

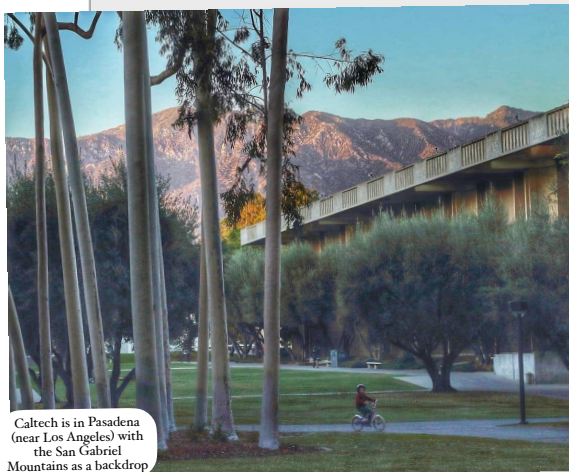
NEWSLETTER

of the Work Group Mathematical Fluid Mechanics

Newsletter no. 11 (2024)

Kathrin submitted an application for a Humboldt Feodor Lynen Fellowship

Humboldt's *Feodor Lynen Fellowship* pays research stays for German scientists at universities abroad. Kathrin Hellmut, who will finish her PhD next year, has applied to visit *Caltech* in California for two years beginning Sept. 2025 with this fellowship. It is a top university with a beautiful campus. Good luck, Kathrin!



Caltech is in Pasadena (near Los Angeles) with the San Gabriel Mountains as a backdrop

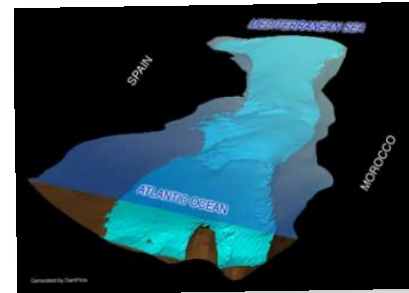
Kathrin Hellmuth submitted a paper on multi-scale chemotaxis

The paper *Egger, Hellmuth, Philippi, Schlottbom: A kinetic chemotaxis model and its diffusion limit in slab geometry (2024)* has been submitted. They study a macroscopic chemotaxis model and its asymptotic regime for high tumbling rates.

We obtained a German-Spanish DFG-AEI grant

The *Deutsche Forschungsgemeinschaft* (DFG) together with its Spanish counterpart, the *Agencia Estatal de Investigación* (AEI) had a call last year for joint projects. *Carlos Pares* (Malaga) approached me, suggesting to submit a joint proposal. Inspired by the complicated ocean flow near the Strait of Gibraltar, the Malaga group has always been interested in modeling and numerical simulations of such flows. In that spirit we wrote a research proposal continuing this research by among other things by focussing on genuinely multi-dimensional schemes for such models.

The good news is that we were awarded this project. We will begin next year with one researcher each paid for by this grant.



A two-layer 2D model showing simulated two-layer exchange flow through the Strait of Gibraltar

Jayesh Badwaik's PhD defense

On Sept. 26 Jayesh Badwaik (see [here](#) and [here](#)) successfully defended his PhD thesis. All went well. Congratulations, Jayesh!

Jayesh looks relieved right after his successful defense



This is the imaginary "Mount Carlo", an alliteration to the Monto Carlo method used by Jayesh



On an excursion with the work group in a train Jayesh mistook the emergency stop button for the door opener.

Jayesh had two screens on his desk. Rumor was that one was for coding, the other for watching movies.

A marble inside a flexible net makes the net move: an allusion to the moving mesh method Jayesh used.

Jayesh's doctoral hat built by the PhD students of our workgroup. At the top one sees funny things from Jayesh's time in Würzburg, at the bottom photos from back then.



We submitted a mini symposium to ICOSAHOM

The bi-yearly [ICOSAHOM](#) conference on numerics of differential equations will take place July 2025 in Montréal, Canada. It mainly consists of contributed mini-symposia. We proposed a mini-symposium with 8 lectures on the Active Flux method. In February we will hear if it gets accepted.



the ICOSAHOM conference will take place on the campus of McGill University (Montréal, Canada)

19th MHD Days 2024 in Potsdam

A workshop by numerical astrophysicists ([19th MHD Days 2024](#)) interested in magnetohydrodynamics will take place Dec. 2 - 4, 2024 in Potsdam.

Fritz Röpke's "Würzburg" Winter Workshop on Stellar Astrophysics 2024

The numerical astrophysicist Fritz Röpke organizes a yearly workshop "[Würzburg](#)" Winter Workshop on Stellar Astrophysics. He calls it "Würzburg", because this series was initiated during his time in Würzburg 2011 - 2016. Afterwards he moved to Heidelberg. I have collaborated with Fritz since his time in Würzburg.

This year the workshop will take place Dec. 9 - 11 in Heidelberg. Junming Duan, Lisa Lechner and myself will attend the workshop for one day, on Dec. 9. The three of us will give lectures there.

Upcoming scientific conferences

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

- Nov. 4 - 7, **2024**: "[Numerical Methods for the Kinetic Equations of Plasma Physics](#)" in Garching, Germany, organized by Eric Sonnendrücker
- Dec. 2 - 4, 2024: [19th MHD days 2024](#) in Potsdam, Germany, organized by Rainer Artl
- Dec. 9 - 11, 2024: [XVIII "Würzburg" Winter Workshop on Stellar Astrophysics 2024](#), in Heidelberg, organized by Fritz Röpke
- Dec. 16 - 20, 2024: [14th AIMS conference on differential equations](#), in Abi Dhabi, UAE, organized by the [American Institute of Mathematical Sciences](#) (AIMS)
- March 3 - 7, **2025**: [SIAM Conference on Computational Science and Engineering \(CSE25\)](#), in Fort Worth, Texas, USA
- June 9 - 13, 2025: [Numerical methods for hyperbolic problems 2025](#) (NumHyp25), in Darmstadt, organized by Jan Giesselmann and others
- July 13 - 18, 2025: [International Conference on Spectral and High-Order Methods](#) (ICOSAHOM), in Montreal, Canada
- Sept. 14 - 20, 2025: Hirscheegg Workshop, in the Kleinwalsertal, Austria, organized by Ferdinand Thein and Gerald Warnecke
- one week in Nov. 2025: SIAM Conference on Analysis of Partial Differential Equations (PD25), somewhere in the USA
- sometime in **2026**: Finite Volume and Complex Applications 11, in Münster, Germany
- 2nd half of July, 2026: 20th International Conference on Hyperbolic Problems: Theory, Numerics and Applications, in Stuttgart, Germany

Jan Nordström will visit us

Sweden has distinguished applied mathematicians working in numerics of differential equations. Examples are [Heinz-Otto Kreiss](#) (1930 - 2015) and his student [Bertil Gustafsson](#) (*1939). At the HONOM conference in Crete this September we met [Jan Nordström](#), who is Gustafsson's best student. Jan Nordström approached us after our series of Active Flux lectures, expressing his wish to collaborate with us.

Jan Nordström plans to visit us next year (May 25 - June 7, 2025) in Würzburg, before the NumHyp25 conference in Darmstadt. In the mean time we plan to begin discussions via Zoom.



Jan Nordström