Scholar to discuss the applications of quantum technology

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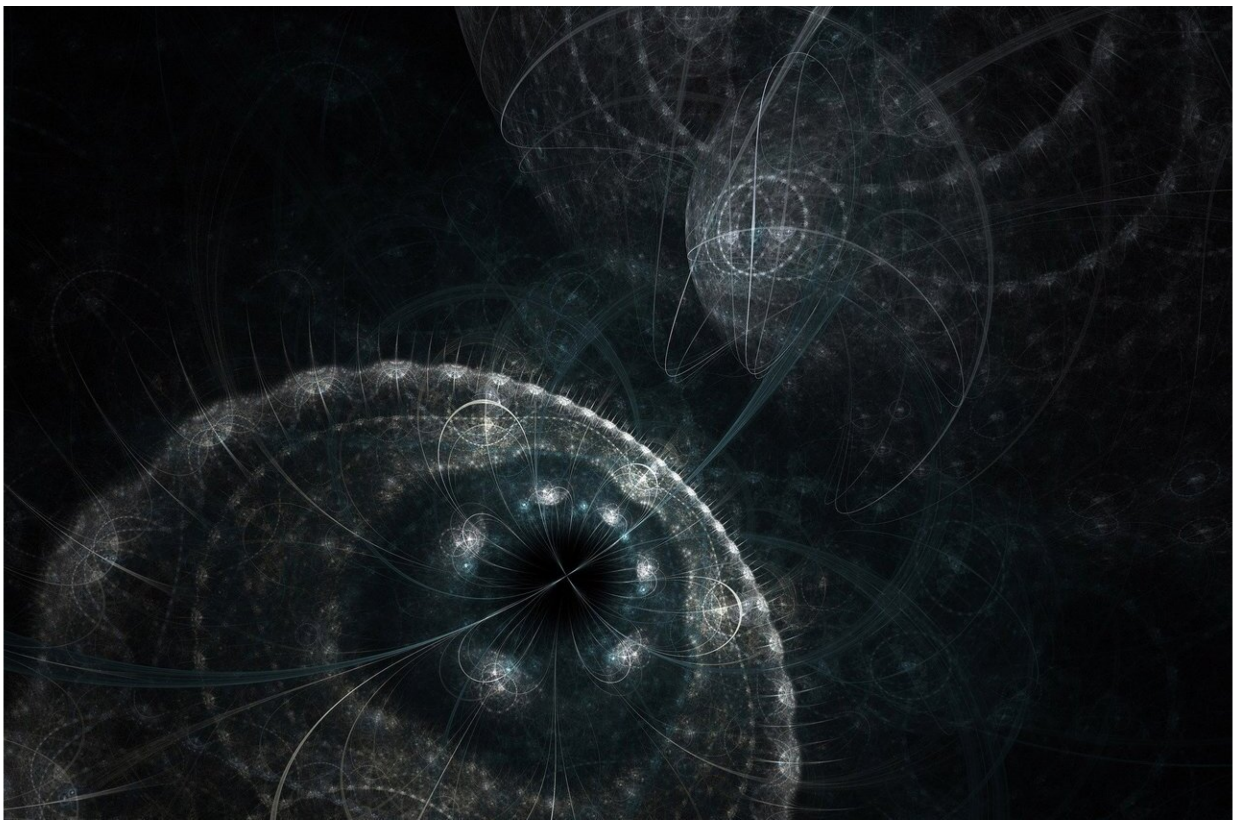

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Northwestern University's Danna Freedman will share novel insights on quantum chemistry's ability to unlock access to molecules and open new fields of study at the American Association for the Advancement of

Science (AAAS) annual meeting.

Freedman is a founding member of Q-NEXT, a transformative 100-person cross-institutional Department of Energy National Quantum Information Science Research Center at the Argonne National Laboratory.

Freedman's research approaches quantum systems from the bottom up—rather than building quantum bits from the same components as everyday electronics—will enable the creation of next-generation quantum technology.

"Molecular chemistry enables a new paradigm for creating quantum information systems from the ground up," Freedman said. "Molecules enable the construction of complex architectures by conferring structural precision and reproducibility."

Freedman will discuss this work in her presentation "Molecular Quantum Information Technology: A New Way to Access Quantum Computers" during a group scientific session called "Designer Molecules: Understanding and Utilizing Their Quantum Nature."

Freedman, a professor of chemistry in the Weinberg College of Arts and Sciences at Northwestern, applies synthetic inorganic chemistry to overcome fundamental obstacles in physics and energy research.

Molecules are critical to our understanding of some of science's most fundamental questions such as the Big Bang, star formation and access to quantum computing techniques. However, researchers have long considered molecules as too complex to study effectively.

Freedman's research challenges this assumption and paves the way for new understandings of molecules in ways that previously seemed impossible. Her cross-disciplinary team chemically synthesizes molecules that encode quantum information into their magnetic, or "spin," states.

Provided by Northwestern University

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