

## **Three-dimensional Structure Determination of Molecules without Crystallization: from Electron Microscopy to Semidefinite Programming**

Amit Singer, Princeton University

In cryo-electron microscopy (cryo-EM), a microscope generates a top view of a sample of randomly-oriented copies of a molecule. The cryo-EM problem is to use the resulting set of noisy 2D projection images taken at unknown directions to reconstruct the 3D structure of the molecule. In this talk we will discuss methods for estimating the unknown orientations using semidefinite programming.