

## BIOGRAPHICAL DATA

September 30, 2019

**NAME:** William A. Sirignano

**TITLE:** Professor, Mechanical and Aerospace Engineering  
Henry Samueli Endowed Chair in Engineering

**OFFICE ADDRESS:** Engineering Gateway, S3202  
Department of Mechanical and Aerospace Engineering  
University of California, Irvine  
Irvine, CA 92697-3975

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home page, <http://mae.eng.uci.edu/Faculty/WAS/index.html>

**CITIZEN:** U.S.A.

### PROFESSIONAL INTERESTS:

Spray Combustion, Multiphase Flows, Hydrodynamic Instabilities, Turbulent Combustion, Ignition, and Nonequilibrium Gasdynamics, Aerospace Propulsion, Rocket Combustion Instability, Energy Conversion and Air Pollution, Fire Research, Noise Suppression and Applied Mathematics

### EDUCATION:

Rensselaer Polytechnic Institute, Troy, New York, 1955-1959  
(B. Aero. Eng. 1959)

Princeton University, Princeton, N.J., 1959-1963  
(M.A.-1962), (Ph.D.-1964)

### ACADEMIC APPOINTMENTS:

University of California, Irvine  
Dean, School of Engineering, January 1985-August 1994  
Professor of Mechanical Engineering, January 1985-June 1987  
Professor (Above-Scale) of Mechanical and Aerospace Engineering, July 1987-present

Visiting Professor, Princeton University, Fall 1990

Visiting Scholar, University of California, Berkeley, July-August 1984

George Tallman Ladd Professor and Department Head, Department of Mechanical Engineering, Carnegie-Mellon University, Sept. 1979 to December 1984

Princeton University, Princeton, N.J.

Department of Mechanical and Aerospace Engineering Professor, July 1973 - Aug. 1979

Associate Professor, July 1969 - June 1973

Assistant Professor, July 1967 - June 1969

Member of the Research Staff, Sept. 1964 - June 1967

Lecturer, March 1964 - Sept. 1964

Research Assistant, Sept. 1963 - March 1964

Assistant-in-Research (part-time plus full-time summers) July 1960 - Sept. 1963

### **HONORS AND AWARDS:**

Wyld Propulsion Award, 2009, American Institute of Aeronautics and Astronautics.  
*Citation "For extensive and fundamental contributions to the advancement of chemical rocket propulsion through theories of nonsteady combustion and fluid dynamics."*

Sustained Service Award, 2006, American Institute of Aeronautics and Astronautics.

Energy Systems Award, 2004, American Institute of Aeronautics and Astronautics.  
*Citation "For fundamental pioneering research on fuel atomization, spray combustion, and turbulent flows in gas-turbine and automotive engines, and for the innovative turbine-burner and miniature-liquid-fuel-film-combustor concepts".*

National Academy of Engineering, elected 2002

*Citation "For contributions to the science and technology of spray combustion systems for propulsion."*

The Combustion Institute, Alfred C. Egerton Medal, 1996

*Citation: "For distinguished, continuing, and encouraging contributions to the field of combustion."*

American Electronics Association, Orange County Council, 1994

*Citation: "In recognition and appreciation for outstanding contribution to the Orange County Technology Community."*

President's Award for Engineering Excellence In Service To Education, Orange County Engineering Council, 1994

IDERS Oppenheim Award, 1993

*Citation: "In recognition of his outstanding contributions to the theory of non-linear rocket instability, spray dynamics and combustion in heterogeneous systems."*

UC Irvine Alumni Distinguished Research Award, 1992

Propellants and Combustion Award, 1992, American Institute of Aeronautics and Astronautics

*Citation: "For his pioneering and outstanding contributions in the areas of combustion instability, spray vaporization and combustion, flame spreading, and modeling of internal combustion engines."*

Freeman Scholar Award, 1992, American Society of Mechanical Engineers, Fluids Engineering Division, *for Research on Fluid Dynamics of Sprays.*

Edward G. Pendray Aerospace Literature Award, 1991, American Institute of Aeronautics and Astronautics

*Citation: "For his numerous, exceptionally clear, and important contributions to the technical literature of combustion, non-steady fluid mechanics and heat transfer that are recognized as quality references in the fields of air and space flight, noise pollution, air pollution, fire safety, and energy conservation."*

Society for Industrial and Applied Mathematics Fellow, 2009.

*Citation; For contributions to fluid dynamics, combustion theory, and their applications to propulsion.*

Institute for the Advancement of Engineering Fellow, 1994

Combustion Institute Inaugural Fellow, 2018.

*Citation: "For groundbreaking research towards understanding the multitude of processes associated with the combustion of droplets and sprays."*

APS Fellow, 2000,

*Citation: "For his pioneering efforts in combining modeling and simulation of complex multiphase flows, and for the understanding these models have provided for pool fires and capillary instabilities."*

AAAS Fellow, 1992

ASME Fellow, 1989

AIAA Fellow, 1987

United Aircraft Research Fellow, 1973-74

### **Other Recognition:**

Certificate of Appreciation, National Research Council, 1994 (Service on Space Studies Board)

Certificate of Appreciation, National Research Council, 1994 (Service as Chairman, Microgravity Research Committee)

Certificate of Appreciation, ASME, 1992

Certificate of Appreciation, NASA, 1988

Certificate of Appreciation, ASME, 1984

Certificate of Appreciation, AIAA, 1983

Certificate of Appreciation, AIAA, 1970

Certificate of Appreciation, AIAA, 1969

Personalities of America, Sixth Anniversary Edition, 1992

Dictionary of International Biography, Vol. 9

Who's Who in the East, 13th through 18th Editions

Who's Who in the West, 21st through 33rd Editions

Who's Who in America, 40th through 60th Editions

Who's Who in the World, 5th through 23rd Editions

Who's Who in American Education, 4th through 7<sup>th</sup> Edition

Who's Who in Engineering, 7th and 9th Editions

Who's Who in Science & Engineering, 1st through 10th Editions

Who's Who in Frontier Science and Technology, 1st & 2nd Editions

Who's Who in Aviation, 1983

Who's Who in California, 19th, 20th, 25th through 27th Editions  
Who's Who in Finance & Industry, 26th Edition  
American Men and Women of Science, 1983, 1991, 1994  
Five Thousand Personalities of the World, 2nd Edition, 1988  
Marquis Who's Who Albert Nelson Lifetime Achievement Award, 2018.  
Sigma Xi, Tau Beta Pi, and Sigma Gamma Tau, 1959  
New York State Regents Scholarship, 1955-59  
RPI Scholarship, 1956-59  
Ricketts Prize (RPI), June 1959  
Guggenheim Fellowship, 1959-61

#### **OTHER PROFESSIONAL EXPERIENCE:**

Grumman Aircraft Engineering Corp.  
Bethpage, Long Island, NY  
Apprentice Engineer (Summer Employee)  
Research Dept., June-Sept. 1959

United Technologies Research Center  
East Hartford, CT  
United Aircraft Research Fellow, Sept. 1973-Feb. 1974

Sandia National Laboratories  
Livermore, CA  
Visiting Research Scientist, Summers of 1978 and 1984

#### **CONSULTING ASSOCIATIONS:**

Marshall Space Flight Center, Huntsville, AL, 1963-64  
Curtiss-Wright Corporation, Wood-Ridge, NJ, 1966  
Advisory Group for Aeronautical Res. & Dev., Paris, France, 1966-67, 1980  
Aerojet-General Corporation, Sacramento, CA, 1966-67, 1986-  
Thiokol Chemical Corporation, Denville, NJ, 1966-67  
Arthur D. Little, Inc., Cambridge, MA, 1966-68  
Walter Kidde Company, Belleville, NJ, 1965-66, 1968-70  
Electronic Associates, Inc., Princeton, NJ, 1969  
Hercules, Inc., Magna, UT, 1969  
Naval Ordnance Test Station, Indian Head, MD, 1968-70  
Dyanalysis, Inc., Princeton, NJ, 1971-1977  
TRW Systems, Inc., Redondo Beach, CA, 1971  
National Academy of Sciences, 1971-73  
Sandia Laboratories, Livermore, CA and Albuquerque, NM, 1972-present  
United Aircraft Research Laboratories, East Hartford, CT, 1973-74  
Aerojet Solid Propulsion Company, Sacramento, CA, 1975  
Falcon Research and Development Company, Denver, CO, 1967-1980  
Princeton Combustion Laboratories, 1977  
Purdue University, U.S.-Italy Workshop, 1982

Pandalai Coatings, Pittsburgh, PA, 1982-83  
James J. Burke, Attorney, NY, 1982-1984  
Richard Levine, Attorney, Pittsburgh, PA, 1983  
Energy and Environmental Research, Inc., Irvine, CA, 1985  
CHAM of North America, Huntsville, AL, 1986  
Allison Gas Turbine Division, General Motors, Indianapolis, IN, 1987-1992  
Metrolaser, Tustin, CA, 1989-1992  
United Technologies Research Center, East Hartford, CT, 1989-1992  
Mitsubishi Heavy Industries, Ltd., Tokyo, Japan, 1989  
Innovative Sci. Solutions, Inc., 2000  
Direct Propulsion Devices, 2000-2002.  
Tour Engines, 2005-  
Siemens Gas Turbine Division, 2006.  
Control Components, Inc., 2007.  
HyPerComp, Inc. 2013-

### **BOOKS, MONOGRAPHS:**

1. Behaviour of Supercritical Nozzle Under Three Dimensional Oscillatory Conditions, AGARDograph No. 117, 1967 (with L. Crocco).
2. Fluid Dynamics and Transport of Droplets and Sprays, Cambridge University Press, 1999. Paperback version, 2005.
3. Fluid Dynamics and Transport of Droplets and Sprays – Second Edition, Cambridge University Press, 2010. E-book version, 2012. Paperback version 2014.

### **BOOKS EDITED:**

1. Co-editor, International Colloquium on Dynamics of Explosions and Reactive Systems (ICDERS), Progress in Astronautics and Aeronautics, (A.L. Kuhl, J.-C. Leyer, A.A. Borisov and W.A. Sirignano, eds.) AIAA, 1991.

Dynamics of Deflagrations and Reactive Systems: Flames, v. 131.

Dynamics of Detonations and Reactive Systems: Heterogeneous Combustion, v. 132.

Dynamics of Detonations and Explosions: Detonations, v. 133.

Dynamics of Detonations and Explosions: Explosion Phenomena, v. 134.

2. Co-editor, Modern Research Topics in Aerospace Propulsion, Springer-Verlag, (G. Angelino, L. DeLuca and W.A. Sirignano, eds.) 1990.

3. Co-editor, International Colloquium on Dynamics of Explosions and Reactive Systems (ICDERS), Progress in Astronautics and Aeronautics, (A.L. Kuhl, J.-C. Leyer, A.A. Borisov and W.A. Sirignano, eds.) AIAA, 1993.

Dynamics of Gaseous Combustion v. 151.

Dynamics of Heterogeneous Combustion and Reacting Systems, v. 152.

Dynamic Aspects of Detonations, v. 153.

Dynamic Aspects of Explosion Phenomena, v. 154.

4. Series Editor, Combustion Science and Technology, An Introduction to Combustion, (authored by W.C. Strahle) Gordon and Breach Science Publishers, 1993.

5. Special Issue Editor, Combustion Science and Technology, Vol. 105, 4-6, Gordon and Breach Science Publishers, 1995.

6. Series Editor, Combustion Science and Technology, Dynamics of Exothermicity - In Honor of Antoni Kazimierz Oppenheim, (J.R. Bowen, ed.) Gordon and Breach Science Publishers, 1996.

7. Series Editor, Combustion Science and Technology, Physical and Chemical Aspects of Combustion: A Tribute to Irvin Glassman, (F.L. Dryer and R.F. Sawyer, eds.) Gordon and Breach Science Publishers, (in press) 1996.

8. Series Editor, Combustion Science and Technology, Laser Diagnostics for Combustion Temperature and Species, Second Edition, (authored by Alan C. Eckbreth) Gordon and Breach Science Publishers, 1996.

9. Special Issue Editor, Combustion Science and Technology, Vol. 113-114, Gordon and Breach Science Publishers, 1996.

10. Co-editor, Advances in Combustion Science--In Honor of Ya.B. Zel'dovich, (W.A. Sirignano, A.G. Merzhanov and L. De Luca, eds.) Volume 173, AIAA Progress in Astronautics and Aeronautics, 1997.

11. Special Issue Editor, Combustion Science and Technology, Vol. 135, 1-6, Gordon and Breach Science Publishers, 1998.

12. Special Issue Co-Editor, Combustion Science and Technology, Vol. 158, 1-6, Gordon and Breach Science Publishers, 2000.

13. Special Issue Co-Editor, Combustion Science and Technology, Vol. 174, 5-6, Taylor and Francis, 2002.

14. Series Editor, Combustion Science and Technology Self-Propagating High-Temperature Synthesis of Materials, (A.A. Borisov, L. DeLuca, and A. Merzhanov, eds.), Taylor and Francis, 2002.

15. Special Issue Co-Editor, Combustion Science and Technology, Vol. 176, 10, Taylor and Francis, 2004.

16. Special Issue Co-Editor, Combustion Science and Technology, Vol. 178, 10 & 11, Taylor and Francis, 2006.

## BOOK CHAPTERS AND ARTICLES:

1. Liquid Propellant Rocket Combustion Instability, Editor, D.T. Harrje and Associate Editor, F.H. Reardon, NASA SP194, October 1972 (U.S. Government Printing Office). Section 3.5.1 "Linear Wave Motion", Section 3.5.2.3 "Nonlinear Transverse Gas Displacement," Section 3.5.3.1 "Liquid and Solid Particle Drag," Section 3.5.3.2 "Acoustic Liners and Nonrigid Walls," Section 3.6 "Unsteady Flow in Exhaust Nozzles," Section 4.1 "Introduction to Analytical Models of High Frequency Combustion Instability," Section 8.1 "Introduction to Design Factors Affecting Damping," and Section 8.4.1 "General Considerations of Thrust Chamber Shape."
2. "Transient Heating and Liquid-Phase Mass Diffusion in Fuel Droplet Vaporization" (with C.K. Law), invited paper Proceedings of American Chemical Society Symposium on Evaporation-Combustion of Fuel Droplets, San Francisco, August 30 - September 3, 1976. Evaporation-Combustion of Fuels, Advances in Chemistry Series 166, 1978 ACS.
3. "Linear Model of Convective Heat Transfer in a Spray" Recent Advances in Aerospace Science, Plenum Press, New York, NY, pp. 213-236, 1985.
4. "Spray Combustion Simulation" in Numerical Simulation of Combustion Phenomena, (R. Glowinski, B. Larrouturou and R. Temam, eds.) Springer-Verlag, Heidelberg, 1985.
5. "Spray Combustion in Idealized Configurations: Parallel Droplet Streams" (with R.H. Rangel), in Numerical Approaches to Combustion Modeling, American Institute of Aeronautics and Astronautics Progress Series, (E.S. Oran and J.P. Boris, eds.) v. 135, pp. 585-613, 1991.
6. "Review of Theory of Mixing and Reaction Within A Vortical Structure" in Numerical Combustion, Lecture Notes in Physics, (A. Dervieux and B. Larrouturou, eds.), Springer-Verlag, 1989.
7. "Computational Spray Combustion" in Numerical Modeling in Combustion, (T. J. Chung, ed.), Hemisphere Publications, 1993.
8. "Unsteady Spherically-Symmetric Flame Propagation through Multicomponent Spray Clouds" (with G. Continillo), in Modern Research Topics in Aerospace Propulsion, (G. Angelino, L. De Luca and W.A. Sirignano, eds.), Springer-Verlag, 1991.
9. "Spray Flows" Yearbook of Science and Technology, pp. 389-391, McGraw-Hill, 1995.

10. "Liquid Propellant Droplet Vaporization: A Rate-Controlling Process for Combustion Instability" (with J.-P. Delplanque, C.H. Chiang, and R. Bhatia), AIAA Progress in Astronautics and Aeronautics book series, (V. Yang, ed), Vol. 169, pp. 307-343, 1995. Also presented at the First International Symposium on Liquid Rocket Combustion.
11. "Mechanisms of Flame Spread Across Condensed-Phase Fuels" (with D.N. Schiller), in Physical and Chemical Aspects of Combustion, A Tribute to Irvin Glassman, Combustion Science and Technology book series (F.L. Dryer and R.F. Sawyer, eds.), Gordon and Breach, pp. 353-407, 1997.
12. "Generation, Vaporization and Combustion of Droplet Arrays and Streams" (with R.H. Rangel, D. Dunn-Rankin, and M.E. Orme), Recent Advances in Spray Combustion, AIAA Progress in Astronautics and Aeronautics book series, Vol. 166 (K. Kuo, ed.), 1996.
13. "Nonlinear Two-Dimensional Symmetric Travelling Wave Distortion of a Thin Liquid Sheet" (with C. Mehring), in Dynamics of Exothermicity - In Honor of Antoni Kazimierz Oppenheim., Combustion Science and Technology book series (J. Ray Bowen, ed.), Gordon and Breach, 1996.
14. "Metal Slurry Droplet and Spray Combustion" (with R. Bhatia), Advances in Combustion Science--In Honor of Ya. B. Zel'dovich, AIAA Progress in Astronautics and Aeronautics (W.A. Sirignano, A.G. Merzhanov, L. DeLuca, eds.), Vol. 173, Chapter 7, pp. 117-130, 1997.
15. "Distortion and Disintegration of Liquid Streams" (with C. Mehring), in Liquid Rocket Combustion Devices: Aspects of Modeling, Analysis, and Design, AIAA Progress in Astronautics and Aeronautics book series, Volume 200 (V. Yang, M. Habiballah, J. Hulba, and M. Popp, editors), 2005, pp. 167-249.
16. "Recent Theoretical Advances For Liquid-fuel Atomization and Burning," Energetic Material Synthesis and Combustion Characterization for Chemical Propulsion, (K. Kuo and K. Hori, Editors) Begell House, 2009.
17. "Miniature Liquid-Fuel Combustion" (with D. Dunn-Rankin, Y.-C. Chao, Y.-H. Li), in *Microscale Combustion and Power Generation*, Y. Ju, C. Cadou, K. Manuta, Editors, invited article, Momentum Press, 2015.

#### **JOURNAL PUBLICATIONS AND MAJOR CONFERENCE PROCEEDINGS:**

1. "A Shock Wave Model of Unstable Rocket Combustors" (with L. Crocco), AIAA Journal 3, pp. 1285-1296, 1964.
2. "A New Concept in Rocket Engine Baffles" (with W.C. Strahle), AIAA Journal 3, pp. 954-956, 1965.



3. "Nonlinear Aspects of Combustion Instability in Liquid Propellant Rocket Motors" (with D.T. Harrje and L. Crocco), Proceedings of 2nd ICRPG Combustion Conference, (Los Angeles, CA, Nov. 1965), CPIA Publication No. 105, May 1966.
4. "Effect of the Transverse Velocity Component on the Non-Linear Behavior of Short Nozzles" (with L. Crocco), AIAA Journal 4, No. 8, August 1966.
5. "Longitudinal Shock Wave Combustion Instability in Liquid Propellant Rocket Engines" (with C.E. Mitchell and L. Crocco), Proceedings of 3rd ICRPG Combustion Conference, Cape Kennedy, FL, Oct., 1966), CPIA Publication No. 138, Vol. 1, 1966.
6. "Acoustic Liner Studies" (with L. Crocco and D.T. Harrje), Proceedings of 3rd ICRPG Combustion Conference, (Cape Kennedy, FL., Oct. 1966), CPIA Publication No. 138, Vol. 1, 1966.
7. "Flow Behavior with Acoustic Liners" (with D.T. Harrje and W.A. Stinger), Proceedings of 4th ICRPG Combustion Conference, (Stanford Research Institute, Palo Alto, Calif., Oct. 1967), CPIA Publication No. 162, Vol. 1, 1967.
8. "Acoustic Liner Studies" (with T. Tonon, G. Zaic and D.T. Harrje), Proceedings of the 5th ICRPG Liquid Combustion Conference, (John Hopkins University, Oct. 1968) CPIA Publication No. 183, pp. 351-357, 1968.
9. "Non-Steady Burning Phenomenon in Solid Propellants: Theory and Experiments" (with M. Summerfield, H. Krier, and J. T'ien), AIAA Journal 6, p. 278, 1968.
10. "Nonlinear Oscillations in Liquid Rocket Combustion Chambers" (with C.E. Mitchell and L. Crocco), Proceedings of the First International Colloquium on Gasdynamics of Explosions, (Brussels, Belgium, Sept. 1967), Astronautica Acta, Vol. 14, pp. 409-410, May 1969.
11. "Nonlinear Longitudinal Instability in Rocket Motors with Concentrated Combustion" (with C.E. Mitchell and L. Crocco), Combustion Science and Technology 1, No. 1, pp. 35-63, July 1969.
12. "Ignition of Stagnation Point Flow by a Hot Body" (with O.P. Sharma), Combustion Science and Technology 1, No. 2, pp. 95-104, Sept. 1969.
13. "A Theory of Axial-Mode Shock Wave Oscillations in a Solid Rocket Combustor" Proceedings of the Twelfth (International) Symposium on Combustion, (University of Poitiers, France, July 14-20, 1968), Combustion Institute, Pittsburgh, PA, pp. 129-137, 1969.

14. "Longitudinal Mode Oscillations in an End-Burning Solid Rocket Motor" (with J.S. T'ien), Proceedings of the 6th ICRPG Solid Propellant Combustion Conference, (Jet Propulsion Laboratory, California Institute of Technology, Oct. 1969) CPIA Publication No. 192, Vol. 1, pp. 467-475. Dec. 1969.
15. "Near-Resonant, Off-Resonant, and Quasi-Steady Theories of Acoustic Liner Operation" (with T.S. Tonon), Proceedings of the 6th ICRPG Combustion Conference, (Illinois Institute of Technology, Chicago, IL, Sept. 9-11, 1969) CPIA Publication 192, Vol. 1, Dec. 1969.
16. "Axisymmetric Jet Diffusion Flame in External Oscillating Stream" (with A.P. Chervinsky, D.T. Harrje and A.K. Varma), Proceedings of the 6th ICRPG Combustion Conference, (Illinois Institute of Technology, Chicago, IL, Sept. 9-11, 1969), CPIA Publication No. 192, Vol. 1, Dec. 1969.
17. "Theory of L-Star Combustion Instability with Temperature Oscillation" (with J.S. T'ien and M. Summerfield), AIAA Journal 8, No. 1, pp. 120-126, Jan. 1970.
18. "Flame Spreading Above Liquid Fuels: Surface-Tension-Driven Flows" (with I. Glassman), pre-printed for Western Section/Combustion Institute Fall Meeting, University of California, San Diego, Oct. 1969, Combustion Science and Technology, Vol. 1, No. 4, pp. 307-312, Feb. 1970.
19. "On the Ignition of a Premixed Fuel by a Hot Projectile" (with O.P. Sharma), Combustion Science and Technology 1, No. 6, pp. 481-494, May 1970.
20. "Unsteady Thermal Response of the Condensed-Phase Fuel Adjacent to a Reacting Gaseous Boundary Layer" (with J.S. T'ien), Proceedings of the Thirteenth (International) Combustion Symposium, (Salt Lake City, UT, August 1970), Combustion Institute, Pittsburgh, pp. 529-539, 1971.
21. "The Effect of High Frequency Periodic Disturbances on Axisymmetric Wake Diffusion Flames" (with A.P. Chervinsky), Combustion Science and Technology 2, pp. 351-64, Jan. 1971.
22. "The Effect of External Periodic Disturbances on Axisymmetric Wake Diffusion Flames" (with A.K. Varma and D.T. Harrje), Proceedings of the 7th JANNAF Liquid Combustion Instability Meeting, (Pasadena, CA, Oct. 27-29, 1970), CPIA Publication No. 204, Vol. 1, pp. 571-590, Feb. 1971.
23. "Quarter Wave Tubes Versus Helmholtz Resonators: Theories, Experiments, and Design Criteria" (with P.K. Tang, T.S. Tonon and D.T. Harrje), Proceedings of the 7th JANNAF Liquid Combustion Instability Meeting (Pasadena, CA, Oct. 27-29, 1970), CPIA Publication No. 204, Vol. 1, pp. 727-742, Feb. 1971.

24. "Interaction of an Axisymmetric Jet with a Coaxial Oscillating Stream" (with A.P. Chervinsky and D.T. Harrje), Presented at the Thirteenth Israel Annual Conference on Aeronautics and Astronautics, March 1971, Israel Journal of Technology 9, No. 1 & 2, pp. 115-122, 1971.
25. "Ignition of Fuels by a Hot Projectile" (with O.P. Sharma), AGARD Conference Proceedings, No. 84, AGARD-CP-84-71, pp. 15-1-15-18, Sept. 1971.
26. "Experimental Flow Effects and Selection Requirements Related to Acoustic Dampers" (with P.K. Tang and D.T. Harrje), Proceedings of the 8th JANNAF Liquid Propellant Combustion Instability Meeting, (Los Angeles, CA, Oct. 5-7, 1971) Chemical Propulsion Information Agency Publication No. 220, Vol. 1, pp. 805-815, Nov. 1971.
27. "Turbulent Mixing as Related to Performance Improvement" (with T.J. Rosfjord and D.T. Harrje), Proceedings of the 8th JANNAF Propellant Combustion Instability Meeting, (Los Angeles, CA, Oct. 5-7, 1971), Chemical Propulsion Information Agency Publication, No. 220, Vol. 1, pp. 611-617, Nov. 1971.
28. "Interaction of Axisymmetric Wake and Jet Flows with a Coaxial Oscillating Stream" (with A.K. Varma and D.T. Harrje), Proceedings of the 8th JANNAF Liquid Propellant Combustion Instability Meeting, (Los Angeles, CA, Oct. 5-7, 1971) Chemical Propulsion Information Agency Publication, No. 220, Vol. 1, pp. 583-593, Nov. 1971.
29. "A Critical Discussion of Theories of Flame Spread Across Solid and Liquid Fuels" Combustion Science and Technology 6, pp. 95-105, No. 1 & 2, 1972.
30. "Non Linearita Dei Risonatori Di Helmholtz" L'Aerotecnica Missili e Spazio 51, No. 4, pp. 256-265, August 1972.
31. "Damping Devices for Various Combustion Environments" (with P.K. Tang, J.Rosentweig Bellan, and D.T. Harrje), Proceedings of the 9th JANNAF Combustion Meeting, Monterey, CA, CPIA Publication 231, Vol. II, pp. 429-446, Dec. 1972.
32. "Interaction of Axisymmetric Wake Diffusion Flames with a Coaxial Oscillating Stream" (with A.K. Varma, D.T. Harrje, and C. Bruno), Proceedings of the 9th JANNAF Combustion Meeting, Monterey, CA, CPIA Publication 231, Vol. II pp. 117-137, Dec. 1972.
33. "Experiments and Predictions in the Rocket Combustion Mixing Zone" (with T.J. Rosfjord and D.T. Harrje), Proceedings of the 9th JANNAF Combustion Meeting, Monterey, CA, CPIA Publication 231, Vol. II, pp. 217-228, Dec. 1972.

34. "Theoretical Analysis of Wankel Engine Combustion" (with F.V. Bracco), Combustion Science and Technology 7 No. 3, pp. 109-123, May 1973. Also appears in preliminary form in Proceedings of the 1972 Intersociety Energy Conversion Engineering Conference, San Diego, CA, Sept. 25-29, pp. 1146-1151, 1972.
35. "Experimental Verification of the Energy Dissipation Mechanism in Acoustic Dampers" (with P.K. Tang and D.T. Harrje), Journal of Sound and Vibration 26, No. 2, pp. 263-267, Jan. 1973.
36. "Theory of a Generalized Helmholtz Resonator" (with P.K. Tang), Journal of Sound and Vibration 26, No. 2, pp. 247-262, Jan. 1973.
37. "One-Dimensional Analysis of Combustion in a Spark-Ignition Engine" Combustion Science and Technology 7, No. 3, pp. 99-108, May 1973. Also appears in preliminary form in Proceedings of the 1971 Intersociety Energy Conversion Engineering Conference, Boston, MA, pp. 52-62, August 1971.
38. "Response of a Two-Dimensional Diffusion Flame to Small Amplitude Wave Disturbances" (with A.K. Varma and C. Bruno), Proceedings of the 10th JANNAF Combustion Meeting, Newport, RI, August 1973, CPIA Publication 243, Vol. 3, December 1973.
39. "Mixing and Recirculation in Rocket Combustors" (with T.J. Rosfjord and D.T. Harrje), Proceedings of 10th JANNAF Combustion Meeting, Newport, RI, August 1973). CPIA Publication 243, Vol. 3, pp. 237-248, December 1973.
40. "A Problem in Fire Safety: Flame Spreading Across Liquid Fuels" (with F.L. Dryer and I. Glassman), NSF/RANN Conference on Fire Research, Georgia Institute of Technology, May 28-29, 1974.
41. "A Theory of Turbulent Flame Development and Nitric Oxide Formation in Stratified Charge Internal Combustion Engines" (with J. Rosentweig Bellan), Combustion Science and Technology 8, No. 1 & 2, pp. 1285-1299, Sept./Oct. 1974.
42. "Theory of Flame Spread Above Solids" Acta Astronautica 1, No.9-10, pp. 1285-1299, Sept./Oct. 1974.
43. "Flame Spreading Across Materials: A Review of Fundamental Processes" AGARD Conference Proceedings No. 166 on Aircraft Fire Safety, Rome, Italy, April 7-11, 1975.
44. "A Problem in Fire Safety: Flame Spreading Across Liquid Fuels" (with F.L. Dryer and I. Glassman), Proceedings of NSF/RANN Conference on Fire Research, Harvard University, pp. 79-83, June 25-27, 1975.

45. "Combustion and NO Formation in a Stratified Charge Engine: A Two-Turbulent Equations Model" (with J.R. Bellan), Combustion Science and Technology 12, pp. 75-104, 1976.
46. "Fundamental Aspects of Flame Spread Across Liquid and Solid Fuels" (with F.L. Dryer and I. Glassman), invited paper, Proceedings of American Chemical Society Symposium on Flammability and Combustion of Non-Metallic Materials, San Francisco, CA, August 30 - September 3, 1976.
47. "Theory of Convective, Transient, Multicomponent Droplet Vaporization" (with C.K. Law and S. Prakash), Proceedings of Sixteenth International Combustion Symposium, pp. 605-617, Combustion Institute, 1977.
48. "Unsteady Droplet Combustion with Droplet Heating II: Conduction Limit" (with C.K. Law), Combustion and Flame 28, pp. 175-186, 1977.
49. "Further Calculations Based Upon a Theory of Flame Spread Across Solid Fuels" (with C.C. Feng), Combustion and Flame 29, pp. 247-263, 1977.
50. "Theory of Multicomponent Fuel Droplet Vaporization" Archives of Thermodynamics and Combustion 9, pp. 235-251, 1979.
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82. "Transient Spray Combustion Computations" Proceedings of the First World Congress on Computational Mechanics, Austin, TX, September 1986. Invited paper. (Abstract only).
83. "Analysis of Combustion Instability in Liquid-fueled Ramjets" SIAM Conference on Numerical Combustion, San Francisco, CA, March 1987. Invited paper. (Abstract only).
84. "Spray Combustion: A Driving Mechanism for Ramjet Combustion Instability" (with G.Riva, A.Tong, B.Abramzon, and K.Molavi), 23rd JANNAF Combustion Meeting, Langley, VA, October 1986.
85. "Oscillations in a Liquid-Fueled Combustor" Joint Meeting of the French and Italian Sections of The Combustion Institute, Amalfi, Italy, June 1987.
86. "Fundamental Studies on Spray Combustion and Turbulent Combustion" (with G.S. Samuelsen, M.S. Raju, R.H. Rangel, B.E. Stapper), AFOSR Technical Report, April 1988.
87. "Computational Analysis of Acoustic Instabilities in Dump Combustor Configuration" (with K. Molavi), Preprint No. 88-2856, AIAA/ASME 24th Joint Propulsion Conference, Boston, MA, July 1988.
88. "High-Tech Industries and the UCI School of Engineering" High Technology, Business To Business Magazine, Inc., pp. 12-13, August 1988.

89. "Spray Combustion Driving Mechanism for Ramjet Instability" (with K. Molavi), 25th JANNAF Combustion Meeting, Huntsville, AL, October 1988.
90. "Spray Combustion Processes in Ramjet Combustion Instability" (with C.T. Bowman and C.K. Law), presented at the 25th JANNAF Combustion Meeting, Huntsville, AL, October 1988.
91. "An Analysis of Molecular Mixing in a Vortical Structure: Bias in PDF Measurement" (with F. Miralles-Wilhelm and R. Rangel), Preprint No. 89-0482, AIAA 27th Aerospace Sciences Meeting, Reno, NV, January 1989.
92. "The Dynamics of Vortex Pairing and Merging," (with R.H. Rangel), Preprint No. 89-0128, AIAA 27th Aerospace Sciences Meeting, Reno, NV, January 1989.
93. "Behavior in Normal and Reduced Gravity of an Enclosed Liquid/Gas System with Nonuniform Heating from Above" (with H.D. Ross, D.N. Schiller, and P. Disimile), NASA Technical Memorandum 101471. Also see Preprint No. 89-0070, AIAA 27th Aerospace Sciences Meeting, Reno, NV, January 1989.
94. "Fundamental Studies on Spray Combustion and Turbulent Combustion" (with G.S. Samuelsen, R.H. Rangel, C.-H. Chiang, F. Miralles-Wilhelm, and B.E. Stapper), AFOSR Technical Report, February, 1989.
95. "Enclosed Liquid/Gas System Heated Nonuniformly from Above: Variable Properties and Vaporization Effects" (with D.N. Schiller and B. Abramzon), presented at the 26th ASME/AIChE Heat Transfer Conference, Philadelphia, PA, August 1989.
96. "Review of Spray Combustion Theory," invited presentation for the Joint Meeting of the British and French Sections of The Combustion Institute, Rouen, France, April 1989.
97. "PDF Analysis of Molecular Mixing in Turbulent Flows" (with R.H. Rangel), (abstract only) SIAM 1989 Annual Meeting, San Diego, CA, July 1989.
98. "A Computational Fluid Dynamics Approach to Jet-Blast Atomization Studies" (with R.H. Rangel), invited presentation for 3rd Annual ILASS Conference on Liquid Atomization and Spray Systems, Irvine, CA, May 1989.
99. "Metal Slurry Droplet and Spray Combustion" (with C. M. Megaridis and R. Bhatia), Second ONR Propulsion Meeting Energetic Materials Combustion, Combustion Diagnostics and Under Water Propulsion, Irvine, CA, October 1989.
100. "Prediction of a Liquid Jet in a Gaseous Crossflow" (with F.H. Tsau and S.E. Elghobashi), AIAA/SAE/ASME/ASEE Joint Propulsion Conference, Orlando, FL, July 1990.

101. "Modelling of Vaporization-Controlled Incineration of Hazardous Wastes" (with J.-P. Delplanque, C.M. Megaridis, and R.H. Rangel), First International Congress on Toxic Combustion By-Products: Formation and Control, August 1989.
102. "Fundamental Studies on Spray Combustion and Turbulent Combustion" (with G.S. Samuelsen, R.H. Rangel, C.-H. Chiang, and B.E. Stapper), AFOSR Technical Report, January 1990.
103. "Study of Liquid Hydrogen and Liquid Oxygen Rocket Propellant Hazards" (with R.H. Rangel and C.M. Megaridis), Consultants Report to Professor T. Hirano, University of Tokyo, November 1989.
104. "Transverse Injection of Liquid and Gaseous Fuels Into Subsonic/Supersonic Flows" (with G.S. Samuelsen, D. Papamoschou, S.E. Elghobashi, F.H. Tsau, W. Sowa), AFWAL Annual Report, March 1990.
105. "Transverse Injection of Liquid and Gaseous Fuels Into Subsonic/Supersonic Flows" (with G.S. Samuelsen, D. Papamoschou, S.E. Elghobashi, F.H. Tsau, W. Sowa), AFWAL Interim Supplemental Report, March 1990.
106. "Liquid Fueled Ramjet Combustion Instability: Acoustical and Vortical Interactions with Burning Sprays" (with R. Bhatia and K. Molavi), ONR Final Technical Report, May 1990.
107. "Metal Slurry Droplet and Spray Combustion" (With C.M. Megaridis and R. Bhatia), ONR Annual Summary Report, September 1990.
108. "Transverse Injection of Liquid and Gaseous Fuels into Subsonic/Supersonic Flows" (with G.S. Samuelsen, D. Papamoschou, S.E. Elghobashi, and F.-H. Tsau), AFWAL Annual Report, October 1990.
109. "Heat and Mass Transfer in Liquid-Gas Spray Systems," ASME Winter Annual Meeting, Dallas, TX, November 1990.
110. "Fundamental Studies on Droplet Interactions in Dense Sprays" (with S.E. Elghobashi, I. Kim, and C.H. Chiang), AFOSR Annual Technical Report, December 1990.
111. "Oscillatory Behavior of LOX Droplet Stream Combustion in a Gaseous Hydrogen Flow" (with J.-P. Delplanque), Societe Europeenne de Propulsion Progress Report, December 1990.
112. "Ignition Delay of Gas Mixture Above a Liquid Fuel Pool" (with D. Schiller), Preprint No. 91-0717, AIAA 29th Aerospace Sciences Meeting, Reno, NV, January 1991.

113. "Axisymmetric Vaporizing Oxygen Droplet Computations" (with C.H. Chiang), Preprint No. 91-0281, AIAA 29th Aerospace Sciences Meeting, Reno, NV, January 1991.
114. "Future Directions in Engineering Education at the University of California" (with many co-authors), Advisory Committee for Planning Engineering Education, Office of the President, University of California, March 1991.
115. "Transcritical Phase Equilibrium Computations: Application to O<sub>2</sub>/H<sub>2</sub> and N<sub>2</sub>/H<sub>2</sub> Mixtures" (with J.-P. Delplanque), Societe Europeenne de Propulsion Report, July 1991.
116. "Aerodynamic Interactions Amongst Neighboring Droplets" (with C.H. Chiang, I. Kim, and S.E. Elghobashi), 4th International Symposium on Computational Fluid Dynamics, Davis, CA, September 1991.
117. "Computational Challenges in Spray Combustion," Computers and Computing in Heat Transfer Science and Engineering (W. Nakayama and K.T. Yang, eds.), CRC Press, Inc.; U.S.-Japan Heat Transfer Seminar, Oiso, Japan, October 1991.
118. "Fuel Droplet Vaporization in an Acoustic Field" (with A. Duvvur and C.H. Chiang), Fourth International Conference on Numerical Combustion, St. Petersburg, FL, December 1991.
119. "Metal Slurry Droplet and Spray Combustion" (with R. Bhatia), 28th JANNAF Combustion Meeting, Brooks Air Force Base, San Antonio, TX, October 1991.
120. "Numerical Simulation and Modelling of LOX Droplet Vaporization at Supercritical Conditions" (with J.-P. Delplanque, C.-H. Chiang), 28th JANNAF Combustion Meeting, Brooks Air Force Base, San Antonio, TX, October 1991.
121. "Ignition and Flame Spread Above Liquid Fuel Pools" (with D. Schiller), Western States Section/The Combustion Institute, UCLA, October 1991.
122. "Three-Dimensional Flow Interactions Between Two Neighboring Spheres" (with I. Kim, S.E. Elghobashi), 44th Annual Meeting of the Division of Fluid Dynamics of the American Physical Society, Scottsdale, AZ, November 1991.
123. "Oscillatory and Transcritical Vaporization of an Oxygen Droplet" (with J.-P. Delplanque), Preprint No. 92-0104, AIAA 30th Aerospace Sciences Meeting, Reno, NV, January 1992.
124. "Three-Dimensional Flow Computation for Two Interacting, Moving Droplets" (with I. Kim and S.E. Elghobashi), Preprint No. 92-0343, AIAA 30th Aerospace Sciences Meeting, Reno, NV, January 1992.

125. "Flame Propagation in Metal Slurry Sprays" (with R. Bhatia), WSS/CI92-54 1992 Fall Meeting of the Western States Section of The Combustion Institute, Livermore, CA, October 1992.
126. "Analysis of Shell Formation from a Vaporizing Metal Slurry Droplet" (with I. Ray), 1992 Fall Meeting of the Western States Section of The Combustion Institute, Livermore, CA, October 1992.
127. "Toward a Microgravity Research Strategy," (with R.F. Sekerka, R.A. Brown, F.D. Lemkey, J.R. Carruthers, and T.A. Steitz), Committee on Microgravity Research, Space Studies Board, National Research Council, 1992.
128. "Metal Slurry Droplet and Spray Combustion," (with R. Bhatia), 5th ONR Propulsion Meeting, Arlington, VA, September 1992.
129. "Task One Report" submitted to Pratt & Whitney, 1993.
130. "Transverse Injection of Liquid and Gaseous Fuels into Subsonic/Supersonic Flow," (with D. Papamoschou and G.S. Samuelsen), AFWAL Final Report, October 1992.
131. "Metal Slurry Droplet and Spray Combustion, ONR Final Technical Report, September 1993.
132. "Energetic Fuel Droplet Gasification with Liquid-Phase Reaction," (with R. Bhatia), 6th ONR Propulsion Meeting, Boulder, CO, August-September 1993.
133. "Metal Slurry Droplet and Spray Combustion," (with R. Bhatia), 6th ONR Propulsion Meeting, Boulder, CO, August-September 1993.
134. "Microgravity Research Opportunities for the 1990s," Chair of authoring committee, Space Studies Board, National Research Council, 1995.
135. "Droplet-Turbulence Interactions Over a Wide Spectral Range," (with I. Kim and S.E. Elghobashi), presented at the AFOSR Propulsion Contractors' Meeting, Lake Tahoe, NV, June 1994.
136. "Energetic Fuel Droplet Gasification with Liquid-Phase Reaction," (with Q.H. Zhu, D. Schiller, R. Bhatia), Seventh ONR Propulsion Meeting, Buffalo, NY, August 1994.
137. "Metal Slurry Droplet and Spray Combustion," (with R. Bhatia), Zel'dovich Memorial International Conference on Combustion, Moscow Region, Russia, September 1994.



138. "Droplet Arrays and Streams," (with R.H. Rangel, D. Dunn-Rankin, and M.E. Orme), International Union of Theoretical and Applied Mechanics, Symposium on Combustion, Tainan, Taiwan, December 1994.
139. "Nonlinear Capillary Kelvin/Helmholtz Waves on Thin Liquid Sheets," (with C. Mehring), ILASS Americas '95 Meeting, Troy, MI, May 1995.
140. "Strukturen Laminarer Sprayflammen in der Gegenstromkonfiguration," (with E. Gutheil), Verbrennung und Feuerungen-17, Deutscher Flammentag, Hamburg-Harburg, Germany, September 12-13, 1995.
141. "Energetic Fuel Droplet Gasification with Liquid-Phase Reaction," (with D. Schiller and R. Bhatia), ONR Contractors' Meeting, UC San Diego, October 1995.
142. "Flame Spread with Concurrent Air Flow Across n-Propanol Pools," (with D.N. Schiller), Fall Western States Section of The Combustion Institute, Palo Alto, CA, October 1995.
143. "Vortex-Droplet Interaction Influencing Convective Droplet Heat Transfer," abstract (with M. Masoudi), 48th Annual Meeting of The American Physical Society, Irvine, CA, November, 1995.
144. "A Modified Equation for the Motion of a Spherical Particle," abstract (with I. Kim and S. Elghobashi), 48th Annual Meeting of The American Physical Society, Irvine, CA, November 1995.
145. "Droplet-Turbulence Interactions Over A Wide Spectral Range," (with S.E. Elghobashi, I. Kim and M. Masoudi), AFOSR Final Technical Report, February 1996.
146. "Nonlinear Travelling Wave Distortion of a Thin Liquid Sheet," (with C. Mehring), ILASS Americas '96, San Francisco, CA, May 1996.
147. "Nonlinear Distortion and Disintegration of Liquid Sheets for Pressure Atomization System," (with C. Mehring and I. Kim), AFOSR/ARO Contractors' Meeting, Virginia Beach, VA, June 1996.
148. "Energetic Fuel Droplet Oxidation with Liquid-Phase Decomposition," (with D. Schiller and J. Li), 9th ONR Propulsion Meeting, Alexandria, VA, September 1996.
149. "Fundamentals of Fuel Ignition and Flammability," National Research Council, Workshop on Aviation Fuels with Improved Fire Safety, Washington, DC, November 1996.
150. "Symmetric Distortion of a Thin Liquid Sheet with Infinite Length," (with C. Mehring and I. Kim), ILASS Americas '97 Meeting, Ontario, Canada, May 1997.

151. "Symmetric Distortion of a Thin Liquid Sheet with Semi-infinite Length," (with C. Mehring), ILASS Americas '97 Meeting, Ontario, Canada, May 1997.
152. "Three-dimensional Nonlinear Temporal Stability of an Infinitely Long Thin Liquid Sheet," (with I. Kim), ILASS Americas '97 Meeting, Ontario, Canada, May 1997.
153. "Selected Challenges in Jet and Rocket Engine Combustion Research," (with J.-P. Delplanque and F. Liu), 33rd AIAA/ASME/SAE/ASEE Joint Propulsion Conference, Seattle, WA, July 1997.
154. "Capillary Waves on Thin Planar Liquid Sheets," (with C. Mehring), DFD97 Meeting of the American Physical Society, San Francisco, CA, November 1997.
155. "Simultaneous Effect of Vortex Advection and Temperature Stratification on Droplet Heating," (with M. Masoudi), DFD97 Meeting of the American Physical Society, San Francisco, CA, November 1997.
156. "Unsteady Flame Propagation Beyond Steady Flammability Limits," Seventh International Conference on Numerical Combustion, St. John's College, York, U.K., March 1998 (abstract only).
157. "Nonlinear Distortion of Infinitely Long Thin Planar and Annular Liquid Sheets," (with C. Mehring), 11th ILASS Americas '98 Meeting, Sacramento, CA, May 1998.
158. "Nonlinear Distortion of Semi-Infinitely Long Thin Planar and Annular Liquid Sheets," (with C. Mehring), 11th ILASS Americas '98 Meeting, Sacramento, CA, May 1998.
159. "Three-Dimensional Symmetric Distortion of Thin Liquid Sheets," (with I. Kim), 11th ILASS Americas '98 Meeting, Sacramento, CA, May 1998.
160. "Energetic Fuel Droplet Gasification with Liquid-Phase Reaction," (with D.H. Schiller), ONR Final Technical Report, May 1998.
161. "Axisymmetric and Planar Flame Spreads Across Propanol Pools," (with I. Kim), Poster Paper 27<sup>th</sup> International Symposium on Combustion, Boulder, CO, August 1998.
162. "Nonlinear Distortion and Disintegration of Liquid Sheets for Pressure Atomization Systems," (with C. Mehring and I. Kim), ARO/AFOSR Contractors' Meeting in Chemical Propulsion, Long Beach, CA, June/July 1998.
163. "Opposed-Flow Flame Spread Across Propanol Pools: Effect of Liquid Fuel Depth," (with I. Kim), Joint Meeting of the US Sections, The Combustion Institute, Washington, March 1999.

164. "Three-dimensional Anti-symmetric Distortion of Modulated Semi-infinite Thin Liquid Sheets," (with I. Kim), ILASS Americas '99 Meeting, Indianapolis, IN, May 1999.
165. "Three-dimensional Symmetric Distortion of Modulated Semi-infinite Thin Liquid Sheets," (with I. Kim), ILASS Americas '99 Meeting, Indianapolis, IN, May 1999.
166. "Axisymmetric Distortion of Thin Annular Liquid Sheets," (with C. Mehring), ILASS Americas '99 Meeting, Indianapolis, IN, May 1999.
167. "Flame Spread Across Liquids: Numerical Modelling," (with I. Kim and H. Li), NASA Microgravity Combustion Conference, Cleveland, OH, May 1999.
168. "Review of Theory of Distortion and Disintegration of Liquid Streams," (with C. Mehring), 30<sup>th</sup> AIAA Fluid Dynamics Conference, Norfolk, VA, June-July, 1999.
169. "Flame Spread Across Liquids: 3-Dimensional Numerical Modelling," (with H. Li), 1999 Fall Combustion Institute Western States Meeting.
170. "Collision of a Vortex with a Vaporizing Droplet," (with M. Masoudi), American Physical Society, Division of Fluid Dynamics New Orleans, Louisiana, November 1999.
171. "Nonlinear Distortion and Disintegration of Conical Liquid Sheets at High Pressure" (with C. Mehring), extended abstract, ARO/AFOSR Contractors' Meeting, Santa Fe, NM, June 2000.
172. "Comments on Energy Conservation in Liquid-Stream Disintegration" (with C. Mehring), presented at ICLASS 2000, July 16-20, Pasadena
173. "Planar-Liquid-Stream Distortion from Kelvin-Helmholtz and Capillary Effects" (with C. Mehring), presented at ICLASS 2000, July 16-20, Pasadena
174. "Flame Spread Across Liquids: 3D Numerical Modelling," (with H. Li), Poster paper at The International Combustion Symposium. July 2000.
175. "Conical and Annular Free Liquid Film Instabilities," (with C. Mehring), Plenary Lecture, ILASS-Europe, Darmstadt, Germany, Sept. 2000.
176. "Nonlinear Three-dimensional Distortion and Disintegration of Conical Liquid Films," (with C Mehring), abstract only, APS Fluid Dynamics Meeting, Washington, D.C., November 2000.
177. "Liquid Film Disintegration Due to Gas Jet Impact," (with C. Mehring), abstract only, APS Fluid Dynamics Meeting, Washington, D.C., November, 2000.

178. "Ignition and Flame Studies for Turbulent Transonic Mixing in a Curved Duct Flow," with (J. Cai, O. Icoz, and F. Liu), AIAA preprint 2001-0189, 39<sup>th</sup> AIAA Aerospace Science Meeting, Reno, Nevada, January 2001.
179. "Ignition and Flame Studies for a Turbulent Accelerating Transonic Mixing Layer" (with C. Mehring and F. Liu), AIAA preprint 2001-1096, 39<sup>th</sup> AIAA Aerospace Sciences Meeting, Reno, Nevada, January 2001.
180. "Opportunities and Challenges of Turbine Burners," Plenary Lecture, 41st Israel Annual Conference on Aerospace Sciences, Haifa, February 21-22, 2001.
181. "Combustion in a Transonic Flow with Large Axial and Transverse Pressure Gradients," (with J. Cai, O. Icoz, F. Liu), 2nd Joint Meeting of the US Sections of The Combustion Institute, Oakland, CA, March 26-28, 2001.
182. "Three-Dimensional Flame Propagation Above Liquid Fuel Pools," (with J. Cai, F. Liu), 2nd Joint Meeting of the US Sections of The Combustion Institute, Oakland, CA, March 26-28, 2001.
183. "Free Planar Liquid Films Impacted by Gas Jets," (with C. Mehring), ILASS 2001, Dearborn, Michigan, May 20-23, 2001.
184. "Three-Dimensional Capillary Stability of Modulated Swirling Liquid Films," (with C. Mehring), ILASS 2001, Dearborn, Michigan, May 20-23, 2001.
185. "Three-Dimensional Ignition and Flame Propagation Above Liquid Fuel Pools: Computational Analysis," (with J. Cai, F. Liu), Sixth International Microgravity Combustion Workshop, Cleveland, Ohio, May 22-24, 2001.
186. "Nonlinear Distortion and Disintegration of Conical Liquid Sheets at High Pressure," (with C. Mehring), ARO/AFOSR Contractors' Meeting, Los Angeles, CA, June 18-19, 2001.
187. "Combustion in a Transonic Flow with Large Axial and Transverse Pressure Gradients," (with J. Cai, O. Icoz, and F. Liu) 18<sup>th</sup> International Colloquium on Dynamics of Explosions and Reactive Systems, Seattle, WA, August 2001.
188. "Miniature Combustor with Liquid-Fuel Film" (with D. Dunn-Rankin, B. Strayer, and T. Pham), preprinted for Western States Section/Combustion Institute Fall Meeting, Salt Lake City UT, October 2001.
189. "Accelerating Turbulent Methane-Air Reacting Mixing-Layer Computation," (with F. Lui, C. Mehring), abstract only, APS Fluid Dynamics Meeting, San Diego, CA, November 2001.

190. "Dynamic Straining of Viscous Liquid Film," (with J. Xi, C. Mehring), abstract only, APS Fluid Dynamics Meeting, San Diego, CA, November 2001.
191. "Primary Atomization of Liquid Film Discharging From Twin-Fluid Atomizer" (with C. Mehring), abstract only, APS Fluid Dynamics Meeting, San Diego, CA November 2001.
192. "Analysis of Miniature Liquid-Film Combustor," preprinted for Eastern States Section Combustion Institute Fall Meeting, Hilton Head, SC, December 2001.
193. "A New Gas Turbine Engine Concept for Electricity Generation with Increased Efficiency and Power" (with F. Liu), Final Report to California Energy Commission, 2002.
194. "Turbine Burners: Ignition and Flame-Holding in High Acceleration Flows," Plenary Lecture, Western States Section/Combustion Institute Spring Meeting, San Diego, CA, March 2002.
195. "Further Development on Miniature Scale Liquid-Fuel Film Combustion," (with T.K. Pham and D. Dunn-Rankin), Western States Section/Combustion Institute Spring Meeting, San Diego, CA, March, 2002.
196. "Opposed Flow Impact on Flame Spread Above Liquid Fuel Pools," (with J. Cai and F. Liu) Western States Section/Combustion Institute Spring Meeting, San Diego, CA, March 2002.
197. "Dynamic Stretching of a Thin Planar Liquid Bridge," (with C. Mehring and J. Xi), ILASS 15<sup>th</sup> Annual Conference, Madison, WI, May 2002.
198. "Nonlinear Distortion and Disintegration of Conical Liquid Sheets at High Pressure," (with C. Mehring), ARO/AFOSR Contractors Meeting, Dayton, OH, June 2002.
199. "Combustor Miniaturization With Liquid Fuel Filming," (with S. Stanchi and D. Dunn-Rankin), AIAA Preprint 2003-1163, Aerospace Sciences Meeting, Reno, Nevada, January 2003.
200. "Linearized Analysis of Liquid Film Combustor" (with S. Stanchi), Proceedings of the 3<sup>rd</sup> Joint Meeting of the US Sections of the Combustion Institute, Chicago, Illinois, March 2003.
201. "Combustion Efficiency of a Miniature Fuel Film Combustor" (with T.K. Pham and D. Dunn-Rankin), Proceedings of the 3<sup>rd</sup> Joint Meetings of the US Sections of the Combustion Institute, Chicago, Illinois, March 2003.

202. "Ligament Shedding From Discharging Free Planar Liquid Film" (with C. Mehring), Proceedings of ILASS 2003, Monterey, CA, May 2003.
203. "Computational and Experimental Studies of Three-Dimensional Flame Spread Over Liquid Fuel Pools" (with J. Cai, F. Liu, and F.J. Miller), Proceedings of 7<sup>th</sup> Microgravity Workshop, Cleveland, Ohio, May 2003.
204. "Current Status of Spray Combustion Modelling," Invited Paper, AIAA Preprint 2003-4784, Joint Propulsion Conference, Huntsville, Alabama, July 2003.
205. "Liquid-Film Combustor: Perturbation Analyses for the Effects of Swirl, Stefan Flow, and Gas Expansion" (with S. Stanchi), Poster Presentation at 19<sup>th</sup> ICDERS, Hakone, Japan, July 2003.
206. "Vaporization and Combustion in Three-dimensional Droplet Arrays" (with R. Imaoka), Proceedings of Western States Section/Combustion Institute Fall Meeting, Los Angeles, CA, October 2003.
207. "Computational Investigation of a Miniature Liquid-fuel-film Combustor" (with C. Mehring, T.K. Pham, and D. Dunn-Rankin), Proceedings of Western States Section/Combustion Institute Fall Meeting, Los Angeles, CA, October 2003.
208. "Theoretical Foundations for the Analysis of Laminar and Turbulent Spray Flows" Proceedings of Western States Section/Combustion Institute Fall Meeting, Los Angeles, CA, October 2003.
209. "Numerical Simulations of an Accelerating Reacting Mixing Layer in Transition" (with F. Cheng and F. Liu) APS Fluid Dynamics Meeting, East Rutherford, New Jersey, November 2003.
210. Book Review of "Modeling Engine Spray and Combustion" by G. Stiesch for AIAA Journal, Vol. 42, March 2004, p. 669.
211. "Numerical Study of a Miniature Liquid-Fuel-Film Combustor" (with T.K. Pham, C. Mehring, D. Dunn-Rankin) Paper 04S-10, Proceedings of Western States Section/Combustion Institute Spring Meeting, Davis, CA, March 2004.
212. "Fuel-Droplet-Array Burning with Asymmetry and Droplet-Size Variation" (with R. Imaoka) Paper 04S-41, Proceedings of Western States Section/Combustion Institute Spring Meeting, Davis, CA, March 2004.
213. "Linearized Analysis of Liquid-Film Combustor" (with S. Stanchi and R. Imaoka) abstract only, SIAM Numerical Combustion Meeting, Sedona, AZ, May 2004.

214. "Progress in Miniature Liquid Fuel Film Research," (with T.K. Pham, J.E. Papac, D. Dunn-Rankin), poster paper, 30<sup>th</sup> International Symposium on Combustion, Chicago, IL. July, 2004.
215. "Nonpremixed Combustion in an Accelerating Transonic Flow Undergoing Transition" (with F. Cheng, F. Liu), AIAA Aerospace Sciences Meeting, Reno, NV, January 2005.
216. "Transient Vaporization and Burning in Dense Droplet Arrays," (with R.Imaoka), Joint Meeting of the US Sections of the Combustion Institute, Philadelphia, March 2005.
217. "Liquid-Film Combustion in Small Cylindrical Chambers," (with T.K. Pham, N. S. Amade, D. Dunn-Rankin), Joint Meeting of the US Sections of the Combustion Institute, Philadelphia, March 2005.
218. "Simulation and Experiments of a Liquid Fuel Film Burning off of a Flat Plate," (with Y.-H. Li, J. Papac, D. Dunn-Rankin), Joint Meeting of the US Sections of the Combustion Institute, Philadelphia, March 2005.
219. "A Generalized Analysis for Dense Sprays," (with R.Imaoka), ILASS 2005, Irvine, CA, May, 2005.
220. "Computations for Liquid-fuel Combustion: Sprays, Pools, and Films," Plenary Lecture Invited Paper, European Community on Computational Methods in Applied Sciences Conference on Computational Combustion, Lisbon, June 2005.
221. "Film Combustion in Small Cylinders," (with T.K. Pham, D. Dunn-Rankin), ICDERS 2005, Montreal, August 2005.
222. "Liquid Fuel Burning with Non-unitary Lewis Number," Paper 05F-52 Proceedings of the Western States Section / Combustion Institute Fall Meeting, Stanford University, October 17-18, 2005.
223. "Non-Premixed Combustion in an Accelerating Transonic Flow Undergoing Transition," (with F. Cheng, F. Liu), APS Fluid Dynamics Meeting, Chicago, Illinois, November 2005.
224. "Recent Advances in Spray Combustion Theory," Preprint AIAA2006-1522 Aerospace Sciences Meeting, Reno, NV, January 2006.
225. "Identification of Promising Naval Aviation Science and Technology Opportunities," (co-authored with fifteen other members of the NRC Committee on Identification of Promising Naval Aviation Science and Technology Opportunities), National Research Council, March, 2006.

226. "Turbine Burners: Turbulent Combustion of Liquid Fuels," (with F. Liu, D. Dunn-Rankin), preprinted for AFOSR/ ARO Contractors' Meeting, Arlington, VA., June, 2006.
227. "Break-up of Liquid Streams at High Pressures," (with D. D. Joseph), preprinted for AFOSR/ ARO Contractors' Meeting, Arlington, VA., June, 2006.
228. "Instabilities in a Turning Reacting Mixing Layer Undergoing Transition," (with F. Cheng, F. Liu), APS Fluid Dynamics Meeting, Tampa, Florida, November 2006.
229. "Cavitation in an Orifice Flow," (with S. Dabiri, D. D. Joseph), Preprint AIAA 2006-1178, Aerospace Sciences Meeting, Reno, NV, January 2007.
230. "Non-Premixed Combustion in an Accelerating Turning, Transonic Flow Undergoing Transition," (with F. Cheng, F. Liu), Preprint AIAA Aerospace Sciences Meeting, Reno, NV, January 2007.
231. "Miniature Combustor with Liquid-Fuel Film," (with D. Dunn-Rankin), NSF Final Report, February 2007.
232. "Theoretical Issues in Droplet Array Vaporization and Burning," Paper # D01, 5th US Combustion Meeting, UC San Diego, March 25-28, 2007.
233. "Fuel/Air Mixing in a Model Turbine Burner Section," (with N. Sarzi-Amade and D. Dunn-Rankin) Paper # E02, 5th US Combustion Meeting, UC San Diego, March 25-28, 2007.
234. "Combustion in a Flow Cavity," (with B. Colcord), poster paper, 5th US Combustion Meeting, UC San Diego, March 25-28, 2007.
235. "Breakup of a Laminar Axisymmetric Liquid Jet," (with S. Dabiri and D. D. Joseph), ILASS meeting, May 2007.
236. "Breakup of Liquid Streams at High Pressures," (with S. Dabiri and D. D. Joseph), AFOSR/ ARO Contractors Meeting, June 2007.
237. "Turbine Burners: Turbulent Combustion of Liquid Fuels," (with F. Liu and D. Dunn-Rankin), AFOSR/ ARO Contractors Meeting, June 2007.
238. "Miniature Fuel-Film Combustor: Flame Confinement and Stability," (with R. Mattioli, T. K. Pham and D. Dunn-Rankin), 21st ICDERS, Poitiers, France, July 23-27, 2007.
239. "Final Report: Literature Review on Formation and Atomization of Emulsions," (with S. Abbilian, C. D. Bolszo, A. A. Narvaez, D. Dunn-Rankin, and V. G. McDonell), Report to Siemens Power Corporation, July, 2007.



240. Flame Spread User Manual, (with F. Cheng, C. Mehring, and F. Liu) a report to NASA on three-dimensional flame-spread code, August 2007.
241. Flame Spread Documentation Report, (with F. Cheng, C. Mehring, and F. Liu) a report to NASA on three-dimensional flame-spread code, August 2007.
242. "Recent Theoretical Advances for Liquid-fuel Atomization and Burning," Plenary Lecture Paper, Seventh International Symposium on Special Topics in Chemical Propulsion: Advancements in Energetic Materials & Chemical Propulsion, Kyoto, Japan, September, 2007.
243. "Multicomponent-Liquid-Fuel Vaporization with Complex Configuration," (with G. Wu), preprinted for Western States Section/ Combustion Institute Meeting, Sandia Laboratories, October 2007.
244. "Combustion Model with Fuel Injection into and Air Flow past a Cavity," (with B. Colcord), preprinted for Western States Section/ Combustion Institute Meeting, Sandia Laboratories, October, 2007.
245. "Experimental and Numerical Investigation of a Model Turbine-Burner," (with S. Puranam, B. Colcord, J. Arici, D. Dunn-Rankin) Western States Section/The Combustion Institute Spring Meeting paper 08S-41, University of Southern California, Los Angeles, March 17–18, 2008.
246. "Growth and Collapse of Cavitation Bubbles in Viscous Flow through an Orifice," (with S. Dabiri, D. D. Joseph), preprinted for ILASS Americas 21th Annual Conference on Liquid Atomization and Spray Systems, Orlando, Florida, May 18-21, 2008.
247. "Combustion and Flameholding in a Turbine Burner Configuration: An Experimental and Numerical Exploration of Reacting Flow in a Curving Contracting Channel," (with J. Arici, S. V. Puranam, B. Colcord, D. Dunn-Rankin), poster paper, 32<sup>nd</sup> International Combustion Symposium, 2008.
248. "Effects of Cavitation on the Breakup of Liquid Jets: Bubble Growth, Distortion, and Collapse in an Orifice Flow," (with S. Dabiri and D. D. Joseph), AIAA Preprint 2009-0996, 47<sup>th</sup> Aerospace Sciences Meeting, Orlando, FL January 5-8, 2009.
249. "Convective Vaporization and Burning of Droplet Arrays," (with G. Wu), 6th US National Combustion Meeting, Ann Arbor, MI, May 18-20, 2009.
250. "Flame-holding with Fuel Injection into Cavity Adjacent to Air Channel," (with B. Colcord and F. Liu), 6th US National Combustion Meeting, Ann Arbor, MI, May 18-20, 2009.
251. "One-dimensional Spray Combustion Optimization with a Sequential Linear Quadratic Algorithm," (with J. A. Sirignano, L. Rodriguez, and A. Sideris), 6th US National Combustion Meeting, Ann Arbor, MI, May 18-20, 2009.

252. "Breakup of Liquid Streams at High Pressure," (with D. D. Joseph), Extended Abstract for ARO/AFOSR Contractors Meeting, National Harbor, MD, June 2009.
253. "Generation and Pressure Atomization of Water-in-oil Emulsions for Gas Turbines," (with C.D. Bolszo, A.A. Narvaez, S. Abbilian, A. Jepsen, D. Dunn-Rankin, and V.G. McDonell), ICLASS 2009, 11th Triennial International Annual Conference on Liquid Atomization and Spray Systems, Vail, Colorado USA, July 2009.
254. "Cavitation Bubbles in Shear Flow," (with S. Dabiri and D. D. Joseph), ICLASS 2009, 11th Triennial International Annual Conference on Liquid Atomization and Spray Systems, Vail, Colorado USA, July 2009.
255. "Progress on UCI Liquid Film Miniature Combustor," (with D. Dunn-Rankin), Preprinted for Joint Propulsion Conference, Denver, Colorado, August 2009.
256. "Turbine Burners: Flameholding in Accelerating Flow," (with D. Dunn-Rankin, F. Liu, B. Colcord, and S. Puranam), Preprinted for Joint Propulsion Conference, Denver, Colorado, August 2009.
257. "Oil/Water Emulsion Mixing and Atomization Characterization: Final Report to Siemens," (with C.D. Bolszo, A.A. Narvaez, S. Abbilian, D. Dunn-Rankin, and V.G. McDonell), July 2009.
258. "Turbine Burners: Turbulent Combustion of Liquid Fuels – Final AFOSR Report," (with D. Dunn-Rankin, F. Liu, B. Colcord, and S. Puranam, August, 2009.
259. "Flame-holding in Cavity Adjacent to Accelerating, Turning Flow Channel," (with B. J. Colcord and F. Liu), Paper 09F-18, Fall Technical Meeting, Western States Section of the Combustion Institute, Irvine, CA, October 26-27, 2009.
260. "Pressure Atomization of Water-in-Oil Emulsions for Gas Turbines," (with C. D. Bolszo, A. A. Narvaez, S. Abbilian, A. Jespen, V. G. McDonell, and D. Dunn-Rankin), Paper 09F-46, Fall Technical Meeting, Western States Section of the Combustion Institute, Irvine, CA, October 26-27, 2009.
261. "Transient Burning of a Convective Fuel Droplet," (with G. Wu), Paper 09F-84, Fall Technical Meeting, Western States Section of the Combustion Institute, Irvine, CA, October 26-27, 2009.
262. "Transient Convective Burning of Fuel-Droplet Arrays," (with G. Wu). Spring Technical Meeting, Western States Section of the Combustion Institute, University of Colorado at Boulder, March 21-23, 2010

263. "Breakup of Water-in-Oil Emulsions in Liquid Jets and Conical Sheets," (with C. D. Bolszo, M. Rohani, A. A. Narvaez, D. Dunn-Rankin, and V. G. McDonell), 22<sup>nd</sup> ILASS Meeting, Cincinnati, OH, May 2010.
264. "Pressure Swirl Atomization of Water-in-Oil Emulsions," (with C. D. Bolszo, A. A. Narvaez, D. Dunn-Rankin, and V. G. McDonell), 22<sup>nd</sup> ILASS Meeting, Cincinnati, OH, May 2010.
265. "Flameholding in a Cavity Adjacent to an Accelerating Air Channel," (with B. Colcord and F. Liu), US National Combustion Meeting, Atlanta, GA, March, 2011.
266. "Theoretical Developments in Group Combustion of Droplets and Sprays," abstract only, 13<sup>th</sup> International Conference on Numerical Combustion, Korfu, Greece, April, 2011.
267. "Transient High-pressure Fuel Injection Processes," (with D. Jarrahbashi and S. Dabiri), ILASS Meeting, Ventura, CA, May 2011.
268. "Transient High-pressure Fuel Injection Processes," (with D. Jarrahbashi), Extended Abstract for ARO/AFOSR Contractors Meeting, Williamsburg, VA, June 2011.
269. "Flame Stabilization with Fuel Injection into a Cavity Adjacent to a Curved, Converging Air-flow Channel," (with B. Colcord, F. Liu) 23<sup>rd</sup> ICDERS, Irvine, CA July, 2011 .
270. "UCI Liquid Film Miniature Combustor," (with D. Dunn-Rankin), invited talk, AIAA Aerospace Sciences Meeting, Nashville, TN, January 9-12, 2012. Abstract only.
271. "Turbine-Burner Model: Cavity Flameholding in a Converging, Turning Channel Flow," (with Ben J. Colcord and Feng Liu), Joint Propulsion Conference, Atlanta, July 29-August 1, 2012.
272. "Effects of Acceleration on Jet Instability in High-pressure Fuel Injection Processes," (with D. Jarrahbashi), ICLASS Meeting, Heidelberg, September 2012.
273. "Reduced Basis and Stochastic Modeling of Liquid Propellant Rocket Engine as a Complex System," (with A. Sideris, S. Menon, R. Munipalli, D. Ota, D. R. Kassoy), Space Propulsion and Power Program Review, Arlington VA., 10-13 September 2012.
274. "Transient High-Pressure Fuel Injection Processes," ARO Grant W911NF-09-1-0208, Final Report (with D. Jarrahbashi), November 21, 2012.
275. Book review of "Small Wind Turbines: Analysis, Design and Application," by D. Wood, Springer Verlag. AIAA Journal 2013. doi: 10.2514/1.J052296

276. "Two-dimensional Model for Liquid-Rocket Transverse Combustion Instability," (with P. Popov), AIAA Aerospace Sciences Meeting, Grapevine, Texas, January 2013.
277. "Three-dimensional Segment Analysis of Transient Liquid Jet Instability," (with D. Jarrahbashi), ILASS Meeting, Pittsburgh, PA, May 2013.
278. "Theoretical Developments for Spray Formation, Vaporization, and Burning," Keynote Lecture, Abstract only, ILASS Meeting, Pittsburgh, PA, May 2013.
279. "Stochastic Modeling of Transverse Wave Instability in a Liquid Propellant Rocket Engine," (with P. Pavel and A. Sideris), Joint Propulsion Conference, San Jose, CA, July 2013.
280. "Solid Fuel Regression Rate Modeling for Hybrid Rockets," (with F. M. Favaró, M. Manzoni, A. Coronetti, and L. T. DeLuca), 5th European Conference for Aeronautics and Space Sciences, Munich, July 2013.
281. "Transient Liquid Injection," Invited Lecture, abstract only, American Physical Society Fluid Dynamics Annual Meeting, Pittsburgh, PA November, 2013.
282. "Propellant Injector System Influence on Rocket Engine Combustion Instability," (with P. P. Popov and A. Sideris), AIAA Aerospace Sciences Meeting, National Harbor, MD, January 2014.
283. "Triple flame: Inherent Asymmetries and Pentasectional Character," (with A. Jorda Juanos), Western States Section/ Combustion Institute Meeting, March 2014, Pasadena, CA.
284. "Uncertainty Quantification of Non-linear Oscillation Triggering in a Multi-injector Liquid-propellant Rocket Combustion Chamber," (with P. P. Popov and A. Sideris), American Physical Society Fluid Dynamics Meeting, November 2014, San Francisco, CA. Abstract only.
285. "Combustion Instability: Triggering, Transients, and Limit Cycles ," US National Combustion Meeting, Cincinnati OH, May 2015.
286. "Early Spray Development at High-Pressure: Hole, Ligament, and Bridge Formations ," (with D. Jarrahbashi, P. Popov, F. Hussain), ILASS Meeting, Raleigh, NC May 2015.
287. "Triggering and Re-stabilizing Potential of Acceleration Pulses in Liquid-Propellant Rocket Motors," (with P. P. Popov and A. Sideris), Joint Propulsion Conference, July 2015.
288. "Wave Dynamics for Transverse Acoustic Instabilities in a Rectangular Rocket Motor," (with P. P. Popov), Joint Propulsion Conference, July 2015.

289. “Thermodynamic Analysis for Combustion at High Gas Densities,” (with A. Jordà Juanos), ICDERS, Leeds, UK, 2015.
290. “Nonlinear Two-time-scale Perturbation Theory for Transverse Combustion Dynamics,” ICDERS, Leeds, UK, 2015.
291. “Three-dimensional Planar Liquid Sheet Breakup,” (with A. Zandian and F. Hussain), AIAA Science and Technology Forum and Exposition, San Diego. January, 2016.
292. “Counterflow Analysis for Combustion at High Pressure,” (with A. Jordà Juanos and P. P. Popov), AIAA Science and Technology Forum and Exposition, San Diego. January, 2016.
293. “Low-Probability Events Leading to Rocket Engine Combustion Instability,” (with P.P. Popov and A. Sideris), AIAA Science and Technology Forum and Exposition, San Diego. January, 2016.
294. “Mechanisms, Role of Vorticity, and Time Scales for Planar Liquid Sheet Breakup,” (with A. Zandian and F. Hussain), APS Fluid Dynamics Meeting, Portland, Oregon, November 20-22, 2016.
295. “Temporal Length-scale Cascade and Expansion Rate on Planar Liquid Jet Instability,” (with A. Zandian and F. Hussain), APS Fluid Dynamics Meeting, Portland, Oregon, November 20-22, 2016.
296. “Simulation of Liquid-Propellant Rocket Longitudinal Combustion Instability,” (with T. M. Nguyen and P.P. Popov), AIAA Science and Technology Forum and Exposition, Gaylord, TX. January, 2017.
297. “Analytical / Computational Approach to Liquid Injection at Supercritical Pressures,” (abstract only) Invited for the Minisymposium *Recent Progress and Opportunities in Modeling and Simulations of Supercritical Combustion*, 2017 SIAM International Conference on Numerical Combustion, Orlando, FL, April 3-5, 2017.
298. “Extinction Analysis of a Methane-Oxygen Counterflow Flame at High Pressure,” (with A. Jordà Juanós), 10th U.S. National Combustion Meeting, College Park, MD, April 23–26, 2017.
299. “Planar Liquid Sheet Breakup Mechanisms, Time Scales, and Length Scale Cascade,” (With A. Zandian and F. Hussain), ILASS-Americas 29th Annual Conference on Liquid Atomization and Spray Systems, Atlanta, GA, May 2017.

300. "Explaining the Planar Liquid Jet Atomization via Vortex Dynamics," (With A. Zandian and F. Hussain), ILASS-Americas 29th Annual Conference on Liquid Atomization and Spray Systems, Atlanta, GA, May 2017.
301. "Diffusion Flame at High Pressure with Air and Water-laden Methane," (with A. Jorda Juanos), ICDERS, Boston, August, 2017.
302. "Mechanisms, Vorticity, and Time and Length Scales for Liquid Stream Breakup," (with A. Zandian and F. Hussain), ILASS Europe-2017, Valencia, Spain, September 2017.
303. "Analytical / Computational Approach to Liquid Spray Heating and Vaporization at Supercritical Pressures," (with A. Jorda Juanos), ILASS Europe-2017, Valencia, Spain, September 2017.
304. "Normal Shocks with High Upstream Pressure", (abstract only), APS Fluid Dynamics Meeting, Denver, Colorado, November 19-21, 2017.
305. "Vortex Dynamics of a Spatially Developing Liquid Round Jet", (with A. Zandian and F. Hussain), ICLASS 2018, Chicago, Illinois, 2018.
306. "Liquid-Gas Equilibrium and Interface Dynamics at Supercritical Pressure", (with J. Poblador Ibanez), ICLASS 2018, Chicago, Illinois, 2018.
307. "Spontaneous and Triggered Longitudinal Combustion Instability in a Single-Injector Rocket Engine", (with T.M. Nguyen), Joint Propulsion Conference, Cincinnati, Ohio, 2018.
308. "Nonlinear Combustion Instability in a Multi-Injector Rocket Engine", (with J. Xiong, T. H. Morgan, J. Krieg, and F. Liu ), Joint Propulsion Conference, Cincinnati, Ohio, 2018.
309. "Neural Network Closure Models for Estimating Flame Variables in a Liquid-Propellant Rocket Engine," (with Z. Shadram, T. M. Nguyen, A. Sideris), AIAA Scitech Forum, San Diego, January 2019.
310. "A Neural Network Based Flamelet Model for a Liquid-propellant Rocket Engine with Partially-premixed Flame," (with Z. Shadram, T. M. Nguyen, A. Sideris), US National Combustion Meeting, Pasadena, CA, March 2019.
311. "Analysis of an Axisymmetric Liquid Jet at Supercritical Pressures", (with J. Poblador-Ibanez), ILASS-Americas 30th Annual Conference on Liquid Atomization and Spray Systems, Tempe, AZ, May 2019.

312. "Normal Strain Rate and Pressure Effects using Detailed and Global Chemistry Models in a CH<sub>4</sub>-Air Counterflow Flame," (with C-F. López-Cámara, A. Jordà Juanós), Western States Meeting, Albuquerque, N. M., October 2019.

313. "Three-Dimensional Counterflow Combustion with Multiple Flames," Western States Combustion Institute Meeting, Albuquerque, N. M., October 2019.

314. "Vorticity Dynamics for a Spatially Developing Liquid Jet within a Co-flowing Gas," (with A. Zandian, F. Hussain), APS Fluid Dynamics Meeting, Seattle, WA, November 2019.

#### **PATENTS:**

Liquid-Film Miniature Combustor, U.S. Patent 6877978, granted April 12, 2005 (with D. Dunn-Rankin).

#### **PUBLIC LECTURES:**

1. "An Introduction to Combustion Instability Research," a series of Lectures at Marshall Space Center in Huntsville, Alabama, October 1963.

2. "Nonlinear Oscillations in a Rocket Motor," Aerospace Seminar, University of California, Berkeley, CA, November 1963.

3. "A Shock-Wave Model of Unstable Rocket Motors," AIAA Solid Rockets Conference, Palo Alto, CA, January 1964.

4. "Some Combustion Instability Researches," University of Virginia, April 1966.

5. "A Shock-Wave Model of Unstable Rocket Combustors," Pennsylvania State University, May 1966.

6. "Combustion Instability Research," Aerospace Corporation, San Bernardino, CA, June 1966.

7. "Acoustic Liner Studies," 3rd ICRPG Liquid Combustion Conference, Cape Kennedy, FL, October 1966.

8. "Combustion Instability Research at Guggenheim Laboratories," NASA Lewis Laboratories, Cleveland, OH, November 1966.

9. "Nonlinear Oscillations in Liquid Rocket Combustion Chambers," First International Colloquium on Gas Dynamics of Explosions, Brussels, Belgium, September 1967.

A series of seven AGARD-sponsored lectures in France, The Netherlands, Norway, and West Germany during August and September 1967:

10. "Some Theory and Experiments in the Field of Combustion Instability," Deutsche Versuchsanstalt für Luft-und-Raumfahrt, Lampoldshausen, W. Germany.
11. "Theory of Nonlinear Combustion Oscillations," Deutsche Versuchsanstalt für Luft-und-Raumfahrt, Lampoldshausen, Stuttgart, W. Germany.
12. "Liquid Droplet Burning in an Oscillatory Field," Deutsche Forschungsanstalt für Luft-und-Raumfahrt, Trauen, W. Germany.
13. "Nonsteady Solid Propellant Burning," Norwegian Defense Research Establishment, Kjeller, Norway.
14. "Nonsteady Solid Propellant Burning," Delft Technical University and Defense Research Laboratories, The Netherlands.
15. "Nonsteady Solid Propellant Combustion" and "Theory of Liquid Droplet Burning," Office National d'Etudes Recherches Aerospatiales, Chatillonsous Bagneux, France.
16. "Non-Steady Burning of Solid Propellants," Georgia Institute of Technology, Atlanta, GA, November 1967.
17. "Quasi-Steady Assumptions for Gas Phase of Solid Propellant Combustion," Conference on the Theory of Coupling of Combustion with Gas Dynamics Flow Field, Princeton, NJ, January 1968.
18. "A Theory of Axial-Mode Shock Wave Oscillations in a Solid Rocket Combustor," Twelfth International Symposium on Combustion, University of Poitiers, France, July 1968.
19. "Theoretical Analysis of Nonlinear Transverse Combustion Instability in Liquid Propellant Rocket Motors Using a Droplet Evaporation Model," 5th ICRPG Liquid Combustion Conference, Johns Hopkins University, October 1968.
20. "Flame Spreading on Liquid Fuels: Surface-Tension-Driven Flows," Columbia University, March 1969.
21. Invited comments on "A Theoretical Study of Nonlinear Damping by Helmholtz Resonators" by B.T. Zinn, AIAA 5th Propulsion Joint Specialists Conference, U.S. Air Force Academy, June 1969.
22. "Near-resonant, Off-resonant, and Quasi-steady Theories of Acoustic Liner Operation," 6th ICRPG Liquid Propellant Combustion Conference, Illinois Institute of Technology, September 1969.



23. "Axisymmetric Jet Diffusion Flame in an External Oscillating Stream," 6th ICRPG Liquid Propellant Combustion Conference, Illinois Institute of Technology, September 1969.
24. "Longitudinal Mode Oscillations in an End-Burning Solid Rocket Motor," 6th ICRPG Solid Propellant Combustion Conference, Jet Propulsion Laboratory, California Institute of Technology, October 1969.
25. "Flame Spreading Above Liquid Fuels: Surface-Tension Driven Flows," Western States Section/ Combustion Institute Fall Meeting, University of California, San Diego, CA, October 1969.
26. "Surface-Tension-Driven Flows," Univ. of Michigan, Ann Arbor, MI, March 1970.
27. "Some Comments on Turbojet Instability Research," Wright Patterson AF Base, Dayton, OH, March 1970.
28. "Aerospace Propulsion" a graduate level short course (30 hours), Space Research Institute, North Troy, Vermont, March 1970.
29. "Calculation on Rocket Combustion Instability with Droplet Evaporation Model," 7th JANNAF Liquid Combustion Instability Meeting, Pasadena, CA, October 1970.
30. "Acoustic Liner Theory and Experiments," 7th JANNAF Liquid Combustion Instability Meeting, Pasadena, CA, October 1970.
31. "Combustion Model of the Otto Engine," General Motors Research Labs., Warren, Michigan, January 1971.
32. "Acoustic Liner Design from a Fluid Mechanics Approach," AIAA/SAE 7th Propulsion Joint Propulsion Conference, Salt Lake City, UT, June 1971.
33. "A One-Dimensional Analysis of Combustion in a Spark Ignition Engine," Intersociety Energy Conversion Engineering Conference, Boston, MA, August 1971.
34. "Review of Theories of Flame Spread Across Liquid and Solid Fuels," 1971, Eastern Section Combustion Institute Fall Meeting, University of Waterloo, Canada, August 1971.
35. "The Range of Technical Options: Introduction to Non-Specialists," Princeton University Conference on Air Quality and Automobile Emissions: A Case Study, April 1972.
36. "Damping Devices for Various Combustion Environments," 9th JANNAF Combustion Meeting, Monterey, CA, September 1972.

37. "Interaction of Axisymmetric Wake Diffusion Flames with a Coaxial Oscillating Stream," 9th JANNAF Combustion Meeting, Monterey, CA, September 1972.
38. "Fundamentals of Combustion," a series of three tutorial seminars at Sandia Laboratories, Albuquerque, NM, August 1972.
39. "Theory of Turbulent Flame Propagation in Spark Ignition Engines," Rutgers University, October 1972.
40. "Theory of Turbulent Flame Propagation in Spark Ignition Engines," RCA Sarnoff Research Center, March 1973.
41. "Flame Spreading Across Solid Materials," Brooklyn Polytechnic Institute, April 1973.
42. "Theory of Turbulent Flame Propagation in Spark Ignition Engines," Chemical Engineering Department, Princeton University, April 1973.
43. "Theory of Flame Spread Above Solid Fuels," University of California at San Diego, 4th International Colloquium on Gasdynamics of Explosions and Reactive Systems, July 1973.
44. "Flame Spreading Across Liquid Fuels," NSF/RANN Conference on Fire Research, Georgia Institute of Technology, May 1974.
45. "Transient Convective Fuel Droplet Burning and Vaporization," NSF Workshop on Energy-Related Basic Combustion Research, Princeton University, June 1974.
46. "Further Calculations Based Upon a Theory of Flame Spread Across Solid Fuels," Eastern Section/ Combustion Institute Fall Technical Meeting, Johns Hopkins University, October 1974.
47. "Flame Spread Above Solid Fuels," Case Western Reserve University, October 1974.
48. "Flame Spreading Across Materials: A Review of Fundamental Processes," AGARD Conference on Aircraft Fire Safety, Rome, Italy, April 1975.
49. "Preliminary Analysis of a Fuel Droplet in a Convective Field," Joint Meeting of Central and Western States Sections/Combustion Institute, San Antonio, TX, April 1975.
50. "An Approach to Multicomponent, Transient, Convective Fuel Droplet Burning," NSF Workshop on Combustion Modeling, La Jolla, CA, April 1975.

51. "Theory of Multicomponent Fuel Droplet Burning and Vaporization," Northwestern University, October, 1975.
52. "Rocket Nozzle Acoustic Damping," Solid Propellant Combustion Instability Conference, Edwards Air Force Base, CA, October 1975.
53. "Multicomponent Fuel Droplet Burning," Sandia Laboratories, Livermore, CA, October 1975.
54. "Program Report on Ignition of Combustible Mixtures by Hot Metal Particles," AFOSR Meeting, August 1976.
55. "Fundamental Aspects of Flame Spread Across Liquid and Solid Fuels," American Chemical Society Meeting, San Francisco, CA, August 1976.
56. "Transient Heating and Liquid Phase Mass Diffusion in Fuel Droplet Vaporization," American Chemical Society Meeting, San Francisco, CA, August 1976.
57. "Multicomponent, Transient, Convective Fuel Droplet Burning and Vaporization," Purdue University, October 1976.
58. "Multicomponent, Transient Convective Fuel Droplet Burning and Vaporization," University of Illinois, Chicago Circle, October 1976.
59. "Program Report on Unsteady Flame Propagation Through Fuel-Air Sprays," ARO Meeting, Warren, MI, November 1976.
60. "Theory of Flame Spread Over Solid Fuels," University of California, Berkeley, CA, March 1977.
61. "Multicomponent Droplet Vaporization," Lawrence Livermore Laboratories, May 1977.
62. "Program Report on Multicomponent Fuel Droplet Vaporization with Internal Circulation," DOE Meeting, San Francisco, CA, July 1977.
63. "A Theory of Multicomponent Fuel Droplet Vaporization," V International Symposium on Combustion Processes, Krakow, Poland, September 1977.
64. "Program Report on Unsteady Flame Propagation Through Fuel-Air Sprays," ARO Meeting, Purdue University, January 1978.
65. "Multicomponent Fuel Droplet Vaporization with Internal Circulation," University of California, Davis, March 1978.

66. "Multicomponent Fuel Droplet Vaporization with Internal Circulation," California Institute of Technology, March 1978.
67. "An Overview of Turbulent Combustion Modelling and Multicomponent Fuel Vaporization Studies at Princeton University," Sandia Laboratories, March 1978.
68. "Unsteady Flame Propagation Through a Fuel-Air Spray with Droplet Heating," Central States Section/ Combustion Institute Meeting, April 1978.
69. "Program Report on Multicomponent Droplet Vaporization," DOE Contractors' Meeting, Washington, D.C., September 1978.
70. "Program Report on Study of Ignition by Burning Metal Particles," AFOSR Meeting, October 1978.
71. "Program Report on Turbulent Reacting Mixing Layers," ONR Project SQUID Meeting, Yale University, October 1978.
72. "Theory of Convective Droplet Vaporization With Unsteady Heat Transfer in the Circulating Liquid Phase," AIAA Aerospace Sciences Meeting, New Orleans, LA, January 1979.
73. "Review of Spray Combustion and Fuel Droplet Vaporization Studies," Sandia Laboratories, Livermore, CA February 1979.
74. "Numerical Prediction of Axisymmetric Laminar and Turbulent Flows in Motored, Reciprocating Internal Combustion Engines," SAE Meeting, Detroit, MI, February 1979.
75. "Turbulent Reacting Planar Mixing Layer Theory," Aerochem Research Laboratories, June 1979.
76. "Flame Propagation Through Fuel-Air Sprays," ARO Meeting, University of Wisconsin, June 1979.
77. "Comparisons Amongst Various Theories for Turbulent, Reacting, Planar Mixing Layers," 7th Colloquium on the Gasdynamics of Explosions and Reactive Systems, University of Gottingen, August 1979.
78. "Program Report on Turbulent Reacting Flows," ONR Project SQUID Meeting, California Institute of Technology, Pasadena, CA, October 1979.
79. "Laser Doppler Velocimetry Measurements in a Motored IC Engine," AIAA Aerospace Sciences Meeting, Pasadena, CA, January 1980.
80. "Progress Report on Multiple Ignition Studies," AFOSR Meeting, Alexandria, VA, January 1980.

81. "Turbulent Combustion Modelling," University of Pittsburgh, February 1980.
82. "Multicomponent Fuel Droplet Vaporization with Liquid Phase Mass Diffusion and Internal Circulation," U.S. Bureau of Mines, February 1980.
83. "Multicomponent Fuel Droplet Vaporization with Liquid Phase Mass Diffusion and Internal Circulation," Pennsylvania State University, April 1980.
84. "Spray Combustion," a series of ten lectures presented at Politecnico de Milano, June 1980.
85. "Turbulent Combustion," a series of ten lectures presented at Politecnico de Milano, June 1980.
86. "Ignition of a Combustible Mixture by an Inert Hot Particle," Combustion Symposium University of Waterloo, August 1980.
87. "Turbulent Flow Field in Homogeneous-Charge, Spark Ignition Engines," Combustion Symposium, University of Waterloo, August 1980.
88. "Progress on Swirling Reacting Turbulent Flow Studies," ONR Project SQUID Meeting, MIT, October 1980.
89. "Multicomponent Fuel Droplet Vaporization with Liquid-Phase Mass Diffusion and Internal Circulation," University of Pennsylvania, October 1980.
90. "A Review of Spray Combustion Research at Carnegie-Mellon University," Sandia Laboratories, Livermore, CA, March 24, 1981.
91. "Progress Report on Ignition and Flame Propagation in Spray Research Program," ARO Workshop, Georgia Institute of Technology, Atlanta, GA, April 1981.
92. "Multicomponent Fuel Droplet Vaporization," Department of Mechanical Engineering, Stevens Institute of Technology, Hoboken, NJ, April 1981.
93. "Multiple Ignition, Combustion and Quenching of Hydrocarbon Fuel Sprays," AFOSR Contractors' Meeting, Clearwater, FL, November 1981.
94. "Vaporization of Synthetic Fuels," Combustion Contractors' Review Meeting, Pittsburgh Energy Technology Center, Holiday Inn, Pittsburgh, PA, April 1982.
95. "Spray Combustion in a Turbulent Environment," United States-Italy Joint Workshop on Heat Transfer in Combustion, Pisa, Italy, September 1982.

96. "Ignition of Fuels by Incendiary Particles and Hot Bodies," AFOSR Contractors' Meeting, Clearwater, FL, November 1982.
97. "Computation of Laminar Spray Flames; Hybrid Eulerian-Lagrangian Schemes," Eastern Section/Combustion Institute Fall Technical Meeting, Atlantic City, NJ, December 1982.
98. "Fuel Droplet Vaporization and Spray Combustion Theory," Eastern Section/Combustion Institute Fall Technical Meeting, Atlantic City, NJ, December 1982.
99. "A Comparison of Vaporization Models in Spray Calculations," AIAA 21st Aerospace Sciences Meeting, Reno, NV, January 1983.
100. "Fuel Droplet Vaporization and Spray Combustion," UC Berkeley, February 1983.
101. "Fuel Droplet Vaporization and Spray Combustion," UC Irvine, February 1983.
102. "Analysis of Vaporizing Droplet with Slip, Internal Circulation, and Unsteady Liquid-Phase and Quasi-Steady Gas-Phase Heat Transfer," ASME-JSME Thermal Engineering Joint Conference, Honolulu, HI, March 1983.
103. ONR Contractors' Meeting, Ramjet Workshop, Georgia Institute of Technology, Atlanta, GA, April 1983.
104. "Ignition and Combustion of Liquid and Gaseous Hydrocarbon Fuels," AFOSR Contractors' Meeting on Airbreathing Combustion Dynamics Research, Scottsdale, AZ, September 1983.
105. "Fuel Droplet Vaporization," US-China Joint Workshop, Peking, China, October 1983.
106. "Ignition of Fuel-Air Spray Mixtures by Hot Surfaces," Eastern Section/Combustion Institute Fall Technical Meeting, Providence, RI, November 1983.
107. "Fuel Droplet Vaporization," Rensselaer Polytechnic Institute, November 1983.
108. "Fuel Droplet Vaporization," United Technologies Research Center, November 1983.
109. "Fuel Droplet Vaporization," Cornell University, November 1983.
110. "Molecular Mixing in a Turbulent Flow: Some Fundamental Considerations," AIAA 22nd Aerospace Sciences Meeting, Reno, NV, January 1984.
111. "Molecular Mixing in a Turbulent Flow: Some Fundamental Considerations," Sandia Laboratories, March 1984.

112. "Molecular Mixing in a Turbulent Flow: Some Fundamental Considerations," Drexel University, Philadelphia, PA, March 1984.
113. "Flame Propagation Through Sprays," ARO Contractors' Meeting, Philadelphia, PA, March 1984.
114. "Fuel Droplet Vaporization and Spray Combustion," University of Naples, June 1984.
115. "Fuel Droplet Vaporization and Spray Combustion," Politecnico de Milano, June 1984.
116. "Molecular Mixing in a Turbulent Flow," Politecnico de Milano, June 1984.
117. "Molecular Mixing in a Turbulent Flow," UC Berkeley, July 1984.
118. "Spray Combustion Modelling," UC Berkeley, August 1984.
119. "Molecular Mixing in a Turbulent Flow," Sandia Laboratories, August 1984.
120. "Effect of Spray Combustion on Ramjet Instability," ONR Contractors' Meeting, Monterey, CA, October 1984.
121. "Spray Combustion Modelling," New York University, November 1984.
122. "Molecular Mixing in a Turbulent Flow," Princeton University, November 1984.
123. "The Effect of Droplet Spacing on Spray and Group Combustion," ASME Winter Annual Meeting, New Orleans, LA, December 1984.
124. "Spray Combustion Simulation," Jet Propulsion Laboratories, Pasadena, CA, April 1985.
125. "Spray Combustion Simulation," Institut National de Recherche en Informatique, Sophia-Antipolis, France, May 1985.
126. "A Numerical Technique for the Solution of a Vaporizing Fuel Droplet," 10th International Colloquium on Dynamics of Explosions and Reactive Systems, Berkeley, CA, August 1985.
127. "Acoustical and Vortical Interactions with Burning Sprays," ONR/NAVAIR Contractors' Meeting, Columbia, MD, October 1985.
128. "Enclosed Gas and Liquid with Nonuniform Heating from Above," NASA Lewis Research Center, Cleveland, OH, October 1985.

129. "Molecular Mixing in Turbulent Reacting Flow," Fall Technical Meeting, Eastern Section/Combustion Institute, Philadelphia, PA, November 1985.
130. "Transient Spray Combustion Computations," NASA/CHAM Meeting on the Thermofluid Analysis of the SSME Fuelside Preburner, George C. Marshall Space Flight Center, Huntsfield, AL, February 1986.
131. "Vaporization Ignition and Combustion of Two Parallel Droplet Streams," 6th Army Workshop on Combustion, Davis, CA, March 1986.
132. "Transient Spray Combustion Computations," Washington State University, Pullman, WA, May 1986.
133. "Spray Combustion as a Driving Mechanism for Ramjet Instability," US/French Ramjet Combustion Instability Workshop, Naval Weapons Center, China Lake, CA, April 1986.
134. "Axisymmetric, Transient Calculation for Two Vaporizing Fuel Droplets," Canadian and Western States Section/The Combustion Institute 1986 Spring Technical Meeting, Banff, Canada, April 1986.
135. "Fundamental Studies on Spray Combustion and Turbulent Combustion," 1986 AFOSR/ONR Contractors' Meeting on Combustion, Stanford, CA, June 1986.
136. "Heterogenous Combustion," a series of three lectures at Politecnico de Milano sponsored by NATO-AGARD, September 1986.
137. "Transient Spray Combustion Computations," First World Congress on Computational Mechanics, Austin, TX, September 1986.
138. "Transient Spray Computations," UC Irvine, October 1986.
139. "Spray Combustion: A Driving Mechanism for Ramjet Combustion Instability," 23rd JANNAF Combustion Meeting, NASA/Langley Research Center, Hampton, VA, October 1986.
140. "Enclosed Gas and Liquid with Concentrated Heating Source Above in Reduced Gravity Field," University of Colorado, Boulder, CO, November 1986.
141. "An Integrated Approach to Spray Combustion Model Development," ASME 107th Winter Annual Meeting, Anaheim, CA, December 1986.
142. "Analysis of Combustion Instability in Liquid-Fueled Ramjets," SIAM Conference on Numerical Combustion, San Francisco, CA, March 1987.



143. "Theory of Combustion of Liquid Fuels," California State University, Fullerton, CA, February 1987.
144. "Transient Spray Computations," AFOSR, Washington, D.C., February 1987.
145. "Oscillations in a Liquid-Fueled Combustor," Joint Meeting of the French and Italian Sections of The Combustion Institute, Amalfi, Italy, June 1987.
146. "Fundamental Studies on Turbulent Combustion and Spray Combustion," 1987 AFOSR/ONR Contractors' Meeting on Combustion, University Park, PA, June 1987.
147. "Two-Dimensional Modeling of Flame Propagation in Fuel Stream Arrangements," 11th International Colloquium on Dynamics of Explosions and Reactive Systems, Warsaw, Poland, August 1987.
148. Workshop on Experimental, Analytical and Computational Methods in Liquid Fuel Sprays, a series of three lectures at the Institute of Aeronautics and Astronautics, National Cheng Kung University, Tainan, Taiwan, November 1987.
149. "Vaporization Response of Fuel Droplet in Oscillatory Field," ONR Workshop on Combustion Instabilities, UC Berkeley, November 1987.
150. "Study of Mixing and Reaction in the Field of a Vortex," Western States Section of The Combustion Institute, Honolulu, HI, November 1987.
151. "Droplet Vaporization Model for Spray Combustion Calculation," AIAA 26th Aerospace Sciences Meeting, Reno, NV, January 1988.
152. "Analysis of Molecular Mixing and Chemical Reaction in a Mixing Layer," AIAA 26th Aerospace Sciences Meeting, Reno, NV, January 1988.
153. "Mixing and Reaction in a Vortical Structure," UC San Diego, March 1988.
154. "Heat Transfer in a Two-Fluid System Under Reduced Gravity," Brown University, Providence, RI, March 1988.
155. "Review of Spray Combustion Theory: Remaining Challenges on the Droplet Scales," Workshop on Mass, Momentum, and Energy Exchange in Combusting Sprays: Droplet Studies, Sandia National Laboratories, Livermore, CA, March 1988.
156. "Fundamental Studies on Spray Combustion and Turbulent Combustion," 1988 AFOSR/ONR Contractors' Meeting on Combustion, California Institute of Technology, Pasadena, CA, June 1988.
157. "Liquid Pool Fires: Modeling," Microgravity Science and Applications Ground-Based Science Review, NASA Lewis Research Center, Cleveland, OH, July 1988.

158. "Spray Combustion Driving Mechanism for Ramjet Instability," 25th JANNAF Combustion Meeting, NASA/Marshall Space Flight Center, Huntsville, AL, October 1988.
159. "Molecular Mixing and Chemical Reaction in Vortical Structures," Sandia National Laboratory, December 1988.
160. "Review of Spray Combustion Theory," plenary lecture for the Joint Meeting of the British and French Sections of the Combustion Institute, Rouen, France, April 1989.
161. "Review of Theory of Mixing and Reaction Within A Vortical Structure," Third International Conference on Numerical Combustion, Antibes, France, May 1989.
162. "Mixing and Reaction Within a Vortical Structure," The University of Alabama in Huntsville, AL, May 1989.
163. "Fundamental Studies on Spray Combustion and Turbulent Combustion," 1989 AFOSR/ONR Contractors' Meeting on Combustion, Ann Arbor, MI, June 1989.
164. "Potential Combustion Instability Mechanisms," keynote address JANNAF Workshop on Liquid Rocket Engine Combustion Driven Instability Mechanisms, Monterey, CA, July 1989.
165. "Metal Slurry Droplet and Spray Combustion," ONR Propulsion Meeting on Energetic Materials Combustion, Combustion Diagnostics and Under Water Propulsion, Irvine, CA, October 1989.
166. "Fundamental Studies of Droplet Interactions in Dense Sprays," AFOSR Contractors' Meeting, Atlanta, GA, June 1990.
167. "Combustion Instability Computational Analysis," JANNAF Workshop on Numerical Methods in Combustion Instability, Orlando, FL, February 1990.
168. "Liquid-Waste Incineration in a Parallel-Stream Configuration: Parametric Study," The Twenty-Third International Symposium on Combustion, Orleans, France, July 1990.
169. "Metal Slurry Droplet and Spray Combustion," Third ONR Propulsion Meeting and Contractors' Review, Middletown, RI, October 1990.
170. "Heat and Mass Transfer in Liquid-Gas Spray Systems," ASME Winter Annual Meeting, Dallas, TX, November 1990.
171. "Interacting LOX Droplets in Dense Sprays," AFOSR Contractors' Meeting, Boulder, CO, June 1991.

172. "Axisymmetric Calculations of Three-Droplet Interactions," Fifth International ICLASS Conference on Liquid Atomization and Spray Systems, Gaithersburg, MD, July 1991.
173. "Vaporization and Combustion of Fine Metal Slurry Droplets," 13th International Colloquium on the Dynamics of Explosions and Reactive Systems, Nagoya, Japan, July 1991.
174. "Aerodynamic Interactions Amongst Neighboring Droplets," 4th International Symposium on Computational Fluid Dynamics, UC Davis, CA, September 1991.
175. "Computational Challenges in Spray Combustion," U.S.-Japan Heat Transfer Seminar, Oiso, Japan, October 1991.
176. "Metal Slurry Droplet Studies," Fourth ONR Propulsion Meeting and Contractors' Review, Memphis, TN, October 1991.
177. "Fuel Droplet Vaporization in an Acoustic Field," Fourth International Conference on Numerical Combustion, St. Petersburg, FL, December 1991.
178. "Numerical Simulation and Modelling of LOX Droplet Vaporization at Supercritical Conditions," 28th JANNAF Combustion Meeting, Brooks Air Force Base, San Antonio, TX, October 1991.
179. "Recent Advances in Fuel Droplet and Spray Theory," UC San Diego, January 1992.
180. "Recent Advances in Fuel Droplet and Spray Theory," University of Southern California, March 1992.
181. "Fundamentals of Spray Combustion," AFOSR Propulsion Contractors' Meeting, La Jolla, CA, June 1992.
182. "The Fluid Dynamics of Sprays," ASME Freeman Scholar Award Lecture, Anaheim, CA, November 1992.
183. "The Fluid Dynamics of Sprays," UC Los Angeles, April 1993.
184. "Energetic Fuel Droplet Gasification with Liquid-Phase Reaction," 6th ONR Propulsion Meeting, Boulder, CO, August-September 1993.
185. "Metal Slurry Droplet and Spray Combustion," 6th ONR Propulsion Meeting, Boulder, CO, August-September 1993.
186. "Droplet-Turbulence Interactions Over a Wide Spectral Range," AFOSR Propulsion Contractors' Meeting, Lake Tahoe, NV, June 1994.

187. "Energetic Fuel Droplet Gasification with Liquid-Phase Reaction," 7th ONR Propulsion Meeting, Buffalo, NY, August 1994.
188. "Fundamental Research in Support of Industrial Combustion Needs," DOE Workshop, Irvine, CA, August 1994.
189. "Metal Slurry Droplet and Spray Combustion," Zel'dovich Memorial International Conference on Combustion, Moscow Region, Russia, September 1994.
190. "Oxygen Droplet Vaporization," Bilateral U.S.-Russia Workshop on Combustion, Voronovo, Russia, September 1994.
191. "Nonlinear Capillary Kelvin/Helmholtz Waves on Thin Liquid Sheets," Princeton University, Princeton, NJ, March 1995.
192. "Nonlinear Capillary Kelvin/Helmholtz Waves on Thin Liquid Sheets," Department of Mathematics, UC Irvine, March 1995.
193. "Nonlinear Capillary Kelvin/Helmholtz Waves on Thin Liquid Sheets," Massachusetts Institute of Technology, Cambridge, MA, April 1995.
194. "Nonlinear Capillary Kelvin/Helmholtz Waves on Thin Liquid Sheets," 8th Annual Conference on Liquid Atomization and Spray Systems, Troy, MI, May 1995.
195. "Nonlinear Capillary Kelvin/Helmholtz Waves on Thin Liquid Sheets," University of California, Davis, CA, June 1995.
196. "Energetic Fuel Droplet Gasification with Liquid-Phase Reaction," 15th ICDERS, Boulder, CO, July/August 1995.
197. "Energetic Fuel Droplet Gasification with Liquid-Phase Reaction," 8th ONR Contractors' Meeting, San Diego, CA, October 1995.
198. "Turbine Burners," 8th ONR Contractors' Meeting, San Diego, CA, October 1995.
199. "Nonlinear Capillary Kelvin/Helmholtz Waves on Thin Liquid Sheets," University of Illinois at Chicago, Chicago, IL, November 1995.
200. "Nonlinear Capillary Kelvin/Helmholtz Waves on Thin Liquid Sheets," Carnegie Mellon University, Pittsburgh, PA, December 1995.
201. "Nonlinear Capillary Kelvin/Helmholtz Waves," Virginia Polytechnic Institute, Blacksburg, VA, April 1996.

202. "Nonlinear Capillary Kelvin/Helmholtz Waves," University of California, San Diego, La Jolla, CA, May 1996.
203. "Nonlinear Travelling Wave Distortion of a Thin Liquid Sheet," 9th Annual Conference on Liquid Atomization and Spray Systems, San Francisco, CA, May 1996.
204. "Nonlinear Distortion and Disintegration of Liquid Sheets for Pressure Atomization System," AFOSR/ARO Contractors' Meeting, Virginia Beach, VA, June 1996.
205. "Opposed-Flow Flame Spread Across n-Propanol Pools," the Twenty-Sixth International Symposium on Combustion, Naples, Italy, July/August 1996.
206. "Energetic Fuel Droplet Oxidation with Liquid-Phase Decomposition," 9th ONR Propulsion Meeting, Alexandria, VA, September 1996.
207. "Fundamentals of Fuel Ignition and Flammability," National Research Council Workshop on Aviation Fuels with Improved Fire Safety, Washington, D.C., November 1996.
208. "Droplet and Spray Studies," Brigham Young University, Provo, Utah, February 1997.
209. "Symmetric Distortion of a Thin Liquid Sheet with Infinite Length," ILASS Americas '97 Meeting, Ontario, Canada, May 1997.
210. "Symmetric Distortion of a Thin Liquid Sheet with Semi-infinite Length," ILASS Americas '97 Meeting, Ontario, Canada, May 1997.
211. "Three-Dimensional Nonlinear Temporal Stability of an Infinitely Long Thin Liquid Sheet," ILASS Americas '97 Meeting, Ontario, Canada, May 1997.
212. "Microgravity Combustion Research Opportunities," Gordon Research Conference on "Gravitational Effects in Physico-Chemical Systems," Henniker, NH, June 29-July 4, 1997.
213. "Axisymmetric Flame Spread Over Alcohol Pools," 16th International Colloquium on the Dynamics of Explosions and Reactive Systems, Cracow, Poland, August 1997.
214. "Nonlinear Distortion and Disintegration of Injected Liquid Sheets," University of Illinois, Urbana, Illinois, November 1997.
215. "Nonlinear Distortion and Disintegration of Injected Liquid Sheets," Stanford University, Stanford, CA, February 1998

216. "Unsteady Flame Propagation Beyond Steady Flammability Limits," 7th International Conference on Numerical Research, York, UK, March/April 1998.
217. "Nonlinear Distortion of Infinitely Long Thin Planar and Annular Liquid Sheets," ILASS Americas '98 Meeting, Sacramento, CA, May 1998.
218. "Nonlinear Capillary Waves on a Liquid Stream" United Technologies Research Center, September 1998.
219. "Opposed-Flow Flame Spread Across Propanol Pools: Effect of Liquid Fuel Depth," Joint Meeting of the US Sections of The Combustion Institute, Washington, March, 1999.
220. "Turbine Burners," Wright-Patterson Air Force Base, Aeronautical Research Labs, March 1999.
221. "Three-Dimensional Anti-symmetric Distortion of Modulated Semi-infinite Thin Liquid Sheets," ILASS Americas '99 Meeting, Indianapolis, IN, May 1999.
222. "Three-dimensional Symmetric Distortion of Modulated Semi-infinite Thin Liquid Sheets," ILASS Americas '99 Meeting, Indianapolis, IN, May 1999.
223. "Axisymmetric Distortion of Thin Annular Liquid Sheets," ILASS Americas '99 Meeting, Indianapolis, IN, May 1999.
224. "Flame Spread Across Liquids: Numerical Modelling," Fifth International Microgravity Combustion Workshop, Cleveland, OH, May 1999.
225. "Review of Theory of Distortion and Disintegration of Liquid Streams," 30<sup>th</sup> AIAA Fluid Dynamics Conference, Norfolk, VA, June 1999.
226. "Nonlinear Distortion and Disintegration of Conical Liquid Sheets at High Pressure" ARO/AFOSR Contractors' Meeting, Santa Fe, NM, June 2000.
227. "Comments on Energy Conservation in Liquid-Stream Disintegration," ICLASS 2000, Pasadena, CA July 2000.
228. "Conical and Annular Free Liquid Film Instabilities," Plenary Lecture, ILASS – Europe, Darmstadt, Germany, September 11, 2000.
229. "Opportunities and Challenges of Turbine Burners," Seminar, University of Aachen, Germany, September 14, 2000.
230. "Liquid Film Disintegration Due to Gas Jet Impact," American Physical Society Fluid Dynamics Meeting, Washington, D.C., November 2000.

231. "Opportunities and Challenges of Turbine Burners," Plenary Lecture, 41st Israel Annual Conference on Aerospace Sciences, Haifa, February 22, 2001.
232. "Free Planar Liquid Films Impacted by Gas Jets," ILASS 2001, Dearborn, Michigan, March 26, 2001.
233. "Three-Dimensional Ignition and Flame Propagation Above Liquid Fuel Pools: Computational Analysis," Sixth International Microgravity Combustion Workshop, Cleveland, Ohio, May 22, 2001.
234. "Opportunities and Challenges for Turbine Burners" invited talk ARO/AFOSR Contractors' Meeting, Los Angeles, CA, June 2001.
235. "Three-dimensional Ignition and Flame Propagation Above Liquid Fuel Pools: Computational Analysis," 18<sup>th</sup> ICDERS, Seattle, WA, July 29- Aug 3, 2001.
236. "Proposal for LPT Module Analysis," seminar, Lam Research, Fremont, CA, Aug 20, 2001.
237. "Miniature Combustor with Liquid-Fuel Film," Western States Section/Combustion Institute Fall Meeting, Salt Lake City UT, October 2001.
238. "Analysis of Miniature Liquid-Film Combustor," Eastern States Section Combustion Institute Fall Meeting, Hilton Head, SC, December 2001.
239. "Dynamic Straining of Viscous Liquid Film," APS Fluid Dynamics Meeting, San Diego, CA, November 2001.
240. "Turbine Burners: Ignition and Flame-Holding in High Acceleration Flows," Plenary Lecture, Western States Section/Combustion Institute Spring Meeting, San Diego, CA, March 2002.
241. "Combustion: A Complex Science and An Ancient But Immature Technology," UCI School of Engineering Distinguished Lecture, June 2002.
242. "Nonlinear Distortion and Disintegration of Conical Liquid Sheets at High Pressure," ARO/AFOSR Contractors Meeting, Dayton, OH, June 2002.
243. "A General Super-Scalar for the Combustion of Liquid Fuels," 29<sup>th</sup> International Symposium on Combustion, Sapporo, Japan, July 2002.
244. "New Concepts in Combustion Technology," San Diego State University, November 2002.
245. "Linearized Analysis of Liquid Film Combustor" 3<sup>rd</sup> Joint Meeting of the US Sections of the Combustion Institute, Chicago, March 2003.

246. "Current Status of Spray Combustion Modelling" Invited Paper, Joint Propulsion Conference, Huntsville Alabama, July 2003.
247. "Theoretical Foundations for the Analysis of Laminar and Turbulent Spray Flows," University of Pittsburgh, October 2003.
248. "Theoretical Foundations for the Analysis of Laminar and Turbulent Spray Flows" Western States Section/Combustion Institute Fall Meeting, UCLA, October 2003.
249. "Theoretical Foundations for the Analysis of Laminar and Turbulent Spray Flows" Georgia Institute of Technology, November 2003.
250. "Numerical Simulation of an Accelerating Reacting Mixing Layer in Transition," APS Fluid Dynamics Meeting, East Rutherford, New Jersey, November 2003.
251. "Linearized Analysis of Liquid-Film Combustor," Society of Industrial and Applied Mathematics Numerical Combustion Meeting, Sedona, AZ, May, 2004.
252. "Turbine Burners: Mixing, Ignition, and Flame-Holding in High-Acceleration Flows," Mechanical and Aerospace Engineering Dept. Seminar, Princeton University, October 1, 2004
253. "Transient Vaporization and Burning in Dense Droplet Arrays," Joint Meeting of the US Sections of the Combustion Institute, Philadelphia, March 2005.
254. "Combustion: A Complex Science and An Ancient But Immature Technology," Chinese Academy of Sciences: Institute of Mechanics, Beijing, April, 2005
255. "Turbine Burners: Mixing, Ignition, and Flame-Holding in High-Acceleration Flows," Beijing University of Aeronautics and Astronautics, Beijing, April, 2005.
256. "Turbine Burners: Mixing, Ignition, and Flame-Holding in High-Acceleration Flows," Nanjing University of Aeronautics and Astronautics, Nanjing, April, 2005.
257. "Combustion: A Complex Science and An Ancient But Immature Technology," Northwestern Polytechnic University, Xian, April, 2005.
258. "Combustion: A Complex Science and An Ancient But Immature Technology," Dean's Distinguished Lecture, UC Davis, May, 2005.
259. "A Generalized Analysis for Dense Sprays," UC Davis, Mechanical and Aerospace Engineering Dept. Seminar, May, 2005.
260. "A Generalized Analysis for Dense Sprays," ILASS 2005, Irvine, CA, May, 2005.



261. "Computations for Liquid-fuel Combustion: Sprays, Pools, and Films," Plenary Lecture, European Community on Computational Methods in Applied Sciences Conference on Computational Combustion, Lisbon, June 2005.
262. "Liquid Fuel Burning with Non-unitary Lewis Number," Western States Section/Combustion Institute Fall Meeting, Stanford University, October 2005.
263. "Recent Advances in Spray Combustion Theory," Aerospace Sciences Meeting, Reno, NV, January 2006.
264. "Break-up of Liquid Streams at High Pressure," AFOSR/ARO Contractors' Meeting, Arlington, VA, June 2006.
265. "Turbine-Burner Technology," Siemens Combustion Strategy Workshop, Daytona Beach, FL, October 30-November 1, 2006.
266. "Instabilities in a Turning Reacting Mixing Layer Undergoing Transition," APS Fluid Dynamics Meeting, Tampa, Florida, November 2006.
267. "Theoretical Issues in Droplet Array Vaporization and Burning," 5th US Combustion Meeting, UC San Diego, March 25-28, 2007.
268. "Advances in the Theory of Liquid-Fuel Burning," First Dusinberre Lecture, Pennsylvania State University, April 10, 2007.
269. "Breakup of Liquid Streams at High Pressures," AFOSR/ ARO Contractors Meeting, June 2007.
270. "Turbine Burners: Turbulent Combustion of Liquid Fuels," AFOSR/ ARO Contractors Meeting, June 2007.
271. "Recent Theoretical Advances for Liquid-fuel Atomization and Burning," Plenary Lecture, Seventh International Symposium on Special Topics in Chemical Propulsion: Advancements in Energetic Materials & Chemical Propulsion, Kyoto, Japan, September, 2007.
272. "Recent Advances in Selected Combustion Processes," University of Connecticut, September 28, 2007.
273. "Recent Advances in Selected Combustion Processes," Rensselaer Polytechnic Institute, December, 2007.
274. "Turbine-burner Research," presented at Panel Session on "Advanced Compact Combustor Technologies," 2008 AIAA Aerospace Sciences Meeting, Reno, NV.

275. "Turbine Burners: Turbulent Combustion of Liquid Fuels," AFOSR/ ARO Contractors Meeting, June 2008.
276. "One-dimensional Spray Combustion Optimization with a Sequential Linear Quadratic Algorithm," US National Combustion Meeting, Ann Arbor, MI, May 18-20, 2009.
277. "Breakup of Liquid Streams at High Pressure," ARO/AFOSR Contractors Meeting, National Harbor, MD, June 2009.
278. "Progress on UCI Liquid Film Miniature Combustor," Joint Propulsion Conference, Denver, Colorado, August 2009.
279. "Turbine Burners: Flameholding in Accelerating Flow," Joint Propulsion Conference, Denver, Colorado, August 2009.
280. "Transient Convective Burning of a Periodic Fuel-Droplet Array," Thirty-third International Combustion Symposium, Beijing, August 2010.
281. "Distortion and Disintegration of Injected Liquid Streams," Distinguished Aerospace Engineering Seminar, Georgia Tech, September 2010.
282. "Recent Advances in Fuel-Droplet-Array-Burning Theory," seminar, Yale University, October 2010.
283. "Recent Advances in Fuel-Droplet-Array-Burning Theory," seminar, UC San Diego, October 2010.
284. "Recent Advances in Fuel-Droplet-Array-Burning Theory," seminar, University of Darmstadt, October 2010.
285. "Recent Advances in Fuel-Droplet-Array-Burning Theory," seminar, University of Heidelberg, Chemistry department, October 2010.
286. "Distortion and Disintegration of Injected Liquid Streams," seminar, University of Stuttgart, October 2010.
287. "Recent Advances in Fuel-Droplet-Array-Burning Theory," seminar, Karlsruhe Institute of Technology (formerly University of Karlsruhe), October 2010.
288. "Theoretical Developments in Group Combustion of Droplets and Sprays," Keynote Lecture, First International Conference on Group Combustion of Droplet and Sprays, Tainan, Taiwan, January 20-21, 2011.
289. "Flameholding in a Cavity Adjacent to an Accelerating Air Channel," US National Combustion Meeting, Atlanta, GA, March, 2011.

290. "Turbine Burners: Flameholding in Flows over Cavities," University of Illinois, Urbana-Champaign, April, 2011.
291. "Theoretical Developments in Group Combustion of Droplets and Sprays," 13<sup>th</sup> International Conference on Numerical Combustion, Korfu, Greece, April, 2011.
292. "Tutorial on Droplets and Sprays," Ecole Centrale Polytechnique, EM2C Laboratory, Paris, France, May 2011.
293. "Tutorial on Combustion Instability in Liquid Propellant Rockets and Liquid-fueled Ramjets," Ecole Centrale Polytechnique, EM2C Laboratory, Paris, France, May 2011.
294. "Distortion and Disintegration of Injected Liquid Streams," Ecole Centrale Polytechnique, EM2C Laboratory, Paris, France, May 2011.
295. "Group Combustion," Keynote Lecture, Workshop on Two-phase Flow Combustion, Ecole Centrale Polytechnique, Paris, France, May 2011.
296. "Fuel-film Combustion," ICARE, CNRS laboratories, Orleans, France, May, 2011.
297. "Transient High-pressure Fuel Injection Processes," AFOSR/ARO Meeting, Williamsburg, Virginia, June, 2011.
298. "Nonlinear Combustion Instability: Liquid-propellant Rockets," invited talk, AFOSR Workshop on Nanoenergetics and Combustion Dynamics, Arlington VA, August 23-24, 2011.
299. "UCI Liquid Film Miniature Combustor," invited talk, AIAA Aerospace Sciences Meeting, Nashville, TN, January 9-12, 2012.
300. "Turbine Burners: Flameholding in Accelerating Flow over a Cavity," University of Notre Dame, April 17, 2012.
301. "Turbine Burners: Flameholding in Accelerating Flow over a Cavity," University of Pittsburgh, April 19, 2012.
302. "UCI Liquid Film Miniature Combustor," Distinguished Lecture, Carnegie-Mellon University, April 20, 2012.
303. "Miniature Liquid-film Combustor," invited speaker, Animal Locomotion/ Robotics Workshop, Arlington, VA, May 2012.
304. "Turbine-Burner Model: Cavity Flameholding in a Converging, Turning Channel Flow," Joint Propulsion Conference, Atlanta, July 29- August 1, 2012.

305. "Effects of Acceleration on Jet Instability in High-pressure Fuel Injection Processes," ICLASS Meeting, Heidelberg, September 2012.
306. "Reduced Basis and Stochastic Modeling of Liquid Propellant Rocket Engine as a Complex System," Space Propulsion and Power Program Review, Arlington VA., 10-13 September 2012.
307. "The Roles of Liquid-phase Inertia and Nonlinearity in Rocket Combustion Instability," invited speaker, Ben T. Zinn Symposium, Atlanta, GA, November 1-1, 2012.
308. "Two-dimensional Model for Liquid-Rocket Transverse Combustion Instability," AIAA Aerospace Sciences Meeting, Grapevine, Texas, January 2013.
309. "Theoretical Developments for Spray Formation, Vaporization, and Burning," Keynote Lecture, ILASS Meeting, Pittsburgh, PA, May 2013.
310. "Three-dimensional Segment Analysis of Transient Liquid Jet Instability," ILASS Meeting, Pittsburgh, PA, May 2013.
311. "Continuing Challenge of Nonlinear Combustion Oscillations in Rocket Motors," Invited speaker, Academies Forum, UCI, Irvine, CA June, 2013.
312. "Liquid-Rocket Transverse Triggered Combustion Instability: Deterministic and Stochastic Analyses," President's Distinguished Lecture Series in Engineering, Science, and Medicine, Texas Tech University, Lubbock, TX, November 11, 2013
313. "Transient Liquid Injection," Invited Lecture, American Physical Society Fluid Dynamics Annual Meeting, Pittsburgh, PA November, 2013.
314. "Current UCI Combustion Instability Research" AFOSR Contractors Meeting, Arlington, VA , Dec. 17, 2013.
315. "Mixing and Combustion in Dense Mixtures," High-Pressure Workshop, NIST, Boulder, CO, November, 2014.
316. "Reduced Basis and Stochastic Modeling of Liquid Propellant Rocket Engine as a Complex System," Energetics Workshop, UCLA, January, 2015.
317. "Triggered Nonlinear Acoustic Resonance in Liquid-propellant Rocket Combustors," Auburn University, Auburn, Alabama, April 2015.
318. "Vorticity Dynamics for High-pressure Liquid Injection," Gebhardt Distinguished Lecture, Georgia Institute of Technology, Atlanta, GA, April 2015.
319. "Combustion Instability: Triggering, Transients, and Limit Cycles," National Combustion Meeting, Cincinnati, OH May 2015.

320. "Thermodynamic Analysis for Combustion at High Gas Densities," ICDERS, Leeds, UK, 2015.
321. "Nonlinear Two-time-scale Perturbation Theory for Transverse Combustion Dynamics," ICDERS, Leeds, UK, 2015.
322. "Early Spray Development at High-Pressure: Hole, Ligament, and Bridge Formations," Distinguished Seminar, Iowa State University, Ames, September 2015
323. "Early Spray Development at High-Pressure: Hole, Ligament, and Bridge Formations," Cornell University, Ithaca, NY, September 2015.
324. "High-Pressure Liquid-Propellant Rocket Engine Combustion Instability: Complex System, Uncertainty Quantification, and Reduced Basis Modeling," AFOSR Contractors Meeting, Arlington, VA, October, 2015.
325. "Liquid-propellant Rocket Combustion Instability," Distinguished Lecture, University of Miami, January 2016.
326. "Temporal length-scale cascade and expansion rate on planar liquid jet instability," APS Fluid Dynamics Meeting, Portland, Oregon, November 20-22, 2016.
327. "Analytical / Computational Approach to Liquid Injection at Supercritical Pressures," Invited for the Minisymposium *Recent Progress and Opportunities in Modeling and Simulations of Supercritical Combustion*, 2017 SIAM International Conference on Numerical Combustion, Orlando, FL, April 3-5, 2017.
328. "High-Pressure Liquid-Propellant Rocket Engine Combustion Instability: Complex System, Uncertainty Quantification, and Reduced Basis Modeling," AFOSR Contractors Meeting, Arlington, VA, May 2017.
329. "Diffusion Flame at High Pressure with Air and Water-laden Methane," ICDERS, Boston, August, 2017.
330. "Analytical / Computational Approach to Liquid Spray Heating and Vaporization at Supercritical Pressures," ILASS Europe-2017, Valencia, Spain, September 2017.
331. "Normal Shocks with High Upstream Pressure", (abstract only), APS Fluid Dynamics Meeting, Denver, Colorado, November 19-21, 2017.
332. "Unsteady Transport at a Liquid-Gas Interface at Supercritical Pressure", Symposium in honor of Professor P. Ayyaswamy at University of Pennsylvania, May 9, 2018.
333. "Liquid-Propellant Rocket Combustion Instability: A Physics-based Multi-fidelity Approach," Georgia Tech, June 11, 2018.

334. "High-Pressure LPRE Combustion Dynamics: Low-Cost Computation and Stochastic Analysis," AFOSR Contractors Meeting, Arlington, VA August, 2018.

335. "High-Pressure LPRE Combustion Dynamics: Low-Cost Computation and Stochastic Analysis," AFOSR Contractors Meeting, Arlington, VA August, 2019.

336. "Three-Dimensional Counterflow Combustion with Multiple Flames," Western States Meeting, Albuquerque, N. M., October 2019.

#### **PUBLIC RELATION SPEECHES:**

1. "Interaction Between Engineering Education and Research," Image Engineering Conference, January 1985.
2. "Industry-Academia Cooperation," American Electronics Association, April 1985.
3. "Industry-Academia Cooperation," Engineering Affiliates Annual Dinner, May 1985.
4. "Industry-Academia Cooperation," Biotechnology Conference, May 1985.
5. "Industry-Academia Cooperation," Irvine Company Sponsored Dinner, June 1985.
6. "Industry-Academia Cooperation," Pacific Club, March 1986.
7. "Industry-Academia Cooperation," UCI Chief Executive Roundtable Inaugural Meeting, April 1986.
8. "Progress at the UCI School of Engineering," Engineering Affiliates Annual Dinner, May 1986.
9. Comments at Dedication of ICS/Engineering Research Facility Building, November 5, 1986.
10. "Progress at UCI School of Engineering," Engineering Affiliates Dinner Meeting, November 13, 1986.
11. Welcome address at the workshop on "Frontiers of Intelligent Systems Colloquium Program," UC Irvine, November 14, 1986.
12. Engineering Alumni Address, "Progress and Plans of the UCI School of Engineering," December 1986.
13. "Issues and Challenges Before an Engineering School-Special Relations with Industry," Parker-Hannifin, Irvine, CA, January 1988.

14. Rensselaer Alumni Address, "Progress and Plans of the UCI School of Engineering," February 1988.
15. "An Overview of Engineering Research at UCI," Annual Review of Research Conference, Department of Electrical Engineering, UCI, February 1988.
16. Comments at Engineering Center Groundbreaking Ceremony, UCI, March 1988.
17. Comments at Rockwell Engineering Center and McDonnell Douglas Engineering Auditorium Dedication, UCI, February 1990.
18. Comments at Engineering Unit II Groundbreaking Ceremony, UCI, May 1992.
19. "State of the School of Engineering," Engineering Corporate Affiliates Recognition Dinner, UCI, May 1992.
20. "Overview of Organization, Programs and Goals," Chief Executive Engineering Advisory Meeting, UCI, December 1992.
21. "New Initiatives in the School of Engineering," Engineering Corporate Affiliates Meeting, UCI, March 1993.
22. "Strategic Issues Before the UCI School of Engineering," IEEE Los Angeles Joint Chapter of Engineering Management, Education & Professional Communication Societies, April 1993.
23. "Growth Initiatives at the School of Engineering," Engineering Corporate Affiliates Meeting, UCI, June 1993.
24. "Achievements and Remaining Challenges," Dedication Ceremony for the Engineering Gateway Building, UCI, October 1994.
25. "Spray Research Center," Engineering Corporate Affiliates Meeting, July 9, 1997.
26. "Smart Spray Systems," Engineering Corporate Affiliates Board Meeting, May, 1999.
27. "Internal Combustion Engines," presentation at Direct Propulsion Devices, Inc. Shareholders Meeting, East Wenatchee, WA, April 2002.

## **PROFESSIONAL ACTIVITIES:**

### **A. Editorial Work**

Editor, Combustion Science and Technology Book Series, by Gordon and Breach, 1991- 2000. Four books; see Edited Books section.

Co-Editor, nine volumes of AIAA Progress Series. See Edited Books section.

Co-Editor, Springer-Verlag volume. See Edited Books section.

Member, Editorial Advisory Board, Physics of Fluids, 2016 -

Member, Editorial Advisory Board, Progress in Energy and Combustion Science, 1982-2015

Member, Editorial Advisory Board, Atomization and Sprays, 1989-2007.

Member, Editorial Advisory Board, Numerical Heat Transfer, 1990-1998.

Member, Editorial Advisory Board, Archivum Combustionis, 1992-

Member, Editorial Advisory Board, Combustion and Flame, 2000-2008

Member, Editorial Advisory Board, Journal of Propulsion and Power, 2004-

Member, Editorial Advisory Board, Journal of Energetic Materials and Chemical Propulsion, 2008-

Chair, AIAA Journal Review Committee, 1995.

Member, Editorial Board, Combustion Science and Technology, a bimonthly journal published by Gordon and Breach, 1970-1979, 1990-2000.

Associate Editor, Combustion Science and Technology, Gordon & Breach, 1969-1970, 2000-2006.

Special Issue Editor, Combustion Science and Technology, Gordon and Breach, Vol. 105, 4-6, 1995.

Special Issue Editor, Combustion Science and Technology, Gordon and Breach, Vols. 113-114, 1996.

Special Issue Editor, Combustion Science and Technology, Gordon and Breach, Vol. 135, 1-6 1998.

Special Issue Co-Editor, Combustion Science and Technology, Gordon and Breach, Vol. 158, 2000.

Special Issue Co-Editor, Combustion Science and Technology, Taylor and Francis, Vol. 174, 2002.

Special Issue Co-Editor, Combustion Science and Technology, Taylor and Francis, Vol. 176, 2004.

Special Issue Co-Editor, Combustion Science and Technology, Taylor and Francis, Vol. 178, 2006.

Associate Technical Editor, Journal of Heat Transfer, 1986-1992

Consulting Editor, Springer Verlag, 1986-1991.

Reviewer, NRC Report on Commercial Supersonic Technology.

Chair, AIAA Review of Reviews Subcommittee, 2001.

## **B. Advisory Responsibilities**

Member, Emissions Control Panel, Committee on Motor Vehicle Emissions, National Academy of Sciences, 1971-1973.

Member, NSF Thermal Systems Steering Committee, 1983-85.

Member, NASA-Lewis Research Center Planning Committee for Computational Mechanics Institute, 1984-85.

Chairman, Peer Review Committee on Fundamentals of Combustion Program at NASA Lewis Research Center, 1984.

Member, NASA Space Application Advisory Committee, 1984-1988.



Member, NASA Space Science and Applications Advisory Committee; member, Microgravity Sciences Subcommittee, 1989-1990.

Member, Academic Advisory Council, Industrial Research Institute, 1985-1991; Chairman, 1986.

Chairman, NASA Combustion Science Disciplinary Working Group, 1987-1990.

Member, NSF Advisory Committee for Chemical, Biochemical, and Thermal Engineering, 1987-1989.

Member, Committee on Microgravity Research, Space Studies Board, National Academy of Sciences, National Research Council, 1990-; Committee Chairman and Board Member, 1991-1994.

Advisory Board Member, Institute of Aeronautics, Cheng Kung University, Taiwan, 1990-1994.

Member, USRA Science Council for Microgravity Science and Applications, 1990-1994.

Member, NASA Search Committee for Orbital Research Chief Scientist, 1994.

Member, NASA Search Committee for Senior Scientist, Space Station Program, 1995.

Member, International Scientific Advisory Committee, the 8th International Symposium of Transport Phenomena in Combustion, San Francisco, CA, July 1995.

Member, Advisory Board, California Space Institute, a UC Multicampus Research Unit, 1994-2000.

Member, Combustion Institute Gold Medals Committee, 1997- (Chair, 1997-8).

Member, AIAA Pendray Award Committee, 1998-2001, (Chair 2000-01).

Review of Engineering Division, Brown University, October 1999.

Review of Advanced Scientific Computing Initiative DOE Program, University of Illinois, October, 1999.

Member, Visiting Committee for Engineering Division at Colorado School of Mines, 2004-2011.

Member, Visiting Committee for new College of Engineering at Colorado School of Mines, 2012.

Member, Naval Studies Board (NRC) Committee on Identification of Promising Naval Aviation Science and Technology Opportunities, 2004-2006.

Member, National Academies Committee on US Army Air and Ground Vehicles Research, 2007- present.

Member, International Advisory Board, Center for Combustion Energy, Tsinghua University, Beijing, 2010-present.

Member, Advisory Council for Princeton University Department of Mechanical and Aerospace Engineering, 2014-18.

Chair, National Academies Mechanical Sciences Panel for Review of US Army R & D Centers, 2018 - .

### **C. Professional Societies**

Chairman, AIAA Solid Rockets Technical Committee, Jan. 1, 1969 - Dec. 31, 1970.

Member, AIAA Propellants and Combustion Technical Committee, 1980-85.

Member, ASME Heat Transfer Division, Combustion Committee, 1980-present.  
Chairman, Eastern Section/Combustion Institute, 1979-81.  
Vice-Chairman, Eastern Section/Combustion Institute, 1977-79.  
Treasurer, Combustion Institute, 1982-1984.  
Member, Executive Committee, Combustion Institute, 1982-1994.  
Member, Board of Directors, Combustion Institute, 1982-1994.  
Chairman, Region V ASME Mechanical Engineering Department Heads Committee, 1983.  
Member, AIAA Publications Committee, 1989-2003.  
Member, Board of Directors, Institute for Dynamics of Explosions and Reactive Systems 1989-; Vice President, 1989-1995; President, 1995-1999.  
Member, Combustion Institute Gold Medals Committee, 1997-2000 (Chair, 1997-8).  
Member, AIAA Pendray Award Committee, 1998- 2001 (Chair 2000-1).  
Member, National Academy of Engineering 2006, 2007 Awards Committee, 2005-7.  
Member, 2006 AIAA Fellow Grade Selection Committee.  
Chair, Awards Committee, Institute for Dynamics of Explosions and Reactive Systems, 2011; Member, 2013, 2015.

#### **D. Conference Organization**

Chairman, Combustion Modeling Session, Solid Propulsion Conference, June 1967, Anaheim, CA.  
Associate Organizer and Session Chairman, Conference on Theory of Coupling of Combustion with Gasdynamic Flow Fields, Princeton, NJ, January 1968.  
Chairman, Solid Propellants Sessions, Propulsion Joint Specialist Meeting, Cleveland, OH, June 1968.  
Chairman, 3rd Session of Singular Perturbation Conference, Princeton, NJ, January 1970.  
Chairman, Injection and Combustion Session, 7th JANNAP Liquid Propellant Combustion Instability Meeting, October 27, 1970.  
Organizer, 1972 Technical Meeting of Eastern Section/The Combustion Institute, Princeton University, Dec. 6-7, 1972.  
Session Chairman, 1973 Technical Meeting of the Central States Section/The Combustion Institute, University of Illinois, March 27-28, 1973.  
Co-Organizer, NSF Workshop on Energy-Related Basic Combustion Research, Princeton University, 1974.  
Co-organizer and Session Chairman, Seventh International Colloquium on The Gasdynamics of Explosions and Reactive Systems, Gottingen, 1979.  
Colloquia and Session Chairman, Nineteenth Symposium (International) on Combustion.  
Papers Chairman and Session Chairman, 1976 Fall Technical Meeting, Eastern Section/Combustion Institute, Drexel University, 1977 Fall Technical Meeting, United Technologies Research Center.  
Session Chairman, AIAA Joint Specialist Meeting, 1982.  
Organizer, Ramjet Workshop, Georgia Institute of Technology, March 1983.  
Chairman, Sprays Session, Ninth ICDERS Symposium, Poitiers, France, July 1983.  
Organizer, AFOSR Contractors Meeting, June 1984.

Chairman, Laminar Flames Session, Eastern Section/Combustion Institute, 1984.  
 Chairman, Sprays Session Tenth ICDERS Symposium, Berkeley, August 1985.  
 Session Chairman, Spray Combustion 21st Symposium (International) on  
 Combustion, 1986.  
 Member, International Scientific Advisory Committee, the 8th International  
 Symposium of Transport Phenomena in Combustion, San Francisco, CA, July  
 1995.  
 Scientific Advisory Committee, Numerical Combustion Conference, March 2000.  
 Member, International Advisory Board for Zel'dovich Memorial International  
 Conference on Combustion and Detonation, Aug 30 – Sept 3, 2004, Moscow,  
 Russia.  
 Session Chairman, ILASS 2005 Meeting, Irvine, CA, May 2005.  
 Member, Scientific Committee for European Community on Computational Methods  
 in Applied Sciences Conference on Computational Combustion (ECCOMAS),  
 June 21-24, 2005, Lisbon, Portugal.  
 Executive Committee Member for the NSF Workshop for Frontiers in Transport  
 Phenomena Research & Education: Energy Systems, Biological Systems,  
 Security, Information Technology & Nanotechnology. University of Connecticut,  
 Storrs, May 17-18, 2007.  
 Member, Scientific Committee for Second ECCOMAS Thematic Conference on  
 Computational Combustion Delft, 17-20 July, 2007.  
 Executive Committee Member for the International Symposia on Special Topics in  
 Chemical Propulsion (ISICP) series of symposia. Next meeting, Kyoto,  
 September, 2007.  
 Scientific Committee member, 2010 Conference on Thermal and Environmental  
 Issues in Energy Systems organized by the American Society of Mechanical  
 Engineers (ASME), the Associazione Termotecnica Italiana (ATI) and the Unione  
 Italiana di Termofluidodinamica (UIT).

## **E. Workshop Participation**

Participant, DOE Workshop on Modeling of IC Engine Combustion, La Jolla, CA,  
 1975.  
 Participant, NASA Workshop on Fundamentals of Gas Turbine Combustion, NASA  
 Lewis Laboratories, 1979.  
 Participant, National Academy of Sciences Workshop on High Temperature Science,  
 Washington, D.C., 1979.  
 Participant, ONR Workshop on Turbulent Combustion, 1981.  
 Participant, U.S.-Italy Joint Workshop on Heat Transfer and Combustion, 1982.  
 Participant, U.S.-China Joint Workshop on Heat Transfer, 1983.  
 Participant, Workshop on Spray Combustion, March 1985.  
 Member, Dept. of Energy Planning Workshop on Energy Engineering, 1985-1986.  
 Participant and Panel Chairman, Workshop on Future Role of Sandia CRF in the  
 DOE Combustion Research Program, July 1986.  
 Participant, invited Workshop on Mechanisms of Ramjet Combustion Instability,  
 Reno, NV, January 1987.

Participant, invited Workshop on Liquid Rocket Engine Combustion Instability Mechanisms, Monterey, CA, 1989.

Participant and Panel Chairman, U.S./Japan Heat Transfer Seminar on Computers in Heat Transfer Science, Oiso, Japan, 1991

Participant, Workshop on Basic Combustion Research in Support of Industrial Applications, Irvine, CA, August 1994.

Participant, Bilateral U.S.-Russia Workshop on Combustion, Voronovo, Russia, September 1994.

Participant, AFOSR Workshop on Liquid-Propellant Rocket Combustion Instability, Annapolis, MD, September 2006.

Participant and Panel Co-Chairman, NSF Workshop for Frontiers in Transport Phenomena Research & Education: Energy Systems, Biological Systems, Security, Information Technology & Nanotechnology. University of Connecticut, Storrs, May 17-18, 2007.

Participant, Workshop on Two-phase Flow Combustion, Ecole Centrale Polytechnique, Paris, France, May 2011.

Participant, AFOSR Workshop on Nanoenergetics and Combustion Dynamics, Arlington VA, August 23-24, 2011.

Participant, Animal Locomotion/ Robotics Workshop, Arlington, VA, May 2012.

Participant, AFOSR Workshop on High Pressure Combustion, NIST, Boulder CO, November 2015.

## **F. Reviewing**

Program Reviewer, Environmental Protection Agency, 1972-73.

Program Reviewer, Army Research Office, 1976-present.

Program Reviewer, National Science Foundation, 1972-present.

Program Reviewer, DOE, 1978-present.

Program Reviewer, International Science and Technology Center

Member, Program Subcommittee, Sixteenth, Seventeenth, Eighteenth, Nineteenth, Twentieth, Twenty-First, Twenty-Second, Twenty-Third, Twenty-Fourth and Twenty-Fifth Symposia (International) on Combustion; Member, Program Steering Committee, Nineteenth, Twentieth, Twenty-Second, Twenty-Fourth, Twenty-Fifth, Twenty-Sixth, Twenty-Seventh, Twenty-Eighth, Twenty-Ninth, Thirtieth Symposia, Thirty-first, and Thirty-second Symposia..

Reviewer, National Research Council Reports

Journal Reviewer for --

*AIAA Journal*

*Journal of Spacecraft and Rockets*

*Astronautica Acta*

*Reference Book on Liquid Propellant Rocket Motor Instability*

*SIAM Journal*

*International Journal of Engineering Science*

*Combustion Science and Technology*

*Journal of Fluid Mechanics*

*Journal of Sound and Vibration*

*Combustion and Flame*  
*Proceedings of The Combustion Institute*  
*Journal of Heat Transfer*  
*International Journal of Heat and Mass Transfer*  
*Progress in Energy and Combustion Science*  
*Physics of Fluids*  
*Experimental Thermal and Fluid Science*  
*Journal of Energy Resources Technology*  
*Journal of Propulsion and Power*  
*International Journal of Multiphase Flow*  
*Atomization and Sprays*  
*International Journal of Computational Fluid Dynamics*  
*Chemical Engineering Science*  
*National Research Council Reports*  
*International Communications in Heat and Mass Transfer*  
*International Journal of Heat and Fluid Flow*  
*Journal of Fluids Engineering*  
*Heat Transfer Engineering*  
*Aerospace Science and Technology*  
*Journal of Computational Physics*  
*Journal of Thermophysics and Heat Transfer*  
*Chemical Engineering Journal*  
*Computer Modeling in Engineering and Sciences*  
*Heat and Mass Transfer*  
*Physical Reviews Letters*  
*CLEAN AIR – International Journal on Energy for a Clean Environment*  
*International Journal of Thermal Science*  
*Experiments in Fluids*  
*Computer Modeling in Engineering and Sciences*  
*Heat and Mass Transfer*  
*Physical Reviews E*  
*Combustion Theory and Modelling*  
*Nuclear Engineering and Design*

**G. Other**

Consultant and Lecturer on AGARD-sponsored tour of Europe, August-September 1967. United Aircraft Research Fellow, Sept. 1973 to Feb. 1974.

**Ph.D. Advisees:**

**Princeton University:**

J.S. Tien	1970	Professor, Case Western Reserve
T.S. Tonon	1972	Solar engineering industry, New Jersey
P. Tang	1972	Researcher, Los Alamos National Laboratory, JPL

A.K. Varma	1972	Researcher, Bell Laboratories
C. Bruno	1973	Professor, University of Rome
J.R. Bellan	1974	Researcher, JPL; Lecturer, Cal Tech
T.J. Rosfjord	1974	Manager, United Technologies Research Center
S. Prakash	1978	Professor, University of Roorkee, Hewlett-Packard
J.I. Ramos	1980	Professor, Carnegie Mellon University and U. Malaga
Y.P. Su	1981	Director, Lung-Tan Taiwan Government Laboratory
M. Micci	1981	Professor, Pennsylvania State University
A. Birk	1981	Researcher, Army Ballistics Research Laboratory
S.T. Lerner	1981	Senior VP and Chief Technical Officer, Praxair, Inc.
S. Parker	1981	Researcher, Aeronautical Research Associates at Princeton

**Carnegie Mellon University:**

A.Y. Tong	1983	Professor, University of Texas, Arlington
P. Givi	1984	Professor, SUNY, Buffalo, University of Pittsburgh
G. Patnaik	1985	Researcher, Naval Research Laboratories
A. Eaton	1988	Researcher, Brigham Young University

**University of California, Irvine:**

K. Molavi	1990	Engineering Consultant, Irvine
C.H. Chiang	1990	Assoc. Professor, KaoShiung Polytech Institute, Taiwan
D. Schiller	1991	Engineer, Boeing, Huntington Beach
R. Bhatia	1993	Manager, Dell Inc.
J.P. Delplanque	1993	Professor and Associate Dean, UC Davis
M. Masoudi	1998	Engineer, Bosch
C. Mehring	1999	Professor, University of Stuttgart
F. Cheng	2008	Family manufacturing business, Hong Kong
S. Dabiri	2009	Assistant Professor, Purdue University
G. Wu	2010,	Ansys (FLUENT), scientific staff
B. Colcord	2011	Data Analyst, New Zealand Air
D. Jarrahbashi	2014	Assistant Professor, Texas A & M
T. M. Nguyen	2018	Researcher, Sandia Laboratories
A. Jorda Juanos	2018	Research Engineer, Simerics, Inc.
A. Zandian	2018	Research Engineer, Convergent Science, Inc

**M.S. Advisees:**

B. Seth	1978	Unknown
D. Schiller	1988	Engineer, Boeing
F. Miralles-Wilhelm	1989	Ph.D. Candidate at MIT
J.P. Delplanque	1990	Associate Professor, UC Davis
A. Duvvur	1992	Hewlett-Packard
I. Ray	1992	Working in industry, Pittsburgh
Q.-H. Zhu	1993	Ph.D. Candidate at SUNY Stony Brook
C. Mehring	1994	Professor, University of Stuttgart
S. Miller	1994	Atmospheric Research, New York State
F. Flores	2000	U.S. Air Force
X. Fang	2000	Software Engineering
S. Yalamanchili	2003	Parker Aerospace
R. Imaoka	2004	Scientist, US Navy
G. Wu	2008	Ansys (FLUENT), scientific staff
B. Colcord	2008	Data Analyst, New Zealand Air
A. Jorda Juanos	2013	Simerics, Inc.
A. Zandian	2014	UCI instructor / researcher
A. Frisch	2015	Engineer, Aerojet Rocketdyne
J. Zembal	2015	Engineer, industry
J. Krieg	2016	Engineer, Parker Aerospace
T. H. Morgan	2017	Engineer, industry
J. Poblador Ibanez	2017	UCI PhD student

**MS Advisees, visiting students from Politecnico di Milano**

S. Stanchi	2003-04
C. Fedeli	2004-05
F. Favaro	2011-12
A. Coronetti	2012
D. Cirigliano	2016-17

**Postdoctoral Research Associates:**

A. Chervinsky	Deceased, formerly Lecturer, Technion
O.P. Sharma	Professor, IIT, Kampur
C.C. Feng	Professor, Trenton State College
C.K. Law	Professor, Princeton University
F.V. Bracco	Professor, Princeton University
H.S. Homan	Exxon Research Laboratories
J. Humphrey	Professor, UCB and U. of Va.
A. Gany	Professor, Technion
L. Caveny	Air Force SDI Office
S.K. Aggarwal	Professor, University of Illinois, Chicago

R. Tal	Israel Defense Industry
R.H. Rangel	Professor, UCI
M.S. Raju	Researcher, NYMA
B. Abramzon	Consultant, Israel
B. Cetegen	Professor and Chair, University of Connecticut
G. Continillo	Professor, Universita del Sannio, Italy
C.M. Megaridis	Professor, University of Illinois, Chicago
F.H. Tsau	Researcher, Industrial Technical Institute, Taiwan
L. Chao	Returned to Taiwan
C.H. Chiang	Associate Professor, KaoShiung Polytech Institute, Taiwan
I. Silverman	Researcher, Soreq Nuclear Research Center, Israel
R. Bhatia	Manager, Dell, Inc.
I. Kim	Assistant Professor, U. of Michigan, Dearborn
D. Schiller	Engineer, Boeing, Huntington Beach
E. Gutheil	Professor, University of Heidelberg
H. Li	Software Industry
C. Mehring	Manager, Engineer, Parker Aerospace, Irvine
J. Cai	Research Scientist, National University of Singapore
P. Popov	Researcher, University of Illinois, Urbana-Champaign

#### **SELECTED EXTRAMURAL FUNDING:**

1. Principal Investigator, Fundamental Studies on Spray Combustion and Turbulent Combustion Program, AFOSR, 1985-1989.
2. Principal Investigator, Liquid Fueled Ramjet Combustion Instability: Acoustical and Vortical Interactions with Burning Sprays Program, ONR, 1985-1988.
3. Principal Investigator, Ignition and Flame Propagation In Sprays Program, ARO, 1985-1987.
4. Principal Investigator, Strategy for Advanced Sensing and Control of Combustion Program, AFOSR, 1985-86.
5. Principal Investigator, Ignition and Flame Spread Above Liquid Fuel Pools: Gravity Effects Program, NASA, 1985-present.
6. Principal Investigator, Modeling Aspects of Hazardous Waste Incineration, NSF, 1988-1991.
7. Principal Investigator, Transverse Injection of Liquid and Gaseous Fuels into Subsonic/Supersonic Flows, Air Force Aeropropulsion Laboratories, 1988-1992.
8. Principal Investigator, Metal Slurry Fuels, ONR, 1988-1992.
9. Principal Investigator, Fundamental Studies of Droplet Interaction in Dense Sprays, AFOSR, 1989-1992.
10. Co-Principal Investigator, Liquid Rocket Combustion Instability, Pratt and Whitney, 1989-1992.
11. Principal Investigator, Liquid Propulsion Combustion Instability, Societe Europenne Propulsion, 1990-1993.
12. Principal Investigator, Liquid-Phase Reactions in Energetic Fuel Droplet Vaporization, ONR, 1992-1995.
13. Principal Investigator, Droplet-Turbulence Interactions Over a Wide Spectral Range, AFOSR, 1992-1995.



14. Principal Investigator, The Nitridizing of Aluminum in Microgravity Using Spray Combustion Technology, UC Cal Space Inst., 1993-1994.
15. Principal Investigator, Nonlinear Distortion and Disintegration of Liquid Streams, Army Research Office, 1996-2002.
16. Principal Investigator, Turbine Burner, NSF, 1998-
17. Principal Investigator, Electricity Generation via Turbine Burner, Cal. Energy Commission 1999-2001.
18. Principal Investigator, Fluid Dynamics of Semiconductor Processing, Lam Research, 2001-2003.
19. Principal Investigator, Turbine Burner, Subcontract for Air Force SBIR, Phase II, 2001-2003.
20. Principal Investigator, Liquid-Film Combustor, NSF, 2002-2007.
21. Principal Investigator, Miniature Combustor with Liquid-Fuel Film, University of California, Energy Institute, 2002-2003.
22. Principal Investigator, Flame Spread Computer Code Documentation, NASA, 2003-2007.
23. Principal Investigator, Turbine Burner Research, AFOSR, 2006-2009.
24. Principal Investigator, Cavitation in High-Pressure Injectors, ARO, 2006-2009.
25. Principal Investigator, Injection of Emulsified Fuels, Siemens Power Corporation, 2007-2011.
26. Principal Investigator, High-Pressure Transient Injectors, ARO, 2009-2012.
27. Principal Investigator, Reduced Basis and Stochastic Modeling of Liquid Propellant Rocket Engine as a Complex System, AFOSR, 2012-2020.
28. Principal Investigator, Deep Ocean Burning of Methane Hydrate, NSF, 2013-16.
29. Principal Investigator, Liquid Atomization at Supercritical Pressure, 2018-21.

## TEACHING

### Courses Taught at University of California, Irvine

1986	(Winter)	ME 200D	Engineering Analysis
1987	(Spring)	ME 112	Propulsion
1988	(Winter)	ME 236	Nonequilibrium Gasdynamics
1988	(Spring)	ME 112	Propulsion (portion)
1989	(Winter)	ME 200D	Engineering Analysis
1991	(Spring)	ME 112	Propulsion
1992	(Winter)	ME 226	Fuel Atomization and Spray Combustion
1993	(Winter)	ME 230B	Viscous Incompressible Fluid Mechanics
1993	(Fall)	ME 230D	Theoretical Foundations of Fluid Mechanics
1995	(Winter)	ME 210	Advanced Fundamentals of Combustion
1995	(Fall)	AE 140	Engineering Analysis
1996	(Spring)	ME 231	Fundamentals of Turbulence
1996	(Fall)	AE 140	Engineering Analysis
1996	(Fall)	ME 295	Vorticity Dynamics (Team teaching)

1997	(Winter)	ME 226	Advanced Heat Transfer (Spray and Droplet Behavior)*
1997	(Spring)	AE 146	Orbital Mechanics
1998	(Winter)	MAE 210	Advanced Fundamentals of Combustion
1998	(Spring)	MAE 230D	Theoretical Foundations of Fluid Mechanics
1998	(Fall)	MAE140	Engineering Analysis
1999	(Winter)	MAE 230B	Viscous Incompressible Fluid Dynamics
1999	(Spring)	MAE 226	Liquid Atomization
2000	(Winter)	MAE 210	Advanced Fundamentals of Combustion
2000	(Fall )	MAE 140	Engineering Analysis
2001	(Winter)	MAE 205	Perturbation Methods in Engineering
2001	(Spring)	MAE 146	Astronautics
2002	(Winter)	MAE 230D	Theoretical Foundations of Fluid Mechanics
2002	(Spring)	MAE 226	Droplets and Sprays
2002	(Fall)	MAE 205	Perturbation Methods in Engineering
2003	(Winter)	MAE 112	Propulsion
2003	(Spring)	MAE 231	Fundamentals of Turbulence
2003	(Fall)	MAE 230A	Inviscid Incompressible Fluid Dynamics
2004	(Winter)	MAE 112	Propulsion
2004	(Spring)	MAE 146	Astronautics
2004	(Fall)	MAE 230A	Inviscid Incompressible Fluid Dynamics
2005	(Winter)	MAE 226	Droplets and Sprays
2005	(Spring)		on leave
2005	(Fall)	MAE 230A	Inviscid Incompressible Fluid Dynamics
2006	(Winter)	MAE 230B	Viscous Incompressible Fluid Dynamics
2006	( Spring)	MAE 210	Advanced Fundamentals of Combustion
2006	(Fall)	MAE 230D	Theoretical Foundations of Fluid Mechanics
2007	(Winter)	MAE 112	Propulsion
2007	(Spring)	MAE 236	Nonequilibrium Gasdynamics
2007	(Fall)	MAE 230A	Inviscid Incompressible Fluid Dynamics
2008	(Winter)	MAE 112	Propulsion
2008	(Spring)		on leave
2008	(Fall)	MAE 205	Perturbation Methods in Engineering
2009	(Winter)	MAE 112	Propulsion
2009	(Fall)	MAE 230A	Inviscid Incompressible Fluid Dynamics
2010	(Winter)	MAE 112	Propulsion
2010	(Spring)	MAE 236	Nonequilibrium Gasdynamics
2010	(Fall)	MAE 230D	Theoretical Foundations of Fluid Mechanics
2011	(Winter)	MAE 200B	Engineering Analysis II
2011	(Spring)		on leave
2011	(Fall)	MAE 230A	Inviscid Incompressible Fluid Dynamics
2012	(Winter)	MAE 200B	Engineering Analysis II
2012	(Spring)	MAE 205	Perturbation Methods in Engineering
2012	(Fall)	MAE 230A	Inviscid Incompressible Fluid Dynamics
2013	(Winter)	MAE 112	Propulsion
2013	( Spring)	MAE 210	Advanced Fundamentals of Combustion

2013	(Fall)	MAE 230A	Inviscid Incompressible Fluid Dynamics
2014	(Winter)	MAE 112	Propulsion
2014	(Spring)		on leave
2014	(Fall)	MAE 236	Nonequilibrium Gasdynamics
2015	(Winter)	MAE 210	Advanced Fundamentals of Combustion
2015	(Spring)	MAE 205	Perturbation Methods in Engineering
2015	(Fall)	MAE 230D	Theoretical Foundations of Fluid Mechanics
2016	(Winter)	MAE 210	Advanced Fundamentals of Combustion*
2016	(Spring)		on leave
2016	(Fall)	MAE 230A	Inviscid Incompressible Fluid Dynamics*
2017	(Spring)	MAE 226	Sprays and Atomization*
2017	(Fall)	MAE 230A	Inviscid Incompressible Fluid Dynamics*
2018	(Winter)	MAE 205	Perturbation Methods in Engineering*
2018	(Spring)		on leave
2018	(Fall)	MAE 112	Propulsion

### Courses Taught at Carnegie-Mellon University

1980	(Spring)	24-719	Nonequilibrium Gasdynamics*
1980	(Fall)	24-224	Thermal Systems Analysis
1981	(Spring)		Combustion, a Continuing Education Course (one-half of course)
1981	(Fall)	24-701	Mathematical Techniques in Mech.* Engineering I (a portion only)
1981	(Fall)	39-050	Concepts in Engineering (1 lecture)
1982	(Spring)		Combustion, a Continuing Education Course (one-half of course)
1982	(Fall)	39-050	Concepts in Engineering (1 lecture)
1983	(Spring)	24-712	Turbulent Flows*
1983	(Spring)		Combustion, a Continuing Education Course (one-half of course)
1983	(Fall)	24-716	Nonequilibrium Gasdynamics (one-half of course)
1984	(Spring)	24-719	Advanced Topics in Fluid Mechanics* (Perturbation Techniques)

### Courses Taught at Princeton University

1964	(Spring)	AMS 570	Advanced Theoretical Problems II*
1964	(Fall)	AMS 563	Aerospace Propulsion (a portion only)*
1965	(Spring)	AMS 422	Mechanical Engineering Analysis (a portion only)
1965	(Fall)	AMS 564	Space Flight (a portion only)*
1966	(Spring)	AMS 563	Aerospace Propulsion (a portion only)*
1966	(Fall)	Math	Seminar, Perturbation Techniques I* (now AMS 585)
		AMS 587	Aerophysics I (a portion only)*

1967	(Spring)	Math	Seminar, Perturbation Techniques II* (now AMS 586)
1967	(Fall)	AMS 592	Perturbation Techniques I (now AMS 585)*
1968	(Spring)	AMS 592	Perturbation Techniques II (now AMS 586)*
1968	(Fall)	AMS 539	Advanced Theoretical Problems I*
1969	(Spring)	AMS 592	Nonequilibrium Fluid Mechanics*
		AMS 540	Advanced Theoretical Problems II*
1969	(Fall)	AMS 585	Perturbation Techniques I*
		AMS 333	Aerospace Propulsion
1970	(Spring)	AMS 586	Perturbation Techniques II*
		AMS 592	Nonequilibrium Fluid Mechanics*
1970	(Fall)	AMS 585	Perturbation Techniques I*
		AMS	Undergraduate Seminar
1971	(Spring)	AMS 586	Perturbation Techniques II*
		AMS 213	Engineering and the Environment
1971	(Fall)	AMS 587	Aerophysics I*
1972	(Spring)	AMS 526	Nonequilibrium Gasdynamics*
1972	(Fall)	AMS 587	Aerophysics I*
1973	(Spring)	AMS 526	Nonequilibrium Gasdynamics*
1974	(Spring)	AMS 586	Perturbation Techniques II*
		Eng 101	Introduction to Technological Challenges
1974	(Fall)	AMS 585	Perturbation Techniques I*
1975	(Spring)	AMS 586	Perturbation Techniques II*
			Minicourse on Fluid Dynamics
1975	(Fall)	AMS 592	Special Topics in Combustion*
1976	(Spring)	AMS 526	Nonequilibrium Gasdynamics*
1976	(Fall)	AMS 333	Combustion Energy Conversion
1977	(Spring)	AMS 526	Nonequilibrium Gasdynamics*
1977	(Fall)	AMS 333	Combustion Energy Conversion
1978	(Spring)	AMS 596	Turbulent Combustion*
1978	(Fall)	AMS 427	Fossil Fuel Energy Conversion
1979	(Spring)	AMS 526	Nonequilibrium Gasdynamics*

## THESIS AND POSTDOCTORAL RESEARCH SUPERVISION

### University of California, Irvine

2017-18	6	Graduate Students
	1	Research Staff Member
	1	Visiting Researcher
2016-17	6	Graduate Students
	1	Visiting Researcher
2015-16	5	Graduate Students
	1	Research Staff Member
	1	Visiting Researcher
2014-15	6	Graduate Students
	1	Research Staff Member
	1	Visiting Researcher
2013-14	4	Graduate Students
	1	Research Staff Member
	3	Visiting Researchers
2012-13	4	Graduate Students
	1	Research Staff Member
2011-12	3	Graduate Students
	2	Visiting Researchers
2010-11	3	Graduate Students
2009-10	4	Graduate Students
2008-09	5	Graduate Students
2007-08	5	Graduate Students
2006-07	5	Graduate Students
2005-06	3	Graduate Students
	3	Visiting Researchers
2004-05	3	Graduate Students
2003-04	3	Graduate Students
	2	Research Staff Members
2002-03	4	Graduate Students

	1	Research Staff Members
2001-02	3	Graduate Students
	2	Research Staff Members
2000-01	2	Graduate Students
	2	Research Staff Members
1999-00	3	Graduate Students
	3	Research Staff Members
1998-99	3	Graduate Students
	2	Research Staff Members
1997-98	2	Graduate Students
	2	Research Staff Members
1996-97	2	Graduate Students
	2	Research Staff Members
1995-96	3	Graduate Students
	2	Research Staff Members
1994-95	3	Graduate Students
	3	Research Staff Members
1993-94	3	Graduate Students
	3	Research Staff Members
1992-93	5	Graduate Students
	5	Research Staff Members
1991-92	5	Graduate Students
	5	Research Staff Members
1990-91	5	Graduate Students
	3	Research Staff Members
1989-90	5	Graduate Students
	3	Research Staff Members
	2	Visitors
1988-89	6	Graduate Students
	3	Research Staff Members

1987-88	5	Graduate Students
	3	Research Staff Members
1986-87	3	Graduate Students
	1	Visiting Graduate Student
	4	Research Staff Members
1985-86	1	Graduate Student
	4	Research Staff Members

### **Carnegie-Mellon University**

1979-80	3	Graduate Students (under co-supervision)
	2	Research Staff Members
	1	Undergraduate
1980-81 Fellow)	1	Graduate Student
	5	Graduate Students (under co-supervision, including DuPont
	2	Research Staff Members
1981-82	3	Graduate Students
	3	Research Staff Members
1982-83	5	Graduate Students
	1	Research Staff Member
1983-84	5	Graduate Students
	1	Research Staff Member
1984-85	4	Graduate Students
	1	Research Staff Member

### **Princeton University**

1964-65	2	Graduate Students
1965-66	2	Graduate Students
1966-67	3	Graduate Students
	1	Undergraduate Student
1967-68	2	Graduate Students
	2	Undergraduate Students (1 University Scholar)
1968-69	6	Graduate Students
	2	Postdoctoral Research Associates

1969-70	5	Graduate Students (including one Guggenheim Fellow, one Osgood Fellow and one NASA Fellow)
	1	Postdoctoral Research Associate
	1	Research Staff Member
1970-71	6	Graduate Students (including two Guggenheim Fellows, and one Wallace Fellow)
	1	Postdoctoral Research Associate Research Staff Member
1971-72	7	Graduate Students (including two Guggenheim Fellows, one Amelia Earhart Fellow and one Assistant-in-Instruction)
		Research Staff Members
1972-73	6	Graduate Students (including one Guggenheim Fellow, one Amelia Earhart Fellow and one Assistant-in-Instruction)
1973-74	4	Graduate Students (including one Amelia Earhart Fellow, one Indian Government Fellow and one Assistant-in-Instruction)
	2	Research Staff Members
1974-75	2	Graduate Students (including one Indian Government Fellow)
	2	Research Staff Members
1975-76	3	Graduate Students (Including one Indian Government Fellow and
		two Guggenheim Fellows)
	2	Research Staff Members
1976-77	5	Graduate Students (including one Chinese Ministry Fellow
and one		Mineral Fuel Conservation Fellow
	1	Research Staff Member
1977-78	6	Graduate Students (including one Guggenheim Fellow, one Chinese Ministry Fellow, and one Mineral Fuel
Conservation		Fellow)
	2	Research Staff Members
1978-79	8	Graduate Students (including one Chinese Ministry Fellow
and one		



		Mineral Fuel Conservation Fellow)
	4	Research Staff Members
1979-80	6	Graduate Students
	2	Research Staff Members

## OTHER UNIVERSITY ACTIVITIES

### University of California, Irvine

1. Chairman, Subcommittee on Biochemical Engineering, 1985.
2. Member, Council of Deans and Directors, 1985-1994.
3. Member, Advisory Committee for Planning in Engineering Education, Office of the President, 1990-1991.
4. Member, Applied Mathematics Search Committee, 1986-1987.
5. Member, Dean of Physical Sciences Search Committee, 1986.
6. Member, Academic Computing and Data Communications Advisory Committee, 1987-
7. Member, Dean of Graduate School of Management Search Committee, 1987-1988.
8. Member, Ad Hoc Committee on New Initiatives for UCI, 1996-1997.
9. Member, Committee on Planning and Budget, 1996-1999; Vice Chair; 1996-1997; Chair, 1997-1998.
10. Member, Academic Senate Restructuring Committee, 1997-1998.
11. Member, Strategic Planning Committee, 1997-1998.
12. Member, Universitywide Committee on Planning and Budget, 1997-00; Vice Chair, 1998-99, Chair, 1999-2000.
13. Faculty Chair, School of Engineering, 1998-1999.
14. Chair, DANR Workgroup, 1998-1999.
15. Member, UC Merced Taskforce, 1998-2000.
16. UC Executive Budget Committee, 1999-2000.
17. UC Academic Planning Council, 1999-2000.
18. UC Council on Research, 1998-2000.
19. UC Merced Engineering Advisory Committee, 1999-.
20. Member, UCI Academic Planning Group, 1999-2000.
21. Chair, UCI Law School Work Group, 2000-.
22. Delegate, UC Senate Assembly 2000-2.
23. Member, UG Task Force, 2003-.
24. Member, HSSOE UG Honors Program Committee, 2003-.
25. Member, Engineering III Building Advisory Committee, 2003-.
26. Chair, SOE Space Planning Committee, 2002.
27. Chair, SOE Rankings Committee, 2002-2003.
28. Member, SOE Undergraduate Committee, 2003-2009; Chair, 2007-8.
29. Member, Council on Educational Policy, 2004-2007.
30. Chair, 2005-6; Member, 2005-7; Policy Subcommittee of CEP.
31. Member, Ad Hoc Senate Committee on the Question of The Provost.

32. Aerospace Engineering Undergraduate Advisor, 2003-2009.
33. Member, MAE Undergraduate Studies Committee, 2003-2009, Interim Chair, summer, 2006; 2011- .
34. Member, MAE Graduate Studies Committee, 2005-2011.
35. Interim MAE Graduate Advisor, April-August, 2009.
36. Member, MAE Faculty Search Committee, 2005-2009.
37. Member, Senate Ad Hoc Committee on Shared Governance, 2007-2008.
38. Member, Council on Planning & Budget, 2008-2011.
39. Member, Universitywide Senate Membership Task Force, 2009.
40. Interim MAE Graduate Advisor, April-August, 2009.
41. Chair, HSSOE Strategic Planning Work Group on Data/ Benchmarking, 2009.
42. Chair, Complex Systems Engineering Committee, 2009
43. Member, Council on Undergraduate Admissions and Relations with Schools, 2011-14.
44. Aerospace Engineering Undergraduate Advisor, 2015-2016 .
45. Coordinator, Fluid Dynamics Faculty

### **Carnegie-Mellon University**

1. Member, CIT Department Heads Committee, 1979-1984.
2. Member, University Space Committee, 1980-1981.
3. Member, Dickson Prize Committee, 1980-1984.
4. Member, MCS Applied Science Committee, 1980-1981.
5. Member, CIT Undergraduate Review Committee, 1981.
6. Principal Investigator, Swirling Combustion Research Program, 1979-1982.
7. Principal Investigator, IC Engine Simulation Research Program, 1979-1981.
8. Principal Investigator, Flame Propagation Through Spray Research Programs, 1979-1984.
9. Principal Investigator, Multiple Ignition Research Program, 1979-1984.
10. Principal Investigator, Turbulent Reacting Flow Combustion Research Program, 1981-1984.
11. Principal Investigator, Synthetic Fuels Vaporization Research Program, 1981-1984.
12. Member, Tenure Committee, 1981-1983.
13. Member, COEST, 1982-present.
14. Chairman, Flexible Faculty Retirement Committee, 1983-1984.
15. Principal Investigator, Flame Spread with Reduced Gravity Research Program, 1983-1984.

### **Princeton University**

1. Member, Forrestal Campus Library Committee, 1966-1969.
2. Member, Guggenheim Laboratories Faculty Committee, 1966-1972.
3. Member, Engineering School Committee on Mathematics, 1967-1971.
4. Member, AMS Ad Hoc Committee on Mathematics, 1968.
5. Participant, Applied Mathematics Interdepartmental Program, 1968-1979.

6. Member, AMS Graduate Committee, 1969-1971.
7. Member and Chairman, Ad Hoc Committees to Review Assistant Professor Promotions, Appointments and Reappointments, 1970-1978.
8. Member, Committee on the Structure of the AMS Department, 1970.
9. Member, Engineering Committee on Environmental Studies, 1970-1971.
10. Executive Officer, Guggenheim Laboratories Faculty Committee, June 1970-November 1971.
11. Freshman Advisor, 1970-1972, 1974-1976.
12. Member and Chairman, AMS Ad Hoc Committees to review Research Staff Appointments and Promotions 1971-1979.
13. Member, University Committee on Discipline, 1971-1972.
14. Member, Engineering School Computer Committee, 1971-1972.
15. Member, University Computer Center Committee, 1971-1972.
16. Principal Investigator, Nuclear Rockets Program 1971-1973.
17. Principal Investigator, Fire Research Program, 1971-1976.
18. Member, AMS Computer Committee, 1968-1973; Chairman, 1971-1973.
19. Principal Investigator, Aircraft Fire Safety Program, 1971-1980.
20. Member, Engineering School Engineering Physics Program, 1971-1973.
21. Research Leader, Engine Emissions Program, 1971-1974.
22. Member, Engineering School Energy Conversion Committee, 1972.
23. Chairman, Departmental Committee on Graduate Affairs, 1974-1978.
24. Member, University Faculty Committee on the Graduate School, 1974-1978.
25. Departmental Director of Graduate Studies, 1974-1978.
26. Principal Investigator, Multicomponent Fuel Droplet Burning and Vaporization Program, 1975-1980.
27. Faculty Coordinator, AMS Departmental News Bulletin, 1975-1976.
28. Member, Graduate School Subcommittee on Discipline, 1975-1976.
29. Member, Graduate School Subcommittee on Fellowships and Curriculum, 1974-1977.
30. Member, Departmental Committee on Faculty Development, 1978.
31. Member, Departmental Personnel Committee, 1976-1979.
32. Trustee, Princeton University Store, 1976-1979.
33. Member, Resources Committee, Council of Princeton University Community, 1976-1978.
34. Member, Graduate School Subcommittee on Student Life, 1977-1978.
35. Principal Investigator, Turbulent Combustion Program, 1977-1979.