Most engineering applications require the understanding of the mechanical properties of the selected material for a given application. However, classical mechanical testing (be it tensile or compressive) might not always be appropriate for testing the mechanical response of a material. There are several scenarios where you need to use novel approaches to get to the properties relevant for the design. Some of those scenarios include:

1) limited sample volumes
2) sample cost
3) length-scale effects (e.g. heterogeneous samples such as foams, biomaterials and nanostructures)

This talk will focus on the incipient plasticity of bulk metallic glasses (BMG). The observations made during nanomechanical testing of BMG and the changes of the incipient plasticity in bulk metallic glasses as a function of temperature and prior loading history will be discussed. Furthermore a novel material class, the so-called nanoglasses will be introduced and the initial results will be shown.

Bio: Dr. Oliver Franke is currently a visiting assistant professor in the Aerospace and Mechanical Engineering Department at the University of Southern California, where his research focuses on the nanomechanical behavior of various materials ranging from polymeric to metallic glasses. Prior to his appointment at USC he worked as a post-doctoral associate and lecturer in the group of Professor Christopher Schuh at MIT. He obtained both his Masters and his doctorate from the University of Erlangen, Germany, where he worked on a wide range of topics (biomaterials, combinatorial materials science and corrosion protection coatings) in the group of Professor Mathias Goeken. Furthermore Dr. Franke holds a degree in Quality Management (Quality Systems Manager Junior) of the German and the European Society for Quality. He has also been a visiting scientist at the University of California, San Diego (with Prof. Marc Meyers) and the Karlsruhe Institute of Technology (Institute of Nanotechnology with Profs. Horst Hahn and Herbert Gleiter), Germany. His work was recognized through a research fellowship by the association for the internalization of the University of Erlangen and as a recipient of the Young Investigator Award of the German Materials Society (DGM).