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[Sonia Fernandez](#)

UCSB researchers to collaborate in three of NSF's Quantum Leap Challenge Institutes

Through the National Science Foundation's [Quantum Leap Challenge Institutes \(QLCI\)](#) program, several UC Santa Barbara researchers are poised to tackle hurdles on the road to building widespread, powerful quantum-based technologies.

"We are very proud that UC Santa Barbara professors Dan Blumenthal, Michel Devoret, Andrew Jayich, Ania Jayich and David Weld will be involved in three of the National Science Foundation's Quantum Leap Challenge Institutes," said UCSB Chancellor Dennis Assanis. "These faculty members are shaping the future of quantum science through visionary, multidisciplinary research that addresses the field's greatest challenges. Their accomplishments represent UC Santa Barbara's strength and expertise at the forefront of the quantum revolution."

Thanks to NSF's \$290 million-dollar renewal of its QLCI program, a total of eight Institutes —five ongoing, three newly formed — will be making strides in several areas of quantum information sciences, each receiving between about \$28 and \$37 million over five years.

"For more than four decades, NSF has been laying the foundational groundwork of research and discovery that is powering today's modern quantum computing, sensing and communication," said Brian Stone, performing the duties of the NSF

director. “It’s time for focused activities to leverage that base of knowledge to drive us even further forward to the benefit of all Americans. The NSF Quantum Leap Challenge Institutes are a next step for us in understanding the quantum world we live in.”

UCSB quantum scientists are involved in three of those institutes, leveraging their scientific prowess to advance the state of quantum sciences across the country.

[Daniel Blumenthal](#), a professor of electrical and computer engineering, is a member of the [Quantum Systems through Entangled Science and Engineering](#) (Q-SEnSE) center. Led by University of Colorado Boulder, the institute will continue to focus on building some of the world’s most sophisticated and ultra-precise quantum clocks and sensors, while preparing these quantum components for transition into industry and large-scale manufacturing, and portable technologies, including space-based. Blumenthal's role is photonic integration of lasers and photonics for quantum optical clocks, atom interferometers and experiments for fundamental science involving neutral atoms and trapped ions.

[Michel Devoret](#), a recipient of the 2025 Nobel Prize in Physics and chief scientist at Google Quantum AI, is a senior investigator at MARQUIS (Manufacturable and Resilient superconducting Quantum Information Systems). Led by Princeton University, the newly created institute will devise techniques for fabricating hardware, innovate materials and nanofabrication, and develop education and workforce training programs that deepen U.S. leadership in quantum science and engineering.

Experimental physicists [Andrew Jayich](#), [Ania Jayich](#) and [David Weld](#), meanwhile, are part of the Challenge Institute for Quantum Computation (CIQC). Led by UC Berkeley, the multi-institutional research center will continue to address three priority research challenges: discovering and realizing the power of quantum computation, understanding nature through the lens of quantum information science and developing quantum technologies and their applications.

Each institute within the QLCI program is a broadly collaborative effort spanning academia, government and private industry. The UCSB researchers join a cohort that spans 19 states and 36 institutions of higher education. The institutes’ federal collaborators include multiple U.S. Department of Energy national laboratories, the U.S. Department of War and the National Institute of Standards and Technology.

More than 30 U.S. companies are partnering with the institutes to help inform and accelerate the transfer of fundamental scientific results into products and techniques that can be used and scaled up for industrial production.

NSF is also funding the institutes' education and training programs to help grow the U.S. scientific workforce. The institutes will collectively train hundreds of graduate students, undergraduate students and early career researchers over the next five years. The training will be carried out through partnerships and activities with community colleges, dozens of universities and high schools and community science organizations. Their educational activities span internships and summer schools, K-12 teacher programs and unique mentorship opportunities with leading experts in quantum information research.

Tags

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