

## Nancy R. Forde

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### **Professional appointments**

Professor, Department of Physics, Simon Fraser University (2017-present)  
Member, Centre for Cell Biology, Development, and Disease (C2D2), Simon Fraser University (2016-present)  
Associate Member, Department of Molecular Biology and Biochemistry, Simon Fraser University (2006-present)  
Associate Member, Department of Chemistry, Simon Fraser University (2004-present)  
Associate Professor, Department of Physics, Simon Fraser University (2011-2017)  
Visiting Researcher, Pacific Institute for the Mathematical Sciences, University of British Columbia (2013-2014)  
Assistant Professor, Department of Physics, Simon Fraser University (2004-2011)  
Research Associate, Howard Hughes Medical Institute, University of California, Berkeley (2001-2004)  
Postdoctoral Researcher, Department of Molecular and Cell Biology, University of California, Berkeley (1999-2001)

### **Education**

Ph.D. in Physical Chemistry, University of Chicago (1999)  
Dissertation: *Intramolecular Vibrations and Electronically Nonadiabatic Dynamics in Photodissociation Reactions*  
M.S. in Chemistry, University of Chicago (1995)  
B.Sc. (Honours), University of Toronto (1994)  
Specialist: Chemical Physics; minor: Mathematics

### **Selected Awards, Honors and Scholarships**

Faculty of Science Excellence in Teaching Award, Simon Fraser University, 2022  
Michèle Auger Award for Exceptional Service to the Biophysical Society of Canada, 2018  
Nominated member of AcademiaNet, 2016  
Michael Smith Foundation for Health Research Scholar, 2005-2011  
Cottrell Scholar, Research Corporation for Scientific Advancement, 2007-2009  
Endowed Research Fellowship, Simon Fraser University, 2004  
Natural Sciences and Engineering Research Council of Canada (NSERC) Post-Doctoral Fellowship, 1999-2001  
Norton Prize, Department of Chemistry, University of Chicago, 1999  
Harper Dissertation Fellowship, University of Chicago, 1998-1999  
NSERC, 1967 Science and Engineering Scholarship, 1994-1998  
Dr. Bowen Liu Memorial Award, Women Chemists Committee, American Chemical Society, 1998  
Albert J. Cross Prize for Excellence in Research, Teaching and Departmental Citizenship, Department of Chemistry, University of Chicago, 1997  
William Draper Harkins Fellowship, Department of Chemistry, University of Chicago, 1994  
Lieutenant Governor's Silver Medal, Victoria College, University of Toronto, 1994  
Canada Scholarship, 1990-1994  
Chemistry Club 4th Year Research Prize in Physical Chemistry, University of Toronto, 1994  
NSERC, Undergraduate Research Award in Chemistry, 1993, 1991  
Merck Frosst Award (Industrial Award for Canada Scholars), 1992

## RESEARCH

### Research Publications

(trainee co-authors in **bold**; authors with equal contributions identified with \*)

#### **Peer-reviewed research publications**

Line optical tweezers as controllable micromachines: techniques and emerging trends. Y. Shen, D.A. Weitz, N.R. Forde and M. Shayegan. *Soft Matter* **18**, 5359-5365 (2022)

Through the eyes of creators: observing artificial molecular motors. I.N. Unksov, **C.S. Korosec**, P. Surendiran, D. Verardo, R. Lyttleton, N.R. Forde and H. Linke. *ACS Nanoscience Au* **2**, 140–159 (2022)

Sequence-dependent mechanics of collagen reflect its structural and functional organization. **A. Al-Shaer**, **A. Lyons**, Y. Ishikawa, B.G. Hudson, S.P. Boudko and N.R. Forde. *Biophysical Journal* **120**, 4013-4028 (2021)

AutoSmarTrace: Automated Chain Tracing and Flexibility Analysis of Biological Filaments. **M.Schneider**, **A. Al-Shaer** and N.R. Forde. *Biophysical Journal* **120**, 2599-2608 (2021)

Multivalent diffusive transport. **A. Kowalewski**, N.R. Forde and **C.S. Korosec**. *Journal of Physical Chemistry B* **125**, 6857–6863 (2021)

Substrate stiffness tunes the dynamics of polyvalent rolling motors. **C.S. Korosec**, L. Jindal, **M. Schneider**, **I. Calderon de la Barca**, M.J. Zuckermann, N.R. Forde and E. Emberly. *Soft Matter* **17**, 1468-1479 (2021) [front cover]

Optical tweezers approaches for probing multiscale protein mechanics and assembly. **K. Lehmann**, M. Shayegan, G.A. Blab and N.R. Forde. *Frontiers in Molecular Biosciences* **7**, 577314 (2020) [invited review for special issue on Optical Trapping]

Apparent superballistic dynamics in one-dimensional random walks with biased detachment. **C.S. Korosec**, D.A. Sivak and N.R. Forde. *Physical Review Research* **2**, 033520 (2020)

Synthetic biology approaches to dissecting linear motor protein function: towards the design and synthesis of artificial autonomous protein walkers. H. Linke, B. Höcker, K. Furuta, N.R. Forde and P.M.G. Curmi. *Biophysical Reviews*, **12**, 1041-1054 (2020)

Characterizing the Flexibility of the Body's Building Block: Collagen. **A. Al-Shaer**, **A. Lyons** and N.R. Forde. *Physics in Canada* **75**, 14-17 (2019)

Mechanics and Structural Stability of the Collagen Triple Helix. **M.W.H. Kirkness**, **K. Lehmann** and N.R. Forde. *Current Opinion in Chemical Biology* **53**, 98-105 (2019) [cover]

A chloride ring is an ancient evolutionary innovation mediating the assembly of collagen IV scaffold of basement membranes. V. Pedchenko, R. Bauer, E.N. Pokidysheva, **A. Al-Shaer**, N.R. Forde, A.L. Fidler, B.G. Hudson and S.P. Boudko. *Journal of Biological Chemistry* **294**, 7968-7981 (2019)

The Bar-Hinge Motor: A synthetic protein design exploiting conformational switching to achieve directional motility. L.S.R. Small, M.J. Zuckermann, R.B. Sessions, P.M.G. Curmi, H. Linke, N.R. Forde and E.H.C. Bromley. *New Journal of Physics* **21**, 013002 (2019)

Modified Pluronic F127 surface for bioconjugation and blocking nonspecific adsorption of microspheres and biomacromolecules. **M.H.W. Kirkness**, **C.S. Korosec** and N.R. Forde. *Langmuir*, **34**, 13550-13557 (2018)

Environmentally controlled curvature of single collagen proteins. **N. Rezaei\***, **A. Lyons\*** and N.R. Forde. *Biophysical Journal*, **115**, 1457-1469 (2018)

Dimensionality-dependent crossover in motility of polyvalent burnt-bridges ratchets. **C.S. Korosec**, M.J. Zuckermann and N.R. Forde. *Physical Review E* **98**, 032114 (2018)

Single-molecule assay for proteolytic susceptibility: force-induced collagen destabilization. **M.W.H. Kirkness** and N.R. Forde. *Biophysical Journal* **114**, 570-576 (2018). [Highlighted by "New and Notable" article] [widely publicized by Canadian Press, CBC, phys.org and others]

Genetically modified human type II collagen for N- and C-terminal covalent tagging. **A. Wieczorek**, **C.K. Chan**, **S. Kovacic**, **C. Li**, T. Dierks and N.R. Forde. *Canadian Journal of Chemistry* **96**, 204-211 (2018) [SFU Chemistry 50<sup>th</sup> Anniversary Issue]

Effects of finite and discrete sampling and blur on microrheology experiments. **V.E. Loosemore** and N.R. Forde. *Optics Express* **25**, 31239-31252 (2017)

Engineering Nanoscale Biological Molecular Motors. **C.S. Korosec** and N.R. Forde. *Physics in Canada* **73**, 78-81 (2017) [cover art; focus issue on Nanoscale Approaches to Biology]

- Construction of a chassis for a tripartite protein-based molecular motor. L.S.R. Small, M. Bruning, A.R. Thomson, A.L. Boyle, R. Davies, P.M.G. Curmi, N.R. Forde, H. Linke, D.N. Woolfson and E.H.C. Bromley. *ACS Synthetic Biology* **6**, 1096-1102 (2017)
- Intact telopeptides enhance interactions between collagens. **M. Shayegan\***, **T. Altindal\***, **E. Kiefl** and N.R. Forde. *Biophysical Journal* **111**, 2404–2416 (2016) [featured in *Biophysical Journals*'s [Optical Tweezers collection](#) 2018]
- Development and characterization of a eukaryotic expression system for human type II procollagen. **A. Wieczorek**, **N. Rezaei**, **C.K. Chan**, C. Xu, P. Panwar, D. Brömme, E.F. Merschrod S. and N.R. Forde. *BMC Biotechnology* **15**, 112 (2015)
- Motor properties from persistence: a linear molecular walker lacking spatial and temporal asymmetry. M.J. Zuckermann, C.N. Angstmann, R. Schmitt, G.A. Blab, E.H.C. Bromley, N.R. Forde, H. Linke and P.M.G. Curmi. *New Journal of Physics* **17**, 055017 (2015) [focus issue on Stochastic Thermodynamics]
- Design and construction of the lawnmower, an artificial burnt-bridges motor. **S. Kovacic**, **L. Samii**, P.M.G. Curmi, H. Linke, M.J. Zuckermann and N.R. Forde. *IEEE Transactions on NanoBioscience* **4**, 305-312 (2015)
- Fluidic Switching in Nanochannels for Control of Inchworm: A Synthetic Biomolecular Motor with a Power Stroke. C.S. Niman, M.J. Zuckermann, M. Balaz, J.O. Tegenfeldt, P.M.G. Curmi, N.R. Forde and H. Linke. *Nanoscale* **6**, 15008-15019 (2014)
- Construction and Characterization of Kilobasepair Densely Labeled Peptide-DNA. **S. Kovacic**, **L. Samii**, G. Lamour, H. Li, H. Linke, E.H.C. Bromley, D.N. Woolfson, P.M.G. Curmi and N.R. Forde. *Biomacromolecules* **15**, 4065–4072 (2014) [highlighted on the [Human Frontier Science Program website](#)]
- Microrheological Characterization of Collagen Systems: From Molecular Solutions to Fibrillar Gels. **M. Shayegan** and N.R. Forde. *PLoS ONE* **8**, e70590 (2013) [highlighted in [Extracellular Matrix News](#)]
- Controlled microfluidic switching in arbitrary time-sequences with low drag. C.S. Niman, J.P. Beech, J.O. Tegenfeldt, P.M.G. Curmi, D.N. Woolfson, N.R. Forde and H. Linke. *Lab on a Chip* **13**, 2389-2396 (2013)
- Squaring the Circle in Peptide Assembly: From Fibers to Discrete Nanostructures by De Novo Design. A.L. Boyle, E.H.C. Bromley, G.J. Bartlett, R.B. Sessions, T.H. Sharp, C.L. Williams, P.M.G. Curmi, N.R. Forde, H. Linke and D. Woolfson. *Journal of the American Chemical Society* **134**, 15457-15467 (2012) [highlighted on the [Human Frontier Science Program website](#)]
- Probing the Viscoelasticity of Collagen Solutions via Optical-Tweezers-Based Microrheology. **M. Shayegan** and N.R. Forde. *MRS Proceedings* **1465**, mrs12-1465-ss06-08 (2012)
- Design and Construction of a One-Dimensional DNA Track for an Artificial Molecular Motor. **S. Kovacic\***, **L. Samii\***, D. N. Woolfson, P.M.G. Curmi, H. Linke, N.R. Forde and **G.A. Blab**. *Journal of Nanomaterials* **2012**, 109238 (2012) [invited to submit for special issue on 1D Nanomaterials]
- Positional stability of holographic optical traps. A. Farré, **M. Shayegan**, C. López-Quesada, **G.A. Blab**, M. Montes-Usategui, N.R. Forde and E. Martín-Badosa. *Optics Express* **19**, 21370-21384 (2011) [also selected for inclusion in the *Virtual Journal for Biomedical Optics*]
- Tuning the performance of an artificial protein motor. N.J. Kuwada, M.J. Zuckermann, E.H.C. Bromley, R.B. Sessions, P.M.G. Curmi, N.R. Forde, D.N. Woolfson and H. Linke. *Physical Review E* **84**, 031922 (2011)
- Time-dependent motor properties of multipedal molecular spiders. **L. Samii**, **G.A. Blab**, E.H.C. Bromley, H. Linke, P.M.G. Curmi, M.J. Zuckermann and N.R. Forde. *Physical Review E* **84**, 031111 (2011) [highlighted on the [Human Frontier Science Program website](#)]
- Stretching single DNA molecules to demonstrate high-force capabilities of holographic optical tweezers. **A. Farré\***, **A. van der Horst\***, **G.A. Blab**, **B.P.B. Downing** and N.R. Forde. *Journal of Biophotonics* **3**, 224-233 (2010) [invited to submit for special issue on Innovative Photonic Micromanipulation Tools; selected as "Editor's Choice" for the issue]
- Power spectral analysis for optical trap stiffness calibration from high-speed camera position detection with limited bandwidth. **A. van der Horst** and N.R. Forde. *Optics Express* **18**, 7670-7677 (2010) [also selected for inclusion in the *Virtual Journal for Biomedical Optics*]
- Biased motion and molecular motor properties of bipedal spiders. **L. Samii**, M.J. Zuckermann, H. Linke and N.R. Forde. *Physical Review E* **81**, 021106 (2010) [also selected for inclusion in the *Virtual Journal of Biological Physics Research*]
- The Tumbleweed: Towards A Synthetic Protein Motor. E.H.C. Bromley, N.J. Kuwada, M.J. Zuckermann, R. Donadini, **L. Samii**, G.A. Blab, G.J. Gemmen, B.J. Lopez, P.M.G. Curmi, N.R. Forde, D.N. Woolfson and H. Linke. *HFSP Journal*. **3**, 204-212 (2009) [also selected for inclusion in the *Virtual Journal of Biological Physics Research*]
- Calibration of dynamic holographic optical tweezers for force measurements on biomaterials. **A. van der Horst** and N.R. Forde. *Optics Express* **16**, 20987-21003 (2008) [also selected for inclusion in the *Virtual Journal for Biomedical Optics*]
- Thermal Probing of *E. coli* RNA Polymerase Off-Pathway Mechanisms. Y.X. Mejia, H. Mao, N.R. Forde and C. Bustamante, *Journal of Molecular Biology* **382**, 628-637 (2008)

Brownian Motion in a Modulated Optical Trap. **Y. Deng**, J. Bechhoefer and N.R. Forde. *Journal of Optics A: Pure and Applied Optics* **8**, S256-S263 (2007) [special issue on Optical Micromanipulation] [featured in the November/December 2007 issue of *Europhysics News*]

Comment on "Direct Measurement of the Oscillation Frequency in an Optical-Tweezers Trap by Parametric Excitation". **Y. Deng**, N.R. Forde and J. Bechhoefer. *Physical Review Letters* **98**, 189082 (2007) [also selected for inclusion in the *Virtual Journal of Biological Physics Research*]

Mechanical processes in biochemistry. C. Bustamante, Y.R. Chemla, N.R. Forde and D. Izhaky. *Annual Review of Biochemistry* **73**, 705-748 (2004) [authors listed alphabetically]

Using mechanical force to probe the mechanism of pausing and arrest during continuous elongation by *Escherichia coli* RNA polymerase. N.R. Forde\*, D. Izhaky\*, G.R. Woodcock, G.J.L. Wuite and C. Bustamante. *Proceedings of the National Academy of Sciences USA* **99**, 11682-11687 (2002)

Characterization of nitrogen-containing radical products from the photodissociation of trimethylamine using photoionization detection. N.R. Forde, L.J. Butler, O. Sorkhabi, F. Qi, A. Suits and B. Ruscic. *Journal of Chemical Physics* **113**, 3088-3097 (2000)

Photodissociating Trimethylamine at 193 nm to Probe Dynamics at a Conical Intersection and to Calibrate Radical Detection Efficiency. N.R. Forde, M.L. Morton, S.L. Curry, S.J. Wrenn and L.J. Butler. *Journal of Chemical Physics* **111**, 4558-4568 (1999)

Electronic accessibility of dissociation channels in an amide: N,N-dimethylformamide photodissociation at 193 nm. N.R. Forde, L.J. Butler and S. A. Abrash. *Journal of Chemical Physics* **110**, 8954-8968 (1999)

Chemical Reaction Dynamics when the Born-Oppenheimer Approximation Fails: Understanding Which Changes in the Electronic Wavefunction might be Restricted. N.R. Forde, T.L. Myers and L.J. Butler. *Faraday Discussions* **108**, 221-242 (1997)

The influence of local electronic character and nonadiabaticity in the photodissociation of nitric acid at 193 nm. T.L. Myers, N.R. Forde, B. Hu, D.C. Kitchen and L.J. Butler. *Journal of Chemical Physics* **107**, 5361-5373 (1997)

Photodissociation of Acrylic Acid at 193 nm. D.C. Kitchen, N.R. Forde and L.J. Butler. *Journal of Physical Chemistry A* **101**, 6603-6610 (1997)

### **Conference proceedings – research**

Probing Teloepptide-Induced Collagen-Collagen Interactions Using Optical-Tweezers-Based Microrheology. **T. Altindal, M. Shayegan, E. Kiefl** and N.R. Forde. In *Optical Trapping Applications* (Optical Society of America, Washington, DC, 2015), OTM3E.3 [3 pages]

Probing multiscale mechanics of collagen with optical tweezers. **M. Shayegan, N. Rezaei, N.H. Lam, T. Altindal, A. Wieczorek** and N.R. Forde. in *Optical Trapping and Optical Micromanipulation X*, edited by K. Dholakia and G.C. Spalding, *Proceedings of SPIE* **8010** (SPIE, Bellingham, WA, 2013) 88101P [10 pages]

Using optical tweezers to study mechanical properties of collagen. **N. Rezaei, B.P.B. Downing, A. Wieczorek, C.K.Y. Chan, R.L. Welch** and N.R. Forde. in *Photonics North 2011*, edited by R. Kashyap, M. Têtu, R.N. Kleiman, *Proceedings of SPIE* **8007** (SPIE, Bellingham, WA, 2011) 80070K [10 pages]

Probing the Elasticity of Short Proteins with Optical Tweezers. **B.P.B. Downing, A. van der Horst**, M. Miao, F.W. Keeley and N.R. Forde. In *Optical Trapping Applications* (Optical Society of America, Washington, DC, 2009), OTuA3 [3 pages]

Position and Intensity Modulations in Holographic Optical Traps Created by a Liquid Crystal Spatial Light Modulator. **A. van der Horst, B.P.B. Downing** and N.R. Forde. In *Optical Trapping Applications* (Optical Society of America, Washington, DC, 2009), OMB3 [3 pages]

### **Other research-related publications**

Nanophysical Approaches to Biological Systems (foreword). J. Dutcher, N.R. Forde and S. Leslie. *Physics in Canada* **73**, 59-60 (2017)

### **Invited Research Presentations**

#### **International Conferences**

American Physical Society (APS) March Meeting. Chicago, IL. March 2022 (presented virtually)

Gordon Research Conference on Collagen. New London, New Hampshire. July 2021 (discussion leader; cancelled)

Biological Physics / Physical Biology (BPPB) Virtual Seminar. December 2020 (virtual)

American Chemical Society. San Francisco, CA. August 2020 (virtual)

Multiscale Mechanochemistry and Mechanobiology Conference. Max Planck Institute of Colloids and Interfaces. Berlin, Germany. October 2017

SPIE Conference on Optical Trapping and Optical Micromanipulation XII. San Diego, CA. August 2015 (presented by postdoctoral researcher Tuba Altındal)

Single Molecule Kinetics Discussion. Bad Honnef, Germany. July 2012

Human Frontier Science Program (HFSP) Awardees Meeting. Montreal, Québec. June 2011

The Metals, Minerals, and Materials Society (TMS) meeting, Biological Materials Science Symposium. Seattle, Washington. February 2010

Gordon Research Conference on Elastin & Elastic Fibers. University of New England, Biddeford, Maine. July 2009

Nobel Symposium 131 on Controlled Nanoscale Motion in Biological and Artificial Systems. Bäckaskog Castle, Sweden. June 2005

### **National Conferences**

Canadian Chemistry Conference and Exhibition (CCCE), Symposium on Biomolecular Dynamics: Experimental and Computational Advances. Calgary, AB. June 2022

Canadian Association of Physicists (CAP) Congress, Division of Physics in Medicine and Biology. Hamilton, ON. June 2022

CAP Congress, Soft Matter Symposium. Hamilton, ON. June 2020 (virtual)

CAP Congress, Soft Matter Symposium. Kingston, ON. May 2017

Biophysical Society of Canada (BSC) National Meeting. Montreal, QC. May 2017

CAP Congress. Session on Molecular Biophysics. Montreal, QC. May 2013

Canadian Society for Chemistry (CSC) Conference, Symposium on Structural Characterization of Biomolecules on Surfaces. Quebec City, QC. May 2013

CSC Conference, Symposium on Biophysical Chemistry. Calgary, AB. May 2012

CSC Conference, Symposium on Advances in spectroscopy and imaging for biological systems. Montreal, QC. June 2011

Canadian Society for Chemistry (CSC) Conference, Symposium on Force spectroscopy on macromolecules: from single molecules to materials. Toronto, ON. May 2010

Chemical Biophysics Symposium. Toronto, ON. April 2008

CAP Congress, Medical & Biological Physics Division. Vancouver, BC. June 2005

Canadian Institutes of Health Research (CIHR) New Investigators Meeting. Jackson's Point, ON. November 2004

CAP Congress. Winnipeg, MB. June 2004

### **Regional conferences**

Pacific Centre for Advanced Materials and Microstructures (PCAMM) Meeting. SFU. December 2018

Western Canada Biophysics Conference. UBC Okanagan. March 2017 (keynote)

American Physical Society (APS) Northwest Section Meeting. Pullman, Washington. May 2015 (plenary)

Biomaterials Workshop, Canadian Biomaterials Society Local Student Chapter. UBC. March 2012

British Columbia Association of Physics Teachers (BCAPT) Professional Development Meeting, Keynote Address. TRIUMF. October 2010

American Physical Society (APS) Northwest Section Meeting. Walla Walla, Washington. October 2010

### **Academic and research institution colloquia and seminars**

- McGill University, Department of Chemistry seminar. November 2021 (virtual)
- University of Alberta, Department of Physics Symposium for Graduate Physics Research keynote speaker. January 2021 (virtual)
- University of Michigan, Biophysics Seminar. November 2020 (virtual)
- University of Washington, Physics Colloquium. November 2019
- University of Chicago, Institute for Biophysical Dynamics Seminar. July 2019
- University of Toronto, Physics Colloquium. March 2019
- McMaster University, Physics Colloquium. March 2019
- Reed College, Physics Colloquium. February 2019

- University of British Columbia, Physics Colloquium. September 2018
- Vanderbilt University, Center for Matrix Biology Seminar. March 2018
- University of British Columbia, Cellular and Physiological Sciences Seminar. April 2017
- Cornell University, Biophysics Colloquium. October 2016
- National University of Singapore, Physics Seminar. July 2016
- University of Washington, Materials Science & Engineering Seminar. February 2016
- University of Calgary, Physics Colloquium. October 2015
- Georgetown University, Soft Matter Seminar. July 2015
- National Institutes of Health, Bethesda MD. July 2015
- McGill University, Physics Colloquium. March 2015
- University of Manitoba, Interfaces between Chemistry, Life-Sciences and Physics Seminar. March 2015
- University of British Columbia, Department of Biochemistry and Molecular Biology Seminar. November 2014
- Simon Fraser University, Molecular Biology and Biochemistry Seminar (Student-invited speaker). October 2014
- University of Ottawa, Physics Colloquium. March 2014
- University of Northern British Columbia, Cell and Molecular Biology Seminar. December 2013
- University of British Columbia, Mathematical Biology Seminar. September 2013
- University of Alberta, Department of Physics Seminar. June 2013
- University of Toronto Mississauga, Department of Chemical and Physical Sciences Colloquium. February 2013
- Simon Fraser University, Applied Math Seminar. November 2012
- UBC James Hogg Research Centre, Friday Seminar Series. November 2011
- University of British Columbia, Physics & Astronomy Colloquium. November 2010
- Simon Fraser University, Physics Colloquium. September 2010
- University of Guelph, Physics Seminar. March 2010
- Hospital for Sick Children, Toronto, Cell Biology Seminar. March 2010
- Dalhousie University, Physics Colloquium. March 2010
- University of Washington, Analytical Chemistry Seminar. October 2009
- University of Victoria, Physics Colloquium. October 2009
- McMaster University, Physics Seminar. March 2009
- Ryerson University, Physics Colloquium. March 2009
- University of Victoria, Centre for Advanced Materials and Related Technology (CAMTEC) Seminar. August 2008
- Simon Fraser University, Kinesiology Seminar. January 2008
- University at Buffalo SUNY, Physics Seminar. November 2007
- Hospital for Sick Children, Toronto, Molecular Structure and Function Seminar. November 2007
- University of British Columbia, Biophysics Seminar. March 2007
- Simon Fraser University, Molecular Biology and Biochemistry Seminar. October 2005
- University of British Columbia, Condensed Matter Physics Seminar. December 2004
- University of British Columbia, Physical Chemistry Seminar. December 2004
- University of Oregon, Department of Physics Colloquium. November 2004
- Santa Clara University, Department of Chemistry Colloquium. April 2003
- San Francisco State University, Department of Physics Colloquium. October 2001

### **Public, outreach lectures and workshops**

NanoLund Career Day. Lund University, Sweden. September 2020 (talk; virtual)

60th Anniversary of the Laser Festival, SFU Vancouver. May 2020 (cancelled due to COVID)

Nobel Prize Lecture, Telus World of Science. January 2019

Summer Lunchtime Seminars for Undergraduates, Department of Physics, Simon Fraser University. July 2019, July 2018, July 2017, July 2014, July 2013, July 2012, July 2011, June 2010

TRIUMF Saturday Morning Lecture. April 2018

Academic Summer Camp for Aboriginal High School Students, Lasers and Light workshop. Simon Fraser University. July 2015

University Science Transition Experience Program (USTEP) seminar for high school students. Simon Fraser University. February 2013

Taste of Pi seminar for high school math students. Simon Fraser University. October 2012

Science Alive Electron Camp. July 2012

AAAS Annual meeting, "Meet the Scientists" event at Family Science Days, Vancouver, BC. February 2012

TRIUMF Saturday Morning Lecture. March 2010

Science Alive Nebula Girls' Camp. July 2009

University of British Columbia, "Adventures in Science" program (organized by and for undergraduate students). March 2009

World Year of Physics event for high school students, Science World, Vancouver, BC. November 2005

Café Scientifique, Vancouver, BC. September 2005

## **Contributed Research Presentations**

### ***International Conferences***

63 presentations by group members

- Short talk award, Basement Membranes in Health and Disease 2020 (virtual meeting of the British Society for Matrix Biology) (Alaa Al-Shaer)
- Outstanding Student Poster, Engineering of Biomolecular Motors Biophysical Society Thematic Meeting 2016 (Chapin Korosec)
- Best Poster in the Physical Sciences, AAAS Annual Meeting 2012 (Laleh Samii)
- 1<sup>st</sup> prize in poster session at the International Conference on Mathematical Biology and Annual Meeting of the Society for Mathematical Biology 2009 (Laleh Samii)

### ***National Conferences***

51 presentations by group members

- Short talk award, Soft Matter Canada, Canadian Association of Physicists (CAP) Congress 2020 (Chapin Korosec)
- Best student talk in the Division of Medical and Biological Physics, Canadian Association of Physicists (CAP) Congress 2019; 3<sup>rd</sup> place overall (Alaa Al-Shaer)
- Best Undergraduate Poster, Biophysical Society of Canada National Meeting 2018 (Alaa Al-Shaer)
- Poster Award, Biophysical Society of Canada Meeting 2018 (Chapin Korosec)
- Best Overall Talk, Canadian Undergraduate Physics Conference 2017 (Aaron Lyons)
- Best Talk (Biological Physics), Canadian Undergraduate Physics Conference 2017 (Aaron Lyons)
- Honourable Mention (Engineering), Rising Stars of Research Undergraduate Conference 2010 (Michael Pettigrew)
- Honourable Mention, Canadian Undergraduate Physics Conference 2009 (Rob Welch)
- Honourable Mention (Biochemistry and Molecular Biology), Rising Stars of Research Undergraduate Conference 2009 (Rob Welch)
- Best Talk (Biological Physics), Canadian Undergraduate Physics Conference 2008 (Ruobing Yang)

### ***Regional Conferences***

- Best poster, Frontiers in Biophysics 2022 (Daniel Sloseris)
- Talk award, Frontiers in Biophysics 2019 (Chapin Korosec)
- Best poster, Biomaterials Workshop of the Canadian Biomaterials Society Local Student Chapter 2013 (Marjan Shayegan)
- Best talk, Frontiers in Biophysics 2013 (Naghmeh Rezaei)

## **TEACHING**

### **Courses taught at Simon Fraser University**

President's Dream Colloquium (special topics university-wide graduate course) – The Emergence and Complexity of Life (joint with Peter Unrau, MBB) (students from three different faculties) (Fall 2012)

Phys 102 – Physics for the Life Sciences II (studio-style, at SFU Surrey) (Fall 2014) – developed and wrote 23 activity manuals for this course with Dr. Daria Ahrensmeier (Teaching and Learning Centre)

Phys 102 – Physics for the Life Sciences II (Fall 2021; Spring 2021; Spring 2013; Spring 2012) – added substantial biological content to the course

Phys 132 – Physics Laboratory I (Fall 2021)

Phys 201 – Physics Undergraduate Seminar (2018-19; 2017-18; 2016-17)

Phys 231 – Physics Laboratory II/III (Spring 2017; Fall 2015; Spring 2015)

Phys 344 – Thermal Physics (Spring 2006; Spring 2005)

Phys 347 – Introduction to Biological Physics (Spring 2022; Fall 2020; Fall 2018; Fall 2016; Fall 2015)

Phys 433 – Biological Physics Laboratory (Fall 2017; Fall 2012; Fall 2011; Fall 2010; Fall 2009; Fall 2008; Fall 2007) – conceived and developed this course

Phys 801 – (Graduate) Student Seminar (2018-2019)

Phys 802 – Introduction to Graduate Studies: Research and Teaching in Physics (Fall 2018; Fall 2017)

Phys 833 – Biological Physics Laboratory (Fall 2017; Fall 2012) – developed this course

### **Directed undergraduate research**

Bisc 490 – Research Design (Summer 2016 jointly with Kathleen Fitzpatrick)

Bisc 491 – Research Technique (Summer/Fall 2016 jointly with Kathleen Fitzpatrick)

Bisc 492W – Research Reporting (Fall 2016 jointly with Kathleen Fitzpatrick)

Bisc 497W – Undergraduate Research: Writing Intensive (Spring 2021)

Bisc 498 – Undergraduate Research I (Summer 2012; Fall 2006; Fall 2005)

Bisc 499 – Undergraduate Research II (Summer 2014)

Chem 481 – Undergraduate research (directed studies) (Summer 2007)

MBB 481 – Honours Thesis (Spring 2018)

MBB 482 – Honours Research Performance (Spring 2018)

MBB 483 – Honours Thesis Defense (Spring 2018)

MBB 491 – Directed Research I (Fall 2022)

Phys 432 – Undergraduate Honours Thesis (Spring/Summer 2018; Fall 2016/Spring 2017; Summer 2012; Spring 2010)

### **Invited Guest Lectures**

Case Western Reserve University, **EBME 411: Underpinnings of the Extracellular Matrix**. November 2022 (upcoming; online)

Simon Fraser University, **CHEM 180: Molecules of Life – an Introduction to Biological Chemistry**. November 2012

Simon Fraser University, **ENSC 476: Biophotonics**. April 2012, April 2010, April 2009

Simon Fraser University, **MBB 423/723: Protein Structure and Function**. January 2010

Simon Fraser University, **PHYS 102: Physics for the Life Sciences II**. April 2019

Simon Fraser University, **PHYS 101: Physics for the Life Sciences I**. October 2018, February 2018, July 2013, November 2010, November 2009, July 2007, March 2007, March 2006, March 2005

Simon Fraser University, **PHYS 201: Physics Undergraduate Seminar**. March 2021

Simon Fraser University, **PHYS 847: Topics in Soft-Condensed Matter and Biological Physics**. September 2019, October 2016

Simon Fraser University, **SCI 191: Introduction to Modern Scientific Research**. January 2016

University of British Columbia, **Science One**. March 2005

University of Toronto, Department of Biochemistry. **BCH2021H: Special Topics – Cell and Molecular Imaging** (graduate course). March 2009

### **Teaching Publications**

Fluorescence Correlation Spectroscopy (FCS) module for advanced undergraduate laboratories. N.R. Forde, D. Lee and J. Bechhoefer. *2018 BFY Proceedings*, 2018 Conference on Laboratory Instruction Beyond the First Year of College (BFY) Proceedings

*Gaining practical experience with Physics-based approaches to the micro- and nanoscale world of biology*. N.R. Forde. Compilation of practical modules for a special-topics issue of *Physics in Canada* **73**, 109-112 (2017)

### **Invited Presentations on Teaching**

Canadian Association of Physicists (CAP) Congress, Division of Physics Education. Hamilton, ON. “*Engaging diverse student interests through independent projects*” June 2022 (talk)



Third Conference on Laboratory Instruction Beyond the First Year (BFY III) sponsored by ALPhA, the Advanced Laboratory Physics Association. Loyola University Maryland. “*Fluorescence Correlation Spectroscopy for an advanced undergraduate (biophysics) lab course*” July 2018 (six workshops, co-presented with David Lee)

AAPT Summer Meeting. University of Maryland, College Park. “*Biophysics Modules in a Final-Year Lab Course*” July 2015 (talk)

American Physical Society Northwest Division Meeting. Vancouver. “*Physics 433: Biological Physics Laboratory at Simon Fraser University*” October 2012 (talk)

University of Guelph, Department of Physics. “*Physics 433: Biological Physics Laboratory at Simon Fraser University*” March 2010 (seminar)

McMaster University, Department of Physics. “*Physics 433: Biological Physics Laboratory at Simon Fraser University*” March 2009 (seminar)

14<sup>th</sup> Annual Cottrell Scholar Conference. “*Physics 433: Biological Physics Laboratory at Simon Fraser University*” Tucson, Arizona, July 2008 (poster)

### **Contributed Presentations on Teaching**

Canadian Association of Physicists (CAP) Congress, Montreal. “*Physics 433: Biological Physics Laboratory at Simon Fraser University*” May 2013 (talk)

Biophysical Society Annual Meeting. “*Advanced Undergraduate Laboratory in Biological Physics*” San Francisco, California, February 2010 (poster) [Poster presented by Jenifer Thewalt]

### **Supervisory Activities**

#### ***Graduate Student Theses – Primary supervisor***

Luis Ramírez Ramírez, M.Sc. Physics (Fall 2021 – present)

Koushik Bar, M.Sc. Physics (Fall 2020 – present)

- Kirk H. Michaelian Graduate Scholarship in Physics, 2022

Alaa Al-Shaer, Ph.D. Molecular Biology and Biochemistry (Fall 2018 – present; transferred from MSc)

- NSERC PGS-D fellowship, 2021-2024
- Department of Molecular Biology and Biochemistry Graduate Travel and Research Award (TARA), 2022
- Biophysical Society of Canada Travel Award, 2022
- Poster presentation award: Department of Physics poster session, 2021
- Oral presentation award: Basement Membranes in Health and Disease short talk (virtual meeting of the British Society for Matrix Biology), 2020
- Mitacs Research Training Award, 2020
- Biophysical Society travel award, 2020
- Oral presentation awards: Best student talk in the Division of Medical and Biological Physics, Canadian Association of Physicists (CAP) Congress; 3<sup>rd</sup> place overall, 2019
- Oral presentation award: Best “lightning” talk, Department of Molecular Biology & Biochemistry Colloquium, 2019

Chapin Korosec, Ph.D. Physics (Fall 2015 – Spring 2021; transferred from MSc)

“*Modelling and engineering artificial burnt-bridge ratchet molecular motors*”

- NSERC PGS-D fellowship, 2019-2021
- American Physical Society Division of Biological Physics Conference registration award, 2021
- Oral presentation award: Soft Matter Canada short talk, 2020
- Bio4Comp training grant (Lund University), 2020 [not taken up because of COVID]
- Biophysical Society of Canada Travel Award, 2020
- Steel Memorial Scholarship (Simon Fraser University), 2019
- Oral presentation award: Frontiers in Biophysics, 2019
- Poster presentation award: Biophysical Society of Canada national meeting, 2018
- *Biophysical Journal* award for Outstanding Student Poster, Biophysical Society Thematic Meeting on “Engineering of Biomolecular Motors”, 2016
- Graduate International Research Travel Award (Simon Fraser University), 2016

Current position: NSERC PDF-funded postdoctoral researcher, Department of Mathematics, York University

Ignacio Calderon de la Barça, M.Sc. Physics student (Fall 2018 – Summer 2020)

Current position: Technical Community Manager – Plutus, Cardano

Mike Kirkness, Ph.D. Molecular Biology and Biochemistry (Spring 2013 – Spring 2019; transferred from MSc)

*“Development of Single-Molecule Assays for Proteolytic Susceptibility: Force-Induced Collagen Destabilization”* April 2019

- Dr. Bruce Brandhorst Graduate Prize for Best Publication by an MBB Graduate Student, 2018
- Biophysical Society of Canada Travel Award, 2018
- Indigenous Graduate Student Travel Award (Simon Fraser University), 2018
- Weyerhaeuser Molecular Biology Graduate Scholarship, 2017
- President’s PhD Scholarship (Simon Fraser University), 2017
- David Baillie Graduate Award, Department of Molecular Biology and Biochemistry, 2016
- Robert Russell Family / First Nations Graduate Award (Simon Fraser University), 2016, 2015
- Oral presentation award: Best 5-minute talk, Department of Molecular Biology & Biochemistry Colloquium, 2014
- Masters/Doctoral BC Aboriginal Student Award (Irving K. Barber British Columbia Scholarship Society), 2013-2014
- Aboriginal Graduate Student Grant (Simon Fraser University), 2013

Current position: CEO and President, 3Helix, Salt Lake City

Victoria Loosemore, M.Sc. Physics (Fall 2014 – Summer 2017)

*“Optical tweezers-based microrheological measurements using a high-speed camera”* May 2017

Current position: Analyst, British Columbia Provincial Health Services Authority, Vancouver

Naghme Rezaei, Ph.D. Physics (Spring 2009 – Fall 2016; transferred from MSc)

*“Mechanical Studies of Single Collagen Molecules Using Imaging and Force Spectroscopy”* December 2016

- Biophysical Society of Canada Travel Award, 2017
- Oral presentation award: Best talk at Frontiers in Biophysics, 2013
- Travel award: Biomechanics 2012. Mechanics in Biology: From Single Molecules to Tissues. UCLA, CA, 2012
- Travel award: 7th International Conference on Biological Physics (ICBP), 2011

Current position: Senior research scientist, Google, San Francisco Bay area

Marjan Shayegan, Ph.D. Chemistry (Fall 2008 – Spring 2014)

*“Determining local viscoelastic properties of collagen systems using optical tweezers”* January 2014

- Bruker Prize in Chemical Spectroscopy, Department of Chemistry, for her development of microrheology techniques to characterize collagen systems, 2013
- Poster award: Best poster at the Canadian Biomaterials Society Local Student Chapter Biomaterials Workshop, 2013
- Travel award: Materials Research Society (MRS), 2012
- Oral presentation award: Department of Chemistry oral competition, 2012
- Pacific Century Graduate Scholarship, 2009-2010
- CD Nelson Memorial Graduate Scholarship, 2008-2009

Current position: Research Development Advisor, Concordia University

Laleh Samii, Ph.D. Physics (Fall 2007 – Spring 2013)

*“Studies of synthetic molecular motors”* April 2013

- Poster award: Best poster in the physical sciences at the AAAS annual meeting, 2012
- Travel award: CIFAR Summer Forum on Interdisciplinary Nanoscience. Edmonton, AB, 2010
- Poster award: First prize for poster at the International Conference on Mathematical Biology and Annual Meeting of the Society for Mathematical Biology, 2009

Current position: Financial Engineer, d1g1t Inc., Toronto

Benjamin P.B. Downing, M.Sc. Physics (Summer 2007 – Spring 2010)

*“Probing the mechanical properties of short molecules with optical tweezers”* 2010

- Poster award: Department of Physics poster competition, 2008
- Trainee fellowship, Michael Smith Foundation for Health Research, 2008-2010
- NSERC CGS-M fellowship, 2008-2010
- Pacific Century Graduate Scholarship, 2007-2008

Current position: Paramedic, Nova Scotia

Michelle S.M. Lee, M.Sc. Physics (Fall 2005 – Fall 2007)

*“Quantitative Characterization of Forces and Fields in a Magnetic Tweezers Instrument”* November 2006

- Poster award: Department of Physics poster competition, 2007
- NSERC CGS-M fellowship, 2006-2007

Current position: High school math and physics teacher, Ottawa

Yi Deng, M.Sc. Physics (Spring 2005 – Summer 2007)

*“Calibration and characterization of static and modulated optical traps”* June 2007

Current position: Applied Scientist II, Amazon, Seattle WA

Philip J. M. Johnson, M.Sc. Physics (Fall 2004 – Spring 2007)

*“Toward single-molecule DNA uptake by Haemophilus influenzae”* April 2007

Current position: Staff Scientist (tenure-track), Paul Scherrer Institut, Switzerland

### **External Graduate Student Theses – Primary supervisor**

Janine Srocka, MSc Biophysics, Humboldt University, Germany (October 2021 – April 2022)  
“*Development of single-molecule assays for probing force-dependent collagen binding interactions*”  
• MITACS Globalink Research Award  
Current position: incoming MBB PhD student, Simon Fraser University

Thomas Brouwer, MSc Medical Natural Sciences – Physics of Life, Vrije Universiteit Amsterdam, Netherlands (November 2012 – April 2013)  
“*Single-molecule studies using optical tweezers*”  
Current position: Data Scientist, LUMICKS, Amsterdam

Linda Dekker, MSc Life Sciences, Vrije Universiteit Amsterdam, Netherlands (January 2010 – August 2010)  
“*Cloning and purification of type III procollagen protein*”  
Current position: Physics teacher, Netherlands

### **Supervision of Undergraduate Student Researchers**

Jody Tao, Undergraduate research assistant (March 2022 – present)

Daniel Sloseris, Biological Physics undergraduate research assistant (May 2020 – present)  
• NSERC USRA, 2022  
• Best poster award, Frontiers in Biophysics 2022

Antonia Kowalewski, Biological Physics undergraduate research assistant (September 2019 – present)

Karmen Gill, Biology undergraduate research assistant and BISC 497 student (January 2021 – March 2022)  
• NSERC USRA, 2021

Alyssa Abake Oke, Life Physics undergraduate research assistant from University of Waterloo (June 2021 – December 2021)  
• NSERC USRA, 2021

Josipa Kafadar, Biological Physics undergraduate research assistant (May 2020 – August 2020)

Mathew Schneider, Physics undergraduate research assistant (May 2018 – August 2020)  
• SFU VPR USRA, 2019  
• NSERC USRA, 2018

Daniel Cecchi, Physics undergraduate research assistant from University of Victoria (May 2019 – August 2019)  
• NSERC USRA, 2019  
Current position: MSc student in Medical Physics, University of Alberta

Kassandra Richard, Biological Physics undergraduate research assistant (May 2019 – June 2019)  
• SFU/NTNU Physics Exchange Student Research Award  
Current position: BSc student in Physics, Memorial University of Newfoundland

Andrew (AJ) Koenig, Physics Honours Thesis student (January 2018 – August 2018)  
Current position: Small business owner, Calgary

Alaa Al-Shaer, MBB Independent Study Semester student and Undergraduate research assistant (November 2016 – August 2018)  
• Poster presentation award: Best undergraduate student poster, Biophysical Society of Canada national meeting, 2018  
Current position: PhD student in Molecular Biology & Biochemistry, SFU

Janine Srocka, Undergraduate research intern from Humboldt Universität, Berlin (January 2018 – April 2018)  
Current position: incoming MBB PhD student, SFU

Aaron Lyons, Physics Honours Thesis and Biological Physics undergraduate research assistant (January 2016 – April 2018)  
• Oral presentation award: Best Overall Talk, Canadian Undergraduate Physics Conference (CUPC), 2017  
• Oral presentation award: Best Talk in Biological and Medical Physics, CUPC 2017  
• Poster award: First prize in SFU Science Undergraduate Research Journal (SURJ) Poster Competition, 2017  
• NSERC USRA, 2017  
• SFU VPR USRA, 2016  
Current position: MSc student in Physics, University of Alberta

Teo Penkov, ISS student (BISC 490, BISC 491 and BISC 492W) (April 2016 – December 2016) [co-supervised with Kathleen Fitzpatrick, Department of Biological Sciences]

Darshil Dave, MITACS Globalink student from IIT Bombay (May 2016 – July 2016)

Current position: Risk Management Analyst at American Express

Jorraine Lim, MBB undergraduate research volunteer (September 2015 – April 2016)

Aditya Chhabra, MBB undergraduate research assistant (May 2015 – August 2015) [co-supervised with Lisa Craig, Department of Molecular Biology and Biochemistry]

- NSERC USRA, 2015

Angelina Marinkovic, Biomedical Physiology undergraduate research assistant (September 2012 – December 2013; January 2015 – April 2015)

- Undergraduate CIHR fellowship in Mobility, Musculoskeletal Health and Arthritis, 2015
- NSERC USRA, 2013
- Poster award: Second prize at Department of Physics undergraduate student poster session, Summer 2013

Current position: Medical student, UBC

Tristan Hansen, BISC 498, BISC 499 student and Biological Physics undergraduate research volunteer (February 2012 – August 2012; May 2014 – October 2014)

Current position: Teacher

Evan Kiefl, Physics undergraduate research assistant from University of Victoria (May 2014 – August 2014)

- NSERC USRA, 2014

Current position: Biophysics PhD student, University of Chicago

Gary Tom, Physics undergraduate research volunteer (from McGill University) (May 2014 – August 2014) [co-supervised with Martin Zuckermann]

- Poster award: First prize at Department of Physics undergraduate student poster session, Summer 2014

Current position: Physics MSc student, UBC

Josh Koehn, Biomedical Physiology undergraduate research assistant (April 2013 – December 2013)

- SFU VPR USRA, 2013

Current position: Medical student, UBC

Veronica (Ronnie) Tsai, Biomedical Physiology undergraduate research volunteer (September 2012 – March 2013)

Current position: Medical student, UBC

Mike Kirkness, Physics Honours Thesis (April 2012 – December 2012)

Current position: Chief Operating Officer and Chief Innovation Officer, 3Helix Inc., Salt Lake City

Norman Lam, Physics undergraduate research assistant from University of Toronto (May 2012 – August 2012)

- NSERC USRA, 2012

Current position: Physics PhD student, Yale University

Siyu (Doris) Zhao, undergraduate work-study student (May 2012 – August 2012)

Jason Wang, Biological Physics undergraduate research volunteer (February 2012 – June 2012)

Sameera Jhamb, Science undergraduate research volunteer (January 2012 – June 2012)

Alex Fong, Biology undergraduate co-op student (September 2011 – December 2011)

Clara Chan, Physics Honours Thesis and Biological Physics undergraduate research assistant (January 2010 – August 2010)

- SFU VPR USRA, 2010

Michael Pettigrew, Engineering undergraduate research assistant from University of Toronto (May – August 2010) [co-supervised with Eldon Emberly]

- Poster award: Honourable mention in Engineering, Rising Stars of Research conference, August 2010

Current position: Senior Director, Asset Acquisition at BridgeBio, San Francisco Bay Area

Robert Welch, Physics undergraduate research assistant from University of Toronto (May – August 2009)

- Poster award: Honourable mention, CUPC, October 2009
- Poster award: Honourable mention in Biochemistry and Molecular Biology, Rising Stars of Research conference, August 2009
- Poster award: Department of Physics undergraduate student competition, August 2009
- NSERC USRA, 2009

Current position: Data analyst, Echologics

Samuel Chan, Undergraduate researcher (April – August 2009)

Current position: Laboratory Technician, LifeLabs

Ruobing Yang, Biophysics undergraduate research assistant and co-op student from UBC (May – December 2008)

- Oral presentation award: Best talk in Biological Physics, CUPC, 2008
- NSERC USRA, 2008

Current position: Respirologist

Jos One, Biological Physics Undergraduate Research Assistant (April – August 2008)

- Poster award: Department of Physics undergraduate student competition, 2008
- NSERC USRA, 2008

Jeanie Chiu, Part-time undergraduate volunteer, CHEM 481 student and Chemistry part-time co-op student (January 2007 – April 2008)

Current position: Clinical Trial Associate, Seattle Genetics

Karen Lo, BISC 498 student and part-time undergraduate researcher (January 2006 – August 2007)

Current position: Postdoctoral teaching associate, Trinity Western University

Gina Chang, Biophysics undergraduate research assistant from UBC (May – August 2007)

- Poster award: Department of Physics undergraduate student competition, 2007
- NSERC USRA, 2007

Current position: Licenced Pharmacist, Vancouver

Thomas Luo, Biophysics undergraduate research assistant from UBC (May – August 2007) [co-supervised with John Bechhoefer]

Current position: Physician

Braden Brinkman, Physics undergraduate research assistant (May 2006 – April 2007)

- Poster award: Department of Physics undergraduate student competition, 2006
- NSERC USRA, 2006

Current position: Assistant Professor, Department of Neurobiology and Behavior, Stony Brook University

Katie Gagnon, BISC 498 student (September – December 2005)

Current position: Global Research Alliance Manager, Cyclotrons and TRACERcenter, GE Healthcare, Uppsala, Sweden

Michelle Lee, Physics undergraduate research assistant from McMaster University (May – August 2005)

- NSERC USRA, 2005

Current position: High school math and physics teacher, Ottawa

Derek Howell, Physics undergraduate research assistant (January – April 2005)

Current position: Physics Laboratory Supervisor, Capilano University

### ***Supervision of High School Student Researchers***

Callum Tinant (April – May 2018; full-time co-op student)

Jocelyn Gau (March – April 2017; full-time science co-op student)

Priyansh Malik (June – August 2015; part-time volunteer) [co-supervised by Martin Zuckermann]

### ***Supervision of Research Personnel***

Dr. Ryan Bauer, Postdoctoral researcher (October 2021 – present)

Dr. Eric Lin, Research associate (June 2020 – February 2022) [co-supervised by Peter Unrau from June 2020 – August 2021]

Current position: Lab technician, Photonic

Dr. Kathrin Lehmann, Postdoctoral researcher (November 2018 – May 2020)

- Deutsche Forschungsgemeinschaft (DFG) postdoctoral fellowship, 2018-2020
- Biophysical Society of Canada Travel Award, 2019

Current position: Scientific Coordinator, University of Duisburg-Essen

Dr. Tuba Altindal, Postdoctoral researcher (April 2013 – March 2016)

- MITACS Elevate fellowship, 2014-2016

Dr. Laleh Samii, Postdoctoral researcher (May 2013 – August 2013)

Current position: Financial Engineer, d1g1t Inc., Toronto

Andrew Wiczorek, Research associate (October 2008 – June 2013)

Current position: Research associate, Department of Biological Sciences, SFU

Dr. Suzana Kovacic, Part-time research associate (August 2007 – November 2011) (maternity leave: Dec. 2008-Sept. 2009)

Current position: Research Associate, Department of Chemistry, SFU

Clara Chan, Research assistant (January 2011 – August 2011)

Dr. Gerhard Blab, Postdoctoral research associate (September 2009 – August 2010)

Current position: Universiteitsdozent (Assistant Professor), Department of Physics, Utrecht University

Dr. Astrid van der Horst, Postdoctoral researcher (November 2006 – October 2009)

- Veni fellowship, NWO Netherlands, 2009-2012
- Poster award: Department of Physics competition, 2007

Current position: Senior Researcher, Academic Medical Center, University of Amsterdam

Cindy Li, Research assistant (February 2009 – August 2009)

Michelle Lee, Research assistant (January 2008 – July 2008)

Current position: High school math and physics teacher, Ottawa

Marieke Berga, Research assistant (November 2005 – September 2007)

Current position: High school chemistry and biology teacher, greater Vancouver

Dr. Shahryar Khattak, Short-term postdoctoral researcher (August 2005 – October 2005)

Current position: Stem Cell Core Manager, Qatar Biomedical Research Institute QBRI

### **Visiting Researchers Hosted**

Arnau Farré, Visiting PhD student from the Universidad de Barcelona (March 2009 – August 2009)

Current position: Scientific Director, Impetux Optics, Barcelona

Suckjoon Jun, Visiting Researcher from the FAS Centre for Systems Biology, Harvard University (June – August 2007)

Current position: Associate Professor of Physics and of Biology, UCSD

### **Student Theses – Thesis committee member**

SFU: Physics (4 MSc, 10 PhD), Chemistry (4 MSc, 2 PhD), Molecular Biology and Biochemistry (3 BSc, 1 MSc, 1 PhD)

UBC: Biochemistry (1 PhD), Food Science (1 PhD)

### **Internal Thesis Examiner**

Physics (8 MSc, 2 PhD), Biomedical Physiology and Kinesiology (1 PhD), Chemistry (3 MSc, 1 PhD), Molecular Biology and Biochemistry (2 MSc)

### **External Thesis Examiner**

Massey University (PhD Physics), National University of Singapore (PhD Physics), University of Alberta (PhD Physics), University of British Columbia (PhD Physics), University of Victoria (2 MSc Mechanical Engineering)

## **SERVICE**

### **University Service**

#### ***Departmental***

Chair, Graduate Program Committee (2022-present)

Member, Inclusion, Diversity, Equity Alliance (IDEA) (2020-present) [departmental member of American Physical Society APS-IDEA]

Member of Graduate Program Committee (2017-2019; 2021-present)

Founding co-chair, Inclusion, Diversity, Equity Alliance (IDEA) (2020-2021) [departmental member of American Physical Society APS-IDEA]

Elected Member of Physics Tenure & Promotion Committee (2005-2006; 2008-2009; 2009-2010; 2011-2012; 2012-2013; 2014-2015; 2015-2016; 2017-2018; 2018-2019; 2021-2022)

Faculty advisor for Frontiers in Biophysics Workshops (October 2006, January 2008, January 2009, March 2010, February 2012, March 2014, June 2016, June 2019, June 2022)

Member of Molecular Biology and Biochemistry Tenure & Promotion Committee (2020-2021)

Faculty advisor for undergraduate Biological Physics programs (2006-2010; 2011-2013; 2014-2017)

Member of Undergraduate Curriculum Committee (2011-2013, 2016-2017)

Member of Outreach and Liaison committee (2005-2010)

Biophysics / Soft Condensed Matter Physics seminar organizer (Fall 2010)

Faculty advisor for undergraduate Chemical Physics programs (2008-2010)

Member of Chemistry Tenure & Promotions Committee (2009-2010)

Lecturer at and co-organizer of Physics High School open house (April 2005, April 2006)

Organizer of Biophysics Bash (October 2005)

Biophysics Journal Club organizer (Summer 2005)

Co-organizer, Biophysics Journal Club, University of California, Berkeley (2002-2004)

Student Ombudsperson, Chemistry Department, University of Chicago (1996-1998)

### **University**

Elected Faculty of Science representative for the Diverse Qualifications Adjudication Committee (DQAC), SFU Senate (2014-2021)

Elected Member of Senate (2017-2020)

Internal SFU representative on Biomedical Physiology and Kinesiology External Review Committee (2018)

Member of SFUFA Parental Leave committee (2005-2006)

President, Physical Sciences Division Students Committee, University of Chicago (1995-1997)

Victoria University (University of Toronto) Board of Regents, Elected Student Representative (1993-1994)

### **Active Service to the Academic Community**

#### **Reviewing activities**

NSERC Discovery Grant, Physics Evaluation Group: Section Chair of PHYS05/07/09; Statistical, Soft Condensed Matter, and Mesoscopic Physics, General Physics, and Biological Physics (2019)

NSERC Discovery Grant, Physics Evaluation Group member (2016-2019)

*Biophysical Journal*, member of the Editorial Board (2016-2018)

Guest co-editor of *Physics in Canada* focus issue on *Nanoscale Approaches to Biological Systems* (2017)

Human Frontier Science Program (HFSP) International Research Grant Review Committee member, reviewer and chair (member and reviewer 2013-2016; vice-chair 2014-2015; chair 2015-2016)

NSERC Cellular and Molecular Biology Scholarships & Fellowships Selection Committee (S&FSC 187) member and reviewer (2009-2010)

Michael Smith Foundation for Health Research Trainee Competition committee member and reviewer, Junior Graduate Scholarships (2006-2008)

Reviewer for journals and conference proceedings: *ACS Applied Materials & Interfaces*; *American Journal of Physics*; *Applied Optics*; *Biomacromolecules*; *Biophysical Journal*; *ChemPhysChem*; *Chromosome Research*; *European Polymer Journal*; *International Journal of Biological Macromolecules*; *Journal of Optics*; *Journal of Physical Chemistry*; *Journal of Physics: Condensed Matter*; *Journal of Visualized Experiments (JoVE)*; *Langmuir*; *Laboratory Instruction Beyond the First Year (BFY III)*; *Materials Research Society*; *Methods*; *Micromachines*; *Nanoscale*; *Nature Communications*; *New Journal of Physics*; *Optics Express*; *Physical Biology*; *Physical Review Applied*; *Physical Review E*; *Physical Review Letters*; *Physical Review X*; *Physics in Canada*; *PLOS ONE*; *Proceedings of the National Academy of Sciences (PNAS)*; *Soft Matter*

Reviewer for funding agencies: Alberta Ingenuity; Alberta Prion Research Institute; Banff International Research Station (BIRS); Biotechnology and Biological Sciences Research Council (BBSRC) UK; Canada Foundation for Innovation; Canada Research Chairs (CRC); Canadian Cancer Society Research Institute; Collaborative Health Research Program (CHRP; CIHR- and NSERC-cosponsored); Fonds de recherche Québec; Human Frontier Science Program; MITACS; National Research Council of Canada; National Science Foundation; Natural Sciences and Engineering Research Council of Canada (NSERC); Netherlands Organisation for Scientific Research (NWO); New Frontiers in Research Fund (NFRF); Research Corporation; US Air Force Office of Scientific Research (AFOSR); Vienna Science and Technology Fund (Austria)

Reviewer for various external Tenure & Promotion cases

#### **Other activities**

President, Biophysical Society of Canada (2021-2023)

Member at Large, Division of Biological Physics, American Physical Society (APS) (2021-2024). Chair of Community Engagement Committee (2022-2023). Member of March Meeting Program Committee (2021-2023).

Vice President and President-Elect, Biophysical Society of Canada (2019-2021)

Member, APS Northwest Section Nominating committee (2020)

Membership director, Biophysical Society of Canada (2015-2019)

Herzberg Public Lecture coordinator, Canadian Association of Physicists (CAP) Annual Congress. Burnaby, BC (2019)

Organizer of Molecular Motors session, CAP Annual Congress. Burnaby, BC (2019)

Westcoast Women in Engineering, Science and Technology (WWEST) management oversight committee member (2018-2019)

Lead organizer, Biophysical Society of Canada Annual Meeting. Vancouver, BC (2018)

Program committee member, *Optical Trapping Applications* Topical Meeting, at the Optical Society of America (OSA) Congress on Optics in the Life Sciences, San Diego, CA (2017)

Lead organizer, Biophysical Society Thematic Meeting on *Engineering Approaches to Biomolecular Motors: From in vitro to in vivo*, Vancouver, BC (2016)

Program committee member, *Optical Trapping Applications* Topical Meeting, at the Optical Society of America (OSA) Congress on Optics in the Life Sciences, Vancouver, BC (2015)

Executive committee member, Biophysical Society of Canada (2014-2015)

Member, Canadian delegation to the International Conference on Women in Physics (ICWIP). Waterloo, ON (2014)

Co-organizer with Hongbin Li (UBC) of symposium on *Multiscale Mechanics of Materials: From Single Molecules to the Macroscale*, at the Canadian Society for Chemistry Annual Meeting, Vancouver, BC (2014)

Co-organizer with Mazdak Khajepour (Manitoba) and Christine DeWolf (Concordia) of symposium on *Biophysical Chemistry*, at the Canadian Society for Chemistry Annual Meeting, Vancouver, BC (2014)

Organizer of symposium on *Molecular Biomechanics*, at the Canadian Society for Biomechanics Annual Meeting, Simon Fraser University (2012)

Co-organizer with Hongbin Li (Chemistry, UBC) of symposium on *Single-Molecule Measurements in Biological Chemistry*, at the Canadian Society for Chemistry Annual Meeting, Edmonton, Alberta (2008)

### **Service to the community at large**

Countless outreach workshops (public, high-school, elementary and preschool levels)

Online coordinator for Shelter to Home, a nonprofit organization helping people transitioning from homelessness to independent living. Webmaster 2016-2021, Social media coordinator 2018-present.

Volunteer girls' field hockey coach, West Vancouver Field Hockey Club, 2016-2021

Member of Simon Fraser University Childcare Society Sustainability Committee, 2007-2008

### **Membership in the Academic Community**

American Physical Society  
Biophysical Society  
Biophysical Society of Canada  
Canadian Association of Physicists  
Canadian Society for Chemistry

### **Media Interviews**

Interviewed and lawnmower research featured in article in APS News about molecular motors, 2022

Interviewed on CBC Radio One (On the Coast) regarding 2018 Nobel Physics Prize: optical tweezers and women in Physics, 2018

Featured in widely published Canadian Press article about our centrifuge force microscope, 2018

Featured *Biophysical Journal* editorial board member in the Biophysical Society newsletter, 2016

Interviewed in *National Post* regarding neurons as fibre optics, 2016

Featured alumna in University of Chicago Chemists' Club alumni newsletter, 2013.

Featured in CFI YouTube videos, 2012

Featured scientist on BC's *Year of Science* website, 2011

Interviewed in *Analytical Chemistry* article entitled "*Optical tweezers: not just for physicists anymore*", 2008