

Curriculum vitae **Dr. Hana Šmitala Mizerová**

PERSONAL DETAILS

Name: Hana Šmitala Mizerová
Date and place of birth: 10.11.1988, Trnava, Slovakia
Nationality: Slovak
Family status: married, one child
E-mail: hana.mizerova@fmph.uniba.sk, hana.mizerova@gmail.com
Webpage: <http://hore.dnom.fmph.uniba.sk/~mizerova/>

ACADEMIC AND RESEARCH DEGREES

- 2021 **Independent researcher (VKS IIa)**
Slovak Academy of Sciences
- 2015 **Doctor of natural sciences in Mathematics (Dr. rer. nat.)**
summa cum laude, Johannes Gutenberg University in Mainz
- 2012 **Master in Mathematics (Mgr.)**
with honours, Comenius University in Bratislava
- 2010 **Bachelor in Mathematics (Bc.)**
with honours, Comenius University in Bratislava

EDUCATION

- 12/2012 – 12/2015 **Johannes Gutenberg University in Mainz**
doctoral study in Numerical Mathematics
- 09/2007 - 06/2012 **Comenius University in Bratislava**
bachelor and master studies in Mathematics, major in Mathematical Analysis
- 09/1999 - 06/2007 **Grammar School of Ján Hollý in Trnava**

RESEARCH AND WORKING EXPERIENCE

- assistant professor**
since 02/2018 Department of Mathematical Analysis and Numerical Mathematics,
Faculty of Mathematics, Physics and Informatics,
Comenius University in Bratislava
[19.1.2020 - 31.8.2022 maternity leave]
- postdoctoral researcher**
since 03/2018 Institute of Mathematics, Czech Academy of Sciences
- 10/2017 - 01/2018 Institute of Mathematics, Czech Academy of Sciences
- 04/2017 – 09/2017 Institute of Mathematics, Johannes Gutenberg University in Mainz
- Junior Simons professor**
02/2017 - 03/2017 Banach center, Polish Academy of Sciences
- assistant lecturer & postdoctoral researcher**
12/2015 – 03/2017 Institute of Mathematics, Johannes Gutenberg University in Mainz
- doctoral student**
12/2012 – 12/2015 German Science Foundation (DFG) scholarship
Johannes Gutenberg University in Mainz; Technical University in Darmstadt;
Waseda University in Tokyo (6-months-long research stay 09/2013 - 03/2014)
- assistant lecturer**
09/2012 – 12/2012 Institute of Mathematics, Johannes Gutenberg University in Mainz

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 in Mainz
- 2012 **Award of the rector for excellent master thesis**
Comenius University in Bratislava

PARTICIPATION IN PROJECTS, RECEIVED FUNDING

- 01/2024 - 12/2026 **Czech Science Foundation grant** GAČR 24-11034S [PI: Eduard Feireisl]
“*Dissipative systems in fluid dynamics,*” postdoc
- 01/2023 - 12/2026 **VEGA grant** 1/0084/23 [PI: Michal Pospíšil]
“*Qualitative properties of nonlinear differential equations of both integer and non-integer orders,*” team member
- 01/2021 - 12/2023 **Czech Science Foundation grant** GAČR 21-02411S [PI: Eduard Feireisl]
“*Solving ill posed problems in the dynamics of compressible fluids,*” postdoc
- 03/2018 - 12/2020 **Czech Science Foundation grant** GAČR 18-05974S [PI: Eduard Feireisl]
“*Oscillations and concentrations versus stability in the equations of mathematical fluid dynamics,*” postdoc
- 10/2017 - 01/2018 **ERC Advanced Grant** 320078 [PI: Eduard Feireisl]
“*Mathematical Thermodynamics of Fluids,*” postdoc
- 04/2017 - 09/2017 **Johannes Gutenberg University (JGU) grant** [PI: Mária Lukáčová]
“*Uniformly stable numerical schemes for multiscale weakly compressible flows,*” postdoc
- 02/2017 - 03/2017 **Simons Foundation grant** 346300
within *Simons Semester “CrossFields PDEs,*” Junior Simons professor
- 02/2015 - 09/2017 **DFG Collaborative Research Center** TRR 146
“*Multiscale Simulation Methods for Soft Matter Systems,*” collaborator
- 07/2017, 01/2016 **travel grants by JGU**
- 07/2016 **DAAD travel grant**
- 12/2012 – 12/2015 **DFG IRTG** 1529 “*Mathematical Fluid Dynamics,*”
doctoral scholarship within Japanese-German international research training group

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

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

INVITATION TO INTERNATIONAL CONFERENCES AND WORKSHOPS

- 03/2024 *Algoritmy 2024, Podbanské, Slovakia*
- 12/2023 *Žijem vedu naživo, Bratislava, Slovakia*
- 06/2019 *Numerical methods for hyperbolic problems 2019, Málaga, Spain*
- 05/2018 *Workshop on Mathematical Fluid Dynamics, 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, Germany*
- 10/2016 *CoMFoS16: Mathematical Analysis of Continuum Mechanics and Industrial Applications II, Kyushu University, Fukuoka, Japan*
- 03/2016 *Algoritmy 2016, Podbanské, Slovakia*

INVITED SEMINAR TALKS

- 02/2021 *Seminar on numerical analysis and scientific computing, TU Darmstadt (Zoom)*
- 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*

SERVICE

Editorial board member in **Applications of Mathematics** (Springer)
Reviewer for Applied Mathematics and Computations; Differential Equations & Applications;
IMA Journal of Numerical Mathematics; Mathematical Methods in the Applied
Sciences; Proceedings of the London Mathematical Society

BOOK

2021 E. Feireisl, M. Lukáčová-Medvid'ová, **H. Mizerová**, B. She:
Numerical Analysis of Compressible Fluid Flows
Series: Modeling, Simulation, and Applications; Springer

ARTICLES IN SCIENTIFIC JOURNALS

- 2023 D. Basarić, M. Lukáčová-Medvid'ová, **H. Mizerová**, B. She, Y. Yuan:
Error estimates of a finite volume method for the compressible Navier-Stokes-Fourier
system, *Math. Comp.* 92, pp. 2543-2574, DOI: [10.1090/mcom/3852](https://doi.org/10.1090/mcom/3852)
- 2023 D. Basarić, E. Feireisl, **H. Mizerová**:
Conditional regularity for the Navier-Stokes-Fourier system with Dirichlet boundary
conditions, *J. Differ. Equations* 365, pp. 359-378, DOI: [10.1016/j.jde.2023.04.026](https://doi.org/10.1016/j.jde.2023.04.026)
- 2022 D. Basarić, E. Feireisl, M. Lukáčová-Medvid'ová, **H. Mizerová**, Y. Yuan:
Penalization method for the Navier-Stokes-Fourier system, *ESAIM: M2AN* 56 (6),
DOI: [10.1051/m2an/2022063](https://doi.org/10.1051/m2an/2022063)
- 2021 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.* 41(4), DOI: [10.1093/imanum/draa060](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/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](https://doi.org/10.1016/j.na.2015.03.001)

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

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

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

TEACHING EXPERIENCE

Comenius University in Bratislava

- Winter Integral transformations and special functions
Variational methods for differential equations
Finite element method (2)
Numerical mathematics (2)
Numerical methods (1)
Mathematical analysis (1)
Ordinary differential equations

Summer Finite element method (1)
Numerical mathematics (1)
Numerical methods (2)
Mathematical analysis (2)
Johannes Gutenberg University in Mainz
Winter 2016/17 Numerics of ordinary differential equations
Summer 2016 Basics of numerical mathematics
Summer 2014 Seminar on complex fluids
Winter 2012/13 ODEs and functions of complex variable

LANGUAGE SKILLS

Slovak - mother tongue

English - advanced

German - good working knowledge

Spanish - basics

Japanese - basics (Hiragana a Katakana)