

Four from Cornell elected to National Academy of Sciences

By Tom Fleischman, Cornell Chronicle

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A soil scientist, a virologist, a molecular biologist and a biophysicist are Cornell's 2023 electees to the National Academy of Sciences (NAS), the academy announced May 2 at the close of its 160th annual meeting.

The newly elected members are: **Johannes Lehmann** (<https://cals.cornell.edu/johannes-lehmann>), the Liberty Hyde Bailey Professor, School of Integrative Plant Science Soil and Crop Sciences Section, and professor of global development in the College of Agriculture and Life Sciences (CALS); **Colin Parrish** (<https://www.vet.cornell.edu/research/faculty/colin-parrish-phd>), Ph.D. '84, the John M. Olin Professor of Virology in the Baker Institute for Animal Health, in the College of Veterinary Medicine; **Bik-Kwoon Tye** (<https://cals.cornell.edu/bik-kwoon-tye>), emerita professor of molecular biology and genetics (CALS); and **Michelle Wang** (<https://physics.cornell.edu/michelle-wang>), the James Gilbert White Distinguished Professor of the Physical Sciences, and Howard Hughes Medical Institute Investigator, in the College of Arts and Sciences.

The four Cornellians are among 120 members and 23 international members who were elected in recognition of their distinguished and continuing achievements in original research. With the newest elections, there are now 2,565 active members and 526 international NAS members.

Seventy-four Cornellians have been elected to the academy since inaugural elections in 1863.

Lehmann's research and teaching focuses on soil biogeochemistry and soil fertility management, specializing in soil organic matter and nutrient studies of managed and natural ecosystems. Particular focus is placed on soil carbon sequestration; nutrient recycling from wastes; biochar systems; circular economy; and sustainable agriculture in the tropics, especially Africa.

A Cornell faculty member since 2001 and a fellow of the Cornell Atkinson Center for Sustainability, Lehmann was inducted in 2018 to the **German National Academy of Sciences** (<https://news.cornell.edu/stories/2018/07/lehmann-elected-germanys-national-academy-sciences>), also known as the Leopoldina. He is a co-founder of the steering group of the International Soil Carbon Network and of the International Biochar Initiative.

Parrish studies viruses that have emerged in alternative animal hosts (often dogs) to cause new epidemic diseases, which include several important viruses of dogs, cats and wildlife. His lab is showing in detail how those viruses jumped into and spread in the new host population, and how they sometimes infect other animals – including cats and wild species such as raccoons and foxes.

Parrish, who joined the Cornell faculty in 1988, won a Fulbright scholarship in 2016 and spent the 2016-17 academic year as a **visiting professor** (<https://news.cornell.edu/stories/2016/06/virologist-colin-parrish-teach-scotland-fulbright>) at the University of Glasgow, Scotland. He was elected to a three-year term as president of the American Society for Virology in July 2021.

Tye, who retired in 2015 and now a senior member of the Institute for Advanced Study at the Hong Kong University of Science and Technology, is a pioneer in the study of eukaryotic DNA replication. Her research team uses high-resolution cryo-EM structures of the DNA replication machinery as the framework to interpret biochemical and genetic data for model building.

Tye joined the Cornell faculty in 1977 after a postdoctoral stint at Stanford University, during which she made key discoveries in the field of prokaryotic DNA replication, including the discovery of short Okazaki fragments, generated during aberrant DNA repair in *E. coli* bacteria.

Wang's lab focuses on the motion, dynamics and mechanics of DNA; how DNA motor proteins collide and navigate through roadblocks; and DNA topology during transcription and replication. These highly complex problems require the development of real-time techniques to decipher the actions of multiple players, while also simultaneously allowing the ability to mechanically control, alter and measure DNA topology.


Wang's lab has pioneered several technologies that mimic DNA-based biological processes, including **"DNA unzipping"** (<https://news.cornell.edu/stories/2011/09/physicists-observe-dna-slippage-atp>) and **optical trapping** (<https://news.cornell.edu/stories/2014/04/optical-traps-chip-manipulate-many-molecules-once>). She joined the Cornell faculty in 1998; among her honors is an Alfred P. Sloan Research Fellow Award (1999-2001) and election to the American Physical Society in 2009.

Other recently elected Cornell NAS members include astronomer Jonathan Lunine (2010), computer scientist Jon Kleinberg (2011), physicist Paul McEuen (2011) and chemist Geoffrey Coates (2017).

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