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From High School to Higher Ed: Recent High School Graduate Gains Research Experience in a National Science Foundation Engineering Research Center Laboratory

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Recent high school graduate, Shaun Meehan is following in family footsteps and making a few of his own. The grandson of the designer of the first laser gyroscope, Shaun Meehan turned a lifelong love of science into a unique research opportunity in Colorado State University's Extreme Ultraviolet Science and Technology program, a National Science Foundation Engineering Research Center (EUV ERC).

Meehan's love of science began in elementary school where a Lego robotics kit fostered his lasting interest in electronics and engineering. Since the third grade, Meehan has participated in robotics extracurricular programs including

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the Robotics Club at Tavelli Elementary, which he started. Between fourth and sixth grade Meehan served as a mentor for the club, which is still ongoing today. In junior high, Meehan took his interest in electronics to the next level participating in a robotics competition sponsored by the Poudre High School Alpine Robotics Team. He later went on to become their youngest member as an eighth grader.

With the exception of his sophomore year, when he studied in Melbourne, Australia as an exchange student, Meehan has dedicated his education to science and math. It was this enthusiasm that led him, in his junior year, to the NSF Engineering Research Center for Extreme Ultraviolet Science and Technology's Optics and Lasers Workshop, held at CSU during January 2006. Chosen for his passion and electrical experience, including knowledge of computer drafting programs and milling machinery, Meehan was invited to conduct research the summer following his junior year.

Over the past two years, Meehan has been designing and manufacturing key laser components under University Distinguished Professor and Director of the EUV ERC, Dr. Jorge Rocca. Working alongside both undergraduate and graduate students, Meehan, was one of three high school students working at the laboratory this past summer.

Meehan started his work last year using a 3-dimensional autocad software program to design the vacuum chambers and optical mounts that are part of a new extreme ultraviolet laser. Subsequently, this summer he constructed the hardware utilizing a computer-controlled milling machine. Finally, at the end of this summer, he collaborated with graduate students Federico Furch and Brendan Reagan in integrating the components into a high power laser system that will be used to generate coherent ultraviolet light for nano-scale imaging and other applications.

In addition to gaining invaluable research experience, Meehan has had the unique opportunity to work alongside graduate students and professors conducting novel research, as well as learn graduate level concepts. As part of the team Meehan presented his work to other students in the Research for Undergraduate (REU) program including students from the University of Colorado-Boulder and University of California-Berkeley. Meehan also had the honor of showcasing his designs to President Penley during a recent visit by the president to the ERC.



"Everyone has been amazing. The graduate students and Professor Rocca never treat me like a high school student, they treat me as part of the team," said Meehan. "I could ask anyone any question. They are all so willing to help."

"Shaun is so enthusiastic, smart, and hard working: the magic combination," said Dr. Rocca. "He has a very bright future."

Meehan's future plans include pursuing his electrical engineering degree at CSU, but only after an adventurous year abroad. Upon finishing up his research at the EUV ERC, Meehan will depart for Antarctica. There he will be working as a general assistant for Raytheon at the National Science Foundation Amundsen-Scott South Pole Station through the summer. In February he will then embark on a world tour beginning in New Zealand and ending in Europe.

"I can never turn down an adventure," said Meehan of his upcoming travels and work at the ERC. "I love to be always learning, always trying something new. I love to bend what's known!"

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