NEWSLETTER

of the Work Group Mathematical Fluid Mechanics

Newsletter no. 2 (2023)

Papers submitted to HYP 2022

The proceedings for the *Conference on Hyperbolic Problems* last year in Malaga will be published by Springer Verlag.

These are submissions from our group:

- *Kathrin Hellmuth, Christian Klingenberg, Qin Li: "Multi-scale PDE inverse problem in bacterial movement"*
- *Claudius Birke and Christian Klingenberg: "Finding an Approximate Riemann Solver via Relaxation: Concept and Advantages"*
- Lena Baumann, Marlies Pirner: "Linear Landau damping for a two-species Vlasov-Poisson system for electrons and ions"

Wasilij Barsukow will also submit a contribution.

James Glimm claims to have solved the Millennium Problem

In 2000 the *Millennium Prize Problems* were posed. One of them is the *Navier–Stokes existence and smoothness* question. It is the Millennium question closest to our broader research field. Many of the best mathematicians have tried to make inroads into this questions, so far to no avail. *James Glimm* has now posted a *preprint* on arXiv, which claims to have solved this problem.

Since Glimm's preprint is very difficult to read, it may take a while to decide if he solved this problem. The physical insight he brings to this problem is completely new for the mathematical community and is quite fascinating.

Here is a short interview with him from a few years back with, among other things, advice for young scientists.

Simon joins us with a post-doc fellowship

Simon Markfelder received a post-doc fellowship from the Humboldt Foundation. He will be with us from April on. He has applied for a grant from the German Science Foundation (DFG). After his Humboldt fellowship hopefully he can continue his stay in Würzburg with that.

the speakers in our mini-symposium at SIAM CSE 23

Our mini-symposium at SIAM CSE in Amsterdam

At the SIAM Conference on Computational Science and Engineering (*SIAM CSE 23*) two weeks ago we ran a mini-symposium "*Numerics of inverse problems for kinetic models and their corresponding macroscopic PDEs*", see *here* and *here*.

After the conference *Li Wang* (Minneapolis) and *Kui Ren* (New York) came to visit us in Würzburg. The many discussion both at SAIM CSE and especially with our guests afterwards broadened our perspective of the subject.

Papers submitted to FVCA 2023

In order to attend the conference *Finite Volumes for Complex Applications* in Strasbourg in Nov. 2023, one needs to submit a paper before the conference. If it gets accepted, one gives a talk there. From our workgroup two papers have been submitted:

- *Claudius Birke, Walter Boscheri, and Christian Klingenberg: "A high order semi-implicit scheme for ideal magnetohydrodynamics"*
- *Claudius Birke, Christian Klingenberg: "A Low Mach Two-speed Relaxation Scheme for Ideal MHD Equations"*

Hirschegg

The *16th Hirschegg Workshop on Conservation Laws* Sept. 10 - 16, 2023 takes place in the Kleinwalsertal in the Alps. It is a great place for German PhD students and post-docs to get to know each other.

Applied Inverse Problems Conference

Kathrin Hellmuth has been invited to the *11th Applied Inverse Problems Conference* in September in Göttingen.

Workshop on Stability, Mixing, and Fluid Dynamics

Benjamin Gess, Emil Wiedemann and others are organizing a *Workshop on Stability, Mixing and Fluid Dynamics* in Münster.

Upcoming scientific conferences

Click the links to check where you might want to participate.

- March 29 - 31, 2023: *4th European conference on Non-equilibrium gas flows*, in Eindhoven, Netherlands
- May 22 - 26, 2023: *Sharing Higher-order Advanced Research Know-how on Finite Volume (SHARK-FV)* in Portugal, organized by Raphael Loubère and others
- May 30 - June 3, 2023: *Annual meeting of the Gesellschaft für angewandte Mathematik und Mechanik (GAMM)* in Dresden
- June 5 - 9, 2023: *Emerging topics in applications of optimal transport* at ETH Zürich, organized by *Alessio Figalli* and *Yunan Yang*
- June 26 - 30, 2023: *NumHyp 2023 (Numerical methods for hyperbolic problems)* in Bordeaux, France, organized by Raphael Loubère and others
- Aug. 14 - 16, 2023: *Workshop on Stability, Mixing and Fluid Dynamics*, organized by Benjamin Gess, Emil Wiedemann and others New!
- Sept. 4 - 8, 2023: *European Conference on Numerical Mathematics and Advanced Applications (ENUMATH)*, in Lisbon, Portugal
- Sept. 4 - 8, 2023: *11th Applied Inverse Problems Conference*, in Göttingen, organized by T. Hohage, G. Uhlmann and others New!
- Sept. 10 - 16, 2023: *16th Hirschegg Workshop on Conservation Laws*, in the Alps (Kleinwalsertal), organized by Gerald Warnecke and others New!
- Sept. 25 - 29, 2023: Sino-German workshop, in Beijing, organized by Gerald Warnecke and others New!
- Oct. 30 - Nov. 3, 2023: *Finite Volumes for Complex Applications in Strasbourg* in Strasbourg, France, organized by Philippe Helluy and others
- May or June of 2024: *International Conference on Hyperbolic Problems: Theory, Numerics and Applications (HYP 2024)* in Shanghai, China, organized by Shi Jin

CEMRACS 2023

CERMACS is a type of summer school in Luminy (Marseille, France). It is geared towards training PhD students and postdocs in a focussed subject. In Summer of 2023 the topic will be *Scientific Machine Learning*.

four pictures of the conference center CIRM in Luminy where CERMACS takes place