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‘We Need More Matts Around the Lab’

Take a postdoctoral scholar with a deep grasp of physics, superior technical ability and good communication skills, and you’ll have Matthew Pelliccione, a member of UC Santa Barbara Assistant Professor Ania Jayich’s lab and this recipient of the campus’s Harvey L. Karp Discovery Award.

“I like to build things,” said Pelliccione, who came on board just last September and, according to Jayich’s letter of support to the Karp award selection committee, “has already had a tremendous impact on the lab.” Among his accomplishments: revamping a room-temperature homebuilt scanning probe magnetometer (SPM); designing a low-temperature SPM; and effectively communicating complex and varied physics topics to the more junior members of the group, leading to the consensus that “we need more Matts around the lab.”

Pelliccione, who graduated from Stanford University last fall, is deeply involved in studying quantum effects on the nanoscale, using scanning probes and single-spin sensors. Take, loosely, the concept of a record player, with the record being the material scanned on the nanoscale, and the needle tip being a nanofabricated diamond with a special defect — two adjacent atoms missing in the diamond’s carbon lattice, one space filled with a nitrogen atom — that allows for the sensing of specific properties of the material, particularly magnetism.

“This is a great place; there’s a lot of very interesting work that’s being done at UCSB,” Pelliccione said. He chose to do his postdoctoral work at UCSB because it has a world-renowned physics department that collaborates closely with the Materials Research Lab (MRL). He also wanted to work with Jayich, who specializes in, among other things, nanoscale scanning probe microscopy and quantum assisted sensing based on defects in diamond. In 2012 Jayich received the prestigious Presidential Early Career Award for Scientists and Engineers, the highest honor the nation can bestow on a scientist or engineer at the beginning of his or her career.

“The Karp Award is a great honor for Matt,” said Jayich. “And it is also a well-deserved honor. He has a clear knack for experimental physics and moreover has been a wonderful mentor to the other students in my lab. Working with Matt has been a real pleasure and look I forward to his bright future.”

According to Pelliccione, the $48,000 Karp award will allow him to continue his experiments, which involve diamond nanofabrication and the building of a low-temperature SPM with a diamond nitrogen-vacancy scanning probe. Both feats would be considered rare and coveted successes by any top-notch physics group in the world.

“I am certainly honored to receive the award,” he said, “and it’s humbling to be chosen from a large group of my peers to receive this.” Because of the cutting-edge nature of Pelliccione’s work, the Karp award fills in where other awards might not. It allows for the risk inherent in new and innovative projects, while giving the recipient a certain degree of freedom to perform their experiments.

“I thank Mr. Karp for giving me the opportunity to do this work,” Pelliccione said.

The Harvey L. Karp Discovery Award at UCSB is a gift from international business leader and entrepreneur Harvey Karp. It is intended to provide seed funding to the most exceptional young postdocs early in their careers and to support their innovative research.

About UC Santa Barbara

The University of California, Santa Barbara is a leading research institution that also provides a comprehensive liberal arts learning experience. Our academic community of faculty, students, and staff is characterized by a culture of interdisciplinary

collaboration that is responsive to the needs of our multicultural and global society. All of this takes place within a living and learning environment like no other, as we draw inspiration from the beauty and resources of our extraordinary location at the edge of the Pacific Ocean.