UC SANTA BARBARA
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The Building Blocks of the Future

Better, more efficient batteries and photovoltaics. High-performance materials that withstand extreme temperatures and conditions. High-tech devices that require only minimal amounts of energy. There seems to be no limit to the technology we can imagine to solve global problems, improve life in developing countries or enhance our day-to-day activities.

To realize that vision for the future, UC Santa Barbara materials scientists are working hard today. With more than $6 million from the National Science Foundation in the form of DMREF (Designing Materials to Revolutionize and Engineer our Future) grants, UCSB researchers are collaborating with research and industry partners to develop not only next-generation materials, but also the design and manufacturing systems that surround them.

In the latest round of funding, UCSB materials professor and department chair Tresa Pollock, along with professors Anton Van der Ven, Matthew Begley, Linda Petzold and Frederic Gibou, will continue ongoing research into the design and synthesis of complex multicomponent, multilayered high-temperature materials that could lead to the development of higher-performance aircraft engines and higher-efficiency natural gas-based power plants.

Theirs is the sixth DMREF grant awarded to UCSB — more than any other single institution.

“These awards acknowledge the national leadership of the UCSB Materials Department in the discovery and design of new materials for a broad range of applications and our significant contributions to the fields of electronics, lighting, energy and advanced propulsion,” Pollock said.

Other DMREF-funded projects at UCSB include research on the design and fabrication of conductive polymers, headed by Michael Chabinyc and Craig Hawker; and investigations into the degradation of heterostructures made with materials with very different chemistries, led by Anton Van der Ven and Carlos Levi. Meanwhile, Chris Van de Walle and James Speck are studying how energy band gaps might be affected by advanced materials at the atomic level; and Glenn Fredrickson and Kris Delaney are exploring multiblock polymers at a fundamental level as they develop tools that will enable other researchers in academia and industry to more quickly design, discover and deploy new multiblock polymers.

These DMREF-funded programs are motivated by the Materials Genome Initiative, a federal effort launched in 2011 to accelerate research and development of advanced materials and develop the infrastructure and resources necessary to manufacture and deploy them at a greatly accelerated pace.

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.