Christian Klingenberg

21. November 2021

NEWSLETTER

of the Work Group Mathematical Fluid Mechanics

Newsletter no. 26 (2021)

Our "work group Christmas party" is scheduled for Dec. 10 at 5 pm

On Friday, Dec. 10 at 5 pm at my house we will have our work group Christmas party (end of year party). It will be a G2+ gathering.

Please write to me if you will attend or not.

Robin Nowak began his Bachelor-thesis with us

He plans to work on numerics of conservation laws.

Mathematical biology at the Institute Henri Poincaré in Paris

The conference center *Henri Poincaré* in Paris will hold an emphasis trimester on "Mathematical modeling of organization in living matter" Jan. - April 2022. Invited visitors either come for a longer period or attend a workshop. The complete list of workshops is *here* (this page opens slowly).

Kathrin Hellmuth is invited to the Jan. 10 - 14 workshop "Tissue growth and movement",

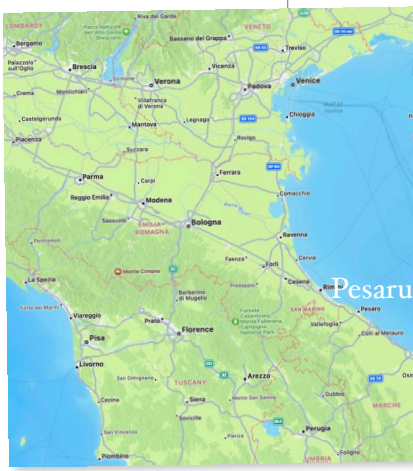
I myself am invited to the March 7 - 9 workshop "Inverse problems in biology".

Let us hope that Corona will allow everyone to attend in person.

Summer School on "Methods and models of kinetic theory"

About every other year in Italy a summer school is organized on kinetic models. The next one is scheduled June 12 - 18, 2022 in Pesaru, Italy, see *here*.

Marlies has attended previous summer schools of this series and liked it a lot.



Articles published by:

i.) Kathrin Hellmuth

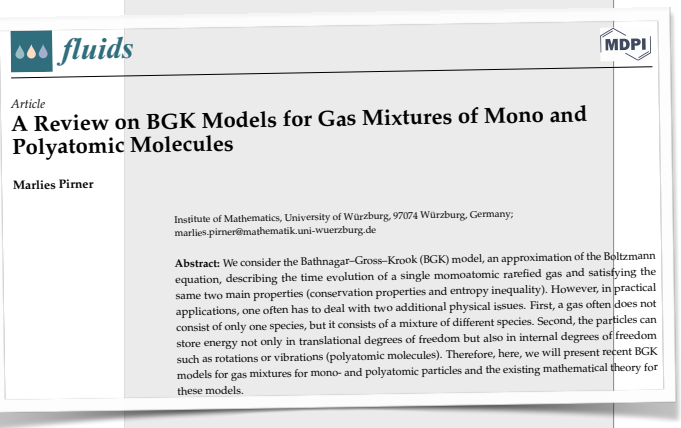
The article *Kathrin Hellmuth, Christian Klingenberg, Qin Li, Min Tang: "Multiscale convergence of the inverse problem for chemotaxis in the Bayesian setting", Computation, vol. 9, 119, special issue "Inverse Problems with Partial Data", ed. by Qin Li, Li Wang and Leonardo Andrés Zepeda Núñez (2021)* has been published.

You can find a brief summary of this article *here* (scroll down).

This is Kathrin Hellmuth's first published article. Congratulations!

ii.) Marlies Pirner

The article *M. Pirner: "A review on BGK models for gas mixtures of mono and polyatomic molecules" Fluids 6, 11, 393 (2021)* has been published. This paper reviews results on kinetic BGK gas mixture models that have more than one internal degree of freedom.



fluids MDPI

Article

A Review on BGK Models for Gas Mixtures of Mono and Polyatomic Molecules

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Abstract: We consider the Bathnagar–Gross–Krook (BGK) model, an approximation of the Boltzmann equation, describing the time evolution of a single momoatomic rarefied gas and satisfying the same two main properties (conservation properties and entropy inequality). However, in practical applications, one often has to deal with two additional physical issues. First, a gas often does not consist of only one species, but it consists of a mixture of different species. Second, the particles can store energy not only in translational degrees of freedom but also in internal degrees of freedom such as rotations or vibrations (polyatomic molecules). Therefore, here, we will present recent BGK models for gas mixtures for mono- and polyatomic particles and the existing mathematical theory for these models.

Upcoming scientific conferences

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

2022:

https://indico.math.cnrs.fr/category/416/

- 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 Carlemann*, 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