# Rishabh P. Sharma

## Curriculum Vitae

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## Education and Qualifications

2020 – Ph.D. in Physics, Faculty of Physics, Uni. of Warsaw, Poland
2015 – 2017 ME in Thermal Engineering, Thapar Uni., India
2010 – 2014 B.Tech. in Mechanical Engineering, Uttar Pradesh Tech. Uni., India

## Research Experiences

2021 – 2024 Research team member in a project, *Solution pipes as a novel paleoclimate proxy*, funded by National Science Center (NCN), Poland and Slovenian Academy of Sciences and Arts.
2018 – 2021 Research team member in a project, *The influence of pore geometry on the dynamics of porous media*, funded by National Science Center (NCN), Poland
2018 Project Tech. Asst., Dept. of Energy Sciences. IIT Bombay in a project studying the propagation of non-linear ultrasonic waves in a medium using Westervelt equation
2017 – 2018 Project Res. Assc., Dept. of Aerospace Engg., IIT Bombay in a project investigating particulate flows using CFD-DEM approach using coupled OpenFoam and LIGGGHTS

## Funding and Awards

2024 IDUB University Research microgrant
2024 IDUB University scholarship for completion of doctoral dissertation
2023 IDUB University Research microgrant
2022 Uni. Integrated Development Programme (ZIP) travel support for a research visit
2021– Scientific scholarship in a project funded by National Science Centre
2020– Interdisciplinary doctoral school scholarship
2020 SEG Student Chapter, Field Camp-2020, IGF-PAN
2018 Scientific scholarship in a project funded by National Science Centre
2015 Graduate Scholarship, Ministry of Education, Government of India
2010 University Scholarship for Merit-Incentive Students
2010 Bronze Medal in Programming Diploma by NCVT, Government of India
2006 $11^{th}$ position in Pioneer $7^{th}$ science competition

## Journal Articles

1. **Sharma, R. P.** and N. Kumar (2018b). Nodal integral method for convection-diffusion transport using linear and higher order quadrilateral elements. *Numerical Heat Transfer, Part B: Fundamentals* **74**(3), 623–645.
2. Cooper, M. P., **Sharma, R. P.**, S. Magni, T. P. Blach, A. P. Radlinski, K. Drabik, A. Tengattini, and P. Szymczak (May 2023). 4D tomography reveals a complex relationship between wormhole advancement and permeability variation in dissolving rocks. *Advances in Water Resources* **175**, 104407.
3. **Sharma, R. P.**, M. Białecki, M. P. Cooper, A. P. Radliński, and P. Szymczak (June 2023). Pore merging and flow focusing: Comparative study of undissolved and karstified limestone based on microtomography. *Chemical Geology* **627**, 121397.
4. **Sharma, R. P.**, J. Deng, P. K. Kang, and P. Szymczak (Oct. 2023). Effects of Mixing at Pore Intersections on Large-Scale Dissolution Patterns and Solute Transport. *Geophysical Research Letters* **50**(21).

## Conference Articles

1. **Sharma, R. P.** and N. Kumar (2018a). Nodal integral method for complex geometries using higher order elements. In: *Proceedings of the 24th National and 2nd International ISHMT-ASTFE Heat and Mass Transfer Conference (IHMTC-2017)*. Begellhouse.

## Conferences

1. Cooper, M. P., S. Magni, **Sharma, R. P.**, P. N. Vu, T. P. Blach, A. P. Radlinski, M. Dohnalik, A. Tengattini, A. Ladd, and P. Szymczak (2019). Determining the influence of pore-scale geometry on wormhole formation. In: *AGU Fall Meeting Abstracts*. Vol. 2019, pp.H21M–1931.
2. **Sharma, R. P.**, M. P. Cooper, A. J. C. Ladd, and P. Szymczak (May 2020). Modeling wormhole formation in digital rock samples: the role of segmentation and permeability-porosity relationships. In: *EGU General Assembly 2020, Vienna, Austria*. EGU General Assembly Conference Abstracts, 996, pp.996.
3. Szymczak, P., M. P. Cooper, S. Magni, **Sharma, R. P.**, T. P. Blach, A. P. Radlinski, M. Dohnalik, and A. Tengattini (Dec. 2020). Combined Neutron and X-ray Time-Resolved Tomography of Wormhole Growth in Dissolving Limestones. In: *AGU Fall Meeting Abstracts*. Vol. 2020, H081-01, pp.H081–01.
4. **Sharma, R. P.**, M. P. Cooper, A. J. C. Ladd, and P. Szymczak (Apr. 2021). Subpixel determination of wormhole tip position in 4D tomography of dissolving limestone cores. In: *EGU General Assembly 2021, Vienna, Austria*, EGU21-14962, pp.EGU21–14962.
5. Szymczak, P., M. P. Cooper, S. Magni, **Sharma, R. P.**, T. P. Blach, A. P. Radlinski, M. Dohnalik, and A. Tengattini (Apr. 2021). Wormhole Growth in Dissolving Limestones: Insights from 4D Tomography. In: *EGU General Assembly 2021, Vienna, Austria*, EGU21-13883, pp.EGU21–13883.
6. Białecki, M., **Sharma, R. P.**, M. P. Cooper, and P. Szymczak (May 2022). Comparative study of undissolved and karstified limestone based on microtomography. In: *EGU General Assembly 2022, Vienna, Austria*, EGU22-5229, pp.EGU22–5229.
7. Cooper, M. P., **Sharma, R. P.**, S. Magni, P. N. H. Vu, T. Ladd, A. P. Radlinski, T. P. Blach, K. Drabik, A. Tengattini, and P. Szymczak (Dec. 2022). Competition Between Wormholes in Dissolving Rocks Captured with 4D Tomography and Numerical models. In: *AGU Fall Meeting Abstracts*. Vol. 2022, H52N-0635, pp.H52N–0635.
8. Dzikowski, M., P. Szymczak, and **Sharma, R. P.** (Dec. 2022). Large Scale Simulations of Wormhole Growth in Dissolving Porous Media using Lattice Boltzmann Method. In: *AGU Fall Meeting Abstracts*. Vol. 2022, H52N-0644, pp.H52N–0644.
9. Lipar, M., P. Szymczak, R. Ciglič, **Sharma, R. P.**, M. Zorn, U. Stepišnik, and M. Ferk (May 2022). Challenges in characterisation and mapping of solution pipes. In: *EGU General Assembly 2022, Vienna, Austria*, EGU22-1619, pp.EGU22–1619.
10. Deng, J., **Sharma, R. P.**, P. Szymczak, and P. K. Kang (Dec. 2023). Anomalous Transport through Dissolving Fracture Networks. In: *AGU Fall Meeting 2023, San Francisco, CA*. Vol. 2023, H12D-04, pp.H12D–04.
11. Dzikowski, M., P. Szymczak, and **Sharma, R. P.** (2023). Empowering pre-exascale computers for Darcy-Brinkman simulation of wormhole growth based on X-CT data-can we recover experiments? In: EGU23-739.
12. **Sharma, R. P.**, P. K. Kang, and P. Szymczak (May 2023). Effects of mixing at pore intersections on large-scale dissolution patterns. In: *EGU General Assembly 2023, Vienna, Austria*, EGU-275, pp.EGU–275.

## Presentation/Talks

1. "Flowfield study in dissolved porous media" (2020). University of Wroclaw, Institute of Theoretical Physics CFD Wroclaw-7 workshop , June-2020. `http://www.ift.uni.wroc.pl/~maq/cfdwroclaw/cfd7.html`.
2. "Fractal shapes in dissolving rocks" (2021). Symposium of young scientist (SMN2021), Warsaw, Aug-2021. `http://smn.fuw.edu.pl/`.
3. "Network modelling of wormholing process in rocks" (2021). DREAMS21 Workshop, University of Paris Diderot, Laboratoire Mati'ere et Syst'emes Complexe, Dec-2021. `http://dreams21.sciencesconf.org/`.
4. "Study of dissolution channels and their geometrical properties using XCMT images" (2021). Looping Network Meeting, University of Paris Diderot (Invited Seminar), Aug-2021.
5. "Study of geometrical measures of wormholes using 4D-tomography" (2021a). University of Warsaw, Department of Complex Modelling Complex system seminar, Nov-2021.
6. "Study of geometrical measures of wormholes using 4D-tomography" (2021b). University of Warsaw, Faculty of Physics Soft matter and statistical Physics seminar, Nov-2021.
7. "Effects of mixing at pore intersections on large-scale dissolution patterns" (2023). EGU General Assembly 2023, Vienna, Austria. `https://doi.org/10.5194/egusphere-egu23-275`.