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## Curriculum Vitae

### ANDREA PROSPERETTI

**Address:** Department of Mechanical Engineering, Johns Hopkins University  
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#### Education

Ph.D. in Engineering Science, California Institute of Technology, June 1974  
M.Sc. in Engineering Science, California Institute of Technology, June 1972  
Laurea in Fisica, Università di Milano, March 1968 (summa cum laude)

#### Professional Experience

1998 - Gerrit Berkhoff Professor of Applied Physics  
University of Twente, The Netherlands (part-time)

1994- Charles A. Miller Jr. Professor of Mechanical Engineering  
Johns Hopkins University

1988-1991 Professor and Chairman, Department of Mechanical Engineering  
Johns Hopkins University

1985 - Professor of Mechanical Engineering  
Johns Hopkins University

1976-1985 Associate Professor of Physics  
Università di Milano and Politecnico di Milano

1975-1976 Assistant Professor of Physics, Università di Milano

1974-1975 Postdoctoral Fellow in Engineering Science  
California Institute of Technology

1969-1971 Research Fellow, Istituto di Fisica, Università di Milano

1968-1969 Research Fellow, Comitato Nazionale per L'Energia Nucleare,  
Frascati National Laboratories

## Honors

European Fluid Mechanics Prize, 2014  
Modesto Panetti & Carlo Ferrari International Prize for Applied Mechanics  
Academy of Sciences of Turin (Italy) 2014  
Elected to the US National Academy of Engineering, 2012  
Silver Medal for Physical Acoustics, Acoustical Society of America, 2012  
Midwest Mechanics Lecturer, 2010-2011  
Fluids Engineering Award, American Society of Mechanical Engineers 2005  
Senior Award, International Conference on Multiphase Flow 2004  
Otto Laporte Award, American Physical Society Division of Fluid Dynamics 2002  
Lifetime Achievement Award, the Japanese Society of Multiphase Flow, 2001  
Foreign Member, Royal Netherlands Academy of Arts and Sciences, 2000  
Fellow of the American Physical Society  
Fellow of the Acoustical Society of America  
Fellow of the American Society of Mechanical Engineers  
Research Award, Japanese National Maritime Research Institute, June 2001  
  
Strani Lecture, Department of Aeronautical Engineering, University of Rome (Italy),  
October 3 2006  
Gurley Lecture, Department of Mechanical Engineering, Aeronautical Engineering,  
and Mechanics, Rensselaer Polytechnic Institute, March 2001

## Scientific Publications

Single author of approximately 40 and co-author of over 160 papers  
in refereed journals (conference papers not included)  
Author of 1 book; co-author/editor of 1 book

## Visiting appointments

Universite' Pierre et Marie Curie, Paris, June/July 2010  
Ecole Centrale de Lyon, June 2009  
Mitsubishi Visiting Professor, University of Tokyo, Sept-Dec. 1991  
Visiting scientist, Courant Institute of Mathematics, March and June 1982  
Visiting Associate Research Engineer, Nuclear Engineering Laboratory,  
University of California at Los Angeles, summers of 1979-1982;  
Visiting Scientist, Department of Physics, Freie Universitat, West Berlin, Summer of 1969

## Professional Activities

- JOURNAL EDITORIAL BOARDS

Editor in Chief, *International Journal of Multiphase Flow*, 2008-  
Associate Editor for Letters, *The Physics of Fluids*, 2002-2007  
Associate Editor, *The Physics of Fluids*, 1998-2010

Member of the Editorial Committee, *Annual Review of Fluid Mechanics*, 1/2007 - 12/2011  
Associate Editor, *International Journal of Multiphase Flow*, 1997-2007  
Member of the Editorial Board, *Bubble Science, Engineering and Technology*, 2009-  
Guest Editor, *Annual Review of Fluid Mechanics*, 1999 - 2000  
Member of the Advisory Board for the *Japanese Society of Mechanical Engineers*  
*International Journal*, 1997-1998  
Co-Editor, *ZAMP - Zeitschrift für Angewandte Mathematik und Physik*, 1998-2011  
Associate Editor, *ASME Journal of Fluids Engineering*, 1990-1993  
Associate Editor, *Meccanica*, 1990-1995

- AMERICAN SOCIETY OF MECHANICAL ENGINEERS

Honors Representative, *Multiphase Flow Technical Committee*,  
ASME Fluids Engineering Division, 2000-2002  
Chair, *Multiphase Flow Technical Committee*,  
ASME Fluids Engineering Division, 1998-2000  
Vice-Chair, *Multiphase Flow Technical Committee*,  
ASME Fluids Engineering Division, 1996-1998  
Initiator, organizer, and co-organizer of the *Open Forum on Multiphase Flow:*  
*Work in Progress*, ASME Fluids Engineering Division summer meetings, 1994-2004  
Co-organizer of the *International Symposium on Numerical Methods in Multiphase Flow*,  
ASME Fluids Engineering Division summer meetings 1998, 2000, 2002, 2004

- AMERICAN PHYSICAL SOCIETY

Conference Chair, 64th Annual Meeting of the Division of Fluid Dynamics, Baltimore, 2011  
Chair of the Acrivos Dissertation Award, 2010  
Chair of the Physics of Fluids Prize Committee, 2000  
Member of the Fluid Dynamics Prize Committee of the Fluid Dynamics Division,  
1992-1994  
Member of the American Institute of Physics Review Committee for the journal,  
*The Physics of Fluids*, 1992  
Member of the Physics of Fluids Prize Committee, 1991  
Member of the American Physical Society Study Group on *Technical Aspects of the,*  
*Efficient Use of Energy*, Princeton, July-Aug. 1974

- FUNDING AGENCIES

Member of the European Research Council Starting Grant Evaluation Committee, 2014  
Member of a proposal evaluation committee for the German DFG-Priority Programme  
SPP 1506 “Transport Processes at Fluidic Interfaces”, 2009  
Member of a proposal evaluation committee for the Research Council of Norway,  
2009, 2010, 2011  
Member or chair of proposal evaluation committees for the National Science Foundation,  
1989, 1992, 1997, 1998, 1999, 2000, 2007, 2008, 2011

Member or chair of NASA Review Panels, 1991, 1993, 1996, 1997, 2001, 2002, 2003  
Member of NIST proposal Review Panels, 1997, 1999  
Member of Department of Energy committees for the evaluation of major proposals,  
1988, 1989  
Member of the Advisory Committee of the Chemical and Thermal Systems Division,  
National Science Foundation, 1989

- CONFERENCE ORGANIZATION

Co-Chair, International Conference on Numerical Methods in Multiphase Flow,  
Penn State, 2012  
Conference Chair, 64th Annual Meeting of the Division of Fluid Dynamics, Baltimore, 2011  
Co-Chair of the *IUTAM Symposium on Computational Approaches to Disperse Multiphase  
Flow*, Argonne National Laboratory, October 4-7, 2004

- CONFERENCE COMMITTEES (selected)

Member of the Scientific Committee of the 2nd International Conference on Numerical  
Methods in Multiphase Flow, Darmstadt, 2014  
Member of the Scientific Committee of the 8th International Conference on Multiphase Flow  
(ICMF 2013) Cheju, Korea 2013  
Member of the Scientific Committee International Symposium on Cavitation CAV2009  
Ann Arbor 2009  
Co-chair of the Pre-Nominated Session on *Drops and Bubbles*, XXII International Congress  
of Theoretical and Applied Mechanics Adelaide, August 2008  
Member of the Scientific Committee of the *6th International Conference on Multiphase Flow*,  
Leipzig, July 2007  
Member of the Scientific Committee of Euromech Colloquium 479 *Numerical Simulation of  
Multiphase Flow with Deformable Interfaces*, Scheveningen, The Netherlands, 2006  
Co-chair of the Pre-Nominated Session on *Drops and Bubbles*, XXI International Congress  
of Theoretical and Applied Mechanics Warsaw, Poland, August 15-21, 2004  
Member of the Scientific Committee of the *5th International Conference on Multiphase Flow*,  
Yokohama, June 2004  
Member of the Scientific Committee of the *4th International Conference on Multiphase Flow*,  
New Orleans, June 2001  
Member of the Scientific Committee of the *3rd International Conference on Multiphase Flow*,  
Lyon, June 1998  
Member of the Scientific Committee of the *IUTAM Symposium on Bubble Dynamics and  
Interface Phenomena*, Birmingham, September 1993  
Member of the Scientific Committee of the Workshop on *Natural Mechanisms of  
Surface-Generated Noise in the Ocean*, La Spezia, June 1987  
Member of the Scientific Committee of the *International Symposium on  
Two-Phase Annular and Dispersed Flows*, Pisa, June 1984;  
Member of the Scientific Committee of the *IUTAM Symposium on the Physics of*

*Bubbles in Liquids*, Pasadena, June 1981;  
Member of the Scientific Committee of the *Symposium on Cavitation and Inhomogeneities in Underwater Acoustics*,  
Göttingen, July 1979;

- MISCELLANEOUS

Chair of the Honors Committee, International Conference on Multiphase Flow, 2004-2007  
Elected to the Governing Board of the International Conference on Multiphase Flow,  
2001-2007  
Member of the Committee on Physical Acoustics, Acoustical Society of America,  
2001-2004, 2005-2007  
Member of the Executive Committee of the Institute for Multifluid Science and Technology,  
University of California at Santa Barbara, 1997-2000  
Member of the Committee on Acoustical Oceanography, Acoustical Society of America,  
1991-1994  
Member of the Visiting Committee of the Department of Advanced Technology,  
Brookhaven National Laboratory, 1994-1998  
Corresponding Member of the *Euromech Colloquia Organization*, 1980-1985;

## Courses Taught

- *Johns Hopkins University*
  - Introduction to Mechanical Engineering (freshman)
  - Heat Transfer (junior)
  - Mechanical Vibrations (junior)
  - Introduction to Fluid Mechanics (junior)
  - Fluid Mechanics I (graduate)
  - Introduction to Acoustics (junior/senior)
  - Mechanics of Flight (junior/senior)
  - Compressible Flow (junior/senior)
  - Physical Acoustics (graduate)
  - Convective Heat Transfer (graduate)
  - Mathematical Methods of Engineering (2 semesters; graduate)
  - Fundamentals of Two-Phase Flows (advanced graduate)
  - Perturbation Methods (advanced graduate)
  - Hydrodynamic Stability (advanced graduate)

- Linear Dispersive Waves (advanced graduate)
- Topics in Applied Mathematics for Engineering (advanced graduate)
- *University of Tokyo*
  - Elements of Multi-Phase Flow (graduate)
- *University of Milano and Politecnico of Milano (Italy)*
  - Electromagnetism and Optics (sophomore)
  - Quantum Mechanics (junior)
  - Numerical Physics (junior)
  - Fluid Mechanics (senior)
  - Kinetic Theory of Gases (graduate)
- *Short Courses*
  - Short course on *Multiphase Flow*, CRS4, Cagliari, Italy, June 2003
  - Short course on *Drop-Surface Interactions*, International Centre for Mechanical Sciences, Udine, Italy (with 5 other lecturers), July 2000
  - Short course on *Bubble Dynamics and Multiphase Flow*, Burgerscentrum, University of Twente, The Netherlands, January 2000 (With Prof. D. Lohse)
  - Short course on *Bubble Dynamics and Bubbly Liquids*, National University of Singapore, 1998
  - Short course on *Multiphase Flow*, Tokyo 1996
  - Short course on *Multiphase Flow*, Tokyo 1997 (with 3 other speakers)
  - Short course on *Multi-Phase Flows*, University of Cagliari, Italy, April 1990

## Ph.D. Student Supervision

1. DONG HYUK KIM. Doctoral dissertation title: *Computational Analysis of Pressure Wave Propagation Phenomena in Bubbly Liquids*. Johns Hopkins, 1988
2. STEPHEN A. WILKERSON. Doctoral dissertation title: *Mechanics of Underwater Explosions*. Johns Hopkins, 1989
3. ADRIANO M. LEZZI. Doctoral dissertation title: *Topics in Free-Surface Flows*. Johns Hopkins, 1990
4. NAN Q. LU. Doctoral dissertation title: *Bubble Clouds as Sources and Scatterers of Underwater Sound*. Johns Hopkins, 1990

5. RAMANI DURAISWAMI. Doctoral dissertation title: *Pressure Wave Propagation in Condensing Fogs*. Johns Hopkins, 1990
6. VINOD KAMATH. Doctoral dissertation title: *A Numerical Study of Nonlinear Gas Bubble Oscillations*. Johns Hopkins, 1991
7. JAMES V. SATRAPE. Doctoral dissertation title: *Interactions and Collisions of Bubbles in Thermocapillary Motion*. Johns Hopkins, 1992
8. DUAN ZHONG ZHANG. Doctoral dissertation title: *Ensemble Phase Averaged Equations for Multiphase Flows*. Johns Hopkins, September 1993
9. KAUSIK SARKAR. Doctoral dissertation title: *Effective Boundary Conditions for Rough Surfaces & Acoustics of Oceanic Bubbles*. Johns Hopkins, March 1994
10. MASAO WATANABE. Doctoral dissertation title: *Topics in Bubbly Liquid Flows and Cavitation*. Johns Hopkins, January 1995
11. HE YUAN. Doctoral dissertation title: *Some problems in the mechanics of gas bubbles in liquids*. Johns Hopkins, October 1996
12. DAVID HAN. Doctoral dissertation title: *Shape Decomposition Technique in Electrical Impedance Tomography*. Johns Hopkins, December 1996
13. DARREN HITT. Doctoral dissertation title: *Analytical and Experimental Topics in Micro-Fluid Dynamics*, Johns Hopkins, December 1997
14. MARCO MARCHIORO. Doctoral dissertation title: *Numerical closure of averaged equations for disperse two-phase flows*, Johns Hopkins, February 1999
15. SERGEY KARPOV. Doctoral dissertation title: *Nonlinear Phenomena in Thermoacoustics and Bubbly Liquids*. Johns Hopkins, May 2000
16. YUE HAO. Doctoral dissertation title: *Numerical Studies of Gas and Vapor Bubble Phenomena*. Johns Hopkins, June 2002
17. VIJAYANAND S. MOHOLKAR. Doctoral dissertation title: *Intensification of Textile Treatments: Sonoprocess Engineering* (co-advised with Dr. Warmoeskerken), University of Twente, June 2002
18. BERNARD KOEHR. Doctoral dissertation title: *An Experimental Study of the Mechanism of Air Entrainment by Planar Liquid Jets at a Free Surface*. Johns Hopkins, September 2002
19. ZHIZHONG YIN Doctoral dissertation title: *Microbubbles and Their Microfluidics Applications*. Johns Hopkins, October 2004
20. JANELLE O. VORREITER Doctoral dissertation title: *Analytical and Numerical Investigations of Bubble Behavior in Electric Fields*. Johns Hopkins, January 2005

21. PETER VAN DIJK. Doctoral dissertation title: *Acoustics of Two-Phase Pipe Flows* (co-advised with Dr. Arie Biesheuvel), University of Twente, May 2005
22. XIAOZHEN LU Doctoral dissertation title: *Numerical Simulation and Axial Stability Analysis of Vertical Slug Flow*. Johns Hopkins, January 2006
23. BINZE YANG Doctoral dissertation title: *Numerical Studies of Single Gas and Vapor Bubble Flows*. Johns Hopkins, February 2006
24. XU GENG Doctoral dissertation title: *Some applications of gas and vapor bubbles*. Johns Hopkins, October 2006
25. QUAN ZHANG Doctoral dissertation title: *Flow of non-uniform suspensions*. Johns Hopkins, May 2008
26. LORENZO BOTTO (Johns Hopkins) Doctoral dissertation title: *Numerical Simulation of Extended Particles in a Fluid Flow*. Johns Hopkins, September 2009
27. JOHANNA J. BLUEMINK (co-advised with D. Lohse and L. van Wijngaarden). Doctoral dissertation title: *Bubbles and particles in a cylindrical rotating flow*, University of Twente, December 2008
28. EDIP CAN. Doctoral dissertation title: *Numerical Computation of Free-Surface Flows*, University of Twente, May 2010
29. LAURA STRICKER (co-advised with D. Lohse). Doctoral research project: *Bubble dynamics in ultrasonic fields and their sonochemical implications*; University of Twente, January 2013
30. RAJA LAKKARAJU (co-advised with D. Lohse). Doctoral research project: *Two-phase Rayleigh-Bénard flows*; University of Twente, January 2013
31. ADAM SIERAKOWSKI, Johns Hopkins University, expected graduation 2016
32. SHIGAN CHU, Johns Hopkins University, expected graduation 2017
33. YAYUN WANG, Johns Hopkins University, expected graduation 2018

### **M.S. Student Supervision**

1. HENK BULTHUIS. Topic: Averaged equations for bubbly flows (1995)
2. X. CHENG. Topic: Proper orthogonal decomposition applied to bubble oscillations (1993)
3. L. ZHANG. Topic: Sound propagation around sea mounds (1995)
4. XUEMEI CHEN. Topic: Gas bubbles in microchannels (1998)
5. WEI WANG. Topic: Averaged equations for disperse two-phase flows (2000)
6. HUA XIAO. Topic: Bjerknes forces on vapor bubbles (2002)



7. YUE LI. Topic: Modeling of Free-Surface Flow in Microchannels (2004)
8. HUGO ANBEEK. Topic: Flow in a partially obstructed channel (University of Twente, 2008)
9. ALEX ENGLÉSBE. Topic: Pressure waves in a supersaturated bubbly liquid, 2012

### **Other Graduate Student Supervision**

1. SHENG ZHAO (Johns Hopkins) 2012/2013
2. LAURA LUKASSEN (Johns Hopkins) Fall 2012
3. LAURA STRICKER (Johns Hopkins) Fall 2011
4. MARK STIJNMAN (University of Twente) 2002-2005
5. MAOSHENG REN (University of Twente) 2000
6. CHRIS SAGOVAC (Johns Hopkins) 1994
7. YONG ZHANG (Johns Hopkins) 1995-1996
8. JOHN SOKOLOVICH (Johns Hopkins) Fall 1996
9. TONY BOUQUOT (Johns Hopkins) 1991-1992
10. J. CHOU (Johns Hopkins) 1988

### **Post-Doctoral Fellow Supervision**

1. Dr. Hasan N. Oğuz, 1988-2001 (Johns Hopkins)
2. Dr. Hyun S. Kim, 1992-1993 (Johns Hopkins)
3. Dr. Huaxiong Huang, 1994-1995 (Johns Hopkins)
4. Dr. Vasil Harik (Johns Hopkins)
5. Dr. Yonggang Zhu, 2000 (Johns Hopkins)
6. Dr. Michael Tanksley 1997-2000 (Johns Hopkins)
7. Dr. Emmanuel Ory, 1999-2000 (Johns Hopkins)
8. Dr. Claus Dieter Ohl 2000-2004 (Johns Hopkins and University of Twente)
9. Dr. Janwei Qi, 2000 (Johns Hopkins)
10. Dr. Changfeng Li, 2000-2001 (Johns Hopkins)
11. Dr. Zhongzhen Zhang, 2001-2005 (Johns Hopkins)
12. Dr. Kengo Ichiki, 2002-2004 (Johns Hopkins)
13. Dr. Mauro Sbragaglia, 2006-2007 (University of Twente)
14. Dr. Paolo Oresta, 2008-2009 (University of Twente)
15. Dr. Qianlong Liu, 2008-2010 (Johns Hopkins)
16. Dr. Kristjan Gudmundsson, 2010-2011 (University of Twente)
17. Dr. Tuan Tran, 2011- (University of Twente)
18. Dr. Henri Lhuissier, 2011- (University of Twente)
19. Dr. Bahni Ray, March 2012 - April 2013 (Johns Hopkins)
20. Dr. Yu-Hau (Howard) Tseng, April 2013 - (Johns Hopkins)

## University Administration

- Member of the Hopkins Homewood Academic Council, 1988/1989 and 1995-2000;
- Program Chair, Hopkins Part-Time Masters' Program in Mechanical Engineering, 1989/90; 1995-2001; 2011-
- Chair of the committee establishing the Board of Review and, subsequently, of the Board of Review, 1991-1999
- Chairman of the Hopkins Department of Mechanical Engineering, 1988-1991
- Responsible for ABET accreditation of ME Department (granted, 1991);
- Member of several Hopkins University committees: Homewood Arts Task Force, Montgomery County Center, Human Climate, Sudler Arts Prize, Whiting School Space Committee, Wolman Fellowships, and others;
- Member and chairman of many search committees for Thermo-Fluid Mechanics positions;
- Member and chairman of many promotion and appointment committees;
- Academic advisor, ME undergraduate class of 1990, 1994, 2000, 2005, 2009;
- Member and chairman of many Graduate Board Oral exams.