

PHYSICAL COLLOQUIUM

INVITATION

Monday, 26.10.2020, 4.15 p.m.,

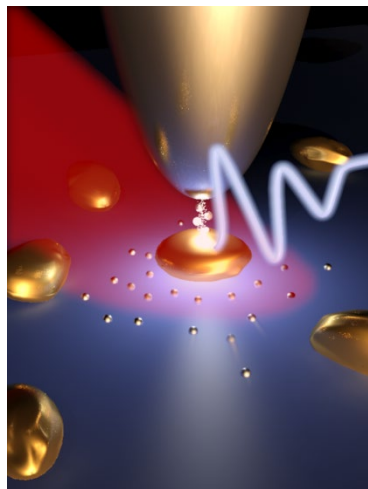
speaks

Frank Hegmann,

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about

“Imaging ultrafast phenomena on the nanoscale”



The ability to directly probe ultrafast phenomena on the nanoscale is essential to our understanding of excitation dynamics on surfaces and in nanomaterials. Recently, a new ultrafast scanning tunneling microscope (STM) technique that couples terahertz (THz) pulses to the scanning probe tip of an STM was demonstrated (THz-STM), showing photoexcitation dynamics of a single InAs nanodot with simultaneous 0.5 ps time resolution and 2 nm spatial resolution under ambient conditions. Operation of THz-STM in ultrahigh vacuum now makes it possible to spatially-resolve subpicosecond dynamics of single molecules and silicon surfaces with atomic precision. This talk will discuss how THz-STM works and how it can provide new insight into ultrafast dynamics on the atomic scale, which is essential for the development of novel silicon nanoelectronics and molecular-scale devices operating at terahertz frequencies.

Short Bio:



Frank Hegmann received his PhD in Physics from McMaster University in 1994 and then worked as a postdoctoral researcher at the Center for Terahertz Science and Technology at the University of California, Santa Barbara. In 1997, he started as an assistant professor in the Department of Physics at the University of Alberta studying ultrafast dynamics in materials using time-resolved terahertz (THz) pulse spectroscopy. He is currently a Professor in Physics and AITF Strategic Chair in Terahertz Science and Technology with research interests in THz pulse spectroscopy, ultrafast imaging, THz-STM, terahertz nonlinear dynamics, and biological effects of intense THz pulses.

All interested persons are cordially invited.

Sgd. Prof. Dr. Sascha Schäfer