

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

Minutes of the Virtual Annual General Meeting of the Indian National Science Academy held on 5 October, 2021.

The following Fellows attended the meeting:

1. Professor Chandrima Shaha, President
2. Professor V Chandrasekhar, Vice-President (Science Promotion)
3. Dr Amit Ghosh, Vice-President (Publications)
4. Professor Gaiti Hasan, Vice-President (Fellowship Affairs)
5. Professor DV Khakhar, Vice-President (Science & Society)
6. Professor Subrata Sinha, Vice-President (Resource Management)
7. Professor Tapan Adhya
8. Professor Madhoolika Agrawal
9. Professor Faizan Ahmad
10. Professor Nahid Ali
11. Dr Mahtab S Bamji
12. Professor DM Banerjee
13. Professor Manju Bansal
14. Dr Anirban Basu
15. Dr Nita Bhandari
16. Dr Shinjini Bhatnagar
17. Professor SV Bhat
18. Professor Santanu Bhattacharya
19. Professor SN Bhattacharya
20. Professor NM Bujurke
21. Dr Nirranjan Chakraborty
22. Dr SL Chaplot
23. Professor Supriya Chakraborty
24. Professor Amitabha Chattopadhyay
25. Professor Debashish Chowdhury
26. Professor Sampa Das
27. Professor Dasgupta
28. Professor Amol Dighe
29. Dr LC Garg
30. Professor Aswini Ghosh
31. Professor Kunal Ghosh
32. Professor NR Jagannathan
33. Professor ED Jemmis
34. Professor KT Joseph
35. Professor Amitabh Joshi
36. Dr Dinakar Kanjilal
37. Professor Tarun Kant
38. Professor M Lakshmi Kantam
39. Dr Sanjeev Khosla
40. Professor Krishan Lal
41. Professor Sulabha Kulkarni
42. Professor Anurag Kumar

43. Professor Sandeep Kunnath
44. Professor AN Lahiri Majumder
45. Professor Rentala Madhubala
46. Dr HK Majumder
47. Professor SS Majumdar
48. Professor Mahitosh Mandal
49. Professor NK Mehra
50. Dr Viswanathan Mohan
51. Professor Rahul Mukherjee
52. Professor V Nagaraja
53. Dr SWA Naqvi
54. Professor Natarajan
55. Professor Sankar K Pal
56. Professor Sourav Pal
57. Professor Maharaj K Pandit
58. Professor Rahul Pandit
59. Professor Kapil Paranjape
60. Professor Deepak Pental
61. Professor VK Pillai
62. Dr Manoj Prasad
63. Professor LC Rai
64. Professor SS Rai
65. Professor TR Ramadas
66. Dr T Ramamurthy
67. Professor SS Ramasesha
68. Professor Sriram R Ramaswamy
69. Professor Saurabh Rindhani
70. Professor HA Ranganath
71. Professor Mamiyil Sabu
72. Professor Poonam Salotra
73. Professor EV Sampathkumaran
74. Dr RS Sangwan
75. Professor MK Sanyal
76. Professor Abhijit Sen
77. Professor Maithili Sharan
78. Professor Shobhana Sharma
79. Professor TR Sharma
80. Professor Ajit Iqbal Singh
81. Professor Kulinder Pal Singh
82. Professor Mewa Singh
83. Professor Narpinder Singh
84. Professor Sarvajit Singh
85. Professor Vinod K Singh
86. Professor Bikash Sinha
87. Professor Sudeshna Sinha
88. Dr RC Srimal
89. Dr Sarala K Subbarao
90. Professor Kandaswamy Subramanian
91. Professor MK Surappa
92. Professor Qudsia Tahseen
93. Professor BK Thelma

94. Dr PK Tripathi
95. Professor GD Veerappa Gowda
96. Professor GD Yadav
97. Professor OP Yadav

Note: Some Fellows who joined the meeting with different names (reflected in list like.... PC, Lenovo, Pixel 3, Dasgupta, Natarajan, could not be identified and hence could not be included in the above list)

President, INSA welcomed all the Fellows. Thereafter, the regular agenda items were taken up.

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

The sad demise of Professors Chunni Lal Khetrpal, Thanu Padmanabhan, Inder Bir Singh Passi, Fellows and Professor Saburo Nagakura, Foreign Fellow of the Academy were reported. The obituary notes were read by the President, INSA and all those who were attending the meeting stood in silence for a minute as a mark of respect to the departed soul.

2. Confirmation of minutes of General Body Meeting held on 10 July, 2021.

Professor Gaiti Hasan, Vice-President (Fellowship Affairs) gave a brief overview of the issues discussed in the General Body Meeting of the Academy held on 10 July, 2021. The minutes were, thereafter, confirmed by the members of the general body.

3. Announcement of result of scrutiny of voting papers for election of Officers and Members of the Council for the year 2022.

President, INSA thanked Professor Niranjana Chakraborty and Dr D Kanjilal who were appointed as scrutineers for counting the e-votes for the election of Fellows, Foreign Fellows and INSA Council for 2022. She also profusely thanked Mr Dharendra Tripathi for his support in developing an e-voting portal and conducting the voting process for the election of Fellows, Foreign Fellows and Council during last three years.

Professor Gaiti Hasan announced names of those who were elected as members of the Council 2022. The list is attached at **Annexure-I, p/ 7)**

4. Announcement of result of scrutiny of voting papers for election of Fellows and Foreign Fellows for the year 2022.

Professor Gaiti Hasan, Vice-President announced names of those elected as Fellows and Foreign Fellows of INSA and read their citations (as per list at **Annexure-II, p/ 8-17).**

5. To announce the INSA Awards for 2021.

Professor Gaiti Hasan, Vice-President announced the names of the awardees. (list enclosed at **Annexure-III, 18-19).**

6. Announcement of name of recipients of the INSA Medal for Young Scientist Award 2021.

The names and brief citation of 36 scientists (*Annexure-IV, p/ 20-26*) selected as awardee of INSA Medal for Young Scientists 2021 were announced by Professor Gaiti Hasan, Vice-President.

7. Announcement of name of recipient of the INSA Young Historian of Science Award 2021.

Professor Gaiti Hasan, Vice-President announced the names of two INSA Young Historian of Science Awardees for the year 2021 :

Mr. Anand Viswanathan (b 21.01.1987), Research Associate, Center for Ancient History and Culture, Jain University (deemed), Bengaluru.

for the significant contributions made by him towards understanding in Pre-Siddhantic Astronomy with special reference to *Vridha-gargiya-jyotisham*.

Dr. S. Uday Kumar (b 01.03.1987), Post-doctoral Research Associate, Heritage Science and Society program, School of Humanities, National Institute of Advanced Studies, Bengaluru.

for the significant contributions made by him towards understanding ancient Technology and Science through an Archaeo-Experimental Approach.

8. Announcement of name of recipients of the INSA Teachers Award 2021.

Professor Gaiti Hasan, Vice-President announced the names of the 15 outstanding Teachers (*Annexure-V, p/ 27-30*) as recipient of the INSA Teachers Award for the year 2021.

9. To announce the voting results on amendments of INSA Rules: 6a and 6b.

Professor Gaiti Hasan, Vice-President informed the Fellowship that Academy had circulated an electronic ballot paper for voting to modify Rule 6a and 6b. 91.66% of Fellows voted in favour of the Rule 6(a) and 88.33% of Fellows voted in favour of Rule 6(b). The Rule, thus, stands amended.

10. Announcement of names of representatives of Cooperating Academies and the Govt. of India on the Council of INSA for the year 2022.

The names of Professors Kunal Ghosh, Paramjit Khurana, R Ramamurthi and Ashish Kumar Lele as representatives of the Asiatic Society, the National Academy of Sciences (India), Indian Science Congress Association and the Govt. of India, Department of Science & Technology, respectively were announced.

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

Professor Gaiti Hasan, Vice-President informed that the number of Fellows as on 5 October, 2021 stood at 941.

12. To read as required under Rule 40(c) the name of nominees for election as INSA Fellow / Foreign Fellow from 23 May, 2021 to 15 June, 2021.

Professor Gaiti Hasan, Vice-President, INSA read the names of those whose nominations were received for election as INSA Fellow.

13. Announcement of institution of an award in the memory of Late Professor Deepak Gaur, FNA.

President, INSA informed the decision of the Council to institute a new endowment award named as **Professor Deepak Gaur Memorial Medal**. The Medal will be awarded to a scientist (below 50 year of age) who has made outstanding contributions in the field of **Infectious Diseases Biology and Interventions**. The award carries an honorarium of Rs 25,000/, a bronze medal and a citation. The first award will be given in the year 2022.

14. Announcement of Institution of 'Anandibai Joshi Oration' and 'Kadambini Ganguly Oration' for 2022 onwards.

President, INSA informed the decision taken in the Council to institute two new awards. She briefly mentioned about two women in medicine who broke a number of firsts to become full fledged doctors in India. Their struggle, their efforts and their successes have become inspiration for many women scientists. They are great role models for women coming into science. To honor both of them, INSA plans to institute two orations in their names. The orations are to be delivered by eminent women scientists, one in the first half of a given year and one in the second half of the same year. Each speaker will be given a gold plated copper medal and a citation. The cost will be met from the INSA corpus fund.

15. Annual Report of the Academy for the year 2020-21.

Professor Gaiti Hasan presented the highlights of the annual report along with the audited annual balance sheet for FY 2020-21. The report has been submitted to DST.

16. 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-VI, p/ 31-35**.

Any Other Item.

After the regular agenda items were over, President, INSA requested all members to make suggestions or recommendations for further improving the activities of the Academy.

Professor Deepak Pental raised few issues like Higher investments in R&D, Competitive grants system, a better deal for young scientists and National level Professorships (attached at ***Annexure-VII, p/ 36***). He proposed, President, INSA may take the lead in discussing these issues and any additional issues suggested by the fellowship and develop a set of recommendations for the Government of India to implement for rapid and sustainable development of the country. The Presidents of other Science, Engineering and Medical Sciences academies may be requested to join in the process of developing these recommendations.

Professor NK Mehra supported Professor Pental's recommendations for increasing the GDP for R&D.

President advised that Professor Pental's recommendations will be circulated to entire fellowship for their comments.

Professor MK Surappa apprised that, quality of research in science in India has not improved. Hence, the criteria for election of INSA Fellowship may be relooked. Not only number of papers but also the impact of the papers should be considered for electing fellows.

President, INSA requested all Fellows to attend the Webinars conducted by INSA.

Professor Krishan Lal informed that there is further scope for INSA to be engaged in various international activities. President intimated that the Academy is trying to participate and be involved in various international activities.

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

Council 2022

President: Professor Chandrima Shaha, Kolkata

Vice-Presidents:

Dr Amit Ghosh, Kolkata

Professor DV Khakhar, Mumbai

Professor Gaiti Hasan, Bengaluru

Professor NK Mehra, Gurugram

Professor SR Wadia, Bengaluru

Professor Subrata Sinha, New Delhi

Members:

Professor DM Banerjee, Delhi

Professor Santanu Bhattacharya, Kolkata

Dr Srivari Chandrasekhar, Hyderabad

Professor Amitabha Chattopadhyay, Hyderabad

Professor Debashish Chowdhury, Kanpur

Professor Tarun Kant, Mumbai

Professor Anurag Kumar, Bengaluru

Professor M Lakshmi Kantam, Mumbai

Dr Subeer S Majumdar, Hyderabad

Dr SC Mande, New Delhi

Professor V Nagaraja, Bengaluru

Dr SWA Naqvi, New Delhi

Professor TR Ramadas, Kelambakkam

Professor EV Sampathkumaran, Mumbai

Professor Chitra Sarkar, New Delhi

Professor Maithili Sharan, New Delhi

Dr Amit Prakash Sharma, New Delhi

Dr Tilak Raj Sharma, New Delhi

Professor Sudeshna Sinha, Mohali

Professor Vidita Ashok Vaidya, Mumbai

Fellows Elected 2021
(Effective from January 1, 2022)

1. Athreya, Siva Ramachandran (b 07.01.1971), PhD, Professor, Indian Statistical Institute, Bengaluru.

Professor Siva Athreya is a leading probabilist who has made very significant contributions to various areas of current interest in probability theory. These include - properties of measure-valued branching processes, martingale problems associated with interactive super-Brownian motion, strong existence and uniqueness for stable stochastic differential equations with distributional drift, invariance principle for random walks on trees. He has also made significant contributions in the interplay of probability theory with statistical physics and population biology.

2. Bakhshi, Sameer (b 13.09.1969), MD, Professor, Department of Medical Oncology, Dr BRA Institute Rotary Cancer Hospital, All India Institute of Medical Sciences, New Delhi.

Professor Bakhshi is a leading paediatric oncologist and has been running a bone marrow transplant program at AIIMS, New Delhi and his major research interest is in childhood leukemias, mainly acute lymphoblastic leukemia of B cell origin. His work on acute myeloid leukemia (AML) showed the role of proliferating and apoptotic markers in AML and revealed that inherited mitochondrial variations can have prognostic significance. He has also contributed immensely on retinoblastomas, bone tumours and sarcomas and has initiated and conducted number of clinical trials.

3. Basak, Soumen (b 15.12.1974), PhD, Staff Scientist VI, National Institute of Immunology, New Delhi.

Dr Basak has spearheaded the use of systems-modelling analysis to probe the molecular basis of key biological pathways in immune homeostasis, host-virus interactions and cancer deregulation. Importantly, he has made seminal contributions in understanding the cross-talk between distinct NF κ B signalling pathways and their implications for inflammation in disease.

4. Basu, Bikramjit (b 15.09.1973), PhD, Professor, Materials Research Center, Indian Institute of Science, Bengaluru.

A path breaking work of Professor Basu is on the use of electric/ magnetic field stimulation of multifunctional biomaterials as an effective bioengineering strategy to modulate the cell functionality on engineered surfaces. The research of Professor Bikramjit Basu has led to development of new materials and technologies. The development of the piezo-bio composites with bone-mimicking functional properties, patient-specific biomedical prototypes for total hip joint replacement surgery, dental reconstruction/ restoration, cranioplasty, and urological applications are perceived as a paradigm shift at the frontiers of biomaterials science.

5. Bhat, Navakanta (b 29.04.1968), PhD, Professor and Chair, Centre for Nano Science and Engineering, Indian Institute of Science, Bengaluru.

Professor Navakanta Bhat has a long list of major contributions to electronic devices. This includes his work on sensors using novel materials such as electrochemical biosensors that led to a point of care diagnostic device (now the basis of a start-up) and highly sensitive gas detectors based on his own work on 2D devices. In device engineering, his major contributions are low resistance ohmic contacts for graphene and MoS₂ leading to 6X reduction of contact resistance, a process to enable high RF inductor performance in Zinc Ferrite, use of a buried channel transistor to generate high performance normally-off transistors for GaN, etc.

6. Bhattacharyya, Aninda Jiban (b 09.10.1968), PhD, Amrut Modi Chair Professor, Solid State and Structural Chemistry Unit, Division of Chemical Sciences, Indian Institute of Science, Bengaluru.

He has designed and tested many unique multifunctional materials controlling their length, time and energy scales systematically to modulate their applications in diverse electrochemical systems and processes of relevance to energy harvesting and high-performance energy storage devices.

7. Chakraborty, Subhra (b 25.09.1964), PhD, Director, National Institute of Plant Genome Research, New Delhi.

Dr Chakraborty is an leading expert is in the area of nutritional and stress genomics particularly in plants. She is recognized internationally for her proteomic discoveries with implications for biotic stress signaling. In addition, she has contributed immensely in translational research in relation to plant health and human nutrition, with about 100 publications in respected journals and with 18 international patents.

8. Chandak, Giriraj Ratan (b 07.06.1963), PhD, MD, Chief Scientist (Scientist G) and Professor, CSIR-Centre for Cellular and Molecular Biology (CSIR-CCMB), Hyderabad.

Dr GR Chandak has made outstanding contributions in understanding the genetic basis and gene-nutrient interaction in complex human genetic disorders. His studies have proved genetic basis of tropical calcific pancreatitis and mutational and genetic heterogeneity by identify novel genes and different spectrum of mutations in Indians. He has also provided evidence of novel genetic factors while establishing the role of various genes in complex diseases like type 2 diabetes between Indians and Europeans. He has also established causal role of micronutrients like B12 in the developmental programming of obesity and insulin resistance which predict future susceptibility to cardiometabolic syndrome.

9. Chandra, Nagasuma (b 16.05.1965), PhD, Professor, Department of Biochemistry, Indian Institute of Science, Bengaluru.

Professor Nagasuma Chandra has provided leadership to the development of systems biology research in India. Through integration of bioinformatics and structural biology into systems biology, and by devising novel algorithms she has made path-breaking contributions on understanding disease mechanisms and on reversing drug-resistance in MDR and XDR strains of *Mycobacterium tuberculosis*.

10. Chandran Leela, Sunil (b 22.04.1974), PhD, Professor, Department of Computer Science and Automation, Indian Institute of Science, Bengaluru.

Professor Sunil Chandran Leela is a leading expert on the geometric representation of graphs, including his recent work on representation of cubic graphs as the contact graph of axis-parallel rectangles. Professor Sunil Chandran's investigations of various aspects of the notion of boxicity of graphs, through several works spread over more than a decade and a half, have led to the development of important upper and lower bounding techniques; these have attracted new interest in this parameter. Professor Chandran-Leela is also well recognised for his several works connecting various parameters of graphs; these works address and make progress on some deep open problems in graphs theory, including the famous Hadwiger's conjecture.

11. Chauhan, Manmohan Singh (b 05.01.1960), PhD, Director, ICAR- Central Institute for Research on Goats, Mathura.

Dr Chauhan has made major contributions in the field of Reproductive Biotechnology of Livestock. Has developed several assisted reproductive technologies like, IVF, Ovum Pick-up, Stem-Cell and animal cloning for generating superior livestock. Produced many cloned buffalo-calves using hand guided cloning; the first and only person to practice that in India. This successful teamwork brought to him the prestigious Rafi Ahmad Kidwai award.

12. Dhurandhar, Sanjeev Vishnu (b 29.11.1951), PhD, Emeritus Professor, Inter-University Centre for Astronomy and Astrophysics (IUCAA), Pune.

Sanjeev Dhurandhar is a pioneer of gravitational wave research in India and has contributed outstandingly in this area in the last three decades. He and his group made original contribution to the development of foundational techniques and methods for extracting gravitational wave signals from gravitational wave detector data.

13. Ehtesham, Nasreen Zafar (b 28.03.1959), PhD, Director-in-Charge, National Institute of Pathology, Safdarjung Hospital Campus, New Delhi.

Dr Nasreen Zafar Ehtesham has made significant contributions in the areas of (A) Nutrition and metabolic disorders; (B) The intricate triangle of infection-inflammation and unfolded protein response (UPR), and (C) Understanding the pathogen that causes Tuberculosis (TB). While her work has been well cited in all these areas, her contributions in the area of Infection-inflammation and UPR can be considered outstanding. Her pioneering work conclusively showed that human resistin is functionally different from mouse resistin. This established the role of human resistin as a chaperone protein involved in UPR.

14. Gahalaut, Vineet Kumar (b 26.09.1966), PhD, Senior Principal Scientist, CSIR-National Geophysical Research Institute, Hyderabad.

Dr Vineet Gahalaut has been the key Indian contributor for sustained and large-scale GPS measurements towards quantifying the tectonic plate motions, studies on large earthquakes and the process of strain build-up along major plate boundaries and fault zones within and around India. His work has elucidated seismic hazard due to plate

movements in the Himalaya, the Burmese arc and the Andaman subduction zone with novel results of inter-seismic locking of major faults. These form the basis of complete understanding of the Sumatra 2004 earthquake. He also used crustal deformation arising from seasonal variation of water storage to monitor the impact of climate change on water resources.

15. Govindarajan, Rama (*b* 26.08.1962), PhD, Senior Professor and Dean Academic, International Centre for Theoretical Sciences, Tata Institute of Fundamental Research, Bengaluru.

Professor Rama Govindarajan has contributed over many different aspects of fluid mechanics, including the important fields of instabilities in viscous and stratified flows and the ubiquitous multiphase flows involving the dynamics of bubbles and drops in immiscible continuous medium in different regimes. She is a researcher par excellence in terms of depth, originality, creativity and the overall impact of her work. It is difficult to imagine the contemporary literature without her contributions.

16. Hari, KVS (*b* 10.05.1962), PhD, Professor, Department of ECE, Indian Institute of Science, Bengaluru.

Professor KVS Hari has seminal contributions to Multiple-Input-Multiple-Output (MIMO) communications, such as his classic work on root-MUSIC algorithm for Direction of Arrival estimation, his major role in the Stanford University Interim models for wireless channels that became a part of IEEE 802.16 standards, and his contributions to spatial modulation in MIMO systems, sparse signal processing, neuroscience, etc., which show his exceptional versatility.

17. Kant, Rama (*b* 18.01.1963), PhD, Professor, Department of Chemistry, University of Delhi, Delhi.

He is a pioneer in theoretical electrochemistry. He has developed phenomenological theories to provide an in-depth understanding of electric double layers, electrochemical response, and electrode kinetics of rough and fractal electrodes.

18. Kolthur-Seetharam, Ullas (*b* 30.07.1974), PhD, Professor, Department of Biological Sciences, Tata Institute of Fundamental Research, Mumbai.

Dr Ullas Kolthur used systems level approaches to dissect molecular machineries involved in metabolic sensing and maintenance of physiological homeostasis. These sensing mechanisms are derailed in several human diseases with diabetes, cancer, neurodegeneration being some examples. His research gives novel and deep insights on mitochondrial functions, cellular energy sensing and their crosstalk with nuclear gene expression. The implications for organismal physiology, metabolic and age-related diseases are clear.

19. Kulkarni, Giridhar Udapi Rao (*b* 22.07.1963), PhD, President, Jawaharlal Nehru Centre for Advanced Scientific Research, Bengaluru.

He has made pioneering contributions in the areas of Materials Chemistry covering mesoscale organizations of metal and semiconductor nanocrystals, direct-write patterning of nanomaterials, twisted graphene as well as fabrication of nanodevices. His

unique approach has led to translation of lab-level inventions into demonstrable prototypes and realising technology leads.

20. Kumar, Vinod (b 14.11.1956), PhD, Professor, Department of Zoology, University of Delhi, Delhi.

Professor Vinod Kumar has contributed to the understanding of how in a shared ecological niche, a self-sustained timekeeping system sensitive to multiple environmental cues, enables individuals and species to schedule their behavioral activities in the most profitable way. The fundamental concept that the endogenous circadian clock mediating seasonal responses in migratory birds is flexible to the photoperiod environment was conceptualized and experimentally proved in his laboratory.

21. Maiti, Prabal Kumar (b 25.03.1969), PhD, Professor, Department of Physics, Indian Institute of Science, Bengaluru.

For his pioneering contributions in understanding (i) the unusual translational and orientational dynamics of water confined in nanotubes/nanorings, (ii) DNA-based nanostructures, (iii) unzipping and melting of DNA strands, (iv) DNA packaging, (v) phase transition in surfactant bilayers and (vi) the structure of dendrimers, using novel techniques of computer simulations and analytical tools.

22. Majumder, Gobinda (b 26.02.1967), PhD, Professor (H), Tata Institute of Fundamental Research, Mumbai.

Dr Gobinda Majumder has played major roles to select and design the CMS electromagnetic calorimeter, essential in the discovery of Higgs boson in gamma-gamma channel and led the design and construction of the CMS outer hadron calorimeter at CERN. He has played a key role in SUSY searches and probing QCD predictions at LHC, heavy quark sector studies at CLEO and rare B-meson decays at BELLE. He developed the INO simulation and reconstruction program for the ICAL detector, used by the entire INO collaboration.

23. Mallik, Roop (b 02.03.1970), PhD, Professor, Department of Biosciences and Bioengineering, Indian Institute of Technology Bombay, Mumbai.

Professor Roop Mallik, an internationally highly recognized mechanobiologist, demonstrated how in cells opposite-directed motor proteins exert tug-of-war like forces. These biophysical forces coordinate intracellular cargo motions to guide cellular processes like phagosome trafficking to lysosomes or lipid vesicle movement within hepatocytes. His contributions are seminal, very unique in combining intensive biophysical and cell biology tools to address basic biology questions with high translational opportunities.

24. Mandal, Prabhat (b 01.11.1959), PhD, Professor (H), Condensed Matter Physics Division, Saha Institute of Nuclear Physics, Kolkata.

For high standard research in the field of transition metal oxides and topological systems. For building-up a world class laboratory for growing extremely good quality

single crystal which is capable of producing high quality research as evident from the fact that many of his observations were for the first time and later reproduced by others.

25. Mukherjee, Prasun Kumar (b 18.10.1963), PhD, Scientific Officer H, Professor and, Head, Environmental Biotechnology Section, Nuclear Agriculture and Biotechnology Division, Bhabha Atomic Research Centre, Mumbai.

Dr Mukherjee made seminal contributions in biocontrol of plant diseases by understanding the basic biology and genetics of *Trichoderma* spp. He discovered novel gene clusters for secondary metabolism in *Trichoderma* and developed formulations which are widely used in agriculture and biomass waste management.

26. Parida, Swarup Kumar (b 26.05.1979), PhD, Scientist IV, National Institute of Plant Genome Research, New Delhi.

Dr Swarup made outstanding research contributions in designing genetic markers and devising strategies for integrated genomics-assisted breeding for genetic improvement of rice and chickpea. His work has led to effective delineation of superior trait-associated genes and their alleles for producing high-yielding crop varieties. Two chickpea genotypes developed by him are in advanced stages of testing in All India trials of ICAR

27. Patil, Nitin Tukaram (b 22.05.1975), PhD, Associate Professor, Department of Chemistry, Indian Institute of Science Education and Research (IISER) Bhopal, Bhopal.

He has made outstanding contributions in gold catalyzed carbophilic activations and cross-coupling reactions. The methodologies developed by him are of importance in natural product synthesis and have promising applications in material science and biology.

28. Prabhakaran, Dorairaj (b 22.08.1961), MD, DM, Vice President (Research and Policy) and Director, Centre for Control of Chronic Conditions, Public Health Foundation of India, Gurgaon.

Dr Dorairaj Prabhakaran has made seminal contributions in the area of epidemiology of cardiovascular disease that helps in understanding and mitigating cardiovascular health issues in the community. His work relates to house hold clustering of chronic disease risk factors, which helps in understanding how different mechanisms both environmental and genetic can interact with each other to give rise to risk factors for non-communicable diseases. Beyond his scholarly contributions he has been an effective mentor having trained a large number of youngsters, and has also played an important role in science advocacy and in policy.

29. Raghuram, Anantharam (b 16.01.1971), PhD, Professor, Department of Mathematics, Indian Institute of Science, Education and Research, Pune.

Professor A Raghuram is a leading expert on the special values of automorphic L-functions. He has extensively used deep geometric methods from the cohomology of arithmetic groups, and analytic methods from the Langlands program, to give a cohomological interpretation to an analytic theory of L-functions, thus paving the way to study rationality properties of their special values. In his foundational work, in collaboration with Günter Harder, Raghuram systematically studied Eisenstein

cohomology of locally symmetric spaces attached to $GL(N)$ over a totally real number field, and applied this machinery to prove rationality results of special values of Rankin—Selberg L-functions. Raghuram has made important developments in the study of p-adic interpolation of L-values for $GL(2n)$ to give a purely arithmetic proof of nonvanishing results for central L-values that are entirely in the realms of analytic number theory.

30. Rao, Thota Narayana (*b* 15.08.1969), PhD, Group Head, Clouds and Connective Systems Group (CCSG) and Scientist-SG, National Atmospheric Research Laboratory, Gadanki (Andhra Pradesh).

Dr TN Rao's research on rain microphysics and spatio-temporal variability of precipitating systems has revealed that evaporation and collision-coalescence processes during the descent of rain drop dictate their drop size distribution and thereby determine surface rain in arid and semi-arid regions. His research has direct application in improving estimates of precipitation using radar and satellite measurements. In a novel approach, he combined radar observations with isotopic analysis to explain puzzling short-term variations of heavier isotopes in precipitation. Most importantly, he has led the indigenous development and establishment of UHF wind profiler and X-band dual-polarization radar at NARL.

31. Saha-Dasgupta, Tanusri (*b* 12.11.1966), PhD, Senior Professor and Dean (Academic), Department of Condensed Matter Physics and Materials Science, SN Bose National Centre for Basic Sciences, Kolkata.

Tanusri Saha-Dasgupta has developed a novel method of modeling and computation of electronic structure of complex functional compounds with strong correlation effects. This led to understanding of the complicated physical processes and in particular of the microscopic processes that come about from strong correlation effects coupling with system-specific degrees of freedom.

32. Sharma, Dinesh Kumar (*b* 02.05.1950), PhD, Adjunct Professor, EE Department, Indian Institute of Technology Bombay, Mumbai.

Professor Dinesh K Sharma has made outstanding contributions to teaching and research in electrical engineering over a distinguished career at IIT Bombay. In addition to his remarkable scientific and engineering contributions to the field of semiconductor devices, he has put his knowledge to practical use in a number of instances. Most notably so, as a technical expert for the development of electronic voting machines (EVM), which have a continuing impact on the ability to carry out successfully the mammoth exercise of conducting elections in the world's largest Democracy such as ours, with a high degree of trust among the people. This contribution makes his nomination particularly worthy of election in this special category.

33. Singh, Inderjit (*b* 24.12.1963), PhD, Professor, Department of Environmental Studies, University of Delhi, Delhi.

Professor Inderjit Singh has excelled in ingeniously dissecting the otherwise complex ecological process of plant invasions, into simple yet impressive principles. His work on invasion ecology stands out from the rest in: (a) formulating logical hypotheses to explain why some species are successful as invaders, and (b) testing these hypotheses by a range of experiments that stretch from lab to landscape. Using a combination of

ecological and evolutionary theoretical framework, he has demonstrated that the plants that invade a new ecosystem do so by manipulating the soil microbiota and thence the biochemical niche that favors its establishment at the cost of native flora. Owing to the new path he has treaded in the field of invasion ecology, his work is globally recognized resulting in a wide range of collaboration across several countries.

34. Singhal, Rekha Satishchandra (b 07.02.1962), PhD, Professor of Food Technology and Dean (Research, Consultancy and Resource Mobilization), Institute of Chemical Technology, Mumbai.

Dr Singhal developed methods for supercritical fluid extraction of industrially important food constituents and new carbohydrate-based biomaterials from indigenous sources as import substitutes for fermentative production of biomolecules and additives in food processing. Her work on hydrocolloids to reduce oil uptake in deep fried foods has made a major impact on food industry.

35. Srinivasan, Narayanaswamy (b 01.04.1962), PhD, Professor and Chair, Molecular Biophysics Unit, Indian Institute of Science, Bengaluru.

Professor Srinivasan has contributed significantly to the development of new approaches to recognize 3-D structures, functions and interaction properties of proteins, and their applications in contexts of protein phosphorylation, infectious diseases. He has also worked on several projects with applied interests, for example, the repurposing of drugs to combat host-pathogen interactions.

36. Sriram, Mayasandra Subrahmanya (b 04.11.1950), PhD, Professor, Professor KV Sarma Research Foundation, Chennai.

Professor Sriram worked in Dept. of Theoretical Physics, University of Madras for about 30 years, getting interested in History of Science in the latter part of his tenure. Through a large number of scholarly volumes which serve as source of crucial, scientific information on the early development of Astronomy and Mathematics in India and various other publications in journals as well as invited articles in encyclopedias, Prof. Sriram has been able to bring to light, in an authentic manner, without an iota of hyperbole, some of the remarkable contributions made by Indians to Astronomy and Mathematics, which had remained only partially known, or totally unknown for long and for this reason he is highly suited for election under this special category.

37. Tiwari, Virendra Mani (b 05.11.1968), PhD, Director, CSIR- National Geophysical Research Institute, Hyderabad.

Dr VM Tiwari, using gravity and magnetic data has contributed to the understanding of crustal structure and geodynamics of the Indian lithosphere. His works on determination of effective elastic strength of Indian lithosphere, the extent of under-thrusting of Indian crust and crustal eclogitization under Himalayan collision zone, models on localization of large thrust earthquakes in Sunda-Andaman Subduction zone, and numerical simulations of present-day tectonic stress across Indian subcontinent have provided important insights on Indian lithospheric geodynamics. Using GRACE (Gravity Recovery and Climate Experiment) satellite data, he has made a pioneering contribution towards understanding of temporal and spatial variations of the water storage in Indo-Gangetic

alluvial tract and demonstrated that it suffers from extreme water loss ascribed to over exploitation.

38. Venkataraman, Chandra (b 03.06.1963), PhD, Professor, Department of Chemical Engineering, Indian Institute of Technology Bombay, Mumbai.

Professor Venkataraman Chandra's contributions towards understanding aerosol processes within multi-scale atmospheric phenomena are widely acclaimed. Her research combined with experimental studies of polluting particles, data-driven energy-emission modelling, and atmospheric model simulations have changed conventional concepts on the origin of atmospheric absorption over South Asia. Her work on the origin of black carbon emissions in India led to the development of an Indian emissions inventory for the assessment of air pollution and climate change. She provided compelling evidence for aerosol influences on rainfall suppression and heat-wave enhancement in the Indian region.

39. Verma, Akhilesh Kumar (b 01.09.1968), PhD, Professor, Department of Chemistry, North Campus, University of Delhi, Delhi.

He has made significant contribution towards development of methodologies using alkynes and transition metal reagents for the synthesis of N-heterocycles – valuable intermediates of medicinal importance.

40. Vijayachari, Paluru (b 10.05.1962), MD, PhD, Scientist G & Director, Regional Medical Research Centre (ICMR), Department of Health Research, Ministry of Health & FW, Port Blair.

Dr P Vijayachari is a leader in the field of leptospirosis. As a member of expert advisory group to the WHO Director General, he along with other members estimated the global disease burden of leptospirosis. As a head of WHO collaborating Centre on leptospirosis, he was instrumental in establishing reference laboratories across India, Sri Lanka, Indonesia, Nepal and Bhutan. He isolated a new strain of *Leptospira* that is associated with severe form of haemorrhagic fever in Andaman Islands. Recently, he organized a world congress on leptospirosis in Port Blair and developed a road map for prevention and control of leptospirosis.

Foreign Fellows Elected 2021
(Effective from January 1, 2022)

- i. **Cooks, Robert Graham** (b. 02.07.1941), *Henry Bohn Hass Distinguished Professor, Department of Chemistry, Purdue University, 560 Oval Drive, West Lafayette, IN 47907, USA.*

Professor Cooks is an intellectual leader in analytical chemistry and has contributed significantly to the premier position that Purdue University holds in this field. He is widely considered to be the leading active scientist in mass spectrometry. His multiple reaction monitoring method (MRM) is widely used in proteomics. His early work on energy transfer in ion collisions led to a method of chiral determination by mass spectrometry. He was the first to use a matrix to improve ionization and he invented the ambient ionization methods.

- ii. **Mukamel, Shaul** (b. 11.12.1948), *Distinguished Professor of Chemistry and of Physics and Astronomy, University of California, Irvine, Department of Chemistry-1102 Natural Sciences II, Irvine, CA 92697-2025.*

Professor Mukamel had pioneered the field of coherent ultrafast multidimensional molecular spectroscopy across the electromagnetic spectrum from the THz to the X-ray regime. His unified diagrammatic framework for nonlinear spectroscopy based on "Liouville space pathways" and his popular textbook "Principles of Nonlinear Optical Spectroscopy (1995), commonly referred to as "The Bible" of nonlinear spectroscopy, had created the standard language for the design and interpretation of ultrafast spectroscopic signals of molecules.

- iii. **Ramesh, Ramamoorthy** (b. 10.06.1960), *Purnendu Chatterjee Professor, Department of Physics and Department of Materials Science & Engineering, University of California, Berkeley, CA 94720.*

Professor Ramesh's work on complex oxide thin film epitaxy, heterostructure and superlattice synthesis has led to several fundamental and applied discoveries, spanning atomic scale design of interfaces in ferroelectrics materials and memories, colossal magneto resistance in manganite, electric field control of magnetism using multiferroics.

SUBJECTWISE MEDALS / LECTURES / AWARDS
(Due for the Year 2020 & 2021)
Announced during Council Meeting

| <i>Name of Award</i> | <i>Name of Awardee</i> |
|---|--|
| SUBJECTWISE MEDALS / LECTURES / AWARDS | |
| For the Awards due for the year 2020 | |
| MEDALS INSTITUTED BY THE ACADEMY | |
| 1. Homi Jehangir Bhabha Medal (2020) | Professor HR Krishnamurthy, FNA |
| 2. Sunder Lal Hora Medal (2020) | Professor HA Ranganath, FNA |
| 3. Prasanta Chandra Mahalanobis Medal (2020) | Professor Arup Bose, FNA and Professor Mythily Ramaswamy |
| ENDOWMENT LECTURES | |
| 4. Professor Bal Dattatraya Tilak Lecture (2020) | No Award |
| For the Awards due for the year 2021 | |
| MEDALS INSTITUTED BY THE ACADEMY | |
| 1. Satyendranath Bose Medal (2021) | Professor Rahul Pandit, FNA |
| 2. Darashaw Noshervanji Wadia Medal (2021) | Professor DM Banerjee, FNA |
| 3. Golden Jubilee Commemoration Medal - for Animal Sciences (2021) | Dr R Sukumar, FNA |
| ENDOWED MEDALS | |
| 4. Vishwakarma Medal (2021) | Professor Thalappil Pradeep, FNA |
| 5. Professor GN Ramachandran 60 th Birthday Commemoration Medal (2021) | Dr Amit P Sharma, Pravasi Fellow |

| | |
|--|--|
| 6. Professor Krishna Sahai Bilgrami Memorial Medal (2021) | Professor Narpinder Singh, FNA |
| 7. Professor Har Swarup Memorial Medal (2021) | Professor Paramjit Khurana, FNA |
| 8. Professor Subramania Ranganathan Memorial Medal (2021) | Professor Amit Basak, FNA |
| 9. Professor SK Joshi Memorial Medal (2021) | To be decided |
| <i>ENDOWMENT LECTURES</i> | |
| 10. Dr Nitya Anand Endowment Lecture (2021) | Professor Asit Kumar Chakraborti, FNA and Professor Sandeep Verma, FNA |
| 11. Professor Vishnu Vasudeva Narlikar Memorial Lecture (2021) | To be decided |
| 12. Professor Vishwa Nath Memorial Lecture (2021) | To be decided |

RECIPIENTS OF INSA MEDAL FOR YOUNG SCIENTISTS- 2021

1. **Dr Mohd Asgher** (10.04.1987), PhD, School of Biosciences and Biotechnology, Department of Botany, Baba Ghulam Shah Badshah University, Rajouri (J & K).

Dr. Mohd Asgher has carried out excellent work on the role of heavy metals and signaling molecules in plant physiology using cultivated and medicinal species. In particular, his research on ethylene optimization using sulphur supplementation for augmenting photosynthesis and growth under cadmium stress can be used for developing heavy metal tolerant genotypes. He has also shown that the toxicity of arsenic may be reduced by using H₂O₂ as a signaling molecule. His research on reactive oxygen species (ROS) in *Valeriana wallichii*, an important medicinal herb of the Himalayan region, provides insights into amelioration of oxidative stress and improving reproductive performance.

2. **Dr Mrigya Babuta** (17.10.1987), PhD, Beth Israel Deaconess Medical Center and Harvard Medical School, Massachusetts, USA.

Mrigya Babuta has identified novel molecules in a new pathway for phagocytosis in the protozoan parasite *Entamoeba histolytica*. Her work is the first detailed molecular study on phagocytosis in this organism and has important implications for understanding parasite virulence and disease.

3. **Dr Anjana Badrinarayanan** (15.08.1986), PhD, National Centre for Biological Sciences (TIFR), Bengaluru.

Anjana Badrinarayanan has applied novel approaches to make novel fundamental findings on how bacterial cells maintain genome integrity and repair DNA under conditions of stress. These have future implications for development of new strategies to combat infection.

4. **Dr Agnid Banerjee** (09.02.1988), PhD, TIFR CAM, Bengaluru.

Dr Agnid Banerjee has made significant contributions to the study of strong unique continuation property for fractional parabolic equations and sublinear parabolic equations and higher regularity of free boundary in the parabolic Signorini problem.

5. **Dr Anirban Basak** (30.01.1986), PhD, International Centre for Theoretical Sciences, Tata Institute of Fundamental Research, Bengaluru.

Dr Anirban Basak has made a distinguished beginning in what promises to be an outstanding research career in the theory of Random Matrices. His work on the sharp dependence of the invertibility property of a sparse matrix, on a specific relationship between its sparsity parameter and the order, is very significant .

6. **Dr Haritha Bollinedi** (23.07.1987), PhD, Division of Genetics, Indian Agricultural Research Institute (IARI), New Delhi.

Dr Haritha Bollinedi has made important contributions by analysing technical complexities in molecular events required for crop improvement by transgenic approaches. Her work on molecular characterization of provitamin A enriched golden rice lines, identification of stable donors and QTLs for Fe and Zn, analysis of genetic variation in starch composition of rice endosperm and identification of novel LOX3 null genotypes, are important for addressing the global challenges of hidden hunger, obesity and type-2 diabetes.

7. **Dr Dhiman Chakravarty** (11.03.1988), PhD, Bhabha Atomic Research Centre, Mumbai.

Dr. Dhiman Chakravarty has done significant work in unravelling the underlying mechanisms involving specific Mn-catalase for overcoming environmental stresses especially salt/desiccation stress in the agriculturally important nitrogen fixing cyanobacterium *Anabaena* having immense potential for suitable biotechnological applications.

8. **Dr Aravind Kumar Chandiran** (24.06.1986), PhD, Department of Chemical Engineering, Indian Institute of Technology, Chennai.

For designing new materials for various optoelectronic, and (photo)electrochemical applications, and realizing air- and moisture-stable lead-free double/vacancy-ordered perovskites.

9. **Dr Shouvik Das** (02.01.1990), PhD, Pulse Research Lab, Division of Genetics, Indian Agricultural Research Institute (IARI), New Delhi.

Dr. Shouvik Das has made important contributions to developing large-scale genomic resources and efficient genotyping strategies for rapid quantitative dissection of complex traits in chick pea. He delineated promising major genomic loci governing flowering time, pod number and seed weight for genetic improvement of chickpea.

10. **Dr Debdip Ganguly** (20.10.1986), PhD, Department of Mathematics, Indian Institute of Science Education and Research, Pune.

Dr Debdip Ganguly has made important contributions to a broad swath of areas: Geometry and Analysis with heat kernels and Green's functions in Riemannian Manifolds. His studies on the Liouville theorem for Schrodinger operators and more recently, on hyperbolic spaces are of high quality .

11. **Dr Eshan Ghosh** (07.07.1988), PhD, Department of Drug Design and Pharmacology, Faculty of Health and Medical Sciences, Copenhagen, Denmark.

Dr. Ghosh's work focused on understanding the interaction of G protein-coupled receptors (GPCRs) with their regulatory proteins called β -arrestins (β arrests), and for modulating the functional outcomes of this interaction. He developed synthetic antibody fragments that selectively bind β -arrestin2 but not β -arrestin1, which could be used to selectively inhibit GPCR endocytosis without altering their signaling outcomes, thereby allowing a clear dissociation of endocytotic and signalling functions of β -arrestin2.

12. **Dr Najmul Haque** (05.06.1986), PhD, National Institute of Science Education and Research (NISER), Bhubaneswar.

For his outstanding work on QCD thermodynamics. He was the first to calculate the QCD thermodynamics at finite chemical potential within resummed perturbation theory (pt) up to the maximum possible loop-order (three-loop order). Three-loop HTLpt thermodynamics set a new milestone in the resummed perturbative framework in the field of theoretical nuclear physics and specifically heavy-ion physics.

13. **Dr Bharath Holla** (02.02.1986), MD, Department of Integrative Medicine, National Institute of Mental Health and Neuro-Sciences (NIMHANS), Bengaluru.

Dr. Holla's research is on studying vulnerability risks in children of parents with alcohol use disorder, as well as treatment response biomarkers. Graph-theoretical modeling of functional brain networks showed that developmentally relevant disruptions at critical brain regions sub-serving cognitive, affective, and sensorimotor processes. Recently, he developed the Indian brain templates for ages 6 to 60 years. These will be a valuable resource for neurologists, neurosurgeons, psychiatrists and neuroscientists that provide reference maps for areas of interest in individual patients with neurological disorders like strokes, brain tumors, and dementia.

14. **Dr Amit Jaiswal** (27.09.1986), PhD, Indian Institute of Technology Mandi, Mandi.

Dr. Amit Jaiswal is acknowledged for his innovative work on the development of gold nano-rattle, embedded in a shell structure as a multi-modal platform for biological sensing and theranostic applications. By bringing about a control on the shape and size of the embedded nano-rattle to tune the NIR plasmonic response and using the silica shell for SERS imaging, these nano-particle assemblages have been effective as the stimuli responsive nanomaterial for drug delivery and photothermal therapy.

15. **Dr Anshuman Kumar** (01.11.1986), PhD, Indian Institute of Technology, Bombay.

For his exceptional research which has fundamentally influenced the understanding of novel optical phenomena in two dimensional quantum materials as well as artificially engineered photonic structures called metamaterials.

16. **Dr Rajni Kumari** (01.10.1989), PhD, Department of Cell Biology, Albert Einstein College of Medicine, New York.

Dr. Kumari worked on the role of genes critical for p53 tumor suppressive functions under metabolic stress and found caspase-10 as one of the significantly upregulated p53-target genes. This has the potential for exploiting metabolic stress and caspase-10-ACLY regulation axis with therapeutic strategies for progression prevention and cancer interception.

17. **Dr Santosh Kumar Kuncha** (01.04.1990), PhD, Centre For Cellular And Molecular Biology, Structural Biology Laboratory, Hyderabad.

Dr. Kuncha has worked on how nature maintains proteome homeostasis by the use of the enzyme D-aminoacyl-tRNA deacylase for proofreading during protein biosynthesis.

During the present COVID-19 pandemic, he has also contributed to the development of a new RNA-independent mode of SARS-CoV-2 diagnosis.

18. **Dr Biplab Maji** (26.01.1987), PhD, Indian Institute of Science Education and Research Kolkata.

For his significant contributions to greener and sustainable organic synthesis using earth abundant metal catalysts.

19. **Dr Venkata Vamsee Aditya Mallajosyula** (27.09.1986), PhD, Institute for Immunity, Transplantation and Infection, Stanford University, California.

Dr. Vamsee Mallajosyula has made significant contributions in designing influenza immunogen, which was the basis for development of universal flu vaccines. Subsequently, he extended these designs to other subtypes and constructs. He also developed stem-domain fragments from various strains of H1 and H3 HA that could be expressed as soluble trimeric proteins in *E. coli*.

20. **Shri Nitesh Mishra** (08.01.1993), MSc, All India Institute of Medical Sciences, New Delhi.

Mr. Nitesh is continuing his PhD work in the field of HIV vaccine design. He made a detail presentation on identification of HIV-1 infected infants with potent anti-HIV-1 plasma broadly neutralizing antibodies and understanding the viral features that are responsible for generation of such potent plasma Abs. He explained that plasma Abs targeting the top of the viral spike are common in infants of Indian origin. His work has the potential to be an important step in the field of HIV-1 vaccine for assessing polyvalent vaccine candidates. He has very good publications in International Journals of high impact factor including Nature Communications (2020).

21. **Dr Abhishake Mondal** (02.04.1987), PhD, Indian Institute of Science, Bengaluru.

For developing new classes of molecular magnets and demonstrating photomagnetic spin-state switching in a variety of transition metal complexes and polymers.

22. **Dr Tridib Kumar Mondal** (15.04.1986), PhD, Geological Studies Unit, Indian Statistical Institute Kolkata.

For his original contributions towards elucidating the tectonic processes operative at the time of cratonization of the Archean greenstone granite belts, through innovative use of the field structures, micro-structures, anisotropic magnetic susceptibility (AMS) and paleo-stress determinations. His work has practical significance in understanding the evolution of auriferous lodes in shear zones.

23. **Dr MD Nasim** (15.01.1987), PhD, Department of Physics, Indian Institute of Science Education and Research, Berhampur, Odisha.

For his outstanding work, towards understanding the Quantum Chromodynamics (QCD) phase diagram using STAR data. This has a long lasting impact on the quark-gluons plasma (QGP) program.

24. **Dr Praneeth Kumar Netrapalli** (20.07.1986), PhD, Microsoft Research, Bengaluru.

Dr. Praneeth Kumar Netrapalli is recommended for his copious and excellent contributions to optimization algorithms for machine learning, in particular for nonconvex optimization and nonconvex-nonconcave min-max optimization in order to address issues in an adversarial framework.

25. **Dr Vamsi Pritham Pingali** (02.06.1987), PhD, Department of Mathematics, Indian Institute of Science, Bengaluru.

Dr Vamsi Pritham Pingali has made significant contributions to certain differential geometric aspects of vector bundle theory. He formulated a novel vector bundle version of the Monge- Ampère equation which gave differential-geometric interpretation of the stability of a certain class of bundles. He also proved a Kobayashi-Hitchin correspondence for this equation in the case of vortex bundles. His work on providing interesting evidence for Griffiths's conjecture on positivity criteria for ampleness of Hermitian holomorphic vector bundles is noteworthy.

26. **Dr Lakshmi Narayan Ramasubramanian** (19.05.1986), PhD, Indian Institute of Technology Delhi, New Delhi.

Dr Lakshmi Narayan Ramasubramanian has made significant contributions in the development of bulk metallic glass composites which have very high strength and at the same time high toughness. By following a new method of laser beam modulation, he has generated superior microstructures in laser additive manufactured objects.

27. **Dr Kabir Ramola** (03.05.1986), PhD, Tata Institute of Fundamental Research, Hyderabad.

For his outstanding contributions to several areas of Statistical Physics. His work elucidates how cooperative phenomena arise in interacting systems, both in and out of equilibrium, focusing on phenomena such as condensation in lattice gases, jamming and glassy behavior in athermal systems, and clustering and phase separation in locally driven systems.

28. **Dr Chinmay Saha** (05.05.1986), PhD, Genome Science School of Interdisciplinary Studies, University of Kalyani, Nadia.

Dr Chinmay Saha has worked on interaction between rice, JGTA-S1 and its endosymbiotic bacteria. JGTA-S1 was amongst the endophytes isolated from the cattail which grows in nitrogen-free media and is positive for dinitrogen reductase gene nifH. JGTA-S1 shows a dimorphic change from yeast to filament form when it is near or inside the rice plant. In its filament form JGTA-S1 interacts with bacteria. These are interesting findings as eukaryotes cannot fix nitrogen. Dr. Saha and others for the first time suggested that JGTA-S1 not only increases nitrogen uptake in plants but also fixes nitrogen.

29. **Shri Manmohan Sharma** (28.05.1989), MSc, International Centre For Genetic Engineering and Biotechnology (ICGEB), New Delhi.

Shri Sharma's work has provided the biochemical validation of plasmodium phenylalanine tRNA synthetase enzyme as a drug target for the highly potent series of anti-malarial compounds (BRD) that have the potential to become the next-generation antimalarials. His work has shown that structure-based small-molecule design strategy can generate potent inhibitors not only for malaria parasites but also against other eukaryotic pathogens.

30. **Dr Akanksha Singh** (29.04.1987), PhD, Division of Crop Protection and Production, CSIR-Central Institute of Medicinal and Aromatic Plants, Lucknow.

Dr Akanksha Singh has made important contributions to promoting and understanding the mechanism of protection of chickpea and rice against abiotic stress by rhizosphere associated microbes. She identified the anti-virulence potential of phytochemicals, like thymol oil in controlling bacterial blight in rice by inhibiting biofilm formation. In chickpea, she demonstrated the biocontrol activity of *Trichoderma* against collar rot, through redox homeostasis. Her work on the protective effect of specific anti-oxidants on promoting root colonization by rhizosphere bacteria is noteworthy.

31. **Dr Abhishek Sinha** (12.03.1987), PhD, Department of Electrical Engineering, Indian Institute of Technology Madras, Chennai.

Dr. Abhishek Sinha is recommended for his contributions to stability and optimality problems in wireless and content distribution networks, inclusive of issues such as robustness in adversarial settings using rigorous performance metrics like competitive ratio and regret functions. It includes many classical problems like routing in networks, mobile computing and caching in realistic dynamic settings.

32. **Dr Saloni Sinha** (08.03.1991), PhD, Yale University, Connecticut, USA.

Dr. Saloni Sinha has contributed towards our understanding of hematopoietic homeostasis. She deciphered the conserved role of Asrij, an OCIA domain protein and demonstrated how its absence causes the onset of myeloproliferative disorder due to loss of hematopoietic stem cell quiescence and premature aging.

33. **Dr Hrishikesh A Tavanandi** (06.04.1986), PhD, Department of Food Engineering, CSIR-Central Food Technological Research Institute, Mysore.

Dr. Hrishikesh Tavanandi has developed innovative and translatable hybrid and integrated separation processes to achieve gains in yield and quality of extractable, economically useful phytochemicals from biomass. The noteworthy processes developed by him include, high quality c-phycoerythrin from *Spirulina* and quality drying of micro-organisms by methods alternative to freeze drying. He has designed a variety of equipment for versatile applications in food processing, like those for dosa-making, lemon cutting, puffing and popping, and wet-cum dry grinding.

34. **Dr Ritika Tiwari** (01.07.1988), PhD, Cleveland Clinic, Lerner Research Institute, Cleveland Ohio, USA.

Dr. Ritika's research is towards delineating the molecular mechanism of SPINK1-mediated oncogenesis, and understanding tumour heterogeneity. She has used prostate, and colorectal cancer models to establish the functional relevance of the SPINK1 oncogene and its therapeutic implications in the patients. Importantly she verified that Casein Kinase 1 inhibitor, could be used as an adjuvant therapy to halt the progression of SPINK1-positive neuroendocrine prostate cancer. One of her papers though appeared in pubpeer but has a corrigendum published in Oncogenesis.

35. **Dr Vivek Tiwari** (21.03.1986), PhD, Indian Institute of Science, Bengaluru.

For developing state-of-the-art coherent multidimensional spectroscopic techniques and quantum dynamical models to understand ultrafast energy and charge delocalization at the nanoscale.

36. **Dr Sudipta Tung** (14.01.1989), PhD, Ashoka University, Sonapat.

Dr. Sudipta Tung has carried out original and creative work on population stability and evolution of dispersal. Using laboratory populations of *Drosophila melanogaster*, he has uncovered the behavioural, physiological and metabolic correlates of dispersal evolution. He has also investigated the efficacy of various control methods in stabilizing the dynamics of real biological populations. He combines theory and classical assays of experimental evolution with modern physiological and metabolomics techniques, which is a very rare combination in the field.

RECIPIENT OF INSA TEACHER AWARDEES (2021)

1. **Professor Vidya Dnyaneshwar Avasare**, (b 07-08-1971) Department of Chemistry & Department of Interdisciplinary Sciences, S P College, Pune

Professor Vidya Dnyaneshwar Avasare is recommended for the INSA Teacher Award for her excellent teaching of a variety of courses for undergraduate and postgraduate students including guidance of a large number of M.Sc. students, and also for development of new courses and laboratories, infusing research into teaching, and inspiring a large number of students to take up higher studies.

2. **Dr. Yashmin Choudhury**, (b 28-10-1978) Assistant Professor, Department of Biotechnology, Assam University, Durgakona Silchar Assam

Dr. Yashmin Choudhury is focusing on socially relevant biomedical issues like diabetes, and tobacco and betel-nut use, linked to high cancer risk in North-Eastern India. Through her research and teaching she is creating awareness and capacity building in biomedicine. She has made instructional videos to communicate with students in the absence of internet connectivity. She is an inspiring role model for budding women scientists.

3. **Dr. Uma Dhawan**, (b 05-09-1977) Department of Biomedical Science, Bhaskaracharya College of Applied Sciences, University of Delhi, Sector-2, Dwarka, New Delhi

Dr. Uma Dhawan has promoted teaching in human genetics, computational biology, and bioinformatics, and strongly motivates her students towards scientific research. She has initiated a highly popular certificate course on *in silico* drug design. Her undergraduate students regularly undertake small research projects under her enthusiastic guidance.

4. **Dr. Roshan D' Souza**, (b 04-04-1968) Associate Professor in Zoology, Sophia College (Autonomous), Bhulabhai Desai Road, Mumbai

Dr. Roshan D'Souza is tirelessly working to keep undergraduate Zoology teaching abreast of new research developments in the field; and provide holistic training to the students. She conducts the 'Excellence in Science Program' where students learn through seminars and project work; and is active in outreach for biology teaching to marginalized children

5. **Professor Pankajkumar Natawarlal Gajjar**, (b 15-09-1966) Gujarat University, Ahmedabad, Gujarat

Professor Gajjar has an allround contribution in teaching, research and outreach programmes. He has taught at different levels, UG and PG. Besides, he has taken interest in school education by translating NCERT physics books in gujarati. Many of his ideas have been implemented in the laboratories of the state. He has fabricated some of the equipment in the university and encouraged other institutions in the state to develop their own. He has motivated a large

number of students to join a research programme and brought about an excellent academic environment. He is also an active member of the Indian Association of Physics teachers and the Gujarat Science Academy.

6. **Professor Santosh Janardan Gharpure**, (b 07-08-1971) Department of Chemistry, Indian Institute of Technology Bombay, Powai, Mumbai

Professor Santosh Janardan Gharpure is recommended for the INSA Teacher Award for his excellence in teaching of chemistry courses for both undergraduate and postgraduate students including guidance of a large number of M.Sc. students for their project dissertations and Ph.D. students for their doctoral thesis, and also for active participation in outreach activities.

7. **Professor Naseer Iqbal**, (b 11-11-1967) Department of Physics, University of Kashmir, Srinagar

Professor Iqbal has succeeded in motivating students, both boys and girls coming from remote areas of J and K in joining a research programme. He has widened their horizons by arranging regular visits to IUCAA and other academic institutes in the country. This also involved counselling the students and sometimes their families. Professor Iqbal has set an example by teaching a variety of courses and actively pursuing research. Many of his students are faculty members in academic institutions in the country. The award is a recognition for an impact in a region full of challenges.

8. **Professor Parasar Mohanty**, (b 19-10-1967) Department of Mathematics & Statistics, Indian Institute of Technology Kanpur, UP

Parasar Mohanty strikes an excellent balance between research and teaching, bringing his research experience to bear in classroom teaching. This has resulted in a large number of his students pursuing a PhD, and many of them occupy faculty positions in premier institutes. We note also, with appreciation, his contribution to outreach activity for underprivileged students.

9. **Dr. Upendranath Nandi**, (b 03-04-1966) Associate Professor, Department of Physics Scottish Church College, Kolkata 1 & 3, Urquhart Square Kolkata West Bengal

Dr. Nandi is an outstanding teacher and has inspired his students to do excellent research. He has opened a modern research laboratory to do experimental research, a rarity in a graduate-level college. He has been teaching a wide variety of subjects from 2000 in Scottish Church College. He has been a strong motivator of many students, including from other colleges by exposing them to recent developments. His commitment to do good research has set a benchmark for others, making a lively department. He has written text books including several examples and solutions, which has helped students to grasp the basics.

10. **Dr. Charu Dogra Rawat**, (b 19-10-1977) Assistant Professor, Ramjas College, University of Delhi, Delhi

Dr. Charu Dogra Rawat has pioneered the undergraduate teaching of molecular microbiology and metagenomics through a project-based approach to expose students to practical research methodology. She organizes regular lectures/workshops for students on diverse topics. She has been conducting the Bani School innovation camp for rural students in Himachal Pradesh under INSA outreach program.

11. **Professor Prasanta Sahoo**, (b 12-07-1969) Department of Mechanical Engineering, Jadavpur University, Kolkata

Professor Prasanta Sahoo is recommended for the INSA Teacher Award in Engineering and Technology in recognition of his excellence in teaching at both undergraduate and postgraduate levels, inspirational guidance of a large number of Masters' and Ph.D. theses, and also for designing new courses, writing textbooks and outreach activities involving delivery of popular lectures for the benefit of students.

12. **Professor Pranab Sarkar**, (b 12-06-1969) Professor in Chemistry, Visva-Bharati (Central University), Santiniketan, West Bengal

Professor Pranab Sarkar is recommended for the INSA Teacher Award for his excellence in teaching of chemistry courses at both undergraduate and postgraduate levels including guidance of a large number of M.Sc. and Ph.D. students, and also for active participation in designing new courses and development of laboratories.

13. **Professor Shalivahan**, (b 10-03-1971) Dean (Research and Development), Department of Applied Geophysics, Indian Institute of Technology (ISM), Dhanbad, Jharkhand

Professor Shalivahan is recommended for the INSA Teacher Award for his passion and excellence in teaching Geophysics courses at undergraduate and postgraduate levels. As an inspirational teacher and an active researcher, he has been instrumental in developing scientific aptitude among students and motivated many students to take up research careers in Earth Science. He has the skill to explain the complicated topics in Geophysics in a lucid and easily understandable way.

14. **Professor Uma Shankar**, (b 14-11-1967) Department of Botany, North-Eastern Hill University Umshing-Mawkynroh, NEHU Campus, Shillong, Meghalaya

Professor Uma Shankar is an inspirational teacher and an active researcher. He has a great mix of master and doctoral level students hailing from different parts of the country. Professor Shankar has a long experience of working in the North Eastern Region (NER) of India, besides working in the difficult terrains of Western Ghats and in Eastern Himalaya, and successfully collaborated with the institutions in these regions.

15. **Dr. Paul Agastian Theoder**, (b 02-09-1967) Associate Professor, Plant Biology and Biotechnology, Loyola College Nungambakkam, Chennai, Tamil Nadu

Dr. P. Agastian Theoder is recommended for the INSA Teacher Award for his sincere attempts in both teaching and research to popularize science with direct relevance to the society. He has ventured into diverse efforts that attempt to strike a balance between the intellectual and utilitarian aspects in his teaching courses. In all, Dr. Theoder's career has spanned several key aspects of what constitutes motivational and inspiring teaching.

Presidential Remarks

Council

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

- Voting for Election of Fellows, Foreign Fellows and Council 2022 done electronically.
- Mr. Dharendra Tripathi helped INSA to conducting the online voting. Prof. Gaiti Hasan, VP (Fellowship Affairs) supervised the whole process.
- Total Nominations 459 , 40 Fellows (including seven women) were elected.
- Total Nominations for Foreign Fellowship- 21, 3 Foreign Fellows were elected.
- Youngest Fellow 42 years; oldest 71 years. Average age 55.95 years.
- Out of 684 nominations 36 Young Scientist have been selected.
- Total awards: 71
- Instituted Professor Deepak Gaur Memorial Medal Award.
- Out of 104 nominations for Teachers Award, 15 were selected.
- During the 2020 session, 95 INSPIRE Faculty Fellows were selected out of 2007 applicants.
- INSPIRE Faculty Fellowship Session for 2021 has already been started. The last date of applying on portal was 4th October 2021.

Science & Society

- To celebrate National Science Day the Indian National Science Academy (INSA) and the Indian National Young Academy of Science (INYAS) organized a public lecture on *Shedding Light on Dark Matter* by Prof. Rohini M. Godbole, FNA on 28 February 2021 (virtual).

- **WEBINAR**

The 1st webinar in the Indian/Foreign Fellows Webinar Series held on February 11, 2021 titled *Exploring Active Matter* by Professor Sriram R Ramaswamy, FNA, FRS (Virtual).

2nd webinar in the Indian/Foreign Fellows Webinar Series held on Aug. 05, 2021 titled *Lose Win Options: Are people in developing countries paying with their lives to reduce climate change?* by Prof AR Ravishankara, Foreign Fellow of INSA, Colorado State University, USA.

1st webinar in the *75 Years of Independence (2021- 2022) Webinar Series* held on April 16, 2021 titled *Epigenetics, Life Beyond Your Genes: Implications in Diseases and Therapeutics* by Prof. Tapas K. Kundu, FNA.

The INSA Local Chapter at Kolkata in collaboration with NASI local chapter organized a webinar on 26th April by Dr. A. Hazra of IPGMER and SSKM Hospital on the second wave of the virus.

A 45-day online exhibition season on the transmission of diseases, behaviours and emotions, CONTAGION started on 30th April where INSA is a programme partner with Bengaluru Science Gallery.

INSA organized World Environment Day Lecture (virtual mode) titled *Why to Restore Ecosystem: Safeguarding Environment and Health* by Dr. Prahlad Kishore Seth, FNA, on June 5, 2021.

INSA organized a Talk show titled *Understanding Covid-19: Science of Oxygen Therapy* on 26 June on virtual mode by Prof Subrata Sinha, FNA, AIIMS; Prof. Ashok Jaryal, AIIMS and Prof. Vimi, AIIMS, New Delhi (virtual).

- **Women's Day Celebration**

INSA Women in Science Panel jointly with Institute of Chemical Technology, Mumbai (ICT) and Global Young Academy celebrated International Women's Day virtually on March 8, 2021.

- **Indian National Young Academy of Science (INYAS)**

Sixth Annual General Body Meeting (GBM) of INYAS was held on February 18-21, 2021 (virtual).

Indian National Young Academy of Science (INYAS) first time celebrated International Women's Day Event on 8th March 2021 (virtual).

3rd Annual Newsletter of Indian National Young Academy of Sciences (INYAS) was published.

- **INSA-INYAS Vigyan Setu Webinar Series**

Following Webinars have been conducted during 1 October, 2020 – 13 September, 2021.

1. Science & Technology for Addressing Societal Challenges-Learnings from Covid-19 on October 16, 2020 by Dr. Renu Swarup, Secretary, Department of Biotechnology (DBT), Govt. of India, New Delhi.

2. The Fiber Optics Revolution on December 12, 2020, by Prof. Ajoy Ghatak, President, NASI & Former Professor of Physics, IIT Delhi.

3. Musings on an Academia with a Social Responsibility on January 30, 2021 by Prof. A. K. Singhvi, FNA.

- INYAS launched a nationwide mass awareness campaign on Covid-19 vaccination on April 6, 2021.

This campaign was planned through a multi-pronged approach on April 6 event.

- 1) Documents containing myths and facts about vaccines in 11 languages including Hindi and English.
- 2) COVACNEWS Android based Mobile App made by INYAS for ensuring information at the fingertips.
- 3) Pan-India Infographic Video and Audio Competition (PIVAC) with motivation to transform information into better readable and effective formats. The entries will be utilized to increase vaccine awareness by INYAS.

- **GYANTEEKA Webinar Series**

The new webinar series, GYANTEEKA is an initiative of INYAS to create awareness on vaccination in general and on Covid-19 vaccination in particular.

The following webinars were conducted under this series:

1. On February 20, 2021 by Dr. Shahid Jameel, FNA on *Science of Vaccine*.
2. On March 25, 2021 by Prof. Gagandeep Kang, FNA, on *Value of vaccines*.
3. On April 24, 2021 by Dr. Soumya Swaminathan, FNA, on *Lessons from the Pandemic: New Models for Global Scientific Collaboration*.
4. On May 29, 2021, by Dr. Satyajit Rath, immunologist, adjunct faculty, Indian Institute of Science Education and Research (IISER), Pune on *Covid-19, Vaccines and the Way Forward*.
5. On June 26, 2021 by Dr. Raghavan Varadarajan, FNA, on *Influenza and Covid-19 Vaccine Design*.
6. On July 31, 2021 by Dr. Anurag Agrawal, FNA, on *Global Delta Outbreak, Vaccine Efficacy and Road Ahead*.

- **INSA-NCM Online Teachers' Enrichment Workshops**

INSA in collaboration with the National Center for Mathematics (NCM) organizing Teachers' Enrichment Workshops to update the knowledge of college and university teachers and Ph. D. students.

The following workshops have been organized:

1. 'Linear Algebra and its applications' during 19 th November 2020 to 13 th December 2020 at IIT Jodhpur.
2. 'Algebra & Discrete mathematics' during 19 th November 2020 to 3 rd January 2020 at Mepco Schlenk Engineering College, Sivkasi.
3. 'Algebra & Multivariate Calculus for Science and Engineering Teachers' during 8 th January to 14 th February 2021 at School of Mathematical & Physical Sciences, Dr. Harisingh Gour Vishwavidyalaya, Sagar, MP.
4. "Differential Equations and its Applications" during March 15 - 28, 2021 at Deshbandhu College, University of Delhi.

- **India International Science Festival 2020 (IISF 2020)**

As Curtain-Raisers to the India International Science Festival 2020 (IISF 2020, December 22 and 25, 2020 in virtual mode) INSA organised following two symposia:

1. The first symposium was on the theme 'Brain and Its Health' on 4th of December.
2. The second symposium on 'COVID -19 Pandemic' was organised on December 8, 2020.

- **Science Education Programme**

The Academy, jointly, in association with IASc, Bangalore and NASI, Allahabad sponsored a variety of activities aimed at strengthening of higher education in science and encouraging the young students to take science as a career. These are:

Summer Research Fellowships for Students and Teachers: During 2021, 793 Students and 43 Teachers availed this Fellowship.

A 2-week All India Refresher Courses for Teachers: 4 courses were conducted during this period.

Lecture/Workshops for Students and Teachers: 41 lectures/workshops were held.

Focus Area Science Technology Summer Fellowship (FAST-SRF): 68 Students and 2 Teachers availed this Fellowship.

- **Partial assistance by INSA for participation in International Conferences abroad sponsored by agencies other than ISC and its listed bodies**

One Indian scientist was supported by the Academy for attending NON-ISC sponsored International conferences abroad.

- **Proceedings of the Indian National Science Academy**

The following Proceedings of Indian National Science Academy issues were published during the above mentioned period.

1. Proceedings of Indian National Science Academy- vol.86, No. 4(December 2020).
2. Proceedings of Indian National Science Academy- vol. 87, No. 1(March 2021).

3. Proceedings of the Indian National Science Academy -- Volume 87, No. 2 (June 2021).
The journal from 2021 March issue onwards has been co-published with Springer.

Science Promotion

- Nineteen INSA Fellows has been awarded INSA Senior Scientist Position.
- Seven Extension for INSA Senior Scientist Position (2 years) has been awarded
- Three INSA Fellows have been offered INSA Honorary Scientist position.
- Extension for INSA Honorary Scientist position has been offered to one Fellow.
- Three INSA Fellows have been awarded for INSA Emeritus Scientist position.
- Sixty scientists were offered the Visiting Fellowship.

History of Science

National Commission approved 10 new projects and renewed 18 on-going projects.
2 researchers have been awarded INSA Young Historian of Science Award.

Publications

- INSA Year Book 2021 has been published.
- INSA profile (both in English & Hindi Version) published.
- Proceedings of the INSA, IJPAM and IJHS published.
- Special Publications:
- Biomaterials Science and Implants: Status, Challenges and Recommendations by Dr Bikramajit Basu.
- INSA organized a book release function as part of 75th Years of Independence (2021-2022) celebration on June 23, 2021. The following three books and INSA brochures (English and Hindi) were released by Prof. Chandrima Shaha, President, INSA and Prof. Ajay Kumar Sood, Former President INSA.
- i. Vignettes for Success in Academia : a guide for young Researchers by Prof. Biman Bagchi, FNA, Editor and Co-ordinator Prof. A.K. Singhvi
- ii. Drug Discovery and Drug Development : the Indian Narrative edited by Prof. Madhu Dikshit, FNA
- iii. Host Immunity and Vaccines Covid-19 : a white paper by Prof. Narinder K Mehra, FNA

Informatics

- Sonicwall new firewall has purchased and installed in IT networks.
- Necessary support was provided for organizing various virtual meetings of the Academy.

International Programme

- **Indian Scientist elected in various positions of ISC and its Unions**
- ❖ Professor KVR Chary, FNA, has been elected for the position of Councilor of International Union of Pure and Applied Biophysics, for the term of three years i.e., 2022-2025.
- ❖ Dr.V.Prakash, Former Director, CFTRI, Mysore elected as President, International Union of Food Science and Technology (IFoST) for the term 2020-22.
- **Scientists nominated for various positions of ISC and its Unions**
- ❖ INSA has nominated 18 Indian Scientists for various commissions of International Union of Pure and Applied Physics.
- ❖ Dr. Deepti Jain, RCB, Gurgaon, Dr Parthapratim Munshi, Shiv Nadar University, UP, Dr Surjeet Singh, IISER, Pune and Dr S. M. Yusuf, BARC, Mumbai have been nominated as Councillors to vote in the business meeting of AsCA during the IUCR conference in Prague from August 14 – 22, 2021
- ❖ Dr. Sandeep Tambe, Professor- Indian Institute of Forest Management and Dr. Vandana Prasad, Director, BSIP, Lucknow have been nominated by the Academy for the Future Earth Assembly/Council 2021.
- ❖ Dr Ajit Kembhavi, Chair, CODATA National Committee, Former Director, Intern Univ. Centre for Astronomy & Astrophysics, Pune has been nominated for the Executive Committee of CODATA for the term 2021-2023.
- ❖ Professor K. Ramasubramanian FNA has been nominated as Treasurer of DHST/IUHPST
- Dr. Suvabrata Sarkar, Assistant Professor, Department of History, Rabindra Bharati University, Kolkata has been nominated as Assessor of DHST/IUHPST
- ❖ Dr.K.Rajeev, Scientist, Space Physics Laboratory, Vikram Sarabhai Space Centre, Indian Space Research Organisation, Thiruvananthapuram, India has been nominated as National Representative for COSPAR.

❖ Dr.B.Gopal, Dr.C.Narayana and Dr.Deepti Jain have been nominated for IUCr General Assembly held in 14-22 August 2021

❖ Dr.Kamala Krishnaswamy, FNA, former Director of ICMR – National Institute of Nutrition and former President of NSI has been nominated for the “Living Legend” Award of International Union of Nutritional Sciences (IUNS), 2021.

➤ One Indian scientist was supported by INSA for attending ISC sponsored conference (virtual).

INSA Representation at International Forum

❖ Prof. BK Thelma, FNA nominated by the Academy to represent the fellowship at the International Commission of Human Germline Genome Editing in 2019, participated in the preparation of a report on “Heritable Human Genome Editing”, which has been released on September 3, 2020. The team also provided a special briefing for the interested folks on October 12, 2020.

❖ Prof. JP Khurana, Vice President (International Affairs), INSA attended the virtual conference titled ‘B-20 Global Dialogue in India’ on October 7, 2020 jointly organized by CII, Research and Information System (RIS) for developing countries.

❖ Prof. JP Khurana, Vice President, INSA attended the virtual IAP Policy Board quarterly meeting held on November 18, 2020. He also attended the IAP Membership Committee call on 2nd March 2021, held online.

❖ Prof. JP Khurana, Vice President, INSA, and other INSA nominated members Dr. Anurag Agarwal, FNA, Dr. Ramanan Laxinakaran, Center for Disease Dynamics Economics & Policy and Prof. Narinder K Mehra, FNA attended BRICS Conference on 14-15 December 2020 via online and gave talk in three different sessions of their respective expertise.

❖ The second joint Royal Society Yusuf Hamied Workshop for India and the UK was held virtually on 3-4 March 2021. The programme was co-hosted by Prof. Chandrima Shaha, President, INSA from India and Professor Steve Furber from UK. Prof. Chandrima Shaha delivered the welcome address during the workshop.

❖ Prof. AK Singhvi, FNA, attended the Science Diplomacy virtual workshop on March 12, 15 and 16, 2021, convened by the National Academies of Sciences, Engineering and Medicine (NASEM).

❖ Professor NK Mehra, FNA made a presentation at International Scientific Symposium entitled “Geopolitical, Socio-economic and psychological impact of the pandemic COVID-19” organized by the Russian Academy of Sciences on May 27, 2021.

❖ Prof. S Sivaram, FNA, attended the BAS-AASSA webinar on plastic pollutions on 28 -30 May 2021.

❖ IAP Statutes as revised in Version II dated May 17 2021 was endorsed by INSA

❖ Prof. Narinder K.Mehra, FNA attended and made a presentation at the virtual meeting of S20 hosted by the Italian Academy Lincei. on 15 July 2021.

❖ Professor Maneesha Inamdar, FNA served as a member of the Statement Working Group (SWG) for the IAP Statement on Regenerative Medicine. IAP Statement on Regenerative Medicine, led by the German National Academy of Sciences, Leopoldina has been published on 29th July, 2021 together with a Press Release

❖ Dr. Nishant Chakravorty, Member INYAS Member, Assistant Professor, Indian Institute of Technology Kharagpur nominated by INSA is selected by IAP to attend the IAP Young Physician Leaders programme and the World Health Summit to be held in Berlin, Germany from 21 October 2021 - 26 October 2021.

❖ In response to the invitation by the S20 Chair, Saudi Arabia, Prof. Chandrima Shaha, President, INSA expressed concurrence to the recommendations to be presented to the G20 Science Academies leaders by signing the consensus S20 Communique Endorsement.

❖ Prof. Rakesh Bhatnagar was invited to coordinate as IAP member academy Focal Point with the IAP Secretariat and the core BWG on relevant issues.

❖ INSA endorsed IAP statement on the ongoing opportunities and challenges in *Regenerative Medicine*.

❖ INSA endorsed IAP statement on *Protection of Marine Environments*.

❖ Academy Nominated Professor M K Pandit, FNA Professor & Head, Department of Environment Studies & Director, CISMHE, University of Delhi, Delhi to serve on the IAP working Committee tasked with development a statement on Inter-linkages between Biodiversity and Climate Change.

❖ The Academy has endorsed the third draft of the S20 joint statement on, “Pandemic preparedness and the role of science”.

❖ Academy had agreed to support the STEM Women Asia Database Project established by The Association of Academies and Societies of Sciences in Asia (AASSA), with support and funding from the Inter Academy Partnership (IAP). The project is being overseen by AASSA’s Special Committee on Women in Science and Engineering (WISE), chaired by Professor Cheryl Praeger of Australian Academy of Sciences. 58 INSA Women Fellows and INYAS Women Members have been nominated by the Academy.

- ❖ Academy endorsed the IAP Statements entitled “The Implication of Urbanization in Low and Middle Income Countries” and “climate change and biodiversity interlinkages and policy options”.
- ❖ The Academy has endorsed AASSA's Climate Change and Health report “The Imperative of Climate Action to Promote Health In Asia”.
- ❖ As nominated by President, INSA, Dr.Alok Moitra, Advisor, INSA had attended the ISC Extraordinary General Assembly during 1-3 February, 2021.

An issue raised under Any Other Matter in the Annual General Meeting of INSA – 5th October 2021

In the 75th year of India's independence, we are looking back at some of the developments in R&D that have helped in ushering in prosperity, self-sufficiency in many domains, strategic autonomy, and social welfare. I propose that it is an opportune time to discuss the weaknesses in the R&D ecosystem of the country and make some recommendations to the Government of India and the nation at large that would make our R&D system more robust, nimble, and globally competitive to meet the present and future challenges.

I flag a few issues –

- **Higher investments in R&D.** Currently India is spending less than 0.7% of its GDP on R&D – putting together both public and private sector spending. This is significantly less than what the developed countries and newly emerged economies of east Asia are spending. Our higher education system has expanded in the last 10 years, R&D needs have increased to meet various threats and challenges in the health, agriculture, energy, and manufacturing sectors, but the spending as a percentage of GDP remains stagnant at around 0.7%. Can we recommend that in the 75th year of India's independence public spending on R&D should be increased so that 1% of the GDP is committed to R&D? This needs to be raised to 2 – 2.5% in the next 10 years by increasing both public as well as private sector spending on R&D.
- **Competitive grants system.** Competitive grants for R&D are a major support for training doctoral students in universities and institutions. The New Education Policy has highlighted the importance of research in higher education. NEP suggests the establishment of a National Research Foundation. What augmentation in resource input is required? What procedural changes are required to make the funding more effective in meeting the R&D goals in the projects? How can PIs be made more autonomous from the administrative setup in their institutions? Can funding be made more comprehensive? Streamlining the processes of funding requires attention.
- **A better deal for young scientists.** India should invest in training young scientists, both at the doctoral and postdoctoral level, in the leading laboratories abroad in areas that are emerging or are important for national good but adequate expertise is not available in the country. First Japan followed by South Korea, Taiwan and China did this to their great advantage. Postdoctoral work should also be encouraged within the country with better salaries and improved research facilities in the best laboratories within the country. The recent QUAD initiative on training in STEM areas is a step in the right direction; it should be expanded from 500 to 5000 within the next 10 years. Sectoral areas in which India wants to forge ahead need to be identified.
- **National level Professorships.** Scientists and technologists who would not like to go into administration for higher remuneration and whose full-time involvement in R&D will bring better dividends for the country should get salaries equal to that of science administrators.

I propose that President INSA may take the lead in discussing the issues flagged above, and any additional issues that may be suggested by the fellowship, in special meetings of the INSA Council and the General Body and develop a set of recommendations for the Government of India to implement for rapid and sustainable development of the country. It will be useful if INSA President could request Presidents of the other Science, Engineering, and Medical Sciences academies to join in the process of developing the recommendations.

Deepak Pental