

May 5, 2008

DAVID R. KASSOY

Professor Emeritus of Mechanical Engineering
University of Colorado, Boulder

1. GENERAL

Mechanical Engineering Department
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Married 1964; Caryl F. Kassoy
Two Children: Andrew (38), Erin (32)
U.S. Citizen-Born in New York City

2. EDUCATIONAL and PROFESSIONAL TRAINING

B.A.E., Polytechnic Institute of Brooklyn, 1959

M.S.A.E., University of Michigan, 1961

Ph.D., Aerospace Engineering, University of Michigan, 1965

Wharton/IRHE Executive Education Program, University of Pennsylvania, February 1998

3. PROFESSIONAL EXPERIENCE

Research Assistant, University of Michigan, 1960-1965

Postdoctoral Fellow, University of California, San Diego, 1965-1967

Visiting Assistant Professor, University of California, San Diego, 1967-1969

Assistant Professor, University of Colorado, 1969-1975

Visiting Lecturer, University of East Anglia, Norwich, England, 1973

Associate Professor, University of Colorado, 1975-1977

Professor, University of Colorado, 1977-present

Associate Research Engineer, University of California, San Diego; La Jolla, California,
1977-1978

Senior Visiting Fellow, School of Mathematics and Physics, University of East Anglia,
Norwich, England, 1982-1983

Fulbright Research Visitor, School of Aerospace Engineering, Technical University of Delft,
The Netherlands, 1983

Visiting Fellow, Japan Society for the Promotion of Science, Nagoya University, Japan, June 1985

Co-Director, Center for Low Gravity Fluid Mechanics and Transport Phenomena, College of Engineering, 1985-1988

Assistant Vice Chancellor for Research, University of Colorado, Boulder, 1988-91, 1992-93

Interim Dean of the Graduate School and Associate Vice Chancellor for Research, University of Colorado-Boulder, 1991-1992

Associate Vice Chancellor for Academic Affairs (Budget and Planning), University of Colorado-Boulder, 1993-1997

Interim Associate Vice-President for Technology, University of Colorado System, 1997-2000

4. **PROFESSIONAL ACTIVITIES**

Consultant for a Geothermal Energy Film Production, Division of Continuing Education, University of Colorado, September 1975-June 1976

Consultant - Science Applications Inc., 1975-1978 (geothermal problems)

Consultant - Johnson, Mahoney and Scott, Attorneys at Law, 1981-1982 (product liability)

Consultant - Bionetics Corporation, 1990-1993 (NASA Microgravity Science and Application Division program and proposal evaluation)

Chair, Executive Committee, Fluid Dynamics Division of the American Physical Society, 1992-93

Member, Board of Directors, CU-Cortez Center, Cortez, Colorado, 1994-1997

Member, University of Colorado Museum Advisory Committee, 1996-1997

Member, Policy Review Board, Colorado Advanced Software Institute, 1998-present

University of Colorado Representative, Western Cooperative for Educational Telecommunications, WICHE, 1998-2000

Member, Planning Committee, Annual Meeting of the Western Cooperative for Educational Telecommunications, WICHE, 1998

Member, Advisory Board, Center for Internet Technology in Education, eCollege.com, 1999-2001

Member, Advisory Board, Colorado, Executive Leadership Forum, 1999-2000

University of Colorado Representative, State of Colorado CIO Group, 1999-2000

University of Colorado Representative, CCHE CIO Council, 2000

5. **PROFESSIONAL SERVICE**

Proposal Reviewer:

National Science Foundation, 1969-present; Department of Energy, 1976-present;
Army Research Office, 1978-present; NASA-OSSA, 1985-present; Air Force Office of
Scientific Research, 1988-present

Manuscript Reviewer:

Adv. in Water Resources, Combustion and Flame, Combustion Science and
Technology, Combustion Theory and Modeling, J. Australian Math Society, J.
Engineering Math, J. Fluid Mechanics, J. Geophysical Research, J. Heat Transfer,
Physics of Fluids, Q. Jl. Mech. Appl. Math, SIAM J. Appl. Math, Water Resources
Research, AIAA J., J. Prop. & Power., Amer. Inst. of Aero. and Astro., Combustion
Institute

Geothermal Proposal Review Panel, U.S. Geological Survey, 1977-1980. Reservoir
Committee: Hot Dry Rocks Program Development Council, Los Alamos Geothermal
Program, 1979-1983

American Physical Society, Fluid Dynamics Division:

Executive Committee, Division of Fluid Dynamics, American Physical Society: Member,
1989-1994; **Vice Chairman** 1989-1990; **Chair-elect** 1991-1992; **Chair** 1992-1993, **Past
Chair** 1993-94; Public Information Coordinator 1995-1996

Fluid Dynamics Prize Committee: Member, 1980-1981, 1989-1991;
Vice Chairman 1989-1990, Chairman 1990-1991

Otto Laporte Award Committee: Member 2000-2003

Nominations Committee: Member, 1981-1982, 1988-1989, 1996-97

Program Committee: Member, 1989-90, 1991-1992, 2004-2007
Chairman 1992-1993

American Physical Society:

Program Committee, Division of Fluid Dynamics representative, March Meeting 1993,
April Meeting 1993

University's Space Research Association:

University of Colorado, Boulder representative to the USRA Council of Institutions, 1990-
1993

Technology Transfer Committee of the Boulder Development Commission:

University of Colorado, Boulder representative, 1988-1992

Center for the Study of Advance Rockets, University of Illinois, Member, External Advisory
Board, 1999-present

Sigma Xi:

President of the University of Colorado Chapter, 1999-2001
Vice President and seminar organizer, 2001-pres.
Boulder Faculty Assembly
Secretary 2005-2006, 2007-2008,
Vice Chair 2006-2007

6. **SOCIETY MEMBERSHIP**

Sigma Gamma Tau, 1959
Sigma Xi, 1962-present
American Physical Society - Fluid Dynamics Division, 1965-present, **Fellow (1986)**
Society of Industrial and Applied Mathematics, 1969-present
Pi Tau Sigma, 1973-present
American Geophysical Union, 1973-1983
Combustion Institute, 1983-present
American Institute of Aeronautics and Astronautics 1992-present, **Associate Fellow (2001)**
Council of Graduate Schools, 1988-1992
National Council of University Research Administrators, 1988-1992
Texas Technology Transfer Association, 1991-94
CRPGE/COTT - National Association of State Universities and Land Grant Colleges, 1991-1993
Western Cooperative for Educational Telecommunication, 1997-2000

7. **HONORS, AWARDS AND FELLOWSHIPS**

Boeing Fellowship (University of Michigan), 1960-1961
University Fellowship (University of Michigan), 1961-1963
Teaching Fellowship (University of Michigan), 1959-1960, 1963-1965
Postdoctoral Fellowship (University of California, San Diego), 1965-1967
NATO-NSF Travel Grant, Summer 1971
John Simon Guggenheim Fellowship, 1972-1973
College of Engineering and Applied Science Outstanding Scholarship Award, 1980
Croft Professorship, College of Engineering, 1982-1983
Faculty Fellowship, University of Colorado, 1982-1983
Fulbright Research Grant, The Netherlands, 1983
Senior Visiting Fellowship, Science and Engineering Research Council, United Kingdom, 1982-1983
Japan Society for the Promotion of Science Fellowship, June 1985
Fellow, American Physical Society, elected November 1986
Outstanding Ph.D. Recipient, The H.H. Rackham Graduate School, University of Michigan, 1988
Associate Fellow, American Institute of Aeronautics and Astronautics, 2002
Award for Excellence in Service: Boulder Faculty Assembly, University of Colorado 2006

8. **PUBLICATIONS**

"The Particle Problem in Gasdynamics - A Summary." BAMIRAC Annual, Institute of Science and Technology, The University of Michigan, 1965.

"Low Reynolds Number Variable Density Flow Around a Sphere." Ph.D. Thesis, The University of Michigan, 1965.

"Compressible Low Reynolds Number Flow Around a Sphere," with T.C. Adamson, Jr. and A.F. Messiter. *Phys. Fluids*, 9:671-681, 1966.

"Heat Transfer from Circular Cylinders at Low Reynolds Numbers: Part 1. Theory." *Phys. Fluids*, 10:938, 1967.

"Heat Transfer from Circular Cylinders at Low Reynolds Numbers: Part 2. Experimental Results and Comparison with Theory," with Y. Aihara and P.A. Libby. *Phys. Fluids*, 10:947, 1967.

"Liquid Droplets Combustion with Finite Rate Chemistry." AIAA 6th Aerospace Sciences Meetings, New York, Jan. 1968, *AIAA Preprint No. 68-181*.

"Variable Property Effects on Liquid Droplet Combustion," with F.A. Williams. *AIAA Journal*, 6:1961, 1968.

"Some Effects of Chemical Kinetics on Near Equilibrium Combustion in Non-Premixed Systems," with F.A. Williams. *Phys. Fluids*, 11:1343, 1968.

"Injection Effects on Energy Transfer for High Prandtl Number Boundary Layer Flows." *AIAA Journal*, 6:1796, 1968.

"Heat Transfer to Cylinders in Nitrogen-Neon, Nitrogen-Helium Mixtures," with G. Baccaglioni and P.A. Libby. *Phys. Fluids*, June 1969.

"A Note on the Effects of Chemical Kinetics on Near-Equilibrium Combustion in Non-Premixed Systems," with M.K. Liu and F.A. Williams. *Phys. Fluids*, Jan. 1969.

"On Laminar Boundary Layer Blowoff." *SIAM Applied Math.*, 18:29, 1970.

"Laminar Boundary Layers with Zero Wall Shear, Large Suction and Strong Adverse Pressure Gradients." *AIAA J.*, 7:2360, 1969.

"Laminar Boundary Layer at an Infinite Swept Stagnation Line with Large Rates of Injections," with P.A. Libby. *AIAA J.*, 8:1846-1853, Oct. 1970.

"On Laminar Boundary Layer Blowoff - II." *J. Fluid Mech.*, 48:209, 1971.

"Similar Laminar Boundary Layer with Zero Wall Shear and Mass Addition." *AIAA J.*, 9:725, 1971.

"The Singularity at Boundary Layer Separation Due to Mass Addition." *SIAM Applied Math.*, 25:105-123, 1973.

"Boundary Layer Separation Due to Mass Addition," with A. Amr. *Phys. of Fluids*, 16:1579-1586, 1973.

"A Resolution of the Blowoff Singularity for Similarity Flow on a Flat Plate." *J. Fluid Mechanics*, 62:145-161, 1974.

"An Eigenvalue Study of a Viscous Flow Separated by Mass Addition," with A. Zebib. *J. Eng. Math.*, 8:229-240, 1974.

"Perturbation Methods for Mathematical Models of Explosion Phenomena." *Q. Jl. Mech. Appl. Math.*, 28:63-74, 1975.

- "Homogeneous Explosions, Initiation to Completion." *AIAA Preprint*, 74-105, 12th Aerospace Sciences Meeting, 1974.
- "A Theory of Adiabatic, Homogeneous Explosion from Initiation to Completion." *Combustion Science and Technology*, 10: 27-35, 1975.
- "Effects of Kinetic Mechanism on Diffusion-Controlled Structure of Hydrogen-Halogen Reaction Zones," with A. Zebib and F.A. Williams. *Combustion Science and Technology*, 10:37-44, 1975.
- "The Subcritical Spatially Homogeneous Explosion: Initiation to Completion," with J. Poland. *Combustion Science and Technology*, 11:147-152, 1975.
- "A Note on the Description of an Attached Supersonic Boundary Layer Near a Point of Injection Cut-Off," with A. Amr. *J. Fluid Mech.*, 71:455-463, 1975.
- "Reattachment of a Separated Supersonic Boundary-Layer Subsequent to Injection Cut-Off," with A. Amr. *Physics of Fluids*, 19, No. 9:1312-1318, 1976.
- "Variable Viscosity Effects on the Onset of Convection in Porous Media," with A. Zebib. *Physics of Fluids*, 18, No. 12:1649-1651, 1975.
- "Heat and Mass Transfer in Models of Undeveloped Geothermal Fields." Proceedings of the Second U.N. Symposium on the Development and Use of Geothermal Resources, 3:1707-1711, 1976.
- "Extremely Rapid Transient Phenomena in Combustion, Ignition and Explosion." *SIAM-AMS Transactions*, 10:61-72, 1976.
- "The Supercritical Spatially Homogeneous Thermal Explosion - Initiation to Completion." *Q. Jl. Mech. Appl. Math.*, 30:71-89, 1977.
- "Onset of Natural Convection in a Box of Water Saturated Porous Media with Large Temperature Variation," with A. Zebib. *Physics of Fluids*, 20, No. 1:4-9, 1977.
- "Variable Property Effects on the Onset of Convection in an Elastic Porous Matrix," with L. Morland and A. Zebib. *Physics of Fluids*, 20, No. 8:1255-1259, 1977.
- "The Influence of Reactant Consumption on the Critical Conditions for Homogeneous Thermal Explosions," with A. Linan. *Q. Jl. Mech. Appl. Math.*, 31:99-112, 1978.
- "Three Dimensional Natural Convection Motion in a Confined Porous Medium," with A. Zebib. *Physics of Fluids*, 21, No. 1:1-3, 1978.
- "Convection Fluid Dynamics in a Model of a Fault Zone in the Earth's Crust," with A. Zebib. *J. Fluid Mechanics*, 88:769-792, 1978.
- "Stagnation Point Boundary Layers on a Subliming Surface with Numerous Small Roughness Elements," with P.A. Libby. *J.A.I.A.A.*, 16:630-631, 1978.
- "The Response of a Confined Gas to a Thermal Disturbance; I - Slow Transients." *SIAM Applied Math.*, 30:624-634, 1979.
- "Heat and Mass Transfer in a Saturated Porous Wedge with Impermeable Boundaries," with K.P. Goyal. *Int. J. Heat Mass. Trans.*, 22, (11):1577-1585, 1979.

"Convection Heat and Mass Transfer in Hydrothermal Systems," with S.K. Garg. Chapter 2, *Geothermal Systems: Principles and Case Histories*, Eds. L.S.P. Muffler and L. Rybach, J. Wiley Ltd., London, pp. 37-76, 1980.

"The Thermal Explosion Confined by a Constant Temperature Boundary, I - Induction Period Solution." *SIAM J. Applied Math.*, 39:412-430, 1980.

"Fault Zone Controlled Charging of a Liquid Dominated Geothermal Reservoir," with K.P. Goyal. *J. Geophys. Res.*, 85, B4:1867-1975, 1980.

"A Mathematical Analysis of Blow-Up for Thermal Reactions - The Spatially Nonhomogeneous Case," with J. Bebernes. *SIAM J. Applied Math.*, 40:476-484, 1981.

"Computation of Steady and Oscillatory Convection in Saturated Porous Media," with J. Gary. *J. Comp. Phys.*, 40:120-142, 1981.

"The Thermal Explosion Confined by a Constant Temperature Boundary II - The Extremely Rapid Transient," with J. Poland. *SIAM J. Applied Math.*, 41:231-246, 1981.

"A Guide to Mathematical Models of Convection Processes in Geothermal Systems," in Fluid Mechanics in Energy Conversion, (a reviewed publication). Proceedings of the SIMS Conference on Energy Conversion and Fluid Mechanics, Alta, Utah, June 25-29, 1979, pp. 129-150, 1980.

"The Effects of Significant Viscosity Variation on Convective Heat Transport in Water Saturated Porous Media," with J. Gary, J. Tadjeran and A. Zebib. *J. Fluid Mechanics*, 117:233-249, 1982.

"A Plausible Two-Dimensional Vertical Model of the East Mesa Geothermal Field," California, with K.P. Goyal. *J. Geophys. Res.*, 86, B11:10719-10733, 1981.

"The Induction Period of a Thermal Explosion in a Gas Between Infinite Parallel Plates," with J. Poland. *Combustion and Flame*, 50:259-274, 1983.

"A Note on Asymptotic Methods for Jump Phenomena." *SIAM J. Applied Math.*, 42:926-932, 1982.

"Ignition Processes in Confined Thermal Explosions," with I. Hindash and J. Poland. *Combustion Science and Technology*, 27:215-227, 1982.

"Activation Energy Asymptotics Applied to Burning Carbon Particles, with P.A. Libby. *Combustion and Flame*, 48:287-301, 1982.

"Heat and Mass Transfer in a Fault-Zone Controlled Geothermal Reservoir," with R. Pratt and J. Gary. *J. Geophysical Research*, 88, B4:3458-3466, 1983.

"The Homogeneous Thermal Explosion with Disassociation and Recombination," with M. Birkan. *Combustion Science and Technology*, 33:125-139, 1983.

"An Axisymmetric Model for the Charging of a Liquid Dominated Geothermal Reservoir," with J. Troncoso. *Int. J. Heat Mass Transfer*, 26:1389-1401, 1983.

"The Response of a Confined Gas to a Thermal Disturbance. II: Rapid Boundary Heating," with A. Radhwan. *J. Eng. Math.*, 18:133-156, 1984.

"Shocks Generated in a Confined Gas Due to Rapid Heat Addition at the Boundary, I. Weak Shock Waves," with J.F. Clarke and N. Riley. *Proc. Roy. Soc. London*, A393:309-329, 1984.

"Shocks Generated in a Confined Gas Due to Rapid Heat Addition at the Boundary, II. Strong Shock Waves," with J.F. Clarke and N. Riley. *Proc. Roy. Soc. London*, A393:331-351, 1984.

"The High Speed Deflagration with Compressibility Effects," with J.F. Clarke. *Dynamics of Shock Waves, Explosions, and Detonations, Prog. in Astronautics and Aeronautics*, eds. J.R. Bowen, N. Manson, A.K. Oppenheim and R.I. Soloukhin, 94:175-185, 1984.

"Mathematical Modelling for Planar, Steady, Subsonic Combustion Waves." *Annual Reviews of Fluid Mechanics*, 17:267-287, 1985.

"The Effects of Sidewall Heat Loss on Convection in a Saturated Porous Vertical Slab," with B. Cotte. *J. Fluid Mechanics*, 152:361-378, 1985.

"The Structure of a High Speed Deflagration with a Finite Origin," with J.F. Clarke. *J. Fluid Mechanics*, 150:253-280, 1985.

"The Unified Theory for Chain Branching Thermal Explosions with Dissociation-Recombination and Confinement Effects," with M.A. Birkan. *Combustion Science and Technology*, 44:223-256, 1986.

"The Influence of Side Wall Heat Loss on Convection in a Confined Saturated Porous Medium," with P.D. Weidman. *Physics of Fluids*, 29 (2):349-355, 1986.

"On the Direct Initiation of a Plane Detonation Wave," with J.F. Clarke and N. Riley. *Proc. Roy. Soc. London*, A408:129-148, 1986.

"Onset of Convection in a Vertical Slab of Saturated Porous Media Between Two Impermeable Conducting Blocks," with M. Wang and P.D. Weidman. *Int. J. Heat Mass Transfer*, 30:1331-1341, 1987.

"The Effect of Slab Width on the Stability of Natural Convection in Confined Saturated Porous Media," with D. Chelghoum and P.D. Weidman. *Physics of Fluids*, 30:1941-1947, 1987.

"Natural Convection and Thermomechanical Motion in Helium in Low-Gravity Environments," with Sutrisno (refereed). Proceedings of the First National Fluid Dynamics Congress, AIAA-88-3730-CP, 1988.

"Transient Decomposition - Recombination Dynamics of Dissociating and Ionizing Gases," with M. Birkan and C.K. Law. *Proc. Roy. Soc. London*, A418:331-343, 1988.

"A Unified Formulation for Diffusive and Nondiffusive Thermal Explosion Theory," with A.K. Kapila and D.S. Stewart. *Combust. Sci. and Technology*, 63:33-44, 1989.

"The Confined Nondiffusive Thermal Explosion with Spatially Homogeneous Pressure Variation," with N. Riley, J. Bebernes and A. Bressan. *Combust. Sci. and Technology*, 63:45-62, 1989.

"Induction Zone Structure of a High-Speed Deflagration with Variable Mole Chemistry," with K. Kirkkopru. *Physics of Fluids A*, 1 (5):874-880, 1989.

"Dynamic Compression and Weak Shock Formation in an Inert Gas due to Fast Piston Acceleration," with M. Wang. *J. Fluid Mechanics*, 220:267-292, 1990.

"Evolution of Weakly Nonlinear Waves in a Cylinder with a Movable Piston," with M. Wang. *J. Fluid Mechanics*, 221:23-52, 1990.

"On the Evolution of Plane Detonations," with J.F. Clarke, N.E. Meharzi, N. Riley and R. Vasantha. *Proc. Roy. Soc. London A*, 429:259-283, 1990.

"Dynamic Response of an Inert Gas to Slow Piston Acceleration," with M. Wang. *J. Acoustic Soc. of America*, 87 (4):1466-1472, 1990.

"Weak Shocks Initiated by Power Deposition on a Spherical Source Boundary," with Sutrisno. *SIAM J. Appl. Math*, 51:658-672, 1991.

"Response of a Confined Gas to Volumetric Heating in the Absence of Gravity: I - Slow Transients," with A. Herczynski. *Physics of Fluids A*, 3:566-577, 1991.

"High-Speed Reaction Zone Structure for Variable Mole Chemistry," with K. Kirkkopru. *SIAM J. Applied Math.*, 51:1090-1118, 1991.

"Thermally Initiated Detonation Through Deflagration to Detonation Transition," with A.A. Sileem and A.K. Hayashi. *Proc. Roy. Soc. London*, A435:459-482, 1991.

"Dissociation-Recombination Relaxation Behind a Normal Shock," with K. Kirkkopru. *The Physics of Fluids*. A3:2777-2785, 1991.

"Transient Acoustic Processes in a Low Mach Number Shear Flow," with M. Wang. *J. Fluid Mech*, 238:506-536, 1992.

"Standing Acoustic Waves in a Low Mach Number Shear Flow," with M. Wang. *AIAA J.*, 30:1708-1715, 1992.

"The Generation and Evolution of Unsteady Vorticity in a Model of a Solid Rocket Engine Chamber", with Q. Zhao, AIAA 94-0779, 32nd Aerospace Sciences Meeting, Reno, 1994

"Nonlinear Acoustic Oscillations in a Resonant Gas Column; An Initial - Boundary Value Study", with M. Wang, *SIAM J. Applied Math.*, 55:923-915, 1995

"Unsteady Vorticity Generation and Evolution in a Model of a Solid Rocket Motor: Sidewall Mass Addition Transients", with K. Kirkkopru and Q. Zhao, AIAA 95-0603, 33rd. Aerospace Science Meeting, Reno, 1995

"Unsteady Vorticity Generation and Evolution in a Model of a Solid Rocket Motor: Sidewall Mass Addition Transients", with K. Kirkkopru and Q. Zhao, *J. of Propulsion and Power*, 12, #4, 646-654, 1996

"Co-existing Acoustic-Rotational Disturbances in a Coldflow Model of a Solid Rocket Motor", with P.L. Staab and T.Y. Chang and A.M. Hegab, AIAA 97-0697, 35th Aerospace Science Meeting, Reno,NV. 1997

"Co-existing Acoustic-Rotational Disturbances in a Coldflow Model of a Solid Rocket Motor", with P. L. Staab, AIAA 97-2066, 28th AIAA Fluid Dynamics Conference, Snowmass, CO. 1997

"Three Dimensional, Unsteady, Acoustic-Shear Flow Dynamics in a Cylinder with Sidewall Mass Addition", with P.L Staab, *Physics of Fluids*, 9, #12, 3753-3763, 1997

“Numerical Investigation of Acoustic Fluid Dynamics Interaction in a Solid Rocket Motor Chamber-Nozzle Model”, with A.K. Hegab, AIAA 98-0724, 36th Aerospace Science Meeting, Reno, NV., 1998

“The Effect of Finite Rate Heat Release on the Solidification of an Undercooled Pure Liquid”, with J. Adam Norris, *Proc. of the Royal Society of London, Series A*, 454, #1977, 2347-2370, 1998

“Three Dimensional Acoustic-Rotational Disturbances in a Cylinder with Sidewall Mass Addition”, with P. L. Staab, AIAA 99-1015, 37th Aerospace Science Meeting, Reno, NV. 1999

“Co-Existing Acoustic-Rotational Flow in a Cylinder with Axisymmetric Sidewall Mass Addition”, with P. L. Staab, Q. Zhao, and K. Kirkkopru, *The Physics of Fluids*, 11, #10, 2935-2951, 1999

“Acoustically Generated Vorticity in an Internal Flow” with Q. Zhao, P. Staab and K. Kirkkopru *J. Fluid Mechanics*, 413, 247-285, 2000

“Thermal Response for an Internal Flow in a Cylinder with Time Dependent Sidewall Mass Addition”, with M. Rempe and P.L. Staab, AIAA 2000-0996, 38th Aerospace Science Meeting, Reno, NV. 2000

“The Thermal Response of an Internal Flow in an SRM Chamber Model”, with A. M. Hegab, AIAA 2001-0338, 39th Aerospace Sciences Meeting, Reno, NV. 2001

“Detonation Initiation and Evolution in a Model of a Pulsed Detonation Engine”, with S. Palaniswamy, AIAA 2002-0612, 40th Aerospace Sciences Meeting, Reno, NV 2002

“Acoustically Generated Unsteady Vorticity Field in a Long Narrow Cylinder with Sidewall Injection”, with K. Kirkkopru, Q. Zhao and P.L. Staab, *J. Eng. Math.*, 42, 65-90, 2002

“Three Dimensional Acoustic-Rotational Flows in a Cylinder with Sidewall Mass Addition”, with P.L. Staab, *Physics of Fluids*, 14, #9, 3141-3159, 2002

“Modeling Detonation Initiation and Evolution in a Pulse Detonation Engine”, with S. Palaniswamy, AIAA 2003-1172, 41st Aerospace Sciences Meeting, Reno, NV. 2003

“Acoustic-Rotational Internal Flow Caused by Transient Sidewall Mass Addition”, with M.J. Rempe and P. L. Staab, *SIAM J. Applied Math.* **65**, #2, 587-617, 2005

“Modeling Detonation Initiation on the Microsecond Time Scale”, with J.A. Kuehn, M.W. Naby and J.F. Clarke, AIAA 2005-1169, 43rd Aerospace Sciences Meeting, Reno NV. 2005

“Detonation Initiation on the Microsecond Time Scale: Comparative Modeling”, with J.A. Kuehn, M.W. Naby and J.F. Clarke, AIAA-2006-0956, 44th Aerospace Sciences Meeting, Reno, NV. 2006

“Internal Flow Temperature Dynamics in a Channel with Time-dependent Mass Injection”, with A.M. Hegab, *AIAA J.*, **44**, #4, 812-826, 2007.

Detonation Initiation on the Microsecond Time Scale: One and Two Dimensional Results Obtained from Adaptive Wavelet-Collocation Numerical Methods, with J. Regele and O.V. Vasilyev, AIAA 2006-0986, 45th Aerospace Sciences Meeting, Reno, NV 2007

Detonation Initiation on the Microsecond Time Scale: DDT's, with J.A. Kuehn, M.W. Naby and J.F. Clarke, to appear Combustion Theory and Modeling, 2008

Detonation Initiation Modeling using the Adaptive Wavelet-Collocation Method, with J. Regele and Oleg Vasilyev, AIAA-2008-1037, 46th Aerospace Sciences Meeting, Reno, NV 2008

Experimental Study of Oscillatory Motion of Particles and Bubbles with Application to Coriolis Meters, with J.A. Weinstein and M.J. Bell, submitted to Phys. Fluids, 2008

9. **PROCEEDINGS OF TECHNICAL MEETINGS**

Gasdynamic Aspects of Thermal Explosions," with J. Bebernes. Transactions of the 27th Conference of Army Mathematicians, ARO Report 82-1:687-706, 1982.

"Onset of Convection in a Porous Medium with Sidewall Heat Transfer." Symposium on Stability and Convection, HTD-54, Book #600324, ASME Winter Annual Meeting, November 17-22, 1985.

"Solution Profiles and Thermal Runaway," with J. Bebernes. Lectures in Applied Mathematics, Proc. of the AMS-SIAM Summer Seminar on Reacting Flows, July 1985, 24:217-228, 1986.

"High Speed Reaction Zone Structure for Variable Mole Chemistry," with K. Kirkkopru. Fall 1986 Technical Meeting at the Western States Section, Combustion Institute, October 1986.

"Detonation Wave Initiation by Rapid Energy Deposition at a Confining Boundary," with J.F. Clarke and N. Riley. Proc. of the 4th Army Conference on Applied Mathematics and Computing, U.S. Army Research Office, 1986.

"Modeling the Early Phases of Planer Detonation Wave Initiation," with J.F. Clarke and N. Riley. Proc. of the 2nd ASME-JSME Thermal Engineering Joint Conference, Book #I-02195 ASME, 321-330, 1987.

"Characterizing Self-Similar Blowup," Mathematical Modeling in Combustion and Related Topics, C.M. Brauner and C. Schmidt-Laine, eds. NATO ASI series, M. Nijhoff, Pub.:383-392, 1988.

"Reactive-Euler Induction Models," with J. Bebernes. Trans. of the 6th Army Conference on Applied Mathematics and Computing, ARO Rept. 89-1, 1989.

10. **UNIVERSITY COMMITTEE AND ADMINISTRATIVE ACTIVITY**

Council on Research and Creative Work - University of Colorado

Activity: Evaluation of proposals for research and creative work funded by internal University sources. 9/1/75 - 5/24/77

Search Committee - Vice Chancellor for Academic Affairs

Activity: Evaluation of candidates, interview activity. 12/1/76 - 4/24/77

Administrative Council - College of Engineering

Activity: Advisory activity for College administration. 9/76 - 5/77

Chairman, Education Policy and Planning Committee, College of Engineering

Activity: Organization and evaluation of graduate program. 9/76 - 5/77

Chairman, Fluid Mechanics Committee and Seminar Series, College of Engineering

Activity: Organization of college-wide fluid mechanics activities and seminar scheduling. 9/79 - 8/80

Chairman, Aerospace Engineering Sciences Chairman Search Committee, College of Engineering

Activity: Organization of search activities and recruitment. 1/80 - 5/80

Undergraduate Education and University Structure Committee

Activity: Consideration of undergraduate academic activities on University-wide interest. 9/79 - 12/80

Chairman, Internal Review Team for the Department of Mathematics, Program Review

Activity: Formal review of academic programs and faculty activities in Mathematics Department for the Program Review process. 5/80 - 5/81

Chairman, College of Engineering Dean Search Committee

Activity: Organization of search activities and recruitment. 9/80 - 6/81

Chairman, Mechanical Engineering Thermal Science Search Committee

Activity: Organization of search activities and recruitment. 8/80 - 6/81

Croft Fellowship Committee-College of Engineering

Activity: Evaluation of faculty candidates for college-funded fellowship. 9/79 - 8/80

Chairman, Mechanical Engineering Chairman Search Committee

Activity: Organization of search activity and recruitment. 11/83 - 12/84

Program Review Panel

Activity: Evaluation of University academic programs, research institutes and support services. 9/83 - 8/85

Chairman, Graduate Committee, Mechanical Engineering Department

Activity: Organization and evaluation of graduate program. 11/83 - 9/84

Executive Advisory Council on Research and Graduate Education

Activity: Policy setting, advisory opinions to Vice Chancellor, appeals by graduate students and fellowship evaluation. 9/85 - 8/88

Coordinating Committee for Institute of Applied Mathematics

Activity: Organize and plan for a focused research program in applied mathematics. 1986 - present

Search Committee - Associate Vice President for Research

Activity: Evaluation and interviewing of candidates, selection of finalists. 9/86 - 12/86

Boulder Faculty Assembly

Activity: Faculty governance. 1985-88, and 2002-present

Advisory Panel for the Vice Chancellor for Academic Affairs

Activity: Advisory group for policy and planning. 1986 - 1988

Co-Director, Center for Low-Gravity Fluid Mechanics and Transport Phenomena

Activity: Management of NASA-funded center-of-excellence research program.
9/86 - 12/88

Search Committee - Director of Program in Applied Mathematics

Activity: Evaluation and interviewing of candidates, selection of finalists. 9/87 - 6/88

Chairman, Mechanical Engineering Self-Study Committee for the PRP Report

Activity: Organization and development of the Self-Study Report. 10/87 - 3/88

Human Research Committee

Activity: Monitor compliance with federal regulations governing the use of human subjects in research as Graduate School representative. 7/88 - 7/91, 8/92-present

Animal Use/Care Committee

Activity: Monitor compliance with federal regulations governing the use of animals in research as Graduate School representative. 7/88 - 7/91, 8/92-present

Council on Research and Creative Work

Activity: Award research support to qualified applicants as Graduate School representative.
7/88-7/91, 8/92-present

Graduate Committee on Arts and Humanities

Activity: Award research support to qualified applicants for arts and humanities projects as Graduate School representative. 7/88-7/91, 8/92-8/93

Organizing Chairman, Standing Committee on Research Misconduct

Activity: Organize the campus committee responsible for dealing with research misconduct issues, including education, receipt of allegations, inquiries and investigations. 9/89-7/91; Graduate School representative 8/91-present

Vice Chancellor's Advisory Committee

Activity: Review college and school personnel actions, and make recommendations to Vice Chancellor on final action. 8/91-7/92, 7/93-5/95

Advisory Board of the Space Grant College

Activity: Review NASA-supported educational program focused on training in space science and technology. 8/91-present

Chair, Working Group on Technology

Activity: Develop policy recommendations for using technology in the CU System to enhance teaching, learning, research and administration. 7/97-8/00

Project Leaders Group, Administrative Streamlining Project

Activity: Academic representative to the board of directors of a \$35M effort to modernize financial and human resource information systems for the University of Colorado System, 8/96-8/00

Chair, Total Cost of Ownership Coordinating Team

Activity: Provide leadership for the University of Colorado systemwide Total Cost of Ownership initiative to improve the acquisition, deployment and management of technology. 4/98-8/00

Facilitator, Technology plan for the College of Engineering and Applied Sciences

Activity: Developed a proposal for creating a strategic plan to acquire, deploy and manage technology assets and services in the College. Presented to the Administrative Council, 9/00-2/01

Facilitator, Strategic Plan for the Mechanical Engineering Department

Activity: Develop a departmental strategic planning exercise (Fall 2000-Fall2002), including three departmental strategic planning retreats; author a complete strategic planning document in coordination with the Department's PRP Self-Study (Fall 2001-Fall 2002).

Member, Personnel Committee of the Mechanical Engineering Department

Activity: Evaluate faculty personnel annual performance for merit raises and recommendations for reappointments and advancement in academic rank, 2001-03, 2003-05, 2006-2008

Member, First Level Review Committee, College of Engineering and Applied Sciences

Activity: Evaluate Department recommendations for contract renewal, promotions in rank and tenure, 2002-2005

Chair, First Level Review Committee, College of Engineering and Applied Sciences

Activity: Administer evaluations of Department recommendations for contract renewal, promotions in rank and tenure, 2003-2005.

Member, Internal Review Team for the Program Review of Computer Science, 2005.

Secretary, Boulder Faculty Assembly, University of Colorado-Boulder, 2005-2006, 2007-2008

Vice Chair, Boulder Faculty Assembly, University of Colorado-Boulder, 2006-2007

Activity: Support the Chairs of the Boulder Faculty Assembly in engaging the faculty in significant issues affecting our students and ability to perform at a high level.

Member, Budget Committee of the 2030 Strategic Planning Exercise.

Activity: Advise on sustainable income streams for University operations and on an effective internal resource allocation model to promote academic innovation and evolution.

11. **RESEARCH GRANTS**

1. Mass Addition in Laminar and Turbulent Flow, NSF, 2/71-2/74, \$36,000
2. Transport of Mass and Energy in Porous Media Due to Natural Convection: The Geothermal Basin Problem, NSF and ERDA, 6/74-5/77, \$355,000.
3. Unsteady Fuel Droplet Combustion Phenomena, NATO Research Grant, 11/74-11/76, \$10,000.
4. Rapid Transient Combustion-Thermal Explosions and Liquid Droplet Ignition, NSF, 10/76-9/79, \$74,200.
5. Heat and Mass Transfer at High Rayleigh Numbers in a Water Saturated Porous Medium, NSF, 6/78-5/80, \$75,000.
6. Modelling Heat and Mass Transfer at the Mesa Geothermal Anomaly, Imperial Valley, California, Department of Energy, 4/78-9/78, \$24,000.
7. A Fundamental Mathematical Theory for Thermal Explosions in Rigid Solids and Gases, ARO, Math. Division, 5/79-5/82, \$105,000.
8. Heat and Mass Transfer in Fault Zone Controlled Liquid Dominated Geothermal Systems, USGS, 9/79-6/81, \$52,575.
9. Heat and Mass Transfer at High Rayleigh Numbers in Water Saturated Porous Media, NSF, 5/1/81-4/30/84, \$148,645.
10. A Mathematical Theory for Thermal Explosions in Rigid Solids and in Gases, ARO Math. Division, 3/82-2/85, \$250,000.
11. Thermal Explosions in a Confined Reactive Gas Mixture: Initiation and Evaluation of Gasdynamics, International Division (U.S.-U.K. Cooperative Research Program), NSF, 9/1/83-2/28/87, \$8,000.
12. Scientific Computing Research Equipment (VAX 11/750 and peripherals), DOD, 1985-1986, \$155,000.
13. Physical Sources of Oscillatory Convection: 10 hours CRAY time, NCAR 1985-1986.
14. Observation of Convection Patterns in Porous Media, Council on Research and Creative Work, University of Colorado, 1985, \$3,980.
15. A Fundamental Mathematical Theory for the Dynamics of Combustion Processes, ARO Mathematics Division, 8/85-5/88, \$240,000.
16. Center for Low-Gravity Fluid Mechanics and Transport Phenomena, Office of Space Science and Application, NASA, 8/1/86-5/31/90, \$1,300,000 (also \$385,000 matching funds, University of Colorado).
17. Mathematical Analysis of Transient Reactive Gas-dynamic Phenomena, ARO Mathematical Sciences Division, 6/88-5/91, \$210,000.
18. Solid Rocket Combustion Phenomena, AFOSR, 10/88-9/91, \$352,000.

19. Direct Initiation of Detonation Waves, NATO International Cooperative Research Grant, 8/88-7/90, \$6,000; 6/91-5/93, \$6,700.
 20. Mathematical Analysis of Wave Initiation, ARO Mathematical Sciences Division, 6/1/91-5/31/92, \$40,000.
 21. Nonlinear Acoustic Processes in Solid Rocket Engines, AFOSR, 10/1/91-12/31/93, \$250,000.
 22. Hydrology and Water Resources Research, USGS, 1/1/91-12/31/95, \$1.77M. (Administrative Principal Investigator)
 23. Nonlinear Rotational Acoustic Processes in Solid Rocket Engines, AFOSR 1/1/94-03/31/97, \$309,000
 24. Nonlinear Co-Existing Rotational Acoustic Processes in Solid Rocket Engines, AFOSR 4/1/97- 3/31/98, \$187,000
 25. Nonlinear Co-Existing Rotational Acoustic Processes in Solid Rocket Engines, AFOSR4/1/98-9/30/99, \$212,000
 26. Analysis of Unsteady Flow in a Solid Rocket Motor, NATO Cooperative Research Grant, 6/1/98-5/31/00, \$5,600
 27. Nonlinear Co-Existing Rotational Acoustic Processes in Solid Rocket Engines, AFOSR1/1/2000-9/30/2000, \$50,284
 28. Pulsed Detonation Propulsion Alternative for Space-Phase I, Metacomp Technologies Inc. (AFOSR), 10/23/00-10/22/01, \$49,000
 29. Detonation Initiation and Evolution in Spray-Fueled Pulsed Detonation Engine, AFOSR3/1/02-2/28/05, \$234,000
 30. Pulsed Detonation Propulsion Alternative for Space-Phase II, Metacomp Technologies Inc. (AFOSR), 7/01/02-6/30/04, \$169, 987
12. **SEMINARS AND LECTURES - 1985 - 2005**
1. "The Structure of the Thermal Explosion Singularity."
University of East Anglia, Norwich, England 1/7/85
and
Cranfield Institute of Technology, Cranfield, England. 1/15/85
 2. "A Mathematical Methods for Combustion Modeling."
A series of 12 lectures. Department of Aeronautical
Engineering, University of Nagoya, Nagoya, Japan. 6/10/85 -
6/20/85
 3. "Unified Theory of Low and High Speed Flames."
University of Tokyo, Dept. of Reaction Chemistry 6/24/85
and
Saitama University, Mechanical Engineering
Dept., Tokyo, Japan. 6/25/85
 4. "Unified Theory of Low and High Speed Flames," and
"Unified Chain-Branching and Thermal Explosion
Theory." Tsukuba University, Engineering Mechanics

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| | Institute, Japan. | 6/26/85 |
| 5. | "Modeling Heat and Mass Transport in Geothermal Systems." Industrial Research Institute Tohoku, Sendai, Japan. | 6/28/85 |
| 6. | "Detonation Wave Initiation by Rapid Energy Deposition at a Confining Boundary." 10th International Colloquium on Dynamics of Explosions and Reactive Systems, Berkeley, California. | 8/8/85 |
| 7. | "The Status of Thermal Explosion Singularity Modeling." International Workshop on Mathematics in Combustion, Berkeley, California. | 8/12/85 |
| 8. | "Onset of Convection in a Porous Medium with Sidewall Heat Transfer." Symposium on Stability and Convection, ASME Winter Annual Meeting, Miami Beach, Florida. | 11/18/85 |
| 9. | "Compression of a Confined Inert Gas by a Piston." American Physical Society, Fluid Dynamics Division, Tucson, Arizona. | 11/24/85 |
| 10. | "Compression of an Inert Gas in a Cylinder by a Piston." University of East Anglia, Norwich, England
and
Cranfield Institute of Technology, Cranfield, England. | 11/29/85

12/4/85 |
| 11. | "Onset of Convection in a Confined Porous Medium with Sidewall Heat Loss." Mechanical Engineering Dept., University of Houston, Texas. | 12/19/85 |
| 12. | "The Influence of Sidewall Heat Transfer on Convection in a Confined Saturated Porous Medium." 62nd Annual Meeting of the Rocky Mountain Division on the AAAS, Boulder, Colorado. | 4/1/86 -
4/5/86 |
| 13. | "Onset of Convection in a Porous Medium Embedded Between Conducting Blocks." 62nd Annual Meeting of the Rocky Mountain Division on the AAAS, Boulder, Colorado. | 4/1/86 -
4/5/86 |
| 14. | "Detonation Wave Initiation by Rapid Energy Deposition at a Confining Boundary." 4th Army Conference on Applied Mathematics and Computing, Ithaca, New York. | 5/28/86 -
5/30/86 |
| 15. | "Detonation Wave Initiation." International Workshop on Mathematics in Combustion, Garmisch-Partenkirchen, West Germany. | 8/9/86 -
8/11/86 |
| 16. | "Natural Convection in an Unstably Heated Porous Slab." SERI, Golden, Colorado. | 10/2/86 |
| 17. | "Subsonic High Speed Reaction Zone Structure for Variable Mole Chemistry." Western States Combustion Institute Meeting, Tucson, Arizona. | 10/27/86 -
10/29/86 |

18. "Compression of a Confined Inert Gas by a Piston." Dynamics Division of the American Physical Society. 11/23/86 - 11/25/86
19. "Structure of a Planar High Speed Reaction Zone." Fluid Dynamics Division of the American Physical Society. 11/23/86 - 11/25/86
20. "Center for Low-Gravity Fluid Mechanics and Transport Phenomena." Space Advisory Board of the University of Colorado, Boulder, Colorado. 3/3/86
21. "Low-Gravity Fluid Mechanics and Transport." Golden Gate Materials Conference, San Francisco, California. 2/3/87 - 2/5/87
22. "Initiation of Gasdynamics by Intense Power Deposition." Computational Mathematics Group, C.U.-Denver, Colorado. 2/17/87
23. "Detonation Wave Initiation by Energy Deposition at a Boundary." Invited presentation. Minisymposium I, SIAM Conference on Numerical Combustion, San Francisco, California. 3/10/87
24. "Modeling the Early Phases of Planar Detonation Wave Initiation." 2nd ASME-JSME Thermal Engineering Joint Conference, Honolulu, Hawaii. 3/24/87
25. "High Speed Reaction Zone Structure for Variable Mole Chemistry." Mathematical Sciences Institute, Cornell University, Ithaca, New York 5/4/87
26. "High Speed Reaction Zone Structure for Variable Mole Chemistry." 11th International Colloquium on Dynamics of Explosions and Re-active Systems, Warsaw, Poland. 8/5/87
27. "Detonation Wave Initiation and Related Ignition Phenomena." 8th International Workshop on Mathematics in Combustion, Warsaw, Poland. 8/4/87
28. "Studies Related to Planar Detonation Initiation and Structure" and "Formulation of Diffusive and Nondiffusive Thermal Explosion Theory." Joint USA/Japan Seminar on Mathematical Modeling in Combustion Science, Juneau, Alaska. 8/18/87 - 8/19/87
29. "Diffusive and Nondiffusive Thermal Explosion." Mathematics Department, University of Colorado, Boulder, Colorado. 9/3/87
30. "The Center for Low-Gravity Fluid Mechanics and Transport Phenomena." Microgravity Science and Applications Office, NASA, Washington, D.C. 10/8/87
31. "Detonation Wave Initiation by Power Deposition: Numerics and Asymptotics." SIAM 35th Anniversary Meeting, Denver, Colorado. 10/13/87
32. "Low-Gravity Natural Convection in Rapidly Heated Gaseous Helium" and "Planar Detonation Wave Initiation by Thermal Power Deposition." 40th Annual Meeting of

- the Division of Fluid Dynamics, American Physical Society, Eugene, Oregon. 11/23/87 - 11/24/87
33. "The Center for Low-Gravity Fluid Mechanics and Transport Phenomena." J.P.L., Pasadena, California. 11/20/87
34. "Unified Theory for Diffusive and Nondiffusive Thermal Explosions." (See also 35-38 below.) U.C. San Diego, La Jolla, California. 4/20/88
35. University of Southern California 4/22/88
36. U.S. Army Mathematicians Meeting, Boulder, Colorado. 6/1/88
37. Gordon Conference on Condensed Explosives, New Hampton, Virginia.
38. Mechanical Engineering Department, University of Colorado, Boulder, Colorado 6/29/88 10/24/88
39. Natural Convection and Thermomechanical Motion in Helium in Low-Gravity Environments." (See 40 below.) 1st National Congress on Fluid Dynamics, Cincinnati 7/26/88
40. Mechanical Engineering Department, Stanford University, Stanford, California. 10/21/88
41. "Dynamic Compression of a Gas in a Cylinder." American Physical Society Fluid Dynamics Meeting, SUNY at Buffalo, New York. 11/20/88
42. "Thermally Initiated Detonation Wave Initiation." American Physical Society Fluid Dynamics Meeting, SUNY at Buffalo, New York. 11/22/88
43. "Evolution of Nondiffusive Thermal Explosions." Mechanical and Aerospace Engineering, University of Arizona, Tucson, Arizona. 4/8/89
44. "Acoustic Phenomena in Solid Rocket Engines." AFOSR Contractors Meeting, University of Michigan, Ann Arbor, Michigan. 6/21/89 - 6/23/89
45. "Computational Results for Detonation Initiation." International Coll. on Detonations, Explosions and Reacting Systems. University of Michigan, Ann Arbor, Michigan. 7/22/89-7/28/89
46. "Detonation Initiation." IMA Workshop on Combustion Mathematics, University of Minnesota, Minneapolis, Minnesota. 11/14/89 - 11/17/89
47. Initiation of Acoustic Waves in Solid Rocket Engines." (See 48 below.) Mechanical Engineering Department, University of Colorado, Boulder, Colorado. 11/14/89
48. American Physical Society Fluid Dynamics Meeting,

- Palo Alto, California. 11/21/89
49. "Low-Gravity Thermoconvection." Mechanical and Aerospace Engineering, University of Arizona, Tucson, Arizona. 3/16/90
50. "Acoustic Waves in Reactive Cases." Mechanical Engineering and Applied Math Program, University of Colorado, Boulder, Colorado. 4/17/90 - 4/19/90
51. "Travelling Wave Generation in Models of Solid Rocket - Engines." AFOSR Contractors Meeting, Atlanta, Georgia. 6/11/90
6/13/90
52. "Detonation Wave Initiation and Evolution." Cranfield Institute of Technology, Cranfield, U.K. 7/20/90 - 8/4/90
53. "Standing and Acoustic Waves in a Low Mach Number Shear Flow." American Physical Society Fluid Dynamics Division Meeting, Cornell University, Ithaca, New York. 11/18/90 - 11/20/90
54. "Acoustic Wave Evolution in a Reactive Gas System." Mechanical Engineering Department, University of Colorado, Boulder, Colorado. 3/15/91
55. "Research Misconduct Administrative Procedures at the University of Colorado." NIH Workshop on Research Misconduct, Seattle, Washington. 3/25-26/91
56. "Modeling of Acoustic Phenomena in Solid Rocket Engines." AFOSR Contractor's Meeting in Propulsion. University of Colorado, Boulder. 6/10-14/91
57. "Transient Acoustic Processes in a Low Mach Number Shear Flow." ICIAM, Washington, DC. 7/8-12/91
58. "Acoustic Wave Propagation in an Exploding Reactive Gas." 45th Meeting of the Division of Fluid Dynamics, American Physical Society, Scottsdale, Arizona. 11/24-26/91
59. "Resonant Acoustic Oscillations in Shear Flows." 45th Meeting of the Division of Fluid Dynamics, American Physical Society, Scottsdale, Arizona. 11/24-26/91
60. "Vorticity Generation in Solid Rocket Engines", AMES, University of California at San Diego, California. 6/10/92
61. "Nonlinear Acoustic Processes in Solid Rocket Engines", AFOSR Contractors Meeting, San Diego, California. 6/15/92
62. "Detonations and Explosions", Aerospace Engineering Dept., University of Michigan. 10/23/92
63. "Nonlinear Evolution of Acoustic Resonance in Open and Closed Tubes", Division of Fluid Dynamics Meeting, American Physical Society. 11/22/92

Society , Tallahassee, Florida.

64. "Thermal Initiation of a Deflagration Wave and Evolution to Detonation", Division of Fluid Dynamics Meeting, American Physical Society, Tallahassee, Florida 11/23/92
65. "Fostering Inquiry in a Research University: Integrating Teaching and Research", Graduate Teachers Program Winter Intensive, University of Colorado, Boulder, Colorado. 1/11/93
66. "Federal Compliance Issues of the University of Colorado. Research Misconduct, NCURA Regional Conference, Denver, Colorado. 4/26/93
67. "Research and Technology Transfer", Kiwanis Club of Boulder, Boulder, Colorado 5/10/93
68. "Nonlinear Acoustics in Solid Rocket Motors", Program in Mathematics, University of Colorado, Boulder, Colorado 8/17/93 Applied
69. "Detonation Initiation and Evolution", School of Mathematics, University of East Anglia, United Kingdom. 9/5/93
70. (a) "Nonlinear Vorticity Generation by Acoustic Wave Interaction with an Injected Gas in a Tube", (b) "Effects of Finite Rate Phase Transformation Kinetics on the Steady-State Solidification Front Propagation Speed in Undercooled Pure Liquids", Division of Fluid Dynamics (American Physical Society) Albuquerque, New Mexico. 11/20-23/93
71. "The Generation and Evolution of Unsteady Vorticity in a Model of a Solid Rocket Motor", AIAA Aerospace Sciences Meeting, Reno, Nevada. 1/10/94
72. "Nonlinear Vorticity Generation in a Solid Rocket Motor", AFOSR Contractors Meeting, Lake Tahoe, Nevada. 6/8/94
73. "Nonlinear Vorticity Generation in a Solid Rocket Motor", Wright Laboratory/AFOSR Workshop on Integrated Theory and Numerics for Design Application, Eglin AFB, Fort Walton Beach, Florida. 6/15-17/94
74. "Asymptotics, Acoustics, Vorticity: Elements Turbulence", Rocky Mountain Experience IV, Program in Applied Mathematics, University of Colorado, Boulder, Colorado. 8/3/94
75. (a) "Nonlinear Vorticity Generation by Acoustic Wave Interaction with an Injected Gas in a Tube: Transient Sidewall Mass Addition", (b) "Nonlinear Vorticity Generation by Acoustic Wave Interaction with an Injected Gas in a Tube: Computational Results", Division of Fluid Dynamics-American Physical Society, Atlanta, Georgia. 11/20-22/94
76. "Unsteady Vorticity Generation and Evolution in a Model of a Solid Rocket Motor: Sidewall Mass Addition Transients", AIAA Aerospace Sciences Meeting, Reno, Nevada. 1/10-12/95
77. "Vorticity Generation by Acoustic Disturbances in a Finite Cylinder with Sidewall Mass Injection", Special Fluid Dynamics Seminar, Department of Aeronautics and Astronautics , Stanford University, Stanford, California. 2/10/95

78. "Nonlinear Vorticity Generation by Acoustic Wave Interaction with an Injected Gas in a Tube: Transient Sidewall Mass Addition", Center for Combustion Science, Mechanical Engineering Department, University of Colorado, Boulder, Colorado. 5/1/95
79. "Nonlinear Acoustic Processes in Solid Rocket Motors", AFOSR Contractors Meeting, Chicago, Illinois. 5/16-18/95
80. "The Origin and Evolution of a Planar Detonation Following Thermal Power Deposition in a Reactive Gas", 15th International Colloquium on Detonations, the Dynamics of Explosions and Reactive Systems, Boulder, Colorado. 7-31 to 8-4/95
81. "Acoustically Generated Transient Vorticity in a Weakly Viscous Internal Flow", Division of Fluid Dynamics-American Physical Society, Irvine, California. 11/21/95
82. "Acoustically Generated Transient Vorticity in a Weakly Viscous Internal Flow", Seminar in the Department of Aerospace Engineering, University of Illinois. 4/22/96
83. "Acoustically Generated Transient Vorticity in a Weakly Viscous Internal Flow", Seminar in the Department of Aerospace and Mechanical Engineering, University of Notre Dame, Notre Dame IN. 4/23/96
84. "Nonlinear Acoustic-Rotational Processes in Solid Rocket Motors: Quasi-turbulence, Numerical Viscosity and Three-dimensional Flow Dynamics, AFOSR Contractors Meeting, Virginia Beach, Virginia. 6/3-5/96
85. "Three Dimensional Unsteady Acoustic-Shear Flow Dynamics in a Wall-Injected Internal Flow, Division of Fluid Dynamics-American Physical Society, Syracuse, N.Y. 11/23/96
86. "Three-Dimensional Flow in a Cylinder with Unsteady Sidewall Mass Addition", AIAA 97-2066, 28th Fluid Dynamics Conference, Snowmass, CO., 7/97
87. "Three Dimensional Unsteady, Acoustic-Shear Flow Dynamics in a Cylinder with Sidewall Mass Addition", AFOSR Contractors Meeting, San Diego CA., 7/97,
88. "Three-Dimensional, Unsteady, Acoustic Shear Flow Dynamics in a Cylinder with Sidewall Mass Addition", Meeting of the Division of Fluid Dynamics of the American Physical Society, San Francisco, CA., 11/ 97
89. "Numerical Investigation of Acoustic-Fluid Dynamic Interactions in an SRM Chamber/Nozzle Model", AIAA 98-0712, 36th Aerospace Sciences Meeting, Reno, NV 1/98
90. "The Effect of Non-Axisymmetric Unsteady Injection on Transient Flow Processes in a Cylinder", Meeting of the Division of Fluid Dynamics of the American Physical Society, Philadelphia, PA. 11/98
91. "Three-Dimensional Acoustic-Rotational Disturbances in a Cylinder with Sidewall Mass Addition", AIAA 99-1015, 37th Aerospace Sciences Meeting, Reno, NV. 1/99

92. "So, Distance Education is on Your Agenda", SHEEO Meeting, Breckenridge, CO.
8/99
93. "A Unified Theory for Combustion-Driven Flow Dynamics in a Model of a Solid Rocket Motor Chamber", Low Speed Combustion Workshop, IMA, University of Minnesota, Minneapolis, MN.
9/99
94. "Adopting Total Cost of Ownership Strategies in A Four Campus System", Western Cooperative for Educational Telecommunications Annual Meeting, Portland, OR.
11/99
95. "Thermal Response of an Internal Flow in a Cylinder to Transient Sidewall Mass Addition", Meeting of the Division of Fluid Dynamics of the American Physical Society, New Orleans, LA.
11/99
96. "A Unified Theory for Combustion-Driven Flow Dynamics in a Model of a Solid Rocket Motor Chamber", Center for the Study of Advance Rockets, University of Illinois, Champaign IL.
12/99
97. "Thermal Response for an Internal Flow in a Cylinder with Time Dependent Sidewall Mass Addition", 38th Aerospace Sciences Meeting, Reno NV,
1/00
98. A Unified Theory for Combustion-driven Flow Dynamics in a Model of a Solid Rocket Motor Chamber", Mechanical Engineering Department, University of Colorado, Boulder, CO,
3/1/00
99. "A Unified Theory for Combustion-driven Flow Dynamics in a Model of a Solid Rocket Motor Chamber", Istanbul Technical University, Turkey,
5/15/00
100. "Thermal Properties of a Transient Flow in a Model of a Solid Rocket Motor Chamber, Mechanical Engineering Department, University of Colorado
10/00
101. "Acoustically Generated Heat Transfer in a Cylinder or a Channel with Transient Sidewall Mass Addition", Division of Fluid Dynamics of the American Physical Society, Washington D.C.
11/00
102. "The Thermal Response of an Internal Flow in a Solid Rocket Motor Chamber/Nozzle Model", 39th AIAA Aerospace Sciences Meeting, Reno NV.
1/01
103. "Heat Transfer and Vorticity in a Model of a Solid Rocket Motor Chamber", Mechanical Engineering Department Graduate Seminar, UCB
2/01
104. "Fireballs; The Making of a High Pressure and Temperature Spot in a Reactive Gas", London Mathematical Society Conference on Combustion Theory, University of Durham, Durham, U.K.,
7/01
105. "Fireballs; Initiation and Evolution of High Temperature and Pressure Spots in a Reactive Gas", Division of Fluid Dynamics of the American Physical Society, San Diego, CA.
11/01
106. "Detonation Initiation and Evolution in a Model of a Pulsed Detonation Engine", 40th AIAA Aerospace Sciences Meeting, Reno NV
1/02
107. Fireballs; Initiation and Evolution of High Temperature and Pressure Spots in a Reactive Gas", Applied Mathematics Department Colloquium, UCB
2/02

- 108 "Fireballs; The Making of a High Pressure and Temperature Spot in a Reactive Gas", Western States Section, The Combustion Institute, La Jolla, CA. 3/02
- 109 "Fireballs: Mathematical Modeling of High Temperature and Pressure Spots in a Reactive Gas", DAMTP, University of Cambridge, Cambridge UK, 5/22
- 110 "Detonation Initiation Processes Affecting the Operation of a Pulsed Detonation Engine", AFOSR Space Propulsion and Power Program Contractors Meeting, Colorado Springs, CO. 8/02
- 111 "Pulsed Detonation Engines: An Advanced Propulsion Concept", Mechanical Engineering Department Graduate Seminar, UCB 9/02
- 112 "Detonation Initiation in a Pulsed Detonation Engine", Institute of Mechanics, Chinese Academy of Sciences, Beijing, China 10/02
- 113 "Detonation Initiation in a Pulsed Detonation Engine", Northwestern Polytechnical University, Xian, China 10/02
- 114 "Fireballs: Rapid Initiation of Reactive Gasdynamics by Source Heated Spots", 55th Meeting of the Division of Fluid Dynamics of the American Physical Society, Dallas, TX, 11/02
- 115 "Fireballs: Very Rapid Detonation Initiation by Transient, Spatially Resolved Thermal Power Deposition", 19th International Colloquium on the Dynamics of Explosions and Reactive Systems, Hakone, Japan, 7/03
- 116 "Evaporation of LOX Droplets in a Cryogenic Hydrogen Environment with Application to Pulsed Detonation Engines", Mechanical Engineering Department Graduate Student Seminar, 10/03
- 117 "Fireballs: Detonation Initiation on the Microsecond Time Scale", Mechanical and Aerospace Engineering Department, Rutgers University, New Brunswick, N.J., 11/03
- 118 "Fireballs: Detonation Initiation on the Microsecond Time Scale", 56th Annual Meeting of the Division of Fluid Dynamics of the American Physical Society, The Meadowlands, N.J., 11/03
- 119 "Acoustic-Rotational Internal Flow Caused by Transient Sidewall Mass Addition", CNES, Toulouse, France 9/04
- 120 "Detonation Initiation by Thermal Power Deposition", 57th Meeting of the Division of Fluid Dynamics of the American Physical Society, Seattle WA. 11/04
- 121 "Modeling Detonation Initiation on the Microsecond Time Scale", 43rd Aerospace Sciences and Display, Reno, NV. 1/05
- 122 plus 23 additional presentations at technical meetings and to universities in the period 2005-2008

13. **BOOK REVIEWS**

Transfer Processes: An Introduction to Diffusion, Convection, and Radiation, by D.K. Edwards, V.E. Denny and A.F. Mills. Second Edition, Hemisphere, 1979. *Journal Fluid Mechanics*, 103:507, 1981.

Studies in Heat Transfer, A Festschrift for E.R.G. Eckert. Eds. J.P. Hartnett and T.F. Irvine, E. Pfender and E.M. Sparrow. Hemisphere, 1979. *Journal Fluid Mechanics*, 103:508, 1981.

Introduction to Perturbation Techniques. A.H. Nayfeh. Wiley-Interscience, 1981. *American Scientist* 70:435, July-August 1982.

Lectures on Mathematical Combustion by J.D. Buckmaster and G.S.S. Ludford. SIAM, Philadelphia, 1983. *Combustion and Flame*, 64:247, 1986.

Asymptotic Treatment of Chemically Reacting Systems, by A.K. Kapila. Pitman, Boston, 1983. *Combustion and Flame*, 64:249, 1986.

14. GRADUATE STUDENT DEGREES

1. Abdelfatah Amr PhD 1973
2. Abdelfatah Zebib PhD 1975
3. Justin Poland PhD 1978
4. Keshav Goyal PhD 1980
5. Randy Pratt, MS 1982
6. Ismail Hindash, MS 1982
7. Juan Troncos, MS 1983
8. Mitat Birkan, PhD 1984
9. Abdulhaiy Radhwan PhD 1984
10. B. Cotte, MS 1984
11. Kadir Kirkkopru, PhD 1988
12. Nidan Meharzi, MS 1988
13. M Wang, PhD 1989
14. Ahmed Sileem, PhD 1989
15. Sutrisno, PhD 1989
16. Adam Norris, PhD 1993
17. QingZhao, PhD 1994
18. Peter Staab, PhD 1998
19. Abdelkarim Hegab, PhD 1999
20. Keith Wojciechowski, PhD (incomplete)
21. Seth Friedly, MS 2004
22. Matthew Nabity, PhD- (incomplete)
23. Heather Chluda, MS-2006
24. Joel Weinstein-PhD in progress 2007
25. Behzad Elizeh-Gorbhani- in progress 2007