

## Curriculum vitae **Dr. Hana Šmitala Mizerová**

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### PERSONAL DETAILS

Date of birth: November 10th, 1988  
Nationality: Slovak  
Email: hana.mizerova@fmph.uniba.sk, mizerova@math.cas.cz  
Webpage: <http://hore.dnom.fmph.uniba.sk/~mizerova/>

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### ACADEMIC DEGREES

- 2015 **Doctor of Natural Sciences in Mathematics** (Dr. rer. nat.)  
*summa cum laude*, Johannes Gutenberg University Mainz, Germany
- 2012 **Master of Science in Mathematics** (Mgr.)  
*summa cum laude*, Comenius University in Bratislava, Slovakia
- 2010 **Bachelor of Science in Mathematics** (Bc.)  
*summa cum laude*, Comenius University in Bratislava, Slovakia

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### RESEARCH EXPERIENCE

- since 03/2018 **PostDoc researcher**  
Czech Academy of Sciences, Prague, Czech Republic
- since 02/2018 **Assistant professor**  
Comenius University in Bratislava, Slovakia
- 10/2017 - 01/2018 **PostDoc researcher**  
Czech Academy of Sciences, Prague, Czech Republic
- 04/2017 – 09/2017 **PostDoc researcher**  
Johannes Gutenberg University Mainz, Germany
- 02/2017 - 03/2017 **Junior Simons Professor**  
Polish Academy of Sciences, Banach center, Warsaw, Poland
- 12/2015 – 03/2017 **Research assistant**  
Johannes Gutenberg University Mainz, Germany
- 09/2013 - 03/2014 **PhD student (research stay in Tokyo)**  
Waseda University in Tokyo, Japan  
6-months-long stay funded by *German Research Foundation (DFG)*
- 12/2012 – 12/2015 **PhD student**  
*German Research Foundation (DFG) scholarship*  
Johannes Gutenberg University Mainz; Technical University Darmstadt, Germany
- 09/2012 – 11/2012 **Research assistant**  
Johannes Gutenberg University Mainz, Germany

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### AWARDS

- 2018 **Seal of Excellence by the European Commission**  
for the proposal submitted under H2020-MSCA-IF-2017
- 2016 **Prize of the Faculty for excellent dissertation thesis**  
Faculty of Physics, Mathematics and Computer Science  
Johannes Gutenberg University Mainz, Germany
- 2012 **Rector's award for excellent master thesis**  
Comenius University in Bratislava, Slovakia

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## PARTICIPATION IN PROJECTS, RECEIVED FUNDING

- 03/2018 - 12/2020 **Czech Grant Agency (GAČR) grant** 18-05974S [PI: Eduard Feireisl]  
*“Oscillations and concentrations versus stability in the equations of mathematical fluid dynamics”*; PostDoc researcher
- 10/2017 - 01/2018 **ERC Advanced Grant** 320078 [PI: Eduard Feireisl]  
*“Mathematical Thermodynamics of Fluids”*; PostDoc researcher
- 04/2017 - 09/2017 **Grant of IURF JGU Mainz** [PI: Mária Lukáčová]  
*“Uniformly stable numerical schemes for multiscale weakly compressible flows”*;  
PostDoc researcher
- 02/2017 - 03/2017 **Simons Foundation grant** 346300  
within *Simons Semester “CrossFields PDEs”*; Junior Simons Professorship
- 02/2015 - 09/2017 **DFG Collaborative Research Center (CRC) TRR 146**  
*“Multiscale Simulation Methods for Soft Matter Systems”*;  
associate PhD student and PostDoc researcher
- 07/2017, 01/2016 *travel grants* from **IURF JGU Mainz**
- 07/2016 *travel grant* from **German Academic Exchange Service (DAAD)**
- 12/2012 – 12/2015 **DFG IRTG 1529 “Mathematical Fluid Dynamics”**; doctoral scholarship

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## INVITATION TO INTERNATIONAL CONFERENCES AND WORKSHOPS

- 06/2019 Conference *Numerical methods for hyperbolic problems 2019*, **Málaga, Spain**
- 05/2018 *Workshop on Mathematical Fluid Dynamics*  
DFG IRTG 1529, **Bad Boll, Germany**
- 11/2016 *KI-Net Young Researches Workshop:*  
*Stochastic and deterministic methods in kinetic theory*  
Duke University, **Durham, North Carolina, USA**
- 11/2016 *Oberwolfach Seminar: Different Mathematical Perspectives*  
*on Description of Unresolved Scales in Multiscale Systems*  
Oberwolfach Research Institute for Mathematics, **Oberwolfach, Germany**
- 10/2016 *CoMFoS16: Mathematical Analysis of Continuum Mechanics*  
*and Industrial Applications II*, Kyushu University, **Fukuoka, Japan**
- 03/2016 *Algoritmy 2016*  
Slovak University of Technology, **Podbanské, Slovakia**

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## INVITED SEMINAR TALKS

- 01/2019 *RTG Energy, Entropy and Dissipative Dynamics*, RWTH Aachen University
- 12/2017 *Current problems in numerical mathematics*, Czech Academy of Sciences
- 12/2017 *Nečas seminar on continuum mechanics*, Charles University
- 11/2017 *Seminar on partial differential equations*, Czech Academy of Sciences
- 10/2016 *Seminar at Institute of Science and Engineering*, Kanazawa University
- 12/2015 *Seminar on qualitative theory of differential equations*, Comenius University
- 03/2014 *Seminar on partial differential equations*, Czech Academy of Sciences
- 09/2013 *Seminar at Waseda Institute for Advanced Study*, Waseda University

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## SHORT-TERM RESEARCH STAYS (from one week to one month)

- 01, 03/2019; 01, 05/2018 Johannes Gutenberg University Mainz, Germany
- 10/2016 Kanazawa University, Japan
- 09/2016; 03/2014 Czech Academy of Sciences, Prague, Czech Republic
- 03/2015 Waseda University in Tokyo, Japan

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## EDITORIAL WORK

since 04/2018 editorial board member of *Applications of Mathematics* (Springer)

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## ARTICLES IN SCIENTIFIC JOURNALS

- 2020 E. Feireisl, M. Lukáčová-Medvid'ová, **H. Mizerová**, B. She:  
On the convergence of a finite volume method for the Navier-Stokes-Fourier system, *IMA J. Numer. Anal.*, DOI: 10.1093/imanum/draa060
- 2020 **H. Mizerová**, B. She: Convergence and error estimates for a finite difference scheme for the multi-dimensional compressible Navier-Stokes system  
*J. Sci. Comput.* 84(25), pp. 941-953, DOI: 10.1007/s10915-020-01278-x
- 2020 E. Feireisl, M. Lukáčová-Medvid'ová, **H. Mizerová**:  
A finite volume scheme for the Euler system inspired by the two velocities approach, *Numer. Math.* 144, pp. 89–132, DOI: 10.1007/s00211-019-01078-y
- 2020 E. Feireisl, M. Lukáčová-Medvid'ová, **H. Mizerová**:  
Convergence of finite volume schemes for the Euler equations via dissipative measure-valued solutions  
*Found. Comput. Math.* 20, pp. 923-966, DOI: 10.1007/s10208-019-09433-z
- 2019 E. Feireisl, M. Lukáčová-Medvid'ová, **H. Mizerová**:  
 $\mathcal{K}$ -convergence as a new tool in numerical analysis,  
*IMA J. Numer. Anal.* 40 (4), pp. 2227-2255, DOI 10.1093/imanum/drz045
- 2019 E. Feireisl, M. Lukáčová-Medvid'ová, **H. Mizerová**, B. She:  
Convergence of a finite volume scheme for the compressible Navier-Stokes system, *ESAIM: M2AN* 53 (6), pp. 1957-1979, DOI: 10.1051/m2an/2019043
- 2018 **H. Mizerová**, B. She: A conservative scheme for the Fokker-Planck equation with applications to viscoelastic polymeric fluids  
*J. Comput. Phys.* 374, pp. 941-953, DOI: 10.1016/j.jcp.2018.08.015
- 2018 P. Gwiazda, M. Lukáčová-Medvid'ová, **H. Mizerová**, A. Świerczewska-Gwiazda:  
Existence of global weak solutions to the kinetic Peterlin model  
*Nonlinear Anal.-Real* 44, pp. 465-478, DOI: 10.1016/j.nonrwa.2018.05.016
- 2017 M. Lukáčová-Medvid'ová, **H. Mizerová**, Š. Nečasová, M. Renardy:  
Global existence result for the generalized Peterlin viscoelastic model  
*SIAM J. Math. Anal.* 49-4, pp. 2950-2964, DOI: 10.1137/16M1068505
- 2017 M. Lukáčová-Medvid'ová, **H. Mizerová**, H. Notsu, M. Tabata:  
Numerical analysis of the Oseen-type Peterlin viscoelastic model by the stabilized Lagrange-Galerkin method, Part I: A nonlinear scheme  
*ESAIM: M2AN* 51, pp. 1637-1661, DOI: 10.1051/m2an/2016078
- 2017 M. Lukáčová-Medvid'ová, **H. Mizerová**, H. Notsu, M. Tabata:  
Numerical analysis of the Oseen-type Peterlin viscoelastic model by the stabilized Lagrange-Galerkin method, Part II: A linear scheme  
*ESAIM: M2AN* 51, pp. 1663-1689, DOI: 10.1051/m2an/2017032
- 2016 M. Lukáčová-Medvid'ová, **H. Mizerová**, B. She, J. Stebel:  
Error analysis of finite element and finite volume methods for some viscoelastic fluids, *J. Numer. Math.* 24(2), pp. 105-123, DOI: 10.1515/jnma-2014-0057
- 2015 M. Lukáčová-Medvid'ová, **H. Mizerová**, Š. Nečasová:  
Global existence and uniqueness result for the diffusive Peterlin viscoelastic model, *Nonlinear Anal.-Theor.* 120, pp. 154–170, DOI: 10.1016/j.na.2015.03.001

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## PAPER IN CONFERENCE PROCEEDING

- 2020 M. Lukáčová-Medvid'ová, **H. Mizerová**, B. She:  
New invariant domain preserving finite volume schemes for compressible flows  
Accepted to: *Recent Advances in Numerical methods for Hyperbolic PDE Systems. Selected talks of Numhyp 2019*, SEMA SIMAI Springer Series

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## THESES

- 2015 *Analysis and numerical solution of the Peterlin viscoelastic model*  
(dissertation) Johannes Gutenberg University Mainz
- 2012 *The Navier-Stokes equations with boundary conditions involving pressure*  
(master thesis) Comenius University in Bratislava
- 2010 *On the Navier-Stokes equations*  
(bachelor thesis) Comenius University in Bratislava

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## PARTICIPATION IN INTERNATIONAL CONFERENCES AND WORKSHOPS

- 05/2019 EMS School *Mathematical Aspects of Fluid Flows*, Kácov
- 10/2018 Fall school *Hyperbolic conservation laws and mathematical fluid dynamics*, Würzburg
- 08/2018 Summer school and Workshop *Waves in Flows*, Prague
- 08/2018 The 4th International conference *Applications of Mathematics*, Prague
- 01/2018 The 15th Japanese – German Workshop on Mathematical Fluid Dynamics, Tokyo
- 12/2017 Conference *Prague Compressible Meeting*, Prague
- 07/2017 International conference *Equadiff 2017*, Bratislava
- 03/2017 Workshop *Current Topics in Kinetic Theory* within “*CrossFields PDEs*”, Warsaw
- 02/2017 Workshop *Ideal Fluids and Transport* within “*CrossFields PDEs*”, Warsaw
- 08/2016 Summer school and Workshop *Fluids under Pressure*, Prague
- 06/2016 Workshop *Hybrid Simulation Methods in Fluid Dynamics*, Munich
- 10/2015 Workshop *Women in Applied Math & Soft Matter Physics*, Mainz
- 10/2015 International conference SPP 1506 – IRTG 1529, Darmstadt
- 06/2015 Workshop for Young Researchers in Fluid Dynamics, Darmstadt
- 05/2015 The 14th School *Mathematical Theory in Fluid Mechanics*, Kácov
- 03/2015 The 11th Japanese – German Workshop on Mathematical Fluid Dynamics, Tokyo
- 11/2014 Symposium *Simulation and Optimization of Extreme Fluids*, Heidelberg
- 10/2014 Autumn school and Workshop on Mathematical Fluid Dynamics, Bad Boll
- 08/2014 Summer school and Workshop *Particles in Flow*, Prague
- 01/2014 Winter school *Fluids and Snow*, La Clusaz
- 11/2013 The 9th Japanese – German Workshop on Mathematical Fluid Dynamics, Tokyo
- 06/2013 The 8th Japanese – German Workshop on Mathematical Fluid Dynamics, Tokyo
- 05/2013 The 13th School *Mathematical Theory in Fluid Mechanics*, Kácov
- 09/2012 International conference *Algoritmy 2012*, Podbanské

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## LANGUAGE SKILLS

- Slovak native speaker  
English fluent  
German good working knowledge  
Spanish basic communication skills  
Japanese basics (Hiragana and Katakana)

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## SOFTWARE AND PROGRAMMING SKILLS

C code, MATLAB, COMSOL Multiphysics, ParaView, LaTeX