

Lorena Bociu

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Education and degrees earned

Ph.D. Mathematics, 2008, University of Virginia, VA
M.S. Mathematics, 2004, University of Virginia, VA
B.A. Mathematics, 2002, Lawrence University, WI
University of Bucharest, Faculty of Mathematics, 1998-2000

Appointments

Associate Professor, August 2017 – present, NC State University, Mathematics
Assistant Professor, August 2011- August 2017, NC State University, Mathematics
NSF International Research Fellow, 2013, 2011, and 2009-2010,
CNRS - Institut Non Lineaire de Nice (INLN), Sophia Antipolis, France
Edith T. Hitz Research Assistant Professor, 2010-2011, and 2008-2009,
University of Nebraska-Lincoln, Department of Mathematics, NE
Instructor, 2002 - 2008, University of Virginia, Department of Mathematics, VA

Selected Honors & Awards

2017-2018 NCSU Diversity Mentoring Fellow
2017, 2013 Mathematics Department Nominee for the NCSU Outstanding Teacher Award
2016-present NCSU Faculty Scholar
2016-2021 NSF CAREER Award DMS-1555062
2016 NCSU - Equity for Women Award (Faculty)
2013 MAA Invited Address at the MD-DC-VA Section Meeting of the MAA, Fall
2013-2016 NSF DMS – 1312801
2013 Recipient of NCSU Certificate of Reflective Teaching
2009-2014 NSF International Research Fellowship OISE 0802187
2009 Recipient of University of Nebraska-Lincoln Parent Association “Certificate of Recognition for Contributions to Students” for 2008-2009
2008 Winner of the 2007-08 All-University Graduate Teaching Assistant Award in Math, Sciences, and Engineering, University of Virginia (UVA)
2008 UVA Excellence in Scholarship in Sciences and Engineering
2006 Double Hoo Fellowship, University of Virginia
2006 1st Place in Physical Sciences and Math at the 6th Annual Robert J. Huskey Graduate Research Exhibition, University of Virginia

Publications – Last 5 years [*: postdoc, **: graduate student, ***: undergraduate]

1. M. Verri, G. Guidoboni, L. Bociu and R. Sacco, *The Role of Structural Viscosity in Deformable Porous Media with Applications in Biomechanics*, Mathematical Biosciences and Engineering, Vol. 15, No. 4, August 2018, 933-959.
2. L. Bociu, S. Derochers**, and D. Toundykov, *Feedback Stabilization of a Linear Hydro-Elastic System*, Discrete and Continuous Dynamical Systems - B, Vol. 23, No. 3, May 2018, 1107-1132.
3. H.T. Banks, K. Bekele-Maxwell*, L. Bociu, Marcella Noorman**, and G. Guidoboni, *Sensitivity Analysis in Poro-Elastic and Poro-Visco-Elastic Models with Respect to Boundary Data*, Quart. Appl. Math., Vol. LXXV, No. 4, December 2017, 697-735.
4. L. Bociu, G. Guidoboni, R. Sacco, and J. Webster*, *Analysis of nonlinear poro-elastic and poro-visco-elastic models*, Archive for Rational Mechanics and Analysis, 222 (2016), 1445-1519. DOI: 10.1007/s00205-016-1024-9.
5. H.T. Banks, K. Bekele-Maxwell*, L. Bociu, and Chuyue Wang***, *Sensitivity via the complex-step method for delay differential equations with non-smooth initial data*, Quart. Appl. Math. **75** (2017), 231-248.
6. L. Bociu, S. Derochers**, and D. Toundykov, *Linearized Hydro-Elasticity: A Numerical Study*, Evolution Equations and Control Theory, Vol. 5, Number 4 (December 2016), 533-559.
7. L. Bociu and J.-P. Zolesio, *Hyperbolic equations with mixed boundary conditions: shape differentiability analysis*, AMO, 2016, published online: DOI 10.1007/s00245-016-9354-4.

8. L. Bociu and K. Martin**, *Free Boundary Fluid-Elasticity Interactions: Adjoint Sensitivity Analysis*, New Trends in Differential Equations, Control Theory and Optimization, 2016, 21-39.
9. L. Bociu, D. Toundykov, and J.-P. Zolesio, *Well-posedness analysis for the total linearization of a fluid-elasticity interaction*, SIAM Journal of Mathematical Analysis 47-3 (2015), 1958 - 2000.
10. H.T. Banks, K. Bekele-Maxwell*, L. Bociu, M. Noorman**, and K. Tillman**, *The complex-step method for sensitivity analysis of non-smooth problems arising in biology*, Eurasian Journal of Mathematical and Computer Applications ISSN 2306-6172, Volume 3, Issue 3 (2015), 16 – 68.
11. L. Bociu and J.-P. Zolesio, *A Pseudo-Extractor Approach to Hidden Boundary Regularity for the Wave Equation with Mixed Boundary Conditions*, Journal of DE 259 (2015), 11, 5688 - 5708.
12. L. Bociu, L. Castle**, K. Martin**, and D. Toundykov, *Optimal Control in a Free Boundary Fluid-Elasticity Interaction*, Dynamical Systems, Differential Equations and Applications AIMS Proceedings, 2015, 122 – 131.
13. L. Bociu and D. Toundykov, *Wave equations with nonlinear sources and damping: weak vs. regular solutions*, Palestine Journal of Mathematics, Vol.2(2) (2013), 175-186.
14. L. Bociu, P. Radu, and D. Toundykov, *Regular solutions of wave equations with super-critical sources and exponential-to-logarithmic damping*, Evolution Equations and Control Theory, Vol. 2, no. 2, June 2013, 255-279.
15. L. Bociu and J.-P. Zolesio, *Sensitivity analysis for a free boundary fluid-elasticity interaction*, Evolution Equations and Control Theory Volume 2, Number 1, 2013, 55-79.
16. L. Bociu and J.-P. Zolesio, *Strong shape derivative for the wave equation with Neumann boundary condition*, D. Homberg and F. Troltzsch (Eds.): CSMO 2011, IFIP AICT 391, International Federation for Information Processing (2013), 445 - 460.

Recent Invited Presentations

1. SS at 42nd SIAM-SEAS Conference, UNC Chapel Hill, March 12, 2018.
2. SIAM Conference on Analysis of Partial Differential Equations, MS on Analysis, Control, and Long-time Behavior of Fluid and Flow-Structure Models, December 9-12, 2017.
3. **Colloquium** Applied Mathematics, Penn State University, November 13, 2017.
4. **Plenary** Talk at KUMUNU Conference on PDE, Dynamical Systems and Applications, University of Nebraska-Lincoln, April 21-23, 2017.
5. Women in Control: New Trends in Infinite Dimensions, Banff International Research Station, July 16-21, 2017.
6. MS on Optimal Control and Applications, SIAM Annual Meeting, Pittsburgh, July 10-14, 2017.
7. Southeastern Spring Sectional Meeting of AMS, Special Session on Analysis, Control and Stabilization of PDEs, Charleston, March 10-12, 2017.
8. JMM, SS on Control and Long Time Behavior of Evolutionary PDEs, Atlanta, January 4-7, 2017.
9. 1124th AMS Meeting, SS on Contemporary Geometric Methods in Mechanics and Control, Raleigh, November 12-13, 2016.
10. 11th AIMS Conference on Dynamical Systems, Differential Equations and Applications, SS on Geometric Methods in Mechanics and Differential Equations, Orlando, FL, July 1-5, 2016.
11. 11th AIMS Conference on Dynamical Systems, Differential Equations and Applications, SS on Long time dynamics, numerical analysis and control of evolutionary systems, Orlando, FL, July 1-5, 2016.
12. International Workshop on Fluid-Structure Interaction Problems, Singapore, May 30- June 3, 2016.
13. International Conference on Evolution Equations, SS Analysis and Control of PDE Evolutions with an Interface, Vanderbilt University, May 16-20, 2016.

Organizer for the 27th International Federation for Information Processing (IFIP), System Modeling and Optimization Conference, Sophia Antipolis, France, June 29-July 3, 2015. **Organizer** of 13 special sessions and 4 mini-symposia at national and international conferences.

Chair of the SEARCDE Steering Committee, Fall 2015 – present.

Secretary for The International Federation for Information Processing (IFIP), Technical Committee 7 – System Modeling and Optimization, Working Group 7.2 (Computational Techniques in Distributed Systems), 2011- present.

TEACHING

Philosophy: I am a big promoter of active learning in Mathematics. In all my courses, I design every lecture as a conversation and collaboration between the students and myself. With that in mind, the lecture involves lots of student investigation, and time assigned for group work, volunteer board work, and discussions. I like to think of every class as a “guided” opportunity for student discovery and involvement. In some of my classes I provide fill-in notes, to make class more time efficient and to give the students the chance to participate in making the lecture.

Teaching Training and Enhancement:

- Attended OFD Workshop on “Strategies for a Gender Inclusive Classroom Workshop”, Fall 2017.
- Participant in the Certificate of Reflective Teaching Program, Office of Faculty Development, NCSU, 2013-2014.
- Attended OFD workshops on “Keeping Students Engaged”, “Course Design for University Classes”, “Mid-semester Evaluations: What Do You Do once you have your data”, “What, how and why: An in-depth look at mid-semester evaluations”, and “Overcoming Obstacles to Active Learning”, 2012-2013.
- Attended Office for Institutional Equity & Diversity’s workshop on “GLBT Students”, 2013.
- Participant in the Reading Circle on “Teaching Critical Thinking”, Spring 2013.

Teaching related Conferences:

Organizer for MAA Contributed Paper Session on “Cultivating Critical Thinking through Active Learning in Mathematics”, MAA MathFest, Washington DC, August 5-8, 2015.

Organizer for MAA Paper Session on Active Learning in Mathematics, MathFest, Portland, Oregon, August 2014.

Organizer for MAA Panel Session on Active Learning in Mathematics, JMM, San Diego, CA, January 2013.

Teaching Awards

- 2017 Department of Mathematics Nominee for the NCSU Outstanding Teacher Award
- 2017, 2015, 2013 Recipient of a “Thank a Teacher” Letter, NCSU
- 2013 Department of Mathematics Nominee for the NCSU Outstanding Teacher Award
- 2013 Recipient of NCSU Certificate of Reflective Teaching
- 2009 Recipient of University of Nebraska-Lincoln Parent Association “Certificate of Recognition for Contributions to Students” for 2008-2009
- 2008 Winner of the 2007-08 All-University Graduate Teaching Assistant Award in Math, Sciences, and Engineering, University of Virginia (UVA)
- 2008 Outstanding Graduate Teaching Assistant Award 2007-2008, Mathematics Department, UVA

NC State University Classes

Course Code	Semester	Enrollment	Question 8 - Mean
MA 515 (Analysis I)	Fall 2011	31	4.5
MA 515	Fall 2012	33	4.6
MA 494 (Major Paper in Math)	Fall 2012	1	
MA 715 (Analysis II)	Spring 2013	16	4.4
MA 791 (Spectral theory and Semigroups of Linear Operators)	Spring 2013	9	4.9
MA 515	Fall 2013	23	4.6
MA 715	Spring 2014	13	4.7
MA 491 (Reading in Honors Mathematics)	Spring 2014	1	
MA 515	Fall 2014	11	4.9
MA 493 (Measure Theory and Lebesgue Integration)	Fall 2014	6	5.0
MA 491	Spring 2015	1	
MA 515	Fall 2015	22	4.7
MA 401 (Applied Differential Equations II)	Fall 2015	22	3.6
MA715	Spring 2016	10	5.0
MA 401	Fall 2016	27	4.7
MA 534 (Intro to Partial Differential Equations)	Fall 2016	23	4.9
MA 734 (Partial Differential Equations)	Spring 2017	11	4.9
MA 534	Fall 2017	13	4.9
MA 491	Spring 2018	1	
MA 734	Spring 2018	11	5.0

New Course Design:

- Spectral theory and Semigroups of Linear Operators (MA 791) – Spring 2013: created this class on demand, based on students' inquires and interest after my Analysis I (MA 515) class in Fall 2012. Every class material was planned based on the questions and discussions that we had during the previous class.
- Measure Theory and Lebesgue Integration (MA 493) – Fall 2014, targeted at advanced math majors.

Research Assistant Professor, University of Nebraska - Lincoln

Ordinary Differential Equations (undergraduate, 2 sections), Spring 2011.
Independent Study - Measure theory in PDEs (399), Fall 2010.
Intro Partial Differential Equations (324/824), Fall 2010.
Intro Complex Variables (423/823), Spring 2009.
Ordinary Differential Equations (undergraduate, 2 sections), Fall 2008.

Graduate Instructor, University of Virginia

Calculus III (Multivariable Calculus): Fall 2007, Spring 2008.
Calculus II: Fall 05, Spring 06, Fall 06.
Calculus I: Fall 04, Spring 05, Summer 06.
Applied Calculus I and II: Fall 2003, Spring 2004, and Summer 2008.

ADVISING AND MENTORING

2018 Conor Perks (**undergraduate** research)
2017 William Reese (**undergraduate** research)
2015-2016 Monica Wang (**undergraduate** research)
2014-2015 Justin Webster (**Postdoc**)
2015 Kevin Kristensen (**undergraduate** research)
2014-2017 Steven Derochers (**Ph.D.** 2017)
2014-present Kristina Martin (**Ph.D.** May 2018)
2014-present Lucas Castle (**Ph.D.** August 2018)
2014-present Marcella Noorman (**Ph.D.** Student, December 2018 Expected Graduation)
2013-2014 William Oakley (**M.S.** Student, now Ph.D. student at UCLA).
2015-2016 Faculty Mentor for Lucas Castle for the NCSU Prepare the Professoriate (PTP) Program (MA 401).
2014 Summer REG: Steven Derochers, Kristina Martin, Lucas Castle, and Marcella Noorman.
2012-present Faculty Teaching Mentor and Observer for the following Teaching Assistants:
 Mallory McMahon, Michael Weselcouch, McKay Sullivan, Elisabeth Brown, Lucas Castle, Jessica
 Wagstaff, Kate Brennehan, Allison McAlister Hedges, and Jason Scott.
2012-present Faculty Advisor for undergraduate students
 Ashley Turner, Walker Higgins, Timothy Milowic, Janel Wasilewski, Emma Thorpe, Sara
 Troutman, Stephen Woodward, Eric Lutz, and Daniel Dolder.
2012-2013: Faculty Advisor for 15 Women in Science and Engineering (WISE) students.
2011-present: Faculty Advisor for NCSU – Association of Women in Mathematics (AWM).

Ph.D. and Masters Committee Memberships

- Ph.D. Committee Chair: Marcella Noorman (Mathematics)
- Ph. D. Committee Chair: Lucas Castle (Mathematics)
- Ph. D. Committee Chair: Kristina Martin (Applied Mathematics)
- Ph.D. Committee Member: Amanda Laubmeier (Applied Mathematics)
- Ph. D. Committee Member: Khalid Alanezy (Mathematics) (graduated Spring 2017)
- Ph.D. Committee Chair: Steven Derochers (Mathematics) (graduated Spring 2017)
- Ph.D. Committee Member: Yao Yu (Electrical Engineering) (graduated Spring 2017)
- Ph.D. Committee Member (GSR): Yue Yang (Physics)
- Ph.D. Committee Member (GSR): Qiwen Hu (Bioinformatics)
- Ph.D. Committee Member: Amanda Landi (Mathematics) (graduated 2015)
- Ph.D. Committee Member: Shana Lieberman (Mathematics)
- M.S. Committee Chair: William Oakley (Mathematics) (graduated May 2014)
- Ph.D. Committee Member: Keri Rehm (Mathematics) (graduated 2013)
- M.S. Committee Member: Minsung Kim (Mathematics) (graduated May 2013)

OUTREACH AND DIVERSITY

- NCSU - Recruiting Diverse Faculty Committee Member, 2016-present
- NCSU Diversity Mentoring Fellow, 2017-2018
- Initiated a monthly Diversity and Inclusion Brown Bag Lunch for URM graduate students in Mathematics and Statistics at NCSU, Spring 2018
- Organized a Professional Development Colloquium on Strategies for Supporting Diversity in Mathematics Departments (given by Dr. Rosalie Belanger-Rioux) for the NCSU Mathematics Department, April 2018
- Faculty advisor for NCSU-AWM Chapter, 2012-present
- Chair of the SEARCDE Steering Committee, Fall 2015 – present
- Secretary for The International Federation for Information Processing (IFIP), Technical Committee 7 – System Modeling and Optimization, Working Group 7.2 (Computational Techniques in Distributed Systems), 2011-present.
- Organizer for: MAA Contributed Paper Session on “Cultivating Critical Thinking through Active Learning in Mathematics”, MAA MathFest, Washington DC, August 5-8, 2015; MAA Paper Session on Active Learning in Mathematics, MathFest, Portland, Oregon, August 2014; MAA Panel Session on Active Learning in Mathematics, JMM, San Diego, CA, January 2013
- AWM Mentor Network Committee Member, 2013-2015
- Created and organized **GAMMA (Girls in Applied Math, Modeling and Analysis)** at NCSU, April 8, 2017
GAMMA is a community outreach program that builds interest in mathematics research and mathematics-related careers among women at the high school level. Forty high school girls participated in the program.
- Special Guest at Junior WISE (Women in Sciences and Engineering) Club at the Wake STEM Early College High school, March 2017
- Faculty Participant in the AWM - Women in Teaching Panel, NCSU, September 2016
- Invited Panelist at “Girls Talk Math” Camp, UNC Chapel Hill, June 21, 2016
- Invited Panelist at Nebraska Conference for Undergraduate Women in Mathematics, University of Nebraska-Lincoln, January 29-31, 2016
- Organizer for the Science Spectacular at Apex Elementary School, NC, February 2016
- Speaker on “Careers in Mathematics” and “Why Should I Study Math? What can I do with a Math degree?” at:
 1. Sonia Kovalevsky Day at NCSU – Keynote Speaker, April 2, 2016
 2. NCSU-SUM Series, September 2012
 3. University of Nebraska-Lincoln Math Club, 2010
 4. University of Nebraska-Lincoln Women’s Undergraduate Math Network (WUMN), 2009
 5. Sonja Kovalevsky Mathematics Day, University of Virginia, 2008
 6. Sonja Kovalevsky Mathematics Day, University of Virginia, 2007
 7. Young Women Leadership Program, University of Virginia 2008
 8. The Covenant School, Charlottesville, VA, 2008
 9. Girls and Mathematics Summer Program, 2006
 10. University of Virginia Math Club, 2006
- Created and organized “**Math Doesn't Bug Me**”, an outreach program designed to illustrate the fun, beauty, and usefulness of mathematics to children and their families through engaging games and interaction with mathematics students. Initially featured at the 2012 “BugFest” at the North Carolina Museum of Natural Sciences, the program has been invited back in 2013-2018. Moreover,
 - “Math Doesn’t Bug Me” was part of the NCSU State of the Sciences, Hunt Library, April 13, 2018.
 - “Math Doesn’t Bug Me” participated in NCSU Packapalooza, August 20, 2016.
 - “Math Doesn’t Bug Me” was part of the NCSU State of the Sciences: Museum Takeover at NC Museum of Natural Sciences, April 8, 2016.
 - “Math Doesn’t Bug Me” was invited and participated in Lacy Elementary's Math and Science Night, January 2013 and 2014.