

## Ph.D. scholarships in the structure and dynamics of *Matter*

A number of Ph.D. scholarships are available associated with the Matter project beginning July 2017. Funded by the VILLUM Foundation and directed by Prof. Jeppe C. Dyre, Matter is an integrated part of the *Glass and Time* center (<http://glass.ruc.dk>) at Roskilde University's Department of Science and Environment. Over the coming years the project will employ seven Ph.D. students, six two-year postdocs, and three research professors.

The overall purpose of Matter is to determine the range of validity of the isomorph theory for the structure and dynamics of liquids and solids with hidden scale invariance, see, e.g., J. Phys. Chem. B **118**, 10007 (2014) or J. Phys.: Cond. Mat. **28**, 323001 (2016).

One Ph.D. scholarship begins October 1, 2017, or soon thereafter, the next two begin January 1, 2018, or soon thereafter. We invite applications relating to one of the following six research topics (for more details, please refer to [http://glass.ruc.dk/Matter\\_scholarships\\_2017.pdf](http://glass.ruc.dk/Matter_scholarships_2017.pdf) )

- *Physical aging* [Experiments, possibly also simulations] – Studying changes in material properties due to molecular rearrangements and comparing to isomorph-theory predictions.
- *Isomorph jumps* [Experiments, possibly also simulations] – Studying the predicted instantaneous equilibration upon jumps in the phase diagram along isochrones.
- *Coarse-graining* [Simulations and theory] – Extending isomorph theory to molecules with internal motion and other systems without strong virial potential-energy correlations.
- *Equations of state and quasiuniversality* [Simulations and theory] – Establishing  $pVT$  relations going into the gas phase.
- *1/d expansion* [Theory, possibly also simulations] – Developing a systematic expansion moving from high dimensions to three.
- *Quantum systems* [Theory, possibly also simulations] – Investigating the consequences of hidden scale invariance for quantum phenomena in matter.

We are looking for ambitious and open-minded persons with a master's degree in physics or a related field. The successful applicant has also strong mathematics skills and enjoys the close interaction between theory, simulation, and experiment that is emphasized in the *Glass and Time* center.

For further information you are welcome to contact Prof. Dyre at [dyre@ruc.dk](mailto:dyre@ruc.dk) .

Employment is regulated by an agreement between the Ministry of Finance and the Central Organization of the Academics; thus Ph.D. students have the same rights, formal working hours, vacation, etc., as others in the workforce. After taxes the monthly salary is approximately 16000 DKK (2100 Euro).

Roskilde University welcomes applications from candidates of any social and ethnic backgrounds irrespective of gender, age, religion or any other irrelevant criteria.

Application is submitted via Roskilde University's website <https://ruc.dk/en/phd-scholarships-roskilde-university> . Deadline: September 1, 2017.