

The Department of Mechanical Engineering Presents

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Title: Ultrafast magnetoelastic dynamics of single nanomagnets

Abstract: Nanomagnets form the basis of emerging spintronic devices in data storage and memory, and their dynamic magnetization properties are critical parameters for applications. Recently, the interaction between magnetic and mechanical oscillations via magneto-elastic coupling has been gaining attention. I will discuss the influence of mechanical vibrations in nanopatterned structures on the magnetic properties and behavior of individual nanomagnets. Examples include the use of surface acoustic waves for cold excitation of magnetization dynamics to extract intrinsic material parameters and the first observation of strong coherent coupling between phonons and magnons within a single magnetic element.



About the Speaker: Holger Schmidt received an M.S. degree in physics from the University of Stuttgart, Germany, in 1994, and M.S. and Ph.D. degrees in electrical and computer engineering from the University of California, Santa Barbara, in 1995 and 1999, respectively. After serving as a postdoctoral Fellow with the Massachusetts Institute of Technology, Cambridge, he joined the University of California, Santa Cruz, in 2001. He is a Professor of Electrical and Computer Engineering and holds the Narinder Singh Kapany Chair of Optoelectronics. He served as Associate Dean for Research for the School of Engineering and is Director of the W.M. Keck Center for Nanoscale Optofluidics. Prof. Schmidt has authored over 400 publications and several book chapters in various fields of optics and photonics. He also edited the first Handbook of Optofluidics published with CRC Press. His research interests include single molecule detection and analysis in optofluidic devices, hollow-core waveguide photonics, atomic spectroscopy on a chip, nano-magneto-optics, and spintronics. He received an NSF Career Award in 2002, a Keck Futures Nanotechnology Award in 2005, and the Engineering Achievement Award of the IEEE Photonics Society in 2019. He was elected Fellow of the Optical Society of America in 2014, Fellow of the IEEE in 2017, and Fellow of the National Academy of Inventors in 2019.

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THURSDAY, APRIL, 14, 2022
11:00AM-11:50AM