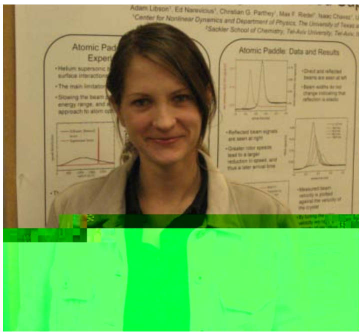
北京大学量子材料科学中心

International Center for Quantum Materials, PKU

Seminar week



Charlotte anders

University of Science and Technology of China.

Time: 4:00pm, July. 17, 2013 (Wednesday)

时间：2013年7月17日（周三）下午4:00

Venue: Room 607, cience Building 5

地点：理科五号楼607会议室

Abstract

In the past year we have demonstrated that epitaxial Ag film has remarkable low-loss plasmonic properties in both the visible range (Science 337, 450 (2012)) and the infrared regime (Nano Letters 12, 6187 (2012)). These studies have highlighted the dramatic effects of film quality on plasmonic damping. From a materials standpoint, Ag film presents singular challenges. Development of plasmonically active structures based on thin films (e.g., plasmonic waveguides, optoelectronic circuits) has been hindered by the difficulty of fabricating such films and by their fragility outside of vacuum. Silver, which is non-wetting on semiconducting and insulating substrates, can adopt a metastable atomically flat epitaxial film morphology on certain substrates if it is deposited at low temperature and then annealed to room temperature. Building on our group's established expertise in film growth and scanning probe microscopy, we have optimized our ability to grow Ag film on Si(111) with very high quality and atomic smoothness over macroscopic areas. Meanwhile, however, the mechanisms of dewetting in this system remain little-understood and need to be fully clarified if Ag film is to realize its potential in device applications. Using scanning probe techniques, low energy electron microscopy, and optical studies, we have investigated Ag dewetting on Si(111) and found interesting thickness-dependent behavior. We have also used Ge to cap Ag films to stabilize them against dewetting. In this talk I will discuss the intriguing processes of growth and dewetting in Ag film on Si(111) and will contextualize the data in terms of its far-reaching implications for plasmonic research.

About the Speaker

Dr. Charlotte Sanders received her Ph.D. in 2013 at the University of Texas at Austin under the advisement of Professor Chih-Kang Shih. Her research focus is scanning probe microscopy and epitaxial growth, with particular emphasis on surfaces and interfaces in metal and semiconductor systems, and on the design of thin film platforms for plasmonics applications. She is currently a postdoctoral researcher at the University of Science and Technology of China.