

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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Education

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

Research

Research interests

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

Preprints and Publications

- Homogenization of the unsteady compressible Navier-Stokes equations for adiabatic exponent $\gamma > 3$ (2023)**
Florian Oschmann, Milan Pokorný; submitted to “Journal of Differential Equations” <https://arxiv.org/abs/2302.13789>
- 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” <https://doi.org/10.1007/s00205-023-01847-y>

3. **On two Kuznetsov’s conjectures (2023)**
Florian Oschmann; accepted in “Examples and Counterexamples”; <https://arxiv.org/abs/2209.11074>
4. **On the incompressible limit of a strongly stratified heat conducting fluid (2022)**
Danica Basarić, Peter Bella, Eduard Feireisl, Florian Oschmann, and Edriss S. Titi; submitted to “Journal of Mathematical Fluid Mechanics” http://www.math.cas.cz/fichier/preprints/IM_20221220094335_32.pdf
5. **Γ -convergence for nearly incompressible fluids (2022)**
Peter Bella, Eduard Feireisl, and Florian Oschmann; submitted to “Journal of Mathematical Physics” http://www.math.cas.cz/fichier/preprints/IM_20221213174627_54.pdf
6. **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”; <https://arxiv.org/abs/2210.09070>
7. **Collision of a solid body with its container in a 3D compressible viscous fluid (2022)**
Bumja Jin, Šárka Nečasová, Florian Oschmann, Arnab Roy; submitted to “Proceedings of the American Mathematical Society”; <https://arxiv.org/abs/2210.04698>
8. **Rigorous derivation of the Oberbeck-Boussinesq approximation revealing unexpected term (2022)**
Peter Bella, Eduard Feireisl, Florian Oschmann; submitted to “Communications in Mathematical Physics”; http://www.math.cas.cz/fichier/preprints/IM_20220721120958_85.pdf
9. **Homogenization of compressible fluids in perforated domains (2022)**
Florian Oschmann (PhD thesis) <http://dx.doi.org/10.17877/DE290R-22795>
10. **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” <https://doi.org/10.1007/s00021-022-00707-1>
11. **Homogenization of the full compressible Navier-Stokes-Fourier system in randomly perforated domains (2022)**
Florian Oschmann; published in “Journal of Mathematical Fluid Mechanics” <https://doi.org/10.1007/s00021-022-00679-2>

Teaching Experience

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| Summer 2022 | Tutor of exercise classes for Bachelor students, TU Dortmund
Analysis II |
| Winter 2021/2022 | Masterseminar, Homogenization of compressible Navier–Stokes–Fourier equations, TU Dortmund
<i>Lecturer: Prof. Dr. Peter Bella</i> |
| 2020–2022 | Tutor and organization of exercise classes for Analysis I-III, TU Dortmund
<i>Lecturer: Prof. Dr. Peter Bella</i> |
| 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)

Participation in workshops and conferences

20.05.–25.08.2023 ICIAM23 (Tokyo, Japan; co-organizer of Minisymposium)
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)

Research visits

30.01.–03.02.2023 **University of Hradec Králové**, together with Andrii Khrabustovskyi
16.01.–20.01.2023 **WIAS Berlin**, together with Thomas Eiter
07.11.–11.11.2022 **IMJ-PRG, Université Paris Cité**, together with Richard Höfer and David Gérard-Varet
06.09.–09.09.2021 **Czech Academy of Sciences, Praha**, together with Peter Bella and Eduard Feireisl

Scientific talks

August 2023 **Γ -convergence for nearly incompressible fluids**, ICIAM23, Minisymposium “Limit behavior and asymptotic properties in fluid mechanics”, Tokyo
May/June 2023 **Γ -convergence for nearly incompressible fluids**, GAMM23, Young Researcher’s Minisymposium “Emergent behaviour in systems of hydrodynamically interacting particles”, Dresden
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

Languages

German native
English fluently
Czech basics

Prague, March 14, 2023