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EMPLOYMENT

Assistant Professor 08/18/2008-present
Physics Department
Syracuse University, Syracuse, NY, USA

Assistant Professor by Courtesy 10/01/2010-present
Biology Department
Syracuse University, Syracuse, NY, USA

Assistant Professor by Courtesy 09/01/2011-present
Department of Biomedical and Chemical Engineering
Syracuse University, Syracuse, NY, USA

Postdoctoral Researcher 08/01/2003-07/31/2008
Department of Chemistry
University of California, Berkeley, CA, USA
Supervisor: Prof. Jay T. Groves

Graduate Research Assistant 08/01/2002-06/30/2003
Institute for Experimental Physics I
University of Leipzig, Germany
Supervisor: Prof. Dr. Josef A. Käs
Work was conducted at the University of Texas at Austin under
co-supervision of Prof. Dr. Harry L. Swinney

Graduate Research Assistant 01/11/1999-07/31/2002
University of Texas, Austin, TX, USA
Center of Nonlinear Dynamics
Supervisor: Josef A Käs

EDUCATION

Ph.D. Physics, Center for Nonlinear Dynamics 01/11/1999-05/17/2003
University of Texas, Austin, TX, USA

Dissertation Title: “Motion of Nano-Objects in Langmuir Monolayers”

Thesis Advisors: Prof. Josef A. Käs, Prof. Harry L. Swinney

Diploma in Physics (German M.S. equivalent)

09/20/1992-11/30/1998

University of Regensburg, Germany

Thesis Title: “Brownian and Anomalous Diffusion of Individual Amphiphilic Molecules in Langmuir Monolayers”

Thesis Advisor: Prof. Josef A. Käs

RESEARCH INTERESTS

Understanding quantitatively the dynamic interplay between spatio-temporal organization of biological and biomimetic interfaces and their respective functions using advanced biophotonic techniques.

TEACHING EXPERIENCE

Biological & Medical Physics (PHY 315)

Spring 2013

Physical Cell Biology (BIO/BME/CEN/CHE/PHY 635)

Falls 2012 & 2013

Major Concepts of Physics II for Non Majors (PHY 102)

Springs 2010 & 2011

Experimental Physics 1 & 2 (PHY 344/462)

Falls 2009, 2010 & 2011

Lab Section of Major Concepts of Physics II for Non Majors (PHY 102)

Spring 2009

Physics Journal Workshop (PHY 250)

Spring 2009

Substitute Lectures in Undergraduate and Graduate Level Courses

2004-2008

Teaching Assistant for Physics for Engineering Students

2001

FUNDING

Chancellor’s Leadership Project, SU

2009

“Transformative Alliance on Cellular Engineering (TrACE)”, Co-PI, \$25k

NSF CAREER, “Non-Equilibrium Physics of Biological Interfaces”, PI, \$795k

2010-2015

MRI: Acquisition of a fluorescence activated cell sorter”, Co-PI, \$459k

2013-2016

AWARD

NSF CAREER, “Non-Equilibrium Physics of Biological Interfaces”,

2010

PROFESSIONAL SERVICE

Reviewer for:

Langmuir

2004-present

Journal of Colloid and Interface Science

2007-present

Journal of Structural Biology

2009-present

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|---|--|
| Biophysical Journal | 2009-present |
| European Journal for Chemical Physics and Physical Chemistry Small | 2009-present 2010-present |
| ACS Nano | 2011-present |
| Journal of the American Chemical Society | 2012-present |
| Co-organization of the conference on “Assembly and Self-Assembly at the Interface of Biology, Chemistry and Physics” in Il’Ciocco, Italy | 2001 |
| Panel Reviewer for NSF, <i>ad hoc</i> reviewer for DoE | |

PROFESSIONAL ASSOCIATIONS AND MEMBERSHIPS

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|--|---------------------|
| Biomaterials Institute Syracuse University, Syracuse, NY USA | 2008-present |
| SB3: Structural Biology, Biochemistry and Biophysics Program Syracuse University, SUNY Upstate Medical School, SUNY College of Environmental Science and Forestry, Syracuse, NY USA | 2009-present |
| Biophysical Society | 1999-present |
| American Physical Society | 2002-present |
| American Chemical Society | 2005-present |
| New York Academy of Science | 2008-present |
| American Association for the Advancement of Science | 2009-present |
| Royal Chemical Society, GB | 2012-present |
| The Optical Society | 2013-present |

INVITED PRESENTATIONS AND TALKS

- Forstner, M. B.**, "Biomimetic Membranes in Basic Science and Application", ACS Meeting, Symposium on “New Frontiers and Challenges in Biomaterials Analysis”, New Orleans, **2013**
- Forstner, M. B.**, “Dynamic Organization of Biomembranes”, *Seminar*, Physics Department, Georgia Institute of Technology, **2013**
- Forstner, M. B.**, "Biomimetic Membranes in Basic Science and Application", 108th Topical Symposium on “Recent Advances in Physics” of the APS New York State section at Well’s College, **2013**
- Forstner, M. B.**, "Fluid, yet structured: organization of bio-membranes", *Colloquium*, Science Department, Wells College, **2012**
- Forstner, M. B.**, "Fluid, yet structured: organization of bio-membranes", *Colloquium*, Chemistry Department, Union College, **2012**

- Forstner, M. B.**, "Fluid, yet structured: organization of bio-membranes", *Colloquium*, Physics Department, University of Delaware, **2012**
- Forstner, M. B.**, "Fluid, yet structured: organization of bio-membranes", *Seminar*, Physics Department, SUNY Buffalo, **2012**
- Forstner, M. B.**, "Fluid, yet structured: organization of bio-membranes", *Colloquium*, Physics Department, Rochester University, **2011**
- Forstner, M. B.**, "Fluid, yet structured: organization of bio-membranes", *Colloquium*, Biology Department, Syracuse University, **2010**
- Forstner, M. B.**, "Biological Membranes: from Single Molecules to Cells", *Invited Lecture*, Fall Meeting of the New York State Section of The American Association of Physics Teachers, Syracuse, **2009**
- Forstner, M. B.**, "Membrane Structure of T Cells", *Talk*, Molecular Medicine Seminar Series, Cornell University School of Veterinary Medicine, **2009**
- Forstner, M. B.**, Lillemeier, B.F., Davis, M. M. & Groves, J. T., "Activation Dependent Organization of T Cell Membranes", *Talk*, American Physical Society March Meeting, Pittsburgh, PA, **2009**
- Forstner, M. B.**, Lillemeier, B.F., Davis, M. M. & Groves, J. T., "Activation Dependent Organization of T Cell Membranes", *Talk*, 7th New York Complex Matter Workshop, Cornell University, NY, **2008**
- Forstner, M. B.**, Lillemeier, B.F., Davis, M. M. & Groves, J. T., "Different Lipid Anchors Recruit Proteins into Distinct Membrane Domains: A FCCS Study on Activated T-Cells.", *Talk*, 234th American Chemical Society National Meeting, New Orleans, LA, **2008**
- Forstner, M. B.**, Lillemeier, B.F., Davis, M. M. & Groves, J. T., "Different Lipid Anchors Recruit Proteins into Distinct Membrane Domains: A FCCS Study on Activated T-Cells.", *Talk*, 47th Annual Meeting of the American Biophysical Society, Long Beach, CA, **2008**
- Forstner, M. B.** & Groves, J. T., "Membrane Spatial Organization and Cellular Signal Transduction.", *Talk*, Conference on Biological Membranes and Membrane Proteins: Challenges for Theory and Experiment, City Park, UT, **2007**
- Forstner, M. B.**, Yee, C. K., Parikh, A. N. & Groves, J. T., "Lipid Lateral Mobility and Membrane Phase Structure Modulation by Protein Binding.", *Poster*, 232nd American Chemical Society National Meeting, San Francisco, CA, **2006**
- Forstner, M. B.**, Yee, C. K., Parikh, A. N. & Groves, J. T., "Sparse Protein Binding Alters Long-Range Lipid Mobility via Modulation of Phase Transition Behavior in Membranes.", *Talk*, 45th Annual Meeting of the American Biophysical Society, Salt Lake City, UT, **2006**
- Forstner, M. B.**, Martin, D. S., Navar, A. M. & Käs, J. A., "Simultaneous Single-Particle Tracking and Visualization of Domain Structure on Lipid Monolayers.", *Oral Presentation*, American Physical Society March Meeting, Austin, TX, **2003**
- Forstner, M. B.**, Martin, D. S. & Käs, J. A., "Single Lipid Diffusion in Spatially Inhomogeneous Monolayers.", *Talk*, US-Japan Workshop, Complexity Science, Austin, TX, **2002**

- Forstner, M. B.**, Martin, D. S. & Käs, J. A., "Single Lipid Diffusion in Spatially Inhomogeneous Monolayers.", *Talk*, 46th Annual Meeting of the American Biophysical Society, San Francisco, CA, **2002**
- Forstner, M. B.**, Martin, D. S. & Käs, J. A., "Anomalous Diffusion in a Single Lipid System? Minimal Requisites for Subdiffusion in Lipid Membranes.", *Poster*, Conference on Assembly and Self-Assembly at the Interface of Biology, Chemistry and Physics, Il Ciocco, Italy, **2001**
- Forstner M. B.**, Martin D. S. & Käs J. A., "Anomalous Diffusion in a Single Lipid System? Minimal Requisites for Subdiffusion in Lipid Membranes.", *Talk*, 45th Annual Meeting of the American Biophysical Society, Boston, MA, **2001**
- Forstner, M. B.**, Martin, D. S. & Käs, J. A., "Anomalous Diffusion in a Single Lipid System? Minimal Requisites for Subdiffusion in Lipid Membranes.", *Poster*, 40th Annual Meeting of American Society for Cell Biology, San Francisco, CA, **2000**
- Forstner, M. B.**, Martin, D. S. & Käs, J. A., "Anomalous Diffusion in a Single Lipid System? Minimal Requisites for Subdiffusion in Lipid Membranes.", *Talk*, 44th Annual Meeting of the American Biophysical Society, New Orleans, LA, **2000**
- Forstner, M. B.**, Martin, D. S. & Käs, J. A., "Single Particle Tracking and the Observation of Anomalous Diffusion on Lipid Monolayers.", *Talk*, 43rd Annual Meeting of the American Biophysical Society, Baltimore, MD, **1999**

PUBLICATIONS

- Badiambile, A. K. & **Forstner, M. B.**, "Ion Induced Changes in Phosphoinositide Monolayers at Physiological Concentrations.", *in preparation*.
- Badiambile, A. K. & **Forstner, M. B.**, "Calcium Modulated Compressibility of Phosphoinositide Monolayers.", *in preparation*.
- Degaga, E.K., & **Forstner, M. B.**, "Quantification of compositional changes in the non-erythroid membrane skeleton due to external forces", *submitted*.
- McCabe, I. P. & **Forstner, M. B.**, "Polymer Supported Lipid Bilayers." *Open Journal of Biophysics*, **2013**, 3(1A), pp. 59-69.
- Wilson, D. R., Zhang, N., Silvers, A.L., **Forstner, M. B.** & Bader, R. A., "Synthesis and evaluation of cyclosporine A-loaded polysialic acid-polycaprolactone micelles for rheumatoid arthritis," *European Journal of Pharmaceutical Sciences*, **2014**, 51, pp 146-156, Published online: September **2013**
- McCabe, I. P. & **Forstner, M. B.**, "Polymer Supported Lipid Bilayers." *Open Journal of Biophysics*, **2013**, 3(1A), pp. 59-69.
- Rozovsky, S.; **Forstner, M. B.**; Sondermann H. & Groves, J. T., "Single Molecule Kinetics of ENTH Binding to Lipid Membranes." *Journal of Physical Chemistry B*, **2012**, 116(17), pp. 5122-5131.
- Lillemeier, B. F.; Moertelmaier, M. A.; **Forstner, M. B.**; Huppa, J. B.; Groves, J. T. & Davis, M. M., "TCR and Lat are Expressed on Separate Protein Islands on T Cell Membranes and

Concatenate during Activation." *Nature Immunology*, **2010**, 11(1), 90 - 96.

Featured in: Van der Merwe, P. A.; Dunne, P. D.; Klenerman, D. & Day, S. J. "News and Views: Taking T cells beyond the diffraction limit", *Nature Immunology*, **2010**, 11(1), 51 - 52.

Rabuka, D.; **Forstner, M. B.**; Groves, J. T. & Bertozzi, C. R., "Non-Covalent Cell Surface Engineering: Incorporation of Bioactive Synthetic Glycopolymers into Cellular Membranes." *Journal of the American Chemical Society*, **2008**, 130, (18), 5947-5953.

Forstner, M. B.; Martin, D.; Ruckerl, F.; Käs, J. A. & Selle, C., "Attractive Membrane Domains Control Lateral Diffusion." *Physical Review E*, **2008**, 77, 051906.

Groves, J. T.; Parthasarathy, R. & **Forstner, M. B.**, "Fluorescence Imaging of Membrane Dynamics." *Annual Review of Biomedical Engineering*, **2008**, 10, 311-338.

Paulick, M. G.; **Forstner, M. B.**; Groves, J. T. & Bertozzi, C. R., "A Chemical Approach to Unraveling the Biological Function of the Glycosylphosphatidylinositol Anchor." *Proceedings of the National Academy of Sciences of the United States of America*, **2007**, 129, (37), 11543-11550.

Paulick, M. G.; Wise, A. R.; **Forstner, M. B.**; Groves, J. T. & Bertozzi, C. R., "Synthetic Analogues of Glycosylphosphatidylinositol-Anchored Proteins and their Behavior in Supported Lipid Bilayers." *Journal of the American Chemical Society*, **2007**, 129, (37), 11543-11550.

Forstner, M. B.; Yee, C. K.; Parikh, A. N. & Groves, J. T., "Lipid Lateral Mobility and Membrane Phase Structure Modulation by Protein Binding." *Journal of the American Chemical Society*, **2006**, 128, (47), 15221-15227.

Selle, C.; Ruckerl, F.; Martin, D. S.; **Forstner, M. B.** & Käs, J. A., "Measurement of Diffusion in Langmuir Monolayers by Single-Particle Tracking." *Physical Chemistry Chemical Physics* **2004**, 6, (24), 5535-5542.

Forstner, M. B.; Martin, D. S.; Navar, A. M. & Kas, J. A., "Simultaneous Single-Particle Tracking and Visualization of Domain Structure on Lipid Monolayers." *Langmuir* **2003**, 19, (12), 4876-4879.

Martin, D. S.; **Forstner, M. B.** & Kas, J. A., "Apparent Subdiffusion Inherent to Single Particle Tracking." *Biophysical Journal* **2002**, 83, (4), 2109-2117.

Forstner, M. B.; Kas, J. A. & Martin, D., "Single Lipid Diffusion in Langmuir Monolayers." *Langmuir* **2001**, 17, (3), 567-570.

SCIENTISTS MENTORED

Postdoctoral Researchers

Dr. Lauren O'Neil 2009-2010 now: *Assistant Professor, Wells College, NY*

Graduate Students

Adolphe Kadazi Badiambile 2009- present

Eleni Knife Degaga 2009- present

| | |
|-----------------|-----------------------------------|
| Ian McCabe | 2009- present |
| David Harbage | 2010- Spring 2011 (left with M.S) |
| Kathleen Kelly | 2010- present |
| Rachel Meredith | 2012- Spring 2013 |

Undergraduate Students

| | | |
|----------------------|---------------------|---|
| Pauline Hua | 2009-2010 | now: <i>Downstate Medical School</i> |
| ChaoJie Zhen | 2010-Spring 2011 | now: <i>Weill Cornell Medical College</i> |
| Bridget Lally | REU - 2010 | |
| Shane Dunn | 2010-present | |
| Sundus Mian | 2010-Spring 2011 | |
| Tianiy Zhou | 2010-Spring 2011 | |
| David Kopel | 2010-present | |
| Navjyot Singh Parmar | 2010-Spring 2011 | |
| Lexus Johnson | REU – 2011 | |
| Zoe Kazzaz | Fall 2012 –present | |
| Ismet Yesilada | Spring 2012 | |
| Marcel Lachance | Summer 2013 | |
| Damian Beasock | Fall 2013 – present | |