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CURRICULUM VITAE
Ulf Rørbæk Pedersen



Name: Ulf Rørbæk Pedersen, Ph.D.

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VITEA

2009-2011 Currently a post.doc. at “University of California, Berkeley” under the supervision of Prof. David Chandler, exploiting a grant from “The Danish Council for Independent Research — Natural Sciences” (FNU)“.

2009 Scientific Assistant at the “Danish National Research Foundation Center for Viscous Liquids Dynamics (Glass and time)”, Feb.-Apr. 2009.

2006-2009 Ph.D. in physics from Roskilde University, Denmark (defended April 3rd 2009). Title of thesis: “Long-time simulations of viscous liquids - from strong correlations to crystallization”. Supervisor: Thomas B. Schrøder. The thesis is available at www.urp.dk.

2003-2006 Master degree in physics and chemistry from Roskilde University

(Denmark). Title of thesis: "Structural changes of a phospholipidmembran perturbed with n-alcohol investigated by MD-simulations and SAXS". Supervisors: Peter Westh (chemistry), Dorte Posselt (physics) and Günther H. Peters (external).

1999-2003 Bachelor degree in physics and chemistry from Roskilde University (Denmark).

1996-1999 Himmelev Gymnasium (Denmark).

SKILLS

Programming Matlab/Octave, Java, Fortran and bash-shell scripting.

Simulations LAMMPS,GROMACS, NAMD, VMD and home-made codes.

Platforms Windows, Linux and using a Unix Cluster

Language Danish (native) and English (fluently)

RESEARCH INTERESTS

My main interest have been the use of molecular computer simulations to investigate viscous liquids dynamics and phospholipid membranes.

Viscous liquids Currently I am studying viscous water. The major part of my Ph.D. research is focused around "strongly correlating liquids" with a special focus on viscous liquids. Also, I have been investigating a generic lattice model of viscous liquids.

Crystallization In collaboration with Prof. Peter Harrowell I am investigating metastability and crystallization of a binary Lennard-Jones mixture.

Biophysics I have worked on the understanding of structure and packing of phospholipid membranes perturbed. I have also investigated strong energy and volume correlations in the thermal fluctuations of membranes.

PUBLICATIONS

2009 Thomas B. Schrøder, Ulf R. Pedersen, Nicholas P. Bailey, Søren Toxvaerd, Jeppe C. Dyre. *Hidden scale invariance in molecular van der Waals liquids: A simulation study* Phys. Rev. E 80, 041502 (2009).

2009 Søren Toxvaerd, Ulf R. Pedersen, Thomas B. Schrøder, Jeppe C. Dyre (2009) *Stability of supercooled binary liquid mixtures*. J. Chem. Phys.

130, 224501 (2009)

- 2008** Ulf R. Pedersen, Thomas B. Schröder, Jeppe C. Dyre (2008) *Termiske fluktuationer - er der noget nyt under Solen?* (in danish) *Kvant: Tidskrift for fysik og astronomi* 19(4):26-29
- 2008** Nicholas P. Bailey, Ulf R. Pedersen, Nicoletta Gnan, Thomas B. Schröder, Jeppe C. Dyre (2008) *Pressure-energy correlations in liquids. II. Analysis and consequences.* *J. Chem. Phys.*, 129, 184508 (2008).
- 2008** Nicholas P. Bailey, Ulf R. Pedersen, Nicoletta Gnan, Thomas B. Schröder, Jeppe C. Dyre (2008) *Pressure-energy correlations in liquids. I. Results from computer simulations.* *J. Chem. Phys.*, 129, 184507 (2008)
- 2008** Nicholas P. Bailey, Tage Christensen, Bo Jakobsen, Kristine Niss, Niels Boye Olsen, Ulf R. Pedersen, Thomas B. Schröder, Jeppe C. Dyre (2008) *Glass-forming liquids: one or more 'order' parameters?* *Journal of physics-condensed matter* 20, 244113
- 2008** Ulf R. Pedersen, Günther H. Peters, Thomas B. Schröder, Jeppe C. Dyre (2008) *Volume-energy correlations in the slow degrees of freedom of computer-simulated phospholipid membranes.* *AIP Conf. Proc.* 982, 407-409
- 2008** Ulf R. Pedersen, Tage Christensen, Thomas B. Schröder, Jeppe C. Dyre (2008) *Feasibility of a single-parameter description of equilibrium viscous liquid dynamics.* *Phys. Rev. E* 77, 011201
- 2008** Ulf R. Pedersen, Nicholas P. Bailey, Thomas B. Schröder, Jeppe C. Dyre (2008) *Strong pressure-energy correlations in van der Waals liquids.* *Phys. Rev. Lett.* 100, 015701
- 2007** Ulf R. Pedersen, Günther H. Peters, Peter Westh (2007) *Molecular packing in 1-hexanol-DMPC bilayers studied by molecular dynamics simulation.* *Biophysical Chemistry* 125, 104-111
- 2007** Niels L. Ellegaard, Tage Christensen, Peder Voetmann Christiansen, Niels Boye Olsen, Ulf R. Pedersen, Thomas B. Schröder, Jeppe C. Dyre (2007) *Single-order-parameter description of glass-forming liquids: A one-frequency test.* *J. Chem. Phys* 126, 074502
- 2006** Ulf R. Pedersen, Chad Leidy, Peter Westh and Günther H. Peters (2006) *The effect of calcium on the properties of charged phospholipid bilayers.* *Biochimica et Biophysica Acta (BBA) - Biomembranes* 1758, 573-582
- 2006** Ulf R. Pedersen, Tina Hecksher, Jeppe C. Dyre and Thomas B. Schröder (2006) *An energy landscape model for glass-forming liquids in three dimensions.* *Journal of non-crystalline solids* 352, 5210-5215

ORAL- AND POSTER PRESENTATIONS

- Holderness 2009** *Structural Fluctuations in a Supercooled Binary Lennard-Jones Mixture: Crystal Nucleation or Glassy Relaxation*. Poster presented at The Physics and Chemistry of Liquids (Gordon Conference) [Holderness School, New Hampshir, August 2-7, 2009].
- Lyngby 2009** *Long-lived structural fluctuations and crystallization of a binary Lennard-Jones mixture*. Poster presented at the Danish Physical Society Nordic Meeting [Technical University of Denmark, June 16-18, 2009].
- Sydney 2009** *Fluctuations in Liquids: Scaling Laws, Glassy Relaxation and Crystallization* Seminar given at the School of Chemistry [University of Sydney (Australia), June 10, 2009].
- Søminestationen 2009** *Experimental prediction for strongly correlating liquids: A new look at the Prigogine-Defay ratio*. Oral presentation at Viscous Liquids and the Glass Transition (VII). [Søminestationen, Holbæk (Denmark), Friday April 24 to Sunday April 26, 2009]
- Roskilde 2009** *Stability of Super-cooled Liquids*. Oral presentation given at the series of IMFUFA seminars [Roskilde University (Denmark), April 25 2009].
- Kyoto 2008** *Density scaling as a property of strongly correlating viscous liquids and Long-lived structural fluctuations and crystallization of a binary mixture*. Two posters presented at Unifying Concepts in Glass Physics IV (UCGP2008) [Kyoto, Japan, November 25-28 2008].
- Copenhagen 2008** *Long-lived structural fluctuations and crystallization of a binary Lennard-Jones mixture*. Oral presentation at the international workshop Fragility of Viscous Liquids: Cause(s) and Consequences [Carlsberg Academy, Copenhagen, Denmark, October 8-10, 2008].
- Sitges 2008** *Equilibrium fluctuations of volume and energy of simulated phospholipid membranes*. Poster presented at the XXI Sitges Conference on Statistical mechanics: Statistical Mechanics of Molecular Biophysics [Sitges, Barcelona, Spain, June 2-6, 2008].
- Nyborg Strand 2008** *Volume-energy correlations in the slow degrees of freedom of phospholipid membranes*. Oral presentation at the Danish Physical Society Annual Meeting [Nyborg Strand Hotel, Denmark, June 17-18, 2008].
- Andalo 2008** *Long-lived structural fluctuations and crystallization of a binary Lennard-Jones mixture*. Poster presented at XI International Workshop on Complex Systems [Andalo, Italy, March 17-20, 2008].
- Sendai 2007** *Volume-energy correlations in the slow degrees of freedom of phospholipid membranes*. Poster presented at the 5th International Workshop on Complex Systems [Sendai International Center, Sendai, Japan, September 25-28, 2007].
- Holderness 2007** *Strong pressure-energy correlations in model liquids*. Poster presented at The Physics and Chemistry of Liquids (Gordon Conference)

[Holderness School, New Hampshire, July 29 - August 3, 2007].

Søminestationen 2007 *Crystallization of the Wahnström binary Lennard-Jones liquid*. Oral presentation at Viscous Liquids and the Glass Transition VI [Søminestationen, Holbæk, Denmark, June 29 - July 1, 2007].

Pisa 2006 *The dynamical Prigogine-Defay ratio: Is the glass transition controlled by one or more order-parameters?* IV Workshop on Non Equilibrium Phenomena in Supercooled Fluids, Glasses and Amorphous Materials [Pisa, Italy, September 17-22, 2006].

Søminestationen 2006 *A "tumbling" model of toluene*. Oral presentation at Viscous Liquids and the Glass Transition V [Søminestationen, Holbæk, Denmark, May 26-28, 2006].

Nyborg Strand 2006 *Molecular Dynamic Simulations of Viscous Toluene*. Poster presented at the Danish Physical Society Annual Meeting [Nyborg Strand Hotel, Denmark, June 1-2, 2006].

Lille 2005 *An energy-landscape model for viscous liquids in three dimensions*. Poster presented at International discussion meeting on relaxation in complex systems V [Lille, France, July 7-13, 2005].

Søminestationen 2005 *A simple energy landscape lattice model*. Oral presentation given with Tina Hecksher at "Viscous Liquids and the Glass Transition IV" [Søminestationen, Holbæk, Denmark, June 3-5, 2005].

TEACHING

2006-2008 Supervising student projects at Roskilde University (Denmark).

REFERENCES

Professor Jeppe C. Dyre (Roskilde Uni.; dyre@ruc.dk)

Professor Peter Westh (Roskilde Uni.; pwesth@ruc.dk)

Associate Professor Thomas B. Schrøder (Roskilde Uni.; tbs@ruc.dk)

Professor Peter Harrowell (Sydney Uni.; p.harrowell@chem.usyd.edu.au)

Associate Professor Günther H. Peters (Technical Uni. of Denmark; ghp@kemi.dtu.dk)

Professor Søren Toxværd (Roskilde Uni.; st@ruc.dk)