

Curriculum Vitae Dr. Astrid S. de Wijn

Family name de Wijn
Given names Astrid Silvia
Date of birth 28 September 1979
Place of birth De Bilt, The Netherlands
Nationality Netherlands



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Website <http://www.syonax.net/science/research.html>
Google scholar <https://scholar.google.se/citations?user=4j-PJ-MAAAAJ&hl=sv&oi=ao>

Education and degrees

12 June 2015 Docent, Stockholm University.
22 Nov. 2004 Ph.D. degree (thesis title: "Chaos in systems with many degrees of freedom"; thesis advisor: Prof. Henk van Beijeren, Institute for Theoretical Physics, Utrecht University).
16 Aug. 2001 Doctoraalexamen (master's degree) mathematics.
17 April 2000 Doctoraalexamen (master's degree) theoretical physics.
1996 – 2001 Studies in physics and mathematics, Utrecht University.
1990 – 1996 Grammar school, Stedelijk Gymnasium Amersfoort, The Netherlands.

Scientific employment

1 Jan. 2021 – present Professor at the Department of Mechanical and Industrial Engineering, Norwegian University of Science and Technology (NTNU).
1 Feb. 2016 – 31 Dec. 2020 Associate Professor at the Department of Mechanical and Industrial Engineering, Norwegian University of Science and Technology (NTNU).
1 Feb. 2016 – 31 Dec. 2020 Researcher (20%) at the Department of Physics, Stockholm University.
1 Feb. 2012 – 31 Jan. 2016 Researcher at the Department of Physics, Stockholm University, 75% research, 25% teaching.
1 Nov. 2011 – 31 Dec. 2011 Postdoctoral researcher at the University of Amsterdam, the Netherlands.
14 Jan. 2008 – 24 Sept. 2011 NWO Veni (independent postdoc) fellowship at the Institute for Molecules and Materials, Radboud University Nijmegen.
8 Jan. 2007 – 11 Jan. 2008 Research Associate at the Department of Earth Science and Engineering, Imperial College, London, with Prof. Velisa Vesovic.
1 Jan. 2005 – 31 Dec. 2006 Postdoctoral position at the Max Planck Institute for the Physics of Complex Systems, Dresden.
1 July 2000 – 31 Dec. 2004 Ph.D. position with Prof. Henk van Beijeren, Institute for Theoretical Physics, Utrecht University.

Research Interests

Theory: statistical mechanics, tribology, nonlinear dynamics, materials science, surface science

The common denominator of my work is the investigation of transport of matter, energy, and momentum, and its relationship to microscopic nonlinear interactions and structure. Currently, I focus mostly on: (1) molecules and nanoscale objects on surfaces, and (2) gases and liquids of various levels of complexity. The goal to develop new, general, theoretical models for systems which are out of equilibrium or in which equilibrium does not exist. I employ computational as well as analytical methods to solve applied and fundamental problems. I collaborate with experimental as well as theoretical researchers from a wide variety of fields, ranging from chemical engineering to mathematical physics.

Grants and fellowships

2023 – present	(Nordic Institute for Theoretical Physics (Nordita) Corresponding Fellow.
2022 – 2026	NFR Large-scale Interdisciplinary Researcher Project (Research Council Norway), “Sustainable Stable Ground”, co-applicant and data management officer, project is led by Prof. Klaartje de Weerd (Department of Structural Engineering, NTNU), 3 million NOK of the total 25 million NOK.
2022 – 2026	EIC Pathfinder (European Innovation Council), “Scaling-up SuperLubricity into Persistence (SSLiP)”, work package leader, project is led by Assoc. Prof. Graham Cross (Trinity College Dublin, Ireland), 694 k€ out of the total 3906 k€.
2018 – 2023	NFR (Research Council of Norway) FRIPRO (Researcher Project), “Viscosity of complex polar fluids, electrolytes, and ionic liquids”, project leader, 7.8 million NOK, project number 275507.
2017 – 2021	NTNU Outstanding Academic Fellow, Norwegian University of Science and Technology (NTNU).
2016 – 2020	VR (Swedish Research Council) Projektbidrag (Research Project Grant). Title: “Simple models for friction in electrolyte systems”. kSEK 3070. Project number 2015-0496.
2012 – 2016	VR Unga Forskare (Young Researcher) grant. Title: “The origin of friction: nonlinear dynamics at nanoscales”; research fellowship. kSEK 3200. Project number 2011-04074.
2008 – 2011	NWO (Netherlands Organisation for Scientific Research) Veni fellowship (independent three-year postdoc grant). Title: “Towards a statistical mechanics for small systems, the time-scale separation approach to surface transport”. k€ 208.
2012 – present	Various grants for computer time from national computational infrastructure in Sweden (SNIC) and Norway (Sigma2).
2000 – present	Various travel grants.

Teaching

2016 – present	Lecturing, course administration and development at NTNU, Master course Tribology and Surface Technology, PhD course Simulation Methods in Many-Particle Systems, Master course in Nanoscale Surface Dynamic Processes, PhD course Applied Materials Seminar Series.
2017	Supervising an NTNU project-based master course, Experts in Teamwork – Biomaterials.
2013 – 2015	Lecturing, course administration and development at Stockholm University, Master course Simulation Methods in Statistical Physics.
2008 – 2011	Teaching Fellowship at Radboud University Nijmegen. Administration of tutorials in the Master’s course Advanced Statistical Physics, and various guest lectures.
2009 – 2010	Theoretical support for nonlinear dynamics experiments in second-year laboratory courses at Radboud University.
2000 – 2004	Ph.D. teaching assistant, Utrecht University: various advanced-level tutorials.
1998 – 2000	Student teaching assistant at the Physics Department of Utrecht University: various first-year and advanced-level tutorials and labs.

Research network activities and conference organisation

September 2024	Coorganiser of the NORDITA Program on “Measuring and manipulating non-equilibrium systems: inference, thermodynamic costs, constraints and trade-offs”, Stockholm, Sweden.
2023 – present	Member of the leadership team of the Gemini Centre for the COmputational multi-Scale materials societY (COSY) [together with Raffaella Cabriolu, Titus van Erp (NTNU); Ingebord-Helene Svenum, Stefan Andersson (SINTEF Inudstry); Morten Hjorth-Jensen (UiO)].
2023 – present	Norwegian representative and member of the Management Committee of the COST action CA22132 – Open Network on DEM Simulations (ON-DEM).
2023 – present	Norwegian representative and member of the Management Committee of the COST action CA21121 – European Network for the Mechanics of Matter at the Nano-Scale (MecaNano).
2019 – present	Associate member, PoreLab, NTNU-UiO Porous Media Laboratory, Norwegian Center of Excellence.
2021 – 2022	Sabbatical at PoreLab, Norwegian Center of Excellence for Porous Media.

June 2022	Member of the The Local advisory board of NordTrib2022, The 19th Nordic Symposium on Tribology, Geiranger, Norway.
May 2022	Coorganiser of the NORDITA Program on “Are there universal laws in non-equilibrium statistical physics?”, Stockholm, Sweden.
2021	Coorganiser of the workshop “116th AGEF symposium: Triboelectrochemistry”, online and at the University of Bonn, Germany, 22–24 September 2021.
16 Aug. 2019	Coorganiser of the first NTNU Nano workshop on atomistic modelling [together with Sondre Schnell and Ida-Marie Høyvik].
2018 – present	Member of the Gemini Centre for Tribology leadership team [together with Nuria Espallargas (NTNU), Sergio Armada (SINTEF), and others].
26 – 27 Nov. 2018	Coorganiser of the Gemini workshop on Polymer Surfaces and Tribology - From Foundations to Applications.
2 – 4 Oct. 2018	Coorganiser of the Beilstein Symposium on “Molecular Mechanisms in Tribology”, Potsdam, Germany. [With Roland Bennewitz (INM Leibnitz).]
Sept. 2017	Coorganiser of the NORDITA Program on “Current and Future Trends in Stochastic Thermodynamics”, Stockholm, Sweden.
2013 – 2017	Swedish representative and member of the Management Committee of the COST action MP1303 – Understanding and controlling nano and mesoscale friction.
10 – 12 April 2017	Coorganiser of the Royal Society of Chemistry Faraday Discussion on Chemical Physics of Electroactive Materials, Cambridge UK.
5 – 7 July 2016	Member of the organising committee of the “2nd European Workshop on Understanding and Controlling Nano and Mesoscale Friction” in Riga, Latvia.
Sept. – Oct. 2015	Coorganiser of the NORDITA Program on “Stochastic Thermodynamics in Biology”, Stockholm, Sweden.
22 – 26 June 2015	Member of the organising committee of the “International Conference on Understanding and Controlling Nano and Mesoscale Friction” in Istanbul, Turkey.
2011	Scientific advisor for the “Marie Symposium CHAOS” at Radboud University Nijmegen.

Editorial assignments

2019 – present	Member of the Editorial College of SciPost Physics (Impact factor 5.051, SciPost, Diamond Open Access).
2016 – present	Member of the Editorial Board of Scientific Reports (Impact factor: 5.578, Nature Publishing Group).
2015	Guest editor: Journal of Physics: Condensed Matter (Impact factor: 2.209, IOPscience). Special section on nano- and mesoscale friction.

Evaluation committees, commissions of trust, etc.

2019	Vice chair of the Applied Physics (NT-15) evaluation panel of the Swedish Research Council (VR).
2015, 2016, 2018	Member of the Applied Physics (NT-15) evaluation panel of the Swedish Research Council.
2018	External reviewer for the Swedish Research Council Geology panel (NT-7)
2020	External reviewer for the Swedish Research Council Applied Physics panel (NT-15)
2018	Reviewer for the Deutsche Forschungsgemeinschaft (DFG).
2008 – present	Opponent and examiner on PhD and Licentiate thesis committees (17 PhD and 5 Licentiate committees).

Institutional Responsibilities

2021 – present	Deputy representative for the permanent staff in the extended management meeting at MTP
2020 – present	Contact person for NTNU’s Idun cluster at MTP
2016 – present	Organisation of the Applied Materials Group lunch seminars at MTP
2021	Organising the faglærermøtes, the professor’s meetings at MTP
2013 – 2016	Organisation of the division seminar of the Chemical Physics Division, Department of Physics, Stockholm University

2012 – 2015	Master thesis grading committee at the Physics Department, Stockholm University
2012	Bachelor thesis grading committee at the Physics Department, Stockholm University
2008 – 2011	Organisation of the joint seminar of the theoretical groups, Institute for Molecules and Materials, Radboud University Nijmegen
2009 – 2011	Onderwijscommissie (Education Committee) Institute for Molecules and Materials, Radboud University Nijmegen.

Memberships and honours

2023 – present	Elected member of the Royal Norwegian Society of Sciences and Letters (DKNVS).
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Prizes

2014	European Physical Journal Distinguished Referee 2014.
Sept. 2006	Dynamics Days Europe 2006, Crete, Greece: poster prize for "Analytical calculations of Lyapunov spectra of high-dimensional billiards".
Feb. 1997	PION 97 (Dutch Inter-University Team Physics Competition): first prize.
July 1996	27th International Physics Olympiad, Oslo, Norway: bronze medal.
June 1996	Dutch National Physics Olympiad 1996: second prize.
July 1995	26th International Physics Olympiad, Canberra, Australia: honourable mention.
June 1995	Dutch National Physics Olympiad 1995: fourth prize.

Miscellaneous scientific experience and activities

Debian GNU/Linux system administration • Reviewing for various journals, including Physical Review Letters, EuroPhysics Letters, Tribology Letters, Journal of Physics: Condensed Matter, and the European Physical Journal E.

Current postdocs/researchers

- Ge Li
Molecular-dynamics simulations of clay for sustainable stable ground (2023 – 2025).
- Viet Hung Ho
Simulations of multi-contact superlubricity (2023 – 2025).
- Melisa Gianetti
Molecular-dynamics simulations of non-ideal superlubric contacts of 2D materials (2023 – 2025).
- Roberto Troncoso
Modelling viscosity of polar fluids and electrolytes (2021 – 2023).

Former postdocs/researchers

- Faezeh Pousaneh
Statistical mechanics and transport properties of complex fluids (2017 – 2020).
- Eivind Bering
Collective superlubricity (2021).
- Bassma Khaldoon Abduljabbar Al-Jubouri
Data mining and machine learning for material science and tribology (2019 – 2021).

Current PhD students as main supervisor

- Jennifer Sheehan
Modelling transport in materials (project started September 2018).
- Christopher Fjeldstad
Modelling viscosity of polar fluids and electrolytes (project started October 2019).
- Haakon Tvedt
Machine Learning chemomechanical failure mechanisms of bearings using acoustic emission data (project started August 2021).

Graduated PhD students as main supervisor

- Robin Vacher
Nanoscale tribological simulations of a semi-crystalline polymer, NTNU/SINTEF (PhD 2022).
- David Andersson
Simple Models for Complex Nonequilibrium Problems in Nanoscale Friction and Network Dynamics, SU (PhD 2020, Licentiate 2019).
- Jan Inge Hammer Meling
Hydrogen assisted crack growth in iron: a simulations approach (2021).

Graduated PhD students as co-supervisor

- Eivind Bering (NTNU Department of Physics)
Stretching, breaking, and dissolution of polymeric nanofibres by computer experiments (Main supervisor: Alex Hansen, NTNU Department of Physics (2021)).
- Xu Lu
Multi-scale study of hydrogen-assisted cracking in nickel-based superalloys (Main supervisor: Afroz Barnoush, NTNU (2020)).
- Jonathan Lindström (Linnæus University, Kalmar)
Modelling the evolution of treatment-induced resistance in Ph+ leukaemias (Main supervisor: Ran Friedman, Linnæus University (2020)).

I have graduated a total of 15 Master students at NTNU and Stockholm University.

Invited/keynote conference talks

1. "Understanding the origin of friction", Workshop on Theory and Simulation of Nonequilibrium Fluids, Brisbane, Australia, 11 - 15 September 2023.
2. "Stretching, breaking, and dissolution of polymeric nanofibres", The 8th European Nanomanipulation Workshop, Kraków, Poland, 15 - 17 May 2023
3. "Stretching, breaking, and dissolution of polymeric nanofibres", 12th Nordic Workshop on Statistical Physics: Biological, Complex and Non-equilibrium Systems, online and at NORDITA, Stockholm, Sweden, 15-17 March 2023.
4. "Investigating the tribology of polymers with molecular-dynamics simulations", Friction, lubrication, and rheology at the nano and mesoscale, online and at Durham University, UK, 20-21 July 2022.
5. "Understanding the friction on atomically thin layered materials", 7th World Tribology Congress, Lyon, France, 10-15 July 2022.
6. "Understanding the friction on atomically thin layered materials", Second national meeting of the Swedish Chemical Society, Linköping, Sweden, 20-22 June 2022.
7. "Shear Viscosity of Dense Polar Fluids", 116th AGEF symposium: Triboelectrochemistry, online and at the University of Bonn, DE, 22-24 September 2021.
8. "Understanding the friction on atomically thin layered materials", Nanolubrication Conference 2021, From fundamentals to industrial applications, online and at Durham University, UK, 15-16 July 2021.
9. "Understanding the friction on atomically thin layered materials", 11th Nordic Workshop on Statistical Physics: Biological, Complex and Non-equilibrium Systems, online and at NORDITA, Stockholm, Sweden, 14-16 April 2021.
10. "Modelling nanoscale friction of contaminated surfaces", International Nanotribology Forum, Chiang Rai, Thailand, 13-17 January 2020.
11. "Nanoscale friction of electrolyte molecules", 4th European Symposium on Intelligent Materials, Kiel, Germany, 17-19 June 2019.
12. "A simple model for strengthening and layer-dependence of friction on atomically thin sheets", Interface Dynamics and Dissipation Across the Time and Length-Scales, CECAM Tel Aviv, Israel, 21-23 May 2019.
13. "Atomic-scale sliding friction on a contaminated surface", 10th Nordic Workshop on Statistical Physics: Biological, Complex and Non-equilibrium Systems, NORDITA, Stockholm, Sweden, 20-22 March 2019.
14. "Modelling nanoscale friction of adsorbed molecules", Det 21. Landsmøte i kjemi (Norwegian Chemical Society meeting), Lillestrøm, Norway, 16-18 October 2018.
15. "Theory and simulation of friction at the nano scale", Advanced Materials and Technologies - Conference - School, Palanga, Lithuania, 27-31 August 2018.
16. "Kinetic theory and transport properties of gases", Workshop on Rayleigh-Brillouin Scattering and Lidar Applications in the Earth's Atmosphere, Vrije Universiteit Amsterdam, the Netherlands, 27 June 2018.
17. "Predicting and controlling long jumps and sticks in molecular diffusion", Long NORDITA Program on Crackling Noise in Materials, Stockholm Sweden, 30 April - 11 May 2018.
18. "Friction fluctuations of gold Nanoparticles in the superlubric regime", 9th Nordic Workshop on Statistical Physics: Biological, Complex and Non-equilibrium Systems, NORDITA, Stockholm, Sweden, 21-23 March 2018.
19. "Understanding friction at the nano scale", nano@NTNU symposium, Trondheim Norway, 6-7 December 2017.
20. "How square ice helps lubrication", Gemini Centre workshop on Lifetime extension of bearings and gears, SINTEF and NTNU, Trondheim, Norway, 3 November 2017.
21. "Computers, Friction, and Carbon", Game-changing physics: a symposium in honour of Annalisa Fasolino, Nijmegen, the Netherlands, 20 October 2017.
22. "How square ice helps lubrication", 8th Nordic Workshop on Statistical Physics: Biological, Complex and Non-equilibrium Systems, NORDITA, Stockholm, Sweden, 8-10 March 2017.
23. "Nanoscale friction under electrochemical control: effect of molecule anchoring and dispersion", 7th European Nanomanipulation Workshop, Jena, Germany, 20-22 February 2017.
24. "Nanoscale friction under electrochemical control", 17th Workshop of Dynamical Phenomena at Surfaces, Milan, Italy, 19-21 September 2016.
25. "Nanoscale friction under electrochemical control", 7th Nordic Workshop on Statistical Physics: Biological, Complex and Non-equilibrium Systems, NORDITA, Stockholm, Sweden, 16-18 March 2016.

26. "Lattice geometry and friction anisotropy: complications from 2d interfaces", XIN Workshop on Superlubricity: Fundamental and Applications, XIN Center and State Key Lab on Tribology of China, 18–20 October 2015.
27. "Predicting and triggering long jumps and sticks in molecular diffusion", 6th European Nanomanipulation Workshop, Giessen, Germany, 23–25 September 2015.
28. "Anisotropy of nanoscale friction", 6th Nordic Workshop on Statistical Physics: Biological, Complex and Non-equilibrium Systems, NORDITA, Stockholm, Sweden, 25–27 February 2015.
29. "Nanoscale friction under electrochemical control", CECAM Workshop "Friction and Interface Dynamics at nano and mesoscales", Tel Aviv, Israel, 27–31 October 2014.
30. "Nanoscale friction under electrochemical control", Oxford Discussion Meeting on: "Confined Systems Under Shear: New Materials & Mechanisms", Oxford, UK, 1–2 September 2014.
31. "Preferential sliding directions on graphite", 5th European Nanomanipulation Workshop, Mulhouse, France, 18–20 June 2014.
32. "Nanoscale friction under electrochemical control", The First European Workshop on Understanding and Controlling Nano and Mesoscale Friction, Can Picafort, Majorca, Spain, 26–29 May 2014.
33. "Predicting and triggering long jumps in molecular diffusion", 5th Nordic Workshop on Statistical Physics: Biological, Complex and Non-equilibrium Systems, NORDITA, Stockholm, Sweden, 26–28 March 2014.
34. "Nanoscale friction under electrochemical control", Conference on Friction and Dissipation in Man-made and Biological Systems, ICTP, Trieste, Italy, 5–8 November 2013.
35. "Criticality in Dynamic Arrest: Correspondence between Glasses and Traffic", 4th Nordic Workshop on Statistical Physics: Biological, Complex and Non-equilibrium Systems, NORDITA, Stockholm, Sweden, 20–22 March 2013.
36. "(In)commensurability, scaling, and multiplicity of friction of nanocrystals", 15th Workshop on Dynamical Phenomena at Surfaces, Lorentz Center, Leiden, The Netherlands, 26–30 November 2012.
37. "Lattice geometry and stability of low-friction sliding of nanocrystals", Stick-slip dynamics, from nano to geophysical scales, CECAM-HQ-EPFL, Lausanne, Switzerland, 3–5 May 2010.
38. "Vertical chaos and horizontal diffusion in the bouncing-ball billiard", Statistical Physics Out of Equilibrium, focus meeting on Non-Equilibrium Steady States, Institut Henri Poincaré Centre Emile Borel, Paris, France, 8–12 October 2007.
39. "Analytical calculations of Lyapunov spectra of high-dimensional billiards", Nonlinearities – From turbulent to magic, NORDITA and Niels Bohr Institute thematic workshop, Copenhagen, Denmark, 17–20 May 2006.
40. "Lyapunov exponents of Goldstone modes in hard-sphere systems", CECAM Workshop on Stability, Fluctuations and Transient Behaviour in Nonequilibrium Systems, Lyon, France, 19–22 July 2004.
41. "Goldstone modes in Lyapunov spectra of hard-sphere systems", Microscopic Chaos and Transport in Many-Particle Systems, Dresden, Germany, 5–25 August 2002.

In addition, I have given 43 invited seminars and colloquia at various institutions. I have contributed talks and posters to over 40 conferences.

Outreach activities

August 2021	Blog post on TekNat blog, NTNU, "To deal with the climate crisis we need to break our social bubbles", https://www.ntnu.no/blogger/teknat/en/2021/08/02/to-deal-with-the-climate-crisis-we-need-to-break-our-social-bubbles/
March 2014	Blog entry on Fysikums Blogg (Physics Department Blog), Stockholm University, "Friction at small scales", http://www.fysik.su.se/blog/friction-small-scales/
May 2013	Popular science article in "Nederlands Tijdschrift voor Natuurkunde" (Magazine of the Dutch Physical Society): Daniël Miedema, Astrid de Wijn, Bernard Nienhuis, and Peter Schall, "Structuur in de wanorde op de snelweg".
2012	Popular science guidance for primary school teachers and students on "Grafeen, een verhaal van andere dimensies" (Graphene, a story of other dimensions), by Mikhail Katsnelson, Astrid de Wijn, Inka Locht, Aloysio Janner, and Marina Katsnelson, Chapter 3 in: Wetenschappelijke doorbraken de klas in! (Scientific breakthroughs into the classroom!), Editors: Marieke Peeters, Winnie Meijer, and Roald Verhoeff. ISBN: 978-90-818461-0-3, Wetenschapsknooppunt Radboud University Nijmegen.

- April 2011 Scientific advisor for the “Marie Symposium CHAOS”, a one-day symposium on chaos and nonlinear dynamics organised by students of the Science Faculty at Radboud University Nijmegen.
- 2010 – 2011 Scientific coordination of a project to develop a short curriculum on condensed matter research and graphene for primary-school students between ages 9 and 12 entitled “Structuur van materie: van atomen tot de wereld om ons heen” (structure of matter: from atoms to the world around us). On the occasion of the Radboud Science Award 2010 of Prof. Mikhail Katsnelson.
- 2 Oct. 2009 Marie-Curie Colloquium “Regelmaat in Chaos”, quarterly general colloquium for undergraduate students, Radboud University Nijmegen.

Peer-reviewed journal publications

1. Robin Vacher and Astrid S. de Wijn
Nanoscale friction and wear of a polymer coated with graphene
Beilstein J. Nanotechnol. 2022, 13, 63–73. doi:10.3762/bjnano.13.4.
2. Eivind Bering, Jonathan Ø. Torstensen, Anders Lervik, and Astrid S. de Wijn
Computational study of the dissolution of cellulose into single chains: the role of the solvent and agitation
Cellulose (2022).
3. Bassma Al-Jubouri and Astrid S. de Wijn
Identifying ski roughness using data driven approaches
2021 IEEE International Conference on Systems, Man, and Cybernetics (SMC), 2021, pp. 1861-1868, doi: 10.1109/SMC52423.2021.9658737.
4. Robin Vacher and Astrid S. de Wijn
Molecular-Dynamics Simulations of the Emergence of Surface Roughness in a Polymer under Compression
Materials 2021, 14(23), 7327.
5. J. Roadnight Sheehan, David Andersson, and Astrid S. de Wijn
Thermal effects and spontaneous frictional relaxation in atomically thin layered materials
Phys. Rev. B **103**, 195441 (2021).
6. David Andersson, Sigrid Bratsberg, Andrew K. Ringsmuth, Astrid S. de Wijn
Dynamics of collective action to conserve a large common-pool resource
Scientific Reports **11**, 9208 (2021).
7. R. Vacher and A. S. de Wijn
Nanoscale Simulations of Wear and Viscoelasticity of a Semi-Crystalline Polymer
Tribology Letters **69**, 1-12 (2021).
8. Eivind Bering, Dick Bedeaux, Signe Kjelstrup, Astrid S. de Wijn, Ivan Latella, and J. Miguel Rubi
A Legendre–Fenchel Transform for Molecular Stretching Energies
Nanomaterials **2020**, 10, 2355 (2020).
9. Eivind Bering, Signe Kjelstrup, Dick Bedeaux, J. Miguel Rubi, and Astrid S. de Wijn
Entropy Production beyond the Thermodynamic Limit from Single-Molecule Stretching Simulations
J. Phys. Chem. B **124**, 40, 8909–8917 (2020).
10. Faezeh Pousaneh, Astrid S. de Wijn
Kinetic theory and shear viscosity of dense dipolar hard sphere liquids
Phys. Rev. Lett. **124**, 218004 (2020).
11. Gudrun Glende, Astrid S. de Wijn, and Faezeh Pousaneh
The Vanishing water/oil interface in the presence of antagonistic salt
J. Chem. Phys. **152**, 124707 (2020).
12. Eivind Bering and Astrid S. de Wijn
Stretching and breaking of PEO nanofibres. A classical force field and ab initio simulation study
Soft Matter **16**, 2736–2752 (2020).
13. David Andersson and Astrid S. de Wijn
Understanding the friction of atomically thin layered materials
Nature Comm. **11**, 420 (2020).
14. Faezeh Pousaneh and Astrid S. de Wijn
Shear viscosity of pseudo hard-spheres
Molecular Physics **118** 1622050 (2020).
15. Felix Hartmuth, Dirk Dietzel, Astrid S. de Wijn, and André Schirmeisen
Friction vs. Area Scaling of Superlubric NaCl-Particles on Graphite
Lubricants **2019**, 7(8) 66 (2019).
16. H. Jonathan G. Lindström, Astrid S. de Wijn, and Ran Friedman
Stochastic modelling of tyrosine kinase inhibitor rotation therapy in chronic myeloid leukaemia
BMC Cancer **19** 508 (2019).
17. Wengen Ouyang, Astrid S. de Wijn, and Michael Urbakh
Atomic-scale sliding friction on contaminated surface
Nanoscale **10**, 6375–6381 (2018).

18. Dirk Dietzel, Astrid S. de Wijn, Matthias Vorholzer, and Andre Schirmeisen
Friction Fluctuations of Gold Nanoparticles in the Superlubric Regime
Nanotechnology **29**, 155702 (2018).
19. Astrid S. de Wijn and Lars G. M. Pettersson
How square ice helps lubrication
Phys. Rev. B **95**, 165433 (2017).
20. Per-Anders Thorén, Astrid S. de Wijn, Riccardo Borgani, Daniel Forchheimer, and David B. Haviland
Imaging high-speed friction at the nanometer scale
Nature Comm. **7**, 13836 (2016).
21. Jesper Norell, Annalisa Fasolino, Astrid S. de Wijn
Emergent friction in two-dimensional Frenkel-Kontorova models
Phys. Rev. E **94**, 023001 (2016).
22. Merel M. van Wijk, Astrid S. de Wijn, and Annalisa Fasolino
Collective superlubricity of graphene flakes
J. Phys.: Condens. Matter **28**, 134007 (2016).
23. A. S. de Wijn, A. Fasolino, A. E. Filippov, and M. Urbakh
Effects of molecule anchoring and dispersion on nanoscopic friction under electrochemical control
J. Phys.: Condens. Matter **28**, 105001 (2016).
24. A. S. de Wijn, B. Hess, and B. V. Fine
Chaotic properties of spin lattices near second-order phase transitions
Phys. Rev. E **92**, 062929 (2015).
25. S. Hallerberg and A. S. de Wijn
Understanding and controlling regime switching in molecular diffusion
Phys. Rev. E **90**, 062901 (2014).
26. Balakrishna S.G., Astrid S. de Wijn, and Roland Bennewitz
Preferential sliding directions on graphite
Phys. Rev. B **89**, 245440 (2014).
27. D. M. Miedema, A. S. de Wijn, and P. Schall
A criterion for condensation in kinetically constrained one-dimensional transport models
Phys. Rev. E **89**, 062812 (2014).
28. B. V. Fine, T. A. Elsayed, C. M. Kropf, and A. S. de Wijn
Absence of exponential sensitivity to small perturbation in nonintegrable systems of spin 1/2
Phys. Rev. E **89**, 012923 (2014).
29. A. S. de Wijn, A. Fasolino, A. Filippov, and M. Urbakh
Nanoscopic friction under electrochemical control
Phys. Rev. Lett. **112**, 055502 (2014).
30. Stanislav S. Borysov, Daniel Platz, Astrid S. de Wijn, Daniel Forchheimer, Eric A. Tolen, Alexander V. Balatsky, and David B. Haviland
Reconstruction of tip-surface interactions in multimodal intermodulation atomic force microscopy
Phys. Rev. B **88**, 115405 (2013).
31. A. S. de Wijn, B. Hess, and B. V. Fine
Lyapunov instabilities in lattices of interacting classical spins at infinite temperature
J. Phys. A: Math. Theor. **46**, 254012 (2013).
32. B. A. J. Lechner*, A. S. de Wijn*, H. Hedgeland, A. P. Jardine, B. J. Hinch, W. Allison, and J. Ellis
Atomic scale friction of molecular adsorbates during diffusion
J. Chem. Phys. **138**, 194710 (2013).
[* Joint first authors].
33. A. S. de Wijn, D. M. Miedema, B. Nienhuis, and P. Schall
Criticality in dynamic arrest: correspondence between glasses and traffic
Phys. Rev. Lett. **109**, 228001 (2012).
34. Joost A. van den Ende, Astrid S. de Wijn, and Annalisa Fasolino
The effect of temperature and velocity on superlubricity
J. Phys.: Cond. Matter **24**, 445009 (2012).

35. A. S. de Wijn
(In)commensurability, scaling, and multiplicity of friction in nanocrystals and application to gold nanocrystals on graphite
Phys. Rev. B **86**, 085429 (2012).
36. A. S. de Wijn, B. Hess, and B. V. Fine
Largest Lyapunov exponents for lattices of interacting classical spins
Phys. Rev. Lett. **109**, 034101 (2012).
37. Astrid S. de Wijn, N. Riesco, Velisa Vesovic, George Jackson, and J-P. Martin Trusler
Viscosities of liquid mixtures: the VW method for chain molecules
J. Chem. Phys. **136**, 074514 (2012).
38. A. Manteghi, N. J. Dam, A. S. Meijer, A. S. de Wijn, and W. van de Water
Spectral narrowing in coherent Rayleigh-Brillouin scattering
Phys. Rev. Lett. **107**, 173903 (2011).
39. A. S. de Wijn, A. Fasolino, A. E. Filippov, and M. Urbakh
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