Monika Scholz

Contact Information

Princeton University
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Princeton, NJ 08544

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Education

PhD in Biophysics, The University of Chicago, Chicago, IL ..... August 2017
Thesis: 'Developing a Quantitative Description of Feeding Behavior and its Response to Perturbations' Advisors: Aaron R. Dinner and David Biron

MS in Biophysics, The University of Chicago, Chicago, IL ..... July 2014

Dipl. Phys. in Physics, Technical University Dresden, Dresden, Germany ..... August 2012
Thesis: 'XMAP215 increases both speed and dispersion of microtubule growth', Advisor: Jonathon Howard

B.Sc in Physics, Julius - Maximilians University, Würzburg, Germany ..... August 2010
Thesis: 'Measurement of the applied work in an optical trap', Advisors: Stephan Grill and Haye Hinrichsen

Research Experience

Princeton University, Princeton NJ, USA 2017-ongoing
Dicke Fellow in the Department of Physics
Wholebrain calcium imaging of *C. elegans* to study the neural basis of behavior

The University of Chicago, Chicago IL, USA 2012-2017
PhD student with Aaron Dinner and David Biron
Characterization of feeding behavior in *C. elegans* and models of transport dynamics of molecular motors. Developing instrumentation and image analysis tools for automated behavior quantification

Max-Planck Institute for Cell Biology and Genetics, Dresden, Germany 2011-2012
Investigating dynamics of microtubules using TIRF imaging in microfluidics and developing quantitative image analysis tools for large imaging datasets

Harvard University, Cambridge MA, USA 2010-2011
Research Fellow, Levine Lab
Using fluorescence imaging and quantitative PCR to determine proliferation and transcriptional profile of *P. aeruginosa* during the slow-killing process in *C. elegans*

Max-Planck Institute for Cell Biology and Genetics, Dresden, Germany 2010
Measuring thermodynamic properties in a dual optical trap setup to develop a testable experimental protocol for an optical trap based Szilard engine

Awards and Fellowships

William Rainey Harper Dissertation Fellowship, 2016-2017
HHMI International Graduate Student Fellowship, 2014 - 2017
Awardee of Peirce Fellowship, Harvard University, 2012, *declined*
Baron von Swaine Stipend, University of Würzburg, 2010
German National Academic Foundation, 2008-2012
Konrad Adenauer Stiftung, 2007-2012

Travel awards

Gordon Research Conference on Stochastic Physics in Biology, Ventura, CA, (8 Jan - 13 Jan 2017)
Tenth q-bio Conference, Virginia Tech, Nashville, TN, USA (27 Jul - 31 Jul 2016)
The University of Chicago-Peking University Joint Meeting, Beijing, China (23 Aug - 25 Aug 2013)

Publications in preparation

Scholz, M., Weirich, K. L., Gardel, M. L. and Dinner, A. R. (submitted), Tuning molecular motor transport through cytoskeletal filament network organization
BioRXiv doi: https://doi.org/10.1101/277947

Scholz, M., Linder, A. L., Yu, X., Randi, F., Sharma, A., Shaevitz, J. and Leifer, A. L. (in preparation) Predicting behavior from neural dynamics

Publications

Scholz, M., Dinner, A. R., Levine, E. and Biron, D. (2017). Stochastic feeding dynamics arise from the need for information and energy. Proceedings of the National Academy of Sciences *114*, 9261–9266.

Sanders, J.*, **Scholz, M.***, Merutka, I. and Biron, D. (*equal contribution)(2017). Distinct unfolded protein responses mitigate or mediate effects of nonlethal deprivation of *C. elegans* sleep in different tissues. BMC Biology *15*, 67.

Lee, K. S., Iwanir, S., Kopito, R. B., **Scholz, M.**, Calarco, J. A., Biron, D. and Levine, E. (2017). Serotonin-dependent kinetics of feeding bursts underlie a graded response to food availability in *C. elegans*. Nature Communications *8*, 14221.

Gibbons, S. M., **Scholz, M.**, Hutchison, A. L., Dinner, A. R., Gilbert, J. A. and Coleman, M. L. (2016). Disturbance regimes predictably alter diversity in an ecologically complex bacterial system. mBio *7*, e01372–16.

Scholz, M., Lynch, D. J., Lee, K. S., Levine, E. and Biron, D. (2016). A scalable method for automatically measuring pharyngeal pumping in *C. elegans*. Journal of Neuroscience Methods *274*, 172–178.

Scholz, M., Burov, S., Weirich, K. L., Scholz, B. J., Tabei, S. A., Gardel, M. L. and Dinner, A. R. (2016). Cycling State that Can Lead to Glassy Dynamics in Intracellular Transport. Physical Review X *6*, 011037.

Boecking, F. and **Scholz, M.** (2015). Did the Nationalist Government Manipulate the Chinese Bond Market? A Quantitative Perspective on Short-Term Price Fluctuations of Domestic Government Bonds, 1932–1934. Frontiers of History in China *10*, 126–144.

Bowne-Anderson, H., Zanic, M., **Kauer, M.**(maiden name), and Howard, J. (2013). Microtubule dynamic instability: A new model with coupled GTP hydrolysis and multistep catastrophe. BioEssays *35:452-461.*

Presentations

Scholz, M., Lee, K. S., Dinner, A., Biron, D. and Levine, E. (2016). To eat or not to eat: Feeding in noisy conditions Invited talk for the Dicke fellowship competition Princeton University, Princeton, New Jersey, USA (13 Dec - 15 Dec 2016)

Scholz, M., Burov, S., Weirich, K. L., Scholz, B. J., Tabei, S. A., Gardel, M. L. and Dinner, A. R. (2016). The network structure strongly influences intracellular transport. Contributed Talk at the Tenth q-bio Conference, Virginia Tech, Nashville, Tennessee, USA (27 Jul - 31 Jul 2016).

Scholz, M., Lee, K. S., Dinner, A., Biron, D. and Levine, E. (2015). Feeding in noisy conditions. Contributed talk at the 2016 Annual Meeting of the International Physics of Living Systems Network (iPoLS), Cambridge, MA, USA,(23 July - 26 July 2016).

Scholz, M., Burov, S., Weirich, K. L., Scholz, B. J., Tabei, S. A., Gardel, M. L. and Dinner, A. R. (2016). Cycling state that can lead to glassy dynamics in intracellular transport. Contributed talk at the APS March Meeting in Baltimore, Maryland (March 14 - March 18 2016).

Kauer, M., Burov, S., Tabei, A. and Dinner, A. (2015). A cycling state leads to aging in biological systems. Talk at the 2015 Annual Meeting of the International Physics of Living Systems Network (iPoLS), Arlington, VA, USA,(16 July - 20 July 2015).

Teaching

University of Chicago
2016, Teaching assistant, "Quantitative analysis of biological dynamics"
Teaching a lecture on image analysis of biological data, weekly student meetings to discuss final presentations

2014, Teaching assistant, "Synthesis and Modification"
Leading a 3 week workshop on cell culture techniques for graduate students

Technical University Dresden
winter term 2011, Teaching assistant, Mechanics lab
Designing a lab segment about dampened oscillators

Harvard University
summer term 2011, Teaching assistant, Thermodynamics and Statistics
2 weekly lectures during the semester, grading and office hours for 32 students

SERVICE

Committees

Biophysics student advisory board 2013 - 2017
Chair of recruitment planning 2014, 2016
Organizer Women in Biophysics (2015-2017)