Yale Institute for Nanoscience and Quantum Engineering

Friday-February 2, 2018

12:00-1:00 PM

BECTON SEMINAR ROOM
Light lunch will be served at 11:45 a.m.

Professor Marcus Bosenberg
Department of Dermatology, Pathology and Immunobiology, Yale University

"Concepts in Modeling Anti-Cancer Immune Responses"

Cancer is now the leading cause of death in the US and traditional approaches to treat cancer have had variable and often minimal success. The recent development of drugs that stimulate the immune system to effectively fight cancer have been a revolution in cancer care. However the mechanisms of how these drugs work, and more generally, how the immune system fights cancer are not well-understood. We have developed novel immunogenic models of cancer that allow for the functional evaluation of components required for effective responses and have also developed new real-time imaging capabilities that allow us to image anti-cancer immune responses in three dimensions over time. These tools enable us to develop and evaluate theoretical models that incorporate variables that determine effective vs ineffective anti-cancer immune responses.

Amit Datye
Department of Mechanical Engineering and Materials Science, Yale University

"Nanoindentation of Metallic Glasses"

Nanoindentation, i.e., the probing of a material's response when penetrating its surface at the nanometer scale with a sharp tip of defined shape, has recently emerged as an important technique for locally characterizing mechanical properties. Although its initial applications were geared towards thin films, nanoindenters have evolved into a versatile characterization tool capable of obtaining information that is difficult or impossible to access with traditional methods such as high- and low-temperature testing, high strain rate testing, creep testing, etc. In our research, we perform nanoindentations using both standard commercial instrumentation as well as, for resolution down to the atomic scale, atomic force microscopes to analyze the mechanical properties of bulk metallic glasses (BMGs) and metal alloys sputtered as thin films on silicon wafers using a combinatorial approach. While the research on the bulk samples is designed to provide insight into the plastic flow properties of such glasses, which are currently not conclusively known, the wafer studies are aimed at unveiling the complex correlations between materials properties and an alloy's glass forming ability in order to extract trends that will allow to dramatically accelerate the development of multi-component alloys with tailored properties.

Host: Professor Corey O'Hern