

Fall 2018 Colloquium

Department of Physics & Astronomy, TAMU-Commerce

Sep 6, Thursday, 4-5 PM in Science Building 127

(coffee and cookies will be served at 3:50 PM)

Surface Physics

Surface Science Research at SSRL

Dr. Anil Chourasia

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Dr. Chourasia earned BS (1975) and MS (1978), and a Ph.D. degree (1986) from the Nagpur University, India. His Ph.D. research topic was on X-ray spectroscopic investigation of some compounds of germanium and arsenic. He worked as a post-doc at East Texas State University until 1996. Dr. Chourasia began his appointment as an assistant professor at Texas A&M University-Commerce in the year 1996. He is currently doing research in growth and characterization of metallic thin films.

Abstract

The surface science research performed at the SSRL in TAMU-Commerce will be discussed. An example of Ti/CuO interface will be covered. The techniques of X-ray photoelectron spectroscopy (XPS) and Atomic Force Microscopy (AFM) will be introduced. XPS has been used to study the chemical interaction at the Ti/CuO interface. The CuO gets reduced to elemental copper. This is followed by oxidation of elemental titanium to TiO₂ at the interface. The diffusion barrier characteristics of titanium has also been investigated. The AFM has been used to study the growth of titanium and titanium oxide on the substrates. Titanium grows according to Frank-van der Merwe model (layer-by-layer growth). The Ti/CuO interface exhibited island formation corresponding to the Volmer-Weber growth model (island formation). The percentage area of the islands covering the surface and the average size of the islands showed linear trend for the thicknesses of the titanium overlayer.