FOREIGN FELLOWS ELECTED 2022
(Effective from January 1, 2023)

1. **Fayer, Michael D** (*b.* 12.09.1947), *David Mulvane Ehrsam and Edward Curtis Franklin Professor of Chemistry, Department of Chemistry, Stanford University, Stanford, CA 94305-5080, USA.*

Professor Fayer opened a new era of spectroscopic research on the dynamics of complex molecular materials by his ground-breaking ultrafast nonlinear experiments. He expanded the field from visible to infrared multidimensional techniques, pursuing fundamentally important problems. His work in the visible and IR spread widely, stimulating and extending the fields.

2. **John, Sajeev Oommen** (*b.* 04.04.1957), *University Professor, Department of Physics, University of Toronto, Toronto, Ontario M5S1A7, Canada.*

Professor Sajeev John invented the concept of classical wave localization and photon localization. His “photon-atom bound state” has allowed for the emergence of a new paradigm in quantum electrodynamics. Professor John’s invention and development of light trapping crystals has led to life-saving laser surgeries using photonic band gap fibers. His numerical demonstration of flexible thin-film silicon, photonic crystal solar cells has shown unprecedented power conversion efficiency, beyond 30% and sparked intense innovation in the photovoltaics community. This is revolutionary in our battle against climate change.

3. **Knust, Elisabeth** (*b.* 09.01.1951), *Professor Dr. Rer. Nat, Max-Planck-Institute of Molecular Cell Biology and Genetics, Pfotenhauerstr, 108, 01307 Dresden, Germany.*

Professor Knust's work focuses on questions of cell polarity and how this is established during development and maintained during homeostasis to guarantee the cell’s functions. She studied mainly three cell types in Drosophila: epithelia cells, neuronal stem cells, and photoreceptor cells with the aim to unravel the mechanisms by which multiprotein complexes become asymmetrically localized, to determine the role of their individual components, and to understand how these membrane–associated protein complexes control polarized cell function. She has made seminal contributions to elucidate basic principles of the function of two important, evolutionarily conserved protein complexes, the Crumbs- and the Par- complex. Her work is also directly relevant for medicine, shown by the fact that mutations in some of the genes involved in cell polarity and splicing lead to blindness in flies and zebrafish.

4. **McNutt, Marcia Kemper** (*b.* 19.02.1952), *President, National Academy of Sciences, 505 5th St. NW, NAS 215, Washington, DC, 20001, USA .*

Professor McNutt made fundamental contributions to what are now viewed as accepted theories of how plates deform under loading on geologic time scales. Later, she played a leadership role confronting the challenges of estimating the leak rate of the Deepwater Horizon oil spill and helping to contain the blowout. She took the lead in publishing the new methods that she and her collaborators developed that became essential tools in the growing field of disaster response science. She also launched the Strategic Sciences Group, which was codified into the US government's disaster response, and reactivated for Superstorm Sandy and other emergencies.

5. **Withers, Philip John** *(*b. *11.05.*1963*), Regius Professor of Materials, University of Manchester, Royce Hub Building, Manchester, M139PL, United Kingdom.*

Professor Withers' has pioneered the use of neutron, synchrotron X-ray diffraction and correlative tomography linking X-ray and electron imaging techniques, to follow the behaviour of engineering and natural materials in real time and in three- dimensions across different length scales, often as they operate under demanding conditions. . He is one of the leading experts on the measurement of, and the effect of, residual stresses on the performance of engineering materials. His work on residual stress mapping across different length scales, has supported the safe introduction of solid state welding processes by Rolls-Royce and others. His work has shed new light on the mechanisms of ductile failure, fracture, fatigue, thermochemical cycling and the corrosion/degradation of metals and alloys, composites and coatings.