ICN2 EXCELENCIA SEVERO OCHOA

Manuel Cardona Lectures

This series of lectures offer the opportunity to interact with some of the most prominent researchers in nanoscience-related fields. At the same time, they are a tribute to Prof Manuel Cardona, a key figure in the history of this Institute.

Piezoelectric Films for Microelectromechanical Systems

Susan Trolier-McKinstry
Pennsylvania State University

Piezoelectric thin films are of increasing interest in low voltage microelectromechanical systems (MEMS) for sensing, actuation, and energy harvesting. They also serve as model systems to study fundamental behavior in piezoelectrics. The seminar will discuss how materials are optimized for these applications, as well as examples of the use of piezoelectric films over a wide range of length scales. The key figures of merit for actuators and energy harvesting will be discussed, with emphasis on how to achieve these on practical substrates. For example, control of the domain structure of the ferroelectric material allows the energy harvesting figure of merit for the piezoelectric layer to be increased by factors of 4 – 10. Likewise, control of crystallographic orientation and substrate clamping enables large increases in the figure of merit for actuators. To illustrate the functionality of these films, examples of integration into MEMS structures will also be discussed, including adaptive optics for Xray telescopes, low frequency and non-resonant piezoelectric energy harvesting devices, and piezoelectronic transistors as a potential replacement for CMOS electronics.

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Susan Trolier-McKinstry
Pennsylvania State University

Wednesday, Mar 9, 2016, 12:00h

ICN2 Seminar Hall, ICN2 Building, UAB

Invited by:
Gustau Catalán
Oxide Nanoelectronics group, ICN2

Short Bio

Susan Trolier-McKinstry is a professor of Ceramic Science and Engineering and professor of Electrical Engineering at The Pennsylvania State University. She obtained B.S., M.S. and Ph.D. degrees in Ceramic Science and Engineering, all from Penn State. On graduation she joined the faculty there.

Trolier-McKinstry is director of Penn State's Nanofabrication Laboratory, a part of Penn State's Materials Research Institute, and has been a faculty member at the University since 1992. She is co-director of the Center for Dielectric and Piezoelectric Studies, a joint Penn State/North Carolina State National Science Foundation Industry/University Cooperative Research Center. She is an associate editor of Applied Physics Letters; a fellow of MRS, the Institute of Electrical and Electronics Engineers, and the American Ceramic Society; and an academician in the World Academy of Ceramics. She previously served as the president of the IEEE Ultrasonics, Ferroelectrics, and Frequency Control Society, as well as Keramos and the Ceramic Education Council. She is coauthor of more than 350 papers and holds numerous patents. Among her goals as leader of the MRS board is to actively engage the next generation of materials scientists.

To confirm your attendance, please register at:
http://goo.gl/forms/7FetjZiXdg
Registration is free!

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