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Mathematical Sciences
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BOGDAN VERNESCU



EDUCATION

Ph.D. Applied Mathematics, Institute of Mathematics, Romanian Academy, Bucharest	1989
M.S. Applied Mathematics, Summa cum Laude, University of Bucharest	1982
B.S. Applied Mathematics, University of Bucharest	1982
Postgraduate: Management Development Program, Graduate School of Education, Harvard University	2005
Visiting Scholar, IMA, University of Minnesota	1990-1991

PROFESSIONAL EXPERIENCE

Permanent Positions:

Department Head and Professor, Department of Mathematical Sciences, WPI	2003-present
Professor, WPI, Department of Mathematical Sciences	2002-present
Associate Professor, WPI, Department of Mathematical Sciences	1997-2002
Director, Center for Industrial Mathematics and Statistics at WPI	1997-2003
Assistant Professor, WPI, Department of Mathematical Sciences	1991-1997
Researcher, Institute of Mathematics of the Romanian Academy	1982-1991

Visiting Positions:

Bitdefender Professor, Institute of Mathematics, Romanian Academy	6/2010, 5/2012
Visiting Professor, University of Rouen, France	5/2009
Visiting Professor, University of Metz, France	5/2007
Visiting Professor, University of Savoie, Chambéry, France	3-5/2002
Visiting Professor, University of Nancy, France	5/1999

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PROFESSIONAL EXPERIENCE (continued)	Visiting Scientist, MIT	1-5/1999
	Visiting Associate Professor, MIT	9-12/1998
	Visiting Professor, University of Metz, France	5/1996
	Visiting Scholar, IMA, University of Minnesota	9/1995
Honors and Awards	Honorary Member, Institute of Mathematics, Romanian Academy	2005-present
	President, National Professional Science Master's Association	2012
	Founding President, National Professional Science Master's Association	2007-2008
TEACHING ACTIVITIES	A. Undergraduate courses:	
	Calculus, Introduction to Analysis, Advanced Calculus, Classical Mechanics, Differential Equations, Partial Differential Equations, Boundary Value Problems, Applicable Complex Variables	
	B. Graduate courses:	
	Functional Analysis, Continuum Mechanics, Fluid Mechanics, Measure Theory, Boundary Value Problems, Complex Variables, Optimal Control and Design with Composites, Variational Methods and Applications to Continua	
	C. Curricular Development:	
	Developed the new Professional M.S. Degree in Industrial Mathematics at WPI.	2000
	Developed (with C.J. Larsen) the Introduction to Analysis course sequence at WPI.	1998
	Established and coordinated (with A. Heinricher) the first Research Experience for Undergraduates (REU) in Industrial Mathematics and Statistics in the US in 1998.	1998
	D. K-12 Outreach	
	Advanced Mathematics Program for Middle School Students, WPI	2010-2012
<i>Mathematics in Industry Institute for Teachers</i> , WPI	2002-2005	
E. Advisor for the COMAP "Mathematical Contest in Modeling"		
The teams were awarded 4 Meritorius awards, 1 Honorable Mention and 1 Successful Participant	1995-2001	

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RESEARCH ACTIVITIES

A. Research Areas of Interest

- Partial Differential Equations
- Homogenization
- Variational Calculus
- Multiscale Continuum Mechanics/ Porous Media/ Composites
- Free Boundary Problems

B. Doctoral Students Supervised

Florian Maris (2012)

Random Homogenization of the Stokes Flow through a Permeable Membrane.

Daniel Onofrei (2007)

New Results in the Multiscale Analysis on Perforated Domains and Applications.

C. Member of the Ph.D. Thesis Defense Committees

Bituin Cabarrubias, University of Rouen, France (advisor P. Donato, 2012)

Emily Evans, WPI, (advisor U. Mosco, 2011)

Rebecca Wasyk, WPI, (advisor U. Mosco, 2007)

Ani Velo, WPI, (advisor R. Lipton, 2000)

Gilmer Burgos, ME, WPI, (advisor A. Alexandrou, 1999)

Richard Martin, ME, WPI, (advisor M. W. Richman, 1997)

Rochdi Mohamed, University of Perpignan, France, (advisor M. Sofonea, 1993)

D. Master of Science Students Supervised

Owein Reese (2004)

Homogenization of Acoustic Wave Propagation in a Magnetorheological Fluid.

Daniel Onofrei (2003)

Asymptotic Analysis of a Spectral Problem Associated with the Neumann Strainer.

Jeffrey Perlak (1998)

Effective behavior of Electrorheological Fluids.

Dina Solitro (1995)

A Finite Element Analysis for an Air Cooling System (sponsored by Morgan Construction Co.).

Jean-Luc Hoffman (1992)

Network model for deep-bed filtration for molten aluminum (Pechiney – Centre de Recherches de Voreppe- France).

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RESEARCH ACTIVITIES (continued)

E. Senior Year Projects Supervised

Dante Amoroso, Nicholas LeCompte (2009)

Thin-film Ferrofluidics (co-advisor G. Iannacchione), Provost's MQP Award Honorable Mention.

Ethan Murphy (2002)

Numerical Methods for Neutral Coated Inclusions in Conductivity (co-advisor M. Sarkis).

Brian Ball (2002)

Finite Element Modeling of Heat Transfer in Porous Media (co-advisor C.J. Larsen, sponsored by DEKA Research and Development) Provost's MQP Award second place and CIMS Award.

Allison Bailey, Joseph Golec, Marc Natrillo (2001)

System Reliability and Optimal Cost Study.

Xialong Yu (1999)

Finite Element Simulations in Plasticity (sponsored by Morgan Construction Co.) Provost's MQP Honorable Mention and CIMS Award.

Stanislav Oks, William Montbleau, Forest Lee-Elkin (1997)

Mathematical Modeling in Metal Processing (sponsored by Morgan Construction Co.), Provost's MQP Award.

Adam Garland, Marcie Noyes, Jeffrey F. Perlak (1996)

Rod Path Geometry Study (sponsored by Morgan Construction Co.), Provost's MQP Award.

James Goss (1996)

Compressible Air Flow in a Cooling Chamber (sponsored by Morgan Construction Co.).

F. Industrial Activities

Co-founded the WPI **Center for Industrial Mathematics and Statistics** (CIMS) in 1997 and served as its first Director till 2003. The Center was designed as a means to integrate academic projects in mathematics and statistics with the corporate world. CIMS has provided a coherent format for developing over 120 industrial undergraduate, graduate and faculty projects with more than 50 corporate customers, and attracted significant funding from the National Science Foundation, the Sloan Foundation, the GE Foundation and the Society for Industrial and Applied Mathematics.

GRANTS and AWARDS

NSF, *Creating Tomorrow's Mathematics Professionals Workshop*, \$49,351 - (P.I.) 2011-2012

NSF, *Fractal Fibers and Singular Homogenization*, \$283,000 - (co-P.I.) 2011-2014

Alfred P. Sloan Foundation, *Professional Science Master's Alumni Network*, \$23,000 - (P.I.) 2009-2010

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GRANTS and AWARDS (continued)	NSF, <i>Transmission Problems and Large Surfaces</i> , \$198,807 - (co-P.I.).	2008-2011
	Institute for Mathematics and its Applications, <i>The MPI Workshop</i> , \$5,000 - (co-P.I.).	2008-2009
	NSF, <i>Mathematical Problems for Industry Workshop</i> , \$62,712 - (co-P.I.).	2008-2009
	Alfred P. Sloan Foundation, <i>The National Professional Science Master's Association; Implementation Grant</i> , \$500,000 - (P.I.).	2007-2009
	GE Foundation, <i>Mathematics in Industry Institute for Teachers</i> , \$100,000 - (P.I.).	2004-2005
	MIT Lincoln Labs, <i>Focal Plane Tracking Algorithm Development</i> , \$73,578 - (P.I.).	2004-2005
	MIT Lincoln Labs, <i>Focal Plane Tracking Algorithm Development</i> , \$74,726 - (P.I.).	2003-2004
	NSF, <i>Research Experience for Undergraduates (REU) in Industrial Mathematics and Statistics</i> , \$20,000 (P.I.).	2003
	GE Foundation, <i>Mathematics in Industry Institute for Teachers</i> , \$306,000 - (P.I.).	2001-2004
	NSF, <i>Research Experience for Teachers (RET) in Industrial Mathematics</i> , \$41,575 (P.I.).	2001-2002
	Alfred P. Sloan Foundation, <i>Professional Master Degree Programs in Sciences and Mathematics</i> , \$290,000 from Sloan and \$267,055 WPI cost sharing (P.I.).	2000-2003
	NSF, <i>Research Experience for Undergraduates (REU) in Industrial Mathematics and Statistics</i> , \$184,639 from NSF and \$50,428 WPI cost sharing (P.I.).	2001-2004
	CED, WPI, <i>Introduction to Analysis: an alternative to Calculus</i> , \$8,321 (co-P.I.).	2000
	NSF, <i>Research Experience for Teachers (RET) in Industrial Mathematics</i> , \$19,000 (P.I.).	2000-2001
	NSF, <i>Research Experience for Undergraduates (REU) in Industrial Mathematics and Statistics</i> , 1998-2001, \$150,000 (P.I.).	1998-2001
<i>Mathematical Methods in Materials Science</i> Program, Institute for Mathematics and its Applications, Minneapolis, 1 month support.	1995	

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PUBLICATIONS

Book

C. C. Mei and B. Vernescu, *Homogenization Method for Multi-scale Mechanics*, World Scientific Publishing Co., 2010.

Research Papers

P. Donato, S. Mardare and B. Vernescu, *Darcy Equations in an Infinite Strip: Do Limits Commute?*, to be submitted.

R. Bunoiu and B. Vernescu, *Non-Newtonian Effects for Suspensions with Threshold Slip*, *Applicable Analysis*, submitted.

M. Sarkis and B. Vernescu, *Neutrally Coated Inclusions as Free Boundary Problems*, *Advances in Mathematical Sciences and Applications*, in progress.

B. S. Tilley, B. Vernescu and J. Plummer, *Geometry-Driven Charge Accumulation in Electrokinetic Flows between Thin, Closely Spaced Laminates*, *SIAM J. Appl. Math.* **72**, 1 (2012) pp. 39-60.

F. Maris, B. Vernescu, *Effective leak conditions across a membrane*, *Complex Variables and Elliptic Equations*, 57, 2-4 (2012) pp. 437-453.

D. Onofrei, B. Vernescu, *Asymptotic analysis of second-order boundary layer correctors*, *Applicable Analysis* DOI:10.1080/00036811.2011.616498.

B. S. Tilley, B. Vernescu and J. Plummer, *Electrokinetically-driven flows in swelling porous media*, Proc. 16th National Congress of Theoretical and Applied Mechanics, USNCTAM 2010, June 27-July 2, State College, PA.

D. Onofrei and B. Vernescu, *Error Estimates for Periodic Homogenization with non-smooth coefficients*, *Asymptotic Analysis*, 54, (2007) 103-123.

D. Onofrei, B. Vernescu, *G-convergence Results for some Spectral Problems Associated to the Neumann Sieve and their Applications*, *Multi Scale Problems and Asymptotic Analysis*, eds. A. Damlamian et. al., GAKUTO International Series, Mathematical Sciences and Applications, vol. 24, (2005) 249-260.

I. Ionescu, D. Onofrei, B. Vernescu, *Γ -Convergence for a Fault Model with Slip-Weakening Friction and Periodic Barriers*, *Quarterly for Applied Mathematics*, LXIII, 4, (2005) 747-778.

D. Onofrei, B. Vernescu, *Asymptotics of a Spectral Problem Associated to the Neumann Sieve*, *Analysis and Applications*, 3, 1, (2005), 69-87.

B. Vernescu, *Multiple-scale Analysis of Electrorheological Fluids*, *International Journal of Modern Physics B*, 16, 17-18, (2002), 2643-2648.

J. Perlak and B. Vernescu, *The Effective Yield Stress in Electrorheological Fluids*, *Rev. Roum. Math. Pures et Appl.*, 45, 2, (2000), 287-299.

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**Research
Papers**
(continued)

- R. Lipton and B. Vernescu, *Bounds for Cell Wall Permeabilities*, IUTAM Symposium on Synthesis in Bio Solid Mechanics, eds. P. Pedersen and M. P. Bendsøe, Kluwer Academic Publishers, (1999) 401-406.
- B. Vernescu, *Size and Double-Layer Effects on the Macroscopic Behavior of Clays*, Recent Advances in Problems of Flow and Transport in Porous Media, eds. J. M. Crolet and M. E. Hatri, Kluwer, (1998) 45-58.
- D. Apelian, J. L. Hoffmann and B. Vernescu, *Deep Bed Filtration of Molten Metals*, Proc. International Conference and its Application in Science, Engineering and Industry.
- H. I. Ene and B. Vernescu, *On the Macroscopic Behaviour of Clays*, Mathematical Modelling of Flow through Porous Media, eds. Bourgeat, Carrasso, Luckhaus, Mikelic, World Scientific, (1995), 138-147.
- R. Lipton and B. Vernescu, *Variational Methods, Size Effects and Extremal Microgeometries for Elastic Composites with Imperfect Interface*, Mathematical Models and Methods in Appl. Sci. (M3AS), 5, (1995), 1139-1173.
- R. Lipton and B. Vernescu, *Critical Radius, Size Effects and Extremal Microgeometries for Composites with Imperfect Interface*, J. Appl. Physics, 9, (1996), 8964-8969.
- R. Lipton and B. Vernescu, *Two-phase Elastic Composites with Interfacial Slip*, Zeitschrift für Angewandte Mathematik und Mechanik, (ZAMM), 76, 2, (1996), 597.
- R. Lipton and B. Vernescu, *Composites with Imperfect Interface*, Royal Society of London Proceedings, 452, (1996), 329-358.
- H. I. Ene and B. Vernescu, *Viscosity Dependent Behaviour of Viscoelastic Porous Media, Asymptotic Theories for Plates and Shells*, eds. R. P. Gilbert and K. Hackl, Pitman Research Notes in Mathematics 319, (1995).
- R. Lipton and B. Vernescu, *Homogenization of Two-Phase Emulsions*, Proceedings of the Royal Society of Edinburgh, 124A (1994) 1119-1134.
- B. Vernescu, *Asymptotic Analysis for an Incompressible Fluid Flow in Fractured Porous Media*, Int. J. Engng. Sci. 28, 9, (1990), 959-964.
- B. Vernescu, *Viscoelastic behaviour of a Porous Medium With a Deformable Skeleton*, St. Cerc. Mat. 4, 5, (1989), 423-440.
- R. Stavre and B. Vernescu, *Free Boundary Properties in non-Homogeneous Media Fluid Flow*, Int. J. Engng. Sci. 27, 4, (1989), 399-409.
- I. R. Ionescu and B. Vernescu, *A Numerical Method for a Viscoplastic Problem. An Application to Wire Drawing*, Int. J. Engng. Sci. 26, 6, (1988), 627-633.
- R. Stavre and B. Vernescu, *The Free Boundary Problem for the Anisotropic Dam*, Arch. Mech. 40, (1988), 455-463.

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- Research Papers**
(continued)
- R. Stavre and B. Vernescu, *A Free Boundary Problem in Fluid Mechanics*, Proc. Conf. Diff. Eqs. Cluj-Napoca, (1985).
- I. R. Ionescu, I. Molnar, and B. Vernescu, *A Finite Element Model of Wire Drawing. Variational Formulation and Numerical Method*, Rev. Roum. Sci. Tech. Mech. Appl. 30, 6, (1985), 611-622.
- H. I. Ene and B. Vernescu, *Homogenization of a Singular Perturbation Problem*, Rev. Roum. Math. Pures et Appl., 30, 10, (1985), 815-822.
- R. Stavre and B. Vernescu, *Incompressible Fluid Flow through a non-Homogeneous and Anisotropic Dam*, Nonlinear Analysis TMA 9, 8, (1985), 799-810.
- B. Vernescu, *On the Convergence of Functionals' Minimum Points*, Rev. Roum. Math. Pures et Appl. 30, 8, (1985), 685-692.
- Education Papers**
- B. Vernescu, *The vertical Integration of industrial mathematics- the WPI experience*, Proceedings EIMI 2010, Lisbon, Portugal, April 19-23, A. Araujo, A. Fernandez, A. Azevedo and J. F. Rodrigues (eds).
- D. Berkey and B. Vernescu, *A Model for Vertical Integration of Real-World Problems in Mathematics*, Proceedings of the 2007 ASEE Annual Conference, 2007.
- A. C. Heinricher and B. Vernescu, *How Can Mathematics Help - Mathematicians at Work Today*, Pithagorean Review, Mu Alpha Theta on-line Journal, 2002.
- B. Vernescu and A. C. Heinricher, *Research Experience for Undergraduates in Industrial Mathematics and Statistics at WPI*, Proceedings of the Conference on Summer Undergraduate Mathematics Research Programs, AMS, Providence, Rhode Island, 2000, J. A. Gallian ed.
- Preprints**
- R. Lipton and B. Vernescu, *Composites with Imperfect Interface*, IMA preprint series #1298, (1995).
- R. Lipton and B. Vernescu, *Homogenization of Two-Phase Emulsions with Surface Tension Effects*, IMA preprint series #1139, (1993).
- H. I. Ene and B. Vernescu, *Viscosity Dependent Behaviour of Viscoelastic Porous Media*, IMA preprint series #878, (1991).
- B. Vernescu, *Convergence Results for the Homogenization of Flow in Fractured Porous Media*, IMA preprint series #732, (1990).
- B. Vernescu, *Homogenization of a Transmission Problem in Porous Media Flow*, INCREST preprint series no. 48, (1985).
- H. I. Ene and B. Vernescu, *Homogenization of a Singular Perturbation Problem*, INCREST preprint series no. 19, (1985).

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R. Stavre and B. Vernescu, *Incompressible Fluid Flow through a non-Homogeneous and Anisotropic Dam*, INCREST preprint series no. 1, (1984).

B. Vernescu, *Equations and Variational Inequalities in Domains with Granular Structure*, INCREST preprint series no. 21, (1983).

TALKS and PRESENTATIONS

A. Invited Presentations:

- 2011 *Error estimates for periodic homogenization with non-smooth coefficients*, Workshop on *Homogenization and Multi Scale Analysis*, Joint between INS and ISFMA, Fudan University, Shanghai, China, October 3-7.
- Plenary Talk: *The influence of threshold slip and leak boundary conditions on viscous fluids*, 7th Congress of Romanian Mathematicians, Brasov, Romania, June 29-July 5.
- 2010 *Error estimates in periodic homogenization with non-smooth coefficients*, Workshop on *Asymptotic Analysis and Statistics Methods for Heterogeneous Media*, Alba Iulia, Romania, June 9-13.
- Surface effects in composite materials*, Institute of Mathematics of the Romanian Academy, June 2.
- From Stokes to Darcy in infinite cylinders: do limits commute?*, Homogenization Seminar, Institute of Mathematics of the Romanian Academy, June 1.
- 2009 Invited Presentation, Perspectives in PDEs in honor of Umberto Mosco Program, Rome, Italy, June 24-26, *Surface effects in composites*.
- Heterogeneous Materials with Slip*, Homogenization and Multiple Scale Seminar, University of Paris VI, June 8.
- Homogenization for Heterogeneous Materials*, Colloquium, University of Rouen, France, June 18.
- 2007 Invited Presentation, International Conference on Free Boundary Problems, Chiba, Japan, November 26-30, *Neutral Coated Inclusions as Free Boundary Problems*.
- Two-scale Modeling of Porous Media with Applications to Clays*, IUTAM Symposium on Swelling and Shrinking of Porous Materials, Petropolis, Brazil, August 6-10.
- Error estimates for periodic homogenization with non-smooth coefficients*, Homogenization and Multiple Scales Seminar, Laboratoire J. L. Lions, University of Paris VI, June 11.
- Error estimates for periodic homogenization with non-smooth coefficients*, Colloquium, University of Metz, June 21, 2007.
- 2002 Invited Presentation, Colloquium of the Center for Dynamical Systems and Nonlinear Studies, Georgia Institute of Technology, January 14.

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TALKS and PRESENTATIONS

(continued)

- 2001 Invited Presentation, Colloquium of the Aerospace Engineering, Mechanics and Engineering Science Department, University of Florida, Gainesville, October 5, 2001: *Variational Methods, Size Effects and Extremal Microgeometries for Composites with Imperfect Interfaces.*
- Invited Plenary Lecture at the International Conference on Homogenization and Applications to Material Sciences, Timisoara, Romania, September 15-19, 2001: *Highly oscillating interparticle forces and the constitutive behavior of suspensions.*
- Invited Minisymposium presentation, SIAM Conference on Mathematical and Computational Issues in Geosciences, Boulder, June 2001: *Multiple-scale Analysis of Electrorheological Fluids.*
- 2000 Invited Seminar Lecture, Penn State University, October, 2000: *Multiple-scale Analysis of Electrorheological Fluids.*
- Invited Lecture at the International Conference on Homogenization and Materials Sciences, University of Akron, September 15-17: *Multiple Scale Analysis of Electrorheological Fluids.*
- Invited Lecture at the Second International Conference on Computer Methods for Engineering in Porous Media, University France-Comte, Besancon, France, July, 2000: *Multi-scale Modeling of Flow in Clays.*
- Invited Lecture at the PDE Seminar, University of Connecticut, May, 2000: *Modeling Electrorheological Fluids.*
- 1998 Invited Lecture at the Mathematics Seminar, Northeastern University, March 4, 1998: *Modelling Electrorheological Fluids.*
- 1997 Invited Lecture in the Partial Differential Equations Seminar, Université de Nice, France, January, 1997: *Effective Properties for Composites with Imperfect Interface.*
- Invited Lecture at the International Society for Analysis, its Applications and Computations, ISAAC'97 Congress, University of Delaware, June 2-6, 1997: *Effective Properties of Fluid Emulsions.*
- 1996 Invited Lecture in the Partial Differential Equations Seminar, Université de Savoie, France, May 14, 1996: *Effective Properties for Composites with Imperfect Interface.*
- Invited Lecture in the Asymptotic Analysis Seminar, Université de Metz, France, May 9, 1996: *Matériaux Composites avec Discontinuités aux Interfaces, ou comment cacher des diamants.*
- Invited Lecture in the Porous Media Conference, Oberwolfach, Germany, February 26-29: *Effects of Ion Convection on the Effective Behavior of Clays.*
- 1993 Invited Lecture in the Seminar on Homogenization, Université Jean Monnet de Saint Etienne, France, October 5, 1993: *Asymptotic Analysis of an Incompressible Flow in Fractured Porous Media.*

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TALKS and PRESENTATIONS

(continued)

- 1993 Invited Lecture in the Numerical Analysis Seminar Université Claude Bernard and Ecole Normale Supérieure de Lyon, Lyon, France, October 5, 1993: *Two Phase Emulsions with Surface Tensions: a Homogenization Modeling.*
- 1990 Invited Lecture, Politecnico di Milano, Italy: *Convergence of the homogenization process in fractured porous media.*
- Invited Lecture, Stanford University, Dept. of Chemical Engineering: *Homogenization results in porous media.*
- Invited Lecture, Worcester Polytechnic Institute: *Free boundary problems in porous media.*
- B. Other Presentations:**
- 2006 French-Romanian Colloquium of Applied Mathematics, Chambéry, France, August 28 - September 1: *Asymptotics of a Spectral Problem Associated with the Neumann Sieve.*
- SIAM Conference on Analysis of Partial Differential Equations, Boston, July 10-12: *Asymptotics of a Spectral Problem Associated with the Neumann Sieve.*
- 2004 Multi Scale Problems and Asymptotic Analysis, Narvik University College, Norway, June 22-26: *Asymptotic Analysis of a Fault under Slip-Weakening Friction with Periodic Barriers.*
- 2003 Applied Mathematics and Applications of Mathematics (AMAM), Nice, France, February 10-13: *Modeling of Effective Properties for Electrorheological Fluids.*
- New Trends in Continuum Mechanics, Constanta, Romania, September 8-12: *Effective Properties and Waves in Electrorheological and Magnetorheological Fluids.*
- 2000 French-Romanian Colloquium of Applied Mathematics, Constanta, Romania, September: *Macroscopic Behavior of Electrorheological Fluids.*
- Computer Methods for Engineering in Porous Media Flow and Transport, Besançon, France, July: *Multi-scale Modeling of Flow in Clays.*
- 1998 AMS Meeting, University State College, Pennsylvania, October: *Interfacial Effects in Electrorheological Fluids.*
- 1997 SIAM Conference on Mathematical Aspects of Material Science, Philadelphia, May: *Size Effects for Particle Reinforced Imperfectly Bonded Elastic Composites.*
- 1996 International Conference on Porous Media and their Applications in Science, Engineering and Industry, Hawaii, June 16-21 : *Deep Bed Filtration of Molten Metal.*
- International Workshop on Optimization of Nonlinear Systems and of Free Boundaries, Constanta, Romania, July 29 - August 3: *Variational Characterization for the Effective Conductivity of Composites with Imperfect Interface.*

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TALKS and PRESENTATIONS

(continued)

- 1996 Recent Advances in Problems of Flow and Transport in Porous Media, Marrakech, Morocco, June 9-12: *Size and Double Layer Effects on the Macroscopic Behavior of Clays.*
- The Second World Congress of Nonlinear Analysis, Athens, Greece, July 10-17: *Estimates for the Effective Yield Strength for Composites with Rigid-Plastic Interfaces.*
- International Conference on Porous Media and their Applications in Science, Engineering and Industry, Hawaii, June 16-21 *Two-scale Modeling of Clays.*
- 1995 International Congress for Industrial and Applied Mathematics, ICIAM'95, Hamburg, Germany, July 3-7: *Two-Phase Conductors with Imperfect Interface.*
- International Conference on Mathematical Modeling of Flow through Porous Media, Saint Etienne, France, May 22-26: *On the Macroscopic Behavior of Clays.*
- 1994 19-th Annual Congress, American Romanian Academy of Arts and Sciences, Northampton, MA, November 3 - 6, 1994: *Results in the Modeling of Two Fluid Emulsions.*
- Conference on Materials Sciences, Pittsburgh, April 18-20, 1994: *Homogenization of Two Phase Emulsions with Surface Tension Effects.*
- 1992 29th Annual Technical Meeting of the SES, U.C. San Diego: *Homogenization of immiscible suspensions of two fluids with surface tensions.*
- 1991 PDE Seminar, IMA, University of Minnesota: *Viscosity dependent behavior of deformable porous media.*
- 1990 Nonlinear Equations, Padova, Italy: *Convergence of the homogenization process in fractured porous media.*
- PDE Seminar, IMA, University of Minnesota: *Homogenization of flow in fractured porous media.*
- 43rd Annual Meeting of the APS Division of Fluid Dynamics, Cornell University: *Flow in fractured porous media.*
- 1988 Workshop on Partial Differential Equations and Control, Cluj, Romania: *The homogenization method in the study of flow through deformable porous media.*
- Fluid Mechanics Colloquium, Oradea, Romania: *Flow in deformable porous media.*
- 1987 XVIII Symposium in Fluid Mechanics, Poland.
- Fluid Mechanics Colloquium, Suceava, Romania: *A numerical method for the porous media flow in the presence of a channel.*
- 1986 Fluid Mechanics Colloquium, Sibiu, Romania: *Numerical results in a free boundary flow problem in porous media.*

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TALKS and PRESENTATIONS

(continued)

- 1985 EQUADIFF 6, Brno, Czechoslovakia: *Homogenization of a transmission problem in porous media flow.*
- XVII Symposium in Fluid Mechanics, Poland: *Incompressible fluid flow through a non-homogeneous and anisotropic dam.*
- VI-th National Colloquium on Filtration Theory, Cimpina, Romania: *On the uniqueness of free boundary flows in porous media.*
- 1984 Fluid Mechanics Colloquium, Iasi, Romania: *On Darcy's law for fractured porous media.*
- National Colloquium on Inequalities, Sibiu, Romania: *A class of variational inequalities in the study of flow in porous media.*
- 1983 V-th National Colloquium on Filtration Theory, Cimpina, Romania: *On the flow laws in high permeability porous media.*
- Fluid Mechanics Colloquium, Ploiesti, Romania: *Flow of an incompressible fluid against a porous wall.*
- The VII-th Conference on Solid Mechanics, Petrosani, Romania: *A variational approach to wire drawing.*
- EUROMECH 175 "Viscoplasticity and Applications", Bucharest, Romania: *A variational formulation of a stationary boundary value problem with friction for the Bingham fluid. Numerical approach.*
- 1982 Workshop dedicated to Acad. C. Iacob, University of Bucharest, Romania: *Weak solutions in filtration problems.*
- 1981 Fluid Mechanics Colloquium, Brasov, Romania: *On the uniqueness of flow in fractured porous media.*

C. Invited Presentations on Industrial Mathematics

- 2004 Invited Panel Presentation, American Mathematical Society, Committee on Education, October 22-23, *Issues and Challenges in Undergraduate Mathematics Education.*
- 2002 *A Model for Vertical Integration of Real-world Problems in Mathematics*, ASEE Annual Conference, Hawaii, June 24-27.
- Invited Presentation, University of Tennessee, Chattanooga, March 6, 2002: *A Vertically Integrated Industrial Mathematics Program at WPI.*
- Invited Presentation, Intermountain/Southwest Conference on Industrial and Interdisciplinary Mathematics, Utah State University, March 1-2, 2002: *A Vertically Integrated Industrial Mathematics Program at WPI.*

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TALKS and PRESENTATIONS

(continued)

- 2001 Invited Presentation at the Southeast Regional SIAM Mathematics in Industry Workshop, U. of Houston, Houston, April 27-29, 2001: *How to Maintain an Industrial Mathematics Program*.
- Presentation at the NCSSMST 14th Annual Professional Conference, WPI, March 29-31, 2001: *Industrial Mathematics: Can you make it real?*
- 1999 Invited Presentation at the Southwest Regional SIAM Mathematics in Industry Workshop, Claremont, June 16-19, 1999: *What We Have Learned from Running Industrial Projects at WPI*.
- 1998 Invited Panel Presentation at the Northeast Section of the MAA Meeting, Western Connecticut State University, November, 1998 : *Undergraduate programs that link students to industrial/applied problems*.
- Invited Presentation at the Northeast Regional SIAM Mathematics in Industry Workshop, WPI, May 18-20, 1998.
- Invited Panel Presentation at the Industrial Mathematics Workshop, Northeastern, April 3-6, 1998.
- 1997 Invited Presentation at the Industrial Projects in Undergraduate Education Minisymposium, SIAM Annual Meeting, Stanford, July 14-18, 1997: *Undergraduate Industrial Project Experience at WPI*.

D. Invited Presentations on Professional Science Master's

- 2012 MAA Panel on Graduate School: Choosing One, Getting In, and Staying In. Joint Mathematics Meetings, Boston, MA, January 5, 2012.
- 2011 NPSMA Best Practices Workshop, Baltimore, February 25.
- AMS Panel on Graduate Education, Joint Mathematics Meeting, New Orleans, LA, January.
- 2010 SUNY University at Buffalo, April 9, Buffalo, NY: *The NPSMA and the Professional Science Master's in Mathematics*.
- Fordham University, May 6, Bronx, NY: *The NPSMA and the Professional Science Master's in Mathematics*.
- University of Massachusetts PSM Planning Meeting, January, Lowell, MA: *Professional Science Master's in Mathematics*.
- Panelist at the Focus Group for directors of graduate studies, AMS-MAA-SIAM Joint Mathematics Meetings, San Francisco, January 13.
- 2009 Annual Meeting Council of Graduate Schools (CGS), April, *The National Professional Science Master's Association*.

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TALKS and PRESENTATIONS

(continued)

- 2009 Northern Association of Graduate Schools (NAGS) Annual Meeting, Delaware, April, *The National Professional Science Master's Association*.
- 2008 NPSMA Inaugural Annual Meeting, November, *The National Professional Science Master's Association*.
- Midwestern Association of Graduate Schools (MAGS) Annual Meeting, *The National Professional Science Master's Association*.
- Annual Meeting CGS, April, *The National Professional Science Master's Association*.
- Western Association of Graduate Schools (WAGS) Annual Meeting, April, *The National Professional Science Master's Association*.
- 2007 American Mathematical Society, Committee on Education, October 25-27, *The National Professional Science Master's Association*.
- Council of Graduate Schools (CGS) PMA Deans and Program Directors Meeting, August 12-13, Boulder, Colorado: *Update on the National Professional Science Master's Association*.
- National Research Council (NRC), *Professional Science Master's Programs at WPI*, National Academies, July 14, Washington DC.

PROFESSIONAL SOCIETY MEMBERSHIP

American Mathematical Society (AMS)

Society for Industrial and Applied Mathematics (SIAM)

American Society for Engineering Education (ASEE)

National Professional Science Master's Association (NPSMA) (President 2007-2008, 2012)

PROFESSIONAL ACTIVITIES

A. Board Memberships

Member of the Board of Directors, National Professional Science Master's Association, 2007-2013.

Member of the Council of Graduate Schools (CGS), PSM Advisory Board, 2007-2010.

Member, Participating Institution Council, Institute of Mathematics and its Applications (IMA), University of Minnesota, 2007-2013.

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PROFESSIONAL ACTIVITIES

(continued)

Member of the National Steering Committee to form an association for Professional Science Masters' Programs, 2006.

Member of the Board for the project , *Making Mathematics*, Education Development Center, (EDC) Inc., Newton MA, 1999.

B. Assessment/Evaluation Panel Memberships

Evaluator for the graduate program in Applied Mathematics at SUNY Institute of Technology, Utica, NY, January 2012.

Member of the Mathematics Panel of Experts for the Romanian Research Assessment Exercise, Executive Agency for Higher Education Research Development and Innovation, 2011.

Evaluator for the PSM programs, Minnesota State Colleges and Universities, December 2011.

Chair of Review Panel, proposals for the Institute of Mathematics and its Applications (IMA) Participating Institutions Conference Program, January 2011.

Reviewer for the Alfred P. Sloan Foundation, 2009.

Evaluator for the graduate program in Financial Mathematics at Monmouth University, West Long Branch, NJ, 2008.

Member of NSF site-visit panel for funding of the Institute for Mathematics and its Applications, University of Minnesota, 2004.

C. Conferences and Minisymposia Organizer

2012 AMS Special Session: *Local Field Properties, Microstructure, and Multiscale Modeling of Heterogeneous Media I & II*, Joint Mathematics Meetings, Boston, MA, January 4-7.

2011 NPSMA Best Practices Workshop: *Creating Tomorrow's Mathematics Professionals*, Niagara Falls, NY, October 13-15.

Mechanics and Applied Mathematics Section, 7th Congress of Romanian Mathematicians, Brasov, Romania, June 29 - July 5.

2010 Recent Topics in the Applied Mathematics Research Workshop, September 22-23, Bucharest, Romania.

The Romanian Educational Network (RoEduNet) 9-th International Conference in Sibiu, Romania. 24-26 June, 2010. ARNIEC/RoEduNet Agency, IEEE Romanian Section.

Workshop on Asymptotic Analysis and Statistics Methods for Heterogeneous Media, Alba Iulia, Romania, June 9-13, 2010.

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PROFESSIONAL

ACTIVITIES

(continued)

- 2009 Eastern Sectional AMS Meeting, WPI, April 25-26.
AMS Special Session: *Scaling, Irregularities, and Partial Differential Equations*, Eastern Sectional AMS Meeting, WPI, April 25-26.
- 2007 Minisymposium: *Multiscale Phenomena in Material Sciences*, SIAM Conference on Analysis of Partial Differential Equations, Phoenix, December 10-12.
SIAM Conference on Mathematics for Industry: Challenges and Frontiers, Member of the Organizing Committee, October 24-26.
- 2006 Minisymposium: *Asymptotic Methods*, French-Romanian Colloquium of Applied Mathematics, Chambéry, France, August 28 - September 1.
- 2006 Minisymposium, *Fractals, Homogenization and PDEs*, SIAM Conference on Analysis of Partial Differential Equations, Boston, July 10-12.
Workshop *New Trends in Material Design of Complex Systems in Space and Time*, in the honor of Konstantin Lurie's 70th birthday, Chair of the Organizing Committee, November 2005.
- 2005 Fourth Biennial Meeting, Integrating Science with Business: *The PSM in the 21st Century Workforce*, Session on Mathematical and Computational Sciences, Washington, DC, October 5-7.
- 2004 MAA Northeastern Fall Sectional Meeting, Member of the Organizing Committee, WPI, November 19-20.
- 2003 Workshop *Perspectives on Nonlinear Equations and Optimization*, in the honor of Homer Walker's 60th birthday, Chair of the Organizing Committee, WPI, September.
Minisymposium *Mathematical Modeling of Electrorheological Fluids*, Applied Mathematics and Applications of Mathematics (AMAM), Nice, France, February 10-13, 2003.
SIAM Mathematics for Industry: *Challenges and Frontiers* Conference, June 2003, Fields Institute, Toronto, Canada. Member of the Organizing Committee.
- 2002 Mathematics in Industry Summer Institute for Teachers, WPI, June, 2002, 2003, 2004, 2005.
- 2000 Mathematics in Industry Workshop for Teachers, WPI, June 26 - 30, 2000.
- 1998 SIAM Northeast Regional Mathematics in Industry Workshop, WPI, May 18 - 20, 1998 (co-chair).
- 1995 International Congress for Industrial and Applied Mathematics, ICIAM'95, Chair for the *Viscoelasticity and Plasticity* session, Hamburg, Germany, July 3-7.

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PROFESSIONAL ACTIVITIES

(continued)

D. Academic Appointments and Activities

Member, Committee on Governance, WPI, 2010-2012.

Chair, Search Committee for the WPI Founding Dean of Arts and Sciences, 2009-2010.

Elected Member, University Council, WPI, 2008-2010.

Chair, Search Committee for the Associate Dean for the First-Year, WPI, 2006.

Member, Search Committee for the Biology and Biotechnology Department Head, WPI, 2003.

Strategic Planning Committee, Massachusetts Academy of Math and Sciences, 1995-1997.