Rebecca Anthony receives $500,000 NSF CAREER Award

Rebecca Anthony, an assistant professor of mechanical engineering in the Michigan State University College of Engineering, has been awarded a five-year, $500,000 NSF Faculty Early Career Development (CAREER) Award to research nanostructure manufacturing that will make LED lights more efficient and versatile. NSF CAREER awards support junior faculty who exemplify the role of teacher-scholars through outstanding research and education.

The NSF award will help advance her research project entitled, “Continuous Vapor-Phase Manufacturing of Anisotropic Silicon Nanostructures for Optoelectronic Applications.”

“We’re trying to use sustainable techniques to make semiconductor nanorods and other non-spherical nanostructures. By controlling the shapes of these materials, you change the colors of light that they can emit and absorb, as well as other important properties. This will allow us to improve the efficiency and versatility of LED lights, solar cells, and communication devices,” she explained.

“Spherical is the norm for nanoparticles. We’re trying to expand and break the norm,” she said.

Anthony noted that current processing for these nanostructures is time-consuming, costly, and uses toxic solvents.

“We’re hoping to sidestep the techniques that already exist by using streamlined, plasma-based, vapor-phase methods to make these non-spherical nanostructures. This will help to give us control over optical absorption and emission behavior of the nanostructures while maintaining sustainable processing methods,” she added.

Anthony becomes the 13th member of the MSU College of Engineering faculty to receive an NSF CAREER Award since 2010.
She joined Michigan State in August 2013. Her research interests include using plasmas to make nanostructures and materials that are used in applications that range from energy-oriented devices like light-emitting diodes and solar cells to biological imaging agents.

In 2016, she was awarded a Withrow Teaching Excellence Award. In her award nomination letter, a student said Anthony creates a learning environment where questions are welcomed. “She is always ready to answer the questions that open the doors to further learning. This approachable nature makes her a remarkable teacher.”

She earned a PhD in mechanical engineering from the University of Minnesota (2011) and attended Carleton College in Northfield, Minnesota, where she majored in physics (2003).

The Faculty Early Career Development (CAREER) Award is among the NSF's most prestigious honors, recognizing
young faculty members who are effectively integrating research and teaching.

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