

*CURRICULUM VITAE*  
**Nathan Louis Gibson**

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**A. EDUCATION AND EMPLOYMENT**

**A.1. EDUCATION:**

**Doctor of Philosophy**, Applied Mathematics August, 2004  
with Concentration in Computational Mathematics  
North Carolina State University, Raleigh, NC  
Committee: Professors H. T. Banks (advisor), H. T. Tran, K. Ito, and N. G. Medhin  
Thesis: *Terahertz-Based Electromagnetic Interrogation Techniques for Damage Detection*

**Master of Science**, Applied Mathematics August, 2001  
with Concentrations in Numerical Analysis and Mathematical Modeling  
University of Tennessee, Knoxville, TN  
Committee: Professors X. Feng (advisor), S. Lenhart, and O. Karakashian  
Thesis: *Solving a Fluid-Plate Interaction Problem Using Finite Element Methods with Domain Decomposition Strategies*

**Bachelor of Science**, Mathematics May, 1998  
with Concentration in Computational and Applied Analysis  
and Minor in Computer Science  
Worcester Polytechnic Institute, Worcester, MA  
Thesis advisor: Prof. B. Servatius  
Thesis: *Molecular Computing*

**A.2. EMPLOYMENT:**

**Associate Professor:** September 2014 - Present  
Department of Mathematics  
Oregon State University, Corvallis, OR

**Assistant Professor (Tenure Track):** September 2008 - September 2014  
Department of Mathematics  
Oregon State University, Corvallis, OR

**Assistant Professor:** September 2006 - August 2008  
Department of Mathematics  
Oregon State University, Corvallis, OR

**NIA Postdoctoral Fellow:**

August 2004 - September 2006

Center for Research in Scientific Computation  
North Carolina State University, Raleigh, NC

Supervised by Prof. H. T. Banks of NCSU and Dr. William Winfree of NASA Langley

III. GRADUATE AND UNDERGRADUATE STUDENTS AND POSTDOCTORAL TRAINEES:

1. *GRADUATE STUDENTS (MAJOR PROFESSOR):*

Student	Degree	Department	Graduation Date
Megan Armentrout	M.S.	Mathematics	2011
Brian McKenzie	M.S.	Mathematics	2011
Duncan McGregor*	Ph.D.	Mathematics	2016
Parnian Hosseini*	M.S.	Civil Eng.	2016
Huanqun Jiang*	Ph.D.	Mathematics	2019 <sup>E</sup>
Evan Rajbhandari	M.S.	Mathematics	2019 <sup>E</sup>

(<sup>E</sup> EXPECTED, \* Co-advised)

2. *UNDERGRADUATE RESEARCH AND THESIS ADVISEES:*

Have advised eight undergraduate juniors and seniors through a Research Experiences for Undergraduates (REU) program, one sophomore through the OSU URISC-Start program, and one sophomore through COS Summer Undergraduate Research Experience in Science (SURE Science) program who continued to work with me while being funded as an ORISE Fellow and through NETL Professional Internship Program.

3. *POSTDOCTORAL TRAINEES:*

Mentor for Dr. Veronika Vasylykivska, Postdoctoral Scholar funded by the Bonneville Power Administration project entitled “Towards reduction of uncertainty in the operation of reservoir systems”, Fall 2012–Summer 2014.

## C. SCHOLARSHIP ACTIVITY

### C.0. SUMMARY OF RESEARCH AREAS

#### I. GENERAL INTERESTS

- Mathematical Modeling
- Numerical Analysis
- Scientific Computing

## II. PRINCIPAL INTERESTS

- Numerical Methods for Partial Differential Equations: Maxwell's equations, Advection-Diffusion equations
- Inverse Problems: optimization, optimal control
- Uncertainty Quantification: optimization under uncertainty, incorporating uncertainty in models of heterogeneous microscales

### C.1. PUBLICATIONS:

#### I. PEER-REVIEWED JOURNAL PUBLICATIONS:

\* Graduate Student, # Undergraduate Student, † Postdoc

- (J20) D. Chen<sup>†</sup>, A. S. Leon, C. Fuentes, **N. L. Gibson**, H. Qin, "Incorporating Filters in Random Search Algorithms for the Hourly Operation of a Multireservoir System", *Journal of Water Resources Planning and Management*, 144 (2), 2018.
- (J19) D. Chen<sup>†</sup>, A. S. Leon, P. Hosseini\*, **N. L. Gibson**, C. Fuentes, "Application of cluster analysis for finding operational patterns of multireservoir system during transition period", *Journal of Water Resources Planning and Management*, 143 (8), 2017.
- (J18) H. Bashiri<sup>†</sup>, E. Sharifi<sup>†</sup>, A. Leon, Y. Chen, **N. L. Gibson**, "Quantification of Short-term Hydropower Generation Flexibility ", *Open Water Journal* 4 (2), 2017.
- (J17) E. Sharifi<sup>†</sup>, H. Bashiri<sup>†</sup>, A. Leon, Y. Chen, **N. L. Gibson**, "Valuation of flexibility for optimal reservoir operation", *Open Water Journal* 4 (2), 2017.
- (J16) D. Chen<sup>†</sup>, A. S. Leon, **N. L. Gibson**, P. Hosseini\*, "Dimension reduction of decision variables for multi-reservoir operation: A spectral optimization model", *Water Resources Research*, 52 (1), 3651, 2016.
- (J14) V. A. Bokil, **N. L. Gibson**, V. Gyrya and D. A. McGregor\*, "Dispersion Reducing Methods for Edge Discretizations of the Vector Wave Equation", *Journal of Computational Physics*, 287, 88-109, 2015.
- (J13) **N. L. Gibson**, "Polynomial Chaos for Dispersive Electromagnetics", *Communications in Computational Physics*, 18 (5), 1234-1263, 2015.
- (J12) V. A. Bokil and **N. L. Gibson**, "Convergence Analysis of Yee Schemes for Maxwell's Equations in Debye and Lorentz Dispersive Media", *International Journal of Numerical Analysis & Modeling*, 11(4), 657-687, 2014.
- (J11) **N. L. Gibson**, C. H. Gifford-Miears\*, A. S. Leon and V. Vasylykivska<sup>†</sup>, "Efficient Computation of Unsteady Flow in Complex River Systems with Uncertain Inputs", *International Journal of Computer Mathematics*, 91 (4), 781-797, 2014.

- (J10) **N. L. Gibson**, P. Medina\*, M. Peszynska, and R. E. Showalter, “Evolution of phase transitions in methane hydrate”, *Journal of Mathematical Analysis and Applications*, 409 (2), 816-833, 2014.
- (J9) V. A. Bokil and **N. L. Gibson**, “Analysis of Spatial High-Order Finite Difference Methods for Maxwell’s Equations in Dispersive Media”, *IMA Journal of Numerical Analysis*, 32 (3): 926-956, 2012.
- (J8) H. T. Banks, V. A. Bokil and **N. L. Gibson**, “Analysis of Stability and Dispersion in a Finite Element Method for Debye and Lorentz Media”, *Numerical Methods for Partial Differential Equations*, 25(4), 885-917, 2009.
- (J7) H. T. Banks, V. A. Bokil and **N. L. Gibson**, “Parameter Estimation Versus Homogenization Techniques in Time-Domain Characterization of Composite Dielectrics”, *Journal of Inverse and Ill Posed Problems*, 15(2), 117-135, 2007.
- (J6) H. T. Banks and **N. L. Gibson**, “Electromagnetic Inverse Problems Involving Distributions of Dielectric Mechanisms and Parameters”, *Quarterly of Applied Mathematics*, **64**, 749–795, 2006.
- (J5) H. T. Banks and **N. L. Gibson**, “Void Detection in Foam with Knit Lines Using THz Pulse Interrogation”, *Mathematical and Computer Modelling*, vol. 44, nos. 9-10, 807–815, 2006.
- (J4) H. T. Banks, V. A. Bokil, D. Cioranescu, **N. L. Gibson**, G. Griso, and B. Miara, “Homogenization of Periodically Varying Coefficients in Electromagnetic Materials”, *Journal of Scientific Computing*, vol. 28, no. 2, 191–221, 2006.
- (J3) H. T. Banks and **N. L. Gibson**, “Well-posedness of solutions with a distribution of dielectric parameters”, *Applied Mathematics Letters* **18**, 423–430, 2005.
- (J2) H. T. Banks, **N. L. Gibson** and W. P. Winfree, “Gap detection with electromagnetic terahertz signals”, *Nonlinear Analysis: Real World Applications* **6**, 381–416, 2005.
- (J1) S. Gavrillets and **N. L. Gibson**, “Fixation Probabilities in a Spatially Heterogeneous Environment”, *Population Ecology* **44**, 51–58, 2002.

## II. PEER-REVIEWED CONFERENCE PROCEEDINGS AND EXTENDED ABSTRACTS:

- (CP9) E. Sharifi<sup>†</sup>, H. Bashiri<sup>†</sup>, A. Leon, Y. Chen, **N. L. Gibson**, “Toward Quantification and Valuation of Flexibility for Hydropower Reservoir Systems”, AGU Fall Meeting Abstracts, 2017.
- (CP8) D. Chen<sup>†</sup>, A. S. Leon, **N. L. Gibson**, and V. Vasylykivska<sup>†</sup>, “Using A Concurrent Hybrid Method To Optimize Short-Term Operation Of A Multi-Reservoir System With Multiple Objectives”, International Conf. on Hydroinformatics, CUNY Academic Works, 2014.

- (CP7) V. A. Bokil, **N. L. Gibson**, D. A. McGregor\* and C. R. Woodside, “Toward Estimating Current Densities in Magnetohydrodynamic Generators”, CCP 2014 Proceedings, Journal of Physics: Conference Series (JPCS), published by the IOP, vol. 640, number 012032, 2015.
- (CP6) M. G. McIntire\*, V. Vasylykivska<sup>†</sup>, C. Hoyle, and **N. L. Gibson**, “Applying Robust Design Optimization to Large Systems”, ASME 2014 International Design Engineering Technical Conferences and Computers and Information in Engineering Conference, 2014.
- (CP5) V. A. Bokil and **N. L. Gibson**, ”Stability and Dispersion Analysis of High Order FDTD Methods for Maxwell’s Equations in Dispersive Media”, Contemporary Mathematics, Volume 586, pp. 73–82, 2013 (*Proceedings of the 8th International Conference on Scientific Computing and Applications, 2012*).
- (CP4) A. S. Leon, **N. L. Gibson**, and C. H. Gifford-Miears\*, “Toward reduction of uncertainty in complex multi-reservoir river systems”, Proceedings, *XIX Intl Conference on Water Resources*, 8 pages, 2012.
- (CP3) V. A. Bokil and **N. L. Gibson**, “Analysis of High-Order Finite Difference Methods for Maxwell’s Equations in Dispersive Media”, Proceedings, *WAVES 2011*, 315–318, 2011.
- (CP2) M. Armentrout\* and **N. L. Gibson**, “Electromagnetic Relaxation Time Distribution Inverse Problems in the Time-Domain”, Proceedings, *WAVES 2011*, 245–248, 2011.
- (CP1) H. T. Banks, **N. L. Gibson** and W. P. Winfree, “2D Modeling of Pulsed THz Interrogation of SOFI with Knit Lines”, *Review of Progress in Quantitative Nondestructive Evaluation* (AIP Conference Proceedings), vol. 894, 408–414, 2007.

## C.2. PROFESSIONAL MEETINGS, SYMPOSIA AND CONFERENCES:

### I. INVITED CONFERENCE PRESENTATIONS AND POSTERS:

24. “Numerical Methods for Dispersive Electromagnetics with Distributions of Parameters”, in Recent Advances in Numerical Methods for Maxwell’s Equations in Complex Media minisymposium, SIAM Annual Meeting, Portland, OR, July 2018.
23. Invited Speaker, “Polynomial Chaos for Dispersive Electromagnetics”, in Topical Workshop on Computational Aspects of Time Dependent Electromagnetic Wave Problems in Complex Materials, ICERM, Providence, RI, June 2018.
22. “Analysis of Methods for Dispersive Electromagnetics with Distributions of Parameters”, in Special Session on Numerical Methods for Partial Differential Equations, invited by Brittany A. Erickson and Jeffrey S. Owall, AMS Western Section Meeting, Portland, OR, April 2018.

21. "Modeling Dispersive Materials with Parameter Distributions in the Lorentz Model" Numerical Analysis minisymposium, invited by Jeffrey Owall, SIAM PNW Meeting, Corvallis, OR, October 2017.
20. "Flexible Decision Variables in Reservoir Operation" in Advances in Dynamic Optimization minisymposium, invited by Mihai Anitescu and Victor M. Zavala, SIAM Conference on Optimization, Vancouver, BC, Canada, May 2017.
19. Invited Speaker, "Electromagnetic wave propagation in complex dispersive media", in Workshop on Quantification of Uncertainties in Material Science, NIST, Gaithersburg, MD, January 2016.
18. Invited Speaker, 2015 PNW Numerical Analysis Seminar, Western Washington University, Bellingham, Washington. "Polynomial Chaos Approach for Dispersive Electromagnetics", October 2015.
17. "Numerical Modeling Methane Hydrate Evolution", in *Recent Developments in Numerical Methods for PDEs* minisymposium, invited by Yekaterina Epshteyn and Fengyan Li, SIAM Annual Meeting, San Diego, CA, July 2013.
16. "Analysis of High Order FDTD Methods for Maxwell's Equations in Dispersive Media", in *Efficient and Accurate Modeling of Waves* minisymposium, invited by Vitaliy Gyrya, SIAM Conference on Computational Science and Engineering, Boston, MA, February 2013.
15. "Toward Reduction of Uncertainty in Complex Multi-Reservoir River Systems", invited poster presentation, XIX International Conference on Computational Methods in Water Resources - CMWR, Urbana, IL, June 2012.
14. "High Order Finite Difference Methods for Maxwell's Equations in Dispersive Media", in *Waves* minisymposium, invited by P. Petropoulos, Ninth Annual Conference on Frontiers in Applied and Computational Mathematics - FACM, Newark, NJ, May 2012.
13. "Towards reduction of uncertainty in the operation of reservoir systems", invited by S. Barton, BPA Technology Innovation: Reservoir System Modeling Technologies Conference, Portland, OR, February 2012.
12. "FDTD Methods for Pulse Propagation in Anomalously Dispersive Media Incorporating Relaxation Time Distributions", in *Numerical Methods for Electromagnetic Wave Propagation in Dispersive Media* minisymposium, invited by V. Bokil, 7th International Congress on Industrial and Applied Mathematics - ICIAM, Vancouver, BC, Canada, July 2011.
11. "Time Domain Parameter Distribution Estimation in Dispersive Media", Invited Talk, 10th International Conference on Mathematical and Numerical Aspects of Waves - WAVES, Vancouver, BC, Canada, July 2011.

10. "Time-domain electromagnetic parameter estimation for anomalously dispersive materials", in *Medical and Seismic Imaging Workshop*, invited by Elise Fear, Michael Lamoureux, Peter Lancaster, and Gary Margrave, Applied Mathematics Perspectives, 2011 ICIAM Satellite Meetings, Vancouver, BC, Canada, July 2011.
9. "Time-domain Electromagnetic Interrogation of Biological Materials", in *Inverse Problems in Medical Modelling* minisymposium, invited by S. Pereverzyev and S. Sampath, 6th International Conference on Applied Inverse Problems - AIP, College Station, TX, May 2011.
8. "Electromagnetic Relaxation Time Distribution Inverse Problems in the Time-domain", in *AMS-SIAM Special Session on Control and Inverse Problems for Partial Differential Equations* minisymposium, invited by M. L. Joyner, Joint Mathematics Meeting, New Orleans, LA, January 2011.
7. "Polynomial Chaos Approach for Approximating Cole-Cole Dispersive Media", in *Numerical Methods for Wave Propagation Problems* minisymposium, invited by V. Bokil, SIAM Annual Meeting, Pittsburgh, PA, July 2010.
6. "Electromagnetic Characterization of Damage in Complex Dielectrics" in *Identification of defects and cracks* minisymposium, invited by S. Kubo, International Conference on Applied Inverse Problems: Theoretical and Computational Aspects, Vancouver, BC, Canada, June 2007.
5. "High Order Staggered Finite Difference Schemes for Electromagnetic Wave Propagation in Debye and Lorentz Dispersive Media", in *Recent Advances in Computational Electromagnetics* minisymposium, invited by J. Li, SIAM Southeastern-Atlantic Section Conference, Columbia, SC, April 2009.
4. "Parameter Identification using Electromagnetic Interrogation of Heterogeneous Dielectrics", in *Inverse Problems Related to Scattering in Complex Structures Session*, invited by J. A. Burns and H. T. Banks, Third International Conference on Inverse Problems: Modeling and Simulation, Oludeniz, Turkey, May 2006.
3. "An Electromagnetic Inverse Problem Involving Distributions of Dielectric Parameters", in *Inverse Problems in Electromagnetics and Biology Minisymposium*, invited by H. T. Banks and A. S. Ackleh, Sixth SIAM Conference on Control and its Applications, New Orleans, LA, Jul 2005.
2. "Gap Detection with Electromagnetic Terahertz Signals", in *Inverse Problems in Electromagnetics and Biology* minisymposium, invited by H. T. Banks, 29th Annual SIAM Southeast Atlantic Section Meeting, Charleston, SC, Mar 2005.
1. "Multiscale and Polarization in Dielectric Materials: A Probabilistic Approach", invited by R. C. Smith, SAMSI Multiscale Working Group Closing Workshop, RTP, NC, Sep 2004.

## II. CONTRIBUTED CONFERENCE PRESENTATIONS AND POSTERS:

12. “Reliability-constrained robust design optimization for multi-reservoir river systems”, contributed poster presentation, IMA Workshop on Computational Methods for Control of Infinite-dimensional Systems, Minneapolis, MN, Mar 2016.
11. “A Solution Method for ODEs with Random Forcing”, contributed poster presentation, IMA Large-scale Inverse Problems and Quantification of Uncertainty workshop, Minneapolis, MN, June 2011.
10. “A Solution Method for ODEs with Random Forcing”, contributed poster presentation, IMA Large-scale Inverse Problems and Quantification of Uncertainty workshop, Minneapolis, MN, June 2011.
9. “Towards reduction of uncertainty in the operation of complex multi-reservoir river systems”, contributed poster presentation, Uncertainty Quantification for High-Performance Computing workshop, Oak Ridge, TN, May 2012.
8. “Toward Reduction of Uncertainty in Complex Multi-Reservoir River Systems”, contributed talk in *Propagation & Prediction* session, SIAM Conference on Uncertainty Quantification, Raleigh, NC, April 2012.
7. “Polynomial Chaos Approach for Wave Propagation in Dispersive Media”, contributed poster presentation, Opening Workshop for the Methodology theme of the SAMSI program on Uncertainty Quantification, Research Triangle Park, NC, September, 2011.
6. “A Solution Method for ODEs with Random Forcing”, contributed poster presentation, IMA Large-scale Inverse Problems and Quantification of Uncertainty workshop, Minneapolis, MN, June 2011.
5. “Polynomial Chaos Approach for Approximating Cole-Cole Dispersive Media”, Short Communication Presentation, International Congress of Mathematicians, Hyderabad, India, August 2010.
4. “Modeling Dispersive Mechanisms Using Distributions of Dielectric Parameters”, Contributed talk, SIAM Annual Meeting, Denver, CO, July 2009.
3. “Stability and Dispersion Analysis of a Finite Element Method for Maxwell’s Equations in Dispersive Media”, Contributed talk, SIAM Annual Meeting, San Diego, CA, July 2008.
2. “2D Modeling of Pulsed THz Interrogation of SOFI with Knit Lines”, Contributed talk, in *Terahertz Imaging Session*, 33rd Annual Review of Progress in Quantitative Nondestructive Evaluation, Portland, OR, August 2006.
1. “DNA Computing”, in IIME Student Paper Session, chaired by R. Smith, MathFest, Toronto, Canada, July 1998.

### III. EXTERNAL COLLOQUIA AND SEMINAR PRESENTATIONS



6. “Robust Optimization for Reservoir Operations: Progress Report”, BPA Technology Innovation Summit, BPA, Portland, OR, Jan 2015.
5. “Applying Computational Methods to Determine the Electric Current Density in a MHD Generator Channel from External Flux Density Measurements”, Pacific Coast Carbon Storage / Computational Energy Science Research Closeout Meeting, National Energy Technology Laboratory, Albany, OR, Oct 2014.
4. “Robust Optimization for Reservoir Operations: Progress Report”, BPA Technology Innovation Summit, BPA, Portland, OR, Jan 2014.
3. “Analysis of FDTD methods for polydispersive media”, Numerical Analysis Seminar, Applied Mathematics and Plasma Physics (T-5) Group, invited by Konstantin Lipnikov, Los Alamos National Laboratory, Los Alamos, NM, July 2013.
2. “Inverse Problems for Distributions of Parameters in PDE Systems”, Mathematics Department Colloquium, invited by D. Perkinson, Reed College, Portland, OR, November 2010.
1. “Polynomial Chaos Approach for Simulations in Dispersive Media”, Waves Seminar Series, Department of Mathematical Sciences and Center for Applied Mathematics and Statistics, invited by P. Petropoulos, New Jersey Institute of Technology, Newark, NJ, Septemeber 2010.

## V. PROFESSIONAL WORKSHOPS, MEETINGS, PANEL PRESENTATIONS

15. Invited Participant, SAMSI year long program on Optimization, August 2016– May 2017, including Optimization Program Opening Workshop August 29 - September 2, 2016 and Transition Workshop May 1-3, 2017, Raliegh, NC.
14. Invited Participant, IMA Workshop on Computational Methods for Control of Infinite-dimensional Systems, Minneapolis, MN, Mar 2016.
13. Invited Participant, IMA Workshop on Optimization and Parsimonious Modeling, Minneapolis, MN, Jan 2016.
12. Invited Participant, IMA Uncertainty Quantification in Materials Modeling, Purdue University, West Lafayette, Indiana, July 28-31, 2015
11. Attendee, CASCADE RAIN, PSU, April 4, 2015.
10. Invited Participant (including poster presentation), Magnetohydrodynamics Power Generation Workshop, Arlington, VA, October 1-2, 2014.
9. Invited Participant, 13th DOE ACTS Collection Workshop, Lawrence Berkeley National Laboratory, August 2012.
8. Attendee, The Society for Mathematical Biology Annual Meeting and Conference, University of Tennessee and NIMBios, Knoxville, TN, July 25-28, 2012.

7. Invited Participant, Uncertainty Quantification for High-Performance Computing workshop, Oak Ridge, TN, May 2012.
6. Invited Participant, Opening Workshop for the Methodology theme of the SAMSI program on Uncertainty Quantification, Research Triangle Park, NC, September, 2011.
5. Attendee, MathFest 2011, Lexington, KY, Aug 2011.
4. Invited Participant, Applied Mathematics Perspectives Workshop on Medical and Seismic Imaging, Vancouver, B.C., Canada, July 2011.
3. Invited Participant, Applied Mathematics Perspectives Workshop on Reproducible Research: Tools and Strategies for Scientific Computing, Vancouver, B.C., Canada, July 2011 .
2. Invited Participant, IMA Large-scale Inverse Problems and Quantification of Uncertainty workshop, Minneapolis, MN, June 2011.
1. Panel Presenter, “The benefits of hosting a regional undergraduate mathematics conference”, *MAA Panel Discussion*, invited by D. Faires, Joint Mathematics Meeting, New Orleans, LA, January 2011.

### C.3. GRANT AND CONTRACT SUPPORT:

#### I. EXTRAMURAL FUNDING:

##### FUNDED GRANTS:

6. Fellow, ORISE Faculty Research Program, National Energy Technology Laboratory (NETL), 7/2017–4/2019, \$19,935.
5. Co-PI, BPA Technology Innovation Program, “Framework for Quantification of Risk and Valuation of Flexibility in the FCRPS”, with Arturo Leon (PI, Civil Engineering) and Christopher Hoyle (Co-PI, Mechanical Engineering), 10/2015–5/2018, \$1.2M.
4. PI, National Energy Technology Laboratory Office of Research & Development Fund, “Applying Computational Methods to Determine the Electric Current Densities in a Magnetohydrodynamic Generator Channel from External Magnetic Flux Density Measurements”, with Vrushali Bokil (Co-PI) and Rigel Woodside (NETL, Albany, OR), 11/2013–10/2016, \$289,928.
3. Senior Personnel, DARPA funded project on robust design of complex multi-physics systems, with Chris Hoyle (PI, Mechanical Engineering), 8/2013–3/2014 (Math portion \$29,550).
2. Co-PI, BPA Technology Innovation Program, “Towards reduction of uncertainty in the operation of reservoir systems”, with Arturo Leon (PI, Civil Engineering) and Christopher Hoyle (Co-PI, Mechanical Engineering), 10/2012–9/2015, \$555,527.

1. Co-PI, DMS-1122699, “NSF-MATHEMATICAL BIOLOGY: Residence and First Passage Time Functionals in Heterogeneous Ecological Dispersion”, with Ed Waymire (PI) and Co-PIs Vrushali Bokil, Enrique Thomann and Brian Wood, 9/15/2011–08/31/2014, \$249,956.

## D. SERVICE

### D.2. SERVICE TO THE PROFESSION:

#### I. REVIEW AND REFEREE SERVICE:

Refereed articles for the following scholarly journals: *Applied Numerical Mathematics*, *Geophysics*, *Computers and Mathematics with Applications*, *Numerical Methods for Partial Differential Equations*, *Computer Methods in Applied Mechanics and Engineering*, *Applied Mathematics and Computation*, *Circuits, Systems & Signal Processing*, *Journal of Mathematical Biology*, *Abstract and Applied Analysis*, *Modern Physics Letters B*, *Journal of Applied Mathematics*, *Proceedings of International Conference of Numerical Analysis and Applied Mathematics*, *Nonlinear Analysis Series B: Real World Applications*, *Journal of Computational Physics*, *Computational Geosciences*, *International Journal of Solids and Structures*, *Advances in Applied Mathematics and Mechanics*, *Journal of Inverse and Ill-Posed Problems*, The journal *Mathematical and Computer Modelling*

Reviewer for:

4. Proposal Reviewer, BPA Technology Innovation Program, May 2016.
3. Proposal Reviewer, Kentucky Science and Engineering Foundation, Apr 2016.
2. BPA Technology Innovation Program: Roadmap Workshop, Nov 2014.
1. Pearson Publishing, *Differential Equations* textbook, Chapters 1-4, 3/2012.

#### II. CONFERENCES/SYMPOSIUM ORGANIZED:

18. Co-Organizer of Minisymposium on “Numerical Methods for Wave Problems in Complex Materials”, along with Vrushali Bokil (OSU) and Simon Shaw (Brunel University London), for The Mathematics of Finite Elements and Applications, Brunel University, London, June 2019.
17. Co-organized a minisymposium on Recent Advances in Numerical Methods for Maxwell’s Equations in Complex Media at SIAM Annual Meeting, Portland, OR, July 2018.
16. Organizing Committee for first biennial PNW SIAM Section meeting, October 2017.

15. Chair of Organizing Committee for Pacific Northwest MAA Section annual meeting, OSU, April 2016.
14. Chair of Organizing Committee for eighth annual NUMS held at PNW MAA meeting, April 2016.
13. Program Committee member for Pacific Northwest MAA Section meeting, UW Tacoma, April 2015.
12. Chair of Organizing Committee for seventh annual NUMS held at PNW MAA meeting, April 2015.
11. Chair of Organizing Committee for sixth annual NUMS held at OSU, April 2014.
10. Steering Committee member for fifth annual Northwest Undergraduate Mathematics Symposium (NUMS) held at Pacific Lutheran University, April 2013.
9. Co-organized a minisymposium on *Random Media: Models, Simulations, and Applications* at SIAM Conference on Uncertainty Quantification, Raleigh, NC, April 2012.
8. Co-organizer: Mathematical Biology Seminar, Spring 2011–present, along with Professors Enrique Thomann, Ed Waymire and Assistant Professor Vrushali Bokil. Seminar involved weekly meetings where students and faculty discussed research related to mathematical problems motivated by biological applications.
7. Steering Committee member for fourth annual NUMS held at Lewis & Clark College April 2012.
6. Co-organized third annual NUMS at Reed College April 2011.
5. Organized a minisymposium on “Numerical Methods for Wave Propagation Problems” at the SIAM Annual Meeting, Pittsburgh, PA, July 2010.
4. Organized the second annual NUMS, with keynote speaker David Perkinson from Reed College, at OSU April 2010.
3. Founded and organized first annual Northwest Undergraduate Mathematics Symposium (NUMS) at OSU, May 2009.
2. Organized an invited session on “Inverse Problems in Biology” at the *Third International Conference on Inverse Problems: Modeling and Simulation*, Oludeniz, Turkey, May 2006.
1. Organized an special session on “Inverse Problems in Electromagnetics and Biology” at the *SIAM Southeast Atlantic Section Meeting*, College of Charleston, SC, March 2005.

### III. PROFESSIONAL AND HONORARY SOCIETIES:

- Society for Industrial and Applied Mathematics (SIAM) 2003–present  
 Student Chapter Advisor, 2008–2011, 2017–present  
 Optimization Activity Group, 2010–present  
 Imaging Science Activity Group, 2010–2017  
 Uncertainty Quantification Activity Group, 2011–present  
 Computation Science and Engineering Activity Group, 2010–present  
 Applied Math Education Activity Group, 2018–present
- Mathematical Association of America (MAA) 1996–present
- Pi Mu Epsilon (PME) 1997–present  
 Permanent Faculty Correspondent, 2014–present  
 Student Chapter Advisor, 2008–2011, 2017–present
- Co-Founder and Co-advisor, Association for Women in Mathematics (AWM) Student Chapter, 2008–2011.

#### IV. COMMITTEE APPOINTMENTS:

- Member, SIAM Education Committee, 2018–2021
- Member, Morgan Prize Committee, 2018–2021.

## **E. AWARDS**

### E.1. NATIONAL AND INTERNATIONAL AWARDS:

#### 3. Pi Mu Epsilon triennial Faculty Advisor Award – August 2011

Awarded the 2009-2011 triennial Faculty Advisor Award from Pi Mu Epsilon, the national math honor society. The award was earned for work with the Oregon Beta student chapter, including re-activating the chapter after 50 years of dormancy, and the founding of the Northwest Undergraduate Mathematics Symposium (NUMS).

#### 2. NIA Post-doctoral Fellowship, July 2004 – June 2006.

#### 1. NASA Graduate Student Researcher Fellowship, July 2002 – June 2004.