

April 2013

## VINCENT P. MANNO

### PERSONAL

Date of Birth: December 4, 1954  
Married: Mariann Montine Manno  
Children: Elizabeth, Michael, and Christopher

### **Work:**

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### EDUCATION

Sc.D. (Nuclear Engineering) - Massachusetts Institute of Technology (1983)  
Nuclear Engineer- Massachusetts Institute of Technology (1979)  
M.S. (Nuclear Engineering) - Massachusetts Institute of Technology (1978)  
B.S. (Nuclear Engineering Science) - Columbia University (1976)

### EMPLOYMENT

#### **Academic:**

#### Franklin W. Olin College of Engineering

Provost and Dean of Faculty (2011-present)  
Professor of Engineering (2011-present)

#### Tufts University

Adjunct Professor of Mechanical Engineering (2011-present)  
Associate Provost (2004-2011)  
Dean *ad interim*, School of Engineering (2003)  
Associate Dean of Engineering (2002-2006)  
Department Chair (1993-2002)  
Professor of Mechanical Engineering (1999-2011)  
Associate Professor of Mechanical Engineering (1990-1999)  
Assistant Professor of Mechanical Engineering (1984-1990)

#### Massachusetts Institute of Technology

Research Affiliate (1988-1993)  
Visiting Assistant Professor of Nuclear Engineering (part-time) (1984-1987)  
Postdoctoral Associate (1983)

#### **Industrial & Other Appointments:**

U.S. Navy Senior Summer Faculty Fellow - Naval Underwater Systems Center (1988)  
Engineer - Controls Group, Stone & Webster Engineering Corp. (1983-84)  
Engineer - American Electric Power Corp. (1978-1981)

**Consulting:**

Altran Corp., C. S. Draper Laboratory, Condenser and MSR Consultants, Inc., Electric Power Research Institute, EPM, Inc., Ford Motor Co., NETGroup, Norton Company, Ontario Hydro, Panametrics, Inc., Thermal Form and Function, University Research Engineers & Associates.

**HONORS AND PROFESSIONAL ACTIVITIES**

Tau Beta Pi Engineering Honor Society (1975)  
American Nuclear Society Award for Outstanding Senior (1976)  
Alpha Nu Sigma Nuclear Engineering Honor Society (1978)  
U.S. Department of Energy Fellowship (1982)  
Ralph R. Teetor Educational Award, Society of Automotive Engineers (1986)  
ASME Membership Development Achievement Award (1988)  
Guest Editor, *IEEE Transactions on Components and Packaging Technology* (1994-2002)  
Review Committee, Nuclear Engineering Division at Argonne National Laboratory (1998-2001)  
Tufts ASME Student Section Award of Excellence (2001)  
Harvey Rosten Award for Excellence in the Physical Design of Electronics (2002)  
2002 ASME Curriculum Innovation Award (2002)  
Fellow, American Society of Mechanical Engineers (2004)  
Tufts University Henry and Madeline Fischer Award for "Engineers Teacher of the Year" (2005)  
Outside PhD Examiner, Visvesvaraya Technological University, Belgaum, India (2007)  
Elected "Last Lecture" speaker for the Tufts Class of 2010 (2010)  
Tufts University Seymour O. Simches Award for Distinguished Teaching and Advising (2011)

**Listed in (various years):**

*American Men and Women of Science*  
*Leading Scientists of the World - 2011*  
*Men of Achievement*  
*Who's Who in America*  
*Who's Who in American Education*  
*Who's Who in Administration Higher Education*  
*Who's Who in Science and Engineering*  
*Who's Who in the East*  
*Who's Who of Emerging Leaders in America*

**Memberships and Activities:**

American Association for the Advancement of Science  
American Society of Engineering Education  
    Board of Directors, Engineering Research Council (2011-present)  
    Global Leadership Forum (2012-present)  
American Society of Mechanical Engineers  
    Nuclear Engineering Division Plant Systems Subcommittee (1984-86)  
    Executive Committee, Boston Section (1987-1990), Co-chair (1989)  
    Region I Operating Board - Secretary (1992-93)  
    Region I ME Department Heads - Secretary (1995-97, 2000-01)  
    Fellow (elected 2004)  
Association of Governing Boards (2012-present)  
Institute of Electrical and Electronic Engineers - Components and Packaging Technology

Annual IEEE SEMI-THERM Symposium  
Program Chair (1995), General Chair (1996), Steering Committee (2002-2007)

Tufts University (Workshop Convener)  
Annual Thermal Manufacturing Workshops (1997-2002)  
“Challenges and Opportunities for the Medical Device Industry” (2004)  
“The Genie Travels On: The Challenges of Emergent Nuclear States” (2011)

**Reviewer (various years) for:**

Addison-Wesley Publishing Company

*AIAA Journal*

American Nuclear Society: Thermal-Hydraulics Division

American Society of Engineering Education: Mechanical Engineering Division

American Society of Mechanical Engineers: Fluids Engineering Division, Heat Transfer  
Division, Electronics Packaging Division

*Chemical Engineering Communications*

Department of Energy

*Electrochemical and Solid State Letters*

*Heat Transfer Engineering*

*IEEE Transactions on Components, Packaging and Manufacturing Technology*

*International Journal of Computational Fluid Dynamics*

*International Journal for Numerical Methods in Engineering*

*International Journal for Numerical Methods in Fluids*

*International Journal of Heat and Mass Transfer*

*International Journal of Thermal Sciences*

International Network for Engineering Education and Research - INEER

Irwin Publishing Company

Italian Ministry for University Education and Research (MIUR)

*Journal of Dynamic Systems, Measurement and Control*

*Journal of the Electrochemical Society*

*Journal of Electronics Packaging*

*Journal of Energy Engineering*

*Journal of Fluids Engineering*

*Journal of Heat Transfer*

Macmillan Publishing Company

McGraw-Hill Publishing Company

*Microelectronics Reliability*

National Science Foundation

Naval Undersea Warfare Center, U.S. Navy

*Nuclear Engineering and Design*

*Nuclear Safety*

*Scientific Journal International*

*Thin Solid Films*

U.S. Civilian Research & Development Foundation

**Patents:**

Laminar Air Jet Cooling of Heat Producing Components (with J. Guarino) – Tufts  
University, assignee – U.S. Patent 6603658 – issued August 5, 2003

## **TEACHING AND SERVICE AT F. W. OLIN COLLEGE OF ENGINEERING (2011 –present)**

### **Teaching:**

ENGR 1121 – Real World Measurements  
MTH 3150 – Numerical Methods and Scientific Computing

### **Service:**

Babson College Graduate School Advisory Board (2011)  
College Board Academic Assembly Delegate (2012 – present)  
Commencement Committee, Chair (2011-present)  
President’s Cabinet (2011-present)

## **TEACHING AND SERVICE AT TUFTS UNIVERSITY (1984-2011)**

### **Teaching:**

EN 12ME – Power Production (course originator)  
ES 8 – Fluid Mechanics  
ME 1 – Introduction to Mechanical Engineering (2002 ASME Curriculum Innovation Award)  
ME 11 – Applied Thermodynamics  
ME 19 – Project Laboratory  
ME 43 – Senior Design Projects  
ME 65 – Applied Fluid Mechanics  
ES 101 – Numerical Methods  
ME 112 – Advanced Heat Transfer  
ME 145 – Power Generation Systems (course originator)  
ME 149 – Electronic System Thermal Analysis (course originator)  
ME 149 – Computational Methods in Thermal Manufacturing (course originator)  
ME 168 – Fluid Mechanics and Heat Transfer Seminar  
ME 212 – Computational Thermal-Fluid Dynamics (course originator)

### **Service:**

#### **University-Wide**

Academic Council (2003-2011)  
Academic Strategy Forum (2004-2007)  
Ad-hoc Computational Server Strategic Planning Group (1999-2001)  
Ad-hoc Patent Review Committee (2004)  
Graduate and Professional Student Admissions Recruitment Committee, Chair (2007-2011)  
Strategic Planning Group (2000-2001)  
Information Technology Council (1997-2003)  
Institutional Lead – 2009 Team Boston DOE Solar Decathlon Project (2007-2009)  
Library and Information Resources Accreditation Committee (2001-2002)  
Provost’s Council (2003-present)  
Provost’s Executive Committee (2008-present)  
Research and Graduate Programs Council, Co-chair (2005-present)  
Review Committee for HED Africa-U.S. Higher Education Initiative Planning Grants (2009)  
ROTC Task Force – Chair (1996-97)  
Scholars at Risk Network, Institutional Representative (2008-2011)  
University Council on Graduate Education, Convener (2004-2010)

### Arts, Sciences & Engineering

Ad hoc Committee on Faculty Development (1999-2000)  
Annual Fund Faculty Financial Aid Fund Advisory Board (1997-1998)  
Arts, Sciences & Engineering Council (2002-2005)  
Berger Family Technology Transfer Endowment Advisory Board (1997-2001)  
Capital Campaign Steering Committee (1993-1998)  
Center for Teaching Excellence Advisory Committee (1996-1999)  
Center for Writing, Thinking and Speaking Steering Committee (1998-2000)  
CENTA Director Search Committee (1997-98)  
Committee on Campus Planning (1988-1989)  
Committee on Computer Network Services (1989-1992)  
Committee on Computer Usage and Facilities (1985-1988), (1996-2002), Co-chair (1996-2000)  
Committee on Undergraduate Advising and Counseling (1989-1991)  
Department Chairs Agenda Committee (1995-1996, 1999-2001)  
Information Technology Management Team (1996-2002)  
Search Advisory Committee, Graduate School of Arts & Sciences Dean (2006)

### School of Engineering

Ad-hoc Committee for First Year Computer Course, Chair (1993)  
Ad-hoc Committee on Lufkin Library (1994-1996)  
Berger Chair Search Committee (1997-98)  
Computational Coordinating Committee (1990-1991), Chair (1990-1991)  
Engineering Graduate Studies Committee, Chair (2000-2005)  
Ethics in Engineering Advisory Committee (1998)  
Executive Committee (1993-2005), Chair (2003)  
Graduate Engineering Working Group, Chair (1999-2000)  
Long Range Planning Group (1993-1995)  
Search Committee for Gordon Institute Director, Chair (2005-2007)

### Department of Mechanical Engineering

BSME Program Director (2005)  
Department Chair (1993-2001)  
Computational Mechanics Studio Director (1988-1993), Co-director (2002-2005)  
Curriculum Committee (1985-1993), Chair (1985-1989)  
Faculty Search Committees – chaired several - (1987, 1989, 1990, 1993, 1994, 2000, 2003, 2005, 2007, 2009, 2010)  
Faculty Advisor to ASME Student Section (1985-1988, 2009)

## RESEARCH SUPPORT AND ACTIVITIES

### Areas of Interest

- Computational and Experimental Investigation of Thermal-Fluid Phenomena
- Engineering of Power Generation Systems
- Engineering Curriculum Development

### Research Support

Funding to Date - Approximately \$2M with \$0.4M indirect cost recovery. Amounts for some grants prior to 1995 are best estimates. (Only activities as PI or segregated direct costs as co-PI included.)

Advanced Nuclear Power Plant Simplification - Electric Power Research Institute - 1985-1987, \$10,000

Reducing Numerical Diffusion In Computational Thermal-Fluid Dynamics - Tufts University Summer Research Fellowship - 1986, \$3,000

Simplified Boiling Water Reactor - U.S. Department of Energy/General Electric Company - Tufts PI (with M.I.T) - 1986-1988, \$10,674

Thermal Environmental Testing of Composites - Bolt, Berenak & Newman - 1987, \$12,000

Simulation of Transient Stratification Dynamics in Enclosures - IBM Academic Systems Grant - 1987-1988, 1000 hours of IBM 3090 time plus unlimited technical support, no direct monetary funding

Numerical Prediction of Fluid Behavior - Shutterway Fluid Dynamics - U.S. Navy Summer Faculty Research Fellowship - 1988, \$12,000

Assessment of the Existing Knowledge Base for the Formulation of Dynamic Circulating Fluidized Bed Combustor Performance Models - Electric Power Research Institute - 1988-1989, \$20,000

Development of Integral Analysis Tools for Prediction of Thermal Conditions in Electronic Enclosures - AT&T Bell Laboratories - 1989-91, \$25,000

Hydrodynamic Test Problem Simulation - Charles S. Draper Laboratory - 1989, \$3,000

Development of Advanced Simulation Methods For Immersed Body Hydrodynamics - Charles S. Draper Laboratory, 1990 - \$37,325

Residual Stress Computer Support - U.S. Department of Transportation - PI - 1990, \$7,500

Development of CFD Methods for Fluid-Acoustic Simulation - Charles S. Draper Laboratory - 1991-3, \$142,565

Computational Fluid Dynamics Techniques for Fluid-Acoustic Simulation - National Science Foundation/Pittsburgh Supercomputing Center - Grant CBT910018P - 1991-92 - Cray YMP Supercomputer Time and support plus approximately \$3,000 in direct support

Integrated Computer Use in the Mechanical Engineering Curriculum - IBM - 1993-1994, several IBM PC's for research computing (list prices unknown)

Integration, Innovation and Information in the Mechanical Engineering Curriculum - Lufkin Memorial Fund - 1996-98, \$225,000

Graduate Fellowship Support - C.S. Draper Laboratory - 1997-1998, \$32,943

Tufts-Rensselaer Thermal Manufacturing Research-Curriculum Program - National Science Foundation - NSF Grant EEC 9700731 - 1997-2000, \$369,732

Research Experiences for Undergraduates Supplemental Grants - National Science Foundation - 1998-1999, \$33,600  
FLOTHERM Software & Support Grant - Flomerics, Inc. - PI - 1999, \$30,000 plus annual fee waver  
Enhanced Cooling of Portable Computers Using Mixed Natural and Jet Impingement Convection - Raytheon Corp. - 1999-2000, \$26,830  
Lufkin 2000 - Lufkin Memorial Fund - 2000-2003, \$200,000  
CMP of Cabot Pads - Cabot Microelectronics - PI with C. Rogers - 2000-2001, \$60,000  
Vacuum Pump Air Ejector Simulation - Nash Engineering Corp. - PI with B. Abedian - 2000, \$19,152  
Characterization of Chemical Mechanical Planarization Processes - Cabot Microelectronics Corp., Intel Corporation through NSF/ERC for Environmentally Benign Semiconductor Manufacturing - PI with C. Rogers - 2000-2008, \$675,000  
CMP of Small-Scale Dies - Draper Lab Fellowship - 2006-8, \$70,200  
In-situ CMP Characterization - SRC/Sematech Center for Environmentally Benign Semiconductor Manufacturing - PI with R. White and C. Rogers - 2008-9, \$64,600  
In-Situ CMP Characterization with Patterned Substrates - Intel Corp. - PI with R. White - 2008-9, \$64,521  
Aspen Aerogel Characterization - U.S. DOE - lead PI for modeling - 2009-10, shared direct costs  
Thermoelectric Module-Liquid Metal Substrate Assemblies for Reduced Power Precision Temperature Control - Peter and Denise Wittich Fund for Alternative Energy - PI with M. Hodes - 2010-11, \$30,771

**Theses Supervision as Primary Advisor:**

Completed: 5 Ph.D.  
38 M.S.  
3 B.S.

Current: None

## REFEREED TECHNICAL PUBLICATIONS

(Italic name implies student advisee)

### Journals:

1. **V.P. Manno**, "The Effect of Low Pressurized Water Reactor Containment Pressure on Peak Cladding Temperature", *Nuclear Technology*, 48(3), 1980, pp. 281-288.
2. **V.P. Manno**, M.W. Golay and K.Y. Huh, "Analytical Models of Hydrogen Transport in Reactor Containment Atmospheres", *Nuclear Science and Engineering*, 87(4), 1984, pp. 349-360.
3. **V.P. Manno** and M.W. Golay, "Application of the LIMIT Code to the Analysis of Hydrogen Transport", *Nuclear Technology*, 67(2), 1984, pp. 320-311.
4. **V.P. Manno** and M.W. Golay, "Containment Hydrogen Transport: A Survey of Analytical Models and Benchmark Experiments", *Nuclear Safety*, 25(6), 1984, pp. 797-814.
5. K.Y. Huh, M.W. Golay and **V.P. Manno**, "A Method for Reduction of Numerical Diffusion in the Donor Cell Treatment of Convection", *Journal of Computational Physics*, 63(1), 1986, pp. 201-221.
6. **V.P. Manno** and M.W. Golay, "Nuclear Power Plant Design Innovation Through Simplification", *Nuclear Engineering and Design*, 85, 1985, pp. 315-325.
7. **V.P. Manno** and M.W. Golay, "Analytical Modelling of Post Accident Containment Atmospheric Stratification", *Nuclear Technology*, 70, 1985, pp. 124-132.
8. P. Brock and **V.P. Manno**, "Industrial Cogeneration: Analysis of Energy Parks", *Journal of Energy Engineering*, 113(2), 1987, pp. 61-77.
9. M.W. Golay, **V.P. Manno** and C. Vlahoplus, Jr., "Non-Prescriptive Nuclear Reactor Regulation: The Example of Loss of Offsite Power", *Nuclear Safety*, 29(1), 1988, pp. 6-20.
10. A. Dehbi and **V.P. Manno**, "A Note: A Model of Steam Injector Performance", *Chemical Engineering Communications*, Vol. 95, 1990, pp. 107-119.
11. **V.P. Manno**, "A Simple Method For Reducing Numerical Integration Errors Near Singularities", *Communications in Applied Numerical Methods*, 4, 1988, pp. 713-716.
12. P.H. Seong, **V.P. Manno** and M.W. Golay, "Application of a Power Plant Simplification Methodology: The Example of the Condensate Feedwater System", *Nuclear Engineering and Design*, 110(1), 1988, pp. 33-46.
13. C. Gnafakis and **V.P. Manno**, "Transient Destratification in a Rectangular Enclosure", *Journal of Heat Transfer*, 111(1), 1989, pp. 92-99.
14. G. Ruocco and **V.P. Manno**, "A Performance Model of Bubbling Fluidized Bed Hydrodynamics", *Powder Technology*, 59(4), 1989, pp. 261-273.
15. M.W. Golay, P.H. Seong and **V.P. Manno**, "A Measure of the Difficulty of System Diagnosis and Its Relationship to Complexity", *International Journal of General Systems*, 16(1), 1989, pp. 1-23.



16. K. Azar, S.E. Develle and **V.P. Manno**, "Sensitivity of Simulated Circuit Pack Thermal Performance to Geometric Arrangement Variation", *IEEE Transactions on Components, Hybrids and Manufacturing Technology*, 12(4), 1989, pp. 732-740.
17. G. Leisk, **V.P. Manno** and K. Azar, "Effect of System Orientation and Cooling Mechanism on Component Thermal Impedances in an Electronic Enclosure", *IEEE Transactions on Components, Hybrids and Manufacturing Technology*, Vol. 13, No. 4, 1990, pp. 967-974.
18. S.H. Reitsma and **V.P. Manno**, "An Annotated Bibliography of Fluidized Bed Combustion Modeling Information", *Powder Technology*, Vol. 63, 1990, pp. 23-34. Also, abstracted in *Applied Mechanics Reviews*, Abstract 1264, Vol. 44, No. 5, 1991, p J596.
19. **V.P. Manno** and K. Azar, "Thermal-Fluid Interactions Of Neighboring Components On Air-Cooled Circuit Boards", *Journal of Electronic Packaging*, Vol. 113, 1991, pp. 374-381.
20. **V.P. Manno** and K. Azar, "Using a Thermal Simulation Model to Interpret Test Data", *IEEE Transactions on Components, Hybrids and Manufacturing Technology*, Vol. 15, No. 5, 1992, pp. 632-639.
21. **V.P. Manno**, S.H. Reitsma and T. F. Tureaud, "Developing Numerical Techniques For Solving Low Mach Number Fluid-Acoustic Problems", *AIAA Journal*, Vol. 31, No. 11, 1993, pp. 1984-1991.
22. P.H. Seong, M.W. Golay and **V.P. Manno**, "Diagnostic Entropy: A Quantitative Measure of the Impact of Signal Incompleteness on System Diagnosis", *Reliability Engineering and System Safety*, Vol. 45, 1994, pp. 235-248.
23. J. Burgos, **V.P. Manno** and K. Azar, "Achieving Accurate Thermal Characterization Using A CFD Code - A Case Study of Plastic Packages", *IEEE Transactions on Components, Packaging and Manufacturing Technology - Part A*, Vol. 18, No. 4, 1995, pp. 732-738.
24. S.H. Reitsma, **V.P. Manno** and T.F. Tureaud, "Numerical Simulation of Receptivity Phenomena in Transitional Boundary Layer Flows", *AIAA Journal*, Vol. 35, No. 5, 1997, pp. 789-795.
25. **V.P. Manno**, "Integrated Thermal Network Models Are Still Useful", *Electronics Cooling*, Vol. 3, No. 3, 1997, pp. 28-31. (invited paper).
26. A. Sbaibi and **V.P. Manno**, "On the Accuracy of Upwind and Symmetric TVD Schemes in Simulating Low Mach Number Flow", *International Journal of Computational Fluid Dynamics*, Vol. 13, 2000, pp. 125-142.
27. S.W. Coppen, **V.P. Manno** and C.B. Rogers, "Turbulence Characteristics Along the Path of a Heavy Particle", *Computers & Fluids*, Vol. 30, 2001, pp. 257-270.
28. J.R. Guarino and **V.P. Manno**, "Laminar Jet Impingement Convective Heat Transfer in Partially Vented Enclosures Typical of Portable Computer Applications", *IEEE Transactions on Components and Packaging Technology - Part A*, Vol. 25, No. 3, 2002, pp. 337-346.

29. J. Lu, C.B. Rogers, **V.P. Manno**, A. Philipossian, S. Anjur, and M. Moinpour, "Measurements of Slurry Film Thickness and Wafer Drag During CMP," *Journal of the Electrochemical Society*, Vol. 151, Issue 4, 2004, pp. G241-G247.
30. B. Ting and **V.P. Manno**, "Transient Thermal-Mechanical Simulation of Laser Hammering in Optoelectronic Package Manufacturing", *Journal of Electronic Packaging*, Vol. 127, No. 3, 2005, pp. 299-305.
31. A. Scarfo, **V.P. Manno**, C.B. Rogers, S. Anjur and M. Moinpour, "In-Situ Measurement of Pressure and Friction During CMP of Contoured Wafers", *Journal of the Electrochemical Society*, Vol. 152, No. 6, 2005, pp. G477-G481.
32. C. Gray, D. Apone, C. Rogers, **V.P. Manno**, C. Barns, M. Mansour, S. Anjur and A. Philipossian, "Viewing Asperity Behavior Under the Wafer During Chemical Mechanical Polishing", *Electrochemical and Solid State Letters*, Vol. 8, 2005, pp. G109-111.
33. C. Gray, R. White, **V.P. Manno** and C. B. Rogers, "Simulated Effects of Measurement Noise on Contact Measurements between Rough and Smooth Surfaces", *Tribology Letters*, Vol. 29, No. 3, 2008, pp. 185-192.
34. J. Vlahakis, C. Rogers, **V.P. Manno**, R. White, M. Moinpour, D. Hooper, and S. Anjur, "Synchronous, In-situ Measurements in Chemical Mechanical Planarization", *Journal of the Electrochemical Society*, 156(10), 2009, pp. H794-H802.
35. N. Mueller, C. Rogers, **V.P. Manno**, R. White, S. Anjur and M. Moinpour, "In-Situ Investigation of Slurry Flow Fields during CMP", *Journal of the Electrochemical Society*, 156(12), 2009, pp. H908-H912.
36. J. Vlahakis, **V.P. Manno**, C. Rogers and R. White, "Stick-Slip Transitions in Chemical Mechanical Planarization", *Electrochemical and Solid State Letters*, 13(6), 2010, pp. H206- H208.
37. C. Gray, C.B. Rogers, **V.P. Manno** and R. White, "Modeling of Dual Emission Laser Induced Fluorescence for Slurry Thickness Measurements in CMP", *Experiments in Fluids*, 51(1), 2011, pp 281-293.
38. R.D. White, A.J. Mueller, M. Shin, D.Gauthier, **V.P. Manno** and C.B. Rogers, "Measurement of Microscale Shear Forces during Chemical Mechanical Planarization", *Journal of the Electrochemical Society*, 158(10), 2011, pp. H1041-1051.
39. C. Melnick, M. Hodes, G. Ziskind, M. Cleary, **V.P. Manno**, "Reduced Power Temperature Control with Thermoelectric Module - Variable Conductance Heat Pipe Assemblies", *IEEE Transactions on Components, Packaging and Manufacturing Technology*, Vol. 2, No. 3, 2012, pp. 474-482.
40. R. Zhang, M. Hodes, D.A. Brooks and **V.P. Manno**, "Optimized Thermoelectric Module-Heat Sink Assemblies for Precision Temperature Control", *Journal of Electronic Packaging*, Vol 134 (2), 2012.
41. J. Griffin, D. Mills, M. Cleary, R. Nelson, **V.P. Manno**, and M. Hodes, "Continuous Extraction Rate Measurements During Supercritical-CO<sub>2</sub> Drying of Silica Alcogels", submitted to the *Journal of Supercritical Fluids*.

Refereed Conference Proceedings:

1. **V.P. Manno** and M.W. Golay, "Analytical Modelling of Post Accident Containment Atmospheric Stratification", Proceedings of the 3rd International Meeting on Nuclear Thermal Hydraulics, 1985, Paper No. 14A.
2. *B.K. Riggs*, M.W. Golay and **V.P. Manno**, "Droplet Condensation Heat Transfer in Nuclear Reactor Containment Sprays", Proceedings of the 3rd International Meeting on Nuclear Thermal Hydraulics, 1985, Paper No. 6D.
3. K.Y. Huh, M.W. Golay and **V.P. Manno**, "A Method for Reduction of Numerical Diffusion in the Donor Cell Treatment of Convection", Proceedings of the 23rd National Heat Transfer Conference, 1986.
4. *P. Brock* and **V.P. Manno**, "Industrial Cogeneration: Aspects of a New Approach", in Computer-Aided Engineering of Energy Systems, Vol. 2, R.A. Gaggioli, ed., ASME Publication AES 2-2, 1986, pp. 27-34.
5. **V.P. Manno** and *J.A. Haubold*, "A Finite Difference Convective Algorithm With Reduced Dispersion", in Numerical Methods in Thermal Problems, Vol. 5-2, R.W. Lewis et al., ed., Pineridge Press, 1987, pp. 1326-1337.
6. **V.P. Manno** and *R.E. Stakutis*, "Experimental Investigation of the Effect of Rib Spacing in an Asymmetrically Roughened Square Duct", Proceedings of the Third International Symposium on Laser Anemometry, A. Dybbs et al., ed., ASME Publication FED-Vol. 55, 1987, pp. 63-71.
7. M.W. Golay, P.H. Seong and **V.P. Manno**, "Design Simplification in Advanced Reactor Design", Proceedings of the 1988 Topical Meeting on the Safety of the Next Generation of Power Reactors, 1988.
8. *A. Dehbi* and **V.P. Manno**, "A Model of Steam Injector Performance", presented at the 1988 National Heat Transfer Conference, ANS Proceedings, HTC -Vol. 3, pp. 162-169.
9. K. Azar, *S.E. Develle* and **V.P. Manno**, "Sensitivity of Simulated Circuit Pack Thermal Performance to Geometric Arrangement Variation", presented at the 5th IEEE Semiconductor Thermal and Temperature Measurement Symposium - SEMITHERM V, 1989, pp. 112-120.
10. *G. Leisk*, K. Azar and **V.P. Manno**, "Effect of System Orientation and Cooling Mechanism on Component Thermal Impedances in an Electronic Enclosure", Proceedings of the 6th Annual IEEE Semiconductor Thermal and Temperature Measurement Symposium - SEMITHERM VI, 1990, pp. 17-24.
11. E.W. Hewitt, M.J. Horn and **V.P. Manno**, "Utilization of Jet Spreading Models in the Prediction of Local Condenser Conditions", Proceedings of the 2nd International Symposium in Condenser and Condensation, Bath, UK, 1990, pp. 257-267.
12. *J.R. Benson*, K. Azar and **V.P. Manno**, "Liquid Crystal Imaging for Temperature Measurement of Electronic Devices", Proceedings of the 7th Annual IEEE Semiconductor Temperature and Thermal Management Symposium, Phoenix, AZ, February 1991, pp. 23-33.

13. S.H. Reitsma and V.P. Manno, "A Fluid Dynamic Model Of A Circulating Fluidized Bed", Proceedings of the 11th International Conference On Fluidized Bed Combustion, Montreal, ASME, 1991, pp. 1431-1437.
14. K. Azar, J.R. Benson and V.P. Manno, "An Experimental Investigation of Microjet Impingement Heat Transfer", in Heat Transfer in Electronic Equipment - 1991, A. Ortega et al., eds., ASME HTD-Vol. 171, 1991, pp. 1-10.
15. V.P. Manno and K. Azar, "Using a Thermal Simulation Model to Interpret Test Data", Proceedings of the Eight Annual IEEE Semiconductor Temperature Measurement and Management Symposium, IEEE, Austin, TX, February 1992, pp. 4-10.
16. V.P. Manno, N.R. Kurita and K. Azar, "Experimental Characterization of Board Conduction Effects", Proceedings of the Ninth Annual IEEE Semiconductor Temperature Measurement and Management Symposium, IEEE, Austin, TX, February 1993, pp. 127-135.
17. A. Sbaibi and V.P. Manno, "New Performance Measures for Assessing Convective Algorithms: Application to 1-D Problems", in Quantification of Numerical Uncertainty in Computational Fluid Dynamics, I. Celik et al., eds., ASME FED-Vol. 158, ASME, 1993, pp. 77-88.
18. A. Sbaibi and V.P. Manno, "On the Origin of Some Bounded Oscillations in the Finite Volume Solution of the Navier-Stokes Equations", in Quantification of Numerical Uncertainty in Computational Fluid Dynamics, I. Celik et al., eds., ASME FED-Vol. 158, ASME, 1993, pp. 39-52.
19. S.H. Reitsma, V.P. Manno and T.F. Tureaud, "Non-Reflective Boundary Conditions For Fluid-Acoustic Simulations Using A Finite Volume Formulation", in Computational Aero- and Hydro-Acoustics - 1993, R. Mankbadi et al., eds., ASME FED-Vol. 147, ASME, 1993, pp. 71-82.
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36. "Boundary Layer Receptivity - A CFD Experiment Case Study", Northeastern University Mechanical, Industrial and Manufacturing Engineering Research Colloquium, May 1998.
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38. "Thermal Manufacturing: What Is It? Who's Doing It?", ASME Boston Section Meeting, January 18, 2000.
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48. Retreat Facilitator, Department of Civil and Environmental Engineering, Tufts University, February 15, 2008.
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49. Moderator, Bringing Energy Technologies to Market, Tufts Energy Conference, March 29, 2008.
50. Guest Lecturer, "Our Energy: Sources, Production, and Uses", Osher Lifelong Learning Institute, Fall 2009.
51. "Non-Nuclear Applications of Reactor Engineering", MIT Nuclear Science and Engineering Seminar, March 15, 2010.
52. Panel Moderator, "Green Technology and Entrepreneurship", Tufts Energy Conference, April 2010.
53. "Nuclear Power: A Primer in the Age of Climate Change and Fukushima", Tufts Energy Conference, April 2011.
54. "Some Thoughts on Tackling Campus-Level Obstacles in Innovation", Kauffman Foundation Retreat on Law Innovation and Growth in Education, Palm Beach, FL, December 1-4, 2011. (Invited Speaker). Text published in "College 2.0: An Entrepreneurial Approach to Reforming Higher Education," Kauffman Foundation, June 2012, pp. 12-14.
55. "Franklin W. Olin College of Engineering: Challenges and Opportunities of Starting a New School", LASPAU Institute on Innovation in Higher Education, Harvard University, March 21, 2012. (Invited Speaker)
56. "Educating the Next Generation of Engineering Innovators: Some Reflections from the Olin College Experience", ASEE Inaugural Intentional Forum, San Antonio, TX, June 9, 2012. (Invited Keynote Speaker)
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58. Catalyzing Change in Undergraduate Engineering Education: A Primer on the Franklin W. Olin College of Engineering's Programs", Department of Mechanical Engineering Seminar, Tufts University, January 25, 2013. (Invited Speaker)

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### **Personal:**

"Analytical Modelling of Hydrogen Transport in Reactor Containments", Sc.D. thesis, September 1983. (Advisor - M.W. Golay)

"Measurement of Heat and Momentum Diffusivities in Recirculating Flows", M.S. thesis, June 1978. (Advisor - M.W. Golay)

### **Supervised as Primary Thesis Advisor:**

1. J. M. Sanchez, "Elimination of Soluble Poison Systems for PWR Simplification," MIT BS thesis, July 1984.
2. B. K. Riggs, "Modelling of Condensation Processes in Nuclear Reactor Containments," MIT MS thesis, January 1985. (co-supervisor)
3. P. Brock, "Industrial Cogeneration: Aspects of a New Approach," Tufts University MS thesis, May 1985.
4. C. Vlahoplus, Jr., "Safety Regulation of Advanced Reactors: Evaluation of a Nonprescriptive Safety Regulatory Approach As Applied to Station Blackout," M.I.T. MS thesis, February 1986. (co-supervisor)
5. A. F. Chin, "Experimental Investigation of Developing Flow in an Asymmetrically Roughened Duct with Variable Rib Height," Tufts University MS thesis, May 1987.
6. C. Gnafakis, "Transient Natural Convection in Thermally Stratified Enclosures: An Experimental Study," Tufts University MS thesis, May 1987.
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10. R. E. Stakutis, "An Experimental Investigation of Turbulent Flow in an Asymmetrically Roughened Duct Using a Laser Doppler Anemometer," Tufts University MS thesis, February 1988.
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