

Workshop 3 on

“PDE-constrained Bayesian inverse problems: Interplay of spatial statistical models with Machine Learning in PDE discretizations”

May 16 - 20, 2022

organized by

Sebastian Reich (U of Potsdam), Christoph Schwab (ETH Zürich), Andrew M Stuart (CalTech, Pasadena), Sara van de Geer (ETH Zürich)

of the Thematic Programme on

“Computational Uncertainty Quantification: Mathematical Foundations, Methodology & Data”,
May 2 - June 24, 2022• **Monday, May 16th, 2022**08:45 – 09:15 **Registration & Welcome**09:15 – 10:00 **Viet Ha Hoang (Nanyang TU Singapore)***Bayesian inversion of log-normal eikonal equation* - online10:00 – 11:00 **Coffee Break**11:00 – 11:45 **Karen Veroy-Grepl (Eindhoven)***Optimal Experimental Design in the Deterministic and Bayesian Settings* - online11:45 – 12:30 **Juan Pablo Madrigal Cianci (EPFL Lausanne)***Generalized Parallel Tempering for Bayesian Inverse Problems* - online12:30 – 14:00 **Lunch Break**14:00 – 14:45 **Research Interaction at ESI**14:45 – 15:15 **Coffee Break**15:15 – 16:00 **Qin Li (U of Wisconsin)***Mean field theory in Inverse Problems: from Bayesian inference to overparameterization of networks*• **Tuesday, May 17th, 2022**09:15 – 10:00 **Simon Weissmann (U Heidelberg)***Surrogate based one-shot formulation for inverse problems and optimization under uncertainty* - online10:00 – 11:00 **Coffee Break**11:00 – 11:45 **Björn Sprungk (TU Freiberg)***Noise-level robust MCMC and pushforward Markov kernels*11:45 – 12:30 **Nikolas Nusken (Kings’s College, London)***Stein optimal transport for Bayesian inference* - online12:30 – 14:00 **Lunch Break**14:00 – 14:45 **Bjorn Engquist (UT Austin)**

Seismic inversion in the presence of noise - online

14:45 – 15:15 **Coffee Break**

15:15 – 16:00 **Franziska Weber (CMU)**

On Bayesian data assimilation for PDEs with ill-posed forward problems - online

16:00 – 16:45 **Nicholas Nelsen (CalTech, Pasadena)**

Noisy linear operator learning as an inverse problem - online

- **Wednesday, May 18th, 2022**

09:15 – 10:00 **Robert Scheichl (U Heidelberg)**

Multilevel Delayed Acceptance MCMC

10:00 – 11:00 **Coffee Break**

11:00 – 11:45 **Kristin Kirchner (TU Delft)**

When are linear predictions of random fields using wrong mean and covariance functions asymptotically optimal?

11:45 – 12:30 **Susana Gomes (U Warwick)**

Parameter Estimation for Macroscopic Pedestrian Dynamics Models using Microscopic Data

12:30 – 14:00 **Lunch Break**

14:00 – 14:45 **Marie-Therese Wolfram (U Warwick)**

Ensemble Inference Methods for Models with Noisy and Expensive Likelihoods

14:45 – 15:15 **Coffee Break**

15:15 – 16:00 **Hanne Kekkonen (TU Delft)**

Consistency of Bayesian inference for a parabolic inverse problem - online

16:00 – 16:45 **Huang (Daniel) Zhengyu (CalTech, Pasadena)**

Efficient Derivative-free Bayesian Inference for Large-Scale Inverse Problems - online

- **Thursday, May 19th, 2022**

09:15 – 10:00 **Urbain Vaes (INRIA)**

Consensus-based sampling - online

10:00 – 11:00 **Coffee Break**

11:00 – 11:45 **Jakob Zech (U Heidelberg)**

Approximation and computation of triangular transport maps

11:45 – 12:30 **Peng Chen (U of Texas, Austin)**

Projected Variational Methods for High-dimensional Bayesian Inference

12:30 – 14:00 **Lunch Break**

14:00 – 14:45 **Alexey Chernov (U of Oldenburg)**

Bayesian parameter identification of impedance boundary conditions for Helmholtz problems

14:45 – 15:15 **Coffee Break**

15:15 – 16:00 **Omar Ghattas (U of Texas, Austin)**

Reduced Basis Neural Network Surrogates for Bayesian Inversion and Optimal Experimental Design - online

16:00 – 16:45 **Houman Owhadi (Caltech, Pasadena)**

Computational Graph Completion - online

- **Friday, May 20th, 2022**

09:00 – 17:00 **No Talks**

The event takes place at the Erwin Schrödinger Institute - Boltzmann lecture hall! On-site participation is possible on request. Online participation is possible via zoom. Zoom coordinates are available on request and after registration (secr@esi.ac.at) until May 14, 2022.