

NEWSLETTER

of the Work Group Mathematical Fluid Mechanics

Newsletter no. 5 (2023)

Papers accepted at FVCA 2023

In order to attend the conference *Finite Volumes for Complex Applications* (FVCA) 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 extended workgroup three papers have been accepted:

- Claudius Birke, Walter Boscheri, and Christian Klingenberg: "A high order semi-implicit scheme for ideal magnetohydro-dynamics"
- Claudius Birke, Christian Klingenberg: "A Low Mach Two-speed Relaxation Scheme for Ideal MHD Equations"
- Wasilij Barsukow: "Truly multi-dimensional all-speed methods for the Euler equations"

With these three contribution Walter Boscheri, Claudius Birke and Wasilij Barsukow will give lecture at FVCA.

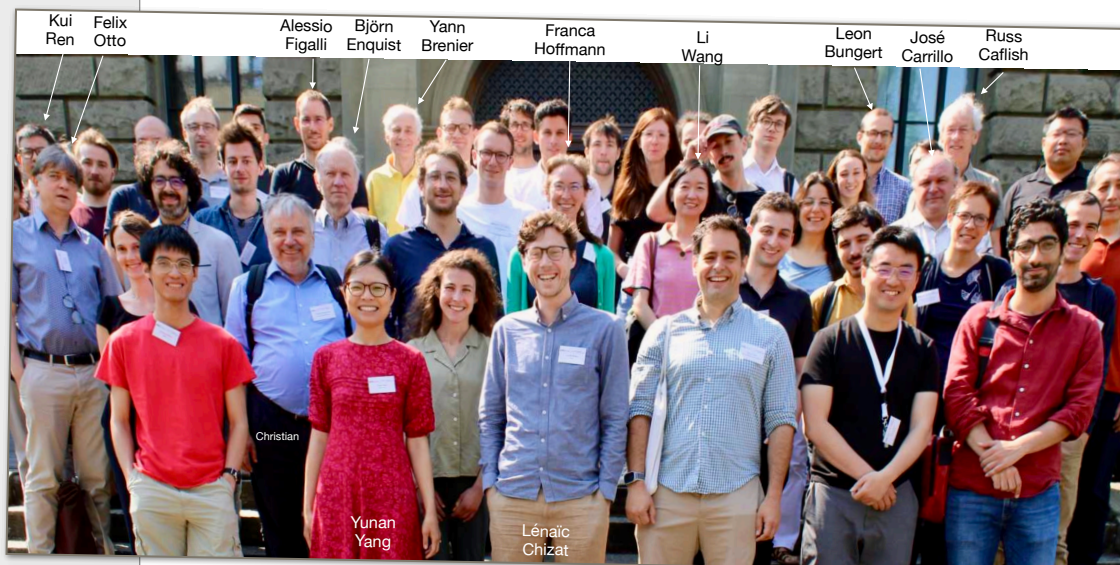
Armin Hofmann begins his Master thesis

Armin Hofmann begins his Master thesis with us. The plan is to combine numerics of conservation laws with aspects of machine learning.

Optimal transport workshop in Zürich

Last week (June 5 - 9, 2023) I attended the workshop *Emerging topics in applications of optimal transport* at ETH Zürich, organized by Lénaïc Chizat, Alessio Figalli and Yunan Yang. - Optimal transport was connected to PDEs by Yann Brenier: a minimization principle that maps the initial data to its solution at later time. The best analysts since then have studied this, like the Fields medallists Cédric Villani and Alessio Figalli. It is useful in a plethora of applications, like inverse problems. Both knowing one of the organizers (Yunan Yang) and having contributed to inverse problems with Kathrin Hellmuth allowed me to attend the workshop.

I knew most the senior people attending (like Yann Brenier, Björn Engquist, Felix Otto) and got to know some of the younger stars, like Leon Bungert (29 years old), who will join our faculty in Würzburg in October.



Group photo at the "Emerging topics in applications of optimal transport" workshop in Zürich

Simon Markfelder submitted two papers

The fruit of Simon Markfelder's post-doc period in Cambridge begins to show in papers he is submitting to journals:

- [D. W. Boutros, S. Markfelder, E. S. Titi: On Energy Conservation for the Hydrostatic Euler Equations: An Onsager Conjecture. Submitted \(2023\)](#)

- [D. W. Boutros, S. Markfelder, E. S. Titi: Nonuniqueness of generalised weak solutions to the primitive and Prandtl equations. Submitted \(2023\)](#)

These results extend aspects of Onsager's conjecture to new systems of equations.

Paper with Yungang Lu has been accepted

- [Xuanji Jia, Christian Klingenberg, Yun-guang Lu, Qingyou Sun: "Existence of entropy solutions to systems of polytropic gas with a class of unbounded sources", *Journal of Nonlinear and Variational Analysis* 7, No. 3, pp. 437-448 \(2023\).](#)

In this paper existence of solutions to certain 1-d systems of conservation laws with source terms is proven.

Chamber music at my house

On July 2 there will be a chamber music concert in our house, see the announcement on the right. Finally we are restarting our house-concert tradition after a three year break.

This will be special, because among other musicians the chief musical director of the Würzburg Philharmonic Orchestra will play the piano and the lead soprano of the Würzburg Opera will sing.

The Bayerische Rundfunk plans to attend for a report afterwards.

Everyone is welcome to attend!

Upcoming scientific conferences

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

- 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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PHILHARMONISCHEN ORCHESTERS WÜRZBURG

die Musiker spielen für
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SONNTAG, 2. JULI '23 • 19:00 UHR

**HAUSKONZERT BEI KLINGENBERGS:
UNTERER NEUBERGWEG 17B IN WÜRZBURG**
Tel.: 01578 1677235

Johann Sebastian Bach „Schafe können sicher weiden“ aus der Kantate BWV 208
Jules Massenet Elegie für Sopran, Violoncello und Klavier
Maurice Ravel „La flûte enchantée“ für Sopran, Flöte und Klavier
Carl Maria Weber aus dem Trio für Flöte VC und Klavier op.63 in g-moll „des Schäfers Klage“
Andante espressivo
Olivier Messiaën „Le Merle noir“ für Flöte und Klavier
Camille Saint-Saëns „Der Schwan“ aus „Der Kameval der Tiere“ für Violoncello und Klavier
C. Francis Brown „Songs of nature and farewell“ für Sopran, Flöte, Violoncello und Klavier
Leo Delibes „Le Rossignol“ für Sopran, Flöte und Klavier
Frank Bridge Three Songs für Sopran, Violoncello und Klavier

Silke Evers – Sopran
Stefan Albers – Flöte
Matthias Steinkrauß – Violoncello
Enrico Calesso - Klavier