UC SANTA BARBARA
THE Current

November 2, 2026
Sonia Fernandez

UCSB graduate researchers focus on quantum sensing and AI with national fellowships

Two UC Santa Barbara graduate students have been awarded fellowships by the UC National Laboratories Southern California Hub (SoCal Hub), a partnership between UC campuses in Southern California and federal national laboratories.

The recipients are Madeleine Bow Jun Leibovitch, who is conducting doctoral work with UCSB atomic physicist David Weld, and Ravindu De Silva, a doctoral student working with computer scientist Christopher Kreugel.

Leibovitch's project, in collaboration with theoretical physicist Andrew Sormborger at Los Alamos National Laboratory (LANL), aims to advance quantum sensing of transient signals by experimentally implementing a method that uses a quantum system tuned near its critical point as both sensor and memory. This work would enable the detection of unknown or intermittent signals not commonly measured by conventional quantum sensors.

"I'm excited to take an idea that exists on paper and realize it experimentally in the lab," Leibovitch said. "This fellowship gives me a unique opportunity to work directly with theorists at LANL and hone the skill of communicating between physics theories and experiments."

De Silva’s project, also in partnership with LANL, addresses a security threat that could be found in autonomous vehicles designed to use onboard AI as the “brains” of the system. The vulnerability is a misalignment between the drone’s independently-measured state and the AI’s view of the drone’s state — a “world-model mismatch” that can result in well-formed but physically unsafe commands from the AI and vulnerabilities that can be exploited by attackers.

“I’m grateful to the SoCal Hub and Los Alamos National Laboratory for supporting my research and providing the opportunity to collaborate with scientists at the Los Alamos National Laboratory,” De Silva said. “This fellowship will advance my research on protecting AI-driven autonomous systems from unsafe decisions and malicious attacks. I look forward to developing practical safeguards that make autonomous systems safer and more secure.”

Tags
Artificial Intelligence
Quantum Science

Media Contact
Sonia Fernandez
Senior Science Writer
(805) 893-4765
sonia.fernandez@ucsb.edu

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