Daniel Onofrei

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Education:

- Ph.D. in Mathematical Sciences, Worcester Polytechnic Institute, 2002 - 2007

  - Thesis Title: "New Results in the Multi-scale Analysis on Perforated Domains and Applications", advisor Professor Bogdan Vernescu
  - Committee: Bogdan Vernescu, Umberto Mosco, Konstantin Lurie, Doina Cioranescu, Alain Damlamian

- B.Sc. in Mathematics, University Al. I. Cuza, Iasi, Romania, 1997 - 2001

Employment:

- Assistant Professor, Department of Mathematics, **University of Utah** 2008 - present
- Postdoctoral Fellow, Department of Mathematics, **Rutgers University** 2007 - 2008
- Teaching Assistant, Mathematics, **Worcester Polytechnic Institute** 2005 - 2007
- Research assistant, Mathematics, **Worcester Polytechnic Institute** 2002 – 2005

Advising activity:

- Bachelor Honors Thesis, "The analysis of the dissipative near cloak", 2008-2009
- REU project on "Mathematical Understanding of Geofoam and Seismic Cloaking", 2009

Research Interests:

Applied analysis and partial differential equations:

- Inverse scattering theory and application to cloaking
- Variational analysis and optimization
- Mathematical analysis of multi-scale phenomena in material science with application to meta-materials and dynamic materials
- Homogenization theory for partial differential equations with non-smooth coefficients

Publications:

1. F. G. Vasquez, G.W. Milton, D. Onofrei, "Characterization of the response of elastic networks", submitted to Journal of Elasticity, 2009

2. F. G. Vasquez, G.W. Milton, D. Onofrei, " Mathematical analysis of the active exterior cloak for the quasistatic electromagnetics", in preparation
3. F. G. Vasquez, G.W. Milton, D. Onofrei, " Mathematical analysis of the active exterior cloak for Helmholtz equation", in preparation
4. D. Onofrei, "Asymptotic analysis of boundary layer correctors and applications", to be submited, 2009
5. R. V. Kohn, D. Onofrei, M. Vogelius, M. Weinstein, "Cloaking via change of variables for Helmholtz equation in the case of fixed frequency", accepted for publication, CPAM, 2009
6. F. G. Vasquez, G.W. Milton, D. Onofrei, "Broadband exterior cloaking", Optics Express, Vol. 17, Issue 17, 14800-14805, 2009
7. F. G. Vasquez, G. W. Milton, D. Onofrei, "Active exterior cloaking", Phys. Rev. Lett., 103, 073901, 2009
8. K. Lurie, D. Onofrei, S. Weekes, "Mathematical analysis of the energy concentration phenomena in waves travelling through a rectangular material structure in space - time", J. Math. Anal. Appl., vol. 355, Issue 1, 180-194, 2009
9. D. Cioranescu, A. Damlamian, G. Griso, D. Onofrei, "The Periodic Unfolding Method for elliptic problems with variable coefficients and variable domains", Jour. Math. Pures et Appl., 89, 248-277, 2008
10. D. Onofrei, B. Vernescu, "Error estimates for periodic homogenization with non-smooth coefficients", Asymptotic Analysis, 54, 103-123, 2007
11. D. Onofrei, "The Unfolding operator near a hyperplane and its application to the Neumann sieve model", Adv. in Math. Sciences and Appl., vol. 16, No. 1, 239-258, 2006
12. I.R. Ionescu, D. Onofrei, B.Vernescu, "Γ-convergence for a fault model with slip weakening friction law and periodic barriers", Quarterly of Appl. Math., vol. LXII, 4, 747-778, 2005
13. D. Onofrei, B. Vernescu, "Asymptotic analysis of a spectral problem associated with the Neumann sieve", J. of Anal. and Appl., vol. 1, 69-87, 2005
14. D. Onofrei, B. Vernescu, "G-convergence results for some spectral problems associated to the Neumann sieve and their applications", GAKUTO Int. Series, Math. Sci. Appl., Vol. 24, 249-260, 2005
15. A. Khibnik, D. Onofrei, "A New Method to update the probability density function for crack size in a crack growth process", technical report, United Technologies Research Center, 2002

Reviewer for:

- Communications in Mathematics and Physics, Quarterly Journal of Mechanics and Applied Mathematics, Science, Journal of Sound and Vibrations, Journal of Physics D: Applied Physics, Acta Acustica

Invited Talks:

- **AMS Special Session** on, "Degenerate and Singular Elliptic Partial Differential Equations" Joint Mathematical meetings San Francisco, January 13-16, 2010
- **AMS Special Session** on, "Inverse problems: Analysis and Computations", Joint Mathematical meetings San Francisco, January 13-16, 2010

- **SIAM,** Mini-symposium on, “Resonance, Scattering, and Design in Electromagnetism”, Annual Meeting Denver, July 6-10, 2009
- **SIAM,** Mini-symposium on, “Cloaking and Invisibility”, Annual meeting Denver, July 6-10, 2009
- **Center for Scientific Computation and Mathematical Modeling, University of Maryland**, Workshop on, "Electromagnetic Materials and Their Approximations: Practical and Theoretical Aspects", Maryland, September, 22-25, 2008
- **SIAM PDE Meeting,** Mini-symposium on, “Microstructures, Spectral Properties and Homogenization”, December 10-12, Arizona, 2007
- **Oregon State University,** Workshop on, “Modeling Analysis and Simulation of Multi-scale Nonlinear systems”, Oregon, July, 25-29, 2007
- **Iowa State University,** Iowa City, April 18, 2007
- **University of Idaho,** March, 2007
- **AMS Special Session** on, “Calculus of Variations and Nonlinear PDE’s”, Joint Mathematical Meetings, New Orleans, LA, January 5-8, 2007
- **AMS Special Session** on, “Non-convex Variational Problems: Recent Advances and Applications”, Salt Lake City, University of Utah, October, 7-8, 2006
- **AMS Special Session** on, “Imaging, Homogenization and Shape Optimization”, Miami, Florida International University, April 1-2, 2006
- **University of Savoie ,** Chambery, France, July 11, 2005
- **Laboratoire J.L. Lions,** University Paris VI, Paris, June 27, 2005
- **SIAM** Conference on Analysis of Partial Differential Equations, mini-symposium on, “Free and moving Boundaries and Optimal Transport”, Houston, December, 2004
- **SIAM** Conference on Mathematics in Industry, Challenges and Frontiers, Toronto, Canada, October, 2003

Contributed presentations:

- The near cloaking scheme, **University of Utah**, Mathematics Department, PDE seminar
- Future Challenges in Multi-scale Modeling and Simulation Workshop, **IMA**, November, 2004
- Homogenization and Multi-scale Problems Conference, Narvik, **Norway**, 22-26 June, 2004
- Free Boundary Problems Conference, Trento, **Italy**, 2002

Grants and Awards:

- **AMS fellowship** to participate in – Mathematics Research Communities’ Conference on Inverse Problems, Snowbird, Utah, June 20- June 26, 2009.
- **SIAM Student Travel Award**, for the conference SIAM Conference on Analysis of Partial Differential Equations, Phoenix, Arizona, December, 2007
- **Research Fellowship**, University Paris VI, Paris, July - August, 2005
- **SIAM Student Travel Award**, for the conference SIAM Conference on Analysis of Partial Differential Equations, Huston, December, 2004
- **National Science Foundation Research Assistantship**, Worcester Polytechnic Institute, 2004 - 2005

- **Research Fellowship**, **University Paris VI**, Paris, June - July, 2004
- **Research Fellowship**, **Fields Institute,** PDE thematic year, Toronto, April – May, 2004
- **Worcester Polytechnic Institute Fellowship,** Department of Mathematics, MA, 2003 - 2004
- **SIAM Student Travel Award**, for the conference SIAM Math in Industry, Challenges and Frontiers, Toronto, Canada, October, 2003
- **Sloan Foundation Assistantship**, Mathematical Sciences Department, Worcester Polytechnic Institute, Worcester, MA, 2002 - 2003

Prizes:

- Fourth place at the **International Olympiad for College Students**, Chisinau, Republic of Moldavia, 1999.
- Third and second prize at the **National Romanian Olympiad** (NRO) in mathematics for high school students, 1996, 1997 respectively.

Professional Memberships:

- AMS - American Mathematical Society 2002 - present
- SIAM - Society for Industrial and Applied Mathematics 2003 - present

Service:

- **Co-organizer** (with G.W. Milton and F.G.Vasquez) of four Mini-symposiums on “Metamaterials and Cloaking”, PA, May, 2010
- **Co-organizer** (with Bogdan Vernescu) of the Mini-symposium on Multi-scale aspects in material Sciences at **SIAM PDE meeting**, Arizona, December 10-12, 2007
- Graduate member in the University Campus Hearing Committee, 2006-2007
- **Team instructor for the Putnam competition**, Worcester Polytechnic Institute , 2005, 2006
- Founding President of the Romanian Student Association at Worcester Polytechnic Institute, 2004-2005