

SEMINAR ANNOUNCEMENT

FRIDAY, 09.09.2016

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“Surface and Interface Science for the 21st century: warm and dense”

Over the past century the science of surfaces has undergone an enormous progress. The atomic and electronic structure, reactivity, and dynamics of many material surfaces have been uncovered. Several Nobel prizes have marked the great accomplishments of our predecessors, from I. Langmuir in 1932 to G. Ertl in 2007. This progress has been fostered and propelled by the continuous development of powerful techniques that have provided atomic and molecular level details of surfaces, adsorption and desorption phenomena, vibration and electronic spectra, electron diffraction and real space imaging by the Scanning Tunneling Microscope. The nature of many techniques has constrained Surface Science to ultra-high vacuum environments, and often under cryogenic temperature to achieve measurable coverage of weakly bound adsorbates. And yet practical surfaces are surrounded by gases and liquids at ambient conditions of pressure and temperature. Under these conditions the surfaces are covered with dense layers of adsorbed molecules in equilibrium with the gas phase, while the relevant ambient temperature unlocks many kinetic processes that are frozen at low temperatures. I will review the physics and chemistry of surfaces with dense layers of adsorbates and show new phenomena that derive from this, including the effect of reactant gases such as O₂, C₂H₄, and CO on the structure of Pt and Cu surfaces. Prospects for similar studies of the solid-liquid interface, a new frontier in the field, and their impact in environmental science, electrochemistry and energy storage will be discussed.

Guests are very welcome!