

# Workshop "New Trends in Complex Flows"

## Editorial

The workshop *New Trends in Complex Flows 2022* took place in Institut Henri Poincaré (Paris-France) in September 19-21, 2022. This workshop was part of the M2SIR project ("Modèles et Méthodes numériques pour la Simulation de Réacteurs"), financed by NEEDS CNRS program. The aim of this event was to highlight the recent advances about the modelling, the analysis and the simulation of multi-physics models arising in industrial applications, in particular in the nuclear safety framework. It received financial support from Needs CNRS Program, GdR MaNu, CEA and EDF. The twelve invited speakers have mainly discussed about modelling techniques and numerical methods arising when tackling simulations of complex single-phase or two-phase flow situations. A poster session has also enriched this event. Focus was given on the mathematical analysis of the Partial Differential Equations involved in associated models. Numerical methods obviously play a central role in simulating models that represent complex fluid phenomena critical to various fields arising in nuclear energy applications. Hence, this event provided an opportunity for experts to share their knowledge, exchange ideas, and discuss upcoming challenges. The list of invited speakers and participants, together with the titles of the invited talks, can be found on the following website: <https://indico.math.cnrs.fr/event/8047/>

The present proceedings gather some contributions, that illustrate the diversity of approaches and applications of advanced numerical methods. Each article reflects the scientific community's dedication to innovation and progress in this field.

All members of the organizing committee would like to take this opportunity to thank invited speakers and authors for their valuable contributions. Referees are also warmly acknowledged for their work and their useful comments. Eventually, the ESAIM Proceedings and Surveys editorial team is warmly acknowledged.

The organizing committee: Gloria Faccanoni, Bérénice Grec, Jean-Marc Hérard, Olivier Hurisse, Jonathan Jung, Samuel Kokh, Hélène Mathis, Michael Ndjinga, Nicolas Seguin