Curriculum Vitae

Graeme Milton   Birthdate: December 1956
Distinguished Professor of Mathematics   Birthplace: Sydney, Australia
                                                  Citizenship: USA and Australian

Degrees

D.Sc.   2003,   Sydney University
Thesis title: The Theory of Composites

Ph.D.   1985,   Cornell University
Thesis title: Some Exotic Models in Statistical Physics.
Adviser: Professor M.E. Fisher.

M.Sc.   1982,   Sydney University
Thesis title: Bounds on the Macroscopic Properties of Composite Materials.
Adviser: Dr. G.H. Derrick and Dr. R.C. McPhedran.

B.Sc.   1980,   Sydney University
               (in Physics with First Class Honors)

Academic and Professional Honors:

2016   Ordway Distinguished Visitor, University of Minnesota Mathematics Department

2015   International prize Tullio Levi-Civita for the Mathematical and Mechanical Sciences.

2015-2018 3 year KAIST Mathematics Research Station Chair Professorship, Korea, up to three months per year. This is a new honor, and in its short history, I am only one of three mathematicians worldwide to be chosen for it (the other two being Bernt Sturmfels, and Mladen Bestvina).

2012   Top Referee for the Proceedings of the Royal Society A for 2012

2012-now President ETOPIM Association

2012   ETOPIM Association Rolf Landauer Medal (first competitive award, jointly with David Bergman) now awarded once every 3 years "for excellence in the field of composite science"

2011   Top Referee for the Proceedings of the Royal Society A for 2011

2010   Top Referee for the Proceedings of the Royal Society A for 2010

2010   Eisenbud Professor at the Mathematical Sciences Research Institute

2009 Inaugural Fellow Society for Industrial and Applied Mathematics (SIAM) "For contributions to the modeling and analysis of composite materials"

2009   Issue of Mechanics of Materials in my honor, Volume 41, Issue 4.

2007 Society for Engineering Science Prager Medal for contributions to theoretical mechanics (awarded to at most one person per year since 1983) "In recognition of his groundbreaking mathematical analyses of heterogeneous media. Milton has made outstanding contributions to the theory of composites materials that have significantly advanced understanding in many disciplines including solid mechanics and electromagnetism".

2003-2006 Editorial Board, Journal of Asymptotic Analysis

2003   SIAM Ralph E. Kleinman Prize for research bridging the gap between mathematics and applications (awarded to only one person every two years since 1999) "For his many deep contributions to the modeling and analysis of composite materials. His accomplishments include new examples of composites with exactly computable properties, new methods for bounding effective moduli, and new links between the analysis of composites, the calculus of variations, and partial differential equations. His scientific vision–mathematically deep yet physically very concrete–has revolutionized the subject."

2003   Invited Lecturer, 20th Anniversary of the Institute for Mathematics and its Applications

1999-2004 Editorial Board, Archive for Rational Mechanics and Analysis. Note: The Archive for Rational Mechanics and Analysis, is ranked 14th amongst all (pure and applied) mathematics journals according to the website "http://www.hse.ru/data/2014/04/29/1322744295/Mathematics%20(miscellaneous).pdf"

1998 Invited Lecture, International Congress of Mathematicians (this is a prestigous honor, more usually given to pure mathematicians.)

1996 Invited Sectional Lecture, International Congress of Theoretical and Applied Mechanics

1988-93 Packard Fellowship for Science and Engineering: This was a unrestricted research fellowship for $500,000 over 5 years, awarded in that year across all fields of engineering and science to only 20 individuals in the US. I was the first mathematician, and only mathematician to receive it in the first two years. In the entire history of the fellowship (27 years) it has only been awarded to 26 mathematicians.

1988   Sloan Research Fellowship (Awarded to only 20 US mathematicians in 1988)

1984-86   California Institute of Technology, Weingart Research Fellowship

Sydney University Travelling Scholarship for Graduate Study 1980

Sydney University Medal in Physics

1979   Australian Institute of Physics, N.S.W. Branch Prize in Physics

Special Lectures, in addition to Plenary and Keynote Lectures

2016   Midwest Mechanics Seminar Speaker, chosen by a vote of the faculty from 10 midwest Universities, which are visited in two tours, each of five days.

2012   Distinguished Visitor Program, University of California at Irvine

2011   Harold L.Gay Lecture, Worcester Polytechnic Institute.

2010   MSRI-Evans Lecture, University of California at Berkeley

2010   Frontiers of Science Public Lecture, University of Utah

2008   The 3rd MinnHokee Lecture, Seoul National University, Korea

Professional Positions:

1999-present   Distinguished Professor, The University of Utah

2002-2005   Chair Mathematics Department, The University of Utah

1994-1999   Full Professor, The University of Utah

1994-1996 Full Professor, Courant Institute of Mathematical Sciences: Note, the Courant Institute at New York University is widely considered to be the best university in the US for applied mathematics (see, e.g. the US news graduate school rankings http://grad-schools.usnews.rankingsandreviews.com/best-graduate-schools/top-science-schools/applied-mathematics-rankings). I moved from the Courant Institute to the University of Utah, because of the outdoor opportunities it presented (I am a keen skier, hiker, road cyclist, mountain biker, and swimmer) : at the time of my move I was also offered a full professorship at Caltech (ranked third in the US in applied mathematics according the US news graduate rankings).

1989-1994 Associate Professor, Courant Institute of Mathematical Sciences 1987-

1989 Assistant Professor, Courant Institute of Mathematical Sciences 1984-1986

Weingart Postdoctoral Fellow, California Institute of Technology

Citation Statistics:

According to Google Scholar I have about 11,000 citations to my work (4,675 since 2011) with an h-index of 51.

Funding:

My research has been continuously funded since 1988. My last two grants follow, and on both of these (as usual) I am the single principal investigator:

Sponsor: National Science Foundation, DMS-1211359
Title: METAMATERIALS AND INVERSE PROBLEMS
Period: 07/01/12 - 06/30/17
Total Budget: $861,803

Sponsor: National Science Foundation, DMS-0707978
Title: MATHEMATICS OF METAMATERIALS
Period: 08/15/07 - 07/31/12
Total Budget: $730,893

Research Interests:

Basic or applied research in composite materials, statistical mechanics, electromagnetism, applied mathematics, condensed matter physics, inverse problems, cloaking theory, networks and realizability, minimization variational principles for wave equations and for problems with non self-adjoint opertators, and related areas.

Selected Invited Lectures at Workshops and Conferences:

1. Conference on the Macroscopic Properties of Disordered Media, Courant Institute of Mathematical Sciences, New York University, New York, U.S.A., June 1981.

2. 18th International Thermal Conductivity Conference, Rapid City, South Dakota, U.S.A., October 1983.

3. International Symposium on the Physics and Chemistry of Porous Media, Schlumberger-Doll Research, Ridgefield, Connecticut, U.S.A., October 1983.

4. Workshop on homogenization and effective moduli of materials and media, Institute for Mathematics and its Application, University of Minnesota, Minneapolis, Minnesota, U.S.A., October 1984.

5. International Symposium on the Multiple Scattering of Waves in Random Media and Random Rough Surfaces, The Pennsylvania State University, University State Park, Pennsylvania, U.S.A., July 1985.

6. Workshop on cross-disciplinary research in multiphase flow, Leesburg, Virginia, June 1986.

7. Symposium on non-classical continuum mechanics: abstract techniques and applications, University of Durham, Durham, England, July 1986.

8. Special session on non-linear partial differential equations at the American Mathematical Society annual meeting, San Antonio, Texas, January 1987.

9. Workshop on the Mathematical Analysis of Material Microstructure, Cornell University, Ithaca, New York, June 1988.

10. AMS-SIAM Summer Seminar on the Mathematics of Random Media, Virginia Tech, Blacksburg, Virginia, May 1989. 6th Symposium on Continuum Models and Discrete Systems, Dijon, France, June 1989.

11. Venice-1, Symposium on applied and industrial mathematics, Venice, Italy, October 1989.

12. Workshop on composite media and homogenization theory, International Center for Theoretical Physics, Trieste, Italy, January 1990.

13. Materials Research Society Spring Meeting, Symposium on Physical Phenomena in Granular Materials, San Francisco, April 1990.

14. Berkeley Mathematical Sciences Research Institute, Workshop on Partial Differential Equations and Continuum Mechanics, Berkeley, January 1991.

15. Congres National d'Analysis Numerique, Royan, France, May 1991.

16. Euromech Colloquium on the Microstructure and Effective Properties of Random Particulate Solids, Schumen, Bulgaria, June 1991.

17. Adriatico Research Conference on the Physics of Inhomogeneous Materials, International Center for Theoretical Physics, Trieste, Italy, June 1991.

18. Advanced Seminar on Applied Mathematics, Summer School, Venice, Italy, June 1991.

19. Workshop on Micromechanics, Leesburg Virginia, October 1991.

20. American Mathematical Society, Special Session on Effective Properties of Inhomogeneous Materials, Salt Lake City, April 1993.

21. Joint ASCE-ASME-SES meeting, Symposia on Homogenization and Constitutive Modeling for Heterogeneous Media and on Micromechanics of Random Media, Charlottesville, June 1993

22. Third International Conference on Electromagnetic, Transport and Optical Properties of Inhomogeneous Media (ETOPIM 3), Mexico, August 1993.

23. International Center for Theoretical Physics, Workshop on Composite Media and Homogenization, Italy, September 1993.

24. ASME Winter Annual Meeting, Symposium on Micromechanics of Composites, New Orleans, November 1993.

25. SIAM Meeting on Mathematics and Computation in the Materials Sciences, Pittsburgh, April 1994 (Plenary speaker).

26. Eurohomogenization Meeting, Nice, France, June 1995.

27. Workshop on Analytical Approaches in Continuum Mechanics, Bath, England, June 1995.

28. ASM/TMS Materials Week, Cleveland, October 1995.

29. 19th International Congress of Theoretical and Applied Mechanics (Invited sectional lecture), Kyoto, Japan, August 1996.

30. IUTAM Symposium on Transformation Problems in Composite and Active Materials, Cairo, Egypt, March, 1997.

31. Joint ASME/ASCE/SES Summer Meeting, Northwestern University, Evanston, June 1997.

32. Conference on Variational Problems and Mathematical Phenomena, Keio University, Japan, September 1997

33. 9th International Symposium on Continuum Models and Discrete Systems, Istanbul, Turkey, June 1998.

34. Progress in Electromagnetics Research Symposium, Nantes, France, July 1998.

35. International Congress of Mathematicians (Invited lecture on applications) Berlin, Germany, August 1998.

36. International Union of Theoretical and Applied Mechanics Symposium on Mechanical and Electromagnetic Waves in Structured Media (Keynote speaker) Sydney, Australia, January 1999.

37. Workshop on Nonlinear Partial Differential Equations and Applications to Materials, Institute for Mathematics and its Applications, Minnesota, April 1999.

38. 20th Annual meeting of the Canadian applied and industrial mathematics society (Plenary lecture) Québec, Canada, June 1999.

39. Fifth International Conference on the Electrical Transport and Optical Properties of Inhomogeneous Media, Hong Kong, June 1999.

40. Fourth International Congress on Industrial and Applied Mathematics, Edinburgh, Scotland, July 1999.

41. International Conference on Homogenization and Materials Science, Akron, Ohio, September 2000 (Also member of discussion panel).

42. Sixth National (Greek) Congress of Mechanics, Thessaloniki, Greece, July 2001.

43. Session on Materials by Design, Plasticity 2002, Aruba, January 2002.

44. IUTAM symposium, Micromechanics of Fluid Suspensions and Solid Composites, University of Texas at Austin, April 2002

45. Session on Some Mathematics around Composites, First Joint International Meeting of the American Mathematical Society and the Unione Matematica Italiane, Pisa, Italy, June 2002.

46. Conference on Quasiconvexity and its Applications, on the 50th anniversary of C. B. Morrey's landmark paper, Princeton University, Princeton, New Jersey, November 2002

47. SIAM Minisymposium on Dynamical Systems at the Joint Mathematics Meeting, Baltimore, Maryland, January 2003

48. 20th Anniversary of the Institute for Mathematics and its Applications, University of Minnesota, Minnesota, June 2003

49. Minisymposium on Homogenization and Material Science, 5th International Congress on Industrial and Applied Mathematics, Sydney, Australia, July 2003

50. Special Session on PDE and Applications, Joint India-AMS Mathematics Meeting, Bangalore, India, December 2003

51. International Workshop on Nonlinear Waves, Hong Kong, June 2004

52. Third Department of Energy workshop on multiscale mathematics, Portland, Oregon, September 2004

53. Symposium on Active Materials, 41st Annual Technical Meeting of the Society of Engineering Science, Lincoln, Nebraska, October 2004 (Keynote lecture).

54. Computational Fuel Cell Dynamics-III, Banff International Research Station, Banff, Canada, March 2005

55. 57th British Mathematics Colloquium and 47th British Applied Mathematics Colloquium Liverpool, England, April 2005 (Plenary speaker)

56. Conference on Mathematical Modeling of Novel Optical Materials and Devices, Snowbird, Utah, June 2005

57. Workshop on Inverse Problems, Multi-scale Analysis and Homogenization, Seoul National University, Seoul, Korea, June 2005

58. Conference on Multi-scale problems: modelling, analysis and applications, University of Bath, September 2005.

59. 38th Congress National d'Analysis Numèrique, Guidel, France, May 2006 (Plenary speaker)

60. Seventh International Conference on the Electrical Transport and Optical Properties of Inhomogeneous Media, Sydney, Australia, July 2006 (Plenary speaker)

61. SPIE Optics and Photonics Meeting, San Diego, August 2006.

62. 1st European Topical Meeting on Nanophotonics and Metamaterials, Seefeld, Austria, January 2007.

63. Quantum Electronics and Laser Science Conference, Baltimore, Maryland, May 2007.

64. Photonic Metamaterials from Random to Periodic, Jackson Hole, Wyoming, June 2007.

65. Des équations aux dérivées partielles au calcul scientifique (Congress in honor of Luc Tartar), Paris, France, July 2007.

66. 44th Annual Technical Meeting, Society of Engineering Science, College Station, Texas, October 2007 (Plenary speaker).

67. 20th Congress of Differential Equations and Applications, and 10th Congress of Applied Mathematics, Sevilla, Spain, September 2007

68. Workshop on Mathematics of Multi-Scale Problems, Hong Kong, December 2007 (Plenary speaker)

69. Physics of Quantum Electronics, Snowbird, Utah, January 2008

70. International Conference on Applied Mathematics: Modeling, Analysis and Computation, Hong Kong, June 2008 (Plenary speaker)

71. Disorder and Composite Media (Conference in honor of David Bergman) Tel Aviv, Israel, June 2008.

72. Imaging Microstructures: Mathematical and Computational Challenges, Paris, France, June 2008.

73. SPIE Conference on Metamaterials: Fundamentals and Applications, San Diego, August 2008.

74. 2nd International Conference on Auxetics, Bristol, United Kingdom, September 2008 (Keynote speaker)

75. IUTAM Symposium on Variational Concepts with Application to the Mechanics of Materials, Bochum, Germany, September 2008.

76. CSCAMM workshop on Electromagnetic Materials and Their Approximations: Practical and Theoretical Aspects, Maryland, September 2008.

77. Eighth International Conference on Electrical, Transport and Optical Properties of Inhomogeneous Media (ETOPIM 8), Crete, Greece, June 2009.

78. Workshop on waves in complex media, Yountville, California, June 2009.

79. 1st Pacific Rim Mathematical Association (PRIMA) Congress, Sydney, Australia, July 2009.

80. IAMCS Workshop on Multiscale and Computational Challenges in Multi-Scale Materials Modeling, College Station, Texas, December 2009 (Keynote speaker).

81. META'10, 2nd International Conference on Metamaterials, Photonic Crystals and Plasmonics, Cairo, Egypt, February 2010 (Keynote speaker)

82. CIMTEC 2010, 5th Forum on New Materials, Electromagmetic Metamaterials Symposium, Montecatini Terme, Italy, June 2010

83. International workshop and conference on Multiscale Analysis and Homogenization, Indian Institute of Science, Bangalore, July 2010.

84. 3rd International Conference on Auxetics, Malta, July 2010 (Keynote speaker)

85. Workshop on Analysis on Graphs and its Applications, Newton Institute, Cambridge, UK, July 2010 (Keynote speaker).

86. ISAM2011, The international symposium on acoustic metamaterials, Beijing, China, May 2011 (Plenary opening lecture).

87. The Seventh Congress of Romanian Mathematicians, Brasov, Romania, July 2011.

88. Workshop on multi-scale and high-contrast PDE, Oxford, June 2011.

89. PLASMETA'11, International Conference on Electrodynamics of Complex Materials for Advanced Technologies, Samarkand, Uzbekistan, September 2011 (Plenary Speaker)

90. AMS Western Section Meeting, Salt Lake City, October 2011 (Plenary Speaker).

91. META'12 3nd International Conference on Metamaterials, Photonic Crystals and Plasmonics, Paris, France, April 2012 (Keynote speaker)

92. White nights workshop, Exotic Structures and Homogenization, St Petersburg, Russia, July 2012

93. Ninth International Conference on Electrical, Transport and Optical Properties of Inhomogeneous Media (ETOPIM 9), Marseille, France, September 2012.

94. Conference on Metamaterials, Plasmonics and Transformation Optics, Hong Kong, China, October 2012

95. SPIE Optics and Optolectronics Symposium, Prague, Czech Republic, April 2013

96. 2013 SIAM Conference on Mathematical Aspects of Materials Science, Philadelphia, June 2013 (Plenary speaker)

97. Applied Inverse Problem Conference, Daejeon, Korea, July 2013 (Plenary speaker)

98. Workshop on Mathematics and Mechanics in the search for new Materials, Banff, Canada, July 2013

99. International Conference on Nonlinear and Multiscale Partial Differential Equations: Theory, Numerics and Applications, Shanghai, China, September 2013 (Plenary speaker)

100. 13th International Congress on Computer Science (CORE 2013), Mexico City, Mexico, November 2013 (Plenary speaker)

101. KOZWaves, The first international Australasian conference on wave science, Newcastle, Australia, February 2014 (Keynote speaker)

102. Mathematics at the Interface of Partial Differential Equations, the Calculus of Variation, and Materials Science, Institute for Mathematics and its Applications, Minnesota, May 2014.

103. Workshop on Spectral Problems on Shrinking Domains, Gregynog, Wales, May 2014.

104. Imaging, Multi-scale and high contrast PDEs, Daejeon, Korea, August 2014.

105. 5th International Conference on Auxetics and other materials and models with "negative" characteristics, Poznan, Poland, September 2014.

106. Inverse Problems and Spectral Theory, College Station, Texas, October 2014.

107. Mathematical and Computational Aspects of Materials Science Symposium at the 2015 Fall MRS meeting, Boston, December 2014.

108. From Nitinol in Coffee...to Now; a 27 year Journey of Active Materials, Pasadena, California, January 2015.

109. Research Day on Modelling of Metamaterials and Waves in Multi-scale systems, Liverpool, March 2015 (Keynote speaker)

110. 2015 MAA/CURM Conference, BYU, Provo, Utah, March 2015 (Plenary speaker)

111. Mini-Symposium on Plasmonics and Cloaking due to Anomalous Localized Resonace, AIP Meeting, Helsinki, May 2015

112. Mathematics of Novel Materials, Mittag-Leffler Institut, Stockholm, June 2015

113. Complex materials; Mathematical models and Numerical Methods, Oslo, June 2015

114. Tenth International Conference on Electrical, Transport and Optical Properties of Inhomogeneous Media (ETOPIM 10), Israel, June 2015.

115. Special Session on Acoustic, elastic and thermal metamaterials, META 15, New York, August 2015.

116. Metamaterials'2015, Oxford, United Kingdom, September 2015.

117. International Workshop : Mathematical Approach to Topological Phases in Spintronics, Tohoku Forum for Creativity, Japan, October 2015.

118. Summer School on Elastic Metamaterials : From Theory to Applications, Alghero, Italy, May 2016.

119. Metamaterials beyond photonics, Edinburgh, UK, June 2016.

120. NSF–SIAM workshop on optics and photonics, Boston, July 2016.

121. LMS Durham Research Symposium, Mathematical and Computational Aspects of Maxwell's Equations, Durham University, July 2016 (two plenary lectures).

122. Unusual Configuration Spaces, ICERM, Rhode Island, September 2016.

123. Workshop METAMATH: Waves in Periodic Media and Metamaterials, Institute d'Etudes Scientifiques de Cargese, France, November 2016.

Organizing, Advisory and Review Committees:

1. Workshop on Random Media and Composites, Leesburg, December 1988.

2. AMS-SIAM Summer Seminar on the Mathematics of Random Media, Blacksburg, May 1989.

3. Workshop on Micromechanics, Leesburg, October 1991.

4. Third International Conference on Electromagnetic, Transport and Optical Properties of Inhomogeneous Media (ETOPIM 3), Mexico, August 1993.

5. Organizing Committee, Special Year on Mathematics in Material Sciences, Institute for Mathematics and its Applications, Minneapolis, 1995-96.

6. NSF Review Panel, Reviewing the Performance of the Institute for Mechanics and Materials in San Diego, October 1995.

7. NRC Review Panel, Reviewing the Performance of the Air Force Office of Scientific Research in Washington, February 1996.

8. IUTAM Symposium on Transformation Problems in Composite and Active Materials, Cairo, Egypt, March, 1997.

9. SIAM meeting on Mathematical Aspects of Materials Science, Philadelphia, May, 1997.

10. Workshop on the Electromagnetic and Mechanical Properties of Composite Materials, The University of Utah, July, 1998.

11. IUTAM Symposium on Mechanical and Electromagnetic Waves in Structured Media, Sydney, Australia, January 1999.

12. Fifth International Conference on Electrical, Transport and Optical Properties of Inhomogeneous Media (ETOPIM 5), Hong Kong, China, June 1999.

13. Sixth International Conference on Electrical, Transport and Optical Properties of Inhomogeneous Media (ETOPIM 6), Salt Lake City, Utah, July 2002 (conference chairman).

14. Minicourse on Waves in Inhomogeneous Media, Salt Lake City, Utah, July 2003

15. Composites and polycrystals, a series of five minisymposia, at the Fourth SIAM Conference on Mathematical Aspects of Materials Science, Los Angeles, CA, May 2004

16. IMA Workshop, Composites: Where Mathematics meets Industry, Minneapolis, MN, February 2005

17. Appointment to the Selection Committee, Society for Natural Philosophy, February 2005.

18. Seventh International Conference on Electrical, Transport and Optical Properties of Inhomogeneous Media (ETOPIM 7), Sydney, Australia, July 2006

19. IMA Workshop, Negative Index Materials, Minneapolis, MN, October 2006

20. Scientific Committee of the 11th International Congress on Continuum models and discrete systems, Paris, France, July 2007

21. Program Committee of the SPIE Optics and Photonics Metamaterials Conference, San Diego, CA, August 2008

22. Committee reviewing UC Santa Barbara Mathematics Department, February 2009.

23. Program Committee of the SPIE Optics and Photonics Metamaterials Conference, San Diego, CA, August 2009

24. The 2nd International Conference on Metamaterials, Photonic crystals and Plasmonics, Cairo, Egypt 2010

25. IPAM Workshop on Metamaterials: Applications, Analysis and Modeling, UCLA, Los Angeles, CA, January 2010 (conference co-chairman)

26. Prize Selection Committee, SIAM Ralph E. Kleinman Prize, 2010 (chairman).

27. Co-organizer of minisymposia on Cloaking and Metamaterials for the SIAM meeting on Mathematical Aspects of Materials Science, Philadelphia, PA, May 2010.

28. Thematic Year on PDE Models Arising in Multi-scale Problems, Control and Inverse Problems and Fluid Dynamics, Indian Institute of Science, Bangalore, 2009-10

29. Committee of Visitors reviewing the three-year performance of the Division of Mathematical Sciences at the NSF, April-July 2010.

30. Prize Selection Committee, SIAM Ralph E. Kleinman Prize, 2011.

31. Scientific Committee of the 12th International Congress on Continuum models and discrete systems, Kolkata, India, March 2011.

32. Scientific Committee of the International Symposium on Acoustic Metamaterials, Beijing, China, May 2011.

33. Invited thematic minisymposium on Cloaking and Metamaterials at ICIAM 2011, Vancouver, Canada, July 2011.

34. Workshop on Future Directions in Mathematics, IPAM, Los Angeles, October 2011.

35. Scientific Advisory Committee, 3rd International Conference on Metamaterials, Photonic Crystals and Plasmonics (META 12) Paris, France, April 2012

36. Committee of Honour of ETOPIM 9, Marseille, France, September 2012

37. Theoretical modeling and applications of metamaterials, a series of four minisymposia at the 2013 SIAM Conference on Mathematical Aspects of Materials Science (with Andrea Alu), Philadelphia, June 2013

38. Scientific Advisory Committee, 4th International Conference on Metamaterials, Photonic Crystals and Plasmonics (META 13) Sharjah, United Arab Emirates, March 2013

39. Scientific Advisory Committee, 5th International Conference on Metamaterials, Photonic Crystals and Plasmonics (META 14), Singapore, May 2014

40. Continuum Models Discrete Systems 13 (CMDS 13), Salt Lake City, July 2014 (Conference co-chairman)

41. Scientific and Programme Committee, 5th International Conference on Auxetics and other materials and models with "negative" characteristics, Poznan, Poland, September 2014

42. Advisory Board of the EPSRC Grant "Mathematical Fundamentals of Metamaterials for Multi-Scale Physics and Mechanics", 3.2 million bounds over 5 years, that is a collaborative effort of Imperial College Mathematics and Physics Departments, and Liverpool University Mathematics Department.

43. Scientific Committee, Applied Inverse Problems 2015, Helsinki, Finland, May 2015

44. Organizing Committee, Mathematics of Novel Materials, Mittag-Leffler Institut, June 2015

45. International scientific committee of ETOPIM 10, Nevah Ilan, Israel, June 2015

46. Scientific Committee, 6th International Conference on Auxetics and other materials and models with "negative" characteristics, Malta, September 2015

47. Organizer of the 2nd International Workshop on "Neumann-Poincaré Operators and Related Fields", Kaist, Daejeon, Korea, July 2015.

48. Organizer, International Workshop : Mathematical Approach to Topological Phases in Spintronics, Tohoku University, Japan, October 2015.

49. Scientific Committee, Conference on Spectral Theory of Novel Materials, CIRM, Luminy, France, April 2016.

50. Scientific Advisory Committee, 7th International Conference on Metamaterials, Photonic Crystals and Plasmonics (META 16), Malaga, Spain July 2016.

51. Program Committee, Conference on Operators, Operator Families and Asymptotics, Bath, UK, May 2016.

52. Organizing Committee, Special Year on Mathematics and Optics, Institute for Mathematics and its Applications, Minneapolis, 2016-17.

53. Main Organizer, Workshop on Novel Optical Materials, Institute for Mathematics and its Applications, March, 2017.

54. Scientific Committee, Metamaterials: from waves to matter, European Materials Research Society, Strasbourg, France, May 2017.

Monographs and Book Chapter

Extending the Theory of Composites to Other Areas of Science, Milton-Patton publishing (2016), ISBN 978-1-483-56919-2 (14 chapters: 4 coauthored with Maxence Cassier, Ornella Mattei, Mordehai Milgrom, and Aaron Welters),

The Theory of Composites, Volume 6 of Cambridge monographs on applied and computational mathematics, Cambridge University Press (2002), ISBN 0-521-78125-6: see the review by Grégoire Allaire, Math Reviews MR1899805 (2003d:74077) (MathSciNet http://ams.rice.edu/mathscinet/searchauthors)

Transformation elastodynamics and active exterior acoustic cloaking (with F.Guevara Vasquez, D.Onofrei and P.Seppecher) in Acoustic metamaterials: Negative refraction, imaging, lensing and cloaking, ed. by Richard Craster and Sebastien Guenneau, Springer Verlag (2013), Springer Series in Materials Science, Vol. 166

Foreword

Dynamics of Lattice Materials, edited by A. Srikantha Phani and Mahmoud I. Hussein, Wiley (2016) ISBN: 978-1-118-72959-5.

Conference proceedings edited

Random Media and Composites (edited with R.V. Kohn) SIAM, Philadelphia (1989)

Mathematics of Multiscale Materials (edited with K.M. Golden, G.R. Grimmett, R.D. James, and P.N. Sen) Volume 99 of the IMA Volumes in Mathematics and its Applications, Springer, New York (1998)

Proceedings of the Sixth International Conference on Electrical Transport and Optical Properties of Inhomogeneous Media (edited with D.Dobson, K.M. Golden, and A.Z. Vardeny) Volume 338, Nos. 1-4, Physica B (2003)

List of Publications

1. Bounds on the complex dielectric constant of a composite material, Appl. Phys. Lett. 37, 300-302 (1980).

2. Bounds on the complex permittivity of a two-component composite material, J. Appl. Phys. 52, 5286-5293 (1981).

3. Bounds on the transport and optical properties of a two-component composite material, J. Appl. Phys. 52, 5294-5304 (1981).

4. Concerning bounds on the transport and mechanical properties of multicomponent composite materials, Appl. Phys. A26, 125-130 (1981).

5. Bounds on the electromagnetic, elastic, and other properties of two-component composites, Phys. Rev. Lett. 46, 542-545 (1981).

6. Transport properties of arrays of intersecting cylinders , (with R.C. McPhedran and D.R. McKenzie), Appl. Phys. 25, 23-30 (1981).

7. Bounds and exact theories for the transport properties of inhomogeneous media, (with R.C. McPhedran), Appl. Phys. A 26, 207-220 (1981).

8. Bounds on the elastic and transport properties of two-component composites, J. Mech. Phys. Solids 30, 177-191 (1982).

9. New bounds on the effective elastic moduli of two-component materials, (with N. Phan-Thien) Proc. Roy. Soc. Lond. A 380, 305-331 (1982).

10. New bounds on the effective thermal conductivity of n-phase materials , (with N. Phan-Thien), Proc. Roy. Soc. Lond. A 380, 333-348 (1982).

11. A comparison of two methods for deriving bounds on the effective conductivity of composites, (with R.C. McPhedran), Lecture Notes in Physics 154, 183-193, ed. by R. Burridge, S. Childress, and G. Papanicolaou (Springer Verlag, New York, 1982).

12. A possible use of bounds on effective moduli of composite materials , (with N. Phan-Thien), J. Reinforced Plastics and Composites 1, 107-114 (1982).

13. Extraction of structural information from measured transport properties of composites, (with R.C. McPhedran and D.R. McKenzie), Appl. Phys. A 29, 19-27 (1982).

14. New third-order bounds on the effective moduli of n-phase composites , (with N. Phan-Thien) Quart. Appl. Math. 41, 59-74, (1983).

15. Continuum fluids with a discontinuity in the pressure, (with M.E. Fisher), J. Stat. Phys. 32, 413-438 (1983).

16. Correlation of the electromagnetic and elastic properties of composites and micro-geometries corresponding with effective medium theory, Physics and Chemistry of Porous Media, 66-77, ed. by D.L. Johnson and P.N. Sen (Am. Inst. of Physics, New York, 1984).

17. Thermal conduction in composites, (with K. Golden), Thermal Conductivity 18, 571-582, ed. by T. Ashworth and D.R. Smith (Plenum Press, New York, 1985).

18. The coherent potential approximation is a realizable effective medium theory, Comm. Math. Phys. 99, 463-500 (1985).

19. Normalization constraint for variational bounds on fluid permeability, (with J. Berryman), J. Chem. Phys. 83, 754-760 (1985).

20. Modelling the properties of composites by laminates , Homogenization and Effective Moduli of Materials and Media, 150-174, ed. by J. Ericksen, D. Kinderlehrer, R. Kohn, and J.L. Lions (Springer Verlag, New York, 1986).

21. On bounding the effective conductivity of anisotropic composites , (with R.V. Kohn), Homogenization and Effective Moduli of Materials and Media, 97-125, ed. by J. Ericksen, D. Kinderlehrer, R. Kohn, and J.L. Lions (Springer Verlag, New York, 1986).

22. Classifying first-order phase transitions, (with M.E. Fisher), Physica 138A, 22-54 (1986) (A special issue dedicated to P.W. Kasteleyn.)

23. Analytical model for the dielectric response of brine-saturated rocks , (with D. Stroud and B.R. De), Phys. Rev. B 34, 5145-5153 (1986).

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