FOREIGN FELLOWS ELECTED 2025
(Effective from January 1, 2026)

1. **Aggarwal, Varinder Kumar** (*b*. 01.01.1961), Professor, School of Chemistry, Cantock's Close, Bristol BS8 1TS, UK.

Professor Aggarwal has developed iterative homologation of boronic esters in a process that resembles a highly effective molecular assembly line. He has developed (i) new methods for making boronic esters, including using modern photoredox processes (ii) created a suite of reagents which insert into C-B bonds generating new C-C bonds with exceptionally high fidelity and stereocontrol (iii) new transformations of boronic esters into other functional groups so that the products of the assembly line can be utilised (iv) automation of the assembly line process. Each of these are major areas in their own right, but when combined, their power for synthesis is truly transformative.

2. **Arulanandam, Bernard P** (*b*. 03.12.1964), Vice Provost for Research and Professor of Immunology, Tufts University 75 Kneeland St, Suite 950 Boston, MA 02111, USA.

Professor Bernard Arulanandam is a preeminent mucosal microbiologist and immunologist who has made highly innovative scientific discoveries and patents in the area of vaccine development. His research focuses on elucidating host-microbial interactions and the cellular and molecular mechanisms involved in the induction of immune responses against infectious diseases. His work as a researcher and a university leader has facilitated national and international development through his focus on translating fundamental scientific findings into real-world applications and impact, specifically in areas of infectious diseases.

3. **Batty, Michael** (*b*. 11.01.1945), Professor, Centre for Advanced Spatial Analysis, University College London, 90 Tottenham Court Road, London W1T 4TJ, UK.

Professor Batty has pioneered the development of mathematical and computer models of land use and transport in cities and regions and has developed many new statistical techniques for implementing these models in planning practice. He has worked on spatial interaction models with Dr PK Sikdar, ex-Director of the Indian Central Road Research Institute (1998-2004). They wrote a series of papers in the 1980s on aggregation and spatial stability in such models. Professor Batty was awarded the Lauréat Prix International de Géographie Vautrin Lud ('Nobel de Géographie') in 2013. He is highly cited in terms of publications with an H index of 119 and over 56,000 individual citations to his books and papers.

4. **Chowdari, BVR** (*b*. 21.01.1943), 3 Jubilee Road, Singapore 128527.

Professor Chowdari's research interests are in Physics of solids, especially in the synthesis and characterization by modern techniques, and finding applications in energy storage devices. His experimental studies provided excellent scientific knowledge for better choice of cathode materials for the development of lithium-ion batteries. He has founded professional organizations that benefit the research community worldwide and has been instrumental in facilitating the visit of 28 Nobel Laureates and thousands of distinguished scientists to Singapore which has enabled strong connection and collaborations between Singapore and the international scientific community, particularly those from India, China, and Japan. One very effective initiative is establishment of the India-Connect Program at NUS and NTU.

5. **Eckert, Jürgen Hartmut,** (*b*. 05.08.1962), Director, Erich Schmid Institute of Materials Science, Austrian Academy of Sciences, Jahnstraße 12, 8700 Leoben, Austria.

Professor Eckert has made seminal research contributions in the area of materials physics and metastable materials fabricated through non-equilibrium processing, providing a generalized understanding of phase formation and structure-property-correlations for amorphous, quasicrystalline and nanostructured materials that serves as basis for developing advanced high-performance structural and functional materials for a variety of applications. He also performed fundamental research on biomedical, energy and sustainable materials and advanced production techniques, illustrating the value of fundamental research to technologies that improve the quality of life and environment.

6. **Gelenbe, Sami Erol** (*b*. 22.08.1945) Professor, Institute of Theoretical & Applied Informatics, Polish Academy of Sciences, ul Baltycka 5, 44100 Gliwice, Poland.

Professor Gelenbe is a pioneering researcher in Computer Systems and Networks. Using Markovian and semi-Markov methods he obtained several seminal analytical results regarding the page fault rates in large classes of memory management algorithms, he derived the stability and optimal control of the ALOHA communication system, and the load dependent optimal values of checkpoints for databases. He invented new modeling and analysis methods, including the G-Network model. He invented the spiking random neural network and its deep learning, auto-associative and reinforcement algorithms. His technological contributions include a patented optimal architecture for many-to-many communications, patented reinforcement learning routing for edge networks and the Internet, and the industrial simulation tool Flexsim.

7. **Joshi, Chandrashekhar Janardan** (*b*. 22.07.1953), 1432, Beckwith Ave, Los Angeles, CA 90049, USA.

In several pathbreaking studies Professor Joshi provided the crucial breakthroughs that made laser and plasma driven particle accelerators a reality. He is unique on the global stage in straddling both the plasma wakefield and laser wakefield areas and does it with aplomb. Professor Joshi founded the field of plasma-based particle acceleration. This field is now making rapid advances such that scientists are contemplating building future colliders and light-sources for research and table-top accelerators for industry and medical applications based on plasma accelerators. His team also showed that a plasma accelerator can be more than 30% efficient, thereby making it affordable.

8. **Klein, Michael Lawrence** (*b*. 13.03.1940), 2001 Hamilton Street, City View South Building Apt. 2006, Philadelphia PA 19130, USA.

Klein's pioneering computer simulations of molecular systems have broadly impacted research in both the physical and life sciences. In the 1970's, Monte Carlo and molecular dynamics computer simulations, with empirical and/or quantum-chemistry derived force fields, helped rationalize contemporary experiments on molecular solids and liquids, including water. Klein's group developed and elaborated algorithms to enable the efficient and rigorous computer simulation of molecular systems. Klein's simulations have yielded unprecedented understanding of self-assembling macromolecular systems, and the behavior of materials under stress. His pioneering studies of the structure and function of membrane-bound ion channels, plus their interaction with anesthetics, are especially noteworthy. His current research employs ab initio and machine learned potentials to bring new understanding to the properties of complex materials and Nature's nano-scale machines.

9. **Mardon, Albert Austin** (*b*. 25.06.1962), CM KCSS FRSC FRCGS FZAS FRGS, PO Box 99548, Cromdale PO, Edmonton, Alberta. T5B 0E1, Canada.

Dr Austin Mardon is a distinguished Canadian geographer and advocate for mental health. His major scientific and technological achievements include substantial contributions to polar research. Mardon is also recognized for his extensive efforts in mental health advocacy, particularly for those with schizophrenia, reflecting his personal experiences with the condition. In the field of literature, Mardon authored numerous books and articles, enhancing public understanding of mental health issues. His technological achievements include developing digital resources and educational materials to support mental health awareness. He has received numerous awards and honors, including the Order of Canada, for his contributions to science, education, and public service.

10. **Mukherjee, Priyabrata** (*b*. 01.08.1969), 2600 White Fox Circle, Edmond, OK, 73034, USA.

Priyabrata Mukherjee has made significant contributions in the realm of cancer research. His work primarily focuses on the tumor microenvironment and the interactions between proteins and nanoparticles, which have implications for angiogenesis-dependent disorders and targeted cancer therapies. Mukherjee has pioneered research into how cancer cells rewire their metabolic pathways, enhancing lipid biogenesis and utilization to survive under stressful conditions like hypoxia and cytotoxic insults. A notable achievement in his research is the discovery of the role of hydrogen sulfide (H2S) in inducing a hibernation-like state in mice, protecting them from hypoxic injury. His team also demonstrated that the loss of H2S synthesizing enzymes, such as CBS, increases bacterial sensitivity to antibiotics and that CBS deficiency leads to abnormal lipid metabolism and reduced body mass in mice. In 2013, Mukherjee and his team elucidated the pathological role of CBS in ovarian cancer.

11. **Sehgal, Amita** (*b*. 28.12.1960), 16 Buck Lane, Haverford, PA 19041, USA.

Amita transformed the sleep field by pioneering mechanistic approaches to elucidate what drives sleep and why it occurs. A major turning point in sleep research was the development of the Drosophila model for sleep by Amita and colleagues. Using creative approaches in flies, Amita identified sleep-regulating mechanisms that have conserved roles in mammals and showed that sleep is required in early life for development of circuits that drive adult mating behavior. Importantly, she has uncovered fundamental cellular functions for sleep that likely underlie beneficial effects of sleep on health and performance. Together with her seminal discoveries in circadian biology, e.g. identification of molecular clock mechanisms, discovery of how the clock entrains to light and mapping pathways through which the clock drives sleep:wake behavior and physiology.

12. Singh, Brajesh Kumar (*b*. 13.01.1973), Professor and Director, Hawkesbury Institute for the Environment, Western Sydney University, Penrith, NSW 2751, Australia.

Professor BK Singh is a global leader in soil and ecosystem ecology and has made a ground-breaking contribution in understanding the distribution and importance of soil biodiversity. He is highly regarded for using system-based and transdisciplinary approaches to bridge the gap between microbial and plant communities in managed and natural ecosystems. Impacts of his research include (a) First global atlas of dominant soil bacteria, fungi, and plant pathogens. (b) Microbiome tools for sustainable agricultural and industrial products, and (c) Paradigm shifts in fundamental microbial ecosystem science, and provided compelling evidence that microbial diversity loss proportionally decreases ecosystem functions at local and global levels.