



Short course on

"Modeling with Heavy Tails and Extremes"

By Sidney Resnick, Cornell University, USA

The course will survey applied probability and statistical modelling techniques and examples where heavy tails and extreme behavior must be incorporated.

Topics will be chosen from the following list:

1. Random measures and point processes; weak convergence to Poisson random measures and Lévy processes.
2. Multivariate regular variation; the Poisson transform; stable processes; convergence on a cone.
 - a. Application to multivariate extreme value theory.
 - b. Hidden regular variation.
 - c. Conditioned limit laws for normalized random vectors where one component is assumed extreme.
3. Applied probability and statistical modeling of data networks.
4. Some stylized applied probability network models: a renewal input model.
5. Some (more) stylized applied probability network models: a large time scale input model.
- 5.5 Some (more more) stylized applied probability network models: Heavy traffic and heavy tails in GI/G/1.
6. Inference methods for multivariate extreme value and heavy tailed data using rank based methods.