Curriculum Vitae

Ashwin Vaidya

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Citizenship

United States of America

Education

- **Ph.D.** ……Mechanical Engineering. University of Pittsburgh, April 2004
  Advisor: Dr. Giovanni P. Galdi
- **M.S,** ……Mathematics, University of Pittsburgh, August 1999
  Advisor: Dr. George Sparling
- **M.S.** ……Physics, University of Pittsburgh, April 1998
- **B.Phil.** ……Physics, Astronomy & Mathematics, University Honors College, University of Pittsburgh, April 1995
  Advisor: Dr. Regina Schulte-Ladbeck

Professional Experience

- 08/2004 – 05/2005 Postdoctoral Associate, Department of Mathematical Sciences, Carnegie Mellon University.
- 05/2004 - 08/2004 Postdoctoral Researcher, Department of Mechanical Engineering, University of Pittsburgh.
- 08/1999 – 12/2003 Adjunct Faculty, Department of Mathematics and Science, Robert-Morris University.
- 08/1998 – 05/1999 Adjunct Faculty, Department of Physical Sciences, Community College of Allegheny County.
- 08/1999 – 04/2004 Graduate Student Researcher / Teaching Fellow, Department of Mechanical Engineering, University of Pittsburgh.
- 08/1995 – 08/1999 Teaching Assistant, Department of Mathematics, University of Pittsburgh.
- 08/1992 – 08/1995 Undergraduate Researcher, Department of Physics and Astronomy, University of Pittsburgh.

Visiting Appointments

- 06/2001 – 07/2001 Department of Mathematics, Institute Superior Technico, Lisbon, Portugal.
- 08/2004 – 05/2005 Center for Nonlinear Analysis, Carnegie Mellon University, Pittsburgh, PA.

Research Interests

Mathematical Fluid Dynamics, Fluid-Structure Interaction, Sedimentation Theory, Nonlinear Partial Differential Equations, Non-Newtonian Fluids, Hydrodynamic Stability, Experimental Fluid Dynamics, Mathematical Physics.

Academic Achievements

- Sitaramayya Memorial Award in Physics, University of Madras, India, 1992.
- Chancellors Undergraduate Research Fellowship, University Honors College, University of Pittsburgh, 1994.
- Halliday-Resnick Award, Dept. of Physics & Astronomy, University of Pittsburgh, 1994.
- REU award, American Astronomical Society, 1994
- National Honor Physics Society, 1995
- Second Place at Engineering Graduate Student Poster Fair, 2001.

Publications

Refereed Publications

1. G.P.Galdi & A. Vaidya, Translational fall of symmetric bodies in a Navier-Stokes liquid with applications to particle sedimentation, *Journal of MathematicalFluid Dynamics*, 3, 183-211, 2001.
2. G.P.Galdi, A.Vaidya, M. Pokorny, D.D.Joseph & J.Feng, Orientation of symmetric bodies falling in a second-order fluid at low Reynolds numbers, *Mathematics Models and Methods in Applied Sciences*, 12, 1653-1690, 2002.
3. A.Vaidya, Steady fall of bodies of arbitrary shape in a second-order fluid at zero Reynolds numbers, *Japan Journal of Industrial and Applied Math.*, Vol. 21, No. 3, 299-322, 2004.
4. A.Vaidya & G.A.J.Sparling, Classical solutions of the perturbed wave equation with singular kernel, *Acta Math Univ. Comenianae*, Vol. 72, No.2, 65-75, 2003.
5. A.Vaidya & G.A.J. Sparling, The perturbed massless, wave equation with singular external potential, *Trends in Mathematical Physics Series*, Ed. Charles Benton, Nova Science Publishers, 2004.
6. A. Vaidya, A Note on the Orientation of Symmetric Rigid Bodies Sedimenting in a Power-Law Fluid, to appear in *Applied Math Letters*, 2005.

7. A. Vaidya, Existence of Steady Freefall of Rigid Bodies in a Second order fluid with Applications to Particle Sedimentation, to appear in *Nonlinear Analysis: Series B,* 2005.

Thesis

1. A.Vaidya, Investigations into the circumstellar environment of herbig ae/be stars, Dept. of Physics & Astronomy, B.Phil. Thesis, University of Pittsburgh, 1995.
2. A.Vaidya, On the classical and quantized solutions of the perturbed wave equation with external potential, M.S. Thesis, Dept. of Mathematics, University of Pittsburgh, 1999.
3. A. Vaidya, Orientation of Rigid Bodies Sedimenting in Newtonian and Non-Newtonian Fluids, Ph.D. Thesis, Dept. of Mechanical Engineering, University of Pittsburgh, 2004.

Submitted

1. A. Vaidya , On the transient nature of shape-tilting bodies sedimenting in polymeric liquids, submitted for publication, 2004.
2. A. Vaidya and B.J. Chung, An axiomitization of realities, submitted for publication, 2004.
3. B.J. Chung, A. Vaidya and R. Wulandana, Energy Stability of Steady Channel Flow with Temperature Dependent Viscosity, submitted for publication, 2005.
4. A. Vaidya and R. Wulandana, Nonlinear Stability for Convection with Temperature Dependent Viscosity, submitted for publication, 2005.

In Preparation

1. A.Vaidya and G.P. Galdi, On the Existence of Steady Translation and Rotation of a Rigid Body in a Second order Fluid, in preparation, 2005.
2. Vaidya and B.J. Chung, The tilt-angle orientation of bodies falling in a generalized second order fluid, in preparation.
3. B.J.Chung and A.Vaidya, A numerical study of the oscillation of symmetric bodies due to a flow at intermediate reynolds numbers, in preparation.

Conferences/Seminars/Workshops

- Science Division Colloquium, Chatham College, October 28, 2004 (Colloquium Talk)
- Center for Nonlinear Analysis Seminar, Carnegie Mellon University, Jan. 25, 2005 (Talk).
- American Mathematical Society, Northeast Divisional Meeting, University of Pittsburgh, Nov. 7, 2004 (Invited Talk)
- Science Division Colloquium, Chatham College, October 28, 2004 (Invited Talk)
- W.G. Pritchard Fluids Lab, Dept. of Mathematics, Penn State University, May 27, 2004 (Invited Talk)

- Applied Mathematics Laboratory, Courant Institute of Mathematical Sciences, New York University, May 6, 2004 (Invited Talk)
- Department of Mathematics, University of Houston, April 6, 2004 (Invited Talk)
- Department of Mathematics, Indian Institute of Technology, Bombay, India, Dec. 3, 2003 (Invited Talk)
- Department of Engineering Mechanics, Jawaharlal Nehru Center for Advanced Scientific Research, Bangalore, India, Dec. 17, 2003 (Fluid Dynamics Colloquium)
- American Mathematical Society International Conference, India, December 2003 (Poster)
- International School on Biomathematics, Bioengineering and Clinical Aspects of Blood Flow, MSRI (Berkeley, CA), July 22-August 09, 2002.
- Society of Rheology Conference, South Carolina, Feb. 2001 (Poster).
- Conference on Contemporary Challenges in Applied Fluid Dynamics, Italy, May 31-June 5, 2001(Talk).
- First Meeting on Numerical Analysis for Applied Flow Problems, Evora, Portugal, June 20-21, 2001(Invited Talk).
- Department of Mathematics, IST, Lisbon, Portugal, June 2001(Invited talk).
- IMA Workshop on Finite Dimensional Topology, University of Iowa, June 1998.
- National Meeting of the American Astronomical Society, 1995(Poster).
- National Meeting of the American Astronomical Society, 1994(Poster).

Teaching Experience

Adjunct Faculty

- Department of Mathematical Science, Carnegie Mellon University, 2004-2005. Calculus 1, Linear Programming and Introduction to Math Software.
- Department of Science, Chatham College, Fall 2004. Scheduled to teach Math Literacy course for non-science majors.
- Department of Mathematics, Robert-Morris University, 1999-Present. Taught Pre-College Algebra, College Algebra, Applied Calculus 1, Applied Statistics 1, Applied Statistics 2, Operations Management.
- Department of Science, Robert-Morris University, 1999-Present. Taught Astronomy.
- Department of Physics, CCAC, 1998-1999. Taught Physics for non-science majors (with lab), Physics 1 (with lab).
- Department of Mathematics, University of Pittsburgh, Fall 1998. Taught Calculus 2 (with Mathematica Software).

Teaching Assistant

- Department of Mathematics, University of Pittsburgh, 1995-1999. Conducted recitation sections, graded and gave occasional lectures for Calculus 1, Calculus 2, Calculus 3, Online Calculus 1, Business Calculus, College Algebra.
- Department of Mechanical Engineering, 1999-2003. Graded and gave occasional lectures for Freshman Engineering, Fluid Dynamics, Vibrations, Continuum Mechanics and Differential Equations.

Other

- Served as Co-Advisor for Mechanical Engineering final project course (ME1043) at University of Pittsburgh for spring 2002, summer 2002, fall 2002, spring 2003, summer 2003, fall 2003 and spring 2004 terms.
- Served as Teaching Assistant for course in Continuum Mechanics at Workshop on Biomathematics, MSRI (Berkeley), June 2002.
- Supervised Student for Independent Study in Physics I at Department of Science, Robert Morris University.
- Gave guest lectures in graduate Continuum Mechanics, Mathematical Methods for Engineers and Advanced Fluid Dynamics courses.

Graduate Coursework

- *Mathematics*: Complex Analysis, Functional Analysis, Group Theory, Differential Geometry, Topology, Ordinary Differential Equations, Partial Differential Equations, Fractal Geometry, Continuum Mechanics.

- *Physics/Engineering:* Classical Mechanics, Quantum Mechanics, Electricity & Magnetism, Fluid Dynamics, Elasticity, Non-Newtonian Fluids, Viscous Fluids, Multiphase Flow, Stellar Astrophysics, Hydrodynamic Stability.

Professional Memberships/Service

- American Mathematical Society
- Society for Industrial and Applied Math
- American Society of Mechanical Engineers
- Reviewer for *Mathematical Reviews*.
- Co-Editor of Buhl Planetarium (Pittsburgh, PA) Quarterly Newsletter.

Computer Experience

- Programming in Fortran
- Familiar with Matlab, Mathematica, Maple, Excel and LaTex packages.
- Familiar with ADINA fluid dynamics analysis software.

Research Proposals Written

- A Mathematical and Experimental Study of Periodic Oscillation of Bodies in a Flow Chamber (PI), Mathematical Sciences Postdoctoral Research Proposal, Nov. 2003, Not Funded.

- Orientation of Rigid Bodies in Newtonian and Non-Newtonian Liquids (Co-PI), Small Grants Research Proposal, University of Pittsburgh, May 2001, Not Funded.
- Polarization Observations of Herbig Ae/Be Stars (Co-PI), REU Grant, American Astronomical Society, May 1994, Funded.

References

- Dr. Giovanni P. Galdi (Advisor), Professor, Dept. of Mechanical Engineering, Benedum Engineering Hall, University of Pittsburgh, Pittsburgh, PA 15261. Phone: 412-624-9789, Fax: 412-624-4846, Email: galdi@engr.pitt.edu

- Dr. Anne M. Robertson, Associate Professor, Dept. of Mechanical Engineering, Benedum Engineering Hall, University of Pittsburgh, Pittsburgh, PA 15261. Phone: 412-624-9775, Fax: 412-624-4846, Email: annerob@engr.pitt.edu

- Dr. William Troy, Professor, Dept. of Mathematics, University of Pittsburgh, Pittsburgh, PA 15260.
  Email: troy@math.pitt.edu

- Dr. George Sparling, Associate Professor, Dept. of Mathematics, Thackeray Hall, University of Pittsburgh, Pittsburgh, PA 15260.
  Phone: 412-624-8342, Email: sparling@math.pitt.edu

- Dr. Allen Lias, Department Chair and Professor, Dept. of Mathematics, Robert Morris University, 881, Narrows Run Road, Moon Township, PA 15108. Phone: 412-604-2507, Email: lias@rmu.edu (teaching letter)