



**Optimization Program Inverse Problems Workshop
January 26-27, 2017**

Lecture: *Mitigating the Influence of the Boundary on PDE-based Covariance Operators*

Speaker: Georg Stadler

Abstract:

Elliptic PDE operators are commonly used to construct covariance operators for Gaussian random fields over infinite-dimensional Hilbert spaces. PDE operators require a choice of boundary conditions, and this choice can have a strong and usually undesired influence on the Gaussian random field. I will illustrate the problem and propose two techniques that allow to ameliorate these boundary effects. The first approach combines the elliptic PDE operator with a Robin boundary condition, where a varying Robin coefficient is computed from an optimization problem. The second approach normalizes the pointwise variance by rescaling the covariance operator. The performance of these approaches is studied numerically.

This is joint work with Yair Daon (NYU).