

INDIAN NATIONAL SCIENCE ACADEMY
Bahadur Shah Zafar Marg, New Delhi – 110002

Minutes of the Annual General Meeting of the Indian National Science Academy held on 26 July, 2019 at Academy premises.

The following Fellows were present:

Professor Ajay K Sood	President
Professor V Chandrasekhar	Vice-President
Professor NR Jagannathan	Vice-President
Professor JP Khurana	Vice-President
Professor Gadadhar Misra	Vice-President
Professor Anurag Sharma	Vice-President
Professor B Buti	
Dr Madhu Dikshit	
Professor Neeraj Jain	
Professor CJ Jog	
Professor R Madhubala	
Professor R Narasimhan	
Professor Sourav Pal	
Dr GP Pandey	
Professor Ranjan K Mallik	
Professor Manoj Prasad	
Professor R Rajaraman	
Professor V Ramgopal Rao	
Professor Poonam Salotra	
Dr Rajender Singh Sangwan	
Professor Abhijit Sen	
Dr Chandrima Shaha	
Professor Maihili Sharan	
Professor Yashwant Singh	
Professor PN Takkar	
Professor KC Upadhyaya	
Professor GD Yadav	

Professor Ajay K Sood, President, INSA welcomed all the Fellows to the General body meeting. Thereafter, the regular agenda items were taken up.

1. Condolence at the passing away of the distinguished Fellows:

The sad demise of Dr Hari Krishan Jain, Professor Satish Chandra Maheshwari, Professor Sudhir Pradyumna Pandya, Professor Awadh Kishore Prasad Sinha and Bidare Venkatasubbaiah Subbarayappa distinguished Fellows of the Academy was reported. The obituary notes were read by the President, INSA and all those present stood in silence for a minute as a mark of respect to the deceased.

2. Confirmation of minutes of General Body Meeting held on 10 April, 2019.

The minutes of the General Body Meeting held on 10 April, 2019 were read by Professor Anurag Sharma, Vice-President. These minutes were already uploaded on INSA website. No comments were received. Thereafter, the minutes were confirmed.

3. Announcement of result of scrutiny of voting papers for election of Officers and Members of the Council for the year 2020.

President, INSA thanked Professor Gadadhar Misra and Professor Rajendra Bhatia who were appointed as scrutineers for counting the e-votes for the election of Fellows, Foreign Fellows and INSA Council for 2020.

Professor Anurag Sharma announced names of those who were elected as members of the Council 2020. The list is attached at **Annexure-I**.

4. Announcement of result of scrutiny of voting papers for election of Fellows and Foreign Fellows for the year 2020.

Professor Anurag Sharma, Vice-President announced names of those elected as Fellows and Foreign Fellows of INSA and read their citations as per **Annexure-II**.

5. Announcement of name of recipients of the INSA Medal for Young Scientist Award 2019.

The names and brief citation of 30 scientists (**Annexure-III**) selected as awardee of INSA Medal for Young Scientists 2019 were announced by Professor Anurag Sharma, Vice-President.

6. Announcement of name of recipient of the INSA Young Historian of Science Award 2019.

Professor Anurag Sharma, Vice-President announced the name of the INSA Young Historian of Science Awardee for the year 2019:

Dr Aditya Kolachana, Research Scholar, Cell for Indian Science and Technology in Sanskrit, Department of Humanities and Social Sciences, Indian Institute of Technology Bombay, Mumbai for his significant contributions made by him to the advancement of studies in the history of Indian astronomy by way of analysing the unpublished manuscripts such as the *Lagnaprakaraṇa* of Mādhava, and the *Candrārākī* of Dinakara.

7. Announcement of name of recipients of the INSA Teachers Award 2019.

Professor Anurag Sharma, Vice-President announced the names of the twelve outstanding Teachers (**Annexure-IV**) as recipient of the INSA Teachers Award for the year 2019.

8. Announcement of name of recipient of the Professor Har Swarup Memorial Award (2019).

Professor Anurag Sharma announced the name of the recipient of Professor Har Swarup Memorial Award :

Dr Mahak Sharma, Department of Biological Sciences, Indian Institute of Science Education and Research, Mohali for her paper entitled : *The dynein adaptor Hook2 plays essential roles in mitotic progression and cytokinesis* published in *Journal of Cell Biology*, doi: 10.1083/jcb.201804183 (2019).

9. Announcement of names of representatives of Cooperating Academies and the Govt. of India on the Council of INSA for the year 2020.

Professor Anurag Sharma announced the names of Professors R Ramamurthi, GC Mishra and Subhasis Chaudhuri as representatives of the Indian Science Congress Association, the National Academy of Sciences (India) and the Govt. of India, Department of Science & Technology, respectively. It was noted that the nomination of the representative of The Asiatic Society is awaited.

10. Submission of the list of Fellows corrected up-to-date.

Professor Anurag Sharma, Vice-President informed that the number of Fellows as on 26 July, 2019 stood at 926. A list of Fellows corrected up to date is available at www.insaindia.res.in.

11. To read as required under Rule 40(c) the name of nominees for election as INSA Fellow / Foreign Fellow from 1st April 2019 to 10th July, 2019.

Professor Anurag Sharma, Vice-President, INSA read the names of those whose nominations were received for election as INSA Fellow and Foreign Fellow.

12. Annual Report of the Academy for the year 2018-19.

Professor Anurag Sharma presented the draft annual report along with the audited annual balance sheet for FY 2018-19. The report will now be printed and submitted to DST.

13. Review of work of the Academy by the President, INSA.

The highlights of the activities of the Academy in past one year was presented by President, INSA. A brief note is given at **Annexure-V**.

14. To release the Hindi version of INSA Publication *Indian Science : Transforming India*.

Dr CM Nautiyal gave a brief background of the INSA Publication on ***Transforming India*** (edited by Professor LS Shashidhara) and its Hindi edition भारत को बदलता भारतीय विज्ञान. President, INSA was later requested to release the Hindi addition of the book, which he did.

A copy of the released publication was distributed to all the Fellows present.

15. Any other item.

After the formal agenda items were over, President, INSA informed the members about certain decisions of the Council and other recent activities :

a. E-voting

The members were informed that beginning this year the voting process has been carried out electronically. The voting portal is presently on the developer's server. It will soon be uploaded on our site. Professor Gadadhar Misra has been responsible for getting the entire process functional successfully.

b. Senior / Honorary Scientists

The Council, earlier in the day, decided that the number of senior scientist positions be raised from 75 to 85 and also the tenure of three years raised to five years. The two year extension will be effective only after reviewing the progress of past three years.

The term of five years will be applicable to all the fellows who are presently holding the senior scientist position. In addition, anybody who has already completed three years period in past will also be eligible for an extension of two years. Similarly, the tenure of the Honorary Scientists is also raised from three to five years. There is no change in upper age limit and emoluments for both senior and honorary scientists.

The number of conferences/ seminars to be supported by INSA is raised from present 50 to 80. There will be no change in funding for each conference/ seminar (i.e. up to Rs.50,000/-).

c. Document on *Publication of and Access to Literature in Science and Technology in India*

The members were informed that Council in the forenoon approved the draft document on ***Publication of and Access to Literature in Science and Technology in India***. This document has been brought out as a joint effort of INSA, NASI and IASc. It will be forwarded to relevant authorities as soon as INSA receives the approval of NASI council. IASc council has already approved this document.

d. Draft National Education Policy:

President, INSA informed the members about the genesis of this document which is based on the observations/ suggestions/ comments from Fellows of three science academies and a nominated inter academy group which worked to consolidate the document. It has been forwarded to Hon'ble Minister of Human Resource Development.

e. Resignation of Professor Milind Watve from INSA Fellowship.

President brought to the notice of the fellows about the communications which he received from Professor Milind Watve who had expressed his desire to resign from the fellowship of INSA and IASc. It was considered by the Council in the forenoon which accepted his resignation from the Fellowship of INSA. The Academy will soon inform Professor Watve about this decision.

f. INSA Teacher's Award

Council agreed to increase the number of awards from 12 to 15 and reduce the required teaching experience from 20 yrs. to 15 yrs. It was also decided that nominee's role in participating on Swayam platform or any other online portal (in developing a course, lectures, articles etc.) should be evaluated by the committee.

g. Installation of Roof Top Solar PV System in INSA

President informed the members that Academy will soon install the Roof Top Solar PV System in INSA under Resco Model. Under this model there will be no expenditure on the part of the Academy. However, we will have to commit our roof tops for next 25 years.

h. Publishing INSA Journals and other publications jointly with private publishers.

The members were informed that beginning next year all INSA journals and other special publications will be co-published with Springer. The pricing of each book will be negotiated separately with them. In addition, INSA will also negotiate royalty agreement with Springer for each special publication. This royalty, in turn, will be shared between INSA and the author. The quantum of sharing will be decided by the Council for each publication. E-version of INSA journals and books will be available on our website under open access policy.

The memoirs, year book and the newsletter will not be published by Springer. The newsletter, which is presently a part of Proceedings, will be brought out as a separate publication from January 1, 2020.

I. Augmenting our Resources

President apprised the members that INSA has constituted a Resource Generation Committee which is exploring the possibility of augmenting our financial position. The committee met a day before (25 July) and recommended many initiatives to be taken. One of the action point was an appeal to be issued to all Fellows for generous donations. It was mentioned that INSA has already received 50% exemption under section 80g. He requested the fellows present to respond to his appeal.

The members present in the General Body appreciated many positive steps and the efforts put in by the Academy in recent past.

The meeting ended with a vote of thanks to the Chair.

List of Council Members 2020

Name and Address	Position Held	Field of Specializations
<p>Dr Chandrima Shaha Professor of Eminence National Institute of Immunology Aruna Asaf Ali Marg New Delhi 110067</p>	President	Cell Biology, Biochemistry
<p>Professor V Chandrasekhar Centre Director Tata Institute of Fundamental Research Hyderabad Gopanpally Hyderabad 500107</p>	Vice-President	Inorganic Chemistry
<p>Professor Gaiti Hasan Former Senior Professor and SERB Distinguished Fellow National Centre for Biological Sciences Tata Institute of Fundamental Research GKVK, Bellary Road Bengaluru 560065</p>	Vice-President	Intracellular Calcium Signalling
<p>Professor JP Khurana Department of Plant Molecular Biology University of Delhi South Campus New Delhi 110021</p>	Vice-President	Photobiology and Signal Transduction, Mechanisms in Higher Plant, Plant Genomics
<p>Professor Gadadhar Misra Department of Mathematics Indian Institute of Science Bengaluru 560012</p>	Vice-President	Operator Theory
<p>Professor AK Singhvi Honorary Scientist AMOPH Division Physical Research Laboratory Navrangpura Ahmedabad 380009</p>	Vice-President	Quaternary Climates and Geochronology, Radiation Effects and Dosimetry
<p>Professor Subrata Sinha Professor and Head Department of Biochemistry All India Institute of Medical Sciences New Delhi 110029</p>	Vice-President	Molecular Oncology

<p>Professor Manju Bansal INSA Senior Scientist, JC Bose National Fellow Molecular Biophysics Unit Indian Institute of Science Bengaluru 560012</p>	Member	Molecular Biophysics, Structural and Computational Biology
<p>Professor Rajendra Bhatia Distinguished Scientist Statistical Mathematics Unit Indian Statistical Institute 7, SJS Sansanwal Marg New Delhi 110016</p>	Member	Mathematics: Matrix Analysis, Functional Analysis, Harmonic Analysis
<p>Professor Amitabha Chattopadhyay INSA Senior Scientist, JC Bose National Fellow CSIR-Centre for Cellular & Molecular Biology Uppal Road Hyderabad 500007</p>	Member	Membrane/Receptor Biophysics & Biology, Fluorescence Spectroscopy & Microscopy
<p>Professor Debashish Chowdhury JC Bose National Fellow Department of Physics Indian Institute of Technology Kanpur 208016</p>	Member	Statistical Physics, Biological Physics
<p>Professor Aparna Dutta Gupta Department of Animal Biology School of Life Sciences University of Hyderabad Hyderabad 500046</p>	Member	Animal Sciences: Insect Molecular Physiology Hormonal Regulation of Insect Development & Reproduction, Integrated Insect Pest Management
<p>Professor Tarun Kant INSA Senior Scientist, Professor Emeritus Department of Civil Engineering Indian Institute of Technology, Bombay Powai Mumbai 400076</p>	Member	Structural Mechanics
<p>Professor Mannepalli Lakshmi Kantam Dr.B.P. Godrej Distinguished Professor Department of Chemical Engineering Institute of Chemical Technology Nathalal Parekh Marg, Matunga Mumbai 400019</p>	Member	Catalysis, Materials and Process Chemistry

<p>Professor Rentala Madhubala School of Life Sciences Jawaharlal Nehru University New Delhi 110067</p>	Member	Molecular Parasitology, Functional genomics
<p>Dr HK Majumder JC Bose National Fellow CSIR-Indian Institute of Chemical Biology 4-Raja S.C. Mullick Road Jadavpur Kolkata 700032</p>	Member	Molecular Parasitology, Molecular Biology, Biochemistry
<p>Dr SWA Naqvi Distinguished Scientist & J.C. Bose Fellow Council of Scientific & Industrial Research 2, Rafi Marg New Delhi 110001</p>	Member	Aquatic Biogeochemistry, Chemical Oceanography, Paleoceanography
<p>Professor R Narasimhan Department of Mechanical Engineering Indian Institute of Science Bengaluru 560012</p>	Member	Fracture Mechanics, Computational Solid Mechanics
<p>Professor Sourav Pal Director Indian Institute of Science Education and Research (IISER) Kolkata Nadia Mohanpur (West Bengal) 741246</p>	Member	Theoretical Chemistry, Electronic Structure Theory, Ab initio quantum Chemistry
<p>Professor Kapil Paranjape Professor of Mathematics Indian Institute of Science Education and Research (IISER) Mohali Sector 81, SAS Nagar Mohali 140306</p>	Member	Geometry
<p>Professor GVR Prasad JC Bose National Fellow Department of Geology Centre for Advanced Studies University of Delhi Delhi 110007</p>	Member	Vertebrate Palaeontology, Biostratigraphy, Palaeobiogeography, Evolution of Mesozoic Mammals
<p>Professor EV Sampathkumaran Distinguished Professor Department of Condensed Matter Physics and Materials Science Tata Institute of Fundamental Research Homi Bhabha Road, Colaba Mumbai 400005</p>	Member	Magnetism & Superconductivity

<p>Professor Abhijit Sen Emeritus Professor and INSA Senior Scientist Institute for Plasma Research Bhat Gandhinagar 382428</p>	Member	Plasma Physics and Non Linear Dynamics
<p>Professor Shobhona Sharma 1103 A, Tulsigagan Building President HS, Plot No 28 & 29 Sector 21, Kharghar Navi Mumbai 410210</p>	Member	Parasite Biology and Immunology
<p>Professor Yashwant Singh INSA Senior Scientist & Distinguished Professor Department of Physics Banaras Hindu University Varanasi 221005</p>	Member	Condensed Matter Theory, Theoretical Biology
<p>Dr RV Sonti Director National Institute of Plant Genome Research Aruna Asaf Ali Marg New Delhi 110067</p>	Member	Pathogen-plant interactions
<p>Professor GD Yadav Vice-Chancellor & R.T. Mody Distinguished Professor J.C Bose National Fellow (DST) Institute of Chemical Technology Nathalal Parekh Marg, Matunga Mumbai 400019</p>	Member	Chemical Engineering, Green Chemistry and Engineering, Catalysis Science and Engineering, Energy Engineering.
<p>Professor Subhasis Chaudhuri Director Indian Institute of Technology Bombay Powai Mumbai 400076</p>	GoI Nominee Additional Member	Computer Vision, Image Processing, Machine Learning and Haptics
<p>Professor GC Mishra NASI-Platinum Jubilee Chair Distinguished Professor National Centre for Cell Science NCCS Complex Ganeshkhind Pune 411007</p>	NASI Nominee Additional Member	Immunology
<p>Professor R Ramamurthi A-9, Vaikuntapuram MR Palli Tirupati 517502</p>	ISCA Nominee Additional Member	Animal Physiology & Environmental Biology

Fellows Elected 2019
(Effective from January 1, 2020)

1. **Baskaran, Sundarababu** (b 16.06.1961), PhD, Professor, Department of Chemistry, Indian Institute of Technology-Madras, Chennai.

Prof. Baskaran has developed domino strategies for the assemblage of natural products of biological interest.

2. **Bhandari, Nita** (b 12.11.1955), PhD, President and Director, Centre for Health Research and Development, Society for Applied Studies, New Delhi.

She is a clinical scientist working in population based research with high impact on Child Health Nutrition in the developing world.

3. **Chakraborty, Supriya** (b 13.12.1969), PhD, Professor, Molecular Virology Laboratory, School of Life Sciences, Jawaharlal Nehru University, New Delhi.

Professor Chakraborty has made significant contributions in understanding biology of plant-virus interactions. He has deciphered novel functions of viral proteins in replication and the stimulation of viral genome transcription in crop models such as tomato, cowpea and okra.

4. **Chatterjee, Mitali** (b 02.11.1960), MBBS, MD, PhD, Professor, Department of Pharmacology, Institute of Postgraduate Medical Education and Research, Kolkata.

She identified clinico-immunological determinants in post kala azar dermal leishmaniasis, which is a major scourge in India and in the third world countries thus paving the way for improved management of the disease.

5. **Chattopadhyay, Arun** (b 05.12.1964), PhD, Professor, Department of Chemistry, Indian Institute of Technology, Guwahati.

For his fundamental contributions to nanoscale material science and technology by way of devising new methods of synthesis as well as applications in submicron scale color lithography and tunable luminescence of quantum dot complexes

6. **Chawla-Sarkar, Mamta** (b 07.07.1970), PhD, Scientist E, Division of Virology, National Institute of Cholera and Enteric Diseases, Kolkata.

She has made substantial research contribution towards understanding host-pathogen interaction and viral pathogenesis for targeted drug development for influenza A and Rota viruses, diseases of global concern.

7. **Dhawan, Jyotsna** (b 31.03.1959), PhD, Chief Scientist and Professor (AcSIR), CSIR-Centre for Cellular and Molecular Biology, Hyderabad.

Dr Dhawan has made fundamental contributions in the area of stem cell research, to define the mechanisms by which adult muscle stem cells attain and maintain progress of self-renewal via control of epigenetic, transcriptional and signaling networks with implications for improving skeletal muscle regeneration.

8. **Garg, Pramod Kumar** (b 10.05.1963), MD, DM, Professor, Department of Gastroenterology, All India Institute of Medical Sciences, New Delhi.

His research on the pathophysiology of chronic pancreatitis has led to its identification as a genetically determined disease with new genetic mutations (4 in India). He has developed a non surgical treatment of acute pancreatitis.

9. **Hamied, Yusuf Khwaja** (b 25.07.1936), PhD, DSc, Non-Executive Chairman, CIPLA Ltd., Mumbai Central, Mumbai.

Dr Hamied is an outstanding R&D expert, a courageous industrialist and an outspoken statesman for affordable drugs for the treatment of HIV, Anti-cancer and Anti-Asthmatics etc. He is the only Indian who has succeeded in his mission of National significance by way of offering essential drugs at low prices.

10. **Jasra, Raksh Vir** (b 28.11.1952), PhD, Senior Vice President (R&D), R&D Centre, Reliance Industries Limited, Vadodara Manufacturing Division, Vadodara.

For his significant contributions to the development and commercialization of chemical processes based on innovative catalytic and adsorption phenomena

11. **Khosla, Sanjeev** (b 05.06.1969), PhD, Staff Scientist-VI, Centre for DNA Fingerprinting and Diagnostics (CDFD), Hyderabad.

For his outstanding contribution in dissecting the mutual epigenetic modulations between Mycobacteria and its host cells.

12. **Krishnamurthy, Manchikanti** (b 21.04.1969), PhD, Professor H, Tata Institute of Fundamental Research, Hyderabad.

For his pioneering contributions to the experimental study of intense, ultrashort laser interactions with clusters, in particular the demonstration of the counter-intuitive, near complete neutralization of highly charged ions to produce MeV neutral atom beams, and his lateral stride in the generation of high brightness hard x-ray emission from plasmas produced in biological cells.

13. **Krishnan, Raghavan** (b 15.03.1965), PhD, Scientist G & Executive Director, Centre for Climate Change Research, Indian Institute of Tropical Meteorology, Pune.

Outstanding contributions in earth system modeling of climate including Indian monsoon

14. **Malhotra, Pawan** (b 16.11.1960), PhD, Group Leader, Malaria Biology Group, International Centre for Genetic Engineering and Biotechnology, New Delhi.

For his outstanding contribution in dissecting the key components of the malarial parasite and the development of therapeutic strategies.

15. **Mehta, Neelesh B** (b 09.01.1975), PhD, Professor, SPW 205, ECE Dept., Indian Institute of Science, Bengaluru.

Prof. Mehta has made fundamental contributions to the modelling, design, analysis, and optimization of cellular systems, cooperative relaying, cognitive radio, and green sensor networks. He has characterized the new trade-offs that arise in energy harvesting networks, invented opportunistic selection algorithms and optimal criteria, and developed widely-used tools for analyzing wireless systems. The cutting-edge and practically driven nature of his work has also led to his being actively engaged with several leading wireless communication

companies such as Qualcomm, Broadcom Corp., Nokia, and Boeing. Prof. Mehta's contributions have been recognized by way of the Shanti Swarup Bhatnagar Award in Engineering Sciences (2017), Swarnajayanti Fellowship, Fellowships of IEEE (USA), INAE and NASI, and the INAE Young Engineer Award. Prof. Mehta's citation record is impressive, with 4,500 citations and h-index of 35 as per Google Scholar.

16. **Munshi, Ritabrata** (b 14.09.1976), PhD, Professor, Indian Statistical Institute, Kolkata.

Munshi is an outstanding young mathematician who is considered a world leader in the theory of L-functions. Specifically, his work in the sub-convexity problem for higher rank L-function is path breaking.

17. **Nath, Utpal** (b 11.09.1965), PhD, Associate Professor, Department of Microbiology and Cell Biology, Indian Institute of Science, Bengaluru.

Professor Nath has done pioneering work in the field of leaf morphogenesis. His work has given insights on leaf growth patterns and its planar geometry using genetic and genomic tools in model plants.

18. **Padmanabhan, Janardhan** (b 15.02.1960), PhD, Senior Professor (G) and Dean, Physical Research Laboratory, Ahmedabad.

Outstanding contributions in solar wind turbulence on magnetosphere and atmosphere

19. **Ramakrishnan, Uma** (b 23.12.1972), PhD, Associate Professor, Ecology and Evolution, National Centre for Biological Sciences, TIFR, Bengaluru.

Uma Ramakrishnan is an outstanding conservation geneticist who has made consistent contribution to wildlife ecology using both reductionist and mathematical modeling approaches. Her work on the population genetics of iconic animals such as the tiger, and of bird communities in the sky islands of the Western Ghats is renowned.

20. **Saha, Bhaskar** (b 02.01.1964), PhD, Scientist G, National Centre for Cell Science, Pune.

For his outstanding contribution in elucidation of novel immune response and signaling mechanisms in cancer and infectious diseases.

21. **Sandeep, Kunnath** (b 03.04.1974), PhD, Associate Professor, TIFR Centre for Applicable Mathematics, Bengaluru.

Sandeep Has made significant contributions in the study of Hardy-Sobolov-Mazya equations, particularly discovering a hyperbolic symmetry in the solution and developed analytical tools to study semilinear elliptic PDE's in the hyperbolic space.

22. **Sankararaman, Sethuraman** (b 15.10.1957), PhD, Institute Chair Professor, Department of Chemistry, Indian Institute of Technology Madras, Chennai.

Prof. Sankararaman has made significant contributions to modern acetylene chemistry and N-heterocyclic carbene chemistry.

23. **Shenoy, Vijay Balakrishna** (b 07.01.1971), PhD, Professor, Department of Physics, Indian Institute of Science, Bengaluru.

Prof. Shenoy is a very versatile and creative theorist who has made original contributions to a wide variety of topics in physics. His most important recent discoveries are in the area of

synthetic non-Abelian gauge fields in cold atom systems where an excitation called the rashbon appears, and the idea that topological phases can appear in amorphous systems.

24. **Singla-Pareek, Sneha Lata** (b 30.04.1969), PhD, Group Leader and National Officer, Plant Stress Biology, International Centre for Genetic Engineering and Biotechnology, New Delhi.

Dr. Singla-Pareek has made pioneering contributions on the role of the glyoxalate pathway in stress tolerance. She has unveiled the cross-talk between different stress responses for plant adaptation. She has developed marker-free transgenic rice for abiotic stress tolerance.

25. **Sivan, Kailasavadivoo** (b 14.04.1957), PhD, Secretary, Department of Space and, Chairman, ISRO, Bengaluru.

Professor Sivan has immensely by contributed in the design and development of the Launch Vehicles of India, including several strategic technologies and their adaptation, initiating research and development in new niche and critical areas, transfer of technology to industry for wider use and public benefit.

26. **Subramanian, Kandaswamy** (b 02.09.1957), PhD, Distinguished Professor (HAG) and Dean, Visitor Academic Programmes, Inter University Centre for Astronomy and Astrophysics, Pune.

For his fundamental contributions towards our theoretical understanding of astrophysical magnetic fields, especially their generation through the turbulent dynamo process and their possible primordial signatures in the Cosmic Microwave Background Radiation.

27. **Trivedi, Prabodh Kumar** (b 15.06.1969), PhD, Senior Principal Scientist, Molecular Biology and Biotechnology Division, CSIR- National Botanical Research Institute, Lucknow.

He has made major achievements in basic science applications to crop improvement. Notable publications are in pathway engineering of secondary metabolites in plants and in environmental biotechnology. Developed GM model plants for insect resistance and animal bone health.

28. **Verma, Mahendra Kumar** (b 27.05.1966), PhD, Professor, Department of Physics, Indian Institute of Technology Kanpur, Kanpur

Prof M. K. Verma has made seminal contributions in the field of MHD turbulence based on results from high performance computer simulations based on the well-known code TARANG which he conceptualized and developed, and his analysis of turbulence based on renormalization group theory.

29. **Wani, Mohan Ramchandra** (b 01.01.1965), PhD, Scientist G, National Centre for Cell Science, University of Pune Campus, Pune.

He has made outstanding and original contributions in the area of bone and cartilage remodeling and regenerative medicine. He demonstrated for the first time that IL-3 prevents pathological bone loss and stimulates new bone formation.

Foreign Fellows Elected 2019
(Effective from January 1, 2020)

1. Attfeld, John Paul (b. 1962), Chair of Materials Science at Extreme Conditions, School of Chemistry and Centre for Science at Extreme Conditions (CSEC), King's Buildings, University of Edinburgh, Mayfield Road, Edinburgh, EH9 3JZ, UK.

Professor Attfeld has extensively contributed to the understanding of the electronic structure of solids. He discovered how unusual conducting and magnetic properties arise as a consequence of a material's chemical composition and structure. He has interacted closely with Indian scientists for over two decades.

2. Braunschweig, Holger (b. 1961), Professor of Chemistry (W3), Institut für Anorganische Chemie, Julius-Maximilians-Universität Würzburg, Am Hubland, 97074 Würzburg, Germany.

Professor Braunschweig's research interests center around organometallic and main group chemistry with a particular emphasis on boron and transition metal-based molecules, and their applications in synthesis, catalysis and material science. His work on transition metal borylene complexes continues to have a major impact on contemporary organometallic chemistry, particularly in terms of activation of small molecules such as dinitrogen.

3. Graner, Andreas (b. 1957), Executive Director, Leibniz Institute of Plant Genetics and Crop Plant Research (IPK), Corrensstr. 3, D-06466 Seeland OT Gatersleben, Germany.

Professor Graner has been at the forefront of plant breeding by developing genomic tools, mapping of agronomic traits and identifying the underlying genes in barley and wheat. In addition, he has explored new ways to deploy genomic information for the advancement of both conservation management and utilization of ex situ collections.

INSA MEDAL FOR YOUNG SCIENTIST AWARDEES- 2019

1. **Dr Mainak Bose** (b 29.07.1986), PhD, European Molecular Biology Laboratory (EMBL), Germany

Dr Bose discovered important steps of miRNA regulation involving biogenesis, turnover and exosome-mediated transport between mammalian cells. His work in the context of *Leishmania* contributes important therapeutic angles in macrophages.

2. **Dr Anirvan Chakraborty** (b 19.09.1985), PhD, Department of Mathematics and Statistics, Indian Institute of Science Education and Research (IISER) Kolkata, Mohanpur, Nadia

Anirvan Chakraborty has made fundamental contributions in developing statistical methods for infinite dimensional data. His work provides useful and interesting insights into probabilistic models for high dimensional data

3. **Dr Krishna Reddy Challa** (b 14.06.1985), PhD, Department of Biology and AERS, West Virginia State University, USA

Dr Challa Krishna Reddy has done outstanding work on mechanisms by which plant morphogenesis is regulated by key developmental genes. One such component was the TCP4 transcription factor, whose role he addressed using in depth genetic, cellular and molecular analysis.

4. **Dr Abhik Narayan Choudhury** (b 04.11.1984), PhD, Department of Materials Engineering, Indian Institute of Science, Bengaluru

For his outstanding contributions to the development of phase field models to address microstructural evolution in complex systems and in their experimental validation.

5. **Dr Tanmay Neelesh Deshpande** (b 15.11.1984), PhD, School of Mathematics, Tata Institute of Fundamental Research, Mumbai

Tanmay Deshpande has made outstanding contributions to the field of “Geometric Representation Theory”. His work on character sheaves on unipotent and solvable groups is highly commendable and has opened up the area.

6. **Dr Siddhesh Balkrishna Ghag** (b 25.03.1986), PhD, Centre for Excellence in Basic Sciences (UM-DAE CEBS), University of Mumbai, Mumbai

Dr. Ghag, presently a DST-INSPIRE faculty and NASI Young scientist awardee did focused work to develop banana for wilt resistance. He deployed a defensin protein from *Petunia* and developed *Fusarium* wilt resistant transgenic banana, used SiRNA strategy against a transcription factor to control the pathogen, developed somaclonal mutants and is currently working on biocontrol. His evaluation of different strategies could lead to the development of agronomically good banana lines with resistance to this important disease.

7. **Dr Gnanasekaran Gunadayalan** (b 05.07.1986), PhD, Department of Botany, Madras Christian College, Chennai

His contributions in plant taxonomy using field data and modern tools with special reference to genus *Andrographis* and family Acanthaceae are highly commendable.

8. **Dr Trinath Jamma** (b 16.09.1986), PhD, Department of Biological Sciences, BITS Pilani-Hyderabad Campus, Hyderabad

Cross-communication between signalling pathways during Mycobacterial infection.

9. **Dr Anukul Jana** (b 27.01.1984), PhD, Tata Institute of Fundamental Research Hyderabad, Hyderabad.

For his exploratory studies of low-valent low-coordinate main group compounds, their applications in developing novel catalysts and materials, and reactions of diradicals.

10. **Dr Geetharani K** (b 22.05.1984), PhD, Department of Inorganic and Physical Chemistry, Indian Institute of Science, Bengaluru.

For her contributions to the development of cost effective and earth abundant metal catalysts for the synthesis of organoboranes as synthetic intermediates for pharmaceuticals, agrochemicals and functional materials.

11. **Dr Siddhesh Shashikant Kamat** (03.01.1985), PhD, Department of Biology, Indian Institute of Science Education and Research, Pune

Dr Kamat has uncovered lipid changes in PHARC human disease where he showed important changes in lipase function. Currently he is mapping lipid epoxide changes during cellular oxidative stress. His collaborative help is significantly contributing in other areas of work involving lipid vesicle recycling and proteome changes.

12. **Dr Bidya Binay Karak** (b 25.08.1984), PhD, Department of Physics, Indian Institute of Technology (Banaras Hindu University), Varanasi

Dr. Bidya Binay Karak made fundamental contributions to our understanding of how the 11-year sunspot cycle is produced by the dynamo process. His work led to a comprehensive theory of the large fluctuations in the sunspot cycle, especially the Maunder minimum. He also carried out state-of-the-art 3D simulations of the dynamo process.

13. **Dr Rohan Jayant Khadilkar** (b 22.04.1987), PhD, Department of Cellular and Physiological Sciences, Faculty of Medicine, Life Sciences Institute, University of British Columbia, Canada

Dr Khadilkar's work uncovered mechanistic description of ARF1-ASrig mediated cross-talk in the endosomal pathway relevant for stem cell maintenance in *Drosophila* hematopoiesis. Interestingly the same interaction plays important role in NFKb pathway.

14. **Dr Mudasir Ahmad Khanday** (b 21.06.1985), PhD, Harvard Medical School, Harvard University, USA

Dr. Mudasir Khanday's research *in vivo* system in rats has advanced our knowledge in delineating the neurophysiological and neurochemical regulation of rapid eye movement sleep.

15. **Dr Nikhil Kunjalli Lokesh** (b 19.10.1988), PhD, Charité - Universitätsmedizin Berlin, Berlin

Dr. Nikhil Lokesh's work unraveled the physiology and molecular basis of "early" and "late" chronotypes exhibited by circadian rhythms in *Drosophila*.

16. **Dr Uttam Manna** (b 01.09.1984), PhD, Department of Chemistry, Indian Institute of Technology Guwahati, Guwahati.

For his outstanding contributions to design and synthesis of reactive and self-healing polymeric gels and of unique three-dimensional materials exhibiting superhydrophobicity.

17. **Dr Archita Mishra** (b 19.10.1986), PhD, Singapore Immunology Network, Agency for Science, Technology and Research, Singapore

Repurposing FDA approved drugs to target *Mycobacterium tuberculosis* metabolic pathways.

18. **Dr Puneet Kumar Patra** (b 08.06.1988), PhD, Department of Civil Engineering, Indian Institute of Technology Kharagpur, Kharagpur.

Innovative molecular simulation methods to study the energy transport in low-dimensional systems using molecular simulations, and the development of novel thermostats for non-equilibrium systems.

19. **Dr Raghavendra S Patwardhan** (b 27.12.1984), PhD, Radiation Biology & Health Sciences Division, Bhabha Atomic Research Centre, Mumbai

He has made significant contributions in the field of radiation biology. Undertook exploration to search for radiation modifying strategies which would be of help to cancer patients undergoing radiation therapy. He has identified baicalein and chlorophyllin as putative radio protectors with potential for immediate phase 1 trial.

20. **Dr Rishi Raj** (b 21.02.1984), PhD, Department of Mechanical Engineering, Indian Institute of Technology Patna, Patna

Innovative techniques for significantly enhancing phase-change heat transfer in zero gravity environments.

21. **Dr Irfan Rashid** (b 17.08.1984), PhD, Department of Earth Sciences, University of Kashmir, Srinagar

For his outstanding research on implications of changing climate and other anthropogenic forcings on glacier dynamics & hazards, snow cover changes, land system-alpine vegetation dynamics, lake & wetland health over Jammu and Kashmir region.

22. **Dr Aritra Sarkar** (b 25.12.1984), PhD, Fatigue Studies Section, Metallurgy and Materials Group, Indira Gandhi Centre for Atomic Research, Kalpakkam

Significant contribution to the experimental determination and analysis of creep fatigue interactions in life estimation of steels

23. **Dr Namisha Sharma** (b 29.08.1987), PhD, National Institute of Plant Genome Research, New Delhi

Dr. Namisha Sharma has made significant contributions towards understanding the small RNA-mediated defense response in tomato against *Tomato leaf curl New Delhi virus* (ToLCNDV). Dr. Sharma has demonstrated the novel role of miR159-MYB33 regulatory module in facilitating disease resistance by activating Sw5-mediated HR mechanism. Dr. Sharma has also developed a novel method for developing transgenic tomato cultivars tolerant to ToLCNDV infection.

24. **Dr Tarun Kumar Sharma** (b 08.09.1985), PhD, Center for Biodesign and Diagnostics, Translational Health Science & Technology Institute, Faridabad

Dr Sharma has expertise in aptamer based diagnostics and has made significant contributions in the field of TB diagnostics. These tests which appear to perform better than the existing nucleic acid amplification tests and antibody based ELISA are in the process of commercialisation. He is also involved in the process of developing aptamer based assay for detection of snake venom.

25. **Dr Pallavi Singh** (b 03.08.1985), PhD, Department of Plant Sciences, University of Cambridge, Cambridge

Dr. Pallavi Singh has done pioneering work to identify and delineate the key role of a mitogen activated protein kinase in conferring submergence tolerance in rice.

26. **Dr Anjani Kumar Tiwari** (b 01.07.1986), PhD, Department of Physics, Indian Institute of Technology Kanpur, Kanpur

For innovative experiments on random lasing in scattering media and for devising methods to control lasing properties in interesting cavity geometries.

27. **Dr Chandni U** (b 22.05.1985), PhD, Department of Instrumentation and Applied Physics, Indian Institute of Science, Bengaluru

For her innovative and challenging experimental work on electron transport in a variety of low-dimensional systems and structural transitions and critical phenomena in shape memory systems.

28. **Dr Supradeepa VR** (b 21.09.1984), PhD, Centre for Nano Science and Engineering, Indian Institute of Science, Bengaluru

Development of efficient cascaded Raman fibre lasers with tunable wavelength for high power laser applications.

29. **Dr Sneha Yadav** (b 10.04.1984), PhD, Space Physics Laboratory, Vikram Sarabhai Space Centre, Thiruvananthapuram

For her outstanding contribution towards understanding of low latitude ionosphere specific to Indian longitudes under varying space weather conditions.

30. **Dr Vikas Yadav** (b 18.10.1989), PhD, Department of Molecular Genetics and Microbiology, Duke University Medical Center, USA

Involvement of RNAi in *Cryptococcus* centromere structure and their dynamics.

INSA Teachers Awardee 2019

1. **Professor Sankar Bose** (b 07.06.1968), Department of Geology, Presidency University, Kolkata.

For his significant contributions to teaching in Earth Science and mentoring students to pursue research.

2. **Professor Goutam Brahmachari** (b 14.04.1969), Department of Chemistry, Siksha-Bhavana (Institute of Science), Visva-Bharati, Santiniketan.

Professor Goutam Brahmachari has been chosen for INSA Teachers Award for his noteworthy contributions in Chemistry education and teaching at Master's level.

3. **Dr Raka Vasant Dabhade** (b 14.07.1965), Department of Physics, Fergusson College, Pune.

Professor Raka Vasant Dabhade has enthused generations of students at the undergraduate level, not only through teaching but also by means of setting up and nurturing an 'Astro-Club' which, expanding much beyond its name has fostered the spirit of free enquiry and research, her roles in outreach and in training students to engage in the same are exceptional.

4. **Dr Sagarika Vivek Damle** (b 28.06.1967), Department Of Life Sciences Kishinchand Chellaram College, Mumbai.

She has initiated a unique UG research program in the College- titled "Jigyasa- Science Honours Program". It is 18-month certificate program, recognized by the UGC as an innovative program. Many UG students have published papers from their research in College on topics ranging from RAPD analysis of plant diversity, to analysis of phytochemicals in indigenous plants of Maharashtra. She has also involved students in plantation of indigenous species for urban greening.

5. **Professor Sudipta De** (b 31.10.1966), Mechanical Engineering Department, Jadavpur University, Kolkata.

Professor Sudipta De via his teachings in emerging interdisciplinary areas, has inspired a large number of students.

6. **Professor Paramartha Dutta** (b 14.06.1966), Department of Computer and System Sciences, Visva Bharati University, Santiniketan.

Professor Paramartha Dutta has inspired a large number of students with his excellent teaching and research.

7. **Professor Debashis Ghoshal** (b 01.09.1964), School of Physical Sciences, Jawaharlal Nehru University, New Delhi.

Professor Debashis Ghoshal has seamlessly integrated his research in fundamental Physics with teaching of a wide-ranging basket of subjects, thereby successfully mentoring students not only at his home institution, but also those pursuing education & research at others. Moreover, he has played an outstanding role in identifying and nurturing research talent from across the country.

8. **Professor Saibal Gupta** (b 22.12.1966), Department of Geology & Geophysics, Indian Institute of Technology, Kharagpur.

In recognition of his outstanding contributions to Earth Science Teaching and for inspiring many students to pursue research in Earth Science.

9. **Professor Sanjay Kumar** (b 05.07.1966), Department of Chemistry, IIT Madras, Chennai.

Professor Sanjay Kumar has been chosen for INSA Teachers Award for his continued excellence in Undergraduate Chemistry teaching to engineers.

10. **Professor Rohit Manchanda** (b 03.01.1964), Department of Biosciences and Bioengineering, Indian Institute of Technology Bombay, Mumbai.

He is a uniquely accomplished teacher and communicator, and an award-winning writer of fiction. He has used his communication skills to regularly give talks in schools and colleges for science popularization. He is consistently evaluated very highly by IIT students, and has won IIT Bombay Excellence in Teaching Award thrice already.

11. **Professor Neela Nataraj** (b 31.05.1968), Department of Mathematics, Indian Institute of Technology Bombay, Mumbai.

Professor Neela Nataraj has excelled in her teaching with her noteworthy contributions.

12. **Dr Sathyakumar Sambandam** (b 11.03.1965), Wildlife Institute of India, Dehradun.

Recognised for his extraordinary teaching and motivational skills to draw young students to challenging areas of high altitude and mountain ecology; and Biodiversity conservation and management in trans-boundary landscapes.

Presidential Remarks

Council

Fellows/ Foreign Fellows/ Young Scientists/ INSA Awards / Teachers Award/ INSPIRE

- Beginning this year, e-voting introduced. Foreign and Pravasi Fellows have also participated in the voting process. They will have same Rights and Privileges as Indian Fellows.
- Out of 464 nominations, 29 (including six women) were elected as Fellows this year; 3 Foreign Fellows were also elected.
- The youngest is aged 43 years and oldest is 83 years. Average age is 55.24 years.
- Out of 586 nominations for Young Scientist award, 30 were finally selected.
- Since inception in 1974, 849 young scientists selected out of which 114 were elected as INSA Fellows.
- Instituted TV Desikachary Memorial Medal bringing the total tally of awards to 70.
- Out of 98 nominations for Teachers Award, 12 were selected
- During the 2nd session of 2018, 59 INSPIRE Faculty Fellows were selected out of 1158 applicants.
- From this year only one round of selection process will be conducted.

Science & Society

- National Science Day celebrated on 28th February. Professor Ashutosh Sharma delivered the Meghnad Saha Medal (2018) Lecture on ***Navigating Complexity by Common Sense***. Five INSA publications also released.
- A joint science academies document on Open Access and observations on Draft National Education Policy were prepared.
- 21 lectures were delivered under Remote Area programme.
- An Interactive meeting of summer research fellows working in Delhi labs with INSA Fellows was held on 8th July. Professor Gaiti Hasan delivered an inspiring talk on ***Big Answers from Small Brains***.
- 21 new members were inducted in INYAS. Total membership : 96
- INYAS is organizing the general assembly of Global Young Academy in June 2020. Around 200 young overseas scientists are expected to participate.

Science Promotion

- Number of Senior Scientist's positions raised from 75 to 100
- 53 Conferences supported. Number of conferences to be supported p.a. raised to 80.
- 26 Senior Scientists, 18 Honorary Scientists and 5 Emeritus Scientist positions offered.
- 66 scientists availed Visiting Fellowship.

History of Science

- A publication on *Emergence of Modern Science in Colonial India* was brought and released on National Science Day.
- National Commission approved 12 new projects and renewed another 12.
- A day long seminar on *Studies in History and Philosophy of Science* was arranged at Jadavpur University last week.
- One researcher was awarded INSA Young Historian of Science Award.

Publication

- All the three journals, Proceedings of INSA, IJPAM and IJHS published as per schedule.
- INSA Year Book was split into two volumes. Volume I will be updated every year and where is Volume II will be published in once in five years.
- Published 4 special publications viz viz. ***Ethics in Science Education, Research and Governance*** (Editors: K. Muralidhar, A Ghosh and AK Singhvi); ***Water Futures: Status of Science and Technology*** (Editors: PP Mujumdar and VM Tiwari); ***Emergence of Modern Science in Colonial India*** (Editors: AK Bagh, Arnab Rai Choudhuri and Deepak Kumar); ***Fellowships and Funding Opportunities for School Students: Way Forward*** (Author: Muthamilarasan Mehanathan) during the period.

Informatics

- Upgraded 25 desktop machines from 2GB to 4GB RAM.
- Purchased 15 Windows 10 Professional Machines, one laptop and one printer.
- Informatics Unit inventory software and Sales Software has been developed
- Purchased CISCO Meraki MR52 Wi-Fi & WIPS advanced setup for INSA. Installation work will start soon.

International Programme

- On the recommendations of National Committees, 6 scientists were nominated for various positions under International Science Council Union / Committees. This includes nomination of Professor LS Shashidhara for President, IUBS and Professor AK Singhvi for President, INQUA.
- A German (October 2018) and a Chinese (July 2019) delegation visited INSA for enhancing bilateral cooperation.
- Two Indo-UK Projects on Energy and Water Quality were reviewed in December 2018 which experts from both the countries participated. A mid-term review of Projects under Water Quality was done in UK early this month. Shri SP Mishra from INSA participated.
- Professor AK Sood represented INSA in Inter Academy Seoul Science Forum and Dr Chandrima Shaha in AASSA General Assembly, both in October 2018. Professor Subrata Sinha participated in symposium on Global Mental Health in an Era of Sustainable Development in South Africa in May 2019.
- 10 Indian young researchers visited Japan as a part of DST-JSPS Fellowship programme.
- Professor PM Ajayan, (Rice University, Houston, USA) delivered the Jawaharlal Nehru Birth Centenary Lecture (2019) at IISc, Bengaluru on 19 July, 2019.
- 26 Indian and 7 Overseas scientists were exchanged under INSA bilateral exchange programme. Besides 7 Indian scientists were supported for International conferences under ISC banner.
- LOC of the URSI Asia Pacific Radio Science Conference meeting was held at INSA (December 2018).
- Executive Committees of IUGS and the International Geological Congress Committee met Indian National Committee for IUGS in May 2019.
- INSA has bid for hosting the 15th Quadrennial Symposium on Solar Terrestrial Physics in September 2021.