Journées SMAI 2021

Editors' word

This special volume presents some proceedings issued from the "Journées SMAI 2021" that gathered several hundreds of people. This conference is organized every two year by the SMAI[1] and is aimed to provide new insights and questions on applied mathematics, numerical methods, PDE, and random and statistical modeling.

In 2021, the local organization had been given to the Institut Mathématiques de Toulouse (Université Toulouse 3 Paul Sabatier). The program of these three days was composed of :

- 9 one hour long plenary lectures linked to the conference themes:
  - Francis Bach (Inria) on global minimization with kernel approximation,
  - Vincent Calvez (Univ Lyon) on wave propagations with several time scales and its application in biology,
  - Isabelle Gallagher (Ens Paris) on the Boltzmann equations derived from a particle systems,
  - Arnaud Guillin (Univ. Clermont-Auvergne) on Lyapunov application to Poincaré and log-Sobolev inequalities,
  - Aline Lefebvre-Lepot (Ecole Polytechnique) on numerical methods based on convex optimization for granular media contacts,
  - Simon Masnou (Univ. Lyon) on the the learning phase field mean curvature flows with neural networks,
  - Jean-Marie Mirebeau (Univ. Orsay) on the anisotropic discretization of PDEs on a Cartesian grid,
  - Anne Philippe (Univ. Nantes) on some long-memory processes,
  - Amandine Véber (Univ. Paris) on the genetic evolution of a population with a spacial structure.
- Nineteen parallel sessions of 2 hours each. The themes – illustrating new advances in applied mathematics, probability and statistics – were stated by both the scientific and local organization committees and the SMAI group.

Among this very rich and diverse program, some works will be presented here, from the plenary speakers and from the parallel sessions:

- "Limit theorems for large scale stochastic particle systems" organized by M. Fathi, A. Menegaki, P. Monmarche, J. Reygner and M. Tomasevic
- "Numerical convex schemes for inelastic contacts with friction", by I. Bloch and A. Lefebvre-Lepot
- "Long time analysis of killed degenerate processes and their particle approximaitons", organized by B. Cloez, L. Journel, P. Monmarche, B. Nectoux and M. Ramil
- "Method of moments in kinetic theory", by T. Pichard
- " Ultra weak variational formulation for heterogeneous Maxwell problem and HPC", organized by S. Pernet, M. Sirdey and S. Tordeux.

The "Journées SMAI 2021" benefited from the support of Université Paul Sabatier Toulouse 3, Université Jean Jaurès, Insa, Amies, CEA, IRSN, Région Occitanie, Onera, Aniti, IUF and CNRS.

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[1]French Society of Applied and Industrial Mathematics

Article published online by EDP Sciences and available at https://www.esaim-proc.org or https://doi.org/10.1051/proc/202375001