

CURRICULUM VITAE: DIONISIOS MARGETIS

1. PERSONAL INFORMATION (Homepage: <http://www.math.umd.edu/~dio>)

Full time, Department of Mathematics

Joint appointment: Institute for Physical Science & Technology (IPST)

Faculty Affiliate: Center for Scientific Computation & Mathematical Modeling (CSCAMM)

Faculty Member, Maryland NanoCenter

Country of citizenship: Greece

Educational background

<u>Degree</u>	<u>Date Awarded</u>	<u>Institution</u>
Electrical Eng. Degree (5-year program) <i>summa cum laude</i>	11/1992	National Technical Univ. of Athens (NTUA), Greece
S. M., Applied Physics	06/1994	Harvard University
Ph. D., Applied Physics (Thesis advisor: Prof. T. T. Wu)	06/1999	Harvard University

Employment background

<u>Institution</u>	<u>Rank</u>	<u>Dates</u>
University of Maryland, College Park	Associate Professor (tenured): Mathematics & IPST	07/2009 - present
	Assistant Professor: Mathematics & IPST	07/2006 - 06/2009
Massachusetts Inst. of Technology (M.I.T.)	Lecturer of Applied Math.	07/2004 - 06/2006
	Instructor of Applied Math.	01/2002 - 06/2004
Harvard University	Lecturer on Applied Math.	09/2001 - 12/2001
	Postdoctoral Fellow: Applied Physics	07/1999 - 08/2001

2. RESEARCH, SCHOLARLY, AND CREATIVE ACTIVITIES

a. Books

i. Books authored

ii. Books edited

iii. Chapters in Books

1. H. A. Stone and D. Margetis, *Continuum Descriptions of Crystal Surface Evolution*, Handbook of Materials Modeling, Vol. I (2005), pp. 1389–1401, S. Yip (Editor), Springer Verlag.

b. Articles in Refereed Journals

Articles are available online at: www.math.umd.edu/~dio/publications.html.

1. D. Margetis, *Pulse propagation in sea water*, J. Appl. Phys., Vol. 77 (1995), pp. 2884–2888.
2. D. Margetis and R. W. P. King, *Comments on “Propagation of EM pulses excited by an electric dipole in a conducting medium”*, IEEE Trans. Antennas Propagat., Vol. 43 (1995), pp. 119–120.
3. J. D. Kanellopoulos and D. Margetis, *A predictive analysis of differential attenuation on adjacent satellite paths including rain height effects*, European Trans. Telecommunications, Vol. 8 (1997), pp. 141–148.
4. D. Margetis, G. Fikioris, J. M. Myers, and T. T. Wu, *Highly directive current distributions: General theory*, Phys. Rev. E, Vol. 58 (1998), pp. 2531–2547.
5. D. Margetis, *Electromagnetic fields in air of traveling-wave currents above the earth*, J. Math. Phys., Vol. 39 (1998), pp. 5870–5893.
6. D. Margetis, *Bose-Einstein condensation in an external potential at zero temperature: Solitary wave theory*, J. Math. Phys., Vol. 40 (1999), pp. 5522–5543.
7. D. Margetis, *Pulse propagation in sea water: The modulated pulse*, Progress in Electromagnetics Research (PIER), Vol. 26 (2000), pp. 89–110.
8. D. Margetis, *Asymptotic formula for the condensate wave function of a trapped Bose gas*, Phys. Rev. A, Vol. 61 (2000), 055601 (2pp).
9. D. Margetis and G. Fikioris, *Two-dimensional highly directive currents on large circular loops*, J. Math. Phys., Vol. 41 (2000), pp. 6130–6172.
10. D. Margetis and T. T. Wu, *Exactly calculable field components of electric dipoles in planar boundary*, J. Math. Phys., Vol. 42 (2001), pp. 713–745.
11. D. Margetis, *Radiation of horizontal electric dipole on large dielectric sphere*, J. Math. Phys., Vol. 43 (2002), pp. 3162–3201.
12. R. W. P. King and D. Margetis, *The low-frequency electric fields induced in a spherical cell including its nucleus*, Progress in Electromagnetics Research (PIER), Vol. 36 (2002), pp. 61–79.
13. D. Margetis, E. Kaxiras, M. Elstner, Th. Frauenheim, and M. R. Manaa, *Electronic structure of solid nitromethane: Effects of high pressure and molecular vacancies*, J. Chem. Phys., Vol. 117 (2002), pp. 788–799.
14. D. Margetis, M. J. Aziz, and H. A. Stone, *Continuum description of profile scaling in nanostructure decay*, Phys. Rev. B, Vol. 69 (2004), 041404(R) (4pp).
15. D. Margetis, M. J. Aziz, and H. A. Stone, *Continuum approach to self-similarity and scaling in morphological relaxation of a crystal with a facet*, Phys. Rev. B, Vol. 71 (2005), 165432 (22pp).

16. H. A. Stone, M. J. Aziz, and D. Margetis, *Grooving of grain boundary by evaporation-condensation below the roughening transition*, J. Appl. Phys., Vol. 97 (2005), 113535 (6pp).
17. J. Choi*, D. Margetis, T. M. Squires[†], and M. Z. Bazant, *Steady advection-diffusion around finite absorbers in two-dimensional potential flows*, J. Fluid Mech., Vol. 536 (2005), pp. 155–184.
18. D. Margetis and J. Choi*, *Generalized iteration method for first-kind integral equations*, Studies in Appl. Math., Vol. 117 (2006), pp. 1–25.
19. D. Margetis and N. Savva*, *Low-frequency currents induced in adjacent spherical cells*, J. Math. Phys., Vol. 47 (2006), 042902 (18pp). (Also selected to appear online in the Virtual Journal of Biological Physics Research, May 1, 2006.)
20. D. Margetis and R. V. Kohn, *Continuum relaxation of interacting steps on crystal surfaces in 2+1 dimensions*, (SIAM) Multiscale Model. Simul., Vol. 5 (2006), pp. 729–758.
21. D. Margetis and J. M. Myers, *Operation-induced decoherence by nonrelativistic scattering from a quantum memory*, J. Phys. A: Math. Gen., Vol. 39 (2006), pp. 11567–11581.
22. D. Margetis, P.-W. Fok*, M. J. Aziz, and H. A. Stone, *Continuum theory of nanostructure decay via a microscale condition*, Phys. Rev. Lett., Vol. 97 (2006), 096102 (4pp). (Also selected to appear online in the Virtual Journal of Nanoscale Science & Technology, September 11, 2006.)
23. P.-W. Fok[†], R. R. Rosales, and D. Margetis, *Unification of step bunching phenomena on vicinal surfaces*, Phys. Rev. B, Vol. 76 (2007), 033408 (4pp). (Also selected to appear online in the Virtual Journal of Nanoscale Science & Technology, July 23, 2007.)
24. D. Margetis, *Unified continuum approach to crystal surface morphological relaxation*, Phys. Rev. B, Vol. 76 (2007), 193403 (4pp).
25. D. Margetis and M. G. Grillakis, *Impurity and quaternions in nonrelativistic scattering from a quantum memory*, J. Phys. A: Math. Theor. (formerly, J. Phys. A: Math. Gen.), Vol. 41 (2008), 065307 (15pp).
26. D. Margetis and R. E. Caflisch, *Anisotropic step stiffness from a kinetic model of epitaxial growth*, (SIAM) Multiscale Model. Simul., Vol. 7 (2008), pp. 242–273.
27. J. Quah* and D. Margetis, *Anisotropic diffusion in continuum relaxation of stepped crystal surfaces*, J. Phys. A: Math. Theor. (formerly, J. Phys. A: Math. Gen.), Vol. 41 (2008), 235004 (18pp).
28. M. G. Grillakis and D. Margetis, *A priori estimates for many-body Hamiltonian evolution of interacting Boson system*, J. Hyperb. Diff. Eqs., Vol. 5 (2008), 857–883.
29. D. Margetis, *Solvable model for pair excitation in trapped Boson gas at zero temperature*, J. Phys. A: Math. Theor. (formerly, J. Phys. A: Math. Gen.), Vol. 41 (2008), 385002 (18pp); *Corrigendum*, J. Phys. A: Math. Theor., Vol. 41 (2008), 459801 (1p).

* The asterisk (*) (or dagger, †) in this CV means that the indicated co-author was a student (or postdoc) when the article was being written. It is my practice to have students (*) and postdocs (†) listed as first authors if they write a substantial part of the first draft.

30. J. Quah*, J. Young*, and D. Margetis, *Macroscopic view of crystal-step transparency*, Phys. Rev. E, Vol. 78 (2008), 042602 (4pp).
31. P.-W. Fok[†], R. R. Rosales, and D. Margetis, *Facet evolution on supported nanostructures: The effect of finite height*, Phys. Rev. B, Vol. 78 (2008), 235401 (17pp).
32. D. Margetis and A. E. Tzavaras, *Kinetic hierarchies and macroscopic limits for crystalline steps in 1+1 dimensions*, (SIAM) Multiscale Model. Simul., Vol. 7 (2009), pp. 1428–1454.
33. D. Margetis, *Homogenization of reconstructed crystal surfaces: Fick's law of diffusion*, Phys. Rev. E, Vol. 79 (2009), 052601 (4pp).
34. A. Bonito, R. H. Nochetto, J. Quah*, and D. Margetis, *Self-organization of decaying surface corrugations: A numerical study*, Phys. Rev. E, Vol. 79 (2009), 050601(R) (4pp).
35. M. G. Grillakis, M. Machedon, and D. Margetis, *Second-order corrections to mean field evolution of weakly interacting Bosons. I.*, Commun. Math. Phys., accepted for publication (31pp).

c. Monographs, Reports, and Extension Publications

d. Book Reviews, Other Articles, and Notes

Articles submitted for publication (see www.math.umd.edu/~dio/publications.html):

1. J. Quah* and D. Margetis, *Electromigration in macroscopic relaxation of stepped surfaces*, submitted to (SIAM) Multiscale Model. Simul. (34pp).
2. D. Margetis, *Stochastic step flow model with growth in 1+1 dimensions*, submitted to J. Phys. A: Math. Theor. (29pp).

Other articles:

1. D. Margetis, *Composite crystal surfaces*, in preparation.

e. Talks, Abstracts, and Other Professional Papers Presented

i. Invited talks

1. July 22, 1996: *Exactly solvable model for electromagnetic field in air of a three-phase power line over the earth*: 1996 Institute of Electrical & Electronics Engineers (IEEE) Antennas & Propagation Society (AP-S) International Symposium, Baltimore, MD, July 21–26, 1996. (Awarded third prize in the 1996 AP-S International Student Paper Contest.)
2. July 13–18, 1997: *Electromagnetic field of a horizontal dipole below the surface of a spherical earth*: 1997 Union Radio-Scientifique Internationale (URSI, International Union of Radio Science), North American Radio Science Meeting, Montréal, Canada, July 13–18, 1997. (Awarded third prize in the 1997 URSI Student Paper Competition.)
3. March 11, 1998: *Bose-Einstein condensation in an external potential at zero temperature*: Seminar, Center for Studies in Physics and Biology, The Rockefeller University, New York, NY.
4. November 12, 1998: *Bose-Einstein condensation in an external potential*, Condensed Matter Theory Seminar, Harvard University, Cambridge, MA.

5. February 23, 1999: *General theory of Bose-Einstein condensation in an external potential*: Atomic and Molecular Physics Division Seminar, Harvard-Smithsonian Center for Astrophysics, Cambridge, MA.
6. February 6, 2001: *Toward a general theory of Bose-Einstein condensation in an external potential*: Physical Mathematics Seminar, Department of Mathematics, M.I.T., Cambridge, MA.
7. March 27, 2002: *General theory of Bose-Einstein condensation in an external potential*: Seminar, Chemistry and Materials Science Directorate, Lawrence Livermore National Laboratory, Livermore, CA.
8. March 27, 2002: *Crystal surface relaxation below the roughening transition: Evolution of axisymmetric structures and scaling via a continuum description*: Seminar, Chemistry and Materials Science Directorate, Lawrence Livermore National Laboratory, Livermore, CA.
9. March 28, 2002: *Electronic structure of solid nitromethane: Effects of static pressure and molecular vacancies*: Seminar, Chemistry and Materials Science Directorate, Lawrence Livermore National Laboratory, Livermore, CA.
10. April 28, 2003: *Continuum description of profile scaling in nanostructure decay*: Mechanics Seminar, Department of Mechanical Engineering, M.I.T., Cambridge, MA.
11. January 27, 2004: *Continuum description of profile scaling in nanostructure decay*: Applied Mathematics Colloquium, Department of Applied Physics and Applied Mathematics, Columbia University, New York, NY.
12. January 30, 2004: *Continuum approach to profile scaling in nanostructure decay below the roughening temperature*: Applied Mathematics Seminar, Courant Institute, New York, NY.
13. February 12, 2004: *Continuum approach to profile scaling in nanostructure decay below the roughening temperature*: informal seminar, Department of Materials Science and Engineering, M.I.T., Cambridge, MA.
14. February 13, 2004: *Continuum approach to profile scaling in nanostructure decay below the roughening temperature*: Physical Mathematics Seminar, Department of Mathematics, M.I.T., Cambridge, MA.
15. May 27, 2004: *Continuum approach to profile scaling in nanostructure decay below the roughening temperature*: Applied Mathematics Seminar, Department of Mathematics, University of California, Los Angeles.
16. May 28, 2004: *Continuum approach to profile scaling in nanostructure decay below the roughening temperature*: Applied Mathematics Seminar, Division of Engineering and Applied Science, California Institute of Technology, Pasadena, CA.
17. June 4, 2004: *A continuum approach to profile scaling in nanostructure decay below the roughening temperature*: informal seminar: Division of Engineering, Brown University, Providence, RI.
18. October 27, 2004: *Towards a unified continuum theory of crystal surface morphological relaxation below roughening*: Colloquium, Department of Materials Science and Engineering, The Johns Hopkins University, Baltimore, MD.
19. November 18-20, 2004: *Continuum theory of interacting steps on crystal surfaces*

in (2+1) dimensions: invited poster presentation: Workshop on Future Challenges in Multiscale Modeling and Simulation, Institute for Mathematics and its Applications (IMA), University of Minnesota, Minneapolis, MN.

20. December 9, 2004: *Continuum approach to nanostructure decay below the roughening temperature*: Mathematics Colloquium, Department of Mathematics and Statistics, University of Vermont, Burlington, VT.

21. January 6, 2005: *Continuum theory of crystal surface relaxation below roughening*: Applied Mathematics Colloquium, Department of Mathematics, University of California, San Diego, CA.

22. January 25, 2005: *Unified continuum theory of crystal surface relaxation below roughening*: Special Applied Mathematics Seminar, Department of Mathematics, University of California, Los Angeles, CA.

23. February 9, 2005: *Continuum theory of crystal surface relaxation below the roughening transition*: Applied Mathematics Colloquium, Department of Mathematics, University of California, Berkeley, CA.

24. February 15, 2005: *Unified approach to crystal surface evolution below roughening*: Physical Mathematics Seminar, Department of Mathematics, M.I.T., Cambridge, MA.

25. March 11, 2005: *Unified approach to crystal surface evolution below roughening*: Condensed Matter and Applied Physics Colloquium, Division of Engineering & Applied Sciences and Department of Physics, Harvard University, Cambridge, MA.

26. May 16, 2005: *Multiscale aspects of surface morphology evolution*: informal seminar: Mini-Workshop on Continuum Treatments of Crystal Surface Morphology Evolution, Division of Engineering & Applied Sciences, Harvard University, Cambridge, MA, May 16-17, 2005.

27. June 10, 2005: *Continuum approach to crystal surface morphology evolution*: Workshop on Effective Theories for Materials and Macromolecules, Institute for Mathematics and its Applications (IMA), University of Minnesota, Minneapolis, MN, June 8-11, 2005.

28. August 8, 2005: *Continuum approach to crystal surface morphology evolution below roughening*: Current Challenges in Mechanics and Materials, Thin-Air Philosophical Society Symposium, University of Wyoming, Laramie, WY, August 8-11, 2005.

29. September 2, 2005: *Continuum approach to crystal surface morphological evolution*: Surface Physics Group Seminar, Department of Physics, University of Maryland, College Park, MD.

30. October 19, 2005: *Crystal surface evolution: From atomic steps to continuum laws and free-boundary problems*: Applied Mathematics Colloquium, Department of Mathematics, University of California, Los Angeles, CA.

31. October 26, 2005: *Continuum approach to crystal surface morphological evolution*: Seminar, Theoretical and Applied Mechanics (TAM), Cornell University, Ithaca, NY.

32. November 1, 2005: *Surfaces of crystalline materials: From microscopic models*

to continuum laws: Mathematics Colloquium, Department of Mathematics, State University of New York (SUNY), Buffalo, NY.

33. November 10, 2005: *Evolution of crystal surfaces: From microscopic models to continuum laws*: PDE & Applied Math Seminar, Department of Mathematics, University of Maryland, College Park, MD.

34. November 16, 2005: *Surfaces of crystalline materials: From atomic steps to continuum evolution laws*: Workshop on Bridging Time and Length Scales in Materials Science and Bio-Physics, Institute for Pure and Applied Mathematics (IPAM), University of California, Los Angeles, CA, September 12-December 16, 2005.

35. January 12, 2006: *Mathematical modeling of crystal surfaces: From discrete schemes to continuum laws*: Department of Mathematics, State University of New York (SUNY), Buffalo, NY.

36. January 17, 2006: *Modeling of crystal surfaces: From microscopic schemes to continuum evolution laws*: PDE Seminar, Department of Mathematics, University of Minnesota, Twin Cities, MN.

37. January 27, 2006: *Mathematical modeling of crystal surfaces: From microscopic schemes to continuum laws*: Computational and Applied Mathematics Seminar, Department of Mathematics, Purdue University, Lafayette, IN.

38. February 2, 2006: *Morphological evolution of crystal surfaces: Modeling from the nanoscale to the macroscale*: Seminar, Department of Applied Mathematics & Statistics, Johns Hopkins University, Baltimore, MD.

39. February 9, 2006: *Modeling crystal surface evolution: From microscopic schemes to continuum laws*: Applied and Computational Mathematics Seminar, Department of Mathematics, Georgia Institute of Technology, Atlanta, GA.

40. February 21, 2006: *Morphological evolution of crystal surfaces: Modeling from nanoscale to macroscale*: Statistical Physics Seminar, Institute for Physical Science and Technology (IPST), University of Maryland, College Park, MD.

41. March 13, 2006: *Morphological evolution of crystal surfaces: From step motion to a continuum theory*: 2006 March Meeting of the American Physical Society (APS), Baltimore, MD.

42. March 27, 2006: *Modeling of crystal surface morphological evolution: From discrete schemes to continuum laws*: Colloquium, Department of Computational & Applied Mathematics, Rice University, Houston, TX.

43. March 31, 2006: *Nonlinear dynamics of crystal surfaces: From discrete schemes to continuum laws*: Workshop on Nonlinearity and Randomness in Complex Systems, Department of Mathematics, State University of New York (SUNY), Buffalo, NY.

44. April 20, 2006: *Mathematical modeling of crystal surfaces: From discrete schemes to continuum laws*: Seminar on Multiscale Modeling and Computations, Department of Mathematics, Pennsylvania State University, University Park, PA.

45. August 27, 2006: *State transformation in quantum memory: Impurity caused by time limits*: Third Feynman Festival, Department of Physics, University of Maryland, College Park, MD.

46. October 13, 2006: *Evolution of crystal surfaces: From discrete schemes to con-*

tinuum laws: Applied Mathematics Colloquium, Department of Mathematics, University of Arizona, Tucson, AZ.

47. October 18, 2006: *From physics-based discrete schemes to PDE's and moving-boundary problems*: Graduate Minicourse, Department of Mathematics, University of Maryland, College Park, MD.

48. October 26, 2006: *Evolution of crystal surfaces: Modeling and analysis from the nanoscale to the macroscale*: Graduate Seminar, Department of Mechanical Engineering, University of Houston, Houston, TX.

49. November 11, 2006: *Modeling and analysis of crystal surface evolution: from microscopic physics to continuum laws*: Society for Natural Philosophy (SNP) Conference, Department of Mathematics, Purdue University, Lafayette, IN.

50. November 15, 2006: *Aspects of computing from the perspective of Schrödinger's PDE*: Graduate Minicourse Series, Department of Mathematics, University of Maryland, College Park, MD.

51. March 14, 2007: *Recent surprises in asymptotics for continuum mechanics*: Plasma Physics Seminar, Institute for Plasma Research (IREAP), University of Maryland, College Park, MD.

52. April 4, 2007: *From microscopic physics to continuum laws for crystal surfaces: progress and challenges*: CSCAMM Seminar, Center for Scientific Computation and Mathematical Modeling (CSCAMM), University of Maryland, College Park, MD.

53. April 23, 2007: *Modeling stepped surfaces across the scales: facet evolution and anisotropic step stiffness*: Workshop on Nonequilibrium Interface and Surface Dynamics: Theory, Experiment and Simulation from Atomistic to Continuum Scales, Center for Scientific Computation And Mathematical Modeling (CSCAMM), University of Maryland, College Park, MD.

54. May 23, 2007: *From discrete schemes to continuum laws: the case of crystal surface evolution*: Applied Analysis and PDE's Seminar, Department of Applied Mathematics, University of Crete, Heraklion (Crete), Greece.

55. June 13, 2007: *Anisotropic step stiffness from a kinetic model of epitaxial growth*: Lake Arrowhead 1st Reunion Conference: Bridging Time and Length Scales in Materials Science and Bio-physics, Institute for Pure and Applied Mathematics (IPAM), University of California at Los Angeles, Lake Arrowhead, CA, June 10-15, 2007.

56. June 25, 2007: *From microscopic physics to continuum laws in epitaxial growth: lessons, progress and challenges*: Gordon Research Conference on Thin Film & Crystal Growth Mechanisms, Mount Holyoke College, South Hadley, MA, June 24-29, 2007.

57. July 17, 2007: *Singular interfacial energy and faceting in epitaxial relaxation*: Minisymposium on Anisotropic Curvature Flow and Its Applications, 6th International Congress on Industrial and Applied Mathematics (ICIAM), Zurich, Switzerland, July 16-20, 2007.

58. July 20, 2007: *Crystal surface evolution: from discrete schemes to continuum laws*: Minisymposium on Modeling, Analysis and Simulation of Crystal Defects: Dislocation and Surface Step Dynamics Across the Scales, 6th International Congress

on Industrial and Applied Mathematics (ICIAM), Zurich, Switzerland, July 16-20, 2007.

59. November 30, 2007: *From discrete models to continuum laws: The paradigm of epitaxial growth*: Mathematics Colloq., Department of Mathematics, Georgetown University, Washington, DC.

60. December 11, 2007: *Singular interfacial energy, faceting, and crystal microstructure in epitaxial relaxation*: Minisymposium on Energy Based Approaches to Non-linear Partial Differential Equations, Society for Industrial & Applied Mathematics (SIAM) Conference on Analysis of Partial Differential Equations, Mesa, AZ, December 10-12, 2007.

61. December 11, 2007: *Modeling and analysis of stepped crystal surfaces*: Minisymposium on From Microscopic Models to Continuum Laws: Current Challenges in Epitaxial Growth, SIAM Conference on Analysis of Partial Differential Equations, Mesa, AZ, December 10-12, 2007.

62. January 17, 2008: *Modeling and analysis of epitaxial relaxation: From steps to the continuum*: Institute of Theoretical Physics, Department of Physics, Cologne University, Cologne, Germany.

63. January 21, 2008: *Evolution of crystal surfaces: From motion of steps to continuum theories*: informal seminar, Theory Department, Fritz Haber Institute of the Max Planck Society, Berlin, Germany.

64. February 13, 2008: *From step models to continuum laws*: Workshop on Facets of Heteroepitaxy: Theory, Experiment, and Computation, Banff International Research Station (BIRS) for Mathematical Innovation and Discovery, Banff, Canada, February 10-15, 2008.

65. April 14, 2008: *From discrete schemes to singular interfacial energies: Lessons and challenges in epitaxial relaxation*: Applied & Computational Math. Seminar, Department of Mathematics, Georgia Institute of Technology, Atlanta, GA.

66. April 25, 2008: *Facets as shocks and other surprises in capturing discrete effects by continuum laws for crystal surfaces*: Surface Physics Group Seminar, Materials Research Sci. & Eng. Center (MRSEC), University of Maryland, College Park, MD.

67. May 1, 2008: *The case of the quantum dilute gas*: Workshop on Nonlocal Operators and Applications, Banff International Research Station (BIRS) for Mathematical Innovation and Discovery, Banff, Canada, April 27 - May 2, 2008.

68. May 12, 2008: *Unification of step bunching phenomena on vicinal surfaces*: invited Lecture: Minisymposium on Instabilities During Epitaxy: From Step Bunching To Phase Segregation, SIAM Conference on Mathematical Aspects of Materials Science, Philadelphia, PA, May 11-14, 2008.

69. May 14, 2008: *Kinetic hierarchies and continuum limits for stepped crystal surfaces*: Minisymposium on Kinetics and Fluctuations of Crystal Surfaces: From Discrete Models to Continuum, SIAM Conference on Mathematical Aspects of Materials Science, Philadelphia, PA, May 11-14, 2008.

70. May 27-30, 2008: Invited participant: Workshop on Quantitative Approaches to Cell Motility and Chemotaxis, Institute for Mathematics and Its Applications (IMA),

University of Minnesota, Minneapolis, MN.

71. November 3-7, 2008: Invited participant: Workshop on Development and Analysis of Multiscale Methods, Institute for Mathematics and Its Applications (IMA), University of Minnesota, Minneapolis, MN.

72. December 10, 2008: *On kinetic descriptions of crystal surface evolution*, CSCAMM Seminar, University of Maryland, College Park, MD.

73. March 27, 2009: *Deconstructing surface reconstruction: Fick's law of diffusion*: Surface Physics Group Seminar, Materials Research Sci. & Eng. Center (MRSEC), University of Maryland, College Park, MD.

74. April 3, 2009: *Macroscopic evolution of epitaxial material systems: The story of two scales*: Mathematics Colloquium, Department of Mathematics, Howard University, Washington, DC.

75. April 10, 2009: *Kinetic aspects of crystal surface evolution: Modeling and analysis*: Applied and Computational Math Seminar, Department of Mathematics, George Mason University, Fairfax, VA.

76. December 8, 2009: *Crystal surface diffusion: Numerical simulations and homogenization*: Minisymposium on Singular and Degenerating Parabolic Problems and Weighted Curvature Flows, SIAM Conference on Analysis of Partial Differential Equations, Miami, FL, Dec. 7-10, 2009.

77. December 9, 2009: *Kinetic descriptions of evolution of crystalline surfaces*: Minisymposium on Kinetic approaches in Materials Science, SIAM Conference on Analysis of Partial Differential Equations, Miami, FL, Dec. 7-10, 2009.

ii. **Refereed conference proceedings**

iii. **Unrefereed conference proceedings**

f. Films, Tapes, Photographs, etc.

g. Exhibits, Performances, Demonstrations, and other Creative Activities

h. Original Designs, Plans, Inventions, and Patents

i. Contracts and Grants

1. Faculty Early Career Development Award (CAREER): Division of Mathematical Sciences, National Science Foundation (NSF), \$475,000, 08/2009 – 06/2014. Project title: *Thermodynamic and Kinetic Approaches for Epitaxial Material Systems*.

2. Seed Funding: PI, NSF/Materials Research Science & Engineering Center (MRSEC), Univ. Maryland, \$21,000, 07/2007 – 06/09. Project title: *Mean Field Theory for Elastic Effects on Crystal Surfaces*.

j. Fellowships, Prizes, and Awards

1. State Scholarships Foundation Award, distinction in entrance exams, National Technical University of Athens (NTUA), 1987.

2. State Scholarships Foundation Fellow, top student in Department of Electrical Engineering, National Technical University of Athens (NTUA), 1988–1992.

3. M. Stai Fellow, Kapodistrian University of Athens, 1987–1992, 1993–1996.
4. Thomaidion Award, top graduate of Department of Electrical Engineering, National Technical University of Athens (NTUA), 1993.
5. C. C. Kao Fellow, best 1st-year PhD student in Division of Applied Sciences, Harvard University, 1994–1995.
6. 3rd Prize, Student Paper Contest, IEEE Antennas & Propagation Society International Symposium, Baltimore, MD, 1996.
7. 3rd Prize, Student Paper Competition, North Amer. Radio Sci. Meeting, Montréal, Canada, 1997.

k. Editorships, Editorial Boards, and Reviewing Activities for Journals and other Learned Publications

1. Invited reviewer for the journals: (SIAM) *Multiscale Modeling & Simulation*; *SIAM Journal of Applied Mathematics*; *Journal of Mathematical Physics*; *Journal of Physics A: Mathematical & Theoretical* (UK); *Journal of Materials Research*; *Physical Review Letters*; *Physical Review B*; *Physical Review E*; *Applied Physics Letters*; *IET Microwaves, Antennas & Propagation* (UK); *IEEE Transactions on Antennas & Propagation*.

l. Other

1. Elected Full Member of Sigma Xi (by nomination), The Scientific Research Society, 08/2000.

3. TEACHING, MENTORING AND ADVISING

a. Courses taught in the last five years

University of Maryland, College Park

<u>Semester</u>	<u>Course</u>	<u>Class size</u>
Fall 06	MATH463: Complx. Variables for Sciencs. & Engrs.	23
Spring 07	MATH648M (Spec. Topics): Adv. Analytic Methods	24
Fall 07, 08, 09	MATH241: Calculus III	245('07), 215('08)
Spring 08, 09	MATH648M	32 ('08), 30 ('09)
Fall 09	MATH673: Partial Differential Equations I	
Fall 09	AMSC698: Advanced Topics in Appl. Math.	3
Spring '10	MATH674: Partial Differential Equations II	

Massachusetts Institute of Technology

<u>Semester</u>	<u>Course</u>	<u>Class size</u>
Spring 2003 - 06	18.306: Advanced PDEs w/ Applications (grad.)	40 (est. avg.)

Fall 03, Spring 06	18.307: Integral Eqs (grad.)	10 (est. avg.)
Fall 04, Spring 06	18.075: Adv. Calc. for Engrs (grad.)	25 (est. avg.)
Fall 2005	18.305: Adv. Analytic Methods in Sci. & Eng. (grad.; co-taught)	15

b. Course or Curriculum Development

1. Development of the new graduate (special topics) course MATH 648M: Advanced Analytic Methods with Applications, University of Maryland. The course has attracted students from Mathematics, Physics, Geology, Chemical Physics and several areas of Engineering.

c. Manuals, Notes, and Other Contributions to Teaching

1. M.I.T. OpenCourseWare Program: Publication of applied math courses 18.075, 18.306, 18.307 to Worldwide Web, Spring 2004, 06, Fall 2005.

d. Teaching Awards and Other Special Recognition

1. Distinction in Teaching, Faculty of Arts and Sciences, Harvard University, 2001.
2. Graduate Teaching Award, School of Science, MIT, 2004.
3. Dean's Prize for Excellence in Graduate Education (by faculty nomination), School of Science, MIT, 2006.
4. Excellence Certificate, in recognition of outstanding service in Education Outreach, Materials Research Science and Engineering Center (MRSEC), Univ. Maryland, 2008.

e. Advising (Other Than Research Direction)

i. Undergraduate

ii. Graduate

iii. Other advising and mentoring activities

f. Advising: Research Direction

i. Undergraduate

University of Maryland, College Park

<u>Program</u>	<u>Student</u>	<u>Title of Project</u>	<u>Dates</u>
Research Experience for Undergraduates (REU), Maryland MRSEC	Mr. Jerrod Young, Norfolk State Univ.	Modeling & numerics for crystal surfaces under stress	Summer 08
	Mr. Li Peng Liang, Montgomery College	Modeling and analysis of crystal-step interactions	Summer 09

ii. Master's

iii. **Doctoral**

University of Maryland, College Park

<u>Ph.D. student</u>	<u>Title of Thesis</u>	<u>Date Degree Conferred</u>
Ms. A. Finkbiner (co-advised)	Global phenomena from local rules: Peer-to-peer networks and crystal steps	12/2007
Mr. J. Quah	A macroscale perspective of near-equilibrium relaxation of stepped crystal surfaces	08/2009
Mr. P. Patrone (Phys.) (co-advised)	Aspects of epitaxial fluctuations: Mean field & beyond	06/2013 (expected)

Massachusetts Institute of Technology

<u>Ph.D. student</u>	<u>Title of Thesis</u>	<u>Date</u>
Mr. P.-W. Fok (co-advised)	Simulations of axisymmetric stepped surfaces with a facet	06/2006

g. Extension Activities

4. SERVICE

a. Professional

i. **Offices and committee memberships in professional organizations**

ii. **Reviewing activities for agencies**

1. Grant proposal reviewer: Department of Energy (DOE)/Applied Mathematics, Spring 2008.

iii. **Other unpaid service to local, state and federal agencies**

iv. **Other non-University committees, commissions, panels, etc.**

1. Organizer: Applicable Mathematics Seminar Series, Institute for Pure & Applied Math. (IPAM), Los Angeles, CA, Fall 2005.
2. Organizer: Minisymposium on: *From microscopic models to continuum laws: Current challenges in epitaxial growth*, Society for Industrial & Applied Mathematics (SIAM) Conference on Analysis of PDEs, Mesa, AZ, Dec. 10-12, 2007.
3. Co-organizer: Minisymposium on: *Kinetics & fluctuations of crystal surfaces: From discrete models to continuum*, SIAM Conference on Mathematical Aspects of Materials Science, Philadelphia, PA, May 11-14, 2008.
4. Co-organizer: Minisymposium on: *Kinetic approaches in Materials Science*, SIAM Conference on Analysis of Partial Differential Equations, Miami, FL, Dec. 7-10, 2009.

v. **International activities not listed above**

1. Co-organizer: Minisymposium on: *Modeling, Analysis and Simulation of Crystal Defects: Dislocation and Surface Step Dynamics Across the Scales*, 6th International

Congress on Industrial & Applied Mathematics, Zurich, Switzerland, July 16-20, 2007.

vi. **Paid consultancies**

b. Campus

i. **Departmental**

1. Organizer: PDE & Applied Mathematics Seminar, 2006-09.
2. Member: Admissions Committee for grad. students, Applied Mathematics & Scientific Computation (AMSC) program, Spring 2007, 08, 09.
3. Invited Member: Ph.D. Thesis Defense Committee for: A. Finkbiner (as co-advisor), November 2007; M. S. Pauletti, August 2008; I-Kun Chen, May 2009; J. T. Halbert, May 2009; J. Quah (*Chair of Committee, as thesis advisor*), June 2009.
4. Member: Preliminary Ph.D. Oral Exam Committee for: J. Quah, February 2008 (Chair of Committee, as advisor); Xuwen Chen, April 2009.
5. Member: Salary Committee, Department of Mathematics, Spring 2008.
6. Co-director: Research Interaction Team (RIT): Spring 2009: Applied Partial Differential Equations.

ii. **College**

1. Co-organizer: Workshop on *Nonequilibrium Interface and Surface Dynamics: Theory, Experiment and Simulation from Atomistic to Continuum Scales*, Center for Scientific Computation And Mathematical Modeling (CSCAMM), Univ. Maryland, April 23-27, 2007.
2. Co-organizer: Research Interaction Teams (RIT's): interdisciplinary research-oriented working group seminars attended by students, postdocs, faculty:
 - Fall 2006: *Schrödinger's Equations with Applications in Physics*.
 - Spring 2007: *Biomembranes: Experiments, Mathematical Modeling, and Numerical Simulations*.
 - Fall 07, Spring 08: *Kinetics and Fluctuations of Complex Crystal Surfaces*.
 - Fall 09: *Challenges in Materials Science: Aspects of Interface Motion*.
 - Spring 2010: *Quantum Information and Computation*.
3. Member: Selection Committee: Research Experience for Undergraduates (REU) program, Materials Research Science & Engineering Center (MRSEC), Spring 2008.
4. Co-organizer: Workshop on *Electromagnetic Metamaterials and Their Approximations: Practical and Theoretical Aspects*, CSCAMM, Univ. Maryland, September 22-25, 2008.
5. Co-organizer: Workshop on *Kinetic Description of Multiscale Phenomena: Kinetic Focused Research Group (FRG) Young Researchers Workshop*, CSCAMM, Univ. Maryland, March 2-5, 2009.