plains and in the Thar Desert was made by Ghose, Kar & Husain (1979) and Kar & Ghose (1984). This work was followed in the desert by linking of the findings with a shallow aquifer in the desert tract of Jaisalmer by Kar and Shukla (1993, 2000) which extended the scope of *Saraswati* research into the desert proper, with emphasis on groundwater management, placer deposits, etc., along the palaeochannels.

Dr. Anil K Gupta spoke on “Course of river Saraswati satellite-based studies findings and implications”, and narrated the studies carried out by ISRO in Haryana, Punjab, Rajasthan and Gujarat, especially to rediscover the buried channels of the river and explore their economic and archaeological potential. Using data from old maps, archaeological records, landform features, sediment characteristics, stream flow, groundwater, etc., the marked courses were validated. Based on the findings, Haryana Government embarked on a plan of revival of *Saraswati* in the state through Haryana *Saraswati* Heritage Board.

Professor Michel Danino, in his paper on “The *Saraswati* river: Issues and debates”, argued that the existence of the mighty *Saraswati* was proven in the studies carried out in the Nineteenth Century while the archaeological discoveries along this lost river further strengthened the earlier findings. Since the last three decades, several new geo-scientific investigations in the river’s basin area have brought out many intricate details of the river’s fate with time, including its expanse, condition during the Mature Harappan period, and ultimate disappearance. In view of the large body of scientific evidence gathered so far, the questioning of the river’s identification in some quarters was uncalled for. At the concluding session, it was unanimously decided that a befitting publication in this area is to be brought out by the Asiatic Society.

- A book release function was organised by the Academy for releasing two special publications of INSA on ‘*Indian Science, Transforming India: Impact of Science in Independent India*’ an anthology edited by Professor LS Shashidhara, FNA and a report on ‘*Opportunities and Challenges for Research on Food and Nutrition Security and Agriculture in Asia*’ under scheme of AASSA on April 25, 2018. Professor Sood, President, INSA presided over the function and invited Professor Ashutosh Sharma, FNA, Secretary DST as chief guest to release the books. Professors MVS Valiathan, Man Mohan Sharma, Krishan Lal and AK Singhvi were among the other senior INSA fellows who participated in the book-release ceremony.



Release of Academy's special publications

RECENT PUBLICATIONS OF THE ACADEMY

Proceedings of the Indian National Science Academy

Volume 84, No. 1 (March 2018) issue of *PINSA* has been published as a thematic issue on “Pharmacology Research in India during 2012-2017”. This issue contained 19 Review Articles and Academy News besides guest editorial by Professor C Adithan, Mahatma Gandhi Medical College and Research Institute, Puducherry, Dr YK Gupta, Department of Pharmacology, All India Institute of Medical Sciences, New Delhi and Dr B Dinesh Kumar, Drug Toxicology Division, National Institute of Nutrition, Hyderabad.

Indian Journal of History of Science (IJHS)

Volume 53, No. 1 (March 2018) issue of *IJHS* has been published. This issue includes papers on *Mādhava's* approach for obtaining the *Prāṇakalāntara*, concepts of *ahargaṇa* in *Makarandasāriṇī*, Medical education at Patna and Dacca during colonial period, 90th anniversary of the Raman Effect, Indian arthropods in Sanskrit literature, History of bedbugs in India; History of development of homeopathy in India; First fifty years (1900-1950) of physiology in India. The issue also carries book reviews, project report and news from history of science.

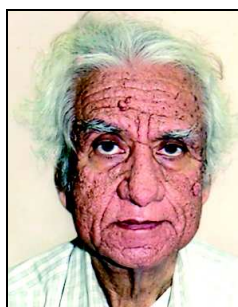
Indian Journal of Pure and Applied Mathematics (IJPAM)

Volume 49, No. 2 (June 2018) issue of *IJPAM* has been published.

OBITUARY

Jayanta Kumar Ghosh

Jayanta Kumar Ghosh (*b* 23 May 1937; *d* 30 September 2017) obtained PhD from Calcutta University on Sequential Analysis. He served as a Lecturer at Calcutta University and joined



the Indian Statistical Institute, Kolkata and became its Director and Jawaharlal Nehru Professor. He held a visiting position at the University of Illinois, Urbana-Champaign and at Purdue University. He was an Emeritus Professor of Indian Statistical Institute and Professor at Purdue University.

Professor Ghosh made fundamental contributions to several areas of statistics, viz., sequential analysis, foundations of statistics, asymptotic theory and Bayesian inference. His work on sequential probability ratio test of composite hypotheses, sufficiency and invariance, Bahadur representation of quantiles, which later came to be known as Bahadur-Ghosh-Kiefer representation, Edgeworth expansion, second order efficiency, Bartlett correction, comparison of the likelihood ratio, Wald's and Rao's statistics, Bahadur-Cochran deficiency, Neyman-Scott problem, matching and other objective priors, limits of posterior distributions, Bayesian nonparametrics, model selection and Bayesian hypothesis testing have led to significant advancement of modern statistics.

Professor Ghosh won many accolades, including the Shanti Swarup Bhatnagar Prize for Science and Technology, Mahalanobis Gold Medal of Indian Science Congress Association, P.V. Sukhatme Prize for Statistics, an honorary D.Sc. degree by the B.C. Roy Agricultural University in West Bengal, the Lifetime Achievement award of the International Indian Statistical Association, an honorary D.Sc. degree by the ISI and Padma Shree by the Government of India. He was elected Fellow of the Indian Academy of Sciences, Bangalore and the National Academy of Sciences, Allahabad.

Professor JK Ghosh was elected to the Fellowship of the Indian National Science Academy in the year 1982 and served as its Council as Member during 1990-92.

ANNOUNCEMENTS

Nomination for Election of Fellows

The last date for receiving nominations for election of Fellows is **October 15, 2018**. Nominations received on or before October 15 will be included for consideration in the year 2019, while those received after October 15, 2018 will go for the year 2020. Nomination form can be downloaded from the INSA website **www.insaindia.res.in**.

Nomination for Election of Foreign Fellows

Nominations are invited from the Fellows of INSA for election of Foreign Fellows for the year 2019. Nomination form can be downloaded from the INSA website **www.insaindia.res.in**.

INSA Medal for Young Scientists - 2019

Nominations are invited for **INSA Medal for Young Scientists – 2019**. Those born on or after **January 1, 1984** are eligible for consideration in the year 2019. The awardee shall receive a **certificate**, a **bronze medal** and cash award of **Rs. 25000/-**. Nominations may be proposed by a Fellow of the Indian National Science Academy or by earlier recipients of this award. Scientific societies of national standing, university faculty, post-graduate departments of research institutions may also nominate eligible candidates. The last date for receiving nominations for INSA Medal for Young Scientists is **October 31, 2018**. Nomination proforma can be downloaded from the INSA website **www.insaindia.res.in**.

INSA Young Historian of Science Award – 2018

Nominations are invited for **INSA Young Historian of Science Award – 2018**. Those born on or after **January 1, 1983** are eligible for consideration in the year 2018. The award is for young historians of science who have made notable research contributions in areas relating to History of Science in India or abroad. The awardee shall receive a **certificate**, a **bronze medal** and cash award of **Rs. 25000/-**. Nominations may be proposed by a Fellow of the Indian National Science Academy, National Scientific Societies, Vice Chancellors of Universities and Heads of Research Institutions. The last date for receiving nominations for INSA Young Historian of Science Award is **June 30, 2018**. Nomination proforma can be downloaded from the INSA website **www.insaindia.res.in**.

Proposal for Lectures in the Remote/rural areas

The Academy has launched a programme under which INSA Fellows, Young Scientists, Teacher Awardees & INYAS members are encouraged to deliver Popular Lectures to young students and teachers of schools and colleges in remote/rural areas in India.

Proposals are invited from Fellows, INSA young scientists, INSA teacher awardees and INYAS members with details like name and address of the school/college where they wish to deliver lectures, title/s of lecture/s, proposed dates and the quantum of required travel support. Proposals may be sent to Executive Director, INSA at **esoffice@insa.nic.in** and to **scisoc@insa.nic.in** at the earliest.

Deputation of Indian Scientists Abroad Under Bilateral Exchange Programme 2019

Applications are invited from outstanding scientists/researchers holding Ph.D. degree and having regular positions in recognized S&T institutions/universities and who are actively engaged in research in frontline areas for deputation abroad during the calendar year 2019 in all fields of Science including Engineering, Medicine and Agriculture for short term (2-4 weeks for senior scientists) and long term visits (3 months for junior/younger scientists) under the Scientific Bilateral Exchange Programme with overseas Academies/Organizations in **China, Czech Republic, France, Germany, Hungary, Iran, Israel, Nepal, Philippines, Poland, Scotland, Slovak Republic, Republic of Slovenia, Sudan, Taiwan and Turkey.**

Hard copy of application, duly completed and endorsed by the Head of the Institution should be submitted latest by **July 31, 2018** to **Deputy Executive Director-I (Scientific), Indian National Science Academy, Bahadur Shah Zafar Marg, New Delhi - 110002.** A soft copy of complete application (single PDF file only) should be emailed to: **intacademy@insa.nic.in**. Please include your **Name, Area of Research and Proposed Country** in the subject line of your email. The soft copy filename should be saved as: *Name of Applicant_Proposed Country*. Incomplete applications will be rejected and no further correspondence shall be made.