

Title: Quantum and classical information processing with tensors

Summary: This is a special topics course aimed at mathematically inclined graduate students from CMS, IQIM, EE and math. No quantum background is required, but familiarity with linear algebra is essential. The concept of quantum entanglement and Strassen's algorithm for fast matrix-matrix multiplication will serve as concrete motivations for a rigorous study of tensors. This analysis will lead to formulas for integrating polynomials over the complex sphere (Haar integration) and sum-of-squares hierarchies of convex relaxations. Both concepts are highly useful in their own right. More applied topics will include different tensor decompositions, associated algorithmic challenges, and their applications in data processing and deep learning.

Just to double-check:

course nr.: ACM 270-1

schedule: M/W from 2:30 pm till 4pm in Annenberg 314.