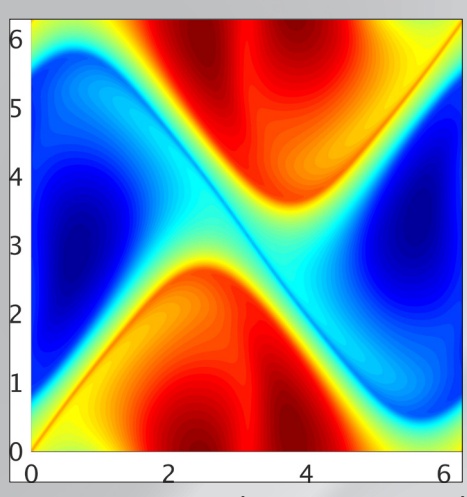
Topical Workshop

JUNE 18 – 22, 2018

Fractional PDEs: Theory, Algorithms and Applications

Organizing Committee

George Em Karniadakis, Brown University
Francesco Mainardi, University of Bologna
Mark Meerschaert, Michigan State University
Jie Shen, Purdue University
Hong Wang, University of South Carolina



Fractional partial differential equations (FPDEs) are emerging as a powerful tool for modeling challenging multiscale phenomena including overlapping microscopic and macroscopic scales. Compared to integer-order PDEs, the fractional order of the derivatives in FPDEs may be a function of space and time or even a distribution, opening up great opportunities for modeling and simulation of multi-physics phenomena, e.g. seamless transition from wave propagation to diffusion, or from local to non-local dynamics. In addition, data-driven fractional differential operators may be constructed to fit data from a particular experiment or specific phenomenon, including the effect of uncertainties. FPDEs lead to a paradigm shift, according to which data-driven fractional operators may be constructed to model a specific phenomenon instead of the current practice of tweaking free parameters that multiply pre-set integer-order differential operators.

Confirmed Speakers

Mark Ainsworth, Brown University
Luisa Beghin, Sapienza University
YangQuan Chen, UC Merced
Zhen-Qing Chen, University of Washington
Marta D'Elia, Sandia National Laboratories, NM
Weihua Deng, Lanzhou University
Kai Diethelm, Technical University of Braunschweig
Siwei Duo, University of South Carolina
Roberto Garrappa, University of Bari
Xiaozhe Hu, Tufts University
James Kelly, Michigan State University
Yuri Luchko, Beuth Hochschule für Technik
Marcin Magdziarz, Wrocław University of Science and Technology
Enrico Scalas, University of Sussex
Alla Sikorskii, Michigan State University
Bruce West, US Army Research Office
Chuanju Xu, Xiamen University
Mohsen Zayernouri, Michigan State University
Yong Zhang, Hohai University
Yanzhi Zhang, Missouri University of Sciences and Technology

Participation

Most ICERM workshops are aimed at scientists who have, or are pursuing, a doctoral degree and are actively involved in the topic of the workshop. To request an invitation to an ICERM workshop, please complete an online application. Support for local expenses may be provided. Decisions about online applications are typically made 1–3 months before the workshop, as space and funding permits. ICERM encourages women and members of underrepresented minorities to apply. More information and an application form are available on our website.

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