

Stanford University
Department of Statistics

DEPARTMENTAL SEMINAR

4:30pm, Tuesday, April 9, 2019

*** New Venue ***

Mechanical Engineering (02-530) Room 127

Refreshments served at 4pm in Sequoia Lounge.

Speaker: Richard Nickl
*Center for Mathematical Sciences,
University of Cambridge*

Title: **Statistical Guarantees for the Bayesian Approach
to Inverse Problems**

Abstract:

Bayes methods for inverse problems have become very popular in applied mathematics in the last decade after seminal work by Andrew Stuart. They provide reconstruction algorithms as well as in-built “uncertainty quantification” via Bayesian credible sets, and particularly for Gaussian priors can be efficiently implemented by MCMC methodology. For linear inverse problems, they are closely related to classical penalised least squares methods and thus not fundamentally new, but for non-linear and non-convex problems, they give genuinely distinct and computable algorithmic alternatives that cannot be studied by variational analysis or convex optimisation techniques. In this talk we will discuss recent progress in Bayesian non-parametric statistics that allows to give rigorous statistical guarantees for posterior mean reconstructions in non-linear non-convex inverse problems arising in some elliptic PDE models and in non-Abelian (“neutrons spin”) X-ray tomography.