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National Academy of Engineering Announces Winner of 2024 Charles Stark Draper Prize for Engineering

The National Academy of Engineering (NAE) announced today that **Stuart Parkin,** Max Planck Institute for Microstructure Physics, is the recipient of the 2024 Charles Stark Draper Prize for Engineering. Parkin is being recognized for engineering spintronic technologies, enabling digital information storage that serves as a foundation for today's data-driven world.

Parkin pioneered the development of three novel spintronic technologies for massive data memory and storage. Through their ability to detect ever-smaller bits of magnetically stored information, Parkin's invention of spintronic reading devices made possible the digital world of today. Spin-electronics, or 'spintronics' go beyond conventional charge-based devices and technologies and make use of a quantum mechanical property that has unique attributes— the electron's spin.

Today more than 70% of all data is stored in massive arrays of magnetic disk drives each of which uses Parkin's spintronic reading devices. These vast digital 'server' libraries, often called cloud storage, allow for universal access to information that was previously inaccessible. Social networking tools, libraries, music and films, and advances in many fields, such as public health, internet banking, e-commerce, logistics and surveillance, are also made possible by the spintronic reading devices capacity for enormous stores of digital data.

"Stuart Parkin's trailblazing work enabling massive data memory and digital information storage epitomizes the purpose of the Charles Stark Draper Prize for Engineering," said NAE President John L. Anderson. "The prize recognizes an engineer whose achievements have made a significant impact on society by improving the quality of people's lives and facilitating access to information. Parkin's spintronic technologies truly built the foundation for the digital world that we use and enjoy today and will make possible the technological advancements of the future."

Parkin is managing director of the Max Planck Institute for Microstructure Physics in Halle, Germany, and an Alexander von Humboldt Professor at the Martin Luther University Halle-Wittenberg, Germany. Parkin completed his PhD from the University of Cambridge in 1980. He subsequently carried out postdoctoral studies as a Royal Society European Exchange Fellow at the Laboratoire de Physique des Solides, Université Paris-Sud (1980-1981) and as an IBM World Trade Fellow at IBM Research, San Jose, California (1982). He stayed at IBM Research where he was appointed an IBM Fellow in 1999. Parkin's research interests include spintronic materials and devices for advanced sensor, memory, and logic applications, oxide thin film heterostructures, topological metals, exotic superconductors, and cognitive devices.

Parkin was elected to the NAE in 2009 for "contributions to development of spin-engineered magnetic heterostructures for magnetic sensors and memory devices." He is also an elected fellow or member of seven professional science and engineering societies: The Royal Society, Royal Academy of Engineering, National Academy of Sciences, German National Academy of Science Leopoldina, Royal Society of Edinburgh, Indian Academy of Sciences, and the World Academy of Sciences, which recognizes the advancement of sciences for the developing world.

Parkin has received numerous awards including the American Physical Society International Prize for New Materials (1994); Europhysics Prize for Outstanding Achievement in Solid State Physics (1997); IUPAP Magnetism Prize and Néel Medal (2009); Materials Research Society von Hippel Award (2012); Institute of Physics Swan Medal (2013); Alexander von Humboldt Professorship (2014); Millennium Technology Award (2014); two ERC Advanced Grants, SORBET (2015) and SUPERMINT (2022); King Faisal Prize for Science (2021); and the APS Medal for Exceptional Achievement in Research (2024). Parkin has received four honorary doctorates, published more than 685 papers, holds more than 126 patents, and has given approximately 1,000 invited talks around the world.

About the Charles Stark Draper Prize for Engineering
Recognized as one of the world's preeminent awards for engineering achievement, the Charles Stark Draper Prize for Engineering honors an engineer whose accomplishment has significantly impacted society by improving the quality of life, providing the ability to live freely and comfortably, and/or permitting the access to information.

The Draper Prize is awarded biennially and includes a $500,000 cash award. Engineers in all disciplines worldwide are eligible to receive the Draper Prize. The award is presented by the NAE with support from Draper.

Source: National Academy of Engineering

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