Curriculum Vitae – Hana Dobrovolny

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Citizenship: Canada, Czech Republic

Education

- **Duke University** – Durham, NC, USA
  Ph.D in Physics – 2000–2008
  - Certificate in Complex and Nonlinear Systems
  - Thesis: Spatiotemporal dynamics of cardiac tissue and the onset of alternans
- **Bryn Mawr College** – Bryn Mawr, PA, USA
  M.A. in Physics – 1997–2000
  - Thesis: On nonlinear time series analysis
- **University of Winnipeg** – Winnipeg, MB, Canada
  B.Sc in Physics and Mathematics – 1994–1997

Research Experience

- **Department of Physics & Astronomy, Texas Christian University**
  Assistant Professor of Biophysics: 2012–present
- **Department of Physics, Ryerson University**
  Postdoctoral Fellow: 2008–2012
- **Department of Physics, Duke University**
  Research Assistant: 2000–2008
- **Department of Physics, Bryn Mawr College**
  Research Assistant: 1997–2000
- **Department of Physics, University of Winnipeg**
  Research Assistant: 1997
- **Department of Mathematics, University of Winnipeg**
  Research Assistant: 1996
- **Department of Physiology, University of Manitoba**
  Research Assistant: 1995

Teaching Experience

- **Department of Physics and Astronomy, York University**
  Course Director: 2010–present
- **Department of Physics, Duke University**
  Teaching Assistant: 2001–2002

- **Department of Physics, Bryn Mawr College**
  Teaching Assistant: 1997–2000
- **Department of Mathematics, University of Winnipeg**
  Teaching Assistant: 1995–1997
- **Department of Physics, University of Winnipeg**
  Teaching Assistant: 1994–1997

Professional Activities

- Co-organized *Mathematical and Computational Modelling of Influenza* minisymposium at AMMCS Conference – July 2011
- Chaired *Epidemiology II* session at ICIAM – July 2011
- Postdoctoral Representative on Ryerson Physics Departmental Council – 2008–2010
- At-large Representative on APS Forum on Graduate Student Affairs – 2004–2007
- Coordinator of graduate student seminar (Duke University, Dept. of Physics) – 2004
- At-Large Representative on Graduate Student Organization – 2003–2005
- Coordinator of graduate student mentoring program (Duke University, Dept. of Physics) – 2003–2006

Awards

- **Charles H. Townes Fellowship**
  Duke University: 2000–2002
- **Jenkins Family Graduate Fellowship**
  Duke University: 2000-2001
- **NSERC Postgraduate Scholarship**
  Natural Sciences and Engineering Council: 1998-1999
- **University Gold Medal in Physics**
  University of Winnipeg: 1997
- **Duckworth Scholarship**
  University of Winnipeg: 1995–1997
- **Lawson Scholarship in Mathematics**
  University of Winnipeg: 1996–1997
- **B.G. Hogg Memorial Scholarship in Physics**
  University of Winnipeg: 1995–1996
- **S.K. Sen Scholarship in Physics**
  University of Winnipeg: 1995–1996
- **Academic Proficiency Scholarship**
  University of Winnipeg: 1994–1997
- **Henry Doidge Memorial Scholarship in Physics**
  University of Winnipeg: 1994–1995
- **Canada Scholarship**
  Government of Canada: 1993–1997
- **Special Entrance Scholarship**
  University of Winnipeg: 1993–1994

- **Riverbend Scholarship**
  Balmoral Hall School: 1991–1993

Other Activities

- Member of Missisauga Ice Precise Synchronized Skating Team – 2006–2012
  2012, 2010 Adult III National Champions
- Webmaster for Kidney Cancer Canada – 2007–2008
- Member of Carolina Ice Sensations Synchronized Skating Team – 2004–2006
- Student representative on Duke Student Health Committee – 2004–2005
- Founding member of Duke University Skating Club – 2003–2004
- Member of Duke Canadian Students Association – 2002–2006
- International student representative on Duke Health Insurance Committee – 2002–2006

Publications List

Articles Published in Refereed Journals:

1. **H.M. Dobrovolny**, Micaela B. Reddy, Mohamed A. Kamal, Craig R. Rayner, C.A.A. Beauchemin, 'Assessing mathematical models of influenza infections using features of the immune response.' accepted by PLoS One.

2. **H.M. Dobrovolny**, R. Gieschke, B.E. Davies, N.L. Jumbe, C.A.A. Beauchemin (2011) 'Neuraminidase inhibitors for treatment of human and avian strain influenza: A comparative modeling study.' J. Theor. Biol. **269**:234-244. Times cited: 3

3. **H.M. Dobrovolny**, M.J. Baron, R. Gieschke, B.E. Davies, N.L. Jumbe, and C.A.A. Beauchemin (2010) 'Exploring cell tropism as a possible contributor to influenza infection severity.' PLOS One, **5**(11):e13811. Times cited: 4

4. **H.M. Dobrovolny**, C.M. Berger, N.H. Brown, W. Krassowska Neu, D.J. Gauthier (2009) 'Spatial Heterogeneity of Restitution Properties and the Onset of Alternans.' Proceedings of 31st Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Sep. 6:4186-4189.

5. D.W. Evertson (In Memoriam), M.R. Holcomb, M.D.C. Eames, M.-A.P. Bray, V.Y. Sidorov, J. Xu, H. Wingard, **H.M. Dobrovolny**, M.C. Woods, D.J. Gauthier, and J.P. Wikswo (2008) 'High-resolution high-speed panoramic cardiac imaging system.' IEEE Trans. Biomed. Eng. **55**:1241-1243. Times cited: 6

6. C.M. Berger, X. Zhao, D.G. Schaeffer, W. Krassowska, **H.M. Dobrovolny**, D.J. Gauthier (2007) 'Period-doubling bifurcation to alternans in paced cardiac tissue: Crossover from smooth to border-collision characteristics.' Phys. Rev. Lett. **99**:058101. Times cited: 11

7. N.H. Brown, **H.M. Dobrovolny**, P.D. Wolf, D.J. Gauthier (2007) 'A Fiber-Based Ratiometric Optical Cardiac Mapping Channel using a Diffraction Grating and Split Detector.' Biophys J. **93**:254-263. Times cited: 3

8. S.S. Kalb, **H.M. Dobrovolny**, E. Tolkacheva, S.F. Idriss, W. Krassowska, D.J. Gauthier (2004) 'The restitution portrait: A new method for investigating rate-dependent restitution.' J. Cardiovasc. Electrophys. **15**:698-709. Times cited: 49 – **featured on the cover of JCE**

9. C.J. Cellucci, P.D. Brodfuehrer, R. Acera-Pozzi, **H.M. Dobrovolny**, E. Engler, J. Los, R. Thompson, A.M. Albano (2000) 'Linear and nonlinear measures predict swimming in the leech.' Phys. Rev. E **62**:4826-4834. Times cited: 5

Other Publications:

1. **H.M. Dobrovolny** (2012) 'Experimental Biophysics Book Review.' Physics in Canada

2. **H.M. Dobrovolny** (2011) 'Out of the Shadows Book Review.' Physics in Canada

3. **H.M. Dobrovolny** (2011) 'Physics of the Life Sciences Book Review.' Physics in Canada

4. **H.M. Dobrovolny**, H. Elmariah, S.S. Kalb, J.P. Wikswo, Jr., D.J. Gauthier (2005) 'Imaging cardiac dynamics using low-cost ultra-high-power light emitting diodes and voltage-sensitive dyes.' arXiv:physics/0702241

Presentations

Invited presentations:

1. *The role of mathematical modelling in understanding influenza infections*, IDEAS Seminar, Fields Institute, Toronto, ON, January 20, 2012

2. *What can mathematical modelling tell us about influenza?* Mathematical Biology Research Seminar, McMaster University, Hamilton, ON, October 13, 2011

3. *The effect of external packaging on the dynamics of drug-resistant influenza virus*, AMMCS, Waterloo, ON, July 26, 2011

4. *Modelling of influenza infections*, Graduate Research Conference, York University, Toronto, ON, October 14, 2010

5. *Neuraminidase inhibitor treatment of seasonal and severe influenza*, Thematic Program on Mathematics of Infectious Diseases, Fields Institute, Toronto, ON, July 13, 2010

6. *Introduction to Membrane Biophysics*, Physics Colloquium, York University, Toronto, ON, September 22, 2009

7. *Spatial Heterogeneity of Restitution Properties and the Onset of Alternans*, 31st Annual International Conference of the IEEE Engineering in Medicine and Biology Society, September 4, 2009

8. *Modeling the emergence of influenza drug resistance under various drug therapies*, Infectious Diseases Seminar, York University, Toronto, ON, July 6, 2009

9. *Stability of Cardiac Rhythms*, York University, Toronto, ON, May 25, 2007

10. *Action potential and Conduction Velocity Restitution in Cardiac Tissue*, Nonlinear Dynamics Seminar Series, Duke University, Durham, NC, November 4, 2004

11. *Bioelectricity: Techniques for Measuring Electrical Activity in Living Tissue*, Graduate Seminar Series, Duke University, Durham, NC, February 2004

12. *Recent Developments in Cardiac Dynamics*, University of Cambridge, Cambridge, UK, November 26, 2003

13. *Cardiac Dynamics: The New Restitution Portrait*, Graduate Seminar Series, Duke University, Durham, NC, November 2003

Conference presentations:

1. **H.M. Dobrovolny**, M.B. Reddy, M.A. Kamal, C.R. Rayner, C.A.A. Beauchemin, 'What do we really know about the role of the immune response in influenza?', Poster presentation at the XV International Symposium on Respiratory Viral Infections, Rotterdam, Netherlands, March 14–17, 2013.

2. **H.M. Dobrovolny**, K.D. Poore, C.A.A. Beauchemin, 'Evaluating the efficacy of drug treatment of infectious diseases using mathematical models', Poster presentation at the Gordon Research Conference on Tropical Infectious Diseases, Galveston, TX, February 10–15, 2013.

3. **H.M. Dobrovolny**, K.D. Poore, C.A.A. Beauchemin, 'Evaluating the efficacy of drug treatment of influenza', Oral presentation at the Workshop for Young Researchers in Mathematical Biology, Columbus, OH, August 27-30, 2012.

4. **H.M. Dobrovolny**, K.D. Poore, C.A.A. Beauchemin, 'Characterizing monotherapy and combination therapy of influenza', Oral presentation at SMB, Knoxville, TN, July 25-28, 2012.

5. K.D. Poore, **H.M. Dobrovolny**, C.A.A. Beauchemin, 'Toward a better evaluation of optimal antiviral combination therapy in treating influenza infection', Poster presentation at SHARCNET Research Day, Guelph, ON, May 23, 2012 (Winner of best poster award)

6. **H.M. Dobrovolny**, K.D. Poore, C.A.A. Beauchemin, 'Characterizing influenza drug treatments', Oral presentation at SHARCNET Research Day, Guelph, ON, May 23, 2012

7. M. Shahbaba, **H.M. Dobrovolny**, C.A.A. Beauchemin, 'Characterizing the efficacy of combination antiviral therapy for the treatment of influenza', Poster presentation at AMMCS, Waterloo, ON, July 25-29, 2011.

8. N. Younis, B.P. Holder, **H.M. Dobrovolny**, C.A.A. Beauchemin, 'Investigating the impact of cell tropism on influenza infection spread in computer-simulated lung tissue', Poster presentation at AMMCS, Waterloo, ON, July 25-29, 2011.

9. J. Palmer, **H.M. Dobrovolny**, C.A.A. Beauchemin, 'Modelling time-dependent drug concentrations with constant drug concentration in within host models of influenza', Poster presentation at AMMCS, Waterloo, ON, July 25-29, 2011.

10. **H.M. Dobrovolny**, C.A.A. Beauchemin, 'Investigating the immune response in within host models of influenza', Oral presentation at ICIAM, Vancouver, BC, July 18-July 23, 2011.

11. **H.M. Dobrovolny**, 'Modelling the emergence of influenza drug resistance using stochastic ordinary differential equations', Oral presentation at Sharcnet Research Day, Oakville, ON, May 19, 2011

12. B.P. Holder, **H.M. Dobrovolny**, W. Wong, T. Ngo, P. Simon, G. Boivin, C.A.A. Beauchemin, 'How mathematical and computer models can enhance classic virological assays', Poster presentation at XIII International Symposium on Respiratory Viral Infections, Rome, Italy, March 13–16, 2011.

13. **H.M. Dobrovolny**, G. Boivin, A.S. Perelson, C.A.A. Beauchemin, 'Modeling the emergence of influenza drug resistance under various drug therapies', Oral presentation at CAP, Toronto, ON, June 6-June 12, 2010.

14. **H.M. Dobrovolny**, R. Gieschke, B. Davies, N.L. Jumbe, C.A.A. Beauchemin, 'Why late treatment with neuraminidase inhibitors is effective in treating more severe influenza infections.' Poster presentation at the Pandemic H1N1 Influenza Meeting, Atlanta, GA, April 1722, 2010.

15. **H.M. Dobrovolny**, R. Gieschke, B. Davies, N.L. Jumbe, C.A.A. Beauchemin, 'Why late treatment with neuraminidase inhibitors is effective in treating more severe influenza infections.' Poster presentation at the XIIth International Symposium on Respiratory Viral Infections, Taipei (Taiwan), March 1114, 2010.

16. **H.M. Dobrovolny**, C.A.A. Beauchemin, G. Boivin, A.S. Perelson, 'Modeling the emergence of influenza drug resistance under various drug therapies', Poster presentation at MITACS, Fredericton, NB, May 31-June 5, 2009.

17. D.J. Gauthier, C.M. Berger, X. Zhao, **H.M. Dobrovolny**, D.G. Schaeffer, W. Krassowska, 'Evidence for an unfolded border-collision bifurcation in paced cardiac muscle,' Oral presentation at Nonlinear Dynamics Seminar, U. Maryland, College Park, MD, Apr. 17, 2008.

18. C.M. Berger, X. Zhao, D.G. Schaeffer, **H.M. Dobrovolny**, W. Krassowska, D.J. Gauthier, 'Evidence for an unfolded border-collision bifurcation in paced cardiac tissue,' Poster presentation at Dynamics Days 2007, Boston, MA, Jan. 2-6, 2007

19. D.J. Gauthier, C.M. Berger, X. Zhao, D.G. Schaeffer, **H.M. Dobrovolny**, W. Krassowska, 'Discovery of a new type of bifurcation in paced cardiac muscle,' Oral presentation at Third Wrokshop Promotionskolleg, Helmholtz Center for Brain and Mind Dynamics, Liebenwalde, Germany, July 14, 2006.

20. C.M. Berger, **H.M. Dobrovolny**, X. Zhao, D.G. Schaeffer, W. Krassowska, D.J. Gauthier, 'Investigating a Period-Doubling Bifurcation in Cardiac Tissue Using Alternate Pacing,' Poster presentation at Dynamics Days 2006, Bethesda, MD, Jan. 4-7, 2006.

21. C.M. Berger, **H.M. Dobrovolny**, D.G. Schaeffer, W. Krassowska, D.J. Gauthier, 'Evidence for a border-collision bifurcation in paced cardiac tissue,' Oral presentation at Southeastern Section of the APS, Gainesville, FL, November 10-12, 2005.

22. **H.M. Dobrovolny**, C.M. Berger, S. Kalb, S. Idriss, D. Schaeffer, W. Krassowska, D.J. Gauthier,'Spatial heterogeneity of the restitution portrait correlates with alternans in paced cardiac tissue,' Poster presentation at Heart Rhythm, New Orleans, LA, May 4-7, 2005. [Heart Rhythm, 2:S297 (2005)]

23. C.M. Berger, **H.M. Dobrovolny**, S.S. Kalb, S.F. Idriss, D.G. Schaeffer, D.J. Gauthier, W. Krassowska,'Investigating a Period-Doubling Bifurcation in Cardiac Tissue using Alternate Pacing,' Oral presentation at American Physical Society, Los Angeles, CA, March 21-25, 2005.

24. **H.M. Dobrovolny**, E.G. Tolkacheva, D.J. Gauthier, 'Spatiotemporal dynamics and control of alternans in cardiac tissue with short-term memory,' Oral presentation at APS March meeting, Los Angeles, CA, Mar. 21-25, 2005.

25. **H.M. Dobrovolny**, R. Oliver, S. Kalb, E.G. Tolkacheva, W. Krassowska, and D.J. Gauthier,'Conduction velocity dispersion in cardiac tissue,' Oral presentation at 2004 CAP Congress, Winnipeg, Canada, June 13-16, 2004.

26. **H.M. Dobrovolny**, R. Oliver, S. Kalb, E.G. Tolkacheva, D.G. Schaeffer, W. Krassowska, D.J. Gauthier, 'Action Potential and Conduction Velocity Restitution in Cardiac Tissue', Oral presentation at APS March Meeting, Montreal, Canada, March 21-26, 2004.

27. **H.M. Dobrovolny**, S. Sau, H. Elmariah, D.J. Gauthier, J. Gilligan, J. Wikswo, 'Use of LEDs for imaging cardiac tissue,' Poster presentation at Gordon Research Conference on Cardiac Arrhythmia Mechanisms, New London, NH, August 10-15, 2003.

28. S. Sau, **H.M. Dobrovolny**, E.G. Tolkacheva, D.G. Schaeffer, W. Krassowska, D.J. Gauthier, 'New Experimental Protocol for Simultaneous Measurement of the S1S2, Constant-BCL and Dynamic Restitution Curves,' Poster presentation at Gordon Research Conference on Cardiac Arrhythmia Mechanisms, New London, NH, August 10-15, 2003 (Winner of Best Experimental Poster Award).

29. **H.M. Dobrovolny**, S. Sau, H. Elmariah, D.J. Gauthier, J. Gilligan, J. Wikswo, 'Use of LEDs for imaging cardiac tissue,' Poster presentation at 2nd annual Fitzpatrick Center Conference, Durham, NC, May 27-28, 2003.

30. **H.M. Dobrovolny**, S. Sau, E.G. Tolkacheva, D.G. Schaeffer, W. Krassowska, D.J. Gauthier, 'New Experimental Protocol for Simultaneous Measurement of the S1S2, Constant-BCL and Dynamic Restitution Curves,' Poster presentation at NASPE, Washington, DC, May 14-17, 2003.

31. **H.M. Dobrovolny**, S. Sau, E.G. Tolkacheva, D.G. Schaeffer, W. Krassowska, D.J. Gauthier, 'Stability of cardiac response patterns', Poster presentation at Dynamics Days, January, 2003.