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***Optical second harmonic generation in  
nano-structured surface and interface***

**Date: 2023/03/28 (Tue)**

**Venue: S4-625**

**Time: 14:00-16:00**

**Abstract:**

Second harmonic generation (SHG) is one method of nonlinear optics and highly sensitive to polar structure on the surface and structure. In recent years, reflective SHG (RSHG) is widely used to analyze and study the evolution of nano-structured surface and structure, which provides structural and composition information to realize further nanoscience phenomena. We show how the evolution of Zn dots coherently grown on Si(111) by in a large area can be completely understood as the metastable strain system by combining RSHG and a 2D pole figure with synchrotron X-ray diffraction. Furthermore, RSHG from Zn dots grown on varied Si substrate reveals the correlation between the interface quality and strain relaxation. We also demonstrate that collective oxidized Zn dots act as buffer and seed layers for the growth of high surface quality ZnO thin films on Si(111) by rf-sputtering, and we further in situ analyze the structural evolution by RSHG. Meanwhile, we utilize the charge trapping characteristic to study surface gas adsorption and demonstrate the competitive adsorption behaviors between oxygen and water vapor from the perspective of electrical dipole by observing the evolution of RSHG.