UC SANTA BARBARA

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UCSB RESEARCHER LAUDED FOR EXCELLENCE IN CHEMICAL ENGINEERING

Dimitrios Maroudas, associate professor of chemical engineering at the University of California, Santa Barbara, has won a Camille Dreyfus Teacher-Scholar Award from the Camille and Henry Dreyfus Foundation.

The Camille Dreyfus Teacher-Scholar Awards Program is given to scholars who show exceptional research promise and teaching excellence. Winners receive a $60,000 grant, of which $5,000 goes to their respective academic departments to enhance undergraduate education.

"Selection of the 20 Teacher-Scholars was not a simple task," according to foundation officials.

"It is the foundation's expectation that this award will assist these outstanding scientists to continue the high level of accomplishment in education and research that they have demonstrated thus far."

Of the winners, only three were chemical engineering faculty members such as Maroudas.

Foundation officials were drawn to Maroudas' ongoing research on surface and interface science of semiconductor materials, the basic components of all integrated

circuits used in today's electronics and of other optoelectronic and photovoltaic devices such as flat panel displays and solar cells.

Maroudas is probing the chemical reactivity of semiconductor surfaces to better understand how surface reactions during semiconductor processing determine the structural characteristics and the properties of these electronic materials.

He places special emphasis on the surface reactivity of silicon, the most common material used by far in the manufacturing of electronic devices.

Part of Maroudas' research looks at the process of semiconductor thin film growth on such surfaces by plasma-enhanced chemical vapor deposition. An alternative to conventional chemical vapor deposition, the plasma enhancement, due to high chemical reactivity, allows manufacturers to use lower temperatures and make device fabrication overall more cost-effective.

In addition, Maroudas is studying the role that mechanical strain plays when different layers of compound semiconductor materials, such as gallium arsenide, are used to form a heterostructure with superior electronic properties to those of bulk materials. A problem with growth of a material on a substrate of a different material is that the atomic-scale lattice structures of the different materials do not match. This causes mechanical tension or compression to build during the growth process. To relieve this mechanical stress, defects are generated in such heteroepitaxial systems with catastrophic effects on their electronic properties.

Maroudas is attempting to understand the mechanisms behind relaxing the strain in mismatched lattices and their implications for improving and optimizing heteroepitaxial growth processes for the synthesis of semiconductor heterostructures and confined quantum structures.

Maroudas joined the UC Santa Barbara faculty in 1994 after serving as a post-doctoral fellow at IBM's Thomas J. Watson Research Center in Yorktown Heights, New York.

The associate professor graduated with the highest honors from the National Technical University of Athens, Greece in 1987, where he was ranked first in his class of 200 in chemical engineering. He received his Ph.D. in chemical engineering from the Massachusetts Institute of Technology in 1992.

The Camille and Henry Dreyfus Foundation was established in 1946 by chemist, inventor and businessman Camille Dreyfus as a memorial to his brother Henry, also a chemist and his partner in developing the first commercially successful system of cellulose acetate fiber production.

The foundation serves to advance the science of chemistry, chemical engineering and related sciences as a means of improving human relations and circumstances around the world.

EDITORS: A J-peg image of Dimitrios Maroudas is available upon request.

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.