

Workshop 2 on

“Approximation of high-dimensional parametric PDEs in forward UQ”

May 9 - 13, 2022

organized by

Albert Cohen (Sorbonne U, Paris), Fabio Nobile (EPFL Lausanne), Catherine Powell (U of Manchester), Christoph Schwab (ETH Zürich), Lorenzo Tamellini

of the Thematic Programme on

“Computational Uncertainty Quantification: Mathematical Foundations, Methodology & Data”(May 2 - June 24, 2022)

• Monday, May 9th, 2022

09:30 – 10:30 **Registration & Coffee & Free Time for Discussion**10:30 – 11:20 **Virginie Ehrlacher (ENPC, Paris)***Influence of Monte-Carlo sampling on greedy algorithms for variance reduction*11:20 – 12:10 **André Uschmajew (MPI Leipzig)***Dynamical low-rank approximation for parabolic problems*12:10 – 13:50 **Lunch Break**13:50 – 14:40 **Christian Rieger (Philipps U, Marburg)***Kernel based reconstruction for Bayesian inverse problems*14:40 – 15:10 **Coffee Break**15:10 – 16:00 **Ionut-Gabriel Farcas (U of Texas, Austin)***A general framework for quantifying uncertainty at scale and its application to fusion research - online*16:00 – 16:50 **Clayton Webster (U of Texas, Austin)***Reconstructing high-dimensional Hilbert-valued functions via compressed sensing - online*

• Tuesday, May 10th, 2022

09:30 – 10:30 **Coffee and Free Time for Discussion**10:30 – 11:20 **Eva Vidlickova (EPFL Lausanne)***Variational Formulation and Stability Properties of a Projector-Splitting Scheme for Dynamical Low Rank Approximation of Random Parabolic Equations*11:20 – 12:10 **Gianluigi Rozza (SISSA, Trieste)***Stabilized Reduced Order Methods for Transport Control Problems with Random Inputs*12:10 – 13:50 **Lunch Break**13:50 – 14:40 **Matthieu Dolbeault (Sorbonne U, Paris)***A sharp upper bound for sampling numbers in L_2* 14:40 – 15:10 **Coffee Break**

15:10 – 16:00 **Amir Sagiv (Columbia University, New York)**

A Measure Perspective on Uncertainty Propagation - online

16:00 – 16:50 **Nicholas Dexter (Simon Fraser U, Vancouver)**

Efficient algorithms for computing near-best polynomial approximations to high-dimensional, Hilbert-valued functions from limited samples - online

- **Wednesday, May 11th, 2022**

09:40 – 10:30 **Alex Bespalov (U. of Birmingham)**

Multilevel and goal-oriented adaptivity for stochastic Galerkin FEM

10:30 – 11:00 **Coffee Break**

11:00 – 12:00 **Group Discussion Session**

12:00 – 14:00 **Lunch Break**

14:00 – 14:50 **Alireza Doostan (U of Colorado, Boulder)**

GenMod: A generative modeling approach for spectral representation of PDEs with random inputs - online

14:50 – 15:20 **Coffee Break**

15:20 – 16:10 **Oliver Ernst (TU Chemnitz)**

Wasserstein Sensitivity of Risk and Uncertainty Propagation

19:00 – 22:00 **Conference Dinner at Glacis Beisl**

- **Thursday, May 12th, 2022**

09:30 – 10:30 **Coffee and Free Time for Discussion**

10:30 – 11:20 **Markus Bachmayr (U Mainz)**

Multilevel representations of random fields

11:20 – 12:10 **Helmut Harbrecht (University of Basel)**

Efficient discretization techniques of shape uncertainty problems

12:10 – 14:10 **Lunch Break**

14:10 – 15:00 **Holger Rauhut (RWTH Aachen)**

The implicit bias of gradient descent for learning deep neural networks - online

15:00 – 15:30 **Coffee Break**

15:30 – 16:00 **Yoshihito Kazashi (EPFL Lausanne)**

Sub-optimality of Gauss–Hermite quadrature and optimality of trapezoidal rule for functions with finite smoothness

16:00 – 16:50 **Davide Pradovera (U Vienna)**

Surrogate modeling of parametric frequency response problems via locally adaptive sparse grids

- **Friday, May 13th, 2022**

09:30 – 10:20 **Olga Mula Hernandez (Dauphine U, Paris)**

Bayesian Inverse Problems with ABC-ROM sampling. Application to epidemiological forecasting - online

10:20 – 10:50 **Coffee Break**

10:50 – 11:40 **Gitta Kutyniok (LMU Munich)**

The Impact of Artificial Intelligence on Parametric Partial Differential Equations - online

11:40 – 12:30 **Lorenzo Tamellini (CNR-IMATI, Pavia)**

Multi-Index Stochastic Collocation for forward UQ of single- and multi-disciplinary systems

12:30 – 14:30 **Lunch Break/Finish**

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 6, 2022.