**Speaker:** Mathias Drton  
*Department of Statistics, University of Washington*

**Title:** A Bayesian information criterion for singular models

**Abstract:**

We consider approximate Bayesian model choice for model selection problems that involve models whose Fisher information matrices may fail to be invertible along other competing submodels. Such singular models do not obey the regularity conditions underlying the derivation of Schwarz’s Bayesian information criterion (BIC) and the penalty structure in BIC generally does not reflect the frequentist large-sample behavior of the marginal likelihood. Although large-sample theory for the marginal likelihood of singular models has been developed recently, the resulting approximations depend on the true parameter value and lead to a paradox of circular reasoning. Guided by examples such as determining the number of components in mixture models, the number of factors in latent factor models or the rank in reduced rank regression, we propose a resolution to this paradox and give a practical extension of BIC for singular model selection problems.