abstract

GEOMETRY AND CELL COMPLEXES
Topic:

Speaker:

Affiliation:

Date:

Time/Room:

Polycrystalline materials, such as metals, ceramics and geological materials, are aggregates of single-crystal grains that are held together by highly defective boundaries. The structure of grain boundaries is determined by five geometric parameters: three parameters describing the relative misorientation between adjoining grains and two parameters describing the boundary normal vector. Grain boundaries and their networks have a profound influence on the functional and structural properties of polycrystalline materials. However, analytical studies that incorporate these geometric parameters are limited because the grain boundary parameter space is complicated and even the well-studied subset of this space, the misorientation space, is relatively poorly understood. This talk will highlight our recent efforts in improving the representation of grain boundary misorientation space. The topology of the space of misorientations will be discussed with a focus on the effect of symmetries on the minimum embedding dimensions in Euclidean space. This opens the door to a new and intuitive method of representation of misorientation information in which grain boundaries can be continuously and uniquely colored by their misorientations. (Joint work with Christopher A. Schuh)