
RNDR. Michal Bathory, Ph.D.

PERSONAL DATA	Date and place of birth:	March 29, 1992, Plzeň, Czech Republic
CONTACT INFORMATION	Slepá 22 25066 Zdiby	E-mail: bathorym0@gmail.com Web: karlin.mff.cuni.cz/~bathory/
POSITIONS	2025– JAKUB Group Programmer, relational database systems	
	2024–2025 Faculty of Mathematics and Physics, Charles University Researcher (funded by M. Bulíček’s EXPRO project: GAČR No. 20-11027X)	
	2022–2024 Faculty of Mathematics, University of Vienna Postdoc at the University of Vienna on my own project (ÖAW APART-MINT)	
	2020–2022 Faculty of Mathematics, University of Vienna Postdoc at the University of Vienna on Ulisse Stefanelli’s project (FWF)	
INTERESTS	Partial differential equations, variational methods, continuum mechanics, viscoelasticity Hardy-type inequalities, rearrangement invariant spaces	
EDUCATION	2016–2020 PhD: Mathematical and Computer Modelling Charles University , Faculty of Mathematics and Physics Thesis: <i>Analysis of unsteady flows of incompressible heat-conducting rate-type viscoelastic fluids with stress-diffusion</i> Supervisor: doc. RNDR. Miroslav Bulíček, Ph.D.	
	2014–2016 Master: Mathematical Modelling in Physics and Technology Charles University , Faculty of Mathematics and Physics Thesis: <i>Conjugate function</i> Supervisor: doc. RNDR. Bohumír Opic, DrSc.	
	2011–2014 Bachelor: Mathematics Charles University in Prague , Faculty of Mathematics and Physics Thesis: <i>Conjugate Fourier series</i> Supervisor: doc. RNDR. Bohumír Opic, DrSc.	
PUBLICATIONS	(9) M. Bathory: Commutator calculus and symbolic differentiation of matrix functions, 2025, to appear in <i>SIAM Journal on Matrix Analysis and Applications (SIMAX)</i> . (8) M. Bathory, M. Bulíček, J. Málek and V. Průša: A new representation formula for the logarithmic corotational derivative – a case study in application of commutator based functional calculus, 2025, submitted to <i>Journal of Elasticity</i> . (7) M. Bathory, M. Bulíček and J. Málek: Coupling the Navier-Stokes-Fourier equations with the Johnson-Segalman stress-diffusive viscoelastic model: Global-in-time and large-data analysis, <i>Math. Models Methods Appl. Sci.</i> , 34 (2024), no. 3, 417–476. doi:10.1142/S0218202524500064 (6) M. Bathory and U. Stefanelli: Variational resolution of outflow boundary conditions for incompressible Navier-Stokes, <i>Nonlinearity</i> , 35 (2022), 5553. doi:10.1088/1361-6544/ac8fd8	

- (5) M. Bathory: Sharp nonlinear estimates for multiplying derivatives of positive definite tensor fields, *Math. Inequal. Appl.* **25** (2022), no. 3, 751–769. doi:10.7153/mia-2022-25-48
- (4) M. Bathory, M. Bulíček and J. Málek: Large data existence theory for a three dimensional unsteady flow of rate-type viscoelastic fluids with stress diffusion, *Adv. Nonlinear Anal.*, **10**, 1 (2021), 501–521. doi:10.1515/anona-2020-0144
- (3) M. Bathory, M. Bulíček and O. Souček: Existence and qualitative theory for nonlinear elliptic systems with a nonlinear interface condition used in electrochemistry, *Z. Angew. Math. Phys.* **71**:74 (2020). doi:10.1007/s00033-020-01293-w
- (2) M. Bathory: Joint weak type interpolation on Lorentz-Karamata spaces, *Math. Inequal. Appl.*, **21**, 2 (2018), 385–419. doi:10.7153/mia-2018-21-28
- (1) M. Bathory: Outflow Boundary Condition Leading to Minimal Energy Dissipation for an Incompressible Flow, *WDS'17 Proceedings*, Prague, Matfyzpress, pp. 7–12, 2017. ISBN:978-80-7378-356-3

SCIENTIFIC EXPERIENCE

Research stays abroad

Faculty of Mathematics, University of Vienna, postdoc, supervised by U. Stefanelli, August 2020 – January 2024

HIM, Bonn, Germany, trimester *Evolution of interfaces*, January – April 2019

TU Wien, Vienna, Austria, visit of Ansgar Jüngel, a week stay in Nov. 2017, Nov. 2018 and Dec. 2019

Selected conferences & workshops

The 3rd Chinese-Czech Conference on Mathematical Fluid Mechanics, Xi'An, China, January 2025, talk: *A new perspective on the standard models of viscoelastic fluids*

Modelling, PDE analysis and computational mathematics in materials science, Prague, Czech Republic, September 2024, talk: *Relative energy inequality for viscoelastic fluids with applications to stability*

Multiscale Models for Complex Fluids: Modeling and Analysis (Online), Banff, Canada, November 2020 (talk)

Progress in Mathematical Fluid Dynamics, Cetraro, Italy, June 2019 (talk)

The 12th AIMS Conference on Dynamical Systems, Differential Equations and Applications, Taipei, Taiwan, July 2018 (talk, poster)

Invited lecture *Existence of a solution to highly non-linear elliptic PDE with the interface condition* at Instytut Matematyczny, Uniwersytet Wrocławski in May 2018.

A Sussex School and Workshop on the Navier-Stokes and Euler Equations, Brighton, UK, September 2017 (poster)

Awards

2016: 1st place in the competition for university students in mathematical research (*SVOČ*) in mathematical analysis

2018: Among the 10 finalists in the student paper competition during the *AIMS 2018* conference in Taipei

2022: *ÖAW APART-MINT* Award