

John Fricks

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School of Mathematical & Statistical Sciences
Arizona State University
Tempe, AZ 85281

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Education

PhD (2004), Statistics.
University of North Carolina, Chapel Hill.
Thesis Advisor: Amarjit Budhiraja.

MS (2003), Statistics.
University of North Carolina, Chapel Hill.

MS (1999), Mathematics.
Western Kentucky University.
Thesis Advisor: Randall Swift.

BM (*summa cum laude*, 1994), Music Performance and Economics.
Western Kentucky University.

Professional Employment

Associate Professor.
School of Mathematical and Statistical Sciences.
Arizona State University, Tempe.

August 2016-present

Associate Professor.
Dept of Statistics.
Pennsylvania State University, University Park.

July 2011-July 2016

Assistant Professor.
Dept of Statistics.
Pennsylvania State University, University Park.

July 2005-June 2011

Research Assistant Professor.
Dept of Mathematics.
University of North Carolina, Chapel Hill.
Postdoctoral Mentor: Timothy Elston

August 2004-June 2005

Other Affiliations

Member.
Center for Infectious Disease Dynamics. Until July 2016.
Pennsylvania State University, University Park.

Member.
Center for Cellular Dynamics. Until July 2016.
Pennsylvania State University, University Park.

**Short Term
Visits**

Isaac Newton Institute	Cambridge, UK.	May 2016.
Georg-August-Universität.	Göttingen, Germany.	September 2011.
SAMSI.	Durham, NC.	January 2010-May 2010.

**Articles in
Refereed
Journals**

Jason Bernstein and John Fricks (2016). Analysis of Single Particle Diffusion with Transient Binding using Particle Filtering. *Journal of Theoretical Biology*. **401**, 109-121.

Joshua Goldstein, Murali Haran, Ivan Simeonov, John Fricks, and Francesca Chiaromonte (2015). An attraction-repulsion point process model for respiratory syncytial virus infections. *Biometrics*. **71**, No. 2, 376-385.

Gustavo Didier and John Fricks (2014). On the Wavelet-based Simulation of Anomalous Diffusion. *Journal of Statistical Computation and Simulation*. **84**, No. 4, 697-723.

John Hughes, Shankar Sastry, William O. Hancock, and John Fricks (2013). Estimating Velocity for Processive Motor Proteins with Random Detachment. *Journal of Agricultural, Biological, and Environmental Statistics*. **18**, No. 2, 204-217.

Le Bao, John Fricks, and Murali Haran (2012). Comment on the Mechanistic Modeling and Inference for Cell Motility by Manolopoulou et al. *Journal of the American Statistical Association*. **107**, Issue 499, 869-871.

Gustavo Didier, Scott A. McKinley, David B. Hill, and John Fricks (2012). Statistical Challenges in Microrheology. *Journal of Time Series Analysis*. **33**, No. 5, 724-743.

Emily Simons, Matthew Ferrari, John Fricks, Kathleen Wannemuehler, Abhijeet Anand, Tony Burton, and Peter Strebel (2012). Assessment of the 2010 global measles mortality reduction goal: results from a model of surveillance data. *The Lancet*. **379**, Issue 9832, 2173-2178.

Scott A. McKinley, Avanti Athreya, John Fricks, and Peter R. Kramer (2012). Asymptotic Analysis of Microtubule-based Transport by Multiple Identical Molecular Motors. *Journal of Theoretical Biology*. **305**, 54-69.

John Hughes, William O. Hancock, and John Fricks (2012). Kinesins with Extended Neck Linkers: A Chemomechanical Model for Variable-Length Stepping. *Bulletin of Mathematical Biology*. **74**, No. 5, 1066-1097.

Shi Chen, John Fricks, and Matthew Ferrari (2012). Tracking Measles Infection through Non-linear State Space Models. *Journal of the Royal Statistical Society, Series C.* **61**, No. 1, 117-134.

John Hughes and John Fricks (2011). A Mixture Model for Quantum Dot Images of Kinesin Motor Assays. *Biometrics.* **67**, No. 2, 588-595.

John Hughes, William O. Hancock, and John Fricks (2011). A Matrix Computational Approach to Kinesin Neck Linker Extension. *Journal of Theoretical Biology.* **269**, No. 1, 181-194.

Ivan Simeonov, Xiaoyan Gong, Oekyung Kim, Mary Poss, Francesca Chiaromonte, and John Fricks (2010). Exploratory Spatial Analysis of *in vitro* Respiratory Syncytial Virus Co-infections. *Viruses.* **2**, No. 12, 2782-2802.

Matthew L. Kutys, John Fricks, and William O. Hancock (2010). Monte Carlo Analysis of Neck Linker Extension in Kinesin Molecular Motors. *PLoS Computational Biology.* **6**, No. 11.

John Hughes, John Fricks, and William O. Hancock (2010). Likelihood Inference for Particle Location in Fluorescence Microscopy. *Annals of Applied Statistics.* **4**, No. 2, 830-848.

John Fricks, Lingxing Yao, Timothy Elston, and Gregory Forest (2009). Time-Domain Methods For Diffusive Transport In Soft Matter. *SIAM Journal on Applied Mathematics.* **69**, No. 5, pp. 1277-1308.

John Fricks, Hongyun Wang, and Timothy Elston (2006). A Numerical Algorithm for Investigating the Role of the Motor-cargo Linkage in Molecular Motor Driven Transport. *Journal of Theoretical Biology.* **239**, 33-48.

Amarjit Budhiraja and John Fricks (2006). Molecular Motors, Brownian Ratchets, and Reflected Diffusions. *Discrete and Continuous Dynamical Systems-B.* **6**, No. 4, 711-734.

John Fricks and Randall Swift (2001). A Stochastic Richardson's Arms Race Model. *The American Journal of Mathematical and Management Sciences.* **21**, 313-323.

Other Publications

John Fricks (2007). Stochastic Processes and Models by David Stirzaker. *Journal of the American Statistical Association*, **101**, March 2007.

John Fricks (2004). Biomolecular Motors and Diffusion Ratchets. Doctoral Thesis. University of North Carolina, Chapel Hill.

John Fricks (1999). A Stochastic Analog to the Richardson's Arms Race Model. Master's Thesis. Western Kentucky University.

**External Grants
as Principal
Investigator**

Principal Investigator of record in a multi-PI team:
Fricks (ASU) William Hancock (PSU)
Peter Kramer (RPI) Scott McKinley (Tulane)

*Bridging Understanding of Motor-Cargo Transport from
Artificial to Cellular Systems.*

DMS/NIGMS Initiative at the Interface of Biological and Mathematical Sciences.

National Institutes of Health. September 2016-August 2020.

Total award amount: \$1,597,000

Principal Investigator (with co-Investigator Gustavo Didier, Tulane)

*Forward and Inverse Methods for Stochastic Models of
Diffusing Particles in Complex Biofluids.*

Army Research Office. August 2014-July 2017.

Total award amount: \$355,000.

Principal Investigator (with co-PI William Hancock, PSU)

Diffusion and Kinetics in Processive Molecular Motor. (DMS-0714939).

DMS/NIGMS Initiative at the Interface of Biological and Mathematical Sciences.

National Science Foundation. September 2007-August 2013.

Total award amount: \$567,000.

Principal Investigator (with co-Investigator Gustavo Didier, Tulane)

Statistical Inference and Stochastic Simulation for Microrheology.

Army Research Office. September 2012-June 2013.

Total award amount: \$50,000.

Principal Investigator.

Mathematical Sciences Postdoctoral Fellowship. (DMS-0403040).

National Science Foundation. August 2004-August 2007.

Total award amount: \$108,000.

**External Grants
as co-Investigator**

co-Investigator (with PI Tony Huang, co-I Stephen Benkovic)

Validation of acoustic tweezers for single-cell analyses of purine metabolism.

National Institutes of Health. September 2014 - June 2017.

Total award amount: \$359,000.

co-Investigator (with PI Matthew Ferrari, co-I Kirsten Eilertson)

Retrospective Impact Modeling for Measles Vaccination.

Global Alliance for Vaccines and Immunizations.

September 2014-December 2015.

Total award amount: \$76,000.

Other Funding and Fellowships Faculty Fellowship 2012.
Penn State Institute for CyberScience.
Total award amount: \$25,000.

Research Fellowship.
National Science Foundation
via Statistical and Applied Mathematical Sciences Institute.
January 2010-May 2010.
Total award amount: \$14,746.

Invited Presentations

University of Arizona.	Tucson, AZ. October 2016.
Tulane University.	New Orleans, LA. October 2016.
SIAM-Life Sciences Meeting.	Boston, MA. July 2016.
Isaac Newton Institute.	Cambridge, UK. May 2016.
Oregon State University.	Corvallis, OR. March 2016.
Mathematical Biosciences Institute.	Columbus, OH. February 2016.
Arizona State University	Tempe, AZ. January 2016.
AMS 2015 Fall Eastern Section.	New Brunswick, NJ. November 2015.
University of Tennessee.	Knoxville, TN. October 2015.
IMACS Conference.	Athens, GA. April 2015.
ENAR.	Miami, FL. March 2015.
Old Dominion University.	Norfolk, VA. February 2015.
University of Virginia.	Charlottesville, VA. February 2015.
University of Rochester.	Rochester, NY. November 2014.
SIAM-Life Sciences Meeting.	Charlotte, NC. August 2014.
IMS Asian Pacific Rim Meeting.	Taipei, Taiwan. July 2014.
ENAR.	Baltimore, MD. March 2014.
George Mason University.	Fairfax, VA. January 2014.
University of Maryland, BC.	Baltimore, MD. November 2013.
University of Minnesota.	Minneapolis, MN. September 2013.
NOLTA.	Santa Fe, NM. September 2013.
European Meeting of Statisticians.	Budapest, Hungary. July 2013.
ENAR.	Orlando, FL. March 2013.
SIAM Conference on CS&E.	Boston, MA. February 2013.
UMass, Boston.	Boston, MA. February 2013.
Tulane University.	New Orleans, LA. December 2012.
AMS Fall Southeastern Section.	New Orleans, LA. October 2012.
SIAM-Life Science Meeting.	San Diego, CA. August 2012.
SMB Annual Meetings.	Knoxville, TN. July 2012.
Iowa State University.	Ames, IA. May 2012.
Mathematical Biosciences Institute.	Columbus, OH. October 2011.
Sandia National Laboratory.	Albuquerque, NM. October, 2011.
Georg-August-Universität	Göttingen, Germany. September, 2011.
ICIAM.	Vancouver, BC. July 2011.

Rice University.	Houston, TX. May 2011.
University of Wisconsin.	Madison, WI. April 2011.
University of Florida.	Gainesville, FL. March 2011.
SAMSI.	Durham, NC. November 2010.
AMS 2010 Fall Western Section.	Los Angeles, CA. October 2010.
BEER.	Bloomington, IL. September 2010.
SIAM Life Science Conference.	Pittsburgh, PA. July 2010.
North Carolina State University.	Raleigh, NC. February 2010.
University of Virginia.	Charlottesville, VA. February 2010.
Banff International Research Station.	Banff, AB. January 2010.
AMS 2009 Fall Western Section.	Riverside, CA. November 2009.
SMB Annual Meeting.	Vancouver, BC. July 2009.
New College of Florida.	Sarasota, FL. November 2008.
SIAM Annual Meeting.	San Diego. July 2008.
University of Pittsburgh.	Pittsburgh, PA. November 2007.
Tulane University.	New Orleans, LA. November 2007.
SAMSI.	Durham, NC. September 2007.
Spring Research Conference.	Ames, IA. May 2007.
SAMSI.	Durham, NC. March 2007.
SMB/SIAM Life Sciences.	Raleigh, NC. August 2006.
SIAM Annual Meeting.	Boston. July 2006.
SIAM Annual Meeting.	New Orleans. July 2005.
SPA.	Santa Barbara, CA. June 2005.
Pennsylvania State University.	University Park, PA. February 2004.
Iowa State University.	Ames, IA. February 2004.
Boston University.	Boston, MA. February 2004.
College of William and Mary.	Williamsburg, VA. January 2004.
Clemson University.	Clemson, SC. January 2004.

**Expository
Presentations &
Outreach**

Graduate School Forum.
 REU Capstone Conference.
 Mathematical Biosciences Institute.
 Ohio State University. Columbus, OH. August 2015.

Stochastic Cell Biology: Molecular Motors I & II.
 Escuela de Modelación y Métodos Numéricos 2012.
 Summer School on Mathematical Modeling of Biological Systems:
 From Molecules to Populations.
 CIMAT. Guanajuato, México. June 2012.

Time Series and Stochastic Processes.
 Astrostatistics Summer School.
 Pennsylvania State University. University Park, PA. June 2008.

Time Series I & II.
Astrostatistics Summer School.
Pennsylvania State University. June 2007.

**Graduate
Mentoring**

Thesis Advisor:
Jason Bernstein PhD, Dept of Statistics, PSU. August 2016.
MS, Dept of Statistics, PSU. May 2014.
Ivan Simeonov PhD, Dept of Statistics, PSU. August 2012.
(jointly w. Francesca Chiaromonte)
Initial Employment:
Travelers Insurance.
MS, Dept of Statistics, PSU. December 2010.
John Hughes PhD, Dept of Statistics, PSU. August 2011.
(jointly w. Murali Haran)
Initial Employment:
Asst Prof (tenure-track)
University of Minnesota.
MS, Dept of Statistics, PSU. May 2009.

Doctoral Thesis Committee Member:

Keith Mickolajczyk PhD, Dept of Bioengineering, PSU.
Qingzhou Feng PhD, Dept of Bioengineering, PSU.
Xiao Gan PhD, Dept of Physics, PSU.
Geng-Yuan (Scott) Chen PhD, Dept of Bioengineering, PSU.
James Russell PhD, Dept of Statistics, PSU. Summer 2016.
Joshua Goldstein PhD, Dept of Statistics, PSU. Fall 2015.
Saena Park PhD, Dept of Statistics, PSU. Summer 2015.
Zhan Huang PhD, Dept of Mathematics, PSU. Summer 2015.
Zhongyao Sun PhD, Dept of Physics, PSU. Spring 2015.
Jessica Trail PhD, Dept of Statistics, PSU. Fall 2014.
Lucia Tabacu PhD, Dept of Statistics, PSU. Summer 2014.
Assieh PhD, Dept of Mathematics, PSU.
Saadatpour-Moghaddam Summer 2012.
Yanping Ma PhD, Dept of Mathematics, PSU. Fall 2011.
Chen Shi PhD, Dept of Entomology, PSU. Summer 2011.
Maral Amini PhD, Civil & Environmental Engineering, PSU.
Spring 2011.
Manlin Li PhD, Dept of Mathematics, PSU. Spring 2010.
Angela Luis PhD, Ecology Program, PSU. Spring 2010.
Van Cyr PhD, Dept of Mathematics, PSU. Spring 2010.
Zhe "Bob" Zhang PhD, Dept of Statistics, PSU. Spring 2007

Master Thesis Committee Member:

Tanya Myers MS, Civil & Environmental Engineering, PSU. Spring 2009.

**Undergraduate
Mentoring**

Mentoring as part of MBI REU program:
Amanda Reeder Norfolk State University. Summer 2015.
Emily Nguyen Muhlenberg College. Summer 2015.

Honors Thesis Advisor:

Matthew Kutys Dept of Bioengineering, PSU. May 2009.
(mentored jointly w. William Hancock)

Honors Thesis Reader:

Mu-Chen Eric Li Dept of Statistics, PSU. Spring 2013.

Independent Studies (Stat 496):

Han Wen Spring 2015

Kelly Coughlin Fall 2008 (mentored jointly w. Nicola Constanino)

Theodore Villacorta Spring 2008

**Professional
Activities &
Service**

Served as Referee:

Journal of Theoretical Biology.

The Astrophysical Journal.

Journal of Mathematical Physics.

Journal of Multivariate Analysis.

SIAM Journal for Applied Mathematics.

Biophysical Journal.

Fluctuation and Noise Letters.

Journal of Mathematical Biology.

Statistics & Probability Letters.

Journal of Computational Physics.

PLOS Computational Biology.

Journal of Chemical Information
and Modeling.

Nature Scientific Reports.

Journal of Statistical Software.

Physical Review E.

Applied Mathematics Letters.

Nano Letters.

JASA: Case Studies.

Biostatistics.

Nature Communications.

Annals of Applied Statistics.

Bulletin of Mathematical Biology.

Journal of Molecular Modeling.

Asian-European Journal
of Mathematics.

Ecology.

Grant Review:

National Science Foundation ($\times 4$)

National Science and Engineering Research Council (Canada)

National Security Agency-American Mathematical Society

Membership in Professional Societies:

Institute of Mathematical Statistics 2003-present

Society for Industrial and Applied Mathematics 2003-present

Society for Mathematical Biology 2003-present

Service to the Profession: Minisymposium co-Organizer.

Linking Single Particle Tracking Experiments to Stochastic Diffusion Models.

SIAM-Life Sciences/SIAM Annual Meeting 2016.

Boston, MA.

Co-Organizer.

CTW: Modeling and Inference from Single Molecule to Cells.

Mathematical Biosciences Institute.

Ohio State University. Columbus, OH. February 2016.

Session Organizer.
Statistics of Single Molecule Experiments.
European Meeting of Statisticians 2013.
Budapest, Hungary.

Minisymposium Organizer.
Minisymposium on Molecular Motors-I & II.
SIAM-Life Sciences/SIAM Annual Meeting 2010.
Pittsburgh, PA.

Member.
Student Paper Award Committee 2010.
ASA Section on Bayesian Statistical Science.

Organizing Committee.
Workshop on Molecular Motors, Neuron Models, and Epidemics on Network.
SAMSI. Durham, NC. April 2010.

Minisymposium Organizer.
Stochastic Dynamical Systems and Statistical Inference in Math. Biology.
SIAM-Life Sciences/SMB joint meeting 2006. Raleigh, NC.

Departmental Service (Arizona State):

Seminar Coordinator 2016-2017
Actuarial Science Hiring 2016-2017

Departmental Service (Penn State):

Hiring Committee	2014-2015
Faculty liaison to Schreyer Honors College	2012-2016
Faculty liaison for departmental webpage	2012-2016
Promotion & Tenure Committee	2011-2016
Undergraduate Program Committee	2007-2012
(Assistant Chair, 2010-2012 Acting Assistant Chair, 2007-2008)	
Undergraduate Statistics Club	2007-2012
(Faculty Sponsor)	
PhD Exam Committee	2007-2009
(Chair, 2008-2009)	
Graduate Admissions Committee	2006-2008, 2012-2016
Colloquium Committee	2006-2010
(Chair, 2006-2007)	
Social Committee	2005-2008
Library Committee	2005-2007
Master's Exam Committee	2005-2006, 2011-2013

Interdepartmental Service (Penn State):

Quantitative Infectious Disease Dynamics Hiring Committee 2009-2010
Joint Committee for Probability 2008-2009
(Mathematics and Statistics Depts)
Ad Hoc Initiative for IBIOS Systems Biology Option 2005-2006

Teaching

Arizona State University:

STP 425 Stochastic Processes
Fall 2016

Pennsylvania State University:

Stat 200H Elementary Statistics (Honors section)
Fall 2014
Stat/Math 414 Introduction to Probability Theory
Spring 2015, Fall 2013, Spring 2011 (2 sections), Fall 2005
Stat/Math 415 Introduction to Mathematical Statistics
Spring 2006
Stat/Math 416 Introduction to Stochastic Models
Fall 2015, Spring 2014, Fall 2012, Spring 2012, Spring 2008, Fall 2007
Stat 440 Computational Statistics
Spring 2015
Stat 463 Applied Time Series Analysis
Fall 2007, Fall 2006
Stat 464 Applied Non-parametric Statistics
Fall 2008
Stat 501 Regression Methods
Fall 2015
Stat 510 Applied Time Series Analysis
Fall 2010, Fall 2009, Fall 2009 (online), Spring 2009, Spring 2007
Stat 513 Statistical Theory I
Fall 2013, Fall 2012, Fall 2011
Stat 514 Statistical Theory II
Spring 2012, Spring 2013
Stat 596 Individual Studies
Spring 2012, Fall 2011 w. Lucia Tabacu
Stat 597 Inference for Stochastic Processes
Spring 2016
Stat 597 Stochastic Dynamics of the Living Cell
Spring 2009

University of North Carolina:

Math 10 Algebra
Summer 2001, Summer 2000
Math 30 Trigonometry and Analytic Geometry
Summer 2002
Stat 31 Introduction to Statistics
Summer 2004, Spring 2001

Western Kentucky University:

Math 55 Basic Algebra
Spring 1997, Fall 1996
Math 100 Intermediate Algebra
Spring 1999, Fall 1998, Spring 1998, Fall 1997

**Other
Employment &
Awards
(Pre-PhD)**

Kenan Fellowship.
The Graduate School.
University of North Carolina.
Total award amount: \$42,000 plus tuition. Three years of full support.

Graduate Research Assistant. August 2003-May 2004
Virtual Lung Project.
Dept of Mathematics.
University of North Carolina.

Graduate Teaching Assistant. August 2000-May 2001, Summer 2004
Dept of Statistics.
University of North Carolina.

Instructor. Summers of 2000, 2001 and 2002
Summer Bridge Program.
Dept of Mathematics.
University of North Carolina.

Graduate Teaching Assistant. August 1997-May 1999
Dept of Mathematics.
Western Kentucky University.

Instructor. August 1996-May 1997
Community College.
Western Kentucky University.

Landahl Travel Scholarship.
Society of Mathematical Biology. 2003.

Outstanding Graduate Student.
Ogden College of Science. Western Kentucky University. 1999.

Glenn Powers Scholarship.
Dept of Mathematics. Western Kentucky University. 1998.