NEWSLETTER

of the Work Group Mathematical Fluid Mechanics

Newsletter no. 7 (2021)

Application for an Oberwolfach workshop

Usually one applies to run workshops at Oberwolfach two years ahead of time, and there is stiff competition. During my stay in Oberwolfach I noticed that because of the pandemic there is capacity for an additional workshop the week May 9 - 15, 2021. The director encouraged me to apply for a small hybrid workshop.

I plan to apply for a hybrid workshop that focuses on the topics of our work group. In the application the list of external attendees (who would participate via Zoom lectures) would be among others Christophe Chalons, Praveen Chandrashekar, Eduard Feireisl, Cory Hauck, Qin Li, Min Tang and Seok-Bae Yun.

Let us hope this works out, so save the date.

Report: Oberwolfach workshop on hyperbolic problems last week

Last week there was a workshop in *Oberwolfach*, the premiere conference sight for mathematicians, called "Hyperbolic Balance Laws: modeling, analysis, and numerics", organized among others by Remi Abgrall and Maja Lukacova. I participated in this hybrid workshop.

The lectures at this workshop covered (among others) these subjects: viscosity limits of stochastically forced solutions multi-d compressible flow (Feireisl), in the limits of incompressible ideal MHD defect measures appear (Szekehelydi), well-balancing of shallow water flow (Chertok), AP schemes for neutron transport (Fengyan Li), numerical simulations of compressible flow with stochastic coefficients using stochastic Galerkin (Lukacova, Wiebe), global weak solutions for multi-d conservation laws with relaxation right hand side (Roberta Binachini), entropy dissipative schemes (Öffner), neural networks applied to numerically separating two compressible fluids (Despres), making sure polynomial chaos methods applied to hyperbolic problems maintain hyperbolicity (Herty), structure preserving numerical methods for hyperbolic systems (Dumbser), the active flux method (Helzel).

Note that in our work group we cover a number of these subjects. Also we are up-to-date with the questions we address. Usually in such a meeting more kinetic topics are presented.

Only some of the 40 invited persons participated in person in the workshop. From left to right: Christiane Helzel, Christian Rohde, Maja Lukacova, Christian Klingenberg, Bettina Wiebe, Schneider, Philipp Öffner.

Workshop in conservation laws in the Alps

    In September 2021 Gerald Warnecke plans a *workshop on hyperbolic problems*. Typically this workshop (which is part of a series) is attended by young German researchers. One feature is, that it takes place in the alps, in *Hirschegg* in the Kleinwalsertal.

One of the mountains (Walser Hammerspitze) surrounding the Klainwalsertal, where this workshop will take place.

Upcoming scientific conferences

    I try to keep this list up-to-date. I encourage you to click the links and check, where you may want to participate.

2021:

-March 22- 26: *Kinetic Equations: From Modeling, Computation to Analysis*, in Marseille, France, organized by Shi Jin, to be held hybrid

-May 24 - 28: *The Legacy of Carlo Cercignani: from Kinetic Theory to Turbulence Modeling* Milan, Italy, organized among others by Tommaso Ruggeri

- June 21 - 24: *SIAM Conference on Mathematical & Computational Issues in the Geosciences (GS21)*, in Milan, to be held online

- July 2: *18th International Conference on Hyperbolic Problems, Theory, Numerics, Applications* - Part 1 (formerly HYP 2020), one day online with lectures by Dafermos, Mon Tang and others

- July 5 - 9: *THE BOLTZMANN EQUATION: IN THE TRAIL OF TORSTEN CARLEMAN*, near Stockholm, Sweden

- July 12 - 16: *International Conference on Spectral and Higher Order Methods* ICOSAHOM 2020, Vienna (online only), Wasilij and myself plan to run a mini-symposium there

- Sept. 12 - 18: *Hirschegg Workshop On Conservation Laws* in Kleinwalsertal in Austria, organized by among others Gerald Warnecke

- fall: Special program on Numerical Methods for Nonlinear Hyperbolic PDEs; at SUSTech, Shenzhen, China: organized by Alex Kurganov (still in the planning stage)

- fall: *Nils-Henrik Risebro's birthday conference* in Oslo, Norway (still in the planning stage)

2022:

- some time in spring: *HIGH ORDER NONLINEAR NUMERICAL METHODS FOR EVOLUTIONARY PDEs: THEORY AND APPLICATIONS (HONOM)* in Braga, Portugal, organized by Raphael Loubère und Stephane Clain

- end of May: *Sharing Higher-order Advanced Research Know-how on Finite Volume (SHARK-FV)* in Portugal, organized by Raphael Loubère und Stephane Clain (still in its planning stage)

- June 20 - 25: HYP2022:*18th International Conference on Hyperbolic Problems, Theory, Numerics, Applications* - Part 2 (formerly HYP 2020), in Malaga, Spain, organized by Carlos Pares

- July 18 - 22, 2022: *When Kinetic Theory meets Fluid Mechanics*, Zürich

- Sept. 5 - 9, 2022: *10th International Conference on Numerical Methods for Multi-Material Fluid Flow (MULTIMAT 2021)* in Zürich, organized by Remi Abgrall