

NEWSLETTER

of the Work Group Mathematical Fluid Mechanics

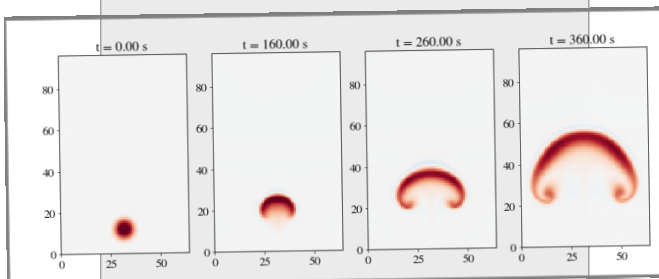
Newsletter no. 7 (2022)

Claudia Knorr submitted her Master thesis

Claudia submitted her Master thesis titled "On Numerical Methods for Astrophysical Flows".

The astrophysics code of Fritz Röpke numerically simulates stellar convection. The numerical scheme for the compressible Euler equations at low Mach numbers uses a so-called pressure diffusion. In this thesis a careful study was done on how to best adjust the diffusive effect of the scheme.

Phillip Edelmann co-supervised this work.



This is the simulation of a bubble of hot gas sitting in a stationary colder gas. Gravity points downwards, so that the bubble rises and deforms. This is a delicate test that would not work if the adjustments done by Claudia had not been done well.

Farah Kanbar defended her thesis successfully

On April 5 Farah passed her PhD defense successfully. She gave her defense lecture plus answered questions by the examiners (Rony Touma, Anja Schlömerkemper and myself).

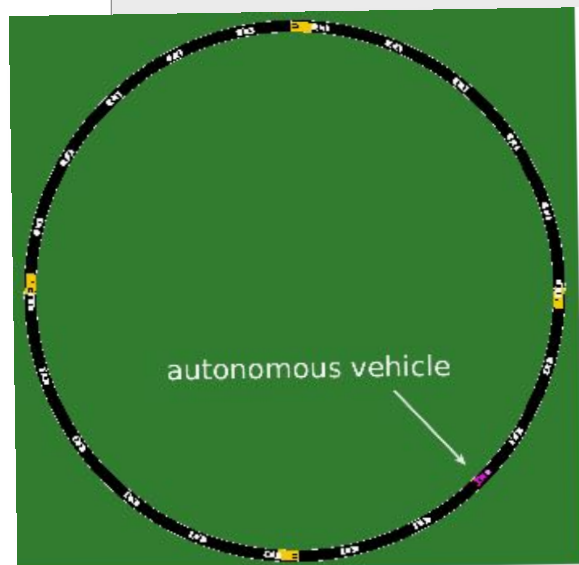
Afterwards she received a doctoral hat, that had been made with great care by the workgroup. In the evening she invited everyone to dinner. She will now move to a job in industry in Germany. Good luck, Farah!



Vanessa Halat submitted her Master thesis

Vanessa submitted her Master thesis "The Optimal Velocity Model - From microscopic to macroscopic traffic flow and the impact of autonomous vehicles on traffic flow"

In her thesis Vanessa modeled the following phenomenon: dense vehicular traffic flow tends to give rise to stop-and-go traffic, even though there is no impediment on the road. This can be alleviated by introducing an autonomous vehicle into the traffic, which is able to adjust the traffic flow in such a way that the traffic flows smoothly.



The autonomous vehicle (red) on the ring road can be adjusted such that the remaining traffic (yellow) flows without traffic jams.

Upcoming scientific conferences

Go ahead and click the links to check where you might want to participate.

- Jan. 10 - June 24, 2022: [Frontiers in kinetic theory: connecting microscopic to macroscopic scales - KineCon 2022](#), a one semester program organized at the Newton Institute at Cambridge University with 5 one week workshops in this time
- April 10 - 15, 2022: [Structure preserving discretizations](#), in Oberwolfach, organized by Bruno Després, Michael Dumbser, myself
- May 11 - 13, 2022: [High-order Time Discretization Methods for PDEs](#), on the island of Capri, Italy, organized by Lorenzo Pareschi, Giovanni Russo and others
- May 16 - 20, 2022: [The Boltzmann Equations: in the trail of Torsten Carlemann](#), near Stockholm, Sweden
- May 23 - 29, 2022: [Sharing Higher-order Advanced Research Knowledge on Finite Volume \(SHARK-FV\)](#) in Portugal, organized by Raphael Loubère und Stephane Clain
- June 12 - 18, 2022: [Summer School on "Methods and models of kinetic theory"](#) organized by Marzia Bisi (Parma) among others
- June 20 - 25: HYP2022: [18th International Conference on Hyperbolic Problems, Theory, Numerics, Applications](#) - Part 2 (formerly HYP 2020), in Malaga, Spain, organized by Carlos Pares
- June 19 - 24, 2022 ["Numerical methods for kinetic equations"](#) a *summer school* by Eric Sonnendrücker and Lukas Einkemmer in the alps in Italy
- June 27 - July 1, 2022: [Hyperbolic balance laws & beyond](#), in Magdeburg, organized by Helzel and Lukacova
- July 18 - 22, 2022: [When Kinetic Theory meets Fluid Mechanics](#), in Zürich, organized among others by Alexis Vasseur
- Aug. 22 - 26, 2022: [10th International Conference on Numerical Methods for Multi-Material Fluid Flow \(MULTIMAT 2021\)](#) in Zürich, organized by Remi Abgrall and others
- Sept. 12 - 14, 2022: [Nils Henrik Risebro birthday conference](#) in Oslo, organized among others by Fjordholm, Holden, Mishra
- Sept. 26 - 30, 2022: [Horizons in non-linear PDEs](#), a *summer school* in Ulm, organized by Emil Wiedemann and others
- Oct. 9 - 14, 2022: [Computation of hyperbolic and related PDEs: A conference in honor of Remi Abgrall](#), organized by Sid Mishra at ETH Zurich on Monte Verità (Ascona, Switzerland)
- Sept. 19 - 23, 2022: [12th European Conference on Mathematical and Theoretical Biology](#) in Heidelberg, organized by Anna Marciniak (Heidelberg) and others
- Nov. 14 - 18, 2022: [Kinetic Theory](#), in Luminy (near Marseille, France), organized by José Carillo, Markus Schmittchen and others