

SARAH A. M. LOOS

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Date of birth: January 19, 1991

Research interests: Nonequilibrium Statistical physics, Stochastic systems with memory, Active matter, Thermodynamics, Information theory, Time-delayed feedback, Non-Markovian Fokker-Planck equations

EDUCATION AND ACADEMIC CARRER

since WT 2015/2016 (winter term)	PhD student at Collaborative Research Center CRC 910 <i>Control of self-organizing nonlinear systems</i> , Supervisor: Sabine Klapp, TU Berlin
WT 12/13 – ST 15 (summer term 2015)	Master in Physics, TU Berlin, Final Grade 1.0* Master thesis: <i>Noise effects on chimera states in the Stuart-Landau model</i> , Supervisors: Eckehard Schöll, Anna Zakharova, Grade 1.0
WS 13/14	6-month research stay at Duke University, North Carolina, USA in the group of Joshua Socolar Numerical study of frustrated structures in anti-ferromagnetic Ising models on fcc lattices, in the context of limit-periodic structures („Socolar-Taylor tiles“)
WT 10/11 – ST 12	Bachelor in Physics, TU Berlin, Final Grade 1,1 Bachelor thesis: <i>Dynamics of colloidal particles in time-dependent periodic Ratchet Potentials</i> , (German title: <i>Dynamik von Kolloiden in zeitabhängigen periodischen Potentialen</i>), Supervisors: Sabine Klapp, Robert Gernert, Grade: 1.0
WT 10/11	Lectures in Philosophy <i>Probleme des induktiven Argumentierens und der Wahrscheinlichkeit</i> , Grade 1.0 Courses on <i>Einführung in die Philosophie</i> and <i>Logik I</i> , Grade 1.0
WT 09/10– ST 10	Bachelor in Physics (first year), Universität des Saarlandes (Saarland University)
Jun 2009	High school graduation, Gymnasium am Rotenbühl, in Saarbrücken, Final Grade 1.0
WT 07/08	Junior student in Mechatronics as high school student at Universität des Saarlandes

Employment as Student assistant

WT 12/13 – ST 13	CRC 910 (TU Berlin), in the group of Sabine Klapp Undergrad Researcher: Investigation of the influence of time-delayed feedback control on diffusion and transport of Brownian particles
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* 6-point German grading scale: 1.0 – 1.5 very good (A), 1.6 – 2.5 good (A), 2.6 – 3.5 satisfactory (B), 3.6 – 4.0 sufficient (C), 4.1 – 6.0 not sufficient (F)

- ST 12 Institute for Theoretical Physics, TU Berlin
Tutor for the lecture *Mathematical methods for physicists* by Andreas Knorr
- ST 10 In the group of Karsten Kruse, Universität des Saarlandes
Reworking the notes to the lecture on *Theoretical mechanics*
- WT 09/10 In the group of Karin Jacobs, Universität des Saarlandes
Taking photographs of the laboratories

AWARDS | SCHOLARSHIPS

- 2019 Europhysics Letters - EPL poster prize shared with S. Hermann, at Nordita, Stockholm, endowed with 200 Euros
- 2016 Physik-Studienpreis of the German Physical Society (DPG) in Berlin
endowed with 1000 Euros
- 2013 – 2015 Scholarship of the Studienstiftung des Deutschen Volkes, endowed with >12 000 Euro over 2 years
- 2013 – 2014 Grants for study abroad by Studienstiftung des deutschen Volkes and by TASSEP (TU Berlin), 6-month stay at Duke University, North Carolina, USA
- 2009 Awards for high school graduation: Best final grade, Best grade in physics award of the German Physical Society (DPG)

SUPERVISION | MENTORING OF STUDENTS

- 2017 Jan Meyer, Bachelor thesis on *Time-delayed dynamics of a Brownian particle in an asymmetric double-well potential*, Reviewers: Sabine Klapp and Gernot Schaller
- 2018 – 2019 Simon Hermann, Student assistant in CRC 910
working on thermodynamic description of non-Markovian systems
- 2019 – Timo Doerries, Master student and student assistant
working on analytical solution for stochastic systems with inertia and memory effects

ORGANIZATION OF SCIENTIFIC EVENTS

- Nov 2019 Session at Conference of Women in Physics, Berlin on *Nonequilibrium Processes in different fields: from extreme weather events to black holes*
- Oct 2019 CRC 910 Seminar on *Brownian molecules formed by delayed harmonic interactions*
Speaker: Viktor Holubec, University of Leipzig
- Jun 2019 CRC 910 Seminar on *The exact solution for a linear stochastic delay differential equation*, Speaker: Rohit Jain, University of Goettingen
- May 2019 Symposium on *Embedding strategies for delay problems in different fields*, CRC 910

VOLUNTEERING | PUBLIC OUTREACH

- Jun 2019 Speaker at Soapbox Event Berlin
- May 2019 Speaker at Perspectivencafe (Mentoring of high school students), TU Berlin
- May 2018 Speaker at Perspectivencafe (Mentoring of high school students), TU Berlin
- Nov 2016 Speaker at German Conference for Women in Physics, DESY Hamburg

PUBLICATIONS

h-index: 6 | total citations: 137 (Google scholar)

Preprint

S. A. M. Loos, S. M. Hermann, and S. H. L. Klapp
Non-reciprocal hidden degrees of freedom: A unifying perspective on memory, feedback, and activity, arXiv:1910.08372

Journal articles

S. A. M. Loos and S. H. L. Klapp
Fokker-Planck equations for time-delayed systems via Markovian Embedding,
Journal of Statistical Physics, 177, 95-118 (2019)

S. A. M. Loos and S. H. L. Klapp
Heat flow due to time-delayed feedback
Scientific Reports 9, 2491 (2019)

S. A. M. Loos and S. H. L. Klapp
Force-linearization closure for non-Markovian Langevin systems with time delay
Physical Review E 96, 012106 (2017)

S. A. M. Loos, J. C. Claussen, E. Schöll, A. Zakharova
Chimera patterns under the impact of noise
Physical Review E 93, 012209 (2016)

Schneider, M. Kapeller, S. Loos, A. Zakharova, B. Fiedler, and E. Schöll
Stable and transient multi-cluster oscillation death in nonlocally coupled networks
Physical Review E 92, 052915 (2015)

S. A. M. Loos, R. Gernert, and S. H. L. Klapp
Delay-induced transport in a rocking ratchet under feedback control
Physical Review E 89, 052136 (2014)

Book chapters

R. Gernert, S. A. M. Loos, K. Lichtner, and S. H. L. Klapp
Feedback control of colloidal transport, in Control of Self-Organizing Nonlinear Systems,
ed. by Schöll, Klapp, Hövel (Springer, 2016)

A. Zakharova, S. A. M. Loos, J. Siebert, A. Gjurchinovski, J. C. Claussen, and E. Schöll
Controlling chimera patterns in networks: interplay of structure, noise, and delay, in *Control of Self-Organizing Nonlinear Systems*, ed. by Schöll, Klapp, Hövel (Springer, 2016)

Conference proceedings

S. Loos, A. Zakharova, J. C. Claussen, and E. Schöll
Robustness of chimera states with respect to noise, in *Proceedings of the 7th International Conference on Physics and Control, Istanbul (PhysCon 2015)*

A. Zakharova, S. Loos, J. Siebert, A. Gjurchinovski, and E. Schöll
Chimera patterns: influence of time delay and noise, *IFAC-PapersOnLine* 48, 007 (2015)

INVITED SEMINARS

- July 2019 Thermodynamic notions of time-delayed stochastic processes
at ICTP, Trieste, *invited by Édgar Roldán*
- June 2019 Time-delayed stochastic processes - Fokker-Planck approach, Markovian embedding and
thermodynamic notions, at Freie Universität Berlin, *invited by Roland Netz*
- May 2019 Time-delayed stochastic processes - Fokker-Planck approach, Markovian embedding and
thermodynamic notions, at Universität Leipzig, *invited by Klaus Kroy*
- Feb 2019 Stochastic systems with time delay – Fokker-Planck approach, Markovian embedding and
thermodynamic notions, at Technische Universität München, *invited by Christian Kuehn*
- Nov 2018 Stochastic systems with time delay – Fokker-Planck approach, Markovian embedding and
thermodynamic notions, at Universität Greifswald, *invited by Thomas Ihle*
- Jun 2018 Stochastic thermodynamics of delayed noisy systems, at Freie Universität Berlin, in the
group of Bernold Fiedler, *invited by Hannes Stuke*
- Jun 2017 Probabilistic treatment of steady states of classical overdamped noisy system with time
delay at Freie Universität Berlin, *invited by Isabelle Schneider*

CONFERENCE CONTRIBUTIONS

Talks

- May 2019 Thermodynamics of time-delayed systems via Markovian embedding
EPS – Statistical Physics of Complex Systems, Stockholm
- Mar 2019 Time-delayed feedback – from a thermodynamic perspective
DPG Fruehjahrstagung der Sektion Kondensierter Materie, Regensburg

- Sep 2018 Heat flow induced by time-delayed feedback
International Conference of CRC910, Rostock-Warnemuende
- Mar 2018 Towards a (stochastic) thermodynamic description of non-Markovian delayed systems, *DPG Fruehjahrstagung der Sektion Kondensierter Materie, Berlin*
- Mar 2017 Approximating the non-Markovian dynamics of classical noisy systems with time-delay
DPG Fruehjahrstagung der Sektion Kondensierter Materie, Dresden
- Nov 2016 Approximating the non-Markovian dynamics of classical noisy systems with time-delay
German Conference of Women in Physics, Hamburg
- Sep 2016 Probabilistic treatment of steady states of classical noisy systems with time-delay,
International Conference on Control of Complex Systems and Networks, Heringsdorf
- Mar 2016 Talk: Chimera patterns under the impact of noise
Poster: Diffusion of colloidal particles under the impact of time-delayed feedback
DPG Fruehjahrstagung der Sektion Kondensierter Materie, Regensburg

Posters

- May 2018 Poster: Heat production in a noisy bistable system with time delay
Optical Trapping Summer School, Gothenburg
- Sep 2017 Poster: Steady-state properties of noisy systems with time delay,
Thermodynamics and Statistical Mechanics of Small Systems, Rome
- Jul 2017 Poster: Force-linearization closure for noisy systems with time delay
Liquid Matter Conference, Ljubljana
- Aug 2014 Poster: Delay-induced transport in a controlled rocking ratchet
International Conference of CRC910, Rostock-Warnemuende
- Mar 2013 Poster: Transport in one-dimensional controlled rocked Ratchet Potentials
DPG Fruehjahrstagung der Sektion Kondensierter Materie, Regensburg

REFEREEING – Physica A (2x), Physics Letters A

LANGUAGES

- English Seven-year school education, Final Grade: 1.0
- Spanish Two-year school education, two courses at Universität des Saarlandes 2009, level UNICert 1: Grades 1.0 and 1.3
- French Three-year school education

MEMBERSHIPS

DPG – German Physical Society, since 2009,
DGNAE – Society of German Natural Scientists and Physicians, since 2018

REFERENCES

Prof. Dr. Sabine Klapp
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