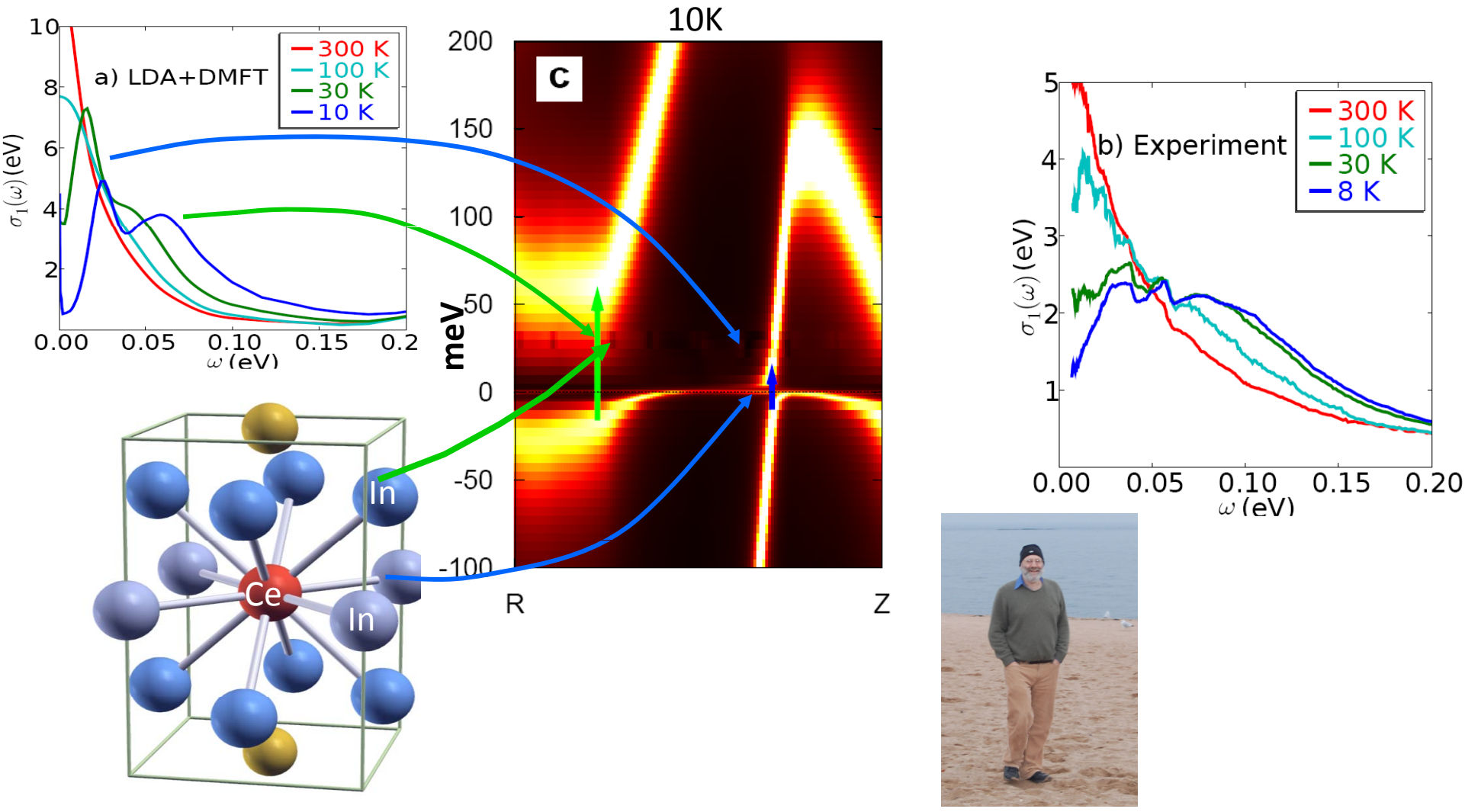
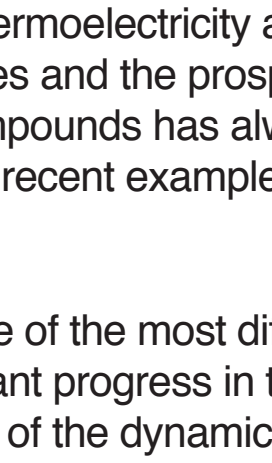
Boston University Physics Colloquium





Strongly Correlated Electron Systems: a Dynamical Mean Field Theory Perspective

Correlated electron systems display a plethora of remarkable phenomena ranging from metal to insulator transitions and high temperature superconductivity to anomalous thermoelectricity and volume collapses. They continue to surprise us with their exceptional physical properties and the prospectives for new potential applications. The discovery of interesting strongly correlated compounds has always been the result of serendipity and the application of the Edisonian approach, the most recent example provided by iron arsenide superconductors.

From a theoretical perspective correlated electron systems pose one of the most difficult non-perturbative problems in physics. In the past decade there has been significant progress in the description of the electronic structure of correlated materials through the development of the dynamical mean field theory (DMFT) approach. In this colloquium I will introduce the subject of strongly correlated electron systems and DMFT. We will then show some applications of the method to problems previously untractable with other methods, including actinides, heavy fermions and correlated superconductivity. We will conclude with the challenges ahead and the prospective for facing the grand challenge of material design.

Gabriel Kotliar

Rutgers University

March 31, 2009 (Tuesday) at 3:30pm (Refreshments at 3:15pm)

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