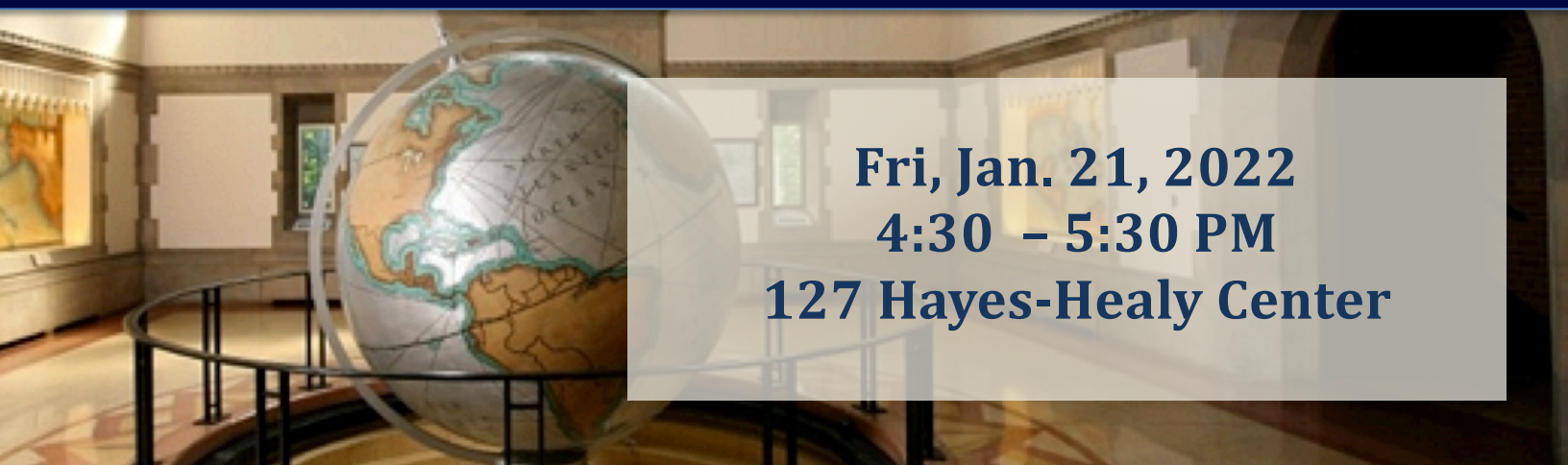
Department of Applied and Computational Mathematics and Statistics Colloquium

Michael Jauch

Cornell University

Mixture representations for likelihood ratio ordered distributions

In many statistical applications, subject matter knowledge or theoretical considerations suggest that two distributions should satisfy a stochastic order, with samples from one distribution tending to be larger than those from the other. In these situations, incorporating stochastic order constraints can lead to improved inferences. This talk will introduce mixture representations for distributions satisfying a likelihood ratio order. To illustrate the practical value of the mixture representations, I'll address the problem of density estimation for likelihood ratio ordered distributions. In particular, I'll propose a nonparametric Bayesian solution which takes advantage of the mixture representations. The prior distribution is constructed from Dirichlet process mixtures and has large support on the space of pairs of densities satisfying the monotone ratio constraint. With a simple modification to the prior distribution, we can also test the equality of two distributions against the alternative of likelihood ratio ordering. I'll demonstrate the approach in two biomedical applications.



Fri, Jan. 21, 2022
4:30 – 5:30 PM
127 Hayes-Healy Center