

# NEWSLETTER

## of the Work Group Mathematical Fluid Mechanics

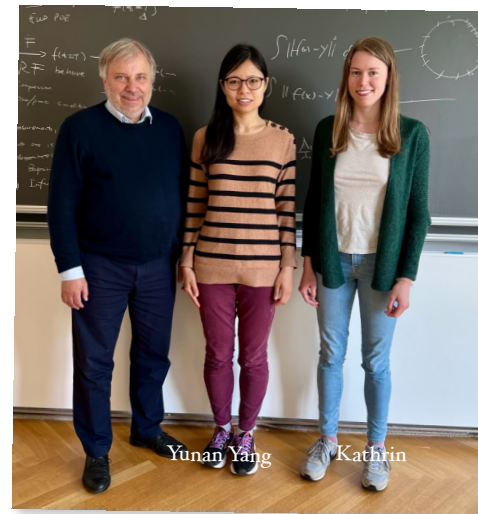
### Newsletter no. 4 (2023)

#### Residenzlauf in Würzburg

On April 30, 2023, the 33rd Würzburger Residenzlauf took place. Among 59 participants (46 men/ 13 women) from the Department of Mathematics and Computer Science there were 4 persons from our work group going on the 10 km run. *Claudius Birke* succeeded as the first of all faculty members in 39:57 minutes, *Marius Volpert* became 8th (47:22 min.), *Moritz Beck* finished 28th (26th male, 53:36 min.) and *Lena Baumann* finished 43rd, she was the 6th female (59:38 min). Congratulations to all participants!

#### Our visit to Zürich

Last week Kathrin Hellmuth and myself traveled to the ETH in Zürich for scientific discussions with *Yunan Yang*. The topic was to find a mathematical underpinning of experimental design. Given a kinetic chemotaxis model of a biological experiment, what is the best placement of measurements, such that we can reconstruct the collision kernels of the kinetic model? We actually made progress!



#### Maria Han-Veiga will visit us

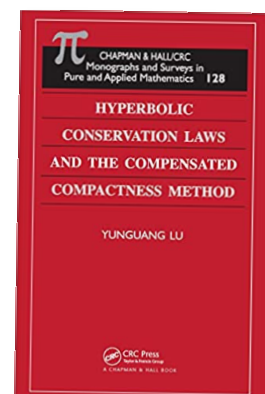
*Maria Han-Veiga* will visit us in Würzburg June 11- 16. Her research interest are both in of numerical methods for conservation laws and machine learning. See the Oberseminar lecture she will present [here](#).

#### Yunguang Lu visits for two months

The mathematician Yunguang Lu is the author of a textbook on compensated compactness. He will visit us June 2 - August 1, 2023 with a Humboldt stipend.

#### Matthias Maier visit us

*Matthias Maier* will visit us on May 25 for the day. He will give a seminar talk.



## Janina Kern begins her Master thesis

Janina Kern has begun her Master thesis with us. She will work on a numerical method for conservation laws, namely the Active Flux method.

## Sophie Lauer submitted Bachelor thesis

Sophie Lauer submitted her Bachelor thesis: "The low Mach limit of the compressible Navier-Stokes equations".

## Papers with Yunguang Lu have been accepted

These two papers of mine with Yunguang Lu and others

- [Yong Chen, Christian Klingenberg, Yunguang Lu, Xianting Wang, Guoqiao Yo: "Invariant region on a non-isentropic gas dynamics system", \*Nonlinear Analysis: Real World Applications\*, Vol. 73 \(2023\)](#)

- [Weifeng Jiang, Christian Klingenberg, Yunguang Lu, Guoqiang You: "The Global Existence of  \$L^\infty\$  Solutions to Isentropic Euler Equations in General Nozzle", \*Mathematische Nachrichten\* \(2023\)](#)

have been accepted for publication. They deal with theoretical questions of systems of 1-dim. conservation laws.

## Dates of HYP2024

Every two years the main conference on hyperbolic problems is held. The next one (XIX International Conference on Hyperbolic Problems: Theory, Numerics and Applications) will be held July 1 - 5, 2024 in Shanghai. [Shi Jin](#) will be the organizer.

I have been asked to join the Scientific Committee of HYP2024.

## Upcoming scientific conferences

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

- May 22 - 26, 2023: [Sharing Higher-order Advanced Research Knowledge 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

- 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

- Sept. 10 - 16, 2023: [16th Hirschegg Workshop on Conservation Laws](#), in the Alps (Kleinwalsertal), organized by Gerald Warnecke and others

- Sept. 25 - 29, 2023: Sino-German workshop, in Beijing, organized by Gerald Warnecke and others

- Oct. 30 - Nov. 3, 2023: [Finite Volumes for Complex Applications in Strasbourg](#) in Strasbourg, France, organized by Philippe Helluy and others

- March 3 - May 31, 2024: [Numerical Methods for Nonlinear Hyperbolic PDEs](#), in Shenzhen, China, organized by Alex Kurganov, Chi-Wang Shu and Alina Chertok

- July 1 - 5, 2024: [XIX International Conference on Hyperbolic Problems: Theory, Numerics and Applications \(HYP 2024\)](#) in Shanghai, China, at Shanghai Jiao Tong University, organized by Shi Jin

- Sept. 9 - 13, 2024: [Conference on high-order nonlinear numerical methods for evolutionary PDEs](#) (HONOM2024) on the Crete Island, Greece, organized by Elena Gaburro

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## The lectures to my student seminar talks have been assigned

Every semester I give Bachelor and Master students the chance to give a talk on a topic of their liking as part of student seminar that I offer. This semester there will be 23 seminar talks, [see here](#).

A number of students asked me for topics in machine learning (ML). I gave them topics ranging from theory of ML to applying ML to solving PDEs. Feel free to attend the lectures.



Shi Jin