

DEPARTMENT OF STATISTICS

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*Statistical guarantees for the Bayesian
approach to inverse problems***October 23, 2019****11:45am – 12:45pm**

Light refreshments will be served

110 Frelinghuysen Road**Hill Center, Room 552**

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 consistency in such models and illustrate the theory in a variety of concrete non-linear inverse problems arising with partial differential equations.

Bio: Richard Nickl is currently a Professor of Mathematical Statistics in the Statistical Laboratory at the University of Cambridge. He obtained his Ph.D. from the University of Vienna in 2005. Professor Nickl has made fundamental contributions to various areas of mathematical statistics, including nonparametric and high-dimensional inference and empirical process theory, and published an influential monograph "Mathematical Foundations of Infinite-Dimensional Statistics Models" with Evarist Gine. Professor Nickl is a fellow of Queens' College Cambridge and the recipient of the Ethel Newbold Prize and a Consolidator's Grant from the European Research Council.

