

Curriculum Vitae

MARIAN BOCEA

Contact information

North Dakota State University
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Personal

Romanian citizen; U.S. permanent resident

Education

Ph.D. in Mathematical Sciences, Carnegie Mellon University, May 2004

Ph.D. Advisor: Irene Fonseca

Ph.D. Thesis Title: *A Young Measure Approach to Nonlinear Membrane Theory*

M.Sc. in Mathematical Sciences, Carnegie Mellon University, December 2000

Ph.D. in Mathematics, University of Craiova, Romania, July 2000

Ph.D. Advisor: Constantin P. Niculescu

Ph.D. Thesis Title: *Contributions to the Mathematical Theory of Hemivariational Inequalities and Applications to Mechanics*

M.Sc. in Applied Mathematics, University of Craiova, Romania, June 1997

M.Sc. Dissertation Advisors: Panagiotis D. Panagiotopoulos, Aristotle University of Thessaloniki, Greece and Vicențiu Rădulescu, University of Craiova, Romania

M.Sc. Dissertation Title: *Eigenvalue Problems in Hemivariational Inequalities*

B.Sc. in Mathematics, University of Craiova, Romania, June 1996

B.Sc. Thesis Advisor: Vicențiu Rădulescu

B.Sc. Thesis Title: *Elliptic Problems with L^1 Data*

Academic Experience

Assistant Professor, Department of Mathematics, North Dakota State University (since August 2006)

Burgess Assistant Professor, Department of Mathematics, University of Utah (July 2004 - July 2006)

Research Interests

Analysis of Partial Differential Equations, Calculus of Variations. Applications to Materials Science: material instabilities, fracture and defects in solids, dielectric breakdown, polycrystal plasticity, the formation of microstructure in crystalline solids, thin films of martensitic materials, shape memory alloys, ferroelectric and magnetic materials, phase transitions, homogenization and optimal design of composite materials.

Current NSF Grant: DMS-0806789 - *Variational Methods for Some Problems in Materials Science* (September 1, 2008-August 31, 2011)

Publications

15. M. Bocea, A justification of the theory of martensitic thin films in the absence of an interfacial energy. *Journal of Mathematical Analysis and Applications* **342** No. 1 (2008), 485-496.
14. M. Bocea and V. Nesi, Γ -convergence of power-law functionals, variational principles in L^∞ , and applications. *SIAM Journal on Mathematical Analysis* **39** No. 5 (2008), 1550-1576.
13. M. Bocea, Young measure minimizers in the asymptotic analysis of thin films. *Electronic Journal of Differential Equations* **15** (2007), 41-50.
12. M. Bocea and I. Fonseca, A Young measure approach to a nonlinear membrane model involving the bending moment. *Royal Society of Edinburgh Proceedings A* **134** No. 5 (2004), 845-883.
11. P.D. Panagiotopoulos, M. Bocea and V. Rădulescu, Inequality problems with non locally Lipschitz energy functional: existence results and applications to nonsmooth mechanics. *Applicable Analysis* **82** No. 6 (2003), 561-574.
10. M. Bocea and I. Fonseca, Equi-integrability results for 3D-2D dimension reduction problems. *ESAIM: Control, Optimization and Calculus of Variations* **7** (2002), 443-470.
9. M. Bocea, D. Motreanu and P.D. Panagiotopoulos, Multiple solutions for a double eigenvalue hemivariational inequality on a spherelike manifold. *Nonlinear Analysis, T.M.A.* **42** No. 5 (2000), 737-749.
8. M. Bocea, P.D. Panagiotopoulos and V. Rădulescu, Double eigenvalue hemivariational inequalities with non-locally Lipschitz energy functionals. *Communications in Applied Nonlinear Analysis* **6** No. 4 (1999), 17-29.
7. M. Bocea, Existence of solutions for hemivariational inequalities with non-Lipschitz energy functionals. *Revue Roumaine de Mathématiques Pures et Appliquées* **44** No. 3 (1999), 315-325.
6. M. Bocea, P.D. Panagiotopoulos and V. Rădulescu, A perturbation result for a double eigenvalue hemivariational inequality with constraints and applications. *Journal of Global Optimization* **14** No. 2 (1999), 137-156.
5. M. Bocea and V. Rădulescu, An eigenvalue Dirichlet problem with weight and L^1 data. *Mathematische Nachrichten* **198** (1999), 5-17.
4. M. Bocea and V. Rădulescu, Multivalued problems with strong resonance at infinity and L^1 data. *Revue Roumaine de Mathématiques Pures et Appliquées* **43** No. 5-6 (1998), 533-540.
3. M. Bocea, Multiple solutions for a class of eigenvalue problems involving a monotone operator in hemivariational inequalities. *Applicable Analysis* **65** No. 3-4 (1997), 395-407.
2. M. Bocea and V. Rădulescu, Problèmes elliptiques avec non-linéarité discontinue et second membre L^1 . *Comptes Rendus de l'Académie des Sciences Paris - Série I - Mathématique* **324** No. 2 (1997), 169-172.

1. M. Bocea, Sur quelques problèmes d'analyse fonctionnelle. *Annals of the University of Craiova* **21** (1995), 51-58.

Selected Colloquia, Conference and Seminar Talks

- AMS Session on *Calculus of Variations and Control*, 2009 Joint Mathematics Meetings, Washington, DC, January 2009
- PDE Seminar, School of Mathematics, Georgia Institute of Technology, September 2008
- SIAM Session on *Elasticity*, SIAM Conference on *Mathematical Aspects of Materials Science* Philadelphia, PA, May 2008
- AMS Session on *Analysis and Ordinary Differential Equations*, Joint Mathematics Meetings, San Diego, CA, January 2008
- Minisymposium on *Multiscale Phenomena in Material Sciences*, SIAM Conference on *Analysis of Partial Differential Equations*, Mesa, AZ, December 2007
- Minisymposium on *Energy Based Approaches to Nonlinear PDEs*, SIAM Conference on *Analysis of Partial Differential Equations*, Mesa, AZ, December 2007
- Workshop on *Modeling, Analysis and Simulation of Multiscale Nonlinear Systems*, Oregon State University, Corvallis, OR, June 2007
- Colloquium, Department of Mathematics, Worcester Polytechnic Institute, December 2006
- *A Conference on Applied Analysis on the Occasion of the 65th Birthday of David Kinderlehrer*, Carnegie Mellon University, Pittsburgh, PA, October 2006
- AMS Special Session on *Nonconvex Variational Problems: Recent Advances and Applications*, 2006 AMS Fall Western Section Meeting, Salt Lake City, UT, October 2006
- Minisymposium on *Microstructures and PDE: New Challenges and New Methods*, SIAM Conference on *Analysis of Partial Differential Equations*, Boston, MA, July 2006
- Colloquium, Department of Mathematics, University of Memphis, February 2006
- Joint Mathematics Meetings, San Antonio, TX, January 2006
- 56th Midwest PDE Seminar, University of Notre Dame, December 2005
- Conference on *Partial Differential Equations and Applications*, University of Florida, November 2005
- AMS Special Session on *Calculus of Variations*, 2005 AMS Fall Central Section Meeting, Lincoln, NE, October 2005
- *Frontiers of Applied Analysis - A Conference on the Occasion of the 15th Anniversary of the Center for Nonlinear Analysis*, Carnegie Mellon University, September 2005
- IMA Workshop: *Effective Theories for Materials and Macromolecules*, Minneapolis, MN, June 2005
- VIGRE Mini-course on *Nonconvex Variational Problems and Applications*, University of Utah, May 2005
- Sixth MSU-UAB Conference on *Differential Equations and Computational Simulations - A conference dedicated to Louis Nirenberg and Klaus Schmitt for their contributions to Mathematics*, Mississippi State University, May 2005
- Colloquium, Department of Mathematics, University of Utah, February 2005
- Joint Mathematics Meetings, Atlanta, GA, January 2005
- Applied Mathematics Seminar, University of Utah, September 2004
- SIAM Conference on *Mathematical Aspects of Materials Science*, Los Angeles, CA, May 2004
- AMS Special Session on *Nonlinear PDEs and Variational Problems*, Joint Mathematics Meetings, Phoenix, AZ, January 2004
- Symposium on *Analysis and PDEs*, Purdue University, May 2003
- Pan American Advanced Studies Institute, Santiago, Chile, January 2003
- SIAM 50th Anniversary and 2002 Annual Meeting, Philadelphia, July 2002
- *Nonlinear Differential Equations, Mechanics and Bifurcation - A conference in honor of David G. Schaeffer*, Duke University, May 2002

- *Progress in Partial Differential Equations*, Royal Society of Edinburgh, U.K., July 2001
- Partial Differential Equations & Kinetic Theory Seminar, Carnegie Mellon University, February 2001
- *Mathematical Challenges of the 21st Century*, University of California at Los Angeles, August 2000
- Colloquium, Department of Applied Mathematics, Universidad Complutense de Madrid, Spain, April 1999

Awards, Fellowships, Grants

- National Science Foundation (DMS-Applied Mathematics Program) Award No. DMS-0806789: *Variational Methods for Some Problems in Materials Science* (September 1, 2008-August 31, 2011)
- 2008 SIAM Early Career Travel Award, SIAM Conference on *Mathematical Aspects of Materials Science*, Philadelphia, PA, May 2008
- Professional Development Grant, Office of the President, North Dakota State University, Academic Years 2006-2007, 2007-2008, and 2008-2009
- DOE-NSF Travel Grant, Workshop on *Modeling, Analysis and Simulation of Multiscale Nonlinear Systems*, Oregon State University, Corvallis, OR, June 2007
- Outstanding Instructor Award, Department of Mathematics, University of Utah, 2005-2006
- Burgess Award, University of Utah, 2004-2007
- Research Fellowship, Department of Mathematical Sciences, Carnegie Mellon University, 2003-2004
- GSA Conference Travel Grant, Carnegie Mellon University, 2002, 2004
- 2002 SIAM Student Travel Award
- E.U. Grant, (through Royal Society of Edinburgh), *Progress in Partial Differential Equations*, Edinburgh, U.K., July 2001
- E.U. Grant, Instructional Conference in *Nonlinear Partial Differential Equations*, Edinburgh, U.K., January 2001
- E.U. Grant, *Selected Issues in the Mechanics of Crystalline Solids*, Padova, Italy, October 2000
- NSF Travel Grant (through American Mathematical Society), *Mathematical Challenges of the 21st Century*, Los Angeles (U.C.L.A.), August 2000
- E.U. Grant, *New Mathematical Methods in Continuum Mechanics*, Crete, July 2000
- World Bank Fellowship, Universidad Complutense, Madrid, Spain, March 1999-May 1999
- TEMPUS Fellowship (E.U. Programme S-JEP 09094-95), Aristotle University of Thessaloniki, Greece, March 1997-June 1997
- Romanian Department of National Education Doctoral Fellowship, October 1996-July 1999

Teaching Experience

Graduate level courses taught:

- MATH 767 Topics in Applied Mathematics: Homogenization and Optimal Design - Fall 2008, NDSU
- MATH 785 Partial Differential Equations II - Spring 2008, NDSU
- MATH 784 Partial Differential Equations I - Fall 2007, NDSU
- MATH 790 Applied Mathematics Seminar (Organizer) - Fall 2008, Spring 2008, Fall 2007, NDSU
- MATH 689 Numerical Analysis II - Spring 2007, NDSU
- MATH 688 Numerical Analysis I - Fall 2006, NDSU
- 7825 Analysis Seminar (Organizer) - Spring 2006, University of Utah
- 7280 Operator Theory - Spring 2006, University of Utah
- 6880 Topics in Applied Mathematics - Fall 2005, University of Utah

Undergraduate level courses taught:

- MATH 266 Introduction to Differential Equations - Fall 2008, Spring 2008, NDSU
- MATH 491 Capstone Seminar (Coordinator) - Spring 2007, Fall 2007, NDSU

- MATH 265 Calculus III - Fall 2006, Spring 2007, Fall 2007, NDSU
- 3210 Foundations of Analysis I - Summer 2006, Spring 2005, University of Utah
- 1010 Intermediate Algebra - Spring 2006, University of Utah
- 7845 Differential Equations Seminar - Fall 2005, University of Utah
- 3220 Foundations of Analysis II - Summer 2005, University of Utah
- 2280 Introduction to Differential Equations - Fall 2004, University of Utah
- 21-111 Calculus for Humanities - Summer 2004, Carnegie Mellon University
- 21-127 Concepts of Mathematics - Spring 2003, Summer 2003, Carnegie Mellon University
- 21-259 Calculus in Three Dimensions - Summer 2002, Carnegie Mellon University
- 21-115 Differential Calculus - Summer 2001, Carnegie Mellon University
- 21-116 Integral Calculus - Summer 2001, Carnegie Mellon University
- 21-260 Differential Equations - Summer 2000, Carnegie Mellon University

Service

- Co-chair of the AMS Session on *Calculus of Variations and Control*, 2009 Joint Mathematics Meetings, Washington, DC, January 2009
- Chair of the AMS Session on *Analysis and Ordinary Differential Equations*, 2008 Joint Mathematics Meetings, San Diego, CA, January 2008
- Member of the American Mathematical Society's Committee on Meetings and Conferences Focus Group, San Diego, CA, January 2008
- Chair of the SIAM Session on *Nonlinear Waves and Turbulence*, SIAM Conference on Analysis of Partial Differential Equations, Mesa, AZ, December 2007
- Co-organizer (with Cristina Popovici, NDSU) of the AMS Special Session on *Calculus of Variations and Nonlinear PDE: Theory and Applications*, 2007 Joint Mathematics Meetings, New Orleans, LA, January 2007
- Co-organizer (with Andrej Cherkaev, University of Utah) of the AMS Special Session on *Nonconvex Variational Problems: Recent Advances and Applications*, 2006 Fall Western Section Meeting, Salt Lake City, UT, October 2006
- Reviewer for *Mathematical Reviews* (since 2005)
- Referee for the following journals:

Archive for Rational Mechanics and Analysis
 Boundary Value Problems
 International Journal of Mathematics and Mathematical Sciences
 Journal of Global Optimization
 Journal of Mathematical Analysis and Applications
 Materials Science and Engineering A (Elsevier)
 SIAM Journal on Applied Mathematics

Professional Affiliations

- American Mathematical Society
- Society for Industrial and Applied Mathematics
 - SIAM Activity Group on *Analysis of Partial Differential Equations*
 - SIAM Activity Group on *Mathematical Aspects of Materials Science*