

ΓΕΝΙΚΟ ΣΕΜΙΝΑΡΙΟ ΤΜΗΜΑΤΟΣ ΦΥΣΙΚΗΣ

PHYSICS COLLOQUIUM

Thursday, 19 April 2018

17:00 -18:00

3rd Floor Seminar Room

**"Quantifying Discovery in Astro/Particle Physics:
Frequentist and Bayesian Perspectives"**

Prof. David A van Dyk

Statistics Section, Imperial College London, UK

Abstract

Statistical discovery questions in neutrino physics, particle physics, and astrophysics often involve mathematical subtleties that mean standard methods (e.g., chi-square) are inappropriate and can lead to misleading results. At the same time Bayesian and classical statistical techniques can lead researchers to differing conclusions. Moreover modern computational strategies are typically infeasible under extreme discovery criteria (4 sigma or more). This talk explores the statistical challenges that arise in the quantification of discovery and suggests a strategy that combines Bayesian and classical statistical techniques to tackle these challenges.