

# NEWSLETTER

of the Work Group Mathematical Fluid Mechanics

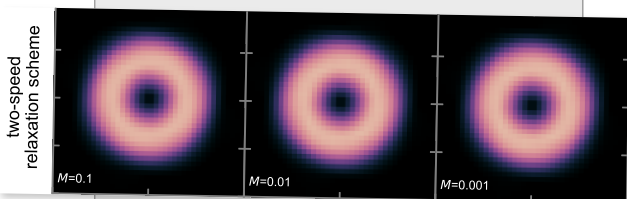
*Newsletter no. 27 (2021)*

## Claudius Birke submitted a paper

Claudius Birke submitted the paper [Claudius Birke, Christophe Chalons and Christian Klingenberg: "A low Mach two-speed relaxation scheme for the compressible Euler equations with gravity", submitted \(2021\).](#)

This is the result of a collaboration with [Christophe Chalons](#) from Versailles in France.

This paper combines well-balancing and the low Mach property of a numerical scheme for the Euler equations with gravity. One very much depends on the other.

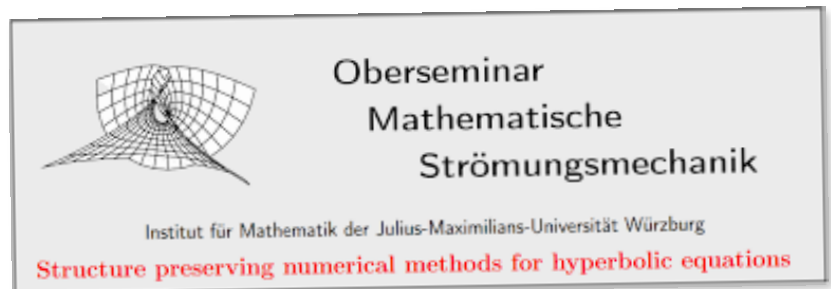


A Gresho vortex for Euler with gravity at successively lower Mach numbers

## Christine Barko: new member of our workgroup

Christine Barko is a HiWi in our group. She plans to begin her Master thesis with us in spring 2022.

## Our seminar series on hyperbolic problems takes a winter break



Our weekly seminar series "[Hyperbolic equations - structure preserving methods & other topics](#)" will take a winter break. This week's upcoming talk by [Lukas Einkemmer](#) will be the end of the fall series. In February we will resume. Eitan Tadmor, Randy LeVeque and Frank Martin among others have promised to give a talk in the spring.

Note that all talks so far are available via video on the webpage of this seminar series.

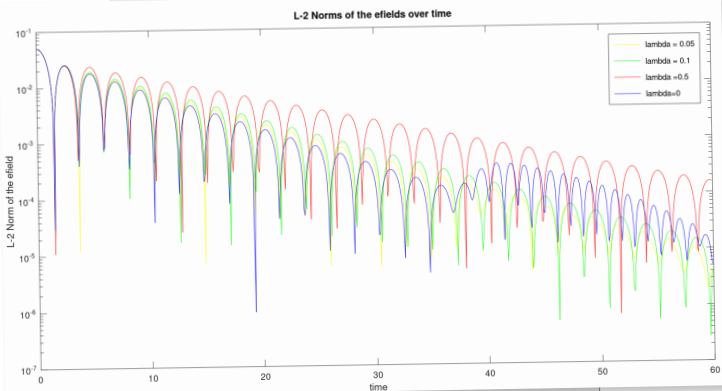
## "Convex Integration" workshop videos

The lectures of the workshop [Convex Integration and Nonlinear Partial Differential Equations](#) from Nov. 2021 are available online, [see here](#).

Camillo DeLellis gave great lectures.

## Theresa Full submitted Master her thesis

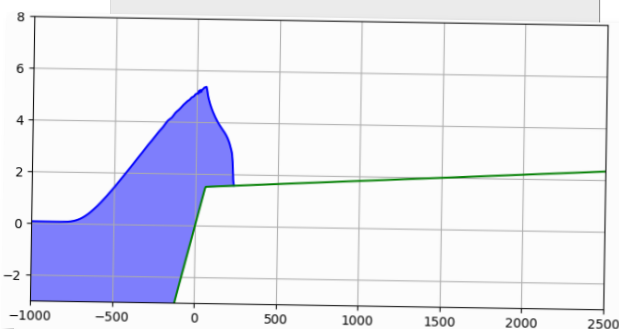
Theresa Full submitted her Master thesis "*The Semi-Lagrange Numerical Method for the Vlasov-Poisson Equation and Other Kinetic Equations*". She implemented the semi-Lagrange method and it worked well on simulations of Landau damping.



Landau damping for the Vlasov-Poisson-BGK equation. Lambda is the collision frequency in front of the BGK term.

## Veronika Mayerhofen submitted her Bachelor thesis

Veronika Mayerhofer submitted her Bachelor thesis "*Simulations of Tsunami Waves Over Variable Bathymetry Using Finite Volume Methods in Clawpack*". Randy LeVeque was kind enough to lend a helping hand for this work. Now it is possible to have Clawpack simulate a Tsunami wave first crossing the continental shelf and then running up a beach.



A Tsunami wave running up a beach which is steep at first and then flat.

## Upcoming scientific conferences

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

### 2022:

- Jan. 10 - 14, 2022: [Workshop on tissue growth and movement](#), at the Poincaré Institute in Paris, co-organized by Perthame
- 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
- Feb. 14 - 18: [Rigorous analysis of incompressible fluid models and turbulence](#) organized among others by Anna Mazzukato and Edriss Titi
- Mar. 7 - 9, 2022: [Workshop on inverse problems in biology](#), at the Poincaré Institute in Paris, co-organized by Marie Doumic
- March 7 - 11, 2022: [Perspectives on Multiphase Fluid Dynamics, Continuum Mechanics and Hyperbolic Balance Laws](#) in Luminy near Marseille, France, organized among others by Dumbser and Warnecke
- March 14 - 18, 2022: [SIAM Conference on Analysis of Partial Differential Equations online](#), organized by Sid Mishra and Emil Wiedemann
- May 16 - 20, 2022: [The Boltzmann Equations: in the trail of Torsten Carleman](#), near Stockholm, Sweden
- April 4 - 8, 2022: [HIGH ORDER NONLINEAR NUMERICAL METHODS FOR EVOLUTIONARY PDES: THEORY AND APPLICATIONS \(HONOM\)](#) in Braga, Portugal, organized by Raphael Loubère und Stephane Clain
- April 10 - 15, 2022: [Structure preserving discretizations](#), in Oberwolfach, organized by Bruno Despres, Michael Dumbser, myself
- May 25 - 29, 2022: [Sharing Higher-order Advanced Research Know-how 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 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