

Abstract Submitted
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Ultrafast Electron Diffraction for Interfaces and Nanometer Scale

Materials CHONG-YU RUAN, Michigan State University — Surfaces are essential in many fundamental processes in materials and biology. Atomic interfaces can be modified with layered structures to engineer properties for nanometer scale sensing and electronics, or be used as templates for monolayer-assemblies with control from surface chemistry. Ultrafast electron diffraction (UED) can be applied to resolve, for these materials, both structures and dynamics to elucidate the underlying mechanisms and functions. I will outline the recent developments of surface UED in which crystalline substrates were used as templates for making chemically modified layers or supramolecular assemblies; their local structures and periodic orders in the long range reflect their affinities to the substrates. With controls of laser fluences, energies, and surface characters, strongly driven (either from charges or from thermal strains) restructuring of the surfaces and adspecies were observed with sub-angstrom displacement of atoms following the ultrashort laser impulse in the far-from-equilibrium regime at short time and at near-equilibrium at long times.

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