

## ISIDORA RAPAJIĆ

Applied Mathematics Researcher

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Citizenship: Serbian | Date of Birth: 3 October 1997

[Google Scholar](#)

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### RESEARCH PROFILE

PhD candidate in applied mathematics specializing in capillary and microfluidic flows, with a focus on nonlinear dynamics. Author of publications in *Physica D* and *Mechanics Research Communications*, with international research experience at Clemson University (USA). Interested in extending capillary-driven flow models toward biologically relevant systems and complex geometries, bridging theory and microfluidic applications.

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### RESEARCH INTERESTS

- Capillary and microfluidic flows
  - Nonlinear differential equations and stability
  - Fluid transport in biological and porous media
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### PUBLICATIONS

- Rapajić, I., Simić, S., Süli, E. (2025)

*Modelling Capillary Rise with a Slip Boundary Condition: Well-posedness and Long-time Dynamics of Solutions to Washburn's Equation*

Physica D: Nonlinear Phenomena

DOI: <https://doi.org/10.1016/j.physd.2025.134842>

→ Rigorous analysis of Washburn-type capillary models with a slip boundary condition; establishes well-posedness and long-time dynamics of solutions

- Rapajić, I., Simić, S. (2026)

*Capillary rise in pipes with variable cross section*

Mechanics Research Communications

DOI: <https://doi.org/10.1016/j.mechrescom.2026.104634>

→ Extension of classical capillary rise models to geometrically non-uniform domains

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### EDUCATION

#### University of Novi Sad, Serbia

PhD in Mathematics (2021–present)

- Research topic: Modelling and analysis of capillary flow of fluids
- Advisor: Prof. Srboľjub Simić

MSc in Applied Mathematics (2019–2021)

- Programme certified by European Consortium for Mathematics in Industry (ECMI)
- Thesis: *Modelling Capillary Rise in the Vascular Tissue of Plants*

#### University of Primorska, Slovenia

BSc in General Mathematics (2016–2019)

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## RESEARCH EXPERIENCE

### Mathematical Institute of the Serbian Academy of Sciences and Arts (SANU), Belgrade

Research Assistant (2026–present)

Research Assistant Trainee (2024–2026)

- Developed mathematical models for capillary flow in non-uniform geometries
- Analyzed nonlinear differential equations governing fluid transport
- Contributed to peer-reviewed publications in applied mathematics and mechanics

### Clemson University, South Carolina, USA

Visiting Researcher (Feb–Apr 2025)

Host: Prof. Konstantin G. Kornev

- Investigated capillary-driven fluid transport in biologically inspired systems, resulting in a poster presentation at Clemson University
- Strengthened international research collaboration

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## SELECTED PRESENTATIONS

- Short talk — International Congress of the Serbian Society of Mechanics, Niš, Serbia (2025)
- Short talk — International Conference on Mathematical Modelling in Mechanics and Engineering, Belgrade, Serbia (2024)
- Short talk — Serbian Mathematical Congress, Belgrade, Serbia (2024)
- Poster — Microfluidic Horizons, Padua, Italy (2026)
- Poster — Student Conference, Clemson, USA (2025)
- Poster — IUTAM Symposium on Capillarity and Elastocapillarity in Biology, Seoul, South Korea (2024)

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## AWARDS & FUNDING

- European Women in Mathematics (EWM) Travel Grant — Microfluidic Horizons (2026)
- Visiting Scholar Funding — Clemson University (2025)
- IUTAM Travel Grant — Capillarity Symposium, Seoul (2024)
- MI SANU Annual Award for MSc thesis (2022)
- Ministry of Science Scholarship, Serbia (2023)

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## PROFESSIONAL ACTIVITIES

- Organizing Committee — GDIS Conference, Zlatibor, Serbia (2024)
- Member: SIAM, EWM, Serbian Society of Mechanics

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## ACADEMIC OUTREACH & COMMUNITY ENGAGEMENT

- Guide at international STEM Olympiads supporting high-school students in mathematics and informatics: European Girls' Mathematical Olympiad (EGMO, 2023) and European Junior Informatics Olympiad (EJOI, 2019).

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## LANGUAGES

Serbian (native), English (C1/C2, CAE Grade A), Slovenian (B1), Italian (B1), Russian (B1)

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## ADDITIONAL EXPERIENCE

Student Research & Industry Experience: University of Ljubljana (2019), Nielsen Lab Koper (2018)