NEWSLETTER

of the Work Group Mathematical Fluid Mechanics

Newsletter no. 10 (2021)

Oberwolfach workshop

Members of our workgroup attended a hybrid Oberwolfach workshop April 11 - 17 (*see here*, also with videos of the lectures). This gave group members a chance to present their work. For those who attended in person, this was a welcome respite from the home-office.

attendees in Oberwolfach

Sandra Warnecke   Eva Horlebein   Christian Klingenberg   Wasilij Barsukow   Kathrin Hellmuth   Claudius Birke   Lena Baumeister   Farah Kanbar

Colloquium

Here are the colloquium lectures for this semester:

Würzburger Mathematisches Kolloquium im Sommersemester 2021

Di 18.05.2021 Prof. Dr. Michal Tabach
14:15 (Tel Aviv University)
Supporting Collective Looking-back Practices: Who-Is-Right Tasks

Di 01.06.2021 Prof. Dr. Ulrich Derenthal
14:15 (Leibnitz Universität, Hannover)
Rational Points on Cubic Hypersurfaces

Di 08.06.2021 Dr. Wasilij Barsukow
14:15 (Max-Planck-Institut für Plasmaphysik, Garching)
Stable Numerical Methods for Conservation Laws

Di 15.06.2021 Prof. Dr. Gitta Kutyniok
14:15 (Ludwig-Maximilians-Universität, München)
The Mathematics of Deep Learning:
Can we Open the Black Box of Deep Neural Networks?

Di 06.07.2021 Prof. Dr. Andrea Malchiodi
14:15 (Scuola Normale Superiore at Pisa, Italy)
Geometric and Analytic Aspects of Liouville Equations

Janina Kern began her Bachelor thesis

She plans to derive the theory of the Euler equations in one space dimension.

Theresa Full began her Master thesis

She plans to implement the semi-Lagrangian numerical method for the Vlasov Poisson equations.

Vanessa Halat beagn her Master thesis

She plans to study traffic models with non-local (in space) flux functions.

Jonas Schlecht submitted his Bachelor thesis

He described and implemented asymptotic preserving schemes for kinetic equations.

Conference in honor of Dafermos

May 17 - 21 will be an online workshop on hyperbolic problems. It takes a slight effort to register - check out the lectures, it might be worth your while.

"Hyp2020"

The big 18th hyperbolic conference (originally scheduled for 2020) will take place in 2022 in Malaga. On July 2, 2021 there will be a short online conference with 4 speakers. One of them is Min Tang, who's talk is closely related to Kathrin Hellmuth's PhD thesis topic.

Our ongoing Seminar on hyperbolic problems

Here is the list of upcoming lectures in our Friday 3 pm seminar (_see here also_):

- **May 7**: _Claus-Dieter Munz_: Sharp interface modeling of phase change in two-phase flow

- **May 14:** _Deep Ray_: A data-driven approach to predict artificial viscosity in high-order solvers

- **May 21**: _Christiane Helzel_: tba

- **May 28**: _Matthis Maier_: Efficient parallel 3D computation of the compressible Euler equations with an invariant-domain preserving second-order finite-element scheme

- **June 4**: _Chi-Wang Shu_: Stability of time discretizations for semi-discrete high order schemes for time-dependent PDEs

Ongoing seminar series

Here is an ongoing online seminar series, where past lectures can be viewed online: _Fifty Years of Kruzhkov Entropy Solutions_.

Upcoming scientific conferences

Go ahead and click the links to check where you might want to participate.

2021:

- May 17 - 21: _Advances and Challenges in Hyperbolic Conservation Laws_ , at Brown University in honor of Dafermos, online

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

- June 14 - 18: _Numerical Methods for Kinetic Equations 'NumKin21'_, online workshop organized among others by Shi Jin, register by April 30

- 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, Min 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 - 24: 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