

Workshop 5 on

“UQ in kinetic and transport equations and in high-frequency wave propagation”

June 13 – June 17, 2022

organized by

Liliana Borcea (U of Michigan), Giacomo Dimarco (U of Ferrara), Clemens Heitzinger (TU Vienna), Shi Jin (Shanghai Jiao Tong U),
Robert Scheichl (U of Heidelberg), Euan Spence (U of Bath)

of the Thematic Programme on

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

• Monday, June 13th, 2022

08:45 – 09:15 **Registration and Welcome**09:15 – 10:00 **Shi Jin (Shanghai Jiao Tong U)***Uncertain Quantification of ODEs/PDEs in quantum computing* - online10:00 – 10:45 **Coffee Break**10:45 – 11:30 **Josselin Garnier (Ecole Polytechnique, Palaiseau)***Radiative transfer equation for surface and body waves*11:30 – 12:15 **Giacomo Dimarco (U of Ferrara)***Micro-macro generalized polynomial chaos techniques for kinetic equations*12:15 – 14:00 **Lunch Break**14:00 – 14:45 **Martin Frank (KIT, Karlsruhe)***Some Aspects of Uncertainty Quantification for Hyperbolic Conservation Laws*14:45 – 15:15 **Coffee Break**15:15 – 16:00 **Alina Chertock (North Carolina State U)***Well-Balanced and Positivity Preserving Stochastic Galerkin Method for the Saint-Venant System with Uncertainty* - online16:00 – 16:45 **Li Wang (U of Minnesota)***Neural network based solver for kinetic equations* - online

• Tuesday, June 14th, 2022

09:00 – 09:45 **Lorenzo Pareschi (U of Ferrara)***Stochastic Galerkin particle methods* - online09:45 – 10:45 **Coffee Break**10:45 – 11:30 **Davide Pradovera (U Vienna)***Can reliable surrogate models for frequency-domain problems be both non-intrusive and cheap to build?*11:30 – 12:15 **Carlos Jerez-Hanckes (U Adolfo Ibanez)**

Helmholtz Scattering By Random Domains: First-Order Sparse Boundary Element Approximation

12:15 – 14:00 **Lunch Break**

14:00 – 14:45 **Francesca Bonizzoni (U Augsburg)**

Rational-based MOR methods for parametric-in-frequency Helmholtz problems with adapted snapshots

14:45 – 15:15 **Coffee Break**

15:15 – 16:00 **Qin Li (U of Wisconsin-Madison)**

Multiscale inverse problem, from Schroedinger to Newton to Boltzmann - online

16:00 – 16:45 **Jose Morales Escalante (UT San Antonio)**

Stochastic Galerkin Methods for the Boltzmann-Poisson system - online

- **Wednesday, June 15th, 2022**

09:00 – 09:45 **Xiaobing Feng (U of Tennessee, Knoxville)**

An efficient multi-modes Monte Carlo method for wave scattering in random media

09:45 – 10:45 **Coffee Break**

10:45 – 11:30 **Giulia Bertaglia (U of Ferrara)**

Uncertainty quantification of the spatial spread of epidemics described through kinetic models

11:30 – 12:15 **Laura Scarabosio (Radboud U)**

Deep neural network surrogates for Helmholtz problems

12:15 – 14:00 **Lunch Break**

14:00 – 14:45 **Group Discussions**

14:45 – 15:30 **Feedback Session & General Discussion**

15:30 – 16:00 **Coffee Break**

16:00 – 16:45 **Yuhua Zhu (SU)**

The Vlasov-Fokker-Planck Equation with High Dimensional Parametric Forcing Term - online

18:30 – **Workshop Dinner at Heuriger Schübel-Auer**

- **Thursday, June 16th, 2022**

– **Public Holiday**

No formal programme - Informal discussions, sightseeing and exploring Vienna.

- **Friday, June 17th, 2022**

09:00 – 09:45 **Ivan Graham (U Bath)**

The forward problem of UQ for the high-frequency Helmholtz equation

09:45 – 10:45 **Coffee Break**

10:45 – 11:30 **Mattia Zanella (U Pavia)**

Uncertainty quantification for kinetic equations of emergent phenomena

11:30 – 12:15 **Simon Michel (U Zürich)**

Uncertainty Quantification by MLMC and Local Time-stepping For Wave Propagation

12:15 – 14:00 **Lunch Break**

14:00 – 14:45 **Ralf Hiptmair (ETH Zürich)**

Frequency-Explicit Shape Uncertainty Quantification for Acoustic Scattering

14:45 – 14:50 **Concluding Remarks**

14:50 – 15:30 **Coffee Break**

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 June 10, 2022.