

**Dr Michelle Carey, University College Dublin**

**Title: Estimating densities with asymmetry and excess kurtosis**

**Abstract:**

Pearson's system is a rich class of models that includes many classical univariate distributions. It comprises all continuous densities arising as solutions to a differential equation involving a vector of parameters. The estimation of a Pearson density is challenging as small variations in the parameters can induce wild changes in the shape of the corresponding density.

I will discuss how to estimate the vector of parameters and the corresponding density effectively through a penalized likelihood procedure involving differential regularization. The approach combines a penalized regression method and a profiled estimation technique. Simulations and an illustration with S&P 500 data suggest that this method can improve market risk assessment substantially through value-at-risk and expected shortfall estimates that outperform those currently used by financial institutions and regulators.