

## Department Colloquium

Speaker: Professor Tryphon Georgiou, University of Minnesota

Date: Friday, March 11

Time: 2:30 p.m.

Place: Jeffery 234

Title: Entropic and Displacement interpolation of probability distributions: geometric and computational aspects

**Abstract:** We will discuss two problems with a long history and a timely presence. Optimal mass transport (OMT) was posed as a problem in 1781 by Gaspar Monge. It provides a natural geometry for interpolating distributions (displacement interpolation) and for modeling flows. As such it has been the cornerstone of many recent developments in physics, probability theory, and image processing. The Schrödinger bridge problem (SBP) was posed by Erwin Schrödinger in 1931, in an attempt to provide a classical interpretation of quantum mechanics. It is rooted in statistical mechanics and large deviations theory, and provides an alternative model for flows of the distribution of particles (entropic interpolation -Schrödinger bridge). We will explain the relation between the two problems, their practical relevance in the control of particles, ensembles, thermal noise, time-series analysis, images interpolation, etc., and we will present a computational approach based on the Hilbert metric. The talk is based on joint work with Yongxin Chen (Mechanical Engineering, University of Minnesota) and Michele Pavon (Department of Mathematics, University of Padova).