

Peter J. Foster

PHYSICS OF LIVING SYSTEMS FELLOW, MIT
QUANTITATIVE CELL BIOLOGY, ACTIVE MATTER PHYSICS, COMPLEX SYSTEMS, SYSTEMS BIOLOGY
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Education

Harvard University

PHD IN APPLIED PHYSICS, MAY 2017 - S.M. IN APPLIED PHYSICS, MAY 2013

Advisor - Prof. Daniel Needleman

Thesis title: *Active dynamics of microtubule and motor protein networks*

Cambridge, MA

Aug. 2011 - Sept. 2017

University of Iowa

B.S. IN PHYSICS AND MATHEMATICS

Honors in Physics

Thesis title: *Mapping the Potential of Mean Force For Charged Colloidal Beads in the Vicinity of a Dielectric Discontinuity*

Iowa City, IA

Aug. 2007 - May 2011

Marine Biological Lab

PHYSIOLOGY COURSE PARTICIPANT

Woods Hole, MA

Summer 2015

Publications

7. B KAYE, O STEIHL, **PJ FOSTER**, MJ SHELLEY, DJ NEEDLEMAN, S FÜRTHAUER, MEASURING AND MODELING POLYMER GRADIENTS ARGUES THAT SPINDLE MICROTUBULES REGULATE THEIR OWN NUCLEATION, *arXiv*, 2017; ARXIV:1710.08405 [Q-BIO.SC]

(submitted)

6. DJ SHERMAN*, R XIE*, RJ TAYLOR*, AH GEORGE*, S OKUDA*, **PJ FOSTER***, DJ NEEDLEMAN, D KAHNE, LIPOPOLYSACCHARIDE IS TRANSPORTED TO THE CELL SURFACE BY A MEMBRANE-TO-MEMBRANE PROTEIN BRIDGE, *Science*, 2018; 359(6377); 798-801; DOI:10.1126/SCIENCE.AAR1886

(* denotes co-first authors)

5. R TAN, **PJ FOSTER**, DJ NEEDLEMAN, RJ MCKENNEY, COOPERATIVE ACCUMULATION OF DYNEIN-DYNACTIN AT MICROTUBULE MINUS-ENDS DRIVES MICROTUBULE NETWORK REORGANIZATION, *Dev. Cell*, 2018; 44(2); 233-247; DOI:10.1016/J.DEVCEL.2017.12.023

4. **PJ FOSTER***, W YAN*, S FÜRTHAUER, MJ SHELLEY, DJ NEEDLEMAN, CONNECTING MACROSCOPIC DYNAMICS WITH MICROSCOPIC PROPERTIES IN ACTIVE NETWORK CONTRACTION, *New J. Phys.*, 2017; 19; 125011; DOI:10.1088/1367-2630/AA9320

(* denotes co-first authors)

3. B KAYE, TY YOO, **PJ FOSTER**, CH YU, DJ NEEDLEMAN, BRIDGING LENGTH SCALES TO MEASURE POLYMER ASSEMBLY, *Mol. Biol. Cell*, 2017; 28(10); 1377-1388; DOI:10.1091/MBE.E16-05-0344

2. B KAYE*, **PJ FOSTER***, TY YOO*, DJ NEEDLEMAN, DEVELOPING AND TESTING A BAYESIAN ANALYSIS OF FLUORESCENCE LIFETIME MEASUREMENTS, *PLoS ONE*, 2017;12(1); E0169337; DOI:10.1371/JOURNAL.PONE.0169337

(* denotes co-first authors)

1. **PJ FOSTER**, S FÜRTHAUER, MJ SHELLEY, DJ NEEDLEMAN, ACTIVE CONTRACTION OF MICROTUBULE NETWORKS, *eLife*, 2015;4:E10837; DOI:10.7554/ELIFE.10837

Presentations & Posters

INVITED TALKS

- 2018 **Fundamental Problems in Active Matter**, Aspen Center for Physics
- 2017 **Cellular Dynamics Research Talk**, Harvard University
- 2017 **Condensed Matter Seminar**, Tufts University
- 2016 **Soft Matter Day**, Mt. Holyoke College
- 2016 **Applied Math Lab Seminar**, Courant Institute, NYU
- 2015 **New England Society for Microscopy Fall Meeting**, Saint-Gobain
- 2015 **Squishy Physics Seminar**, Harvard University

Aspen, CO
Cambridge, MA
Medford, MA
South Hadley, MA
New York, NY
Northboro, MA
Cambridge, MA

CONTRIBUTED TALKS

2018	APS March Meeting	Los Angeles, CA
2016	New England Complex Fluids Meeting , Harvard University	Cambridge, MA
2016	APS March Meeting	Baltimore, MD
2015	ASCB Annual Meeting	San Diego, CA
2015	New England Complex Fluids Meeting , Harvard University	Cambridge, MA
2015	Kavli Seminar , Harvard University	Cambridge, MA
2015	Gordon Research Seminar on Soft Condensed Matter Physics , Colby-Sawyer College	New London, NH
2013	New England Complex Fluids Meeting , Boston University	Boston, MA

POSTERS

2018	Fundamental Problems in Active Matter , Aspen Center for Physics (Won Poster Award)	Aspen, CO
2017	Houghton Conference on Non-Equilibrium Physics of Soft and Biological Systems , Brown University	Providence, RI
2017	BAMM Meeting Whitehead Institute	Cambridge, MA
2016	ASCB Annual Meeting	San Francisco, CA
2016	Annual Meeting of the International Physics of Living Systems (iPoLS) Network	Cambridge, MA
2015	ASCB Annual Meeting	San Diego, CA
2015	Boston Physics of Living Systems Hangout , Harvard University	Cambridge, MA
2015	Gordon Research Conference on Soft Condensed Matter Physics , Colby-Sawyer College	New London, CT
2015	BAMMstock , Whitehead Institute (Won Poster Award)	Cambridge, MA
2014	ASCB Annual Meeting	Philadelphia, PA
2014	BAMMapalooza , Whitehead Institute	Cambridge, MA
2013	ASCB Annual Meeting	New Orleans, LA

Teaching and Service

Biological Soft Matter Conference

ORGANIZER

2017, 2018

ASCB sponsored conference which aims to bring together early career researchers working at the interface between cell biology and soft matter physics.

Boston Soft Matter Social

ORGANIZER

2016 - Present

Monthly gathering of graduate students and postdocs in the Greater Boston area working in the broad field of soft matter physics. The goal of these meetings is to connect soft matter researchers in the local area in order to build a stronger soft matter community.

Engineering Sciences 123 : Introduction to Fluid Mechanics and Transport Processes

Harvard University

PROF. DANIEL NEEDLEMAN AND PROF. SHMUEL RUBINSTEIN

Spring 2014

Undergraduate level course designed for Engineering concentrators surveying fluid mechanics. As a Teaching Fellow for this course, I co-taught a discussion section and ran several lab sections along with other TF's. Based on my work with this course, I received a Certificate of Distinction in Teaching from the Bok Center at Harvard.

Applied Physics 225 : Introduction to Soft Matter

Harvard University

DR. IAN MORRISON

Fall 2012

Graduate level course, providing an overview of the field of Soft Matter physics. As a Teaching Fellow for this course, I managed digital resources for students and developed software to automatically pair publications from SEAS faculty with topics being discussed in class, in addition to holding office hours, grading, and moderating an online forum for student questions and feedback.

Honors & Awards

2018	Early Career Meeting Grant , American Society for Cell Biology
2017	MIT Physics of Living Systems Fellowship , Gordon and Betty Moore Foundation
2017	Early Career Meeting Grant , American Society for Cell Biology
2016	QCBNet Travel Award
2015	Post-Course Research Grant , Marine Biological Lab
2014	Certificate of Distinction in Teaching , Harvard University
2011	ICRU Research Fellow , University of Iowa
2010	ICRU Research Fellow , University of Iowa
2010	William R. Savage Award , University of Iowa
2008	Van Allen Research Grant , University of Iowa

Memberships

2015-	American Physical Society
2015-	American Society of Microbiology
2013-	American Society of Cell Biology
2012-	New England Complex Fluids Workgroup