

Ulf Rørbæk Pedersen, Ph.D.

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Positions

- 2018 – ■ **Associate Professor of Physics**, Department of Science and Environment, Roskilde University, Denmark.
- 2014 – 2017 ■ Senior postdoc, Department of Science and Environment, Roskilde University, Denmark.
- 2011 – 2013 ■ Postdoc, Institute of Theoretical Physics, Vienna University of Technology, Austria. Supervisors: Gerhard Karl and Christoph Dellago.
- 2009 – 2011 ■ Postdoc, Department of Chemistry, University of California Berkeley, USA. Supervisor: David Chandler.

Education

- 2006 – 2009 ■ **Ph.D. in Physics**, Roskilde University, Denmark
Thesis title: *Long-time simulations of viscous liquids - from strong correlations to crystallization*
- 2003 – 2006 ■ Master in Physics & Chemistry, Roskilde University, Denmark
Thesis title: *Molecular packing in phospholipid bilayers studied by molecular dynamics simulation and small angle X-ray scattering.*

Scientific profile

I specialize in theory and **molecular dynamics simulations** with a focus on small **molecules** and **atomic liquids** dynamics, structure, and stability towards crystallization. I co-developed the successful **isomorph theory**, which enhances predictions of material behavior under elevated pressures. I have developed **numerical methods** such as the interface-pinning method for in-silico studies of **crystallization**. I am experienced in theoretical calculation with **quantum mechanical** accuracy of metallic and noble elements. I am currently engaging in developing **analytical theories** for nearly hard-sphere systems, including the Weeks-Chandler-Anderson model, harmonic-repulsive particles, and Hertzian spheres.

Teaching

- 2020 – ■ Course Coordinator: Basic Course in **Empirical Data**, Roskilde University. Major re-design of the course to introduce Python as the general language for all science bachelor's students at Roskilde University (first semester).
- 2024 ■ Instructor: **Supplementary Physics**, Roskilde University.
- 2016 – ■ Teaching Associate: **Quantum Mechanics**, Roskilde University.
- 2017 – ■ Teaching Associate: **Scientific Computing**, Roskilde University.
- 2025 ■ Teaching Associate: Basic Course in **Experimental Methods**, Roskilde University.
- 2019 – 2021 ■ Instructor: **Thermodynamics and Statistical Mechanics**, Roskilde University.

Teaching (continued)

- 2017 – 2019 ■ Teaching Associate: Basic Course in Empirical Data, Roskilde University.
- 2014 – 2018 ■ Teaching Associate: Basic Course in Experimental Methods, Roskilde University.
- 2016 – ■ **Supervision** of 13 student projects at bachelor and master levels.

Grants

- 2014 ■ The Villum Foundation's Young Investigator Program, 4 years, €540.000.
- 2009 ■ Individual postdoc grant from The Danish Council for Independent Research, 2 years, €130.000.

Supervision

- 2024 – 2027 ■ Poul Thrane, Ph.D. student
- 2019 – 2022 ■ Eman Attia, Ph.D. student
- 2015 – 2018 ■ Alejandro Sanz, postdoc
Associate Professor, National University of Distance Education (UNED), Madrid, Spain.
- 2014 – 2016 ■ Lorenzo Costigliola, postdoc
Assistant Professor, Roskilde University, Denmark.

Contributions to the scientific community

- **Reviewer** for *Nature Materials*, *Nature Communications*, *J. Chem. Phys.*, *Phys. Rev. E.* and others.
- **Organizer** of the international conference *Multiplicity of Time Scales in Complex Systems: Challenges for Sciences and Dissemination* (Royal Danish Academy of Sciences and Letters, Denmark, 23.-24. August 2021).
- Contributed to the **open-source software** packages LAMMPS, RUMD, dompap, gamdpy and other code (see <https://github.com/urpedersen> and <https://gitlab.com/urpedersen>).
- Member of the **national examiner corps** in Physics.
- Organize weekly IMFUFA seminars (Roskilde University, Denmark, 2016-2018).

Bibliographical summary

- 41 peer-reviewed publications
- 3 single author
- 16 corresponding author
- 21 first author
- in high-impact journals such as *Nature Physics* (IF: 19.7), *Nature Communication* (IF: 16.6), *Physical Review Letters* (IF: 9.2), . . .
- 3269 citations*
- h-index* of 26
- i10-indeks* of 36
- Complete list of publications: https://urp.dk/publication_list.htm.

* Google Scholar