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Climate Transition Workshop
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Lecture: *Inference on the Future Climate States from Multiple Ensembles using Bayesian Hierarchical Models*

Speaker: Huang Huang

Abstract:
Climate scientists have been developing a lot of climate models for variables of interest, like temperature, pressure, based on physical dynamics. Due to different techniques in implementing the climate models and the uncertainty in the climate system, the variable values are not identical from different model outputs. Scientists have been working on sensible statistical models to combine different climate model outputs, and most of them assume the exchangeability of all the climate model outputs, which, however, may have similar origins or share common components that lead to model dependence. In this work, we present a Bayesian hierarchical model to account for the model dependence, which gives a better inference for the underlying process for the variable of interest. In addition, we use the spatial Gaussian random field to allow for spatial correlation in the modeling, offering us a sensible map of the inferred future climate states.