Tobias Ambjörnsson
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Computational Science for Health and Environment

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Research

Computational science with specilization in bionanophysics

Research

Research overview

I have a broad expertise within the fields of theoretical biological physics, equilibrium and non-equilibrium statistical physics, mathematical physics and nanophysics. I worked with several experimental partners from the fields of physics, chemistry and nanoscience.

Research

Examples of research topics

Data analysis and modeling for particle tracking

Optical DNA mapping (DNA barcoding)

Modeling of biophysical processes at the nanoscale

Crowding effects on tracer particle dynamics in many-body systems

Single-file diffusion

Epidemiology on networks

Localized surface plasmons in metallic nanoparticles

Electric and electromagnetic response of biomembranes

DNA breathing dynamics and protein binding dynamics

Translocation of biopolymers through nanopores

Fluroscence of molecules near metallic surfaces

Interaction between optical electromagnetic fields and molecular aggregates

Research

Group members

Erik Clarkson, PhD student 2024 - present

Mikkel Peter Andersen, PhD student, 2024 - present

Jakob Gunnarsson, BSc student, 2025

Christoffer Karlsson, BSC student, 2025

Research

Previous members

Lauri Eckle, BSc student, 2025

Albertas Dvirnas, post-doc 2022-

Dibyayjoti Mohanta, post-doc 2022-

Steffi Schijf, BSc student 2022-2023.

Erik Clarkson, MSc student, 2022.

Simon Tropp, MSc student, 2022.

Jake Lumsden, MSc student, 2022.

Albertas Dvirnas, PhD student, 2017-2022.

Lennart Golks, Master student, 2020-2021.

Nirvika Chouhan, Research intern (through Jobbsprånget) 2020-2021.

Dolev Illouz, Master student 2020.

Magnus Brander, Master student 2019-2020.

Jens Krog, Post-doc 2018-2020.

Wensi Zhu, Master student 2017-2018.

Magnus Brander, Bachelor student 2018.

Terje Stenström, Bachelor student 2017.

Henrik Nordanger, Master student 2016, project worker 2017.

Callum Stewart, Master student 2016-2017,

Lisa Rämisch, Summer research intern 2017.

Arthur Genthon, Exchange master student (Ecole Normale Superieure Paris-Saclay) 2019

Saair Quaderi, Visting researcher 2015-2017.

Vibha Kumra, Bachelor student 2016.

Hemant Kumar, Visting researcher (Indian Institute of Technology, Delhi) 2016.

Johannes Isaksson, Bachelor student 2016.

Christoffer Pichler, Masters student 2015.

Paola Torche, Bachelor student 2015.

Erik Lagerstedt, Masters student 2014.

Michaela Schad, PhD student 2010-2015.

Erik Lagerstedt, Bachelor student 2011.

Susanna Hammarberg, Summer research intern 2014.

Charleston Noble, Researcher 2013-2014.

Lloyd Sanders, PhD student 2010-2014.

Adam Nilsson, Masters student 2013.

Simon Pigeon, Post-doc 2012-2013.

Karl Fogelmark, Master student and research intern 2010-2011.

Research

List of past and present collaborators (alphabetical order)

Peter Apell, Chalmers University, Sweden.

Suman Banik, Bose Institute, India.

Eli Barkai, Bar Ilan University, Israel.

Dirk Brockmann, Northwestern University, USA.

Yuval Ebenstein, Tel Aviv University, Israel.

Per Lyngs Hansen, University of Southern Denmark, Denmark.

John Kasianowicz, National Institute of Standards and Technology, USA.

Peter Jönsson, Physical chemistry, Lund University

Oleg Krichevsky, Ben-Gurion University, Israel.

Zoran Konkoli, Chalmers University, Sweden.

Mikael Käll, Chalmers University, Sweden.

Ludvig Lizana, Umeå University, Denmark.

Michael Lomholt, University of Southern Denmark, Denmark.

Ed Di Marzio, National Institute of Standards and Technology, USA.

Ralf Metzler, Technical University Munich, Germany.

Gautam Mukhopadhyay, Indian Institute of Technology Bombay, India.

Weihai Ni, Universidade de Vigo, Spain.

Pontus Nordenfelt, Division of Infection Medicine, Lund University.

Tomas Novotny, Charles University, Czech Republic.

Jonas Pedersen, Technical University of Denmark, Denmark.

Robert Silbey, Massachusetts Institute of Technology, USA.

Alessandro Taloni, Tel Aviv University, Israel.

Jonas Tegenfeldt, Lund University and Göteborg University, Sweden.

Jianfang Wang, Chinese University of Hong Kong.

Fredrik Westerlund, Chalmers University, Sweden.

Research

Grants

2023-2027: VR, project grant: Connecting the dots: probabilistic mapping of biomolecular paths in fluorescence microscopy, PI.

2022-2024: Barncancerfonden, Optical DNA mapping for improved diagnostics for children with leukemia, co-PI. PI: Fredrik Westerlund.

2022-2024:The Erling-Persson Family Foundation, Next generation diagnostic of bacterial infections, co-PI. PI: Fredrik Westerlund.

2018-2019: Crafoord Foundation, Detecting antibiotic resistance genes on plasmids using high-throughput and cell-phone microscopy based optical DNA mappings, PI.

2017-2020: The Erling-Persson Family Foundation, A novel ultrafast method for detecting multiresistant bacteria in intensive care units, co-PI. PI: Fredrik Westerlund.

2015-2019: VR, project grant, Non-equilibrium biophysics in nano-confined systems, Grant ID: 2014-4305, PI.

2015-2019: EU, BeyondSeq -- Genomic diagnostics beyond the sequence, PI: Yuval Ebenstein.

2012-2013, Carl Tryggers Stiftelse. Classifying DNA Melting Maps for Ultra-fast Identification of Species, PI.

2011-2012, The Crafoord Foundation. Nanoscale tracer dynamics in many-body heterogenous soft matter systems, PI.

2010-2014: VR, project grant, Modeling of nanoscale biophysical processes and label-free detection using metallic nanoparticles, PI.

2006-2011: The Knut and Alice Wallenberg Foundation. Bio-nano-sensor physics. Post-doc grant + repatriation, PI.

Research

Software

WLS-ICE - Weighted Least Squares Including Correlation in Error.

The latest release of the software is available at: https://github.com/impaktor/wlsice/

The associated methods are described in this publication: https://doi.org/10.1038/s41598-018-24983-y

Filter-function for reducing noise in DNA barcodes. Code: https://figshare.com/s/a63df3aac07777ed878d Methods described in: https://doi.org/10.1371/journal.pone.0179041

Simulation package for interacting particles jumping on a lattice. Code: https://github.com/impaktor/diffusion Methods described in: https://doi.org/10.1088/1742-5468/aa9db3

Bayesian data analysis package for unfolding DNA molecules in nano-channels. Code: https://github.com/krogjens/dna_unfolding Methods described in: https://doi.org/10.1063/1.5051319

Hidden Markov Model for detecting structural variations in DNA barcodes. Code: https://gitlab.com/dnadevcode/hmmsv Methods described in: https://doi.org/10.1371/journal.pone.0259670

Data analysis of dually labeled DNA barcodes. Code: https://gitlab.com/dnadevcode/cdsodm ; Methods described in: https://doi.org/10.1371/journal.pone.0260489

Software for DNA melting predictions, https://github.com/Arthur-Genthon/dna-melting-defect Methods are described in: https://doi.org/10.1063/5.0168915

Photophysical image analysis for EMCCD camera imaging, https://zenodo.org/records/10531777 Methods are described in: https://doi.org/10.1371/journal.pone.0300122

Random sampling of ligand arrangements, https://github.com/dibyajyoti41/ligandbinding Methods are described in: https://doi.org/10.1103/PhysRevE.111.014412

Bayesian and frequentist analyses of two-state single-molecule diffusion trajectories, https://github.com/ewclarkson/BayFreq-2state Methods described in: https://doi.org/10.1088/1751-8121/add064

Qualifications

M.Sc., Linköping University
1993 Sept 1 → 1998 Jun 30
Award Date: 1998 Aug 31

Employment

Director of third cycle studies, Senior lecturer

Department of Earth and Environmental Sciences (MGeo)
Lund University

Lund, Sweden
2025 Dec 8 → present

Post-doc
Massachusetts Institute of Technology
Cambridge, United States
2006 Sept 1 → 2008 Sept 1

Post-doc
Nordic Institute for Theoretical Atomic Physics (NORDITA), Copenhagen
Copenhagen, Denmark
2003 Aug 1 → 2006 Aug 1

PhD student
University of Gothenburg
Gothenburg, Sweden
1998 Aug 1 → 2003 Jun 30

Research outputs

Achieving subtemporal resolution in the analysis of two-state single-molecule trajectories
Clarkson, E. & Ambjörnsson, T., 2026 Jan 30, In: Physical Review Research. 8, 1, p. 013115 18 p.

DOGMA: de novo assembly of densely labelled optical DNA maps using a matrix profile approach
Dvirnas, A., Leal-Garza, L. M., Abbaspour, Z., Fröbrant, E., Frykholm, K., Wrande, M., Sandegren, L., Westerlund, F. & Ambjörnsson, T., 2025 Dec, In: PLOS ONE. 20, 12 December, e0335633.

Strain-Level Typing of Streptococcus pyogenes Using Optical DNA Mapping
Kunnath, R. N., Abbaspour, Z., Johnning, A., Frykholm, K., Wrande, M., Dvirnas, A., KK, S., Giske, C. G., Ambjörnsson, T. , Sandegren, L., Kristiansson, E. & Westerlund, F., 2025 Nov 14, In: ACS Infectious Diseases. 11, 11, p. 3085-3092 8 p.

Photophysical image analysis for sCMOS cameras: Noise modelling and estimation of background parameters in fluorescence-microscopy images
Mohanta, D., Kunnath, R., Clarkson, E., Dvirnas, A., Westerlund, F. & Ambjörnsson, T., 2025 Nov 4, In: PLOS ONE. 20, 11, 20 p., e0335310.

Bayesian and frequentist analyses of two-state single-molecule diffusion trajectories
Clarkson, E. & Ambjörnsson, T., 2025 May 8, In: Journal of Physics A: Mathematical and Theoretical. 58, 19, 22 p., 195004.

Stained DNA Dot Detection (SD^3): An automated tool for quantifying fluorescent features along single stretched DNA molecules
Aning, O. A., Dvirnas, A., Nyblom, M., Krog, J., Carlson, J., Johansson, P., Ambjörnsson, T. & Westerlund, F., 2025 May, In: DNA Repair. 149, 103836.

Random sampling of ligand arrangements on a one-dimensional lattice
Mohanta, D., Dvirnas, A. & Ambjörnsson, T., 2025 Jan, In: Physical Review E. 111, 1, 014412.

Photophysical image analysis: Unsupervised probabilistic thresholding for images from electron-multiplying charge-coupled devices
Krog, J., Dvirnas, A., Ström, O. E., Beech, J. P., Tegenfeldt, J. O., Müller, V., Westerlund, F. & Ambjörnsson, T., 2024 Apr 5, In: PLoS ONE. 19, 4, e0300122.

Equilibrium melting probabilities of a DNA molecule with a defect: An exact solution of the Poland-Scheraga model
Genthon, A., Dvirnas, A. & Ambjörnsson, T., 2023 Oct 14, In: Journal of Chemical Physics. 159, 14, 12 p., 145102.

A simple cut and stretch assay to detect antimicrobial resistance genes on bacterial plasmids by single-molecule fluorescence microscopy
Goyal, G., Ekedahl, E., Nyblom, M., Krog, J., Fröbrant, E., Brander, M., Sewunet, T., Tangkoskul, T., Giske, C. G., Sandegren, L., Thamlikitkul, V., Ambjörnsson, T. & Westerlund, F., 2022 Dec, In: Scientific Reports. 12, 1, 9301.

Combining dense and sparse labeling in optical DNA mapping
Torstensson, E., Goyal, G., Johnning, A., Westerlund, F. & Ambjörnsson, T., 2021 Nov, In: PLoS ONE. 16, 11 November, e0260489.

Detection of structural variations in densely-labelled optical DNA barcodes: A hidden Markov model approach
Dvirnas, A., Stewart, C., Müller, V., Bikkarolla, S. K., Frykholm, K., Sandegren, L., Kristiansson, E., Westerlund, F. & Ambjörnsson, T., 2021 Nov, In: PLoS ONE. 16, 11 November, e0259670.

Modeling protein target search in human chromosomes
Nyberg, M., Ambjörnsson, T., Stenberg, P. & Lizana, L., 2021 Jan 19, In: Physical Review Research. 3, 1, 013055.

A Predictive Model of Antibody Binding in the Presence of IgG-Interacting Bacterial Surface Proteins
Kumra Ahnlide, V., de Neergaard, T., Sundwall, M., Ambjörnsson, T. & Nordenfelt, P., 2021, In: Frontiers in Immunology. 12, 629103.

CRISPR/CAS9 BASED DNA-COMBING ASSAY FOR DETECTING ANTIMICROBIAL RESISTANCE GENES ON PLASMIDS
Goyal, G., Ekedahl, E., Nyblom, M., Krog, J., Torstensson, E., Sewunet, T., Giske, C., Thamlikitkul, V., Ambjörnsson, T. & Westerlund, F., 2021, *MicroTAS 2021 - 25th International Conference on Miniaturized Systems for Chemistry and Life Sciences.* Chemical and Biological Microsystems Society, p. 801-802 2 p.

Cultivation-Free Typing of Bacteria Using Optical DNA Mapping
Müller, V., Nyblom, M., Johnning, A., Wrande, M., Dvirnas, A., Kk, S., Giske, C. G., Ambjörnsson, T., Sandegren, L., Kristiansson, E. & Westerlund, F., 2020 May 8, In: ACS Infectious Diseases. 6, 5, p. 1076-1084 9 p.

Enzyme-free optical DNA mapping of the human genome using competitive binding
Müller, V., Dvirnas, A., Andersson, J., Singh, V., Kk, S., Johansson, P., Ebenstein, Y., Ambjörnsson, T. & Westerlund, F., 2019 Sept 5, In: Nucleic Acids Research. 47, 15, e89.

Optical DNA Mapping Combined with Cas9-Targeted Resistance Gene Identification for Rapid Tracking of Resistance Plasmids in a Neonatal Intensive Care Unit Outbreak
Bikkarolla, S. K., Nordberg, V., Rajer, F., Müller, V., Kabir, M. H., Kk, S., Dvirnas, A., Ambjörnsson, T., Giske, C. G., Navér, L., Sandegren, L. & Westerlund, F., 2019 Jul 9, In: mBio. 10, 4, e00347-19.

Bacterial identification by optical mapping of genomic DNA in nanofluidic channels
Nyblom, M., Müller, V., Johnning, A., Wrande, M., Dvirnas, A., Sriram, K. K., Giske, C. G., Ambjörnsson, T., Sandegren, L., Kristiansson, E. & Westerlund, F., 2019, *23rd International Conference on Miniaturized Systems for Chemistry and Life Sciences, MicroTAS 2019.* Chemical and Biological Microsystems Society, p. 821-822 2 p. (23rd International Conference on Miniaturized Systems for Chemistry and Life Sciences, MicroTAS 2019).

Fitting a function to time-dependent ensemble averaged data
Fogelmark, K., Lomholt, M. A., Irbäck, A. & Ambjörnsson, T., 2018 Dec 1, In: Scientific Reports. 8, 1, 6984.

The resistomes of six carbapenem-resistant pathogens - a critical genotype-phenotype analysis
Johnning, A., Karami, N., Tång Hallbäck, E., Müller, V., Nyberg, L., Buongermino Pereira, M., Stewart, C., Ambjörnsson, T., Westerlund, F., Adlerberth, I. & Kristiansson, E., 2018 Nov, In: Microbial Genomics. 4, 11

Zero-crossing statistics for non-Markovian time series
Nyberg, M., Lizana, L. & Ambjörnsson, T., 2018 Mar 14, In: Physical Review E. 97, 3, 032114.

Facilitated sequence assembly using densely labeled optical DNA barcodes: A combinatorial auction approach
Dvirnas, A., Pichler, C., Stewart, C. L., Quaderi, S., Nyberg, L. K., Müller, V., Bikkarolla, S. K., Kristiansson, E., Sandegren, L., Westerlund, F. & Ambjörnsson, T., 2018 Mar 1, In: PLoS ONE. 13, 3, e0193900.

Stochastic unfolding of nanoconfined DNA: Experiments, model and Bayesian analysis
Krog, J., Alizadehheidari, M., Werner, E., Bikkarolla, S. K., Tegenfeldt, J. O., Mehlig, B., Lomholt, M. A., Westerlund, F. & Ambjörnsson, T., 2018, In: Journal of Chemical Physics. 149, 21, 215101.

Tracer particle diffusion in a system with hardcore interacting particles
Pigeon, S., Fogelmark, K., Söderberg, B., Mukhopadhyay, G. & Ambjörnsson, T., 2017 Dec 21, In: Journal of Statistical Mechanics: Theory and Experiment. 2017, 12, 123209.

Noise reduction in single time frame optical DNA maps
Torche Pedreschi, P. C., Müller, V., Westerlund, F. & Ambjörnsson, T., 2017 Jun 1, In: PLoS ONE. 12, 6, e0179041.

Tracer particles in two-dimensional elastic networks diffuse logarithmically slow
Lizana, L., Ambjörnsson, T. & Lomholt, M. A., 2017 Jan 20, In: Journal of Physics A: Mathematical and Theoretical. 50, 3, 034001.

Direct identification of antibiotic resistance genes on single plasmid molecules using CRISPR/Cas9 in combination with optical DNA mapping
Müller, V., Rajer, F., Frykholm, K., Nyberg, L. K., Quaderi, S., Fritzsche, J., Kristiansson, E., Ambjörnsson, T., Sandegren, L. & Westerlund, F., 2016 Dec 1, In: Scientific Reports. 6, 37938.

Super-Resolution Genome Mapping in Silicon Nanochannels
Jeffet, J., Kobo, A., Su, T., Grunwald, A., Green, O., Kinos, A., Eisenberg, E., Ambjörnsson, T., Westerlund, F., Weinhold, E., Shabat, D., Purohit, P. K. & Ebenstein, Y., 2016 Nov 22, In: ACS Nano. 10, 11, p. 9823-9830 8 p.

Rapid identification of intact bacterial resistance plasmids via optical mapping of single DNA molecules
Nyberg, L. K., Quaderi, S., Emilsson, G., Karami, N., Lagerstedt, E., Müller, V., Noble, C., Hammarberg, S., Nilsson, A. N. , Sjöberg, F., Fritzsche, J., Kristiansson, E., Sandegren, L., Ambjörnsson, T. & Westerlund, F., 2016 Jul 27, In: Scientific Reports. 6, 30410.

A simple method to calculate first-passage time densities with arbitrary initial conditions
Nyberg, M., Ambjörnsson, T. & Lizana, L., 2016 Jun 1, In: New Journal of Physics. 18, 6, 063019.

Rapid tracing of resistance plasmids in a nosocomial outbreak using optical DNA mapping
Müller, V., Karami, N., Nyberg, L. K., Pichler, C., Torche Pedreschi, P. C., Quaderi, S., Fritzsche, J., Ambjörnsson, T., Åhrén, C. & Westerlund, F., 2016 May 13, In: ACS Infectious Diseases. 2, 5, p. 322-328 7 p.

Detailed characterization of plasmids carrying resistance genes using optical DNA mapping
Müller, V., Nyberg, L. K., Quaderi, S., Kristiansson, E., Ambjörnsson, T., Sandegren, L. & Westerlund, F., 2016, *20th International Conference on Miniaturized Systems for Chemistry and Life Sciences, MicroTAS 2016.* Chemical and Biological Microsystems Society, p. 1561-1562 2 p.

A fast and scalable kymograph alignment algorithm for nanochannel-based optical DNA mappings.
Noble, C., Nilsson, A., Freitag, C., Beech, J., Tegenfeldt, J. & Ambjörnsson, T., 2015, In: PLoS ONE. 10, 4, e0121905.

Bacteriophage strain typing by rapid single molecule analysis.
Grunwald, A., Dahan, M., Giesbertz, A., Nilsson, A., Nyberg, L. K., Weinhold, E., Ambjörnsson, T., Westerlund, F. & Ebenstein, Y., 2015, In: Nucleic Acids Research. 43, 18, p. e117

Extension of nanoconfined DNA: Quantitative comparison between experiment and theory
Iarko, V., Werner, E., Nyberg, L. K., Muller, V., Fritzsche, J., Ambjörnsson, T., Beech, J., Tegenfeldt, J., Mehlig, K., Westerlund, F. & Mehlig, B., 2015, In: Physical Review E (Statistical, Nonlinear, and Soft Matter Physics). 92, 6, 062701.

Fast size-determination of intact bacterial plasmids using nanofluidic channels
Frykholm, K., Nyberg, L. K., Lagerstedt, E., Noble, C., Fritzsche, J., Karami, N., Ambjörnsson, T., Sandegren, L. & Westerlund, F., 2015, In: Lab on a Chip. 15, 13, p. 2739-2743

How nanochannel confinement affects the DNA melting transition within the Poland-Scheraga model.
Reiter-Schad, M., Werner, E., Tegenfeldt, J., Mehlig, B. & Ambjörnsson, T., 2015, In: Journal of Chemical Physics. 143, 11 , 115101.

Many-body effects on tracer particle diffusion with applications for single-protein dynamics on DNA
Ahlberg, S., Ambjörnsson, T. & Lizana, L., 2015, In: New Journal of Physics. 17, 043036.

Model for melting of confined DNA
Werner, E., Reiter-Schad, M., Ambjörnsson, T. & Mehlig, B., 2015, In: Physical Review E (Statistical, Nonlinear, and Soft Matter Physics). 91, 6, 060702.

Nanoconfined Circular and Linear DNA: Equilibrium Conformations and Unfolding Kinetics
Alizadehheidari, M., Werner, E., Noble, C., Reiter-Schad, M., Nyberg, L. K., Fritzsche, J., Mehlig, B., Tegenfeldt, J., Ambjörnsson, T., Persson, F. & Westerlund, F., 2015, In: Macromolecules. 48, 3, p. 871-878

Visualizing the entire DNA from a chromosome in a single frame
Freitag, C., Noble, C., Fritzsche, J., Persson, F., Reiter-Schad, M., Nilsson, A., Graneli, A., Ambjörnsson, T., Mir, K. U. & Tegenfeldt, J., 2015, In: Biomicrofluidics. 9, 4, 044114.

Ageing single file motion
Metzler, R., Sanders, L., Lomholt, M. A., Lizana, L., Fogelmark, K. & Ambjörnsson, T., 2014, In: The European Physical Journal. Special Topics. 223, 14, p. 3287-3293

Competitive binding-based optical DNA mapping for fast identification of bacteria - multi-ligand transfer matrix theory and experimental applications on Escherichia coli.
Nilsson, A., Emilsson, G., Nyberg, L. K., Noble, C., Svensson Stadler, L., Fritzsche, J., Moore, E. R. B., Tegenfeldt, J., Ambjörnsson, T. & Westerlund, F., 2014, In: Nucleic Acids Research. 42, 15, p. e118

Nanoconfined circular DNA
Alizadehheidari, M., Werner, E., Noble, C., Nyberg, L. K., Fritzsche, J., Persson, F., Mehlig, B., Tegenfeldt, J. O., Ambjörnsson, T. & Westerlund, F., 2014, *18th International Conference on Miniaturized Systems for Chemistry and Life Sciences, MicroTAS 2014*. Chemical and Biological Microsystems Society, p. 1353-1355 3 p.

Non-Markovian effects in the first-passage dynamics of obstructed tracer particle diffusion in one-dimensional systems.
Forsling, R., Sanders, L., Ambjörnsson, T. & Lizana, L., 2014, In: Journal of Chemical Physics. 141, 9, 094902.

Severe slowing-down and universality of the dynamics in disordered interacting many-body systems: ageing and ultraslow diffusion
Sanders, L., Lomholt, M. A., Lizana, L., Fogelmark, K., Metzler, R. & Ambjörnsson, T., 2014, In: New Journal of Physics. 16, 113050.

Single-file diffusion with non-thermal initial conditions
Lizana, L., Lomholt, M. A. & Ambjörnsson, T., 2014, In: Physica A: Statistical Mechanics and its Applications. 395, p. 148-153

Universality and nonuniversality of mobility in heterogeneous single-file systems and Rouse chains
Lomholt, M. A. & Ambjörnsson, T., 2014, In: Physical Review E (Statistical, Nonlinear, and Soft Matter Physics). 89, 3, 032101.

Identifying bacteria using DNA binding maps
Emilsson, G., Nilsson, A., Nyberg, L. K., Noble, C., Svensson Stadler, L., Moore, E. R. B., Ambjörnsson, T., Tegenfeldt, J. O. & Westerlund, F., 2013 Jan 1, *17th International Conference on Miniaturized Systems for Chemistry and Life Sciences, MicroTAS 2013.* Chemical and Biological Microsystems Society, Vol. 1. p. 473-475 3 p.

Microscopic Origin of the Logarithmic Time Evolution of Aging Processes in Complex Systems
Lomholt, M. A., Lizana, L., Metzler, R. & Ambjörnsson, T., 2013, In: Physical Review Letters. 110, 20, 208301.

Perturbative solution to susceptible-infected-susceptible epidemics on networks.
Sanders, L., Söderberg, B., Brockmann, D. & Ambjörnsson, T., 2013, In: Physical Review E (Statistical, Nonlinear, and Soft Matter Physics). 88, 3, 032713.

First passage times for a tracer particle in single file diffusion and fractional Brownian motion.
Sanders, L. & Ambjörnsson, T., 2012, In: Journal of Chemical Physics. 136, 17, 175103.

Dissimilar bouncy walkers
Lomholt, M. A., Lizana, L. & Ambjörnsson, T., 2011, In: Journal of Chemical Physics. 134, 4, 045101.

Foundation of fractional Langevin equation: Harmonization of a many-body problem
Lizana, L., Ambjörnsson, T., Taloni, A., Barkai, E. & Lomholt, M. A., 2010, In: Physical Review E (Statistical, Nonlinear, and Soft Matter Physics). 81, 5

Observing Plasmonic-Molecular Resonance Coupling on Single Gold Nanorods
Ni, W., Ambjörnsson, T., Apell, S. P., Chen, H. & Wang, J., 2010, In: Nano Letters. 10, 1, p. 77-84

Single DNA denaturation and bubble dynamics
Metzler, R., Ambjörnsson, T., Hanke, A. & Fogedby, H. C., 2009 Jan 21, In: Journal of Physics: Condensed Matter. 21, 3, 034111.

Bubble merging in breathing DNA as a vicious walker problem in opposite potentials.
Pedersen, J., Hansen, M. S., Novotný, T., Ambjörnsson, T. & Metzler, R., 2009, In: Journal of Chemical Physics. 130, 16, 164117.

Diffusion of finite-sized hard-core interacting particles in a one-dimensional box: Tagged particle dynamics
Lizana, L. & Ambjörnsson, T., 2009, In: Physical Review E (Statistical, Nonlinear, and Soft Matter Physics). 80, 5

Single-file dynamics with different diffusion constants
Ambjörnsson, T., Lizana, L., Lomholt, M. A. & Silbey, R. J., 2008 Nov 14, In: The Journal of chemical physics. 129, 18, 185106.

Diffusion of two particles with a finite interaction potential in one dimension
Ambjörnsson, T. & Silbey, R. J., 2008 Oct 28, In: The Journal of chemical physics. 129, 16, p. 165103

Single-File Diffusion in a Box
Lizana, L. & Ambjörnsson, T., 2008, In: Physical Review Letters. 100, 20, 200601.

Breathing Dynamics in Heteropolymer DNA
Ambjörnsson, T., Banik, S. K., Krichevsky, O. & Metzler, R., 2007 Apr 15, In: Biophysical Journal. 92, 8, p. 2674-2684

Single DNA conformations and biological function
Metzler, R., Ambjörnsson, T., Hanke, A., Zhang, Y. & Levene, S., 2007 Jan 1, In: Journal of Computational and Theoretical Nanoscience. 4, 1, p. 1-49 49 p.

Applying a potential across a biomembrane: Electrostatic contribution to the bending rigidity and membrane instability
Ambjörnsson, T., Lomholt, M. A. & Hansen, P. L., 2007, In: Physical Review E. 75, 5, 051916.

Bubble coalescence in breathing DNA: Two vicious walkers in opposite potentials
Novotny, T., Pedersen, J., Ambjörnsson, T., Hansen, M. S. & Metzler, R., 2007, In: Europhysics Letters. 77, 4, 48001.

Master equation approach to DNA breathing in heteropolymer DNA
Ambjörnsson, T., Banik, S. K., Lomholt, M. A. & Metzler, R., 2007, In: Physical Review E. 75, 2, 021908.

Resonant coupling between localized plasmons and anisotropic molecular coatings in ellipsoidal metal nanoparticles
Ambjörnsson, T., Mukhopadhyay, G., Apell, S. P. & Käll, M., 2006, In: Physical Review B. 73, 8

Sequence Sensitivity of Breathing Dynamics in Heteropolymer DNA
Ambjörnsson, T., Banik, S. K., Krichevsky, O. & Metzler, R., 2006, In: Physical Review Letters. 97, 12

Blinking statistics of a molecular beacon triggered by end-denaturation of DNA
Ambjörnsson, T. & Metzler, R., 2005 Dec 14, In: Journal of Physics: Condensed Matter. 17, 49, p. S4305-S4316

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