

NEWSLETTER

of the Work Group Mathematical Fluid Mechanics

Newsletter no. 14 (2022)

A paper of our collaboration with Fritz Röpke published

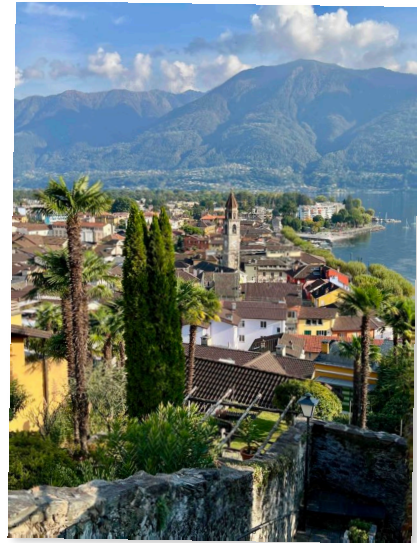
The paper [G. Leidi, C. Birke, R. Andrassy, J. Higl, P. V. F. Edelmann, G. Wiest, C. Klingenberg, F. K. Röpke, "A finite-volume scheme for modelling compressible MHD flows at low Mach numbers in stellar interiors"](#) has been accepted to the journal *Astronomy & Astrophysics*.

Remi Abgrall's birthday conference last week

Last week (Oct. 10 - 14) we celebrated Rémi Abgrall's 61st birthday with a workshop in Ascona, Switzerland, [see here](#). It was an intimate conference, a bit like in Oberwolfach, with a nice roster of [participants](#). Wasilij was there also. - In my lecture I talked about ideas we had when discussing with James Glimm (we visited him at the beginning of this month in New York).

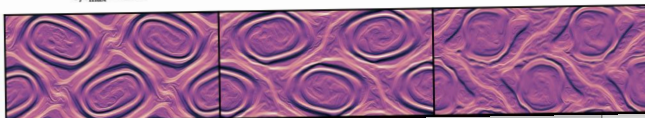


Rémi Abgrall at his birthday conference



the view down to Ascona - seen from close to the conference site

$t/t_{\max} = 0.73$ $t/t_{\max} = 0.83$ $t/t_{\max} = 0.94$



the B_x field in a magnetized Kelvin-Helmholtz instability

Conference in Toulouse

Francis Filbet will organize a conference in Toulouse (France) on [Kinetic and hyperbolic eqations](#) Dec. 12 - 16.

Eric Sonnendrücker's workshop

Eric Sonnendrücker's workshop on [Kinetic equations and plasma](#) will take place in Garching Nov. 7 - 10, 2022.

Scientific visit to the USA last month

Three scientific visits from Sept. 16 to Oct. 4 to Madison, Wisc., Minneapolis, Minn. and New York in the USA together with Kathrin Hellmuth went well. We were hosted by [Qin Li](#) (Madison), [Li Wang](#) Minneapolis and [James Glimm](#) (New York).

The topics during the first two stops were how to model

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Kai Ulrich submitted his Master thesis

Kai Ulrich submitted his Master thesis "[A Dynamical Low-Rank Algorithm for a Kinetic Model for Gas Mixtures](#)". The topic came out of discussions with Lukas Einkemmer.

It is the first attempt to use this numerical method for a multi-species kinetic model.

Johannes Rieger submitted his Bachelor thesis

Johannes Rieger submitted his Bachelor thesis "Herleitung der Black-Scholes-Formeln zur Bepreisung von europäischen Optionen".

Robin Nowak submitted his Bachelor thesis

Robin Novak submitted his Bachelor thesis "Introduction to the Partial Differential Equations of Gas Dynamics & Their Numerical Solution"

Tim Winkler will begin his Bachelor thesis with us

Tim Winkler will begin to work on his Bachelor thesis with us. He will study the Euler equations and the Riemann Problem.

Sandra Warnecke's thesis published

Sandra's PhD thesis had now been published, [see here](#). Sandra had asked me to write a Preface.

coefficients in PDEs by leveraging the ability to i.) gather lots of data for certain phenomena ii.) and use multiple scales. In New York we discussed new admissibility conditions for the multi-dim. Euler equations.



Upcoming scientific conferences

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

- Nov. 7 - 10, 2022: "[Numerical Methods for the Kinetic Equations of Plasma Physics](#)" (NumKin 2022) in Garching (near Munich), organized by Eric Sonnendrücker
- Nov. 14 - 18, 2022: [Research School on Kinetic Theory](#), in Luminy (near Marseille, France), organized by José Carillo, Markus Schmittchen and others
- Dec. 12 - 16, 2022: [Kinetic and hyperbolic equations: modeling, analysis and numerics](#), in Toulouse (France), organized among others by Francis Filbet
- Feb. 26 - March 3, 2023: [SIAM Conference on Computational Sciences and Engineering or SIAM CSE23](#), held in Amsterdam, organized among others by Hans deSterck
- March 29 - 31, 2023: [4th European conference on Non-equilibrium gas flows](#), in Eindhoven, Netherlands
- spring of 2023: NumHyp 2023 in Bordeaux, France ([link of NumHyp2021](#))
- May, 2023 (either 8-12 or 22-26): [Sharing Higher-order Advanced Research Know-how on Finite Volume \(SHARK-FV\)](#) in Portugal, organized by Raphael Loubère and others
- Sept. 4 - 8, 2023: [European Conference on Numerical Mathematics and Advanced Applications \(ENUMATH\)](#), in Lisbon, Portugal
- summer of 2024: [International Conference on Hyperbolic Problems: Theory, Numerics and Applications \(HYP 2024\)](#) in Shanghai, China, organized by Shi Jin