Speaker: Afonso Bandeira  
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Title: On Phase Transitions for Spiked Random Matrix and Tensor Models

Abstract:  
A central problem of random matrix theory is to understand the eigenvalues of spiked random matrix models, in which a prominent eigenvector (or low rank structure) is planted into a random matrix. These distributions form natural statistical models for principal component analysis (PCA) problems throughout the sciences, where the goal is often to recover or detect the planted low rank structured. In this talk we discuss fundamental limitations of statistical methods to perform these tasks and methods that outperform PCA at it. Emphasis will be given to low rank structures arising in synchronization problems. Time permitting, analogous results for spiked tensor models will also be discussed.

This talk is based on joint work with Amelia Perry, Alex Wein, and Ankur Moitra.