

Florian Oschmann

Curriculum Vitae

Personal data

First name Florian
Family name Oschmann
Date of birth 19.03.1995
Place of birth Friedrichroda, Germany
Nationality German
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Recent employment

since 07/2022 **Postdoctoral fellow**, *Akademie Věd České Republiky, Praha*
Department of Evolutionary Differential Equations; Head of group: Šárka Nečasová

Education

2018–2022 **Ph.D. in Mathematics**, *TU Dortmund, Dortmund*
Title of PhD thesis: Homogenization of compressible fluids in perforated domains;
Supervisor: Prof. Dr. Peter Bella, *Final grade: magna cum laude (very good)*

2017–2019 **B.Sc. in Physics**, *Universität Leipzig, Leipzig, Final grade: 1.6*

2013–2018 **Graduate Mathematician (Diplom-Mathematiker)**, *Universität Leipzig, Leipzig, Final grade: 1.2*
Title of Diploma thesis: Über die Joukowski-Abbildung und ihre Anwendungen in der Aerostatik;
Supervisor: Prof. Dr. Hans-Peter Gittel

2005–2013 **High School Diploma (Abitur)**, *Perthes-Gymnasium, Friedrichroda, Germany, Final grade: 1.1*

Employment history

2019–2022 **Ph.D. student**, *TU Dortmund, Dortmund*
2018–2019 **Ph.D. student**, *Universität Leipzig, Leipzig*

Teaching Experience

Summer 2022 **Tutor of exercise classes for Bachelor students**, TU Dortmund
Analysis II

Winter 2021/22 **Consultant in Masterseminar**, *Homogenization of compressible Navier–Stokes–Fourier equations*, TU Dortmund
Supervisor: Prof. Dr. Peter Bella

- 2020–2022 **Tutor and organization of exercise classes for Analysis I-III**, TU Dortmund
Lecturer: Prof. Dr. Peter Bella
- 2019–2020 **Tutor of exercise classes for Bachelor students**, TU Dortmund
 Analysis II (Summer 2020)
 Analysis I (Winter 2019/2020)
- 2016–2019 **Tutor of exercise classes for Diploma and Bachelor students**, Universität
 Leipzig
 Mathematik 4 für Physiker (english) (Summer 2019)
 Mathematik 3 für Physiker (english) (Winter 2018/2019)
 Gewöhnliche Differentialgleichungen LA Gymnasien (Summer 2018)
 Analysis für Lehramt Grund- und Oberschule (Winter 2017/2018)
 Mathematik für Wirtschaftswissenschaftler 2 (Summer 2017)
 Gewöhnliche Differentialgleichungen (Winter 2016/2017)

Research activities

Organizing committee

- 20.05.–25.08.2023 **ICIAM23**, Tokyo, Japan, co-organizer of Minisymposium “Limit behavior and asymptotic properties in fluid mechanics”, together with Thomas Eiter

Participation in workshops and conferences

- 20.05.–25.08.2023 ICIAM23 (Tokyo, Japan; co-organizer of Minisymposium “Limit behavior and asymptotic properties in fluid mechanics”)
- 30.05.–02.06.2023 GAMM23 (Dresden, Germany)
- 18.10.–22.10.2022 Against the flow (Będlewo, Poland)
- 22.08.–26.08.2022 Mathematical Fluid Mechanics In 2022 (Praha, Czech republic)
- 11.07.–15.07.2022 Equadiff 15 (Brno, Czech republic)
- 23.08.–27.08.2021 Summer School “Fluids under Control” (Praha, Czech republic; online)
- 22.02.–26.02.2021 Winterschool on Analysis and Applied Mathematics (Münster, Germany; online)
- 15.02.–19.02.2021 Multi-scale Analysis: Thematic Lectures and Meeting (Bengaluru, India; online)
- 2020–present One World PDE Seminar (Bath, UK; online)
- 17.06.–21.06.2019 Progress in Mathematical Fluid Dynamics (Cetraro, Italy)
- 10.06.–14.06.2019 International Conference on Fluids and Variational Methods (Budapest, Hungary)
- 03.06.–06.06.2019 Material theories, statistical mechanics, and geometric analysis: A conference in honor of Stephan Luckhaus’ 66th birthday (Leipzig, Germany)

Scientific talks

- August 2023 **Γ -convergence for nearly incompressible fluids**, ICIAM23, Minisymposium “Limit behavior and asymptotic properties in fluid mechanics”, Tokyo
- 30.05.2023 **Γ -convergence for nearly incompressible fluids**, GAMM23, Young Researcher’s Minisymposium “Emergent behaviour in systems of hydrodynamically interacting particles”, Dresden
- 02.05.2023 **Some insights in homogenization of compressible Navier-Stokes equations**, Seminar on Partial Differential Equations, Czech Academy of Sciences, Praha

- 24.04.2023 **Singular limits for stratified fluids**, Polish Academy of Sciences, Warszawa
- 13.03.2023 **Some insights in homogenization of compressible Navier-Stokes equations**, *Nečas Seminar on Continuum Mechanics*, Charles University, Praha
- 31.01.2023 **Stratified fluids: On pancakes and non-local temperatures**, University of Hradec Králové, Hradec Králové
- 18.01.2023 **Stratified fluids: On pancakes and non-local temperatures**, *Langenbach-Seminar*, WIAS Berlin, Berlin
- 09.11.2022 **An unexpected term for the Oberbeck–Boussinesq approximation**, *Séminaire EDP*, Université Paris Cité, Paris
- 19.10.2022 **Results on (no) collision of a falling solid in a compressible fluid**, *Against the flow*, Polish Academy of Sciences / Będlewo conference center, Będlewo
- 04.10.2022 **An unexpected term for the Oberbeck–Boussinesq approximation**, *Seminar on Partial Differential Equations*, Czech Academy of Sciences, Praha
- 25.08.2022 **Homogenization of compressible fluids in porous media**, *MFM-IN 2022*, Czech Academy of Sciences, Praha
- 11.07.–15.07.2022 **Homogenization of compressible NSE in randomly punctured domains**, *Equadiff 15*, Masaryk university, Brno
Poster
- 08.09.2021 **Inverse of divergence and homogenization of compressible Navier-Stokes equations in randomly perforated domains**, *Seminar on Partial Differential Equations*, Czech Academy of Sciences, Praha

Research visits

- 21.04.–28.04.2023 **Polish Academy of Sciences, Warszawa**, collaboration with Aneta Wróblewska-Kamińska
- 30.01.–03.02.2023 **University of Hradec Králové**, collaboration with Andrii Khrabustovskyi
- 16.01.–20.01.2023 **WIAS Berlin**, collaboration with Thomas Eiter
- 07.11.–11.11.2022 **IMJ-PRG, Université Paris Cité**, collaboration with Richard Höfer
- 06.09.–09.09.2021 **Czech Academy of Sciences, Praha**, collaboration with Peter Bella and Eduard Feireisl

Publications and Preprints

Research interests

partial differential equations, homogenization of Navier–Stokes and Navier–Stokes–Fourier equations, singular limits, fluid–structure interaction, collision problems

Publications

- Inverse of Divergence and Homogenization of Compressible Navier–Stokes Equations in Randomly Perforated Domains (2023)**
Peter Bella, Florian Oschmann; published in “Archive for Rational Mechanics and Analysis” (IF: 2.793); Number of Citations: 2; <https://doi.org/10.1007/s00205-023-01847-y>
- Homogenization of compressible fluids in perforated domains (2022)**
Florian Oschmann (PhD thesis) <http://dx.doi.org/10.17877/DE290R-22795>
- Homogenization and low Mach number limit of compressible Navier-Stokes equations in critically perforated domains (2022)**
Peter Bella, Florian Oschmann; published in “Journal of Mathematical Fluid Mechanics” (IF: 1.907)

(2021)); Number of Citations: 2; <https://doi.org/10.1007/s00021-022-00707-1>

4. **Homogenization of the full compressible Navier-Stokes-Fourier system in randomly perforated domains (2022)**

Florian Oschmann; published in “Journal of Mathematical Fluid Mechanics” (IF: 1.907 (2021)); Number of Citations: 1; <https://doi.org/10.1007/s00021-022-00679-2>

Preprints

1. **Homogenization of the unsteady compressible Navier-Stokes equations for adiabatic exponent $\gamma > 3$ (2023)**

Florian Oschmann, Milan Pokorný; submitted to “Journal of Differential Equations” (IF: 2.615); <https://arxiv.org/abs/2302.13789>

2. **On two Kuznetsov’s conjectures (2023)**

Florian Oschmann; minor revisions in “Examples and Counterexamples”; <https://arxiv.org/abs/2209.11074>

3. **On the incompressible limit of a strongly stratified heat conducting fluid (2022)**

Danica Basarić, Peter Bella, Eduard Feireisl, Florian Oschmann, and Edriss S. Titi; accepted in “Journal of Mathematical Fluid Mechanics” (IF: 1.907 (2021)); http://www.math.cas.cz/fichier/preprints/IM_20221220094335_32.pdf

4. **Γ -convergence for nearly incompressible fluids (2022)**

Peter Bella, Eduard Feireisl, and Florian Oschmann; submitted to “Journal of Mathematical Physics” (IF: 1.469); http://www.math.cas.cz/fichier/preprints/IM_20221213174627_54.pdf

5. **Homogenization of the two-dimensional evolutionary compressible Navier-Stokes equations (2022)**

Šárka Nečasová and Florian Oschmann; submitted to “Calculus of Variations and Partial Differential Equations” (IF: 2.097 (2021)); <https://arxiv.org/abs/2210.09070>

6. **Collision of a solid body with its container in a 3D compressible viscous fluid (2022)**

Bumja Jin, Šárka Nečasová, Florian Oschmann, Arnab Roy; <https://arxiv.org/abs/2210.04698>

7. **Rigorous derivation of the Oberbeck-Boussinesq approximation revealing unexpected term (2022)**

Peter Bella, Eduard Feireisl, Florian Oschmann; submitted to “Communications in Mathematical Physics” (IF: 2.361 (2021)); http://www.math.cas.cz/fichier/preprints/IM_20220721120958_85.pdf

Languages

German native

English fluently

Czech intermediate

Prague, April 21, 2023