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 - online

  10:00 – 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 - online

  16:00 – 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 - online

  09:45 – 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 – 15:30 **Seung-Yeal Ha (Seoul National University)**
  Stochastic flocking of the Cucker-Smale flocking model

15:30 – 15:40 **Concluding Remarks**

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.