

凝聚态物理-北京大学论坛

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Probing Surfaces and Interfaces of Solid Materials with Linear and Nonlinear Optical Techniques

时间: 10月18日 (星期四) 15:00—16:30

地点: 北京大学物理大楼中212教室

•**摘要:** Surfaces and interfaces of solid materials that consist of only a few atomic or molecular layers are a unique class of materials by themselves. Understanding properties of surfaces and interfaces is crucial from a number of standpoints. All forms of material synthesis and processing start at a solid surface, they are thus controlled by atomistic and molecular processes that occur at the surface. As physical dimensions of building blocks of solid-state devices continue to decrease down to a few nanometers, properties of the devices made of these nano-materials are significantly influenced by structural, electronic and transport properties of the surface that are distinct from those of the bulk. This is because the surface possesses different symmetries as required by its distinct physical setting. Furthermore, an interface separating two materials often hosts localized states with properties not found in either of the bulk materials such as classical surface plasmon polaritons in the vicinity of a metal surface, surface states on a topological insulator (driven by abrupt change in topological order parameter), and conducting states at the interface between polar and non-polar insulators (driven by polarization catastrophe). Measuring various properties of a solid surface by analyzing rich information in light reflection from the solid has many advantages such as non-invasiveness, in-situ detection.

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