Charlotte Petersen

Institute for Theoretical Physics
University of Innsbruck
Technikerstraße 21A
A-6020 Innsbruck
charlotte.petersen@uibk.ac.at

Education

2012 - 2016 Australian National University
Conferred December 2016
Doctor of Philosophy in Theoretical Chemistry
Title: An Investigation Into the Significance of Dissipation in Statistical Mechanics.
Supervisors: Prof. Denis Evans and Dr. Stephen Williams

2008 – 2011 Australian National University
Bachelor of Philosophy (Science)
First class honours in chemistry, awarded the university medal.
Honours thesis title: Computational Demonstration of the Fluctuation Theorem with a Parallel RC Circuit.

2010 University of California, Berkeley
One semester overseas exchange.

2006 – 2007 Narrabundah College
University Admissions Index (UAI) of 99.95, Dux of school

Employment

March 2019 – Present.
University of Innsbruck, Institute for Theoretical Physics, Austria
Lise Meitner Fellow in the Bio and Nano Physics group of Thomas Franosch

September 2017 – February 2019.
University of Innsbruck, Institute for Theoretical Physics, Austria
Postdoctoral researcher in the Bio and Nano Physics group.
Supervisor: Prof. Dr. Thomas Franosch

December 2016 – July 2017.
Aalto University, Department of Applied Physics, Finland
Postdoctoral researcher in the Complex Systems and Materials group.
Supervisors: Prof. Mikko Alava and Prof. Stefano Zapperi

August 2015 – December 2016.
Aalto University, Department of Applied Physics, Finland
Research stay
Supervisors: Prof. Mikko Alava and Prof. Stefano Zapperi

Funding, Scholarships, Prizes, and Awards

2019: Austrian Science Fund (FWF) Lise Meitner Programme
Project title: Characterization of liquids with modulated density profiles. Co-applicant: Prof. Dr. Thomas Franosch
2018: AIP 2018 ANN Education travel grant
2017: Aalto School of Science Education Network in Condensed Matter and Materials Physics Travel Support
2014: Australian Nanotechnology Network Student/Early Career Researcher Travel Bursary
2012: Australian Postgraduate Award (APA
2012: Alan Sargeson Merit Scholarship in Chemical Science
2012: RSC Supplementary Scholarship
2011: University Medal
2010: Endeavour University Mobility in Asia and Pacific Grant
2008: ANU National Undergraduate Scholarship
2008: Australian National University Dux Award
2008: Lord Florey Student Prize

Publications

C. F. Petersen, L. S. Schrack, T. Franosch (2019) Static properties of quasi-confined hard-sphere fluids, *Journal of Statistical Mechanics: Theory and Experiment*, accepted for publication

C. F. Petersen, T. Franosch (2019) Anomalous transport in the soft-sphere Lorentz model, *Soft Matter*, 15, 3906

A. Farhan, M. Saccone, **C. F. Petersen**, S. Dhuey, R. V. Chopdekar, Y.-L. Huang, N. Kent, Z. Chen, M. J. Alava, T. Lippert, A. Scholl, S. van Dijken (2019) Emergent magnetic monopole dynamics in macroscopically degenerate
artificial spin ice, *Science Advances,* 5, eaav6380

M. Hanifour, **C. F. Petersen**, M. J. Alava, S. Zapperi (2018) Mechanics of disordered auxetic metamaterials, *The European Physical Journal B*, 91, 271

C. F. Petersen, A. Farhan, S. Dhuey, Z. Chen, J. M. Alava, A. Scholl, S. van Dijken (2018), Tuning magnetic ordering in a dipolar square-kite tessellation, *Applied Physics Letters*, 112, 092403

A. Farhan, **C. F. Petersen**, S. Dhuey, L. Anghinolfi, Q. H. Qin, M. Saccone, S. Velten, C. Wuth, S. Gliga, P. Mellado, M. Alava, A. Scholl, S. van Dijken (2017) Nanoscale Control of Competing Interactions and Geometrical Frustration in a Dipolar Trident Lattice. *Nature Communications*, 8, 995

A. Farhan, A. Scholl, **C. F. Petersen**, L. Anghinolfi, C. Wuth, S. Dhuey, R. V. Chopdekar, P. Mellado, M. J. Alava, S. van Dijken (2016) Thermodynamics of emergent magnetic charge screening in artificial spin ice. *Nature Communications*, 7, 12635.

C. F. Petersen, D. J. Evans, S. R. Williams (2016) Dissipation in monotonic and non-monotonic relaxation to equilibrium. *The Journal of Chemical Physics*, 144, 074107.

C. F. Petersen, D. J. Evans, S. R. Williams (2016) Mechanism for asymmetric bias in demonstrations of the NPI and fluctuation theorem. *Molecular Simulation*, 42, 531-541.

C. F. Petersen, E. Krausz, D. J. Evans, S. R. Williams (2014) Theoretical Analysis of the Fluctuation Theorem Applied to Electric Circuits. *Communications in Theoretical Physics*, 62, 476-484

C. F. Petersen, D. J. Evans, S. R. Williams (2013) The instantaneous fluctuation theorem. *The Journal of Chemical Physics*, 139, 184106.

M. Bulbrook, M. Chu, K. Deane, R. J. Doyle, J. Hinc, **C. F. Petersen**, G. Salem, N. Thorman, A. C. Willis (2010) Chiral Birch reduced tertiary phosphines: precursors to asymmetric 1,2-cyclohexenebis(tertiary phosphines). *Dalton Trans,* 39, 8878-8881.

Invited conference presentations

Loch Lomond Workshop on Artificial Spin Ice, Glasgow, 26-28 June 2017, title: Investigating artificial spin ice through lattice design.

Contributed conference presentations

DPG Spring Meeting of the Condensed Matter Section. Regensburg, 1 April – 5 April 2019, title: Anomalous transport in the soft Lorentz model of crowded media.

XV International Workshop on Complex Systems, Andalo, 17 -20 March 2019, title: Anomalous transport in soft percolating host structures.

23rd Australian Institute of Physics Congress, Perth, 9-13 December 2018, title: Soft interactions in the Lorentz model: anomalous transport in crowded media

Statistical Mechanics of Soft Matter, Auckland, 6-7 December 2018, title: Softening interactions in the Lorentz model of crowded media.

DPG Spring Meeting of the Condensed Matter Section. Berlin, 11 March - 16 March 2018, title: Nanoscale control of geometrical frustration in a dipolar trident lattice.

Multiscale Material Modeling, Dijon, 9-14 October 2016, title: Disordered Auxetic Materials.

Molecular Modeling 2014, Students and Early-Career Researches' Forum, Queensland, 30-31 July 2014, title: The Instantaneous Fluctuation Theorem in Transient and Steady State Systems.

Statistical Mechanics of Soft Matter, Melbourne, 21-22 November 2013, title: The Instantaneous Fluctuation Theorem

Poster presentations:
Beg Rohu Summer School 2019: Glasses, Jamming, and Slow Dynamics, Saint-Pierre-Quiberon, 23 June – 7 July 2019, title: Subdiffusion in porous media: soft percolating host structures.

International Soft Matter Conference, Edinburgh, 3-7 June 2019, title: Subdiffusion in soft crowded media.

Ian Snook Conference on Chemical Physics, Melbourne, 4-5 December 2014, title: The Instantaneous Fluctuation Theorem: Predicting the behavior of non-equilibrium systems.

Molecular Modeling 2014: *From Biomolecules to Materials*, Queensland, 31 July – 2 August 2014, title: The Instantaneous Fluctuation Theorem and its Integrated Form.

Student Supervision
Bachelor's thesis work:
2019: Leah Rank. Thesis title: Movement of emergent magnetic monopoles in lattices of nanomagnets

2018: Ben Silwa. Thesis title: Disorder in Models of Artificial Spin Ice.

Teaching
2017 – 2019 University of Innsbruck
2019: Designed and ran the practical molecular dynamics section of the Computational Physics course (masters level).

2017-2018: Taught selected tutorials and pro-seminars for the courses Classical Mechanics (second year undergraduate physics), Electrodynamics (third year undergraduate physics), and Continuum Mechanics - Classical Field Theory (masters level physics).

2011 - 2012 Australian National University, Lab Demonstrator
I was a laboratory demonstrator for the courses Chemistry 1, Chemical Structure and Reactivity 1 and Chemical Structure and Reactivity 2.

Outreach
June 2019: Organized physics activities for the public at the University of Innsbruck Festival of Science.
April 2019: Organized the Bio and Nano Physics station for the University of Innsbruck Public Open Day.