

## INVITATION TO THE LECTURE

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CONFERENCE ROOM

# MCMC METHODS FOR THE BAYESIAN IDENTIFICATION OF MATERIAL PARAMETERS

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The Bayesian approach to the solution of inverse problems provides us with the posterior distribution of unknown parameters. The main topic is the use of Markov chain Monte Carlo (MCMC) methods based on the Metropolis-Hastings algorithm for generating samples from the posterior distribution.

The talk is based on the prepared dissertation thesis which focuses on inverse problems governed by computationally expensive forward models, especially numerical solutions of partial differential equations. The key subject is the acceleration of MCMC algorithms using surrogate models that are constructed and further updated during the sampling process. The sampling process often produces sequences of linear systems, for their solution, the deflated conjugate gradient (CG) method is used. Proposed sampling procedures have been implemented in Python with parallelization. The implemented package was used for the identification of material parameters in inverse problems governed e.g. by porous media flow and poro-elasticity models.