# NEWSLETTER

## *of the* Work Group Mathematical Fluid Mechanics

### *Newsletter no. 17 (2021)*

## SIAM PDE 2022 to be held in Berlin

Every two years the American applied mathematics society (SIAM) organizes a conference on the analysis of partial differential equations. I have attended a few of these meetings. Even though it consists mainly of contributed talks, the overall scientific level is high.

The next such meeting will be organized in Berlin in March 2022. Already by August/September one has to submit one's contribution.



**siam 2022**

**Conference on Analysis of Partial Differential Equations**

March 14–18, 2022
Technische Universität Berlin
Berlin, Germany

This is the conference of the SIAM Activity Group on Analysis of Partial Differential Equations and is held in cooperation with GAMM.

Sponsoring Organizations: Humboldt-Universität zu Berlin, Technische Universität Berlin, and Weierstrass Institute for Applied Analysis and Stochastics, Berlin, Germany

Learn more: go.siam.org/PD22

**Themes**
- Conservation laws
- Control and optimization
- Coupled multi-physics PDE systems
- Fluid dynamics
- Geometric PDEs and optimal transport
- Kinetic theory
- Mathematical physics
- Multiscale analysis
- Nonlinear waves
- Nonlocal PDEs
- Numerical analysis of PDEs
- PDEs in biological and complex systems
- Stochastic PDEs
- Variational methods

**Applications of PDEs including:**
- Biology, medicine, and imaging
- Geophysical flows
- PDEs on graphs and networks

## Current members of our group

**associated post-doctoral researchers:**

Wasilij Barsukow (Max Planck Institut for Plasma Physics, Garching)
structure preserving numerical methods for multi-dim. compressible Euler equations

Simon Markfelder (Cambridge University, Great Britain)
convex integration for multi-dim. compressible Euler equations

**post-doctoral researcher:**

Marlies Pirner        modeling and theory of kinetic equations

**doctoral students:**

Claudius Birke   joint project with *Fritz Röpke (Heidelberg)* ,
ideal MHD, low Mach, well-balanced, astrophysical applications
Kathrin Hellmuth   inverse problems for chemotaxis
Eva Horlebein   theory of multi-dim. compressible Euler equations
Farah Kanbar   well-balanced & AP methods for kinetic and compressible flow equations
Sandra Warnecke   numerics for multi-species kinetic equations

**students working on their Master thesis:**

Lena Baumann        Vlasov-Poisson-BGK equation, enhanced Landau damping
Theresa Full         applying the semi-Lagrange method to the Vlasov equations
Vanessa Halat        modeling traffic flow via conservation laws with non-local flux
Jonas Jackwirth        Korteweg de Vries equation
Claudia Knorr        numerical parameter study with Röpke's astrophysics code
Sonja Leicht        solving the elasticity equations using CLAWPACK
Julian Meusel        Einstein equations, numerical implementation
Kai Ulrich        a numerical low rank algorithm for solving kinetic equations
Mattis Vogelsang    numerical methods for MHD

**students working on their Bachelor thesis:**
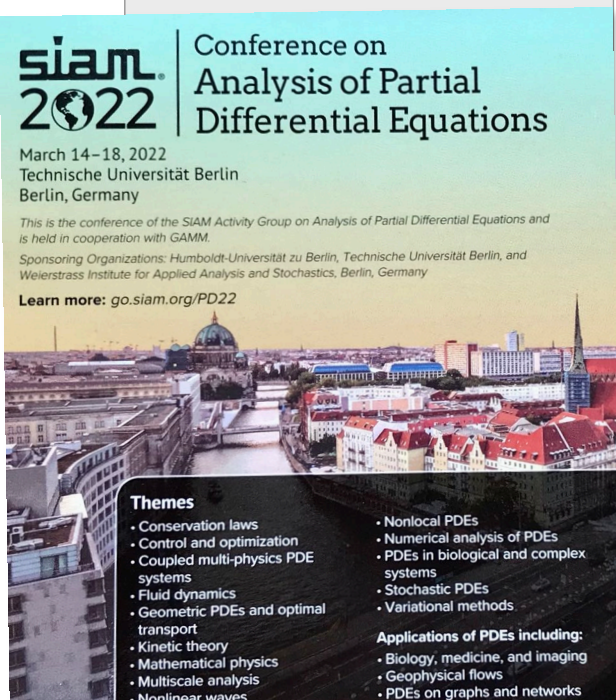
Jonas Dornbusch        traffic flow models
Janina Kern        the Euler equations and its Riemann problem
Veronika Meyerhofer     simulating Tsunami waves using CLAWPACK
Michael Remmel  well-posedness theory for conservation laws via front tracking
Johannes Rieger        stochastic modeling in financial  mathematics

## Rarefied Gas Dynamics Symposium

July 7 - 10, 2021 an online *Symposium on rarefied gas dynamics* will be held. Seok-Bae Yun is one of the organizers.

Marlies Pirner will give a lecture there on '*Velocity dependent collision frequency and quantum descriptions for BGK models'*.



If it had not been for Corona, this Rarefied Gas Dynamics Symposium would have been held in Seoul, Korea.

# Upcoming scientific conferences

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

**2021:**

- June 21 - 24: *SIAM Conference on Mathematical & Computational Issues in the Geosciences (GS21)*, in Milan, to be held online

- July 2: *18th International Conference on Hyperbolic Problems, Theory, Numerics, Applications* - Part 1 (formerly HYP 2020), one day online with lectures by Dafermos, Min Tang and others

- July 12 - 16: *International Conference on Spectral and Higher Order Methods* ICOSAHOM 2020, Vienna (online only), Wasilij and myself have organized a mini-symposium there

- July 26 - 30: *Numerical methods for hyperbolic problems, NumHyp2021* in Trento (hybrid), organized by Michael Dumbser

- Sept. 12 - 18: *Hirschegg Workshop On Conservation Laws* in Kleinwalsertal in Austria, organized by among others Gerald Warnecke

- fall: Special program on Numerical Methods for Nonlinear Hyperbolic PDEs; at SUSTech, Shenzhen, China: organized by Alex Kurganov (still in the planning stage)

**2022:**

- Jan. 10 - 14: *Workshop on tissue growth and movement*, at the Poincaré Institute in Paris, co-organized by Perthame

- March 14 - 18, 2022: *SIAM Conference on Analysis of Partial Differential Equations* in Berlin, organized by Sid Mishra and Emil Wiedemann

- some time in spring: *THE BOLTZMANN EQUATION: IN THE TRAIL OF TORSTEN CARLEMAN*, near Stockholm, Sweden

- some time in spring: *HIGH ORDER NONLINEAR NUMERICAL METHODS FOR EVOLUTIONARY PDEs: THEORY AND APPLICATIONS (HONOM)* in Braga, Portugal, organized by Raphael Loubère und Stephane Clain

- end of May: *Sharing Higher-order Advanced Research Know-how on Finite Volume (SHARK-FV)* in Portugal, organized by Raphael Loubère und Stephane Clain (still in its planning stage)

- June 5 - 9, 2022: *ECCOMAS congress* (ECCOMAS = European Community on Computational Methods in Applied Sciences), in Oslo

- 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

- July 18 - 22, 2022: *When Kinetic Theory meets Fluid Mechanics*, Zürich

- Sept. 5 - 9, 2022: *10th International Conference on Numerical Methods for Multi-Material Fluid Flow (MULTIMAT 2021)* in Zürich, organized by Remi Abgrall