

Nilima Nigam

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Education

- 1996-1999 Ph.D., Applied Mathematics, Department of Mathematical Sciences, University of Delaware, Newark, Delaware.
- 1994-1996 M.S., Applied Mathematics, Department of Mathematical Sciences, University of Delaware, Newark, Delaware.
- 1991-1994 B.Sc.(Honors), Physics, Indian Institute of Technology, Kharagpur, India.

Academic Experience

- 7/2013-present Professor, Department of Mathematics, Simon Fraser University, Burnaby, Vancouver, Canada.
- 7/2008-06/2013 Associate Professor, Department of Mathematics, Simon Fraser University, Burnaby, Vancouver, Canada.
- 7/2008-04/2010 Associate Scientific Director, MITACS, Canada
- 06/2008-12/2008 Associate Professor, Department of Mathematics and Statistics, McGill University, Montreal, Quebec, Canada.
- 2001-2008 Assistant Professor, Department of Mathematics and Statistics, McGill University, Montreal, Quebec, Canada.
- 1999-2001 Industrial Postdoctoral Fellow, Institute for Mathematics and its Applications, University of Minnesota, Minneapolis, Minnesota, USA.
Industrial partner: Seagate Technologies.
- 1994-1999 Graduate Teaching/Research Assistant, Department of Mathematical Sciences, University of Delaware, Newark, Delaware, USA.

Honours and Awards

- 2008-14 Canada Research Chair in Applied Mathematics

Simon Fraser University, Burnaby, Vancouver, Canada.

- 2008 Nominee, McGill Carrie Derick Award for Graduate Student Supervision
- 2007 **NSERC Discovery Accelerator Supplement, \$ 120 K**
- 2007 Nominee, McGill Carrie Derick Award for Graduate Student Supervision
- 2005 McGill Principal's Prize for Excellence in Teaching at the Assistant Professor level.
- 2005 Academic mentor, Ben-Fusaro Award-winning team in the Mathematical Contest in Modeling.
- 2002 SIAM 100-dollar, 100-digit challenge, with Martin Gander, Felix Kwok, Sebastian Loisel, and Paul Tupper. One of 20 winning teams.
- 1997 Graduate Student Scholarship, College of Arts and Sciences, University of Delaware. Nominated and awarded \$1000 by faculty members for excellence in academic achievement.
- 1997 Baxter-Sloyer Award, Department of Mathematical Sciences, University of Delaware. Awarded for excellence as a teaching assistant.
- 1996 Graduate Student Scholarship, College of Arts and Sciences, University of Delaware. Nominated and awarded \$1000 by faculty members for excellence in academic achievement.
- 1996 Departmental Fellowship, Department of Mathematical Sciences, University of Delaware. Awarded for scholastic achievement.
- 1991 Gold Medalist, (Indian) National Graduate Physics Examination, 1991. Ranked in top 5 out of over 3000 participants in a nation-wide competition in Physics open to all graduates and undergraduates.
- 1991 Winner, "Mahindra Search for Talent Scholarship", St. Xavier's College, Bombay. Awarded for highest CGPA in the freshmen class.
- 1991 IISc Summer Research Award, Indian Institute of Science, Bangalore, India. Awarded for scholastic achievement in Physics.

Journals

- [1] George C. Hsiao and Nilima Nigam. A transmission problem in the exterior of thin domain. In *Homage to Gaetano Fichera*, volume 7 of *Quad. Mat.*, pages 177–205. Dept. Math., Seconda Univ. Napoli, Caserta, 2000.
- [2] G. C. Hsiao, P. B. Monk, and N. Nigam. Error analysis of a finite element-integral equation scheme for approximating the time-harmonic Maxwell system. *SIAM J.*

- Numer. Anal.*, 40(1):198–219, 2002.
- [3] G. C. Hsiao and N. Nigam. A transmission problem for fluid-structure interaction in the exterior of a thin domain. *Adv. Differential Equations*, 8(11):1281–1318, 2003.
 - [4] D. Lewis and N. Nigam. Geometric integration on spheres and some interesting applications. *J. Comput. Appl. Math.*, 151(1):141–170, 2003.
 - [5] Catalina Anghel, Gary Margrave, and Nilima Nigam. Locating anomalous seismic attenuation: a mathematical investigation. *Can. Appl. Math. Q.*, 12(4):439–478, 2004.
 - [6] David P. Nicholls and Nilima Nigam. Exact non-reflecting boundary conditions on general domains. *J. Comput. Phys.*, 194(1):278–303, 2004.
 - [7] Dmitry Jakobson, Michael Levitin, Nikolai Nadirashvili, Nilima Nigam, and Iosif Polterovich. How large can the first eigenvalue be on a surface of genus two? *Int. Math. Res. Not.*, (63):3967–3985, 2005.
 - [8] Debra Lewis, Nilima Nigam, and Peter J. Olver. Connections for general group actions. *Commun. Contemp. Math.*, 7(3):341–374, 2005.
 - [9] Inti Zlobec, Russ Steele, Nilima Nigam, and C. Compton, Caroline. A predictive model of rectal tumor response to preoperative radiotherapy using classification and regression tree methods. *Clin Cancer Res.*, 11(15), 2005.
 - [10] David P. Nicholls and Nilima Nigam. Error analysis of an enhanced DtN-FE method for exterior scattering problems. *Numer. Math.*, 105(2):267–298, 2006.
 - [11] Leonid Chindelevitch, David P. Nicholls, and Nilima Nigam. Error analysis and preconditioning for an enhanced DtN-FE algorithm for exterior scattering problems. *J. Comput. Appl. Math.*, 204(2):493–504, 2007.
 - [12] George C. Hsiao, Nilima Nigam, and Anna-Margarete Sändig. Innovative solution of a 2D elastic transmission problem. *Appl. Anal.*, 86(4):459–482, 2007.
 - [13] S. A. Maslowe and N. Nigam. The nonlinear critical layer for Kelvin modes on a vortex with a continuous velocity profile. *SIAM J. Appl. Math.*, 68(3):825–843, 2007.
 - [14] T. Akchurin, T. Aissiou, N. Kemeny, E. Prosk, N. Nigam, and S. Komarova. Complex dynamics of osteoclast formation and death in long-term cultures. *PLoS One*, 3(5), 2008.

- [15] S. Gemmrich and N. Nigam. A boundary integral strategy for the Laplace-Beltrami-Dirichlet problem on the sphere S^2 . In *Frontiers of applied and computational mathematics*, pages 222–230. World Sci. Publ., Hackensack, NJ, 2008.
- [16] S. Gemmrich, N. Nigam, and O. Steinbach. Boundary integral equations for the Laplace-Beltrami operator. In *Mathematics and computation, a contemporary view*, volume 3 of *Abel Symp.*, pages 21–37. Springer, Berlin, 2008.
- [17] Sherwin A. Maslowe and Nilima Nigam. Vortex Kelvin modes with nonlinear critical layers. In *IUTAM Symposium on Hamiltonian Dynamics, Vortex Structures, Turbulence*, volume 6 of *IUTAM Bookser.*, pages 163–175. Springer, Dordrecht, 2008.
- [18] Tommy L. Binford, Jr., David P. Nicholls, Nilima Nigam, and T. Warburton. Exact non-reflecting boundary conditions on perturbed domains and hp -finite elements. *J. Sci. Comput.*, 39(2):265–292, 2009.
- [19] Marc D. Ryser, Nilima Nigam, and Svetlana V. Komarova. Mathematical modeling of spatio-temporal dynamics of a single bone multicellular unit. *J. Bone Miner. Res.*, 24(5):860–970, 2009.
- [20] Marc D. Ryser, Svetlana V. Komarova, and Nilima Nigam. The cellular dynamics of bone remodeling: a mathematical model. *SIAM J. Appl. Math.*, 70(6):1899–1921, 2010.
- [21] George C. Hsiao, Nilima Nigam, Joseph E. Pasciak, and Liwei Xu. Error analysis of the DtN-FEM for the scattering problem in acoustics via Fourier analysis. *J. Comput. Appl. Math.*, 235(17):4949–4965, 2011.
- [22] Harun Kurkcu, Nilima Nigam, and Fernando Reitich. An integral representation of the Green function for a linear array of acoustic point sources. *J. Comput. Phys.*, 230(8):2838–2856, 2011.
- [23] Gabriel N. Gatica, L. Pamela Cook, Kirk E. Jordan, Nilima Nigam, Olaf Steinbach, and Liwei Xu. Preface [Advances in boundary integral equations and related topics: on the occasion of George C. Hsiao’s 75th birthday]. *Appl. Numer. Math.*, 62(6):665–666, 2012.
- [24] S. Gemmrich, J. Gopalakrishnan, and N. Nigam. Convergence analysis of a multigrid algorithm for the acoustic single layer equation. *Appl. Numer. Math.*, 62(6):767–786, 2012.

- [25] Nilima Nigam and Joel Phillips. High-order conforming finite elements on pyramids. *IMA J. Numer. Anal.*, 32(2):448–483, 2012.
- [26] Nilima Nigam and Joel Phillips. Numerical integration for high order pyramidal finite elements. *ESAIM Math. Model. Numer. Anal.*, 46(2):239–263, 2012.
- [27] Marc D. Ryser, Nilima Nigam, and Paul F. Tupper. On the well-posedness of the stochastic Allen-Cahn equation in two dimensions. *J. Comput. Phys.*, 231(6):2537–2550, 2012.
- [28] Mary-Catherine Kropinski and Nilima Nigam. Fast integral equation methods for the Laplace-Beltrami equation on the sphere. *Adv. Comput. Math.*, 40(2):577–596, 2014.
- [29] Hadi Rahemi, Nilima Nigam, and James M Wakeling. Regionalizing muscle activity causes changes to the magnitude and direction of the force from whole muscles - a modelling study. *Frontiers in Physiology*, 5(298), 2014.
- [30] Eldar Akhmetgaliyev, Oscar Bruno, and Nilima Nigam. A boundary integral algorithm for the Laplace Dirichlet-Neumann mixed eigenvalue problem. *J. Comput. Phys.*, 298:1–28, 2015.
- [31] M. Dewapriya, R. Rajapakse, and N. Nigam. Influence of hydrogen functionalization on the fracture strength of graphene and the interfacial properties of graphene-polymer nanocomposite. *Carbon*, 93:830–842, 2015.
- [32] Nilima Nigam. Approximation on pyramids. *CMS Notes*, 47(5):13–14, 2015.
- [33] Nilima Nigam. The closing of IMA and MBI. *Notices of the American Mathematical Society*, 62(11), 2015.
- [34] Hadi Rahemi, Nilima Nigam, and James Wakeling. The effect of intramuscular fat on skeletal muscle mechanics: implications for the elderly and obese. *Journal of the Royal Society Interface*, 12(109), 2015.
- [35] Joe Coyle and Nilima Nigam. An hp-dg method for a class of transport equations with structured populations. *Comput. Math. Appl.*, 72(3):768–784, 2016.
- [36] Bamdad Hosseini, Nilima Nigam, and John Stockie. On regularizations of the δ distribution. *J. Comput. Phys.*, 305:423–447, 2016.

- [37] Nilima Nigam, Mary-Catherine Kropinski, and Bryan Quaife. Integral equation methods for the Yukawa-Beltrami equation on the sphere. *Adv. Comput. Math.*, 42(2):469–488, 2016.
- [38] Sebastian Dominguez, Nilima Nigam, and Bobak Shahriari. A combined finite element and bayesian optimization framework for shape optimization in spectral geometry. *Computers Mathematics with Applications*, 2017.
- [39] Bamdad Hosseini and Nilima Nigam. Well-posed Bayesian Inverse Problems: Priors with exponential tails. *SIAM/ASA J. Uncertain. Quantif.*, 5(1):436–465, 2017.
- [40] Stephanie Ross, David Ryan, Sebastian Dominguez, Nilima Nigam, and James Wakeling. Size, history-dependent, activation and dimensionality effects on the work and power produced during cyclic muscle contractions. *Integrative and Comparative Biology*, 2018.
- [41] Stephanie A. Ross, Nilima Nigam, and James Wakeling. A modelling approach for exploring muscle dynamics during cyclic contractions. *PLoS Computational Biology*, 2018.
- [42] H. Ammari, O. Bruno, K. Imeri, and N. Nigam. Wave enhancement through optimization of boundary conditions. *SIAM J. Scientific Computing*, 2019.
- [43] S. Dominguez, N. Nigam, and J. Sun. Revisiting the jones eigenproblem in fluid-structure interaction. *SIAM Journal of Applied Mathematics*, 2019.
- [44] N. Nigam, B. Siudeja, and B. Young. A proof via finite elements for Schiffer’s conjecture on a regular pentagon. *J. of Foundations of Computational Mathematics*, 2019.
- [45] Nilima Nigam. *Variational methods for a class of boundary value problems exterior to a thin domain*. ProQuest LLC, Ann Arbor, MI, 1999. Thesis (Ph.D.)–University of Delaware.

Refereed Conferences

- [46] Nilima Nigam. A variational method in acoustics related to an impenetrable scatterer coated by a thin penetrable shell. In *Mathematical and numerical aspects of wave propagation (Santiago de Compostela, 2000)*, pages 90–95. SIAM, Philadelphia, PA, 2000.
- [47] Sherwin Maslowe. Kelvin modes with nonlinear critical layers on a vortex with a continuous velocity profile. In *APS Division of Fluid Dynamics Meeting Abstracts*, volume 1, 2005.

[48] H Rahemi, N Nigam, and JM Wakeling. Effects of muscle pennation on its kinematics and force development. In *INTEGRATIVE AND COMPARATIVE BIOLOGY*, volume 50, pages E285–E285. OXFORD UNIV PRESS INC JOURNALS DEPT, 2001 EVANS RD, CARY, NC 27513 USA, 2010.

Invited non-refereed

[49] Gabriel N. Gatica, L. Pamela Cook, Kirk E. Jordan, Nilima Nigam, Olaf Steinbach, and Liwei Xu. Preface [Advances in boundary integral equations and related topics: on the occasion of George C. Hsiao’s 75th birthday]. *Appl. Numer. Math.*, 62(6):665–666, 2012.

[50] Nilima Nigam. Approximation on pyramids. *CMS Notes*, 47(5):13–14, 2015.

[51] Nilima Nigam. The closing of IMA and MBI. *Notices of the American Mathematical Society*, 62(11), 2015.

[52] Nilima Nigam. *Variational methods for a class of boundary value problems exterior to a thin domain*. ProQuest LLC, Ann Arbor, MI, 1999. Thesis (Ph.D.)–University of Delaware.

Book Chapters

[53] Nilima Nigam. Mathematics in industry, mathematics in the classroom: analogy and metaphor. In Susan Oesterle, editor, *Canadian Mathematics Education Study Group 2014*.

[54] Solomon Garfunkel, Rolf Jeltsch, and Nilima Nigam. Communication and collaboration. In *Educational Interfaces between Mathematics and Industry*, pages 319–332. Springer International Publishing, 2013.

[55] Nilima Nigam and José Francisco Rodrigues. University and academic technical/vocational education. In *Educational Interfaces between Mathematics and Industry*, pages 173–183. Springer International Publishing, 2013.

Professional Service

- Editorial board, *Math-in-Industry Case Studies*, 2007-2010, *Journal of Engineering Mathematics*, 2011-present, *SIAM Journal of Applied Mathematics*, 2012-present, *SIAM News*,

2012-present, Computers and Mathematics with Applications, 2012-present, Royal Society Open Science, 2014-2015, Canadian Bulletin of Mathematics/Canadian Journal of Mathematics, 2016-present

- Co-moderator of arXiv/math.na
- Member, Mathematics Evaluation Group, NSERC, 2014-2018.
- Panelist, National Science Foundation, USA. 2002, 2003, 2004, 2006, 2007, 2008, 2009, 2012, 2013, 2014, 2017.
- Referee, European Science Research Council.
- Member, Advancement of Mathematics committee of the Canadian Mathematical Society, 2007-2010.
- Member, SIAM Major Awards Committee, 2010-2012.
- Chair, Canadian Study Group Coordination Committee, 2011-12.
- Member-at-large, CAIMS, 2011-2014.
- Canadian Applied Mathematics representative on the ICIAM/ICME international study on integrating industrially-relevant applications into mathematics education.
- Canadian Mathematics Society Research Committee, 2016-2018.
- SIAM Outstanding Paper committee, 2016.
- SIAM Sonia Kovelvsky Lecture committee, 2018.
- IMA Prize Committee, 2018.

Involvement in Industrial Study-Groups.

- * Graduate Student Math Modeling Camp, PIMS, August 2016. Academic Mentor.
- * Graduate Student Math Modeling Camp, Oxford, UK, April 2014. Academic Mentor.
- * 5th Fields-Mitacs Industrial Problems Workshop, 2014. Co-organizer/Scientific Committee.
- * CRM 5th Industrial Problem Solving Workshop, 2013. Co-organizer/Scientific Committee.

- * 4th Fields-Mitacs Industrial Problems Workshop, 2012. Co-organizer/Scientific Committee.
- * 3rd Fields-Mitacs Industrial Problems Workshop, 2010. Co-organizer/Scientific Committee.
- * 2nd Fields-MITACS Industrial Problems Workshop, 2008, Fields. Co-organizer/Scientific Committee.
- * Graduate Student Math Modeling Camp, 2007, RPI. Academic Mentor.
- * 1st Fields-Mitacs Industrial Problems Workshop, 2006. Co-organizer/Scientific Committee.
- * 10th PIMS-MITACS Industrial Problem Solving Workshop, 2006, SFU. Participant.
- * 8th PIMS-MITACS Industrial Problem Solving Workshop, 2004, UBC. Participant.
- * 7th PIMS-MITACS Industrial Problem Solving Workshop, 2003, Calgary. Participant.

Supervision

▪ Postdoctoral fellow supervision:

- Dr. Harun Kurcku, 2008-2010, postdoctoral work on seismic data compression and Green's functions for quasi-periodic fields.
- Dr. Roger Donaldson, 2009-2010, postdoctoral work on pattern formation in Type-I superconductors.
- Dr. Ben Adcock, 2010-2012, postdoctoral work on non-polynomial methods for eigenfunction calculation and compressed sensing.
- Dr. Roberto Armenta, 2012-2014, postdoctoral work on high-order discretization for mixed boundary value problems in electromagnetics
- Dr. Aditi Ghosh, 2014-2015, postdoctoral work on fast multiple strategies on compact manifolds. Co-supervised with M. Kropinski.

▪ Graduate student research: Ph.D. supervision

- Inti Zlobec (Dept. of Pathology), PhD 2007, on the development of predictive models for brachytherapy response in rectal cancers. Co-supervised with Prof. J. Jass in Pathology. Current position: Associate Professor of Experimental Medicine, University of Bern, Switzerland.
- Simon Gemmrich, PhD 2009, on boundary integral equations on spheres, and multigrid preconditioning.
Awards: Graduate scholarship, Institut des sciences mathématiques (ISM), Montréal.
Current position: Fixed income quantitative analyst, Bank Vontobel, Zurich.
- Joel Phillips, PhD 2010, on the use of differential complexes in the design and analysis of high-order finite elements for pyramids.
Awards: NSERC Graduate Scholarship. Current position: Researcher, Jane Street Capital, London.
- Marc Ryser, PhD 2012, on the modeling and analysis of bone remodeling, and on the numerical analysis of SPDE in two dimensions. Co-supervised with Prof. Tupper in Mathematics and S. Komarova in Biology.
Awards: Canadian Mathematical Society Doctoral Awards, 2013; Hydro-Quebec doctoral fellowship. Current position: Assistant professor (tenure-track) of Mathematics and Population Health Sciences, Duke University.

- Hadi Rahemi, (BPK) 2015 on the mathematical modeling and simulation of muscle-tendon units. Co-supervised with Prof. Wakeling in Kinesiology.
Awards: President's PhD Scholarship, SFU. Current position: Chief Scientist at Circulation Concepts, Inc.
- Nuwan Dewapriya (Engineering Science) PhD 2016, on combined MD and continuum models to study nanoscale fracture and interfacial dynamics in graphene sheets. Co-supervised with Prof. Rajapakse, Engineering Science, SFU.
- Bamdad Hosseini, PhD 2018 on Bayesian inverse problems with non-Gaussian priors. Co-supervised with Prof. Stockie.
Awards: SIAM Student Paper Prize, 2017; Governor General's Academic Gold Medal, 2018; NSERC Postdoctoral Fellowship. Current position: Postdoctoral fellow and von Karman instructor, Caltech.
- Sebastian Dominguez, PhD. 2015- present on Bayesian optimization in spectral geometry and 3-D finite element methods for muscle mechanics.
- David Ryan (BPK), PhD. 2015-present on the impact of transverse compression on muscle architecture, fibre curvature and force output. Co-supervised with Prof. Wakeling in BPK.
- Stephanie Ross (BPK), PhD. 2016-present on the impact of mass, history and muscle size on muscle dynamics. Co-supervised with Prof. Wakeling in BPK.

▪ **Graduate student research: M.S. supervision**

- Mr. Martin Caberlin, MS thesis on "Stiff ordinary and delay differential systems in biological systems". M.S. awarded in Fall 2002.
- Ms. Ying Han, MS thesis on "The maximum likelihood of phylogentic trees. Joint supervision with Prof. D. Bryant. M.S. awarded in Fall 2003.
- Ms. Yuan-yuan Hua, MS on "The use of clustering techniques to analyze genetic data". Graduation date: Feb 2006. Joint supervision with R. Steele.
- Mr. Tobin Marchand, MS on "Magnetohydrodynamics and solar winds". Graduation date: Dec. 2004. Joint supervision with V. Jaksic.
- Mr. Jonathan Duquette, MS on "The nucleation and growth of carbon nanotubes". Graduation date: Summer 2005. Joint supervision with L. Cortelezzi.

- Ms. Olga Trichtchenko, MS on 'The preconditioning of the Kohn-Sham system for nanoelectronic devices'. Graduate date: Summer 2009.
- Mr. Gordon Hiscott, MS on 'The numerical analysis of age-structured populations in cyclical neutropenia'. Spring 2012.
- Mr. Lee Safranek, MS on 'The well-posedness of age-structured populations in cyclical neutropenia'. Fall 2014.
- Mr. Sebastian Dominguez Rivera (visiting from U. Concepcion), 2014.
- Mr. Ernesto Caceres (visiting from U. Concepcion), 2014.
- Mr. Mallory Carlu (visiting from Paris-Sud), 2014.
- Mr. Dillon Nasserden, 2014-2016.

▪ **Undergraduate Honours Projects:**

- Ms. Jessica Conway, Spring 2002.
- Ms. Anna Sher, Spring 2002. Joint with Prof. M. Mackey.
- Ms. Catalina Anghel, Fall 2004.
- Ms. Erin Prosk, Winter 2007.
- Ms. Hannah Sutton, Fall 2017.

▪ **Undergraduate Summer Research Projects:** *I am active in research supervision of undergraduate projects of students from my home institution. I also host international students.*

- Ms. Jessica Conway, Summer 2002.
- Mr. Steve Kanters, NSERC USRA, Summer 2002 (joint with Dr. P. Tupper)
- Mr. Simon Gemmrich, Summer 2002.
- Mr. Frederick Laliberte, NSERC USRA 2003.
- Mr. Ahmed Abu-Safia, NSERC USRA 2003.
- Mr. Leonid Chindelevitch, NSERC USRA, Summer 2005.
- Mr. Tayeb Aisseiou, Summer 2006 (joint with Prof. S. Komarova)
- Ms. Erin Prosk, NSERC USRA, Summer 2007 (joint with Prof. S. Komarova)
- Ms. Olga Trichtchenko, Summer 2007.
- Mr. Raymond Lee, NSERC USRA, Summer 2009

- Mr. Kanishk Kumar (IIT Kharagpur), Summer 2009.
- Mr. Gordon Hiscott, NSERC USRA, Summer 2010
- Mr. Michael deGuzman, Summer 2010
- Mr. Michael Wathen, Summer 2011
- Mr. Raghav Venkatraman (IIT Roorkee), Summer 2011
- Mr. Alex Vlasev, Summer 2012
- Mr. Sihao Wang (Sichuan University), MITACS Globalink fellowship 2014.
- Mr. Dillon Nasserden, NSERC USRA, Summer 2014.
- Ms. Nicole Cossey, Summer 2014.
- Ms. Kong Ruoyan (University of Science and Technology, China), Summer 2015.
- Mr. Ftouhi Ilias (U. Lorraine), Summer 2015.
- Ms. Hannah Redhead, Summer 2015.
- Mr. Daiju Matsunami, Summer 2015.
- Ms. Megan Monkman, Summer 2018.
- Ms. Cassidy Tam (McGill University), NSERC USRA, 2018.
- Mr. Ryan Konno (UBC), NSERC USRA, 2018.

Conferences and invited talks until January 2018

Please note my travel was limited in 2008-2010 for childcare reasons.

Public lectures

- Mathematics of Planet Earth Public Lecture, Winnipeg, April 22, 2013: *Mathematics, light and sound.*
- Mathematics of Planet Earth Public Lecture, Montreal, Feb. 15, 2013: *Mathematics, light and sound.*
- Teach-In! Issues at the frontline of climate change, SFU, Dec.2, 2014: *Divestment from fossil fuels and 'The Engaged University'*

Conferences/minisymposia

- 14th US National Congress on Computational Mechanics, Montreal, Canada, 2017, *Jones Eigemodes.*
- Aerospace Engineering and Mechanics Research Seminar, University of Minnesota, Minneapolis, United States, 2017, *A mathematical model of localized activation & intramuscular fat in muscle.*
- Scientific and Statistical Computing Seminar, Joint by the University of Chicago Departments of Statistics, Mathematics, Computer Science, and the Computation Institute, Chicago, United States, 2017, *Numerical approximation of Laplace eigenvalues with mixed boundary data.*
- SIAM Pacific Northwest Sectional Meeting, Corvallis, United States, 2017, *Numerical approximation of Steklov eigenvalues via integral equation strategies.*
- 'Mathematics of Optics' Annual Program Seminar Series, Institute for Mathematics and its Applications, University of Minnesota, Minneapolis, United States, 2017, *How to use numerical analysis tools to furnish proofs: a modification of Schiffer's conjecture.*
- *Numerical methods for PDEs and their applications*, Institut Mittag-Leffler, Royal Swedish Academy of Sciences, Stockholm, Sweden, 2017, *Regularizations of the Dirac delta distribution, and applications.*
- CASCADE Regional Applied Interdisciplinary and Numerical meeting, 2016, Vancouver, WA, United States, *Convex priors and the well-posedness of Bayesian inverse problems*
- Computational Mathematics and Inverse Problems, Michigan Tech, August 14, 2016, *A Bayesian approach to eigenvalue optimization*
- MAFELAP, June 17, 2016, *Boundary integral strategy for the Dirichlet-Neumann and Steklov-Neumann eigenvalue problem*

- MAFELAP, June 14, 2016, *A Bayesian approach to eigenvalue optimization*
- Dirichlet-to-Neumann maps, CMO-BIRS workshop, May 30, 2016, *Numerical approximation of Steklov eigenvalues via integral equation strategies*
- Computational Mathematics and Applications Seminar, Mathematics Institute, Oxford, May 5, 2016, *Numerical approximation of the Laplace eigenvalues with mixed boundary data*
- Joint Departmental and Analysis Seminar, Dept. of Mathematics, Reading University, May 6, 2016, *Numerical approximation of the Laplace eigenvalues with mixed boundary data*
- 10th International Conference on Scientific Computing and Applications, Toronto, June 6, 2016, *Localized activation and intramuscular fat in muscle: an investigation using DG methods*
- Applied Mathematics Colloquium, Dept. of Mathematical Sciences, New Jersey Institute of Technology, April 15, 2016, *High Accuracy Computation of Mixed Dirichlet-Neumann Eigenvalues*
- U.Victoria Applied Mathematics seminar, Victoria March 1, 2016, *Numerical approximation of Laplace eigenvalues with mixed boundary data.*
- UBC SCAIM seminar, Vancouver, January 26, 2016, *Localized activation & intramuscular fat in muscle.*
- WONAPDE 2016, Concepcion, January 14, 2016, *A modification of Schiffer's conjecture and a Proof via Finite Elements.*
- Advances in DG workshop, Heidelberg, December 15, 2015, *The mechanics of skeletal muscle contractions: a finite element investigation.*
- The 2nd Chongqing Workshop on Computational and Applied Mathematics, Chongqing, August 16, 2015, *Boundary integral equations on surfaces.*
- **Canadian Math Society Plenary lecture**, CMS Summer meeting, Charlottetown, June 7, 2015, *On numerical analysis and spectral geometry.*
- Cascade Rain Numerical Analysis conference, Portland State University, April, 2015: *Schiffer's conjecture on polygons.*
- **Plenary lecture**, Canadian Mathematics Education Study Group, Edmonton, June 1, 2014: *Is there interesting mathematics in industry?*
- Colloque de mathématiques de Laval CRM - ISM, Nov. 27, 2014: *On the well-posedness of the 2D stochastic Allen-Cahn equation.*
- Pacific Northwest Numerical Analysis Seminar, Portland State University, Oct. 18, 2014: *Numerical approximation of Laplace eigenvalues with mixed boundary data.*
- London Mathematical Society - EPSRC Durham Symposium, Durham, July 8, 2014: *Pyramidal Finite Elements.*

- Plenary lecture, Canadian Mathematics Education Study Group, Edmonton, June 1, 2014:*Is there interesting mathematics in industry?*
- Probability seminar, U. Oregon, May 6, 2014:*On the well-posedness of the 2D stochastic Allen-Cahn equation.*
- U. British Columbia Institute of Applied Mathematics seminar, Vancouver, February 6, 2014: *A mathematical model of bone remodeling.*
- Spectral Theory of Laplace and Schroedinger Operators, BIRS, July 2013: *Numerical analysis of spectral problems, validated numerics, and proof.*
- First Canadian Symposium in Numerical Analysis and Scientific Computing (CSNASC), CAIMS Annual Meeting, Québec City, June 19, 2013. *Numerical approximation of mixed Dirichlet-Neumann eigenpairs.*
- Mathematics of finite elements and applications (MAFELAP 14). Minisymposium on high order finite elements, Brunel, June 11, 2013 *High order finite elements on pyramids.*
- Mathematics of Planet Earth Public Lecture, Winnipeg, April 22, 2013: *Mathematics, light and sound*
- Colloque de mathématiques de Montréal CRM - ISM, Feb. 15, 2013: *Eigenproblems, numerical approximation and proof*
- Mathematics of Planet Earth Public Lecture, Montreal, Feb. 15, 2013: *Mathematics, light and sound*
- Winter 2013 Research Symposium: Alumni Lecture. University of Delaware, Feb. 8, 2013: *On the well-posedness of the 2D stochastic Allen-Cahn equation.*
- Fourth Chilean workshop on the numerical analysis of PDE (WONAPDE), Chile, Jan. 14-19 2013: *Boundary integral equation methods for Laplace-Beltrami BVP*
- Eigenvalues/singular values and fast PDE algorithms: acceleration, conditioning, and stability, BIRS, June 2012: *Eigenproblems on manifolds and the Hot Spot conjecture*
- Frontiers in Applied and Computational Mathematics, Newark, May 2012:*Fast BIE methods on compact manifolds*
- Maseeh Colloquium in Applied Mathematics, Portland State University, April 2012: *Mathematical models for bone remodeling and tumor growth*
- Minisymposium on Chebfun and applications, SIAM Annual Meeting, July 19, 2011:*Weird patterns and swirly flows using Chebfun*
- Applied Mathematics Perspectives: Numerical Methods for Incompressible Flow, Vancouver July 14, 2011:*High order finite elements on pyramids and incompressible fluid flow*

- IRMACS Canda Research Chairs Seminar Series, Feb. 24, 2011: Exterior calculus, approximation theory and numerical analysis: high-order FEM approximation on pyramids
- SFU Biophysics Seminar, SFU, Feb.12, 2011: *Mathematical models of bone remodeling*
- AMS Sectional meeting, Notre Dame, Nov. 7, 2010: *Integral equations for PDE on surfaces*
- Finite element circus, Minneapolis, Nov. 5, 2010 *High order finite elements on pyramids*
- SFU Computational Science day plenary talk, SFU, August 2010: *How do bones grow? From lab to desktop, a mathematical journey.*
- U. Delaware Dept. of Mathematical Sciences Colloquium, April 4 2009: *Bone growth and destruction at the cellular level: a mathematical model*
- Second Joint Canada-France meeting of the mathematical sciences, Montreal, July 2008: *The nonlinear critical layer for Kelvin modes on a vortex with a continuous velocity profile.*
- Frontiers in Applied and Computational Mathematics, Newark, May 2008: *Integral Equation Methods and Vortex Motion on Spheres*
- ICES Colloquium, U.of Texas at Austin, Feb. 2008: *High Order Pyramidal Finite Elements for the De-Rham complex*
- Simon Fraser University CSE Seminar, Nov. 2007: *A spatio-temporal model of bone growth and destruction*
- U. British Columbia SCAIM seminar, Nov. 2007: *High Order Pyramidal Finite Elements for the De-Rham complex*
- 5-day BIRS Workshop on Canada-China Industrial Mathematics, August 7, 2007: *A model of bone growth and destruction.*
- Rice Computational Science Colloquium, March 12, 2007: *An error analysis for a combined DtN-FE method.*
- Plenary speaker, Canadian Undergraduate Mathematics Conference, July 2006: *Is there really interesting mathematics in industry?*
- Abel Symposium, May 27-30, 2006: *Fast methods in computational scattering.*
- McMaster PDE Seminar, November 19, 2004: *An error analysis for perturbative Steklov-Poincaré maps.*
- First Joint Canada-France meeting of the mathematical sciences, Toulouse, July 2004: *Perturbative Steklov-Poincaré maps for general domains.*
- Applied and Industrial Mathematics Seminar, York University, February 2004: *Truncation techniques: the good, the bad, and the not-so-ugly.*

- Conference on PDE and their Application, Notre Dame University, August 2003: *Perturbative Techniques for Dirichlet-Neumann maps.*
- 5th Industrial Congress on Industrial and Applied Mathematics, Sydney, Australia, July 2003: *Truncation using the PML– stability and Perturbation Methods.*
- Computational Science and Engineering seminar, McGill, April 2003: *The good, the bad, and the ugly: truncation methods for infinite computational domains.*
- GIREF seminar series, Universite Laval, October 2002: *Perturbative techniques for Dirichlet-Neumann maps.*
- Foundations of Computational Mathematics, Minneapolis, July 2002: *Geometric integration: a closer look at applications in material science.*
- Applied Mathematics seminar, U. Notre Dame, April, 2002: *Computational Scattering Theory- dealing with Infinity.*
- Center for Physics of Materials Seminar, McGill, March, 2002: *Numerical Methods in Micromagnetics.*
- Joint Mathematics Meetings, San Diego, January 2002: *Geometric Integration: An application in Material Science.*
- First Micromagnetics Meeting, Princeton, 2001: *Thoughts on algorithms for micromagnetics.*
- Applied Math and Numerical Analysis Seminar, U. of Minnesota, March 2001: *The overlapping method for exterior electromagnetic scattering problems.*