RECIPIENTS OF INSA YOUNG ASSOCIATES (IYA)-2026

SECTIONAL COMMITTEE – I (*Mathematical Sciences)*

1. **Dr Dootika Vats** (13.02.1990), PhD, Associate Professor, Indian Institute of Technology Kanpur, Kanpur.

Dootika Vats has made significant contributions to Markov chain Monte Carlo re-search and revitalizing the area of Markov chain output analysis. She works at the interface of probability, computation, and statistics, with a sustained focus on the reliability of Markov chain Monte Carlo methods for large-scale Bayesian inference. She has developed a framework for output analysis in parallel MCMC, integrating theoretical, computational, and practical perspectives, and supported by widely used open-source software. Her contributions include variance estimation via coupled Markov chains using Poisson equation techniques, foundational work linking the GelmanRubin diagnostic with effective sample size, and methodological advances such as lugsail lag windows and improved autocovariance estimation. Her recent work extends these ideas to stochastic optimization and machine learning, further broadening the scope and impact of modern Bayesian computation.

SECTIONAL COMMITTEE – II (*Physics)*

1. **Dr Shilpi Jain** (18.02.1984), PhD, Reader – F, Tata Institute of Fundamental Research, Mumbai.

Dr. Shilpi Jain is an experimental high-energy physicist at TIFR working on the CMS experiment at CERN. Her research spans detector development and physics analysis at the LHC. She has made important contributions to calorimetry, including simulation and optimization of detector performance for particle identification and energy measurement. A key focus of her work is the CMS High Granularity Calorimeter (HGCAL) for the High-Luminosity LHC, where she has been involved in developing innovative testing and readout techniques for advanced electronics in challenging environments. On the physics side, she has contributed to precision measurements such as multi-boson production, testing the Standard Model and supporting searches for new physics.

2. **Dr Prabha Mandayam** (18.09.1983), PhD, Associate Professor, Department of Physics, Indian Institute of Technology Madras, Chennai.

Dr. Prabha Mandayam is a quantum information theorist at IIT Madras whose research spans foundational and applied aspects of quantum information science. Her work focuses on quantum error correction, including approximate and noise-adapted schemes crucial for fault-tolerant quantum computation. She has contributed to understanding quantum communication channels, including capacity limits in realistic settings such as queue-based decoherence models, and to quantum cryptography, including quantum key distribution protocols. Her research also addresses entanglement and quantum correlations, including entangling power of quantum gates and measurement incompatibility, as well as connections to uncertainty principles. More broadly, she has contributed to the mathematical structure of quantum information theory and the interface between quantum information, functional analysis, and emerging quantum technologies.

SECTIONAL COMMITTEE – III (*Chemistry)*

1. **Dr Veerabhadrarao Kaliginedi** (31.07.1987), PhD, Associate Professor, IPC Department, Chemical Sciences building, Indian Institute of Science, Bangalore.

Dr. Kaliginedi advances molecular electronics by developing cutting-edge junction techniques to probe charge and heat transport, enabling single-molecule actuation, interfacial chemistry insights, and electric-field and light–matter control of molecular properties.

2. **Dr Ananya Baksi** (06.06.1989), PhD, Assistant Professor, Department of Chemistry, Jadavpur University, Kolkata.

Ananya Baksi advances metal nanoclusters and amorphous materials, controlling heteroatom positioning, enabling unique optical and hydrogen-release properties, and developing catalysts for CO_2 conversion and electrochemical applications with mechanistic insights and novel functionalities.

SECTIONAL COMMITTEE – IV (*Earth & Environmental Sciences)*

1. **Dr Jayesh M Goyal** (01.11.1990), PhD, Reader-F, School of Earth & Planetary Sciences (SEPS), National Institute of Science Education & Research NISER (NISER), Odisha.

He has made seminal contributions in developing theoretical models to interpret the observations of Exoplanet atmosphere. His theoretical models are to be used by the researchers world-wide to interprete Hubbel and James Webb Space Telescope observation.

2. **Dr Rohit Pandey** (01.06.1989), PhD, Assistant Professor, Department of Geology, Institute of Science, Banaras Hindu University, Varanasi.

He has made seminal contributions in geochemistry and mantle derived rocks such as Kimberlites and carbonatites and metallogenic processes from the tectonic margin of Bastar craton and Eastern Ghat Mobile Belt.

SECTIONAL COMMITTEE – V (*Engineering & Technology)*

1. **Professor Sushmee Badhulika** (13.05.1985), PhD, Department of Electrical Engineering, Indian Institute of Technology Hyderabad, Telangana.

Prof. Sushmee Badhulika has made impactful contributions to flexible nanoelectronics, sensors, and energy devices, advancing sustainable nanofabrication and wearable technologies. Her innovations in smart textiles, eco-friendly materials, and scalable prototypes have driven translational research and industry-relevant applications.

2. **Dr Amit Sharma,** (13.11.1988), PhD, Principal Researcher, Microsoft Research, Bengaluru, Karnataka.

Dr. Amit Sharma has made foundational contributions to causal machine learning, advancing algorithms that improve generalization, robustness, and interpretability. His widely adopted tools and frameworks have significantly influenced research and real-world deployment of reliable, responsible AI systems.

3. **Dr Mahesh Vinyas,** (05.12.1991), PhD, Assistant Professor, Department of Mechanical Engineering, National Institute of Technology Silchar, Assam.

Dr. Vinyas Mahesh has made outstanding contributions in smart composite structures and sustainable materials. His pioneering work on energy-efficient magneto-electro-elastic (MEE) composites for real-time vibration control of aircraft structures has significant impact on next generation aircraft and defence applications.

4. **Dr Susmita Dash,** (27.01.1987), PhD, Associate Professor, Department of Mechanical Engineering, Indian Institute of Science, Bangalore.

Prof. Susmita Dash has made outstanding contributions in high heat flux thermal management through pioneering work on two-phase processes, engineered surfaces, and interfacial transport. She has translated two-phase flow science into impactful technologies for electronics cooling, desalination, micropropulsion, thermochemical energy storage, and evaporation-based diagnostics.

5. **Dr Nishant Kumar,** (05.01.1986), PhD, Assistant Professor, Department of Electrical Engineering, Indian Institute of Technology Jodhpur, Rajasthan.

Prof. Nishant Kumar has made outstanding contributions to renewable energy and power systems, advancing solar PV integration, intelligent control, and EV charging infrastructure. His innovations in grid-supportive technologies and sustainable maritime electrification have significantly enhanced efficiency and environmental sustainability.

6. **Dr Pooja Devi,** (20.01.1988), PhD, Senior Principal Scientist, CSIR-Central Scientific Instruments Organisation, Chandigarh.

Dr. Pooja Devi has made pioneering contributions to water pollution monitoring, nanomaterials, and sustainable energy technologies. Her innovations in sensor platforms, MXene-based catalysis, and green hydrogen generation, alongside successful technology transfer and translational research, have advanced environmental remediation and clean energy solutions.

SECTIONAL COMMITTEE – VI (*General Biology)*

1. **Dr K. S. Seshadri** (17.09.1987), PhD, Fellow in Residence (DST INSPIRE Faculty), Ashoka Trust for Research in Ecology and the Environment, Bengaluru.

Dr K S Sheshadri has studied a wide range of ecological systems ranging from amphibians to the forest canopy. All his research work has been in India. He has made outstanding contributions to discovery of new species, novel behaviour, and understanding of evolutionary ecology. He has demonstrated a flair for teaching and has co-designed and taught hands-on training program for ecologists. His research has had direct implications for wetland conservation and his research on road ecology has resulted in regulating night time traffic inside a tiger reserve.

SECTIONAL COMMITTEE – VII (*Molecular and Cellular Biology)*

1. **Dr Debabrata Laha** (29.09.1986), PhD, Assistant Professor, Department of Biochemistry, Indian Institute of Science, Bangalore.

Dr Laha is an Assistant Professor in the Department of Biochemistry at IISc. His research focuses on cell signaling and molecular plant physiology, particularly the role of inosital phosphates and pyrophosphates signalling pathways in regulatory plant growth development and stress responses. His work contributes to understanding how plants adapt to environmental challenges.

SECTIONAL COMMITTEE – VIII (*Biomolecular, Structural Biology and Drug Discovery)*

1. **Dr Aditya Kumar Padhi** (21.02.1988), PhD, Assistant Professor Grade-1, School of Biochemical Engineering, Indian Institute of Technology (BHU), Varanasi.

He has made outstanding contributions by combining Protein Design. MD simulations, ML algorithms, QM/MM and mutational mapping data to predict and understand SAR-CoV-2 proteins and drug interactions.

SECTIONAL COMMITTEE – IX (*Health Sciences*)

1. **Dr Ajay Kumar** (15.02.1986), PhD, Associate Professor, Department of Zoology, Banaras Hindu University, Varanasi.

Dr Kumar has made a substantial contribution to the understanding of the complex interplay between tumor metabolism, pH homeostasis, and the immune microenvironment by employing an integrative approach to dissect the molecular and cellular mechanisms governing these interconnected processes, with a focus on identifying potential tumor biomarkers and targeted therapeutic interventions. His research also unravels the role of promising factors that mediate or moderate metabolic and pH regulatory adaptations in cancer cells, shedding light on their impact on disease progression and immune evasion. Considering his original contributions in Health Sciences to understand the role of the interconnected triad of tumor metabolism, pH homeostasis, and immune microenvironment in the growth and progression of cancer, which holds great promise for the development of innovative diagnostic and targeted or combinational therapeutic approaches for cancer.

SECTIONAL COMMITTEE – X (*Agricultural Sciences*)

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

Dr Akanksha Singh has made a significant contribution in mapping the endomicrobiome in medicinal and aromatic plants. She had demonstrated the mechanistic details of host metabolism reprogramming by beneficial endophytes. Her research has established a scalable framework which enhances phytochemical biosynthesis by modulation of chloroplast function.

2. **Dr Shaon Kumar Das** (25.12.1986), PhD, Senior Scientist, ICAR Research Complex for NEH Region, Sikkim Centre, Sikkim.

Dr Shaon Kumar Das has contributed to the area of low-cost farmer-friendly biochar production and co-composting technology. He developed best management practices for zero-budget natural farming and disseminated them in Sikkim to improve soil health and enhancing crop productivity. His research led to the application of carbon-negative biochar for the preparation of a hydrogel-biochar composite for controlled release of fertilizers and a low-cost technology for arsenic-remediation with locally available organic matter, phosphorus, and two bacterial strains from polluted soil.

3. **Dr Rakesh Shamsunder Joshi** (01.07.1987), PhD, Scientist, CSIR National Chemical Laboratory, Pune.

Dr Rakesh Joshi has made a significant contribution to the field of insects biology for sustainable crop protection. He unraveled species-specific features of enzymes in crop-feeding insect pests, enabling the design of substrate analogue-based inhibitors, which can be used as targeted insect-control agents. Also, his research on neuronal receptors like octopamine and allatostatin, involved in insects' nutrition, development, and behaviour, is significant for designing field-pest control strategies.

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