RENSSELAER POLYTECHNIC INSTITUTE

DEPARTMENT OF MATHEMATICAL SCIENCES/RTG COLLOQUIUM

"Statistical Reduced Models and Rigorous Analysis for Uncertainty Quantification of Turbulent Geophysical Flows "

AbstractThe capability of using imperfect statistical reduced-order models to capture crucial statistics in turbulent flows is investigated. Much simpler and more tractable block-diagonal models are proposed to approximate the complex and high-dimensional turbulent flow equations. A systematic framework of correcting model errors with empirical information theory is introduced, and optimal model parameters under this unbiased information measure can be achieved in a training phase before the prediction. It is demonstrated that crucial principal statistical quantities in the most important large scales can be captured efficiently with accuracy using the reduced-order model in various dynamical regimes of the flow field with distinct statistical structures.

Di Qi (Courant Institute of Mathematical Sciences, NYU)

Monday, April 22, 2019

4-5pm

Amos Eaton 214

Host: Peter Kramer

Refreshments served 3:30-4pm Amos Eaton 4th Floor Lounge