

## CURRICULUM VITAE

DEREK DUNN-RANKIN

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## EDUCATION

University of California, Berkeley Doctor of Philosophy in Mechanical Engineering Major: Thermal Science (Combustion) Minors: Fluid Mechanics and Math Analysis	May 1985
University of California, Berkeley Master of Science in Mechanical Engineering	June 1984
University of California, Santa Barbara Bachelor of Science in Mechanical Engineering with high honors	June 1980

## CURRENT RESEARCH INTERESTS

In-situ optical particle sizing and counting; transport and deposition of combustion generated particulate; droplet combustion; laser spectroscopy in particle laden flows; control of combustion and I.C. engines; indoor air flows; electric field & flame interactions; spray systems; small scale power generation.

## RESEARCH AND PROFESSIONAL EXPERIENCE

–Professor, University of California, Irvine, Mechanical and Aerospace Engineering Department; July 1998–  
–Department Chair, University of California, Irvine, Mechanical and Aerospace Engineering Department; July 2009–July 2014; July 2017– present  
–co-Director – UC Systemwide Louis Stokes Alliance for Minority Participation; July 2007–May 2018  
–Director – NSF Bridge to the Doctorate Program, UCI; Cohort II July 2004–2006; Cohort XII July 2015–2017  
–Joint Appointment – Professor in the Division of Occupational and Environmental Medicine, School of Medicine, Aerosol generation and transport; (formerly the Department of Community and Environmental Medicine) July 2001–  
–Joint Appointment – Professor in the Department of Civil and Environmental Engineering, Henry Samueli School of Engineering, Air quality; July 2010–  
–Faculty Director – California Alliance for Minority Participation (CAMP), University of California, Irvine, campus program for increasing success of underrepresented groups in the sciences and engineering; July 1999–

Associate Professor, University of California, Irvine, Mechanical and Aerospace Engineering Department. Combustion; laser diagnostics; health-related aerosol formation and transport; I.C. engines; July 1992–July 1998.

Assistant Professor, University of California, Irvine, Mechanical Engineering Department. Laser diagnostics for particle laden flows; particle transport and combustion; July 1987–June, 1992.

Post-Doctoral Researcher, Sandia National Laboratories, Combustion Research Division. *In situ* optical particle counting and sizing; fundamental processes of pulverized coal and coal/water slurry combustion; November 1985–July 1987.

Post-Doctoral Researcher, Lawrence Berkeley Laboratory, Applied Science Division. Ignition of premixed gases using excimer laser radiation; thermophoretic transport in a heated turbulent boundary layer; June 1985–November 1985.

## AWARDS

Mechanical and Aerospace Engineering Professor of the Year, Henry Samueli School of Engineering Student Council, 2015-2016; Oppenheim Prize, Institute for the Dynamics of Explosions and Reactive Systems, 2013; Senior Member, Optical Society of America, 2011; Mechanical and Aerospace Engineering Professor of the Year, Henry Samueli School of Engineering Student Council, 2008-2009; Japan Society for the Promotion of Science (JSPS) Fellow, November/December, 2008; Mechanical Engineering Professor of the Year, Henry Samueli School of Engineering Student Council, 2006-2007; California Alliance for Minority Participation (CAMP) Faculty Achievement Award – CAMP Statewide, 2006; HSSoE Team Award for Teaching Excellence – MAE 188 – Engineering Design in Industry (with F. Jabbari, K. Mease, J. Bobrow, J. McCarthy), 2005; Society of Automotive Engineers Faculty Advisor Award, 2004; Pi Tau Sigma Honorary Professor Award, UCI Alpha Beta Chapter, 2004; Chancellor's Award for Excellence in Undergraduate Research, UCI; 1999; Excellence in Undergraduate Teaching, UCI; 1998; Fulbright Research Scholar at Imperial College, London; 1996/1997; UCI SURF Program Mentor of the Year; 1994; UCI School of Engineering Outstanding Assistant Professor; 1990/91; Society of Automotive Engineers Ralph R. Teeter Educational Award; 1991; UCI School of Engineering Instructor of the Year; 1990/91; National Science Foundation Presidential Young Investigator; 1989; AFOSR Summer Faculty Research Fellow; 1988.

## VISITING SCIENTIST

Aoyama Gakuin University, Tokyo, Japan; Combustion and Engineering Education; November 2010; Imperial College of Science Technology and Medicine, London, England; Optical Properties of Small Flames; Fast Deflagrations in Tubes; July 1996–August 1997; Wright Patterson Air Force Base; Coherent Anti-Stokes Raman Scattering in Droplet Laden Combusting Flows; June 1988–September 1988; Sandia National Laboratories, Livermore, CA; Coherent Anti-Stokes Raman Scattering in Internal Combustion Engines; November 1987–January 1988

## CONSULTANT ACTIVITIES

ClearSign Combustion; electrical aspects of combustion, 2012–; FlexEnergy; thermal oxidation processes, 2009–; Knobbe Martens; engines and combustion patents, 2009–; California State University Los Angeles; NASA and CREST Research and Education Centers, 2008–2012; EERGC; miniature film combustor rocket motor design, 2009/2010; Fossil Energy Research Corporation; formation of ammonium bisulfate, 2006–2007; Biolase Technology Inc.; dental surgery using lasers, 2005–2009; Optoknowledge Systems Inc.; coherent anti-Stokes Raman spectroscopy SBIR I and II, 2005–2010; California Environmental Protection Agency, Air Resources Board, Sacramento, CA; clean air technology review, 1999–2003; Micromotors, Inc., Santa Ana, CA; ozone applications in dentistry, 1999/2000; Ormco, Sybron Dental Specialties, Glendora, CA; fluid flows in dental equipment, 1999/2000; Eaton Corporation, Milwaukee, WI; light scattering from particles in fluids, 1999/2000; Lumenyte Corporation, Irvine, CA; light scattering in fiber optics, 1997; ATL Products, Irvine, CA; optical design, 1997; Unit Instruments, Yorba Linda, CA; spectroscopy and fluid mechanics, 1996; Innovative Sensors Incorporated, Santa Ana, CA; fluid mechanics, 1995; Wyvern Technologies, Santa Ana, CA; heat transfer analysis, 1994; Energy and Environmental Research, Irvine, CA; laser spectroscopy research, 1989; Sandia National Laboratories, Livermore, CA; coal combustion research, 1988; Insitec, San Ramon, CA; optical particle sizing research, 1987.

## PROFESSIONAL ACTIVITIES

**Editorial Activities**—*Progress in Energy and Combustion Science* (Editorial Board, 2002–present); *Atomization and Sprays* (Editorial Board, 2004–present); *Journal of Aeronautics, Astronautics, and Aviation (JAAA)* (Editorial Board, 2006–2012); *International Journal of Spray and Combustion Dynamics* (Editorial Board, 2008–present); Academic Press Combustion Treatise Series, co-Editor with J.H. Whitelaw, Imperial College (1997-2002), co-Editor with G. Continillo (2003-2009); Momentum Press Sustainable Energy Series, Editor (2009–2013); Combustion Science and Technology, Associate Editor (2010–present); *International Journal of Aeronautical and Space Sciences*, Associate Editor (2011-present); Associate Editor for Technologies for Sustainable Life (TSL) Concise Monographs Series, to be published by ASME Press (2013-present); Momentum Press Thermal Science Collection, Editor (2013-present); Cambridge University Press – Book Manuscript Reviewer *Statistical Thermodynamics* (2016)

**Combustion Institute** – International Executive Board Member (2006-present); Secretary (2006-2010); Treasurer (2010-present); Silver Medal Review Committee (2010-present); Site Committee (2010-present); Bernard Lewis Fellowship Committee (2012)

**Institute for Dynamics of Explosions and Reactive Systems** – Board Member (2002-2013); Treasurer (2005-2013)

**Western States Section/The Combustion Institute** – Executive Committee Member (1991-present); Chair (2003-2005); Vice-Chair (2001-2003); Papers Chair–(1992-1995); Joint U.S. Sections Oversight Committee (Founding, 1996-2005); US Sections of the Combustion Institute Executive Committee Member (2005-2008)

**Society of Automotive Engineers** – Member (1990-present); Industrial Liaison Committee (1999-2005); UCI Student Chapter Advisor (1989-present)

**Program Committee**—32nd Combustion Symposium, Novel Combustion Concepts Colloquium – Lead, 2008; 31st Combustion Symposium, Novel Combustion Concepts Colloquium – Lead, 2006; 19th International Colloquium on the Dynamics of Explosions and Reactive Systems, 2003 (Chair); 29th International Combustion Symposium, Novel Combustion Concepts Colloquium, 2002; Institute for the Dynamics of Explosions and Reactive Systems: 18th Colloquium, 2001; 20th Colloquium, 2005

**Conference Organizer**—Pacific Rim Workshop on Deep Ocean Power Science, February, 2014, Honolulu, Hawaii; 23rd International Colloquium on the Dynamics of Explosions and Reactive Systems (ICDERS), July 2011, Irvine, California; Engineering Foundation Workshop on Lean Combustion II: Promise and Practice, April, 2004, Tomar, Portugal; Personal Power Systems Workshop, September, 2002, Irvine, California; Engineering Foundation First Workshop on Lean Combustion Technology and its Control, November, 2000, Santa Fe, New Mexico; Western States Section/The Combustion Institute Fall meeting, October, 1999, University of California, Irvine

**External Site Review Committees**—Natural Sciences and Engineering Research Council of Canada (NSERC), Canadian Government Review of Strategic Network for Cleaner Fossil Fuels, (April 2016); CE-COST, Swedish Government Review of Combustion Center of Excellence (March 2013); Lawrence Berkeley National Laboratory EETD Program External Review (October 2011); Department of Mechanical Engineering, University of California, Riverside External Academic Review (Chair) (February 2010); Indoor Aerosol Group of the American Association for Aerosol Research (1996–1998); Brigham Young University ACERC review committee (1994)

**Session Chair**—36th International Combustion Symposium (August 2016); 25th ICDERS, Leeds, England (August 2015); 35th International Combustion Symposium (August 2014); 24th ICDERS, Taipei, Taiwan (July 2013); 7th US Combustion Meeting (May 2013); 34th International Combustion Symposium (August 2012); 23rd ICDERS, Irvine, California (July 2011); 33rd International Combustion Symposium (August 2010); 22nd ICDERS, Minsk (July 2009); 32nd International Combustion Symposium (August 2008); ILASS-Americas, Orlando (May 2008); 21st ICDERS, Poitiers (July 2007); ILASS-Americas, Chicago (May 2007); 31st International Combustion Symposium (August 2006); 20th ICDERS (August 2005); Joint US Sections Meeting, Philadelphia (March 2005); 30th International Combustion Symposium (August 2004); 19th International Colloquium on the Dynamics of Explosions and Reactive Systems (July 2003); Joint US Sections Meeting (March 2003); Plenary of the Western States Section/The Combustion Institute (October 2001); Plenary of the Joint US Sections Meeting of the Combustion Institute (March 2001); International Conference on Liquid Atomization and Spray Systems (July 2000); International Combustion Symposium (July 1996); American Physical Society Division of Fluid Dynamics Conference (November 1995); American Association for Aerosol Research Annual Meeting (October 1995); Joint Western/Central/Mexican Combustion Institute Section Meeting (April 1995); International Combustion Symposium (July 1992); Western States Section/The Combustion Institute Fall Meeting (October 1990); Western States Section/The Combustion Institute Fall Meeting (October 1988); Western States Section/The Combustion Institute Spring Meeting (April 1987)

**Conference Manuscript Reviewer**—20th thru 36th International Symposia on Combustion; 19th–25th International Colloquium on Dynamics of Explosions and Reactive Systems; ASME Gas Turbine Expo Conference; AIAA/ASME Thermophysical Properties Conference; Society of Automotive Engineers International Congress; ASME Winter Annual Meeting

**Journal Reviews**— *Aerosol Science and Technology*; *AIAA Journal*; *Applied Optics*; *Applied Physics Letters*; *ASME Journal*; *Atmospheric Environment*; *Atomization and Sprays*; *Chemical Engineering Science*; *Combustion and Flame*; *Combustion Science and Technology*; *Combustion Theory and Modelling*; *Energy and Buildings*; *Energy and Fuels*; *Environmental Science and Technology*; *Experimental Thermal and Fluid Sciences*; *Experiments in Fluids*; *Fuel*; *Fluids Engineering*; *IEEE Sensors*; *International Journal of Engine Research*; *International Journal of Heat and Mass Transfer*; *International Journal of Hydrogen Energy*; *International Journal of Multiphase Flow*; *Journal of Aerosol Science*; *Journal of Colloid and Interface Science*; *Journal of Heat Transfer*; *Journal of Industrial Engineering Chemistry*; *Journal of Fluids Engineering*; *Journal of Power and Energy*; *Measurement Science and Technology*; *Optics Letters*; *Physics of Fluids*; *Proceedings of the Combustion Institute*; *Proceedings of the Royal Society A*; *Progress in Energy and*

*Combustion Science; Annals of the New York Academy of Sciences; Journal of Optics A: Pure and Applied Optics; Industrial and Engineering Chemistry Research*

**Proposal Reviews**— Army Research Office; U.S. Department of Energy Small Business Innovative Research Program; National Science Foundation; Veterans Administration; Universitywide Energy Research Group; National Aeronautics and Space Administration; California Environmental Protection Agency; Digital Media Innovation Program; ISTC – international science and technology; Israel Science Foundation; UC Energy Institute; UC Discovery Grant Program; Singapore Agency for Science, Technology, and Research; Institute for Science and Health; NOAA; Petroleum Research Fund; Department of Energy; Murdock Charitable Trust; Killam Foundation, Canada;

**Professional Society Memberships**—The Combustion Institute (1983-present); Optical Society of America (1986-present); American Association for Aerosol Research (1987-1995; 1997-1999; 2003-2005; 2013-2015); Gesellschaft für Aerosolforschung (1988-present); Society of Automotive Engineers (1990-present); American Society of Heating and Refrigeration Engineers (1995-1997); Fulbright Foundation (1997-present); ILASS-Americas (1991-2000); American Society for Engineering Education (1995; 1999-present); American Institute of Aeronautics and Astronautics (2002-present).

## UNIVERSITY SERVICE

### Systemwide and Campus Service:

Council on Academic Personnel; 2015-2017; Provost Facilities Renovation Task Force (Chair); 2016; Engineering Dean Review Committee; 2016; UCI Academic Planning Group; 2010-present; UCI Diversity Advisory Board; 2010-present; co-Director, UC Systemwide Louis Stokes Alliance for Minority Participation; 2007-present; UCI Regional Director of the California Alliance for Minority Participation (CAMP); 1999-present; Director of the LSAMP Bridge-to-the-Doctorate Program at UCI; 2015-present; Search Committee for Environmental Institute faculty position; 2010/2011; Search Committee for Vice Chancellor for Student Affairs; 2010/2011; Access and Affordability Workgroup of the UC Commission on the Future; 2009/2010; Search Committee for Dean of Graduate Studies (Chair); 2009; Search Committee for Environment Institute faculty positions; 2009; co-Equity advisor for School of Engineering (with Prof. DaSilva) for ADVANCE program; 2006–2009; UCI Academic Planning Review Board, APRB (Chair); 2006–2009; Search Committee for University Registrar (Chair); 2006; UCI Coordinator for NSF Bridge to the Doctorate Cohort II, Fall 2004–2006; UCI Budget Work Group; 2003–2006; UCI Academic Senate Cabinet; 2004/2005; UCI Council on Planning and Budget; 2002–2005 (Vice-Chair, 2003/2004; Chair, 2004/2005); UCI Academic Planning Group; 2002–2005; Member of the UCI Task Force for Undergraduate Research, Spring 2003; UCI Representative to Systemwide Committee on Planning and Budget; 2003–2005; UCI Freshman Forum presenter, Fall 2002; Advisor for Undecided/Undeclared students; Winter 2001; Academic Program Review Subcommittee review of School of Biological Sciences (Chair); 2000/01; UCI Graduate Council; 1994/95; 1998–2001; UCI Representative to Systemwide Coordinating Council on Graduate Affairs; Fall 1995; 1998/00; Committee on Teaching Quality member; 1995/1996; Task Force on Environmental Health Institute proposal; 1995; Graduate Council member; 1994/95.

### School of Engineering Service:

Dean's Space Utilization Policy Committee (Chair); 2015-2016; Search Committee for HSSoE Facilities Manager; 2016; Search Committee for MAE Department Manager; 2014; Search Committee for HSSoE Director of Facilities; 2011; HSSoE Dean's Diversity Workgroup; 2008/2009; HSSoE Academic Planning Committee; 2006-2008; co-Director of Center for Engineering Science in Design; 2006-; Director of Center for Portable Power Systems; 2006-; Chair of Henry Samuelli SOE Faculty; 2003–2004; SOE Executive Committee; 1998–2001; 2003–2005; Search Committee for SOE Graduate Affairs Coordinator; 2003; Chair, School of Engineering Undergraduate Studies Committee; 1998–2001; ABET accreditation Committee; 1998–2005; Biomedical Engineering Planning Committee; 1993–1994; 25th International Combustion Symposium Planning; 1993–1994; Environmental Engineering Committee; 1992–2004; Search Committee for SOE Graduate Affairs Coordinator; 1989; Chair, School of Engineering Graduate Studies Committee, 1992–1993; School of Engineering Graduate Studies Committee member, 1988–1993.

### MAE Department Service:

Graduate Studies Committee (finance subcommittee); 2015–present; Strategic Planning (Chair - fluid and thermal science); 2016; Space Committee (Chair); 2014–present; Graduate Advisor for Environmental Engineering Program; 2013-2015; Chair of the MAE Department; July 2009–June 2014; DECADE Mentor; 2010–2013; Search Committee for Assistant Professor in Advanced Energy; (Chair, 2006; member, 2005); Vice-Chair External Relations, MAE Department; 2005–2009; Graduate Admissions Committee member, MAE Department; 2005–2009; Undergraduate Studies Committee member, MAE Department; 2005–2009; Department Undergraduate Advisor; 1998–2002; ABET coordinator for Mechanical Engineering; 1998–2004; Undergraduate Curriculum (chair); 1995; 1999–2002; Director, MERIT Program, Department of Mechanical and Aerospace Engineering; 1993–1997; Computer Resources Committee member; 1991–1994; Facilities

Committee (Chair); 1993–1995; Undergraduate Laboratories Committee member; 1990–1993; Search Committee for Assistant Professor in Heat Transfer; 1989; Graduate Advisor for the Department of Mechanical Engineering, 1988–1993; Secretary to the Mechanical Engineering Department faculty; 1987–1988; Faculty Advisor for the student section of the Society of Automotive Engineers; October 1988–present; Faculty Advisor for Engineering Student Council; 1991–1994;

#### **Technical Conference Host:**

Pacific Rim Workshop on Deep Ocean Power Science, Honolulu, HI; February, 2014; International Colloquium on the Dynamics of Explosions and Reactive Systems, UCI; August, 2011; Society of Automotive Engineers International President's Visit, UC Irvine – June, 2007 (local host); ASME Mechanism Design Conference, Irvine, August, 1996; APS Division of Fluid Dynamics Meeting, Irvine, November, 1995; ASEE Annual Meeting, Anaheim Convention Center; June, 1995; 25th International Combustion Symposium, UCI; August, 1994.

## **COURSES TAUGHT AT UCI**

### **Graduate**

MAE 200B—Engineering Analysis  
MAE 210—Advanced Combustion Fundamentals  
MAE 216—Advanced (Statistical) Thermodynamics  
MAE 217—Generalized Thermodynamics  
MAE 224—Fundamentals of Mass Transfer  
MAE 238—Experimental Fluid Dynamics  
MAE 280—Digital Data Acquisition and Analysis  
MAE 282—Optical Experimental Techniques (Spring, 1992)  
MAE 283—Computer Control of Experiments  
MAE 295—Topics in Laser Spectroscopy-CARS (Spring, 1989)  
MAE 295—Optical Diagnostics (Fall, 1989)  
MAE 295—Spectroscopy (Spring, 1991)  
MAE 295—Advances in Combustion Science and Technology (Winter, 2004)  
MAE 295—CFD Code Comparison (Spring, 2005)  
MAE 295—Vaporization and Condensation Processes (Spring, 2006)  
MAE 295—Spectroscopic Diagnostics in Fluid/Thermal Systems (Winter, 2007)  
MAE 295—Fundamentals of Laser Diagnostics (Winter, 2009)  
MAE 295—Advanced Fundamentals of Laser Diagnostics (Fall, 2015)

### **Undergraduate**

MAE 91—Introduction to Thermodynamics  
E 101—Introduction to Thermal Sciences (no longer offered)  
MAE 107—Fluid and Thermal Science Laboratory  
MAE 110—Combustion in Practical Devices  
MAE 121—Topics in Thermal Design (no longer offered)  
ME 130A—Introduction to Fluid Mechanics  
MAE 189ABC—Senior Design Project (replaced by 189)  
MAE 189—Senior Design Project  
ME 151C—Senior Design Class (no longer offered, replaced by MAE 151)  
MAE 151—Mechanical Engineering Design  
MAE 164—Fundamentals and Control of Air Pollution  
MAE 188—Engineering Design in Industry

## **GRADUATE STUDENTS**

### **Ph.D. DISSERTATIONS**

- A.1 Zhu, J.Y. (1991) “Coherent Anti-Stokes Raman Spectroscopy (CARS) Gas Temperature Measurements in Monodisperse Combusting Droplet Stream.”
- A.2 Chung, I.P. (1992) “A Study of Aerosol Inhalability into Blunt Samplers and the Human Head.”
- A.3 Garman, J.D. (1996) “Issues in Laser Diagnostics for Combustion Thermometry: Low Pressure Flames and Spatial Averaging.”
- A.4 Connon, C.S. (1997) “Significance of Droplet-Droplet Interactions in Droplet Streams: Atmospheric to Supercritical Conditions.”

- A.5 Buchanan, C.R. (1997) "CFD Characterization of a Mechanically Ventilated Office Room: The Effects of Room Design on Ventilation Performance."
- A.6 Dimalanta, R. (1998) "Experimental Investigation of Reduced Vaporization in a Droplet Stream Flame."
- A.7 Strayer, B.A. (2001) "The Importance of Actuation Mechanisms in the Control of Non-Premixed Combustion."
- A.8 Posner, J.D. (2001) "Resonant and Non-resonant Holographic Interferometry in Axisymmetric Flames."
- A.9 Rickard, M.A. (2005) "Ion-Driven Wind: Aerodynamics, Performance Limits, and Optimization"
- A.10 Papac, M.J. (2005) "Electrical Aspects of Gaseous Fuel Flames for Microgravity Combustion and Combustion Control."
- A.11 Pham, T.K. (2006) "Fuel Film Combustion in a Miniature Combustor."
- A.12 Gowadia, N.A. (2007) "Size-segregated Chemistry in Mainstream Tobacco Smoke." (in Environmental Toxicology)
- A.13 Therkelsen, P. (2009) "SI to HCCI Operation of a Small Macro-Scale 4-Stroke Engine."
- A.14 Kim, K.M. (2010) "The Effects of Carbon-in-Ash on Mercury Capture from Flue Gas."
- A.15 Puranam, V.S. (2010) "Combustion in Cavities and Accelerating Flows."
- A.16 Abbilian, S. (2011) "Unstable Liquid-Liquid Dispersed Flows in Industrial Installations."
- A.17 Rohani, M. (2011) "Controlling the Breakup of Capillary Liquid Jets." (co-advisor, with F. Jabbari)
- A.18 Tiwari, N. (2011) "Non-Linear Endoscopic Microscopy System for Potential use in Diagnosing Rheumatoid Arthritis." (co-advisor, with B. Tromberg, BME)
- A.19 Karnani, S. (2011) "Electrical Control of Combustion in Microgravity."
- A.20 Jiang, F. (2012) "Mercury Removal from Flue Gas by Aqueous Precipitation" (in Environmental Engineering)
- A.21 Mirsepassi, A. (2012) "Suspension Dynamics and Hydrodynamic Interaction in Viscoelastic Fluids."
- A.22 Roshandell, M. (2013) "Combustion of Methane Hydrate."
- A.23 Moslemi, M.K. (2013) "Measurements and modeling of pulverized fuel char in an Entrained Flow Reactor."
- A.24 Yu-Chien (Alice) Chien (2015) "Electrical Aspects of Impinging Flames."
- A.25 Ziaee, A. (2016) "Ultra-short Pulse Off-axis Digital Holography and Kerr Effect Ballistic Imaging in Highly Scattering Environments such as Formation Region of Diesel Sprays."
- A.26 Dang, J. (2016) "In Field Measurements of Solid Fuel Cookstove Emissions."
- A.27 Padilla, R. (2016) "Structure and Behavior of Non-Premixed Water-Laden Methane/Air Flames."
- A.28 Sauer, V. (2017) "Analysis of Laminar Nonpremixed Stagnation Flow and Swirl-Type Tubular Flames."
- A.29 Tinajero, J. (2017) "Flame Dynamics and Chemi-Ion Flows Driven by Applied Electric Fields."
- A.30 Escofet-Martin, D. (2017) "Laser Diagnostics for High Pressure Combustion."

### M.S. THESES and PROJECTS

- B.1 Huang, H.S. (1990) "Numerical Solutions for Steady Flow Past Two-Dimensional Blunt Body Samplers."
- B.2 Nguyen, Q.V. (1990) "Measurements of Droplet-Droplet Interaction and Aerodynamics."
- B.3 Huang, L. (1991) "Focusing of Gaussian Laser Beams through a Gradient Index Lens." (project)
- B.4 Buerkle, J.A. (1991) "Surface Defect Detection by Laser Light Scattering."
- B.5 Luzar, J.E. (1992) "Vaporization in a Linear Droplet Stream Flame."
- B.6 Gray, A.L. (1992) "Optical Sizing of Tobacco Smoke by Laser Light Scattering and Extinction."
- B.7 Zhang, Y.F. (1992) "Study of Gas Phase Chemistry in CVD Diamond Deposition."
- B.8 Davies, B. (1992) "Computer Control of an IC Engine." (co-advisor Prof. Bobrow)
- B.9 Garman, J.D. (1993) "The Dependence of NO<sub>2</sub> Degenerate Four-Wave Mixing Signals on Buffer Gas Pressure."
- B.10 Chang, E. (1993) "Measurement of Sidestream Tobacco Smoke Particle Size Distribution."
- B.11 Silverman, M.A. (1993) "Experimental Investigation of a Droplet Stream Flame."
- B.12 Connon, C.S. (1993) "Instabilities of Monodisperse Droplet Streams under High Ambient Pressures."
- B.13 Dimalanta, R. (1994) "Vaporization of Waste Oil Sludge."
- B.14 Choi, C. (1996) "Laser Induced Fluorescence in an Acetone Droplet Stream."
- B.15 Miyasato, M. (1996) "Fluid Dynamics near a Self-Cleaning Sensor." (project)
- B.16 Strayer, B. (1997) "Active Control Methodology Applied to a Laminar Non-Premixed Flame." (co-advisor Prof. Jabbari)
- B.17 Vu, K. (1998) "Biomedical Microbeam Characterization using Photochromic Film,"
- B.18 Posner, J.D. (1998) "LDV and PIV Measurements of Indoor Air Flows in a Model Room."
- B.19 Yang, F.S. (1999) "Acoustic Control of a Rijke Tube Burner."
- B.20 Moorefield, C. (1998) "Lean Engine Combustion Using Hydrogen Enhanced Gasoline Fuel." (project)
- B.21 McKinney, D.J. (1999) "A Droplet Stream Flame in an Acoustic Field."
- B.22 Gonzalez, M. (2000) "Prospects for an Electrohydrodynamic Spray Burner" (project)
- B.23 Grueneis, M.E. (2002) "Heat Transfer Correlation for Turbulent Natural Convection on an Isogrid Panel."
- B.24 Rickard, M.A. (2002) "The Study of an Electrified Air-Assisted Liquid Atomizer."
- B.25 Papac, M.J. (2002) "N<sub>2</sub> CARS Thermometry and O<sub>2</sub> LIF Measurements of an Electrically Induced

- Microbuoyant Flame.”
- B.26 Co, T. (2002) “Emissions from a Rijke-tube Combustor.” (project)
- B.27 Pham, T.K. (2003) “Study of a Miniature Liquid Fuel Film Combustor.”
- B.28 Papac, J.E. (2004) “Combustion in a Miniature Combustion Engine.”
- B.29 Ibbi, D.K. (2004) “Controlling Piezoelectric Generated Droplets.”
- B.30 Kwa, S. (2005) “ADVISOR and the RC Car” (project)
- B.31 Pompa, J. (2006) “Performance of Miniature IC Engines.”
- B.32 Amade-Sarzi, N. (2007) “Mixing Flows in a Converging Curved Duct.”
- B.33 Wei, Y. (2007) “Formation Temperature of Ammonium Bisulfate at Simulated Air Preheater Conditions.”
- B.34 Abbilian, S. (2008) “An Investigation of Self-Induced Combustion Instabilities in a Low-Swirl Burner”
- B.35 Jepsen, A. (2009) “Characterization of Dynamic, Surfactant-free Emulsions”
- B.36 Ly, D. (2009) “Analysis of Potential for Quantum Cascade Laser Measurements of Carbon Monoxide under Realistic Combustion Conditions”
- B.37 Maghzi, S. (2009) “Design, Construction, and Testing of an Entrained Flow Reactor for Coal”
- B.38 Mirsepassi, A. (2009) “Numerical Simulation of an Air Preheater Channel.” (project)
- B.39 Menasha, J. (2010) “In Situ Characterization of ABS Formation in a Model Air Preheater Channel.”
- B.40 Palencia, M. (2010) “Feeding Pulverized Coal for Char Burnout Studies.” (project)
- B.41 Lim, J.H. (2010) “Performance Mapping of a Small-Scale Water-Cooled 4-stroke IC Engine: Potential for HCCI Operation.”
- B.42 Tran, M.K. (2010) “Optical Diagnostics to Characterize the Sooting Propensity of Biofuel-Diesel Diffusion Flames.”
- B.43 Karimi, A. (2010) “Thermal Deformation Analysis of Modular Mirrors.”
- B.44 Scott Toma, S. (2011) “Comparison of the Dynamic Response of a Tooth Between a High Speed Drill and Dental Laser.”
- B.45 Tsai, H.-J. (2011) “Attempts to Model Electrical Field Effects on Flames.” (project)
- B.46 Roshandell, M. (2011) “Combustion of Fuel Hydrates.” (project)
- B.47 Marti-Duran, F. (2012) “Droplet Evaporation in an Active Turbulence Grid Wind Tunnel.”
- B.48 Dang, J. (2012) “Structure of Intermittent Fuel Sprays.” (project)
- B.49 Tapia, J. (2012) “Laser Measurements in Flames.” (project)
- B.50 Kuehne, R. (2013) “Prototyping, Testing, and Improvement of a Mechanical Trap Toilet.”
- B.51 Ziaee, A. (2013) “Digital Holography in Multi-Phase Media.” (project)
- B.52 Kong, S. (2013) “Studying the Temperature Profile of a Flame-Heated Plate using Solidworks.” (project)
- B.53 Martin, David Escofet (2014) “OH PLIF Measurements in an Impinging Non-Premixed Flame.” (project)
- B.54 Guerra, Alessandra (2014) “UCI Solar Stove.” (project)
- B.55 Santacana-Vall, Joan (2014) “Water Evaporation during Methane Hydrate Combustion.”
- B.56 Saeidi, Navid (2014) “Designed Loop for a High Pressure Salt Water Tunnel for CO<sub>2</sub> Hydrate Formation.” (project)
- B.57 Rodriguez, Noe (2014) “Energy Balance of Hot Plate Cooking of Chapati.” (project)
- B.58 Tinajero, Jesse (2014) “Chemi-Ion Driven Flows in an Electric Field.”
- B.59 Foster, Stuart (2015) “Spherical Solar Stove: A Characterization Study.” (project)
- B.60 Gomez, Antonio (2015) “Development and Verification of an Instrumented Small Engine Testbed.” (project)
- B.61 Nodem, Andre (2015) “Volume and Flow Rate Measurements using a Custom-Made Flowmeter.” (project)
- B.62 Ricchuiti, Valentina (2016) “OpenFOAM Simulations of Impinging Coflow Flames, including Chemi-Ionization and Electric Fields.”
- B.63 Bryant, Michael (2016) “Discharge Flux Variability in Stored Thermal Energy Cookstoves.”
- B.64 Lladó-Gambin, Adriana (2016) “Heat Transfer Model for Hot Air Balloons.”
- B.65 Mojica, Verence (2018) “Analytical and Experimental Methods for Calculating the Average Emissivity Value of a Flame via Thermal Imaging Applications.” (project)
- B.66 Sanchez, Joseph Alex (2018) “Quantifying Hydrate Formation Rate using Ideal and Real Gas Laws, including the Effects of Surfactants.” (project)

#### SENIOR SCHOLARS/RESEARCHERS

- Elisangela Leal – Post Doctoral Researcher, 2003-2005 – Portable power; fuel cells (with Prof. F. Jabbari and Dr. J. Brouwer)
- Amauri Leal – visiting M.S. student, Brazil, 2003-2005 – On board methanol reformer for miniature IC engines
- Yeuh-Heng (Zic) Li – visiting Ph.D. student from National Cheng Kung University, Taiwan (2005-2006) – Combustion of liquid films on flat plates
- John Garman – Post Doctoral Scientist, 2006-present – Laser Diagnostics in Combustion; Miniature Engine

## Combustion

- Kiyotaka Yamashita, Post Doctoral Scientist, University of Tokyo, summer 2008 – Numerical Simulation of Electric Effects in Diffusion Flames
- Oh Chae Kwon, Sungkyunkwan University, Korea (visiting Professor), 2009/2010 - water laden counterflow flames
- Feng (Jeff) Jiang, Post Doctoral Lab Assistant, Spring/Summer 2012 – Experiment design
- Sunny Karnani, Post Doctoral Project Scientist, 2013-2015 – Deep ocean power science laboratory design and construction
- Bai Jie – Researcher 2013/2014 – Schlieren Methods for Fluid Mechanics Research
- Valentina Ricchiuti – Researcher 2014 – CFD of Combustion using OpenFOAM; Researcher 2016 – CFD of Electrical Properties of Flames using LBNL code
- Yu-Chien (Alice) Chien, Post Doctoral Project Scientist, 2015-2016 – Deep ocean power science laboratory design and construction
- Daijin Li – Researcher 2014/2015 – Energy Systems Analysis
- Chaobo Yang – Researcher 2015/2016 – Advanced Laser Diagnostics, hybrid fs/ps coherent anti-Stokes Raman spectroscopy; measurements and spectral fitting
- Ali Ziaee – Researcher 2016 – Femtosecond holographic imaging
- Young Choi – Researcher 2016/2017 – Advanced combustion systems, small engine emissions
- Yu-Chien (Alice) Chien, Post Doctoral Project Scientist, 2016-present – Lasers, Flames, and Aerosols Laboratory manager and NASA Electric Field Effects on Flames project

## VISITING RESEARCHERS (Thesis Study)

- C.1 Simone Stanchi, Polytechnic Milano – Engineering Degree student, 2002 – Pressurized miniature film combustor (with Prof. W.A. Sirignano)
- C.2 Andrea Favalessa, University of Padua – Engineering Degree student, 2004 – Heat recirculating burner
- C.3 Nicola Amade Sarzi, Polytechnic Milano – Engineering Degree student, 2005 – Annular film combustor (with Prof. W.A. Sirignano)
- C.4 Francesco Borgatelli, Polytechnic Milano – Engineering Degree student, 2006 – Feedback control of flames with electric fields, “Behavior of a Small Diffusion Flame Affected by an Electric Field,” degree conferred 2008/2009.
- C.5 Roberto Mattioli, Polytechnic Milano – Engineering Degree student 2006/2007 – Miniature Liquid Film Combustors with Secondary Air Injection
- C.6 Jonathan Arici, Polytechnic Milano – Engineering Degree student, 2007/2008 – Experiments in a Model Turbine Burner
- C.7 Luca Castronuovo, Polytechnic Milano – Engineering Degree student 2009/2010 – Nanopowder Ignition and Combustion
- C.8 Julian Glorian, Universite D’Orleans, France – Engineering Degree student 2011 – Computational study of ions and excited state species in a methane/air laminar diffusion flame
- C.9 Claudio Giani, Politecnico Milano – Engineering Degree student 2011/2012 – Swirl designs for miniature film combustor
- C.10 David Escofet Martin, Universitat Politcnica de Catalunya, Terrassa, Engineering Degree student 2011/2012 – Laser Spectroscopy Techniques: 2D OH Planar Laser Induced Fluorescence
- C.11 Laia Torregrosa Sauret, Universitat Politcnica de Catalunya, Terrassa, Engineering Degree student 2012/2013 – Automated Measurements in a Counterflow Flame
- C.12 Joan Santacana Vall, Universitat Politcnica de Catalunya, Terrassa, Engineering Degree student 2012/2013 – Automated Measurements in a Hydrate Flame
- C.13 Marco Minniti, Politecnico Milano – Engineering Degree student 2012/2013 – Thin Filament Pyrometry for Combustion System Temperatures
- C.14 Valentina Ricchiuti, Politecnico Milano – Engineering Degree student 2012/2013 – Chemical Kinetics in a Water-Laden Non-Premixed Counterflow Flame
- C.15 Michela Vicariotto, Politecnico Milano – Engineering Degree student 2013/2014 – Laser-Induced Spark Ignition of Methane Hydrates; thesis date: July, 2015
- C.16 Jaume Felip Escolà, Tcnica Superior d’Enginyeries Industrial i Aeronutica de Terrassa (ETSEIAT), Engineering Degree student 2015 – Pressure Measurements in a Small IC Engine
- C.17 Claudia Lopez Camara, Escola Tcnica Superior d’Enginyeria Qumica, Universitat Rovira i Virgili, Tarragona, visiting M.Sc. student 2014/2015 – Numerical Simulation of a Co-Flow Methane/Air Flame Including Ions and Excited Species
- C.18 Albert Aguilera Roman, Universitat Politcnica de Catalunya, Terrassa, Engineering Degree student 2014/2015 – Relating CH\* Chemiluminescence to Charged Species in a Nonpremixed Methane Flame
- C.19 Andrea Biasioli, Politecnico Milano – Engineering Degree student 2014/2015 – Methane Hydrate Growth and Morphology with Implications for Combustion; thesis date: September 2015
- C.20 Adriana Llado Gambin, Universitat Politcnica de Catalunya, Terrassa, Engineering Degree student 2014/2015 – Thin Filament Pyrometry Measurements in a Counterflow Flame
- C.21 Filippo Colagrande, Politecnico Milano – Engineering Degree student 2015/2016 – Study on Plasma



Treatment of NO<sub>x</sub> in Engine Exhaust Gas; thesis date: September, 2016  
C.22 Alex Torredemer Serra, Universitat Politcnica de Catalunya, Barcelona – Engineering Degree student  
2016 – Modeling High Pressure Non-Premixed Flames

### **VISITING SCHOLAR INTERNSHIP PROJECTS (with reports)**

- D.1 Jeremie Descours, ISAE, ENSMA, France – Intern student 2011 – Computational Fluid Dynamics and Experiment of Coal Combustion
- D.2 Benjamin Debareix, ISAE, ENSMA, France – Intern student 2011 (no formal report) – OpenFOAM Computation of Jet Diffusion Flame Impinging on a Surface
- D.3 Mishal Francis, University of Glasgow – Intern student 2011/2012 – IR detection of electrical effects on small diffusion flames
- D.4 Joshua Jacobs, University of Glasgow – Intern student 2011/2012 – Soot imaging in small diffusion flames
- D.5 David Mazo, ISAE Supaero, 2012: Droplet evaporation in turbulent flow
- D.6 Oscar Martinez, ISAE Supaero, 2012: Droplet evaporation in turbulent flow
- D.7 Marie Vinay, ENSMA, 2012: Small engine test stand for biofuel operation
- D.8 Fabien Plongeron, ENSMA, 2012: Image processing for chemiluminescence in sooting flames
- D.9 Antoine Larignon, ENSMA, 2012: Thermal modeling of ice and hydrates for clathrate combustion
- D.10 Kevin Haras, ENSMA, 2012: Particle sizing of cookstove smoke
- D.11 Valentin Thomas, ENSMA, 2012: Burning methane clathrates and gel fuels
- D.12 Dorian Midou, ENSMA, 2012: Automation for pulsed dye laser scanning in combustion diagnostics
- D.13 Tony Martinet, ENSMA, 2012: Coal combustion in an entrained flow reactor
- D.14 Sliman Bouazzaoui, Supmeca, 2012: Small engine combustion and emissions
- D.15 Philippe Diollot, Supmeca, 2012: Small engine combustion and emissions
- D.16 Arnaud Lemoine, ENSMA, 2013: Ballistic imaging and holography
- D.17 Sybille Drevon, ENSMA, 2013: Droplet stream flames with bio-derived fuels
- D.18 Victor Viaud, ENSMA, 2013: Mechanical design of high pressure combustion chamber for methane hydrate flames
- D.19 Simon Deguillaume, ENSMA, 2013: Low temperature urea catalyst kinetics for NO<sub>x</sub> control
- D.20 Nils Bechmann, ENSMA, 2013: High pressure differential scanning calorimeter design to measure phase transformations in hydrates
- D.21 Clement Fillon, ENSMA, 2013: Fundamentals of hydrate formation - structural effects of surfactants
- D.22 Quentin Bervas, ENSMA, 2013: Measurements of evaporation versus draining water during hydrate combustion
- D.23 Thomas Payet-Burin, ENSMA, 2013: Solar cookstove optimization
- D.24 Camille Saux, ENSMA, 2014: Control system for stabilizing a droplet in a flow tunnel
- D.25 Yoann Haucourt, ENSMA, 2014: Spray rig for testing ballistic imaging holography
- D.26 Pierre Lemarie, ENSMA, 2014: Laser spectroscopy for combustion diagnostics
- D.27 Anthony Colle, ENSMA, 2014: Surfactant effects on dissolved methane gas in water
- D.28 Saedeh Mirghasemi, UCI, 2014: High pressure flow tunnel for hydrate formation studies
- D.29 Jordan Billbault, ENSMA, 2015: High pressure combustion flow panel design and thermal analysis
- D.30 Antony Delavois, ENSMA, 2015: High pressure/low temperature salt water flow tunnel design and thermal analysis
- D.31 Gaetan Crouzy, ENSMA, 2015: High pressure CARS calibration cell
- D.32 Adrien Ruas, ENSMA, 2015: Water-laden fuel diffusion coflow burner
- D.33 Remy Petit, ENSMA, 2015: Accurate measurement of volumetric flow from dissociating hydrates
- D.34 Guillaume Eplénier, ENSMA, 2015: Chemical kinetics calculations of flames with ions and excited species
- D.35 Sarah Benhaddou, ENSMA, 2016: Treatment of exhaust gases using non-thermal plasma
- D.36 Louise Autef, ENSMA, 2016: Experiments and modeling of small diffusion flames in electric fields
- D.37 Mohamed Azri, ENSMA, 2016: Optical measurements in high pressure combustion
- D.38 Gaetan Ruscade, ENSMA, 2016: High pressure calibration cell for coherent anti-Stokes Raman spectroscopy
- D.39 Flavien Bart, ENSMA, 2016: High pressure flow tunnel characterization (senior project)
- D.40 Quentin Dupuis, ENSMA, 2016: Water-added counterflow diffusion flames
- D.41 Alexandre Schwartz, ENSMA, 2016: Measurement and calculation of sulfur species in simulated power plant flue gas
- D.42 Thibault Pecoul, ENSMA, 2016: High temperature test cell for sulfur species simulating emission from a power plant flue
- D.43 Guillaume Bernard, ENSMA, 2016: Electrically controlled flames
- D.44 Romain Bouyer, Ecole des Mines d'Alès, 2016: Characterization of controlled conversion efficiency of SO<sub>2</sub> to SO<sub>3</sub> over a catalyst

- D.44 Marion Lallemand, EPF Graduate School of Engineering, France, 2017; Tubular flame burner design and analysis
- D.45 Samuel Perceval, ENSMA, 2017; Experimentation and instrumentation of a 50cc scooter engine to improve its environmental performance
- D.46 Thomas Guedon, ENSMA, 2017; Methane hydrates growth

## OTHER DISSERTATION AND THESIS COMMITTEES

### Ph.D. Dissertation Committees

Hamid Rahai (1988), Dikran S. Babikian (1989), Vincent G. McDonell (1990), Perry Fuehrer (1993), Jean-Pierre Delplanque (1992), Jay Chung (1994), Albino Leiroz (1996), Matt Miyasato (1998), Keeney Willis (2000), Suresh Vilayanur (1998), Arash Ateshkadi (2000), Khoi Nguyen (2002), Roberto Aguirre (2005), Brian Matthew Michaelis (2005), Joseph William Pratt (2008), Fabian Mueller (2008), David Sedarski (2009), opponent for Ph.D. at Lund University Sweden), Qing Wang (2009), James Maclay (2009), Zahra Noroozi (2011), Malcolm Shield (2011, external examiner of dissertation, University of British Columbia), Abdullah Alkudsi (2012), Adam Wachtor (2012), Billy Kaldvee (2012, opponent for Ph.D. at Lund University Sweden), David Beerer (2013), Zhixuan Duan (2013, EnE), Hubert Chan (2013, ChEMS), Elliot Sullivan-Lewis (2014), Donny Zondervan (2014), Daegeun Park (2016, external member at KAUST, Saudi Arabia), Alex Puga (2016), Michele Rosso (2016), Davide Glassi (2017, external evaluator of dissertation, Yale University), Albert Jorda Juanos (2018), Tuan Nguyen (2018), James Lewis (2018)

### M.S. Thesis Committees

Robyn Charles (1987), Craig Wood (1989), Tami Montgomery (1988), Vikram Reddy (1990), Blake Stapper (1989), Scott Drennan (1990), Paul Gladnick (1990), Jean-Pierre Delplanque (1989), Eric DiStefano (1991), Christopher Brown (1991), Massumeh (Hatch) Samii (1991), Robert Brady (1991), Dennis Hubbard (1991), Mike Lin (1992), Scott Shaffar (1993), Christopher Peterson (1993), Matt Miyasato (1993), John Kroll (1993), Stuart Hay (1993), Suresh Vilayanur (1994), James Dill (1994), Neil Davis (1995), Doug Brouwer (1996), Kelly Jon Courter (1997), Patrick Lam (2002), Jose Torres (2002), Satish Yalamanchili (2003), Steven Hill (2003), Joseph Pratt (2004), Qing Wang (2005), Viken Jermakian (2005), Joan Morrison (2006), Patrick Couch (2006), James Maclay (2006), Mark Effinger (2006), Philip Garcia (2006), Peter Therkelsen (2006), Janea Magallanes (2007), Lucas White (2007), Paul Nissenon (2007), Chris Bolszo (2008), Steven Hernandez (2009), David Beerer (2009), Adrian Narvaez (2009), Xavier Cordobes (2009), Alex Cohan (2010), Howard Lee (2010), Amin Akbari (2010), Scott Hill (2011), Tavis Werts (2011), Justin Legg (2012), Donat Racz (2012), Kevin Launglucknavalai (2013), Albert Jorda (2013), Nicolas Marchante (2014), Ali Azizi (2014), Guillermo Gomez (2014), Nathan Kirksey (2014), Adam Silver (2015), Hannah Bower (2016), Aria Etemadieh (2016), Anirudh Krishna (2016), Albert Jorda Juanos (2017), Jordi Poblador Ibanez (2017)

## UNDERGRADUATE STUDENTS

### Laboratory Researchers (grant funded or 199 units for research)

2017–2018 – Harshil Dadhaniya, Isaac Gonzalez, Georges Hatem, Hieu Nguyen; 2016–2017 – Siddharth Baranwal, Jagdeep Batther, Harshil Dadhaniya, Dustin Hall, Lewis Liao, Dorsa Shirazi, Miguel Escobar, Georges Hatem, Elizabeth Bou; 2015–2016 – Quan Le, Dorsa Shirazi, Dustin Hall, Lewis Liao; 2014–2015 – Adam Farsheed, Verence Mojica, Salvador Badillo-Rios, S. Rouzbeh Kazemian, Shirin Ghaffarkhan, Wee Lim; 2013–2014 – Pavel Astakhov, David Feng, Sean Godinez, Jaydeep Kar, I-No Liu, Miguel Plascencia, Abigail Sarafian, Sabrina Ng, Suhaylay Ali, Elaine Haralson; 2012–2013 – David Feng, Jaydeep Kar, Verence Mojica, Siva Udayamurthy, Alireza Zavar, Daniel Jaimes, Navid Saeidi, Nicholas Brady, Brandon Nilles, Timothy Lin, Huzafa Khan, McVincent Obando, I-No Liu; 2011–2012 – Maribel Jaquez, Daniel Jaimes, Michael Chun, Alex Kindel, Ryan Kuehne, Kasra Kakavan, Khizar Karwa, Navid Saeidi, Siva Udayamurthy, Jaydeep Kar; 2010–2011 – Maribel Jaquez, Daniel Jaimes, David Huang, Sina Hashemi, Kamil Samaan, Gary Le, Timothy Chang, Masih Tukhi, Alex Kindel, Guillermo Gomez, Khizar Karwa; 2009–2010 – Brian Pua, Sina Hashemi, Diona Maxon, Kamil Samaan, Syed Zulkharnain, Daniel Jaimes, Jasmine Meza, Ryan Banuelos, Scott Toma, Martin Tajiboy, Gary Le; 2008–2009 – Connor Smith (UK), Jackson Hartman; 2007–2008 – Michael Tran, Viviana Villareal, Liem Pham, Matt Bennett, Eric Obzejta, Chris Miller, Jay Lim, Andre Pineset (Bio 199), Juan Pablo Gonzalez; 2006–2007 – Albert Ye, Evan Gorski, Chris Frantz, Matt Bennett, Michael Tran, Eric Obzejta, Manveer Sadhal; 2005–2006 – Sunny Karnani, Adrian Mulrone, Julianna Wei, Peter Chueh, Albert Ye, Mike Ward, Evan Gorski, Chris Frantz, Dale Huang; 2004–2005 – Sunny Karnani, Adrian Mulrone, Julianna Wei, Lino Della Quadri, Peter Chueh, Jason Brunton; 2003–2004 – Joyce Cheng, Denish Kumar, Sunny Karnani; 2002–2003 – Jerry Rodriguez, Marvin Avila, Joyce Cheng, Nasbi Guzman, Denish Kumar, Jose Navarro, Nick Welche; 2001–2002 – Jerry Rodriguez, Rudi Neri,

Annette Moreno, Jose Jesse Pompa, Joe Papac; 2000–2001 – Jonathan Regele, Joe Papac, James Strayer, Mike Papac, Jerry Rodriguez; 1999–2000 – Catherine Le, Erin Abbey, Jonathan Regele, Ryan Kelly, Joe Papac, James Strayer, Mike Papac, Matt Rickard, Alex Cheung; 1998–1999 – Catherine Le, Sio Fu, Theery Sirinopwongsagon; 1997–1998 – Marco Vujicic; 1996/1997 – sabbatical; 1995/1996 – Shawn Barge, Ben Strayer, John Yang, Bonnie Jiang, Lionel Low; 1994/1995 – Carlson Choi, Dameon Wood, John Yang, Mako Miyasato, Shawn Barge, Ben Strayer, Danny Chu, Cortland Strong; 1993/1994 – John Yang, Minh Ho, Mako Miyasato, Dameon Wood, Carlson Choi, Terry Wang; 1992/1993 – Tuan Trinh, Amit Dhadwal; 1991/1992 – Tuan Trinh, Amit Dhadwal; 1990/1991 – Greg Gorman, Jerry Lin; 1989/1990 – Julie Chang, Lynne Low, Gary Lin; 1988/1989 – Quang-Viet Nguyen; 1987/1988 – Dinhcuong Nguyen, Hoekten Koe

### **Student Mentoring Activities (external stipend funded to do research)**

Francisco Villegas - CAMP Summer Scholar (2017) - ethylene flames under electric field influence; Edward Torres - CAMP Summer Scholar (2016) - data logging temperature measurements; Jason Owusu - CAMP Summer Scholar (2016) - spray system for holographic measurement evaluation; Patricia Martinez - CAMP Summer Scholar (2016) - laser Rayleigh scattering in flames; Vinicius Paolo - Brazil Science without Borders Scholar (2016) - liquid combustion using porous wall burner; Igor Alves - Brazil Science without Borders Scholar (2016) - schlieren imaging of flames under the influence of an electric field;

Marisela Miramontes - UC-LEADS Scholar (2015) - 3D printing of combustion; Andres Vargas - UC-LEADS Scholar (2015) - hot wire anemometry of burner; Pedro Munoz - CAMP Summer Scholar (2015) - hot wire fabrication; Ahmed Alharbi, Muath Askar - SAU Summer Program (2015) - solar cookstove thermal/mechanical design; Saad Almuhanha - SAU Summer Program (2015) - particle image velocimetry (PIV); Samuel Cabrera - CAMP Summer Scholar (2015) - solar stove thermal contact resistance; Joseph Sanchez - CAMP Summer Scholar (2015) - high pressure electrolysis; Kaio Paes - Brazil Science Without Borders Scholar (2015) - small reciprocating engine testbed instrumentation; Andre da Silva - Brazil Science Without Borders Scholar (2015) - liquid film combustor;

Guillermo Gomez, Marielisa Hecht, Dana Hernandez, Andy Lam, Michael Luong - MDP Research Program (2014) - low cost water filtration system (with Prof. Rosso); Andrew DiMauro - UC-LEADS Scholar (2014) - counterflow flame computations; Verence Mojica - summer student (2014) - solar stove thermal testing; Alejandro Sherman - CAMP Summer Scholar (2014) - tracking schlieren images for velocity measurement; Gregory Justice - St. Margaret's Internship Program (2014) - flow measurement for dissolution of methane hydrates; Saud Alanazi - SAU Summer Program (2014) - using hydrates for water desalination;

Dominique Ingato, Abby Aguilar Cubo - MDP Research Program (2013) - low-cost aerosol measurement device for cookstove smoke (with Prof. Mohraz and Edwards); Rosendo Ortiz, Upward Bound (2013) - accurate temperature measurements in counterflow flames; Tessa Hurr, St. Margaret's Internship Program (2013) - engineering and energy research, robotics, fuel cells, combustion; Saud Alzaaqui - SAU Summer Program (2013) - algae biofuel reactor design; Miguel Plascencia - CAMP Summer Scholar (2013) - construction of microgravity electric-field burner system; Sean Godinov - CAMP Summer Scholar (2013) - in-situ press for methane hydrates during formation;

Ali Alshahrani - SAU Summer Program (2012) - solar cookstove design; Jose Jacobo - CAMP Summer Scholar (2012) - coal combustion and carbon in ash; Daniel Jaimes - CAMP Summer Scholar (2012) - sodium line reversal for temperature measurements in flames; Verence Mojica - UC LEADS Scholar (2012) - small combustion engine test bed for biofuel performance studies;

Adrian Garcia - UC LEADS Scholar (2011) - Prosilica camera image analysis for zero gravity flame experiment;

Rosa Padilla - AGEP Scholar, post M.S. (2010) - thermal analysis of laser interaction with tissue; Masih Tukhi - UCI STEM Summer Bridge (2010) - thermal measurements in a drop tube furnace; Sina Hashemi - SURP and Samueli Scholar (2010) - droplet vaporization interaction with turbulence; Tony Eguavoen - CAMP Summer Scholars Program (2010) - optical pyrometry for non-invasive temperature measurements in combustion; Maribel Jaquez - UC-LEADS Scholar, pre B.S. (2010) - electrical effects on diffusion flames (E-FIELD Flames); Adan Amarillas - CAMP Summer Scholars Program (2010) - light scattering and absorption in tissue; Victoria Biggs - CAMP Summer Scholars Program (2010) - flat flame burner for combustion studies;

Martin Tajiboy - CAMP Summer Scholars Program (2009) - HCCI engine behavior; Jasmine Meza - CAMP Summer Scholars Program (2009) - measuring ammonia concentration during ammonium bisulfate formation; Daniel Jaimes - CAMP Summer Scholars Program (2009) - measurements in a model turbine burner; Ryan Banuelos - CAMP Summer Scholars Program (2009) - failure in a small scale HCCI engine; LaiTaras Stokes - Summer AGEP Scholar (2009) - soot particle collection on TEM grids;

Julie Cojulun - CAMP Summer Scholars Program (2008) - air preheater for a model turbine burner; Viviana Villareal - CAMP Summer Scholars Program (2008) - piezoelectric droplet generator for non-Newtonian fluids; Belen Vasquez - CAMP Summer Scholars Program (2008) - laser selection for optical measurements of ammonia in powerplant flue gas; Martin Tajiboy - CAMP Summer Scholars Program (2008) - enclosure

for electrical study of diffusion flames; Ramon Anguiano – CAMP Summer Scholars Program (2008) – conductivity meter for emulsions;

Raymond Valdes – CAMP Summer Scholars Program (2007) – flow panel for magnetic effects on flames study; Andre Pineset – MSP Scholar (2007) – effect of laser ablation on pain mechanism in teeth;

Bode Adenayi – CAMP Summer Scholars Program (2006) – chemical analysis of PAH in cigarette smoke; Evan Gorski and Chris Frantz – UCI SURP Program (2006) – miniature engine combustion with hydrogen and water injection;

Matthew Bennett – UCI SURP Program (2005) – communications with a microsatellite; Sunny Karnani – UCI SURP Program (2005) – emissions from a miniature engine;

Edgar Vargas – UCI SURP Program (2004) – power system for CUBESAT; Puja Ruparel – UCI SURP Program (2004) – thermal analysis and design for CUBESAT; Mayur Patel – UCI SURP Program (2004) – structural design for CUBESAT;

Israel Figueroa – UC LEADS summer scholar (summer 2003) – performance of miniature combustion engines; Joyce Cheng – Summer Undergraduate Research Program (2003) (co-advised with W.A. Sirignano) – vaporization rate of a fluid film from a narrow tube; Jerry Reed – CAMP Summer Scholar (2003) – using ADVISOR for RC cars; Denish Kumar – Summer Undergraduate Research Program (2003) – ionic wind velocity;

Rudi Neri – McNair/STAR Research Scholar (2002/2003) – neighborhood electric vehicle; Annette Moreno and Jose Navarro – CODE Summer Scholars (2002) – frame design for an electric vehicle; Jesse Pompa – CAMP Summer Scholar (2002) – neighborhood electric vehicle power system; Jonathan Sujarit – Troy High School Summer Internship Program (2002);

UCI Undergraduate Research Opportunities Program – 1999/2000 – mentor for Catherine Le, Mike Papac, Jonathan Regele, Matt Rickard; electrosprays project;

UCI Undergraduate Research Opportunity Program – 1998/1999 – mentor for Catherine Le;

Summer Undergraduate Research Fellow (SURF) – 1994 – William Ortiz; McNair/STAR – 1994 – mentor for William Ortiz, Jesse McNaughton, Sylvia Rubalcava;

Summer Undergraduate Research Fellow (SURF) – 1993 – mentor for Salvador Vega; McNair/STAR – 1993 – mentor for Salvador Vega.

### **MAE Senior Project Supervision**

2017/2018 – Advanced combustion technology (7 students)

2016/2017 – Advanced combustion technology (7 students); Solar stove (14 students)

2015/2016 – Advanced combustion technology (2 students); Solar stove (8 students)

2014/2015 – Advanced combustion technology (3 students); Solar stove (7 students); Optical design (12 students – main supervisor was Prof. Sideris)

2013/2014 – Advanced combustion technology (8 students); Solar stove (6 students)

2012/2013 – Advanced combustion technology (4 students); Gas turbine tuning model for emission control (1 student); Carbon smoke measurement in remote regions (1 student)

2011/2012 – Carbon smoke measurement in remote regions (4 students); Gas turbine tuning model for emission control (1 student)

2010/2011 – Fuel hydrate combustion (8 students)

2009/2010 – Fuel hydrate combustion (1 student)

2008/2009 – SAE Formula car (27 students – main supervisor was Prof. McCarthy)

2007/2008 – SAE Formula car (30 students – main supervisor was Prof. McCarthy); Alternative fuel combustion channel (1 student; Eric Obzjetja); Small scale engine dynamometer (1 student; Chris Miller)

2006/2007 – SAE Formula car (30 students – main supervisor was Prof. McCarthy – helped supervise engine/drivetrain); UCISAT, cubical satellite (10 students – main supervisor was Prof. Villac); UCI Rocket (15 students – main supervisor was Prof. Mease)

2005/2006 – SAE Formula car (30 students – main supervisor was Prof. McCarthy – I supervised engine/drivetrain and driver interface); UCISAT, cubical satellite (10 students); UCI Rocket (6 students – main supervisor was Prof. Mease); infrared dental laser interaction with water (1 student)

2004/2005 – SAE Mini Baja car (15 students – main supervisor was Prof. McCarthy); UCISAT, cubical microsatellite (20 students, many ECE)

2003/2004 – Formula SAE miniature race car (2 students); UCISAT, cubical microsatellite (20 students, mostly ECE)

2002/2003 – Formula SAE miniature race car (14 students); neighborhood electric vehicle (3 students); hydrotherapy tub (2 students)

2001/2002 – Formula SAE miniature race car (15 students); miniature turbine engine (with W.A. Sirignano, 4 students)

2000/2001 – Formula SAE miniature race car (14 students)

1999/2000 – Electrospray system (8 students)

1987-1999 – Senior Projects varied in a different format

### **INVITED TECHNICAL LECTURES/PRESENTATIONS**

105. ME Graduate Student Association Research Symposium (MEGSA), University of California, Riverside, Invited Keynote - Electrical Aspects of Flames: Experiments on the International Space Station, May 25, 2018.
104. Multi Agency Coordinating Committee for Combustion Research (MACCCR), Sandia National Laboratories, Livermore, CA - Electric Field Effects on Flames in Microgravity on the International Space Station, April 11, 2018.
103. Gordon Research Conference on Natural Gas Hydrate Systems, invited - Combustion of Gas Hydrates, February 28, 2018.
102. University of California, San Diego, Combustion and Engineering Physics Seminar - Electrical Field Effects on Laminar Diffusion Flames, November 6, 2017.
101. KAUST Clean Combustion Research Center - New Combustion Concepts, Saudi Arabia, Invited Keynote - Electrical Aspects of Flames, Methane Hydrate Combustion, and Miniature Film Combustors, March 7, 2017.
100. University of California, Irvine, MAE Department Seminar - Lasers, Flames, and Aerosols: A Few Fringe Topics in Combustion, March 3, 2017
99. USJI, US-Japan Institute, Research Week, Washington D.C., Presentation and Panel Discussion – Clathrate Hydrates from Resource Development to Novel Energy/Environment Technologies, Environmental Opportunities using Clathrate Hydrates, September 16, 2016
98. Naval Research Laboratory, Washington D.C., Distinguished Chemistry Division Colloquium Speaker – Methane Hydrates: Potential Roles in Energy and the Environment, May 19, 2016
97. University of Southern California, Mechanical Engineering Seminar – Fringe Topics in Combustion, April 20, 2016
96. Korea National Combustion Conference Plenary Lecture, Jeju, Korea – Combustion of Methane Hydrates: Energy and Environmental Aspects, December 10, 2015
95. Seoul National University, Seoul, Korea, Mechanical/Aerospace Engineering Seminar – Laser Diagnostics in Combustion, December 9, 2015
94. Seoul National University, Seoul, Korea, Aerospace Engineering Seminar – Electrical Aspects of Combustion, December 8, 2015
93. US Combustion Meeting Plenary Lecture, Cincinnati, OH – Deep Ocean Power Science: Methane Hydrate Combustion, May 19, 2015
92. Keio University, Yokohama, Japan – Methane Hydrates: Their Growth and Combustion, April 17, 2015
91. Mini-Workshop on Hydrates, Aoyama Gakuin University, Sagami-hara Campus, Japan – Exploring Opportunities for Hydrates in Energy and the Environment, April 16, 2015
90. Gas Hydrate Conference, Research Center for Energy Technology and Strategy, National Taiwan University, Taipei, Taiwan, Opportunities for Hydrates in Energy and the Environment, April 13, 2015
89. Gas Hydrate Conference, Research Center for Energy Technology and Strategy, National Taiwan University, Taipei, Taiwan – Methane Hydrate Formation and Combustion, April 13, 2015
88. ASME-Orange County Chapter, Irvine, California – Thermodynamic Aspects of the Direct Combustion of Methane Hydrates, August 20, 2014
87. University of California, Riverside, Department of Mechanical Engineering Seminar – Direct Combustion of Methane Hydrates, May 23, 2014
86. Louisiana State University, Baton Rouge, Department of Mechanical and Industrial Engineering Seminar – Electrical Actuation of Small Diffusion Flames, April 4, 2014
85. University of California, Irvine, Department of Mechanical and Aerospace Engineering Seminar – Direct Combustion of Methane Hydrates, December 6, 2013
84. Syracuse University, Department of Mechanical and Aerospace Engineering Seminar – Droplet Streams and Droplet Stream Flames, October 16, 2013
83. National Academies US/Iran Symposium on Air Pollution in Megacities, Beckman National Academies, University of California, Irvine – Clean Combustion Technologies, September 3-5, 2013
82. National Cheng Kung University, Tainan, Taiwan, Aerospace Engineering Seminar – Combustion of Methane Hydrates, July 25, 2013
81. University of Alabama, Tuscaloosa, Mechanical Engineering Seminar – Methane Hydrate Combustion, April 11, 2013

80. Locomotion Systems Science Workshop, Washington D.C. – Personal Power Systems, May 29, 2012
79. UCSD Fluids and Combustion Seminar – Droplet Streams and Flames, April 30, 2012
78. China Lake Naval Warfare Center Lecture Series – Recent Research in Combustion – August 10, 2011
77. International Conference on Group Combustion of Droplets and Sprays, Tainan, Taiwan – Experimental Developments in Group Combustion of Many Droplet Systems: Droplet Stream Flames, January 20, 2011
76. UCI MAE Departmental Seminar – Droplet Streams and Droplet Stream Flames, January 7, 2011
75. Aoyama Gakuin University, Tokyo, Japan – Personal Power and Pollution: Critical Thinking for Graduate Study, November 26, 2010
74. GCOE Japan Hydrate Symposium – Combustion of Fuel Hydrates, March 15, 2010
73. CSULA CREST Center Seminar – Personal Power and Pollution, March 4, 2010
72. UCLA Mechanical Engineering Departmental Seminar – Using Old Fuels in New Ways and New Fuels in Old Ways, December 11, 2009
71. UCI MAE Departmental Seminar – Recent Research in the Lasers, Flames, and Aerosols Laboratory, October 14, 2009
70. NASA Glenn Research Center, Cleveland, Ohio – Electric Field Effects in a Small Co-Flow Diffusion Flame, (with S. Karnani), May 21, 2009
69. Hiroshima University, Hiroshima, Japan – Secondary Air Injection in a Miniature Film Combustor, and other topics, December 10, 2008
68. Osaka University, Osaka, Japan – Graduate Research in the LFA Group, December 8, 2008
67. Japanese Combustion Symposium, Kyoto, Japan – Electrical Manipulation of Flames, December 4, 2008
66. Aoyama Gakuin University, Tokyo, Japan – Using Old Fuels in New Ways, November 28, 2008
65. Keio University, Yokohama, Japan – Lasers, Flames and Aerosols: recent results in combustion research, November 27, 2008
64. Aoyama Gakuin University, Tokyo, Japan – Graduate Research at the University of California, Irvine, November 26, 2008
63. Physical Research Laboratory, Ahmedabad, Gujarat, India – Optical Particle Sizing, October 22, 2008
62. University of California, Riverside Departmental Seminar – Recent Combustion Research in Lasers, Flames, and Aerosols, October 10, 2008.
61. Sao Jose dos Campos, Brazil – Optical Diagnostics in Fluid/Thermal Science – Short Course – 6 lectures, July 14–18, 2008.
60. Universidad Nacional Estadio Sao Paulo (UNESP), Brazil – Lasers, Flames, and Aerosols: introduction to research in combustion at UCI, July 10, 2008.
59. Universidad Nacional Estadio Sao Paulo (UNESP), Brazil – Portable Power Systems, July 10, 2008.
58. Universidad Federal Rio de Janeiro, Brazil – Lasers, Flames, and Aerosols: current combustion research at UCI, July 8, 2008.
57. National Taiwan University, Taipei, Taiwan – Lasers, Flames, and Aerosols, June 5, 2008.
56. Industrial Technology Research Institute, Hsinchu, Taiwan – Lasers, Flames, and Aerosols: combustion research innovation, May 29, 2008
55. National Cheng Kung University, Tainan, Taiwan – Lasers, Flames, and Aerosols: current research topics at UCI, May 28, 2008.
54. Siemens Power Corporation, Orlando, Florida – Progress on Water/Oil Emulsion Formation and Spray Behavior, May 21, 2008 (with Dr. V.G. McDonell)
53. World Laser Clinical Institute, San Diego, CA – Fundamentals of Hydrophotonics, January 21, 2008.
52. University of Hawaii, Honolulu, HI, “Flame and Corona Ion Driven Winds,” October 19, 2007.
51. University of Southern California, Los Angeles, CA, Technology Summary for the workshop “Future Fuels Energy Initiative – Alternative Futures for the Automobile,” May 24, 2007.
50. World Laser Clinical Institute Super Symposium, Huntington Beach, CA – Mechanisms of Hydrophotonics, March 18, 2007.
49. Air Force Research Laboratories, Wright-Patterson Air Force Base, Dayton, OH – Laboratory Scale Combustion Experiments at UCI, February 5, 2007.
48. University of California, San Diego Fluid Seminar, San Diego, CA – Convective Transport in Flame and Corona Ion-Driven Winds, January 22, 2007.
47. NEDO Meeting on Tubular Flames, JFE Steel, Hiroshima, Japan – Film Combustor: a liquid-fueled tubular flame, November 10, 2006.

46. Western States Section/The Combustion Institute Spring Meeting, Boise, Idaho – Plenary Lecture - Small Scale Combustion, March 28, 2006.
45. Taiwan Combustion – Small Scale Combustion and Portable Power Systems, March 25, 2006.
44. National Cheng-Kung University, Tainan, Taiwan – Control of Ion Winds from Flames and Corona Discharges, March 23, 2006.
43. COBEM 2005, 18th International Congress on Mechanical Engineering, Ouro Preto, Brazil – Combustion Control, November 8, 2005.
42. COBEM 2005, 18th International Congress on Mechanical Engineering, Ouro Preto, Brazil – Miniature Combustion Systems, November 9, 2005.
41. Interdisciplinary Transport Phenomena in Microgravity and Space Sciences IV, Tomar, Portugal – Using Large Electric Fields to Control Transport in Microgravity, August 11, 2005.
40. UCI Henry Samueli School of Engineering Research Review – Portable Power Systems, May 23, 2005.
39. California Institute of Technology – Characterizing Ionic Winds from Flames and Corona Discharges, February 25, 2005.
38. University of California, Riverside, California – Portable Power Systems, November 24, 2004.
37. University of California, San Diego, California – Personal Power Systems, November 3, 2003.
36. UNESP/INPE, Universidad Nacional Estadio Sao Paulo – Oscillating Combustion for Incineration and Drying (informal discussions only), May, 2003.
35. Workshop on the Control of Fuel Cells, National Fuel Cell Research Center – Control Opportunities in Small Power Systems, April, 2003
34. Henry Samueli School of Engineering Research Review – Personal Power Systems: energy technologies to enhance human autonomy, March 14, 2003
33. Lawrence Livermore National Laboratories, Livermore, California – Personal Power Systems, May 8, 2002
32. University of California, Irvine Environmental Toxicology Seminar Series – Biomedical Applications of Electrosprays, April 26, 2002
31. Hamilton Sundstrand Corporation, San Diego, California – Personal Power Systems, April 26, 2002
30. University of Southern California, Los Angeles, California – Electric Field Manipulation of Flames: and other tales of combustion control, March 7, 2001
29. University of California, Irvine Environmental Toxicology Seminar Series – Prediction and Control of Indoor Air Contaminant Transport – UCI, January 22, 1999
28. American Industrial Hygienists Association Southern California Section Meeting – Prediction and Control of Indoor Air Flows – San Diego, California, August 27, 1998
27. Wright Research Laboratories, Wright-Patterson Air Force Base, – Optical Measurements in Droplet Stream Flames – Dayton, Ohio, June 22, 1998
26. ONERA, Division of Optical Physics seminar – Lasers, Flames, and Aerosols: non-intrusive measurements of heterogenous combustion, Palaiseau, France, June 9, 1997
25. University of Heidelberg, Sonderforschungsbereich 359, Physikalisch-Chemisches Institut Seminar – Laser Measurements in Droplet Stream Flames – Heidelberg, Germany, May 16, 1997
24. Lund Institute of Technology, Seminar in Combustion Physics – UCI Combustion Research Overview – Lund, Sweden, April 13, 1997
23. Institute of Physics, Combustion Physics Group meeting on Combustion Control – Adaptive Control of Flames – Harwell, England, April 9, 1997
22. Imperial College, Mechanical Engineering Dept. Seminar – Active Control of a Laminar Diffusion Flame Sheet – January 30, 1997
21. Imperial College, Chemical Engineering Dept., Combustion Group Seminar – Tulip Flames and other Combustion Flowers – January 19, 1997
20. Imperial College, Chemical Engineering Dept. Seminar – Droplet Streams and Flames – November 28, 1996
19. MIT – Engineering Design in Industry, Indoor Air Quality, and Combustion Control, April 29–30, 1996 (informal discussions only)
18. “Combustion Control,” Department of Mechanical and Aerospace Engineering, University of California, Los Angeles; November 1995;
17. “Droplet Streams and Droplet Stream Flames,” Engineering Division, Colorado School of Mines, Golden; October 1995;

16. "Indoor Air and Aerosols," Department of Mechanical Engineering, University of Iowa, Iowa City; October 1995;
15. "The Tulip Flame," Fluid/Thermal Sciences Seminar, Department of Mechanical and Aerospace Engineering, University of California, Irvine; January 1995
14. "Droplet Arrays and Streams," IUTAM Meeting on Mechanics and Combustion of Droplets and Sprays, National Cheng Kung University, Tainan, Taiwan; December 1994
13. "Fundamentals of Laser Diagnostics," Non Destructive Testing Workshop, University of California, Irvine; August 1993
12. "Optical Measurements in Engineering," California Alliance for Minority Participation Seminar Series, University of California, Irvine; May 1993
11. "Clean and Efficient Combustion," Summer Science Institute, University of California, Irvine; August 1991
10. "Optical Measurements in Two-Phase Flows," MERIT meeting with industry, Fluid/Thermal group; February, 1991
9. "Laser Measurements for Clean and Efficient Combustion," Summer Science Institute, University of California, Irvine; August 1990
8. "Laser Diagnostics in Particle Laden Flows," Fall Meeting of the Los Angeles Section of the IEEE Laser and Electro-Optic Society; November 1988
7. "CARS in Engines," University of California, Irvine; May 1988
6. "Particle Size Distribution Evolution during Coal Combustion," University of California, Irvine; October 1987
5. "Numerical Simulation of Coal Combustion," Sandia National Laboratories, Livermore; May 1987
4. "Particle Size Distribution Evolution during Pulverized Coal Combustion," National Bureau of Standards; May 1986
3. "In-Situ Optical Particle Counting and Sizing Applied in Coal Combustion Research," University of California, Irvine; February 1986
2. "Combustion Generated Flow—'Tulip' Flame Formation," California Institute of Technology; November 1985
1. "Flame Propagation in a Closed Duct," Stanford University; May 1985

## **SPECIAL PROGRAMS AND PRESENTATIONS**

### **Graduate Outreach**

Faculty Panel - Engineering DECADE Graduate Students - discussion of faculty advising and mentoring, UCI, September 23, 2016

NSF UCI Bridge-to-the-Doctorate director kickoff and quarterly meetings, UCI, 2015/2016

Graduate Orientation Panel - panel discussion for incoming graduate students, UCI, September 18, 2015

The Job Talk - presentation in Graduate Certificate Series Preparing for a Faculty Career, UCI, May 10, 2016

Internship Opportunities in MAE at UCI - presented at ENSMA/ISAE, Poitiers, France, November 18, 2014

President's Postdoctoral Fellow Panel - Tips for Tenure - 30th Anniversary Celebration of the PFPF, Berkeley, CA, October 10, 2014

Welcome to UCLA Bridge-to-the-Doctorate Scholars, UCLA, September 29, 2014

Ethics in Academics, Research and Personal Decisions, Speaker for Graduate Student Training Intensive, UCI, May 30, 2014

President's Postdoctoral Fellow Onsite Review Panel, Chair Engineering, Mathematics, and Physical Sciences Division, February 3, 2012

President's Postdoctoral Fellow Onsite Review Panel, February, 4, 2011

ASME Student Meeting on Graduate School for Mechanical Engineers, UCI, November 17, 2010

Panel discussion for summer diversity students in AGEP and other programs, UCI, June 30, 2010

Panel discussion for new graduate students in AGEP, UCI, July 29, 2008

HENAAC Summit Meeting – HSSoE Representative (as academic partner) to Opening Dinner, Anaheim, July 6, 2005



California Forum for Diversity in Graduate Education – panel member in Engineering Session, University of San Diego, April 9, 2005

CAMP Statewide Symposium – moderator for panel on Graduate Education, UCI, February 2005

California Forum for Diversity in Graduate Education – panel member in Engineering Session, California State University, Ventura, May 2004

UC President's Postdoctoral Fellowship Program – review panel member, May 2003

McNair/STAR Program Workshop – panel member on applying to graduate school, April 2002

UC President's Postdoctoral and Dissertation-Year Fellowship Program Workshop – panel member in the session on Mentoring, November 2001

Alliance for Graduate Education and the Professoriate (AGEP); research overview; UCI – July 2000

Fulbright Workshop on Graduate Study in the U.S. – May 1997 – panelist discussing opportunities for financial support

Fulbright Workshop on Graduate Study in the U.S. – November 1996 – panelist discussing opportunities for financial support

### **Undergraduate Outreach**

SPOP Faculty Welcome - faculty introduction for the student/parent orientation, UCI, July 24, 2017

SPOP Faculty Welcome - faculty introduction for the student/parent orientation, UCI, July 9, 2016

International Student Orientation - faculty remarks, UCI, September 13, 2016

International Student Orientation - faculty remarks, UCI, September 16, 2015

SPOP Faculty Welcome - faculty introduction for the student/parent orientation, UCI, August 19, 2015

Advisory Board Meeting for Irvine Valley College Engineering Technology Program, November 9, 2014

Introduction to MAE – lecture in Engr 7A Freshmen course, October 15, 2015

Introduction to MAE – lecture in Engr 7 Freshmen course, October 23, 2014

Introduction to MAE – lecture in E98 Freshmen course, October 31, 2013

Undergraduate Research for Transfer Students - introductory lecture, UCI, May 30, 2013

Introduction to MAE – lecture in E98 Freshmen course, October 25, 2012

Mechanical Engineering as a Discipline – lecture in E1 course, October 24, 2011

UCI Summer Start Transfer Student Program - faculty panel, August 11, 2011

UCI Summer Undergraduate Program - faculty panel, June 27, 2011

Mesa Court Faculty Night, presentation and discussion with UCI undergraduates, April, 20, 2011

Advisory Board Meeting for East LA College Technology Program, June 29, 2010

Faculty lunch roundtable for entering transfer students, Transfer Summer Start Program, July, 2009

University of California Louis Stokes Alliance for Minority Participation (CAMP)

**2016/2017** CAMP Statewide Symposium – Head Judge, February 2017; CAMP Yield Opening Remarks, Spring 2017; CAMP Summer Science Academy – Closing Remarks, August 2017; Critical Thinking in STEM, lecturer, July/August 2017; Summer Scholars Undergraduate Research in STEM, lecturer, July/August 2017

**2015/2016** CAMP Statewide Symposium – Head Judge, February 2016; CAMP Yield Opening Remarks, Spring 2016; CAMP Summer Science Academy – Closing Remarks, August 2016; Critical Thinking in STEM, lecturer, July/August 2016; Summer Scholars Undergraduate Research in STEM, lecturer, July/August 2016

**2014/2015** CAMP Statewide Symposium – Head Judge, February 2015; CAMP Yield Opening Remarks, Spring 2015; CAMP Summer Science Academy – Open Mic Speaker, July/August 2015; Critical Thinking in STEM, lecturer, July/August 2015; Summer Scholars Undergraduate Research in STEM, lecturer, July/August 2015

**2013/2014** CAMP Statewide Symposium – Head Judge, February 2014; CAMP Yield Opening Remarks, Spring 2014; CAMP Summer Science Academy – Open Mic Speaker, July/August 2014; Critical Thinking in STEM, lecturer, July/August 2014; Summer Scholars Undergraduate Research in STEM, lecturer, July/August 2014

**2012/2013** CAMP Statewide Symposium – Head Judge, February 2013; CAMP Yield Opening Remarks, Spring 2013; CAMP Summer Science Academy – Open Microphone Speaker, Opening Speaker, July/August 2013; Critical Thinking in STEM, lecturer, July/August 2013

**2011/2012** CAMP Statewide Symposium – Head Judge, February 2012; CAMP Yield Opening Remarks, Spring 2012; NSF Joint Annual Meeting Participant, Washington D.C., June, 2012; CAMP

Summer Science Academy – Open Microphone Speaker, Opening Speaker, July/August 2012; Critical Thinking in STEM, lecturer, July/August 2012

**2010/2011** CAMP Statewide Symposium – Head Judge, February 2011; CAMP Yield Opening Remarks, Spring 2011; NSF Joint Annual Meeting Participant, Washington D.C., June, 2011; CAMP Summer Science Academy – Open Microphone Speaker, Opening Speaker, July/August 2011; Critical Thinking in STEM, lecturer, July/August 2011; Summer Scholars Symposium – opening speaker, September 2011

**2009/2010** CAMP Statewide Symposium – Head Judge, February 2010; CAMP Yield Opening Remarks, Spring 2010; NSF Joint Annual Meeting Participant, Washington D.C., June, 2010; CAMP Summer Science Academy – Open Microphone Speaker, Opening Speaker, July/August 2010; Summer Scholars Symposium – opening speaker, September 2010

**2008/2009** CAMP Statewide Symposium – Head Judge, February 2009; CAMP Yield Opening Remarks, Spring 2009; NSF Joint Annual Meeting Participant, Washington D.C., June, 2009; CAMP Summer Science Academy – Open Microphone Speaker, Opening Speaker, July/August 2009; Summer Scholars Symposium – opening speaker, September 2009

**2007/2008** CAMP Statewide Symposium – Head Judge, February 2008; CAMP Yield Opening Remarks, Spring 2008; CAMP Summer Science Academy – Open Microphone Speaker, Closing Speaker, July/August 2008; Transfer Student Welcome – panel speaker, July 2008; Summer Scholars Symposium – opening speaker, September 2008

**2006/2007** CAMP Statewide Symposium – Poster Judge, February 2007; CAMP Yield Closing Remarks, Spring 2007; CAMP Summer Science Academy – Welcome Speaker, Open Microphone Speaker, Closing Speaker, July/August 2007

**2005/2006** CAMP Statewide Symposium – Head Judge and Awards Organizer, February 2006; CAMP Yield Opening Remarks, Spring 2006; Farewell Banquet Speaker, June 2006; CAMP Summer Science Academy – Welcome Speaker, Open Microphone Speaker, Closing Speaker, July/August 2006

**2004/2005** CAMP Statewide Symposium – Head Judge and Awards Organizer, February 2005; CAMP Yield Opening Remarks, Spring 2005; Farewell Banquet Speaker, June 2005; CAMP Summer Science Academy – Welcome Speaker, Open Microphone Speaker, July/August 2005

**2003/2004** CAMP Statewide Symposium – CAMP Yield Opening Remarks, Spring 2004; CAMP Summer Science Academy – Welcome Speaker, Open Microphone Speaker, Closing Speaker, July/August 2004

**2002/2003** CAMP Summer Science Academy – Faculty Speaker for School of Engineering – August; CAMP Yield Program – Faculty Speaker, opening remarks and Faculty Panel – parents and students considering UCI, Spring; CAMP Statewide Symposium – Head Judge and Awards Organizer, February.

**2001/2002** CAMP Summer Science Academy – Opening and Closing Day Speaker, August; CAMP Yield Program – Faculty Speaker, opening remarks – parents and students considering UCI, Spring; CAMP research opportunities workshop – October;

**2000/2001** Community College Summer Institute – opening day Plenary speaker for a week long preparatory experience for community college transfer SMET students, August; CAMP Summer Science Academy – Faculty Speaker – part of a 6 week precollege preparatory experience for underrepresented students bound for SMET majors, July; Senior Faculty/Staff Recognition night – June.

**1999/2000** opportunities in engineering; comments to CAMP summer science academy participants – July; Summer Scholars research symposium; opening remarks – September; CAMP research opportunities workshop – October; Senior Faculty/Staff Recognition night; opening remarks & M.C. – June.

**1995/1996** Summer 1996 – Organized Engineering research activities for summer participants; October 1995 – roundtable discussion regarding admission and performance in graduate school

**1994/1995** Summer 1995 – Student Mentor and Poster Judge for AMP Research Conference hosted at UCI

**1993/1994** Summer 1993 – Mechanical Engineering group – “Active Control of Buildings”

**1992/1993** Summer 1992 – Mechanical Engineering group – “Laser Position Sensor”

Society for Hispanic Professional Engineers (SHPE) Leadership Conference – Workshop Leader – teamwork and team building – April, 2003

Mexican American Engineers and Scientists (MAES) Annual Conference – Judge for research presentations – Anaheim, February 2003

UCI Undergraduate Research Symposium – May 2001 – symposium moderator for platform session in physical sciences and engineering

UCI Undergraduate Research Symposium – May 1999 – symposium moderator for platform session in physical sciences and engineering

ASME Student Chapter meeting, internships: value and opportunity, January 17, 1996

UCI Pregraduate Mentorship Program (PGMP) – Symposium Judge – May 1996 – viewed and judged projects completed by minority undergraduate students in science and engineering

Engineering Welcome Day, parent/student orientation at UCI, March 9, 1996

Welcome to UCI, parent/student orientation and discovery to MAE at UCI, March 25, 1995, UCI.

Choices, parent/student conference to examine opportunities for minority students in Engineering, June 4, 1994, UCI.

Celebrate UCI, parent/student orientation to MAE at UCI, April 16, 1994, UCI.

Celebrate UCI, parent/student orientation to MAE at UCI, April 17, 1993, UCI.

### **Pre-College Outreach**

COSMOS – co-organizer and instructor for the Mechanical and Aerospace Engineering Cluster – 4 week summer course for pre-college students, each July, 2010-2017 (with F. Jabbari and K. Mease)

Upland ARCHES Program – Introductory remarks to 8th and 9th graders visiting UCI, May, 2010

COSMOS – co-organizer and instructor for the Mechanical and Aerospace Engineering Cluster – 4 week summer course for pre-college students, July 2009 (with F. Jabbari, J. Bobrow, and K. Mease)

San Francisco SMASH Program Health Sciences Bound High-Schoolers – Introductory remarks for UCI visitors, March 29, 2010

CAAP Summer Accelerated Math Program for African American Male Students – laboratory tour of Lasers, Flames, and Aerosols facility, July 2009

COSMOS – co-organizer and instructor for the Mechanical and Aerospace Engineering Cluster – 4 week summer course for pre-college students, July 2008 (with F. Jabbari, B. Villac, M. Gamero-Castano, and K. Mease)

Push-Pull Symposium applied science speaker – UCI visit for inner city youth organized by the Alpha Phi Alpha Fraternity Incorporated, June 2007

COSMOS – co-organizer and instructor for the Mechanical and Aerospace Engineering Cluster – 4 week summer course for pre-college students, July 2007 (with F. Jabbari, J.E. Bobrow, and K. Mease)

COSMOS – organizer and instructor for the Mechanical and Aerospace Engineering Cluster – 4 week summer course for pre-college students, July 2006 (with F. Jabbari and K. Mease)

COSMOS – organizer and instructor for engineering aspects of the Energy and the Environment Cluster – 4 week summer course for pre-college students, July 2005 (with F. Jabbari)

COSMOS – creator and instructor for Energy and the Environment Cluster – 4 week summer engineering course for pre-college students, July 2004 (with Prof. F. Jabbari and Prof. P. Farmer)

COSMOS – creator and instructor for “Aerospace Engineering” and “Mechanical Engineering” Clusters – two 4 week summer engineering courses for pre-college students, July 2003 (with Prof. J. Bobrow, Prof. F. Jabbari, and Prof. K. Mease)

COSMOS – creator and instructor for “Aerospace and Mechanical Engineering” – 4 week summer engineering course for pre-college students, July 2002 (with Prof. F. Jabbari and Prof. K. Mease)

COSMOS – creator and instructor for “Engineering the Automobile” – 4 week summer reverse engineering course for pre-college students, July 2001 (with Prof. F. Jabbari)

Career Day – presentations on the opportunities of an engineering career to Vista Verde middle school students – May 2001

Ask-a-Scientist night – preparation for the Irvine Unified School District Science Fair – for K-8 students – October 2000

UCI AP Calculus Summer Institute; engineering keeps your options open; presentation to 11th graders; UCI August 2000

Career Awareness Day presentation; Vista Verde Middle School – May 2000

SAE World-in-Motion engineering outreach into Vista Verde Middle School – Spring 1999 – presented flight dynamics exploratory class for 6-8 graders

Ask-a-Scientist night – preparation for the Irvine Unified School District Science Fair – for K-8 students – October 1999

SAE World-in-Motion engineering outreach into Vista Verde Middle School – Fall 1998 – presented an engineering exploratory class for 6-8 graders

Black Leadership Conference and Family Day – March 1996 – Overview of UCI Mechanical and Aerospace Engineering for high school students and their families  
Career Day – Rancho San Joaquin Middle School – 1995

### **General Public and Education**

Invited Panelist on “A Voyage Through Combustion,” US Combustion Meeting, May 19, 2015, Cincinnati, OH  
American Society of Engineers of Indian Origin (ASEI) – Welcome Remarks – Annual Meeting, September 26, 2014, UCI  
Anacapa School Space Science Unit Lecture – Fire in Space: microgravity combustion science, January 30, 2013, Santa Barbara, CA  
Sustainable Energy Technology Club (SETC) Seminar – Personal Power and Pollution, November 2, 2010, UCI  
Orange County Engineering Council, Leaders Night Keynote Address – Connecting Engineering Science and Design, August 19, 2010, Santa Ana, CA  
ASME Mechanical Engineering Education Conference – Diversity in Engineering: Leveraging Alliances for Minority Participation, March 26, 2010, Newport Beach, CA  
Olli Continuing Education Lecture, UCI – Sustainable Energy from Coal?, October 28, 2009  
Sustainable Energy Technology Club (SETC) Seminar – Personal Power and Pollution, October 13, 2009  
Laguna Woods Science Club – “Power and Pollution” – public lecture on combustion and its emissions implications; April 2009.  
Hawaii State Teachers Association, Hawaii – Tribute to Hawai’i State Public Education: Building Fundamentals and Encouraging Creative Initiative, October 11 (Oahu), October 12 (Molokai), October 13 (Maui), 2004.  
Regent’s Point Lecture Series, Irvine California – Small Power Sources, September 11, 2002  
Regent’s Point Seminar – “Power and Pollution” – public lecture on combustion and its emissions implications; November 2001  
E-Week Evening with Industry, Designing Engineers for the Future, keynote speech at E-week reception, February 28, 1996

### **Advisory Activities**

Advisory Board for UCI Extension Optical Engineering and Optical Instrument Design Program – member – 2014-  
Advisory Board for East LA College Engineering Technology Program – member – 2010-  
Indoor Aerosol working group of the American Association for Aerosol Research – member – 1995-1998  
NSF Advanced Combustion Engineering Research Center, Thrust Area 6 External Working Group – member – 1994-1995

### **Contractor and Industry Conferences**

Clearsign Combustion Inc. Invitational Symposium, “Electric Field Effects on Flames: UCI Activities,” Seattle, WA, September 26, 2016  
Requirements Definition Review, “E-FIELD Flames, Electrical Aspects of Microgravity Combustion – part of the ACME suite of flight experiments,” NASA Glenn Research Center, Cleveland, OH, May 10-11, 2010.  
Electric Power Research Institute Project Review, “Characterization of ABS Formation in Model Air-Preheater Channel,” UCI, October 9, 2009  
General Electric Project Review, “Coal Combustion Fundamentals,” UCI, September 22, 2009  
General Electric Project Review, “Coal Combustion Fundamentals,” UCI, October 7, 2008  
Science Concept Review, “E-FIELD Flames, Electrical Aspects of Microgravity Combustion,” NASA Glenn Research Center, February 20-21, 2008  
Institute for Science and Health Workshop, “Size-selective Chemistry of Mainstream Tobacco Smoke,” Poster presentation, St. Louis, MO, February, 2005  
NASA Microgravity Combustion Workshop, “Applications of Electric Fields in Microgravity Combustion,” Cleveland, OH, May, 2003  
NASA Microgravity Combustion Workshop, “Electrical Aspects of Microgravity Combustion,” Cleveland, OH, May, 2001

NSF Site Visit for SCCEME “Connecting Engineering Science and Practice,” California State University Long Beach, May 24, 1996

California Institute for Energy Efficiency, “Industrial, Low NOx, High-Efficiency Burners,” Advisory Committee Meeting, UCI, 1994

California Institute for Energy Efficiency, “Diagnostics Progress in Ultra-Low-NOx Industrial Gas Burners,” CIEE Contractor Meeting, Lake Tahoe, CA, 1994

California Institute for Energy Efficiency, “Low NOx Burner Measurements,” CIEE Contractor Meeting, San Diego, CA, 1993

California Institute for Energy Efficiency, “Diagnostics for Ultra-Low-NOx Burners,” Advisory Committee Meeting, UCI, 1991

## **WORKSHOP PARTICIPANT**

“Fiery Ice 2016,” 10th International Workshop on Methane Hydrate Research and Development, Honolulu, Hawaii, June 15–17, 2016

“Pacific Rim Workshop on Deep Ocean Power Science,” Honolulu, Hawaii, February 23–26, 2014

“Locomotion Systems Science,” NSF/ARO Joint Workshop, Washington, D.C., May 29–31, 2012

“PreSICE - Predictive Simulation of Internal Combustion Engines,” U.S. Department of Energy, Washington, D.C., March 3, 2011

“Energy Independence: America’s Challenge in the Global Economy,” Educational Symposium, The Island Hotel, Newport Beach, California, May 13, 2008

“Future Fuels Energy Initiative – Alternative Futures for the Automobile,” University of Southern California, May 23–24, 2007

“Basic Research Needs for Clean and Efficient Combustion of 21st Century Transportation Fuels,” U.S. Department of Energy, Washington, D.C., October 29–November 1, 2006.

“Lean Combustion Technology and its Control II,” Engineering Conferences International, Tomar, Portugal, April 25–29, 2004

“Control of Fuel Cells,” National Fuel Cell Research Center, UCI, April, 2003

“Personal Power Systems – setting the research agenda,” Arnold and Mabel Beckman Center, Irvine, CA; September 4, 2002

“Lessons from the EC 2000 Accreditation Process,” ASEE Pacific Southwest Section Conference, April 8–9, 2002

“President’s Postdoctoral and Dissertation-Year Fellowship Workshop,” Oakland, CA; November 2, 2001

“Lean Combustion Technology and its Control,” United Engineering Foundation Workshop, Santa Fe, NM; November 17–21, 2000

“National Academy of Engineering National Meeting and Symposium,” Arnold and Mabel Beckman Center, Irvine, CA; February 12, 1999

“Forum on the Future of Graduate Education and Training in the Sciences and Engineering,” Arnold and Mabel Beckman Center, Irvine, CA; January 29, 1999

“Faculty Summer Institute on Use of Technology in the Classroom,” University of California, Irvine, CA; July 27–31, 1998

“Physics of Inhaled Concentrated Aerosols,” National Academy of Sciences UCI, June 5, 1998

“Special Guest Day at LLNL Engineering,” Lawrence Livermore National Laboratory, Livermore, CA; September 2, 1997

“Workshop on the Product Realization Process – A Design Education Methodology,” North Carolina A&T, Greensboro, NC; July 21, 1997

“Workshop on Education in Manufacturing Engineering,” SCCEME Workshop, Long Beach, CA; November 10, 1995

“Workshop on Clean Manufacturing Research Opportunities,” UCLA; September 11, 1995

“Workshop on Alternative Transportation Technologies,” Lawrence Berkeley Laboratory and the UC Energy Institute, Livermore, CA; August 1995

“Conference on Scientific Countermeasures for Pollutant Emissions from Internal Combustion Engines,” UC Berkeley, California; November 1993

“SAE TOPTEC on Natural Gas Vehicles,” Austin, Texas; May 1993

“Tobacco Related Disease Research Program,” Long Beach Hilton; August 1991

“Combustion Dynamics Facility,” Lawrence Berkeley Laboratory; April 1990

“Combustion of Droplets and Sprays,” Sandia National Laboratories; May 1988

## CONTRACTS AND GRANTS

### Awarded Contracts and Grants

Mid IR Laser Sensor for Continuous SO<sub>3</sub> Monitoring to Improve Coal-Fired Power Plant Performance during Flexible Operations, U.S. Dept. of Energy, sub-award from Opto-Knowledge Systems, \$40K, 6/1/2018-9/30/2020

Watery Fuel Diffusion Flames, supplement for REU and Non-Academic Internship, National Science Foundation CBET program, \$55K, 5/1/2018-4/30/2019

Ballistic Holography under Realistic Spray Conditions, Army Research Office, \$150K, 1/3/2017-1/2/2018

ACME - Electric Field Effects on Laminar Diffusion Flames, NASA renewal, \$450K, 11/18/2016-11/17/2019

Relationship between SO<sub>3</sub> and H<sub>2</sub>SO<sub>4</sub> in Power Plant Flue Gas - supplement, EPRI, \$26K, 5/2017-9/2017

Spatially and Temporally Resolved Diagnostics of Dense Sprays Using Gated, Femtosecond, Digital Holography, NASA SBIR Phase I w/Metrolaser, \$33.8K UCI share, 6/2016-12/2016

Watery Fuel Diffusion Flames, National Science Foundation CBET program, \$300K, 6/2016-5/2018

Relationship between SO<sub>3</sub> and H<sub>2</sub>SO<sub>4</sub> in Power Plant Flue Gas, Electric Power Research Institute (EPRI), \$151K, 11/2015-10/2016

Advanced Hydrate Separation Processes for Energy/Environment Applications, UCI Innovation Ignition Initiative (I3) Program, \$50K, start July 2015 (with P. Taborek and M. Nillson co-PIs)

Louis Stokes Alliance for Minority Participation Bridge-to-the-Doctorate Training Grant – National Science Foundation, \$987K, 2 years, start 4/1/2015 (co-PI and director, w/H. Gillman as formal PI)

Applications of Electric Fields in Microgravity Combustion – NASA renewal, \$240K, 10/2014–9/2016, extension of prior grant

Stored Energy Solar Stove Technology – Gates Foundation Grand Challenges Explorations Phase I, \$100K, 11/2013-11/2015

Supplement for Pacific Rim Workshop on Deep Ocean Power Science – National Science Foundation, \$5K, 9/2013–8/2014

Pacific Rim Workshop on Deep Ocean Power Science – University of California Pacific Rim Program, \$25K, 2013/2014

Deep Ocean Power Science Laboratory – W.M. Keck Foundation, \$1,000,000, 1/2013–12/2015 (with P. Taborek co-PI)

Empowering Women for Experimental Research with Fabrication Skills – UCI DECADE Mentor Grant Program, Phase I, \$30K, summer 2012; Phase II, \$30K, summer 2013

GOALI: Probing Dense Sprays with Gated, Picosecond, Digital Particle Field Holography – National Science Foundation, \$325K, 9/2012–8/2016

Applications of Electric Fields in Microgravity Combustion – NASA renewal, \$300K, 10/2011–9/2014, extension of prior grant

Assessing Cookstove Emissions: Global and Local Impacts – UCI Environment Institute, \$30K, 3/2012–2/2013 (with R. Edwards co-PI)

Mercury Removal from Flue Gas via Aqueous Precipitation – Calera and the UC Discovery Program – \$75,200, 8/2010–7/2011

Cal State LA CREST Center Project – alternative fuel combustion – \$30K/year, approximate; depends on student involvement level, 7/2010–6/2012

Mercury Capture During In-Situ Carbon Sequestration from Combustion – preliminary design – Calera Corporation, \$20K, 9/09-12/09

Probing Dense Sprays with Gated, Picosecond, Digital Particle Field Holography – Office of Naval Research STTR w/Metrolaser, \$30K, 7/2010–5/2011

MRI-R2: Acquisition of a structural dynamics and surface characterization system for research and educational activities on microscale structures and devices – National Science Foundation Major Research Instrumentation, \$670K, 4/2010–3/2011 (Co-I, with L. Valdevit PI, and several other Co-I)

Applications of Electric Fields in Microgravity Combustion – NASA renewal, \$200K, 10/2009–9/2011, extension of prior grant

Cal State LA NASA Center Project – \$50K/year, approximate; depends on student involvement and interactions, 7/2008–12/2012

Experimental Investigation of Ammonium Bisulfate (ABS) Formation in a Model Single Air Preheater Channel – Electric Power Research Institute (EPRI), \$20K, 10/2009–12/2009, supplement on prior grant

Combustion of Fuel Hydrates – National Science Foundation, \$330K, 9/2009–8/2012 (with P. Taborek co-PI)

Fluid Mechanics of Environmentally Significant Hydrate Slurries (2009-02) – UCI Environment Institute, \$30K, 3/2009–2/2010 (with P. Taborek co-PI)

The two-way interactions between vaporizing liquid droplets and a turbulent flow: Fully resolved DNS and experiment – National Science Foundation \$300K, 9/2009–8/2012 (co-PI, with S. Elghobashi, PI and J.C. LaRue co-PI)

Mercury Capture by Coal Flyash, General Electric Corporation and the UC Discovery Program supplement to Char Burnout Kinetics grant, \$45K, 11/2008–11/2009

Quantum Cascade Laser Technology applied to Energy Systems, General Electric Corporation, \$100K, 3/2010–2/2011

Particle Chaining in Viscoelastic Fluid – National Science Foundation, \$350K, 9/2008–8/2011 (co-PI, equally shared with R.H. Rangel, PI, and D. Joseph, co-PI)

Experimental Investigation of Ammonium Bisulfate (ABS) Formation in a Model Single Air Preheater Channel – Electric Power Research Institute (EPRI), \$136K, 12/2007–12/2008

Active Control of Liquid Jet Breakup for Advanced Manufacturing – National Science Foundation, \$200K, 9/2007–8/2010 (with F. Jabbari, co-PI)

Fundamentals of Biomass and Char Burnout for Future Carbon-Neutral Power Generation – UC Discovery Grant Program, \$250K, 9/2007–8/2009

Oil/Water Emulsion Formation, Atomization, and Vaporization – Siemens Power Corporation, \$270K, 8/2007–7/2009 (co-PI, with W.A. Sirignano, PI, and V. McDonell, co-PI)

TRDRP Dissertation Fellowship, Neha Gowadia – Tobacco Related Disease Research Program, \$30K, 7/07–6/08

Applications of liquid lenses to biotechnology and chemical sensing – UCI CORCLR Interdisciplinary Research Program, \$25K, 7/07–6/08 (with P. Taborek, Department of Physics)

Oil/Water Emulsion Mixing, Atomization and Vaporization Characterization, Literature Review – Siemens Power, \$25K, 2/2007–6/2007 (co-PI, with W.A. Sirignano, PI, and V. McDonell, co-PI)

Developing Coal Char Oxidation Kinetics for Practical Staged Systems – General Electric Environmental Services, \$200K, 9/2007–8/2009

Applications of Electric Fields in Microgravity Combustion – National Aeronautics and Space Administration, \$325K, 10/06–9/09 – this is a reinstatement and extension of the prior grant

Turbine Burners: Turbulent Combustion of Liquid Fuels – Air Force Office of Scientific Research, \$500K, 2/06–1/09 (co-PI, with W.A. Sirignano, PI, and F. Liu, co-PI)

Portable Power for Space Applications – UC CalSpace Program, \$55K/yr, 7/05–6/06

Size-selective Chemistry of Mainstream Tobacco Smoke – Institute for Science and Health, \$75K, 2/05–1/06

In-Situ Assessment, Analysis, and Remediation of Soil Contamination – Komex Environmental Ltd., \$38K, 11/03–3/05

Campus Research Center in Personal Power Systems – UCI Research and Graduate Studies, \$15K/yr, 7/03–6/06 (with F. Jabbari and K. Mease)

Nanowire Thermoelectrics for Generating Power from Waste Heat – UCI Interdisciplinary Research Program, \$10.5K, 7/03–6/04 (with R. Penner, Department of Chemistry)

Research Tools Training for Engineering and the Physical Sciences – UCI Instructional Improvement Grant, \$5K, 7/03–6/04 (with F. Jabbari and R. Jeffers)

Electric Field Applications in Microgravity Combustion – National Aeronautics and Space Administration, \$425K, 10/03–9/07

International Planning Grant to Brazil – National Science Foundation, \$3K, 6/02–5/03

Personal Power Systems Center Proposal Preparation – UCI Interdisciplinary Grant Program, \$30K, 7/02–6/03

Miniature Film Combustor – National Science Foundation, \$355K, 9/02–8/05 (PI: Sirignano)

Miniature Film Combustor – UC Energy Institute, \$30K, 7/02–6/03 (PI: Sirignano)

High Speed Imaging Equipment – National Science Foundation Equipment grant, \$126K, 7/01–6/02

Technical Review of Air Pollution Technology – ICAT program, California Environmental Protection Agency, \$8K/yr, 11/99–ongoing

Applications of Electric Fields in Microgravity Combustion, National Aeronautics and Space Administration, \$354K, 12/1/98–11/30/02

Applications of Electric Fields in Space, CalSpace, \$25K, 7/98–6/30/99

Introducing Product Realization into the Design Curriculum for Mechanical Engineering, UCI Instructional Improvement grant, \$5K, 1 yr, start 7/97

Resonant Holographic Interferometry: Diagnostic Capabilities in Multi-Phase Flame Environments, National Science Foundation GOALI program, \$168K, 8/97–7/00

Beta-test of Product Realization Modules, Product Realization Consortium of the NSF, \$5K, 1 yr, start 7/97

Resonant Holographic Interferometry, An Innovative Technique for Combustion Diagnostics, Metrolaser, \$20K/yr, 3 yrs, start 6/96

Hydrodynamics of Aquatic Locomotion in Fishes, Committee on Research, UCI, \$12.5K equipment grant, 1996/97

Laser Diagnostics for Combustion Systems, Metrolaser, \$14K/yr, 1 yr, start 2/15/96

Southern California Coalition for Education in Manufacturing Engineering, National Science Foundation, \$37.5K, 1 yr, start 4/1/95 (with Dr. McCarthy; Dr. Bobrow; Dr. Mease of MAE; PI is Dr. A.R. Stubberud, ECE)

NIST Graduate Student Research Supplement, National Science Foundation, \$12K, 3 months, start 6/15/95

Adaptive Control of Flames and Combustion Performance, UC Energy Institute, \$24.4K/yr, 1 yr, start 7/1/95 (with Dr. F. Jabbari)

Graduate Assistance in Areas of National Need–Training Grant, U.S. Department of Education, \$236,430/yr, 3 yrs, start 7/1/95 (with Dr. F. Jabbari, Dr. A.J. Szeri, and Dr. W.E. Schmitendorf)

Acoustic Control of a Spray Nozzle, Berkeley Applied Science and Engineering, \$7.5K, 3 months, start 4/1/95

RHIS Imaging in Combustion Systems, MetroLaser, \$14K/yr, 1 yr, start 2/15/95

Contaminant Transport Indoors, Center for Indoor Air Research, \$85K/yr direct, 3 yrs, start 2/1/95

Energy Efficiency in Industrial Burners–continuation, California Institute for Energy Efficiency, \$150K/yr, 1 yr, start 1/1/95 (with Dr. G.S. Samuelsen, Lawrence Livermore Laboratory, Sandia National Laboratory in Livermore)

Adaptive Control of Combustion, UCI Research Faculty Fellowship, \$7.5K, 1 yr, start 7/94

Enhanced Engineering Design Education, UCI Undergraduate Studies Office, \$1K, 1 yr, start 7/94

Application of Neural Networks for Laser Diagnostics in Combustion, Los Alamos National Laboratory: INCOR Program, \$10K, 1 yr, start 9/93

Adaptive Control of Natural Gas IC Engines, California Institute for Energy Efficiency, \$60K, 1 yr, start 6/92 (with Dr. J.E. Bobrow)

Tobacco Smoke Dispersion and Inhalability, Tobacco-Related Disease Research Program, University of California, \$266K, 3 yrs, start 7/92

Particle Inhalability in Indoor Air, Center for Indoor Air Research, Post-doctoral fellowship grant for Dr. I-Ping Chung, \$70K, 2 yrs, start 4/92

Research Experience for Undergraduates in Combustion and Propulsion, National Science Foundation, \$50K, 2 yr, start 4/92 (with Dr. G.S. Samuelsen and Dr. J.C. LaRue)

Computer Aided Instruction of Fluid Mechanics, UCI Undergraduate Office, \$3K, 1 yr, start 7/1/91

Droplet Vaporization under Supercritical Conditions, Universitywide Energy Research Group, \$24K, 1 yr, start 7/1/91 (with Dr. R.H. Rangel)

Robust Fitting of CARS Spectra Using Neural Networks, Los Alamos National Laboratory: INCOR Program, \$26K, 3 yr, start 6/90

Energy Efficiency in Industrial Burners, California Institute for Energy Efficiency, \$450K/yr, 3 yrs, start 1/1/91 (with Dr. G.S. Samuelsen, Lawrence Livermore Laboratory, Sandia National Laboratory in Livermore)

Optical Particle Size Measurements of Tobacco Smoke: Tobacco-Related Disease Research Program, University of California, \$103K, 3 yrs, start 7/90

Travel Grant to Los Alamos National Laboratory: INCOR Program, \$1000.

Effect of Body Size on Nasal Deposition of Particles: California State Health Service, \$55K/yr, 1 yr, start 9/90 (with Dr. R. Phalen)

Laser Light Scattering for Detection of Micro-Cracks—Phase II: University Technology Transfer Inc., \$143K, 1.5 yr, start 1/90 (with Dr. J.C. Earthman)



Effect of Body Size on Nasal Deposition of Particles: California State Health Service, \$55K/yr, 1 yr, start 9/89 (with Dr. R. Phalen)

Presidential Young Investigator Matching Grant: National Science Foundation, \$187.5K

Presidential Young Investigator Base Grant: National Science Foundation, \$25K/yr, 5 yr, start 6/89 (\$125K received)

Gas Burner Research Facility: Gas Research Institute, \$400K/yr, 3 yr, start 1/89 (with Dr. G.S. Samuelsen and Energy and Environmental Research)

Laser Light Scattering for Detection of Micro-Cracks—Phase I: University Technology Transfer Inc., \$60K, 1/2 yr, start 7/89 (with Dr. J.C. Earthman)

In-Situ Non-contact Fatigue Micro-crack Detection Using Laser Light Scattering: University of California, Irvine Faculty Research Fellowship, \$10K/yr, 1 yr, start 4/89

CARS Temperature Measurements in Droplet Laden Flows—US Air Force Summer Faculty Research Initiation Program, \$20K/yr, 1 yr, start 1/89

Department of Defense Equipment Grant, \$91,200, 1987 (with Dr. G.S. Samuelsen)

Parametric Study of Soot Production: U.S. Air Force, \$300K/yr, 3 yrs, start 10/87 (with Dr. G.S. Samuelsen)

Particle Dispersion in Turbulent Flow: University of California, Irvine Faculty Research Grant, \$5K/yr, 1 yr, start 10/87

Combusting Droplets with Near-Neighbors: Universitywide Energy Research Group, \$18.7K/yr, 1 yr, start 7/88

Effect of Body Size on Nasal Deposition of Particles: California State Health Service, \$52K/yr, 1 yr, start 9/88 (with Dr. R. Phalen)

### **Cash Donations**

Small engine performance, Viscon, \$12K, 2015

Electric field effects on combustion, Clearsign Corporation, \$36K, 2015–2016

Spray research, Kruse Technologies, Santa Ana, \$10K, 2010

Alternative combustion energy research, FlexEnergy Corporation, Irvine, \$38K, 2010

Laser/tissue interaction research, Biolase Incorporated, Irvine, \$54K, 2009–2010

Laser interaction research, Biolase Incorporated, Irvine, \$30K, 2006

Combustion research, LaMond Institute, Huntington Beach, \$2000, 2005

Spectroscopy and fluids research, Unit Instruments Incorporated, \$10K, 1996/1997

Fluid mechanics research, Innovative Sensors Incorporated, \$10K, 1996/1997

Engine combustion research, Environments 2000 (with J.E. Bobrow), \$25K, 1994

Droplet combustion research, Rhone-Poulenc Chemical Company, \$4.5K, 1993

1989–1993 PYI research, General Motors Foundation, Allison Gas Turbine Division, \$150K

### **Major Equipment Donations –\$813.5K total**

1989, Department of Mechanical Engineering Computer Laboratory: Apple Computer (\$123K equipment donation), Apollo Computer (\$12K equipment donation), Calcomp (\$33K equipment donation), UCI Research and Graduate Studies (\$10K), UCI Office of Academic Computing (\$10K), (with Dr. J.M. McCarthy and Dr. J.E. Bobrow); 1989, Particle Sizer Signal Processor: Insitec, San Ramon, CA, \$35K; 1993, Laser spectroscopy equipment, Unocal, \$250K; 1994, Optical Mounts and Components: Newport Corporation, Fountain Valley, CA, \$5K; 1996, Gas Analyzers for internal combustion engine research, Rosemount Analytical, \$34K; 1997, Process control learning center, Opto 22, \$1500; 1999, Nissan Sentra, Nissan, \$8000; 2002, Ford Lincoln LS, Ford Motor Company, \$30K; 2005, FZ6 motorcycle engine, Yamaha R&D, \$3000; 2009, Process control hardware, Opto 22, \$3000; 2009, Optical components and mounts, Newport Corporation, \$6000; 2009, Mercury continuous emissions monitor, General Electric Corporation, \$250K;

### **Engineering Design in Industry Donations (with colleagues)–\$160K total**

Kruse Energy Systems (\$4500 – Spring 2009); Boeing Corporation (\$4500 – Spring 2009); Aluminum Precision Products (\$4500 – Spring 2009); CCI Valves (\$4500 – Winter 2009); Parker Hannifin (\$7500 – Winter 2009); Mars Air (\$4500 – Winter 2008); Man's Best Friend (\$4000 – Spring 2007); Engineered Framing Systems, Inc. (\$3500 – Spring 2007); Pendlar Motors (\$0 – Winter 2007); Parker Aerospace (\$4000 – Winter 2007); Cubical Concepts (\$4000 – Winter 2006); Pacific Precision Products (\$4000 – Fall 2005); Micromotors Inc. (\$3500 – Spring 2005); Private Inventor (\$2500 – Winter 2005); Newport Corporation (\$3500 – Winter 2005); Fossil Energy Research Corporation, FERCO (\$3500 – Winter 2005); UCI MAE Department (\$0 –

Fall 2004); Parker Hannifin (\$3500 – Spring 2004); Private Inventor (\$3500 – Spring 2004); Boeing (\$3500 – Winter 2004); Private Inventor (\$3500 – Winter 2004); Raytheon (\$3500 – Winter 2004); Parker Aerospace (\$3500 – Fall 2003); Private Inventor (\$3000 – Fall 2003); BEI, Duncan Electronics (\$3500 - Spring 2003); Better Retail Inc. (\$0 - Spring 2003); American Remanufacturing Incorporated (ARI) (\$3500 - Winter 2003); Sabritec (\$3500 - Winter 2003); Private inventor (\$3000 - Winter 2003); Driessen (\$0 - Fall 2003); Private inventor (\$3000 - Spring 2002); Ford Motor Company (\$3500 - Winter 2002); Komax (\$2000 - Winter 2002); Private inventor (\$3500 - Fall 2001); Hartwell Corporation (\$3500 - Winter 2001); Fluor Daniel (\$3500 - Winter 2001); Packard Hughes Interconnect (\$3500 - Fall 2000); Cherry Textron (\$3500 - Spring 2000); Edwards Lifesciences (\$3500 - Spring 2000); Parker Aerospace (\$3500 - Winter 2000); Eaton Corporation (\$3500 - Winter 2000); Pioneer Medical (\$3500 - Fall 1999); Toshiba America (\$3500 - Fall 1999); Orthodyne (\$3000 - Spring 1999); Road and Track Magazine (\$3000 - Spring 1999); Packard Hughes Interconnect (\$6000 - Winter 1999); Micromotors (\$3000 - Fall 1998); Toshiba America (\$3000 - Spring 1998); Parker Aerospace (\$3000 - Spring 1998).

## PUBLICATIONS

### Refereed Publications

- A.1 Dunn-Rankin, D., Hoornstra, J., Gruelich, F.A., and Holve, D.J. (1987). "Coal Rank Influences on Agglomeration, Swelling, and Fragmentation of Coal/Water Slurries During Combustion," *Fuel*, **66**, 1139–1145.
- A.2 Lucas, D., Dunn-Rankin, D., Hom, K., Brown, N.J. (1987). "Ignition by Excimer Laser Photolysis of Ozone." *Combustion and Flame*, **69**, 171–184.
- A.3 Dunn-Rankin, D. and Kerstein, A.R. (1987). "Numerical Simulation of Particle Size Distribution Evolution During Pulverized Coal Combustion," *Combustion and Flame*, **69**, 193–209.
- A.4 Steeper, R.R., Jensen, P., and Dunn-Rankin, D. (1988). "Using Mie-Scattering for Measuring Size Changes of Individual Particles," *Journal of Physics E: Scientific Instruments*, **21**, 378–383
- A.5 Dunn-Rankin, D. (1987). "A Kinetic Model for Simulating Particle Size Distribution Evolution During Char Combustion," *Combustion Science and Technology*, **58**, 4–6, 297–314.
- A.6 Dunn-Rankin, D. and Kerstein, A.R. (1988). "The Influence of Ash on Particle Size Distribution Evolution During Coal Combustion," *Combustion and Flame*, **74**, 207–218.
- A.7 Dunn-Rankin, D., Switzer, G.L., Obringer, C.A., and Jackson, T.A. (1990). "Effect of Droplet Induced Breakdown on CARS Temperature Measurements," *Applied Optics*, **29**, 21, 3150–3159.
- A.8 Nguyen, Q.V., Rangel, R.H., and Dunn-Rankin, D. (1991). "Measurement and Prediction of Trajectories and Collision of Droplets," *International Journal of Multiphase Flow*, **17**, 2, 159–177.
- A.9 Dunn-Rankin, D. and Baxter, L.L. (1990) "The Role of Dispersants in CWS Agglomeration during Combustion," *Fuel*, **70**, 1, 84–89.
- A.10 Nguyen, Q.V. and Dunn-Rankin, D. (1992) "Experiments Examining Drag in Linear Droplet Packets," *Experiments in Fluids*, **12**, 3, 157–165.
- A.11 Chung, I.P., Dunn-Rankin, D., Phalen, R.F., and Oldham, M.J. (1992) "Low Cost Wind Tunnel for Aerosol Inhalation Studies," *American Industrial Hygiene Association Journal*, **53**, 232–236.
- A.12 Zhu, J.Y. and Dunn-Rankin, D. (1991) "Using CARS to Probe the Temperature Field of a Combusting Droplet Stream," *Applied Optics*, **30**, 19, 2672–2674.
- A.13 Zhu, J.Y., Dunn-Rankin, D., and Samuelsen, G.S. (1992) "CARS Measurements in a Droplet Stream Flame," *Combustion Science and Technology*, **83**, 97–114.
- A.14 Chung, I.P. and Dunn-Rankin, D. (1991) "Numerical Simulation of Two-Dimensional Blunt Body Sampling in Viscous Flow," *Journal of Aerosol Science*, **23**, 3, 217–232.
- A.15 Phalen, R.F., Oldham, M.J., and Dunn-Rankin, D. (1992) "Inspired Particle Mass per Unit Body Mass per Unit Time," *Applied Occupational and Environmental Hygiene*, **7**, 4, 246–252.
- A.16 Buerkle, J., Dunn-Rankin, D., Bowo, K., and Earthman, J.C. (1992) "In-Situ Surface Defect Detection by Laser Light Scattering," *Materials Evaluation*, **50**, 6, 670–677.
- A.17 Zhu, J.-Y. and Dunn-Rankin, D. (1993) "CARS Thermometry in High Temperature Gradients," *Applied Physics B*, **56**, 47–55.
- A.18 Chung, I.P., Phalen, R.F., and Dunn-Rankin, D. (1993) "Predicted Aerosol Aspiration Efficiency for Infants, Children, and Adults," *Applied Occupational and Environmental Hygiene*, **8**, 7, July, 639–644.
- A.19 Chung, I.P. and Dunn-Rankin, D. (1993) "The Effects of Bluntness and Orientation on Two-Dimensional Samplers in Calm Air," *Aerosol Science and Technology*, **19**, 3, 371–380.
- A.20 Zhang, Y.F., Taborek, P., and Dunn-Rankin, D. (1993) "Potential Role of Atomic Carbon in Diamond Deposition," *Journal of Applied Physics*, **74**, 11, 6941–6947.
- A.21 Silverman, M.A. and Dunn-Rankin, D. (1994) "Experimental Investigation of a Rectilinear Droplet Stream Flame," *Combustion Science and Technology*, **100**, 1–6, 57–73
- A.22 Chung, I.P., Trinh, T., and Dunn-Rankin, D. (1994) "Experimental Investigation of a Two-Dimensional Cylindrical Sampler," *Journal of Aerosol Science*, **25**, 5, 935–955.
- A.23 Buchanan, C.R., Chung, I.P., and Dunn-Rankin, D. (1995) "A Numerical Study of Indoor Contaminant Mixing," *Journal of the Institute of Environmental Sciences*, Sep-Oct, **38**, 5, 15–21.
- A.24 Chung, I.P. and Dunn-Rankin, D. (1996) "In Situ Light Scattering Measurements of Mainstream and Sidestream Cigarette Smoke," *Aerosol Science and Technology*, **24**, 85–101.
- A.25 Connon, C.S. and Dunn-Rankin, D. (1996) "Droplet Stream Dynamics at High Ambient Pressures," *Atomization and Sprays*, **6**, 4, 485–497.
- A.26 Connon, C.S. and Dunn-Rankin, D. (1996) "Flow Behavior Near an Infinite Droplet Stream," *Experiments in Fluids*, **21**, 2, 80–86.
- A.27 Chung, I.P. and Dunn-Rankin, D. (1996) "Experimental Investigation of Air Flow around Blunt Aerosol

- Samplers,” *Journal of Aerosol Science*, **28**, 2, 289–305.
- A.28 Chung, I.P., Dunn-Rankin, D., and Ganji, A. (1996) “Characterization of a Spray from an Ultrasonically Modulated Nozzle,” *Atomization and Sprays*, **7**, 3, 295–315.
- A.29 Dunn-Rankin, D. and Sawyer, R.F. (1998) “Flame Shape Changes during Combustion in Closed Tubes,” *Experiments in Fluids*, **24**, 130–140.
- A.30 Dunn-Rankin, D. and Weinberg, F.J. (1998) “Location of the Schlieren Image in Premixed Flames: Axially Symmetrical Refractive Index Fields,” *Combustion and Flame*, **113**, 303–311.
- A.31 Connon, C.S., Choi, C., Dimalanta, R., and Dunn-Rankin, D. (1997) “LIF Measurements of Fuel Vapor in an Acetone Droplet Stream,” *Combustion Science and Technology*, **129**, 197–216
- A.32 Buchanan, C.R. and Dunn-Rankin, D. (1998) “Transport of Surgically Produced Aerosols in an Operating Room,” *American Industrial Hygiene Association Journal*, **59**, June, 393–402.
- A.33 Chung, I.P. and Dunn-Rankin, D. (1998) “Using Numerical Simulation to Predict Ventilation Efficiency in a Model Room,” *Energy and Buildings*, **28**, 1, 43–50.
- A.34 Dunn-Rankin, D., Bobrow, J.E., Mease, K.D., and McCarthy, J.M. (1998) “Engineering Design in Industry: A Course to Bridge Engineering Science and Practice,” *ASEE Journal of Engineering Education*, July, 219–222.
- A.35 Garman, J.D. and Dunn-Rankin, D. (1997) “Spatial Averaging Effects in CARS Thermometry of a Non-Premixed Flame,” *Combustion and Flame*, **115**, 481–486.
- A.36 Dunn-Rankin, D. and McCann, H.A. (2000) “Overpressures from Nondetonating, Baffle-Accelerated Turbulent Flames in Tubes,” *Combustion and Flame*, **120**, 504–514.
- A.37 McKinney, D.J. and Dunn-Rankin, D. (2000) “Acoustically Driven Extinction in a Droplet Stream Flame,” *Combustion Science and Technology*, **161**, 27–48.
- A.38 Strayer, B.A. and Dunn-Rankin, D. (2001) “Toward a control model for manipulating the breakup of a liquid jet,” *Atomization and Sprays*, **11**, 415–431.
- A.39 Lengsfeld, C.S., Delplanque, J.P., and Dunn-Rankin, D. (2002) “Breakup Transitions within Dense Sprays,” *Atomization and Sprays*, **12**, 12, 501–511.
- A.40 Strayer, B.A., Posner, J.D., Dunn-Rankin, D., and Weinberg, F.J. (2002) “Simulating microgravity in small diffusion flames by using electric fields to counterbalance natural convection,” *Proceedings of the Royal Society of London A*, **458** 2021, 1151–1166.
- A.41 Regele, J., Papac, M., Rickard, M., and Dunn-Rankin, D. (2002) “Effects of Capillary Spacing on EHD Spraying from an Array of Cone-Jets,” *Journal of Aerosol Science*, Volume 33, Issue 11, November 2002, Pages 1471–1479.
- A.42 Papac, M.J., and Posner, J.D., and Dunn-Rankin, D. (2003) “Crossed Two Beam Coherent Anti-Stokes Raman Spectroscopy in Dispersive Media,” *Applied Spectroscopy*, **57**, 1, 93–99.
- A.43 Posner, J.D. and Dunn-Rankin, D. (2003) “Temperature Field Measurements of Small, Non-premixed Flames using Abel Inversion of Holographic Interferograms,” *Applied Optics*, **42**, 6, 952–959 (also cover photograph).
- A.44 Posner, J.D., Buchanan, C.R., and Dunn-Rankin, D. (2003) “Measurement and Prediction of Indoor Air Flow in a Model Room,” *Energy and Buildings*, **35**, 515–526.
- A.45 Papac, M.J., Dunn-Rankin, D., Stipe, C.B., and Lucas, D. (2003) “N<sub>2</sub> CARS Thermometry and O<sub>2</sub> LIF Concentration Measurements in an Electrically Induced Microbuoyant Flame,” *Combustion and Flame*, **133**, 241–254.
- A.46 Weinberg, F.J., Carleton, F.A., and Dunn-Rankin, D. (2003) “Electrically Charged Dispersions of Extinguishants for use in Microgravity Environments,” *Combustion Science and Technology*, **175**, 2161–2179.
- A.47 Posner, J.D., Dunn-Rankin, D., Brown, M.S., Brock, N., and DeBarber, P.A. (2004) “Resonant Holographic Interferometry for Species Concentration Measurements with Saturated Anomalous Dispersion,” *Appl. Phys. B*, Invited Paper, **78**, 6, 661–672.
- A.48 Rickard, M., Dunn-Rankin, D., Weinberg, F., and Carleton, F. (2005) “Characterization of Ionic Wind Velocity,” *Journal of Electrostatics*, **63**, 711–716.
- A.49 Weinberg, F., Carleton, F., Kara, D., Xavier, A., Rickard, M., and Dunn-Rankin, D. (2006) “Inducing Gas Swirl in Tubes using Ion Wind from Corona Discharges,” *Experiments in Fluids*, **40**, 231–237.
- A.50 Dunn-Rankin, D., Leal, E., and Walther, D. (2006) “Personal Power Systems,” *Progress in Energy and Combustion Science*, **31**, 5–6, 422–465.
- A.51 Rickard, M.A., Dunn-Rankin, D., Weinberg, F.J., and Carleton, F. (2006) “Maximizing Ion Driven Gas Flows,” *Journal of Electrostatics*, **64**, 368–376.
- A.52 Papac, J. and Dunn-Rankin, D. (2006) “Characteristics of Combustion in a Miniature Four-Stroke Engine,” *Journal of Aeronautics, Astronautics and Aviation (JAAA)*, invited paper, Series A, **38**, 2, 77–88.

- A.53 Michaelis, M., Dunn-Rankin, D., Smith, R.F., and Bobrow, J.E. (2007) "In-Flight Thermal Control of Molten Metal Droplet Streams," *International Journal of Heat and Mass Transfer*, **50**, 4554–4558.
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- D.29 Dimalanta, R. and Dunn-Rankin, D. (1995) “Vaporizing Binary Component Droplets in a Rectilinear Stream,” Paper 95F-171 of the Western States Section/The Combustion Institute Fall Meeting, Stanford University, October 30–31.
- D.30 Strayer, B.A., Jabbari, F. and Dunn-Rankin, D. (1995) “Controlling a Wolfhard-Parker Slot Burner Flame Using Acoustic Forcing,” Paper 95F-202 of the Western States Section/The Combustion Institute Fall Meeting, Stanford University, October 30–31.
- D.31 Strayer, B.A., Jabbari, F. and Dunn-Rankin, D. (1996) “Acoustic Pulsation for Luminosity Control in a Wolfhard-Parker Slot Burner,” Western States Section/The Combustion Institute Spring Meeting, Arizona State University, Tempe, AZ, March 11–12.
- D.32 Garman, J.D., Dunn-Rankin, D., Farrow, R., Rakestraw, D., and Volponi, J. (1996) “A Comparison of Temperature Measurements in Low Pressure Flames Using Coherent Anti-Stokes Raman Spectroscopy (CARS), Laser-Induced Fluorescence (LIF), and Degenerate Four-Wave Mixing (DFWM),” Western States Section/The Combustion Institute Spring Meeting, Arizona State University, Tempe, AZ, March 11–12.
- D.33 Dunn-Rankin, D., Bobrow, J.E., Mease, K.D., and McCarthy, J.M. (1996) “Engineering Design in Industry: A Course to Bridge Engineering Science and Practice,” Sixth Annual CSU Conference on Cooperative Ventures: The Power of Industry and Education Partnerships, California State University, Long Beach, April 19.
- D.34 Ganji, A.R. and Dunn-Rankin, D. (1996) “Spray Modulation with Potential Application in Gas Turbine Combustors,” 32nd AIAA/ASME/SAE/ASEE Joint Propulsion Conference, Lake Buena Vista, FL, July 1–3.
- D.35 Choi, C., Connon, C.S., and Dunn-Rankin, D. (1996) “LIF Measurements of Fuel Vapor in an Acetone Droplet Stream,” Western States Section/The Combustion Institute Fall Meeting, USC, Los Angeles, CA, October 28–29. (see A.31)
- D.36 Dunn-Rankin, D. and Weinberg, F.J. (1997) “Location of the Schlieren Image in Axially Symmetrical Refractive Index Fields of Premixed Flames,” Western States Section/The Combustion Institute Fall Meeting, Diamond Bar, CA, October 23–24. (see A.35)
- D.37 Strayer, B.A., Dunn-Rankin, D., and Jabbari, F. (1998) “Amplitude and Frequency Modulated Control of a Diffusion Flame,” Western States Section/The Combustion Institute Spring Meeting, Berkeley, CA, March 23–24. (see B.9)
- D.38 Strayer, B.A. and Dunn-Rankin, D. (1998) “Control of Capillary Jet Breakup into a Droplet Stream,” Western States Section/The Combustion Institute Fall Meeting, Seattle, WA, October 26–27.
- D.39 Dunn-Rankin, D. and McCann, H.A. (1998) “Overpressures from Non-Detonating, Baffle-Accelerated Turbulent Flames in Tubes” Western States Section/The Combustion Institute Fall Meeting, Seattle, WA, October 26–27. (see A.36)
- D.40 Posner, J.D. and Dunn-Rankin, D. (1999) “Bragg Cell Modulated DPIV Measurements of Indoor Air Flows in a Model Room,” Second International Particle Image Velocimetry Workshop, Santa Barbara, CA, September 16–18.
- D.41 Strayer, B.A., Posner, J.D., and Dunn-Rankin, D. (1999) “Temperature Field Measurements of a Non-premixed Flame under Electric Field Control,” Western States Section/The Combustion Institute Fall Meeting, University of California, Irvine, CA, October 25–26.
- D.42 McKinney, D.J. and Dunn-Rankin, D. (1999) “Acoustic Interaction with a Droplet Stream Flame,” Western States Section/The Combustion Institute Fall Meeting, University of California, Irvine, CA, October 25–26. (see A.37)
- D.43 Strayer, B.A., Posner, J.D., and Dunn-Rankin, D. (2000) “CARS Temperature Measurements of a Non-premixed Flame under Electric Field Control,” Western States Section/The Combustion Institute Spring Meeting, Colorado School of Mines, Golden, CO, March 13–14.
- D.44 Strayer, B.A. and Dunn-Rankin, D. (2000) “Controlling the Breakup of a Liquid Jet,” Eighth International Conference on Liquid Atomization and Spray Systems, Pasadena, CA, July 16–20.
- D.45 Dunn-Rankin, D., Papac, J., and Strayer, J. (2000) “Air/Fuel Mixing Control of Acoustic Emission from a Rikje-Tube Burner,” American Flame Research Council Meeting, Costa Mesa, California, September 17–21.
- D.46 Posner, J.D. and Dunn-Rankin, D. (2001) “Temperature Measurements of Small Premixed Flames using Abel Inversion of Holographic Interferograms,” 2nd Joint Meeting of the U.S. Sections of the Combustion Institute, Oakland, CA, March 25–28. (see A.43)

- D.47 Dunn-Rankin, D., Papac, M., Regele, J., and Rickard, M. (2001) "EHD Spraying from Single and Multiple Capillaries," 14th Annual International Liquid Atomization and Spray Systems (ILASS)-Americas Conference, Dearborn, Michigan, May 21–23. (see A.41)
- D.48 Lengsfeld, C.S., Delplanque, J.P., and Dunn-Rankin, D. (2001) "Breakup Transitions within Dense Sprays," 14th Annual International Liquid Atomization and Spray Systems (ILASS)-Americas Conference, Dearborn, Michigan, May 21–23. (see A.39)
- D.49 Dunn-Rankin, D., Strayer, B.A., Carleton, F.A., and Weinberg, F.J. (2001) "Electrical Aspects of Flames in Microgravity Combustion," 6th Microgravity Combustion Workshop, Cleveland, Ohio, May 22–24.
- D.50 Strayer, B.A. and Dunn-Rankin, D. (2001) "Control of the Vaporization Rate in a Droplet Stream Flame using Electric Fields," Proceedings of NHTC'01, the 35th ASME National Heat Transfer Conference, Anaheim, California, June 10–12.
- D.51 Strayer, B.A. and Dunn-Rankin, D. (2001) "Response of a Non-Premixed Flame to Electric Field Forcing," 18th International Colloquium on the Dynamics of Explosions and Reactive Systems, Seattle, Washington, July 29–August 3.
- D.52 Dunn-Rankin, D. (2001) "Evaluating Design Alternatives – The Role of Simple Engineering Analysis and Estimation," Proceedings of the 2001 American Society for Engineering Education Annual Conference and Exposition, Albuquerque, New Mexico, June 24–27.
- D.53 Weinberg, F.J., Carleton, F.A., and Dunn-Rankin, D. (2002) "Electrically Charged Dispersions of Extinguishants for use in Microgravity Environments," Mediterranean Combustion Symposium, Sharm El-Sheikh, Egypt, January 6–11. (see A.46)
- D.54 Sirignano, W.A., Dunn-Rankin, D., and Strayer, B.A. (2001) "Miniature Combustor with Liquid-Fuel Film," Paper 01F-36, Western States Section/The Combustion Institute Fall Meeting, Salt Lake City, UT, October 15–16.
- D.55 Papac, M.J., Dunn-Rankin, D., Stipe, C.B., and Lucas, D. (2002) "CARS Temperature and LIF Oxygen Concentration Measurements in an Electrically Induced Microbuoyant Flame," Paper-072 of the Western States Section/The Combustion Institute Spring Meeting, San Diego, CA, March 25–26. (see A.45)
- D.56 Pham, T.K., Dunn-Rankin, D., and Sirignano, W.A. (2002) "Further Developments on Miniature Scale Liquid-Fuel Film Combustion," Paper-029 of the Western States Section/The Combustion Institute Spring Meeting, San Diego, CA, March 25–26. (see B.10)
- D.57 Dunn-Rankin, D., Papac, M.J., and Posner, J.D. (2002) "Two Beam X-CARS in Dispersive Media," Western States w/Mike and Posner, " Paper-062 of the Western States Section/The Combustion Institute Spring Meeting, San Diego, CA, March 25–26. (see A.42)
- D.58 Lengsfeld, C.S., Lentz, Y., Anchordoquy, T., Dunn-Rankin, D., and Manning, M. (2002) "Suitability of Electrostatic Spraying for Macromolecular Therapeutics," 15th Annual ILASS Americas Conference, Madison, WI, May.
- D.59 Rickard, M. and Dunn-Rankin, D. (2002) "Experimental study of a hybrid electrohydrodynamic, air-assisted liquid atomizer," SAE Paper FFL02-15, Fuels and Lubricants Conference, San Diego, CA, October 21–24. (see B.11)
- D.60 Stanchi, S., Dunn-Rankin, D., and Sirignano, W.A. (2003) "Combustor Miniaturization with Liquid-Fuel Filming," Paper AIAA 2003-1163, 41st Aerospace Sciences Meeting, Reno, NV, January 6–9.
- D.61 Pham, T.K., Dunn-Rankin, D., and Sirignano, W.A. (2003) "Combustion Efficiency of a Miniature Fuel-Film Combustor," Paper D-17, 3rd Joint US Sections/The Combustion Institute Meeting, University of Illinois, Chicago, March 16–19.
- D.62 Dunn-Rankin, D. and Weinberg, F.J. (2003) "Flames and Electric Fields in Microgravity," 7th International Workshop on Microgravity Combustion, Cleveland, Ohio, June 2–5.
- D.63 Rickard et al. (2003) "Ionic Wind as a Controllable Air Source for an Electric Burner," Western States Section/The Combustion Institute Fall Meeting, UCLA, October 20–21.
- D.64 Papac, J., Figueroa, I., and Dunn-Rankin, D. (2003) "Performance of Miniature Combustion Engines," Western States Section/The Combustion Institute Fall Meeting Paper 03F-74, UCLA, October 20–21.
- D.65 Mehring, C., Pham, T.K., Dunn-Rankin, D., and Sirignano, W.A. (2003) "Computational Investigation of a Miniature Liquid-Fuel-Film Combustor," Western States Section/The Combustion Institute Fall Meeting, UCLA, October 20–21.
- D.66 Papac, J. and Dunn-Rankin, D. (2004) "Combustion in a Centimeter Scale Four Stroke Engine," Western States Section/The Combustion Institute Spring Meeting paper 04S-12, UC Davis, March 29–30.
- D.67 Dunn-Rankin, D. (2004) "Providing Personal Power using Miniature Combustion Systems," Western States Section/The Combustion Institute Spring Meeting paper 04S-11, UC Davis, March 29–30.

- D.68 Pham, T.K., Mehring, C., Dunn-Rankin, D., and Sirignano, W.A. (2004) "Numerical Study of a Miniature Liquid Fuel Film Combustor," Western States Section/The Combustion Institute Spring Meeting paper 04S-10, UC Davis, March 29–30.
- D.69 Rickard, M.A., Carleton, F., Dunn-Rankin, D., and Weinberg, F.J. (2005) "Characterization of Ionic Wind Velocity," Paper PFA-19, Proceedings of Electrostatics 2005, Helsinki, Finland, June.
- D.70 Papac, J., Pompa, J., and Dunn-Rankin, D. (2005) "In-Cylinder Pressure and Combustion Measurements in a Miniature Reciprocating Engine," Joint US Sections/The Combustion Institute Meeting, Drexel University, Philadelphia, March 21–23.
- D.71 Pham, T.K., Amade, N.S., Li, Y.H., Dunn-Rankin, D., and Sirignano, W.A. (2005) "Liquid Film Combustion in Small Cylindrical Chambers," Joint US Sections/The Combustion Institute Meeting, Drexel University, Philadelphia, March 21–23.
- D.72 Li, Y.-H., Papac, J.E., Dunn-Rankin, D., and Sirignano, W.A. (2005) "Simulation and Experiments of a Liquid Fuel Film Burning Off a Flat Plate," Joint US Sections/The Combustion Institute Meeting, Drexel University, Philadelphia, March 21–23.
- D.73 Gowadia, N. and Dunn-Rankin, D. (2005) "Electrospraying Biologically Active Materials," ILASS Americas 18th Annual Conference on Liquid Atomization and Spray Systems, Irvine, CA, May 23–25.
- D.74 Li, Y.-H., Dunn-Rankin, D., and Chao, Y.-C. (2005) "Burning Liquid Fuel Films from Flat Plates," 20th International Colloquium on the Dynamics of Explosions and Reactive Systems, McGill University, Montreal, Canada, August.
- D.75 Pham, T.K., Dunn-Rankin, D., and Sirignano, W.A. (2005) "Film Combustion in Small Cylinders," 20th International Colloquium on the Dynamics of Explosions and Reactive Systems, McGill University, Montreal, Canada, August.
- D.76 Dunn-Rankin, D. and Weinberg, F.J. (2005) "Using Large Electric Fields to Control Transport in Microgravity," *Proceedings of the Physics of Transport in Microgravity Science Conference*, Tomar, Portugal, August 8–12.
- D.77 Papac, M.J. and Dunn-Rankin, D. (2005) "Canceling Buoyancy of Gaseous Fuel Flames in a Gravitational Environment using an Ion Wind," *Proceedings of the Physics of Transport in Microgravity Science Conference*, Tomar, Portugal, August 8–12.
- D.78 Pompa, J., Karnani, S., Mulrone, A., Leal, A., and Dunn-Rankin, D. (2005) "Emissions Levels of a Centimeter Scale Four-Stroke Engine," XVth International Symposium on Alternative Fuels, San Diego, CA, September 26–28.
- D.79 Pompa, J., Karnani, S., Mulrone, A., Leal, A., and Dunn-Rankin, D. (2005) "Effects of Hydrogen Addition on Combustion in a Miniature Four-Stroke Engine," Paper 05-F27, Proceedings of the Western States Section/The Combustion Institute Fall Meeting, Stanford, CA, October 17–18.
- D.80 Papac, M.J., Chueh, P., Dunn-Rankin, D., and Weinberg, F.J. (2005) "Voltage-Current Characteristics of Small Diffusion Flames under the Combined Influence of Ion-Driven Winds and Natural Convection," Paper 05-F30, Proceedings of the Western States Section/The Combustion Institute Fall Meeting, Stanford, CA, October 17–18.
- D.81 Pompa, J., Karnani, S., and Dunn-Rankin, D. (2006) "Effects of Cooling Techniques on Flame Propagation in a Centimeter-Scale Four-Stroke Engine," Paper 06S-24, Western States Section/The Combustion Institute Spring Meeting, University of Idaho, Boise, March 27–28.
- D.82 Pham, T.K., Dunn-Rankin, D., and Sirignano, W.A. (2006) "Heat Transfer and Flame Structure in Miniature Liquid Film Combustors," Paper 06S-50, Western States Section/The Combustion Institute Spring Meeting, University of Idaho, Boise, March 27–28.
- D.83 Borgatelli, F. and Dunn-Rankin, D. (2006) "Feedback Control of Ion Current from a Small Diffusion Flame," Paper 06S-44, Western States Section/The Combustion Institute Spring Meeting, University of Idaho, Boise, March 27–28.
- D.84 Dunn-Rankin, D., Pham, T.K., Pompa, J., Karnani S., and Sirignano W. A. (2006) "Liquid-Fuel Combustion in Miniature Power and Propulsion Systems," PowerMEMS 2006, Sixth International Workshop on Micro and Nanotechnology for Power Generation and Energy Conversion Applications, Paper P17, pp. 113-116, Berkeley, CA, November 29-Dec. 1.
- D.85 Li, Y.-H., Chen, G.-C., Chao, Y.-C., and Dunn-Rankin, D. (2007) "A Meso-scale Liquid-fuel-film Combustor with Central-Porous Fuel Injection," 6th Asia-Pacific Conference on Combustion (AS-PACC07), May 20-23, Nagoya, Japan.
- D.86 Wei, J.Y., Muzio, L.J., and Dunn-Rankin, D. (2007) "Formation Temperature of Ammonium Bisulfate at Simulated Air Preheater Conditions," Paper H12, U.S. Combustion Meeting, San Diego, March 25–28.
- D.87 Sarzi-Amade, N., Dunn-Rankin, D., and Sirignano, W.A. (2007) "Fuel/Air Mixing in a Model Turbine Burner Section," Paper E02, U.S. Combustion Meeting, San Diego, March 25–28.

- D.88 Sarzi-Amade, N., Li, Y.-H., Pham, T.K., Dunn-Rankin, D., and Sirignano, W.A. (2007) "Miniature Liquid Film Combustors with Double Chamber or Central Porous Fuel Inlets," Paper F31, U.S. Combustion Meeting, San Diego, March 25–28.
- D.89 Abillian, S. and Dunn-Rankin, D. (2007) "Combustion Oscillations of a Low-Swirl Burner Induced Inside a Rijke Tube" Paper H01, U.S. Combustion Meeting, San Diego, March 25–28.
- D.90 Mattioli, R., Pham, T.K., Dunn-Rankin, D., and Sirignano, W.A. (2007) "Miniature Fuel-Film Combustor: Flame Confinement and Stability," 21st International Colloquium on Dynamics of Explosions and Reactive Systems, Poitiers, France, July 23–27.
- D.91 Bennett, M., Borgatelli, F. and Dunn-Rankin, D. (2007) "Behavior of Non-Premixed Flames as Electrically Active Components in a High-Voltage Circuit," 21st International Colloquium on Dynamics of Explosions and Reactive Systems, Poitiers, France, July 23–27.
- D.92 Puranam, S., Sarzi-Amade, N., and Dunn-Rankin, D. (2007) "Turbulent combustion studies in a model turbine burner," 21st International Colloquium on Dynamics of Explosions and Reactive Systems, Poitiers, France, July 23–27.
- D.93 Li, Y.-H., Chao, Y.-C., and Dunn-Rankin, D. (2007) "Combustion in Small-Scale Central-Porous-Media Liquid Film Combustors," 21st International Colloquium on Dynamics of Explosions and Reactive Systems, Poitiers, France, July 23–27.
- D.94 Rohani, M., Jabbari, F., and Dunn-Rankin, D. (2007) "Predicting breakup characteristics of liquid jets disturbed by practical piezoelectric devices," Institute for Liquid Atomization and Spray Systems (ILASS) Annual Meeting, Chicago, May 15-18.
- D.95 Chueh, P., Rizoiu, I., and Dunn-Rankin, D. (2007) "Er,Cr:YSGG Laser Interaction with a Stream of Droplets," Institute for Liquid Atomization and Spray Systems (ILASS) Annual Meeting, Chicago, May 15-18.
- D.96 Abillian, S. and Dunn-Rankin, D. (2007) "Thermoacoustic Investigation of a Low-Swirl Burner in a Rijke Tube," Joint American/Japanese Flame Research Council (AFRC/JFRC) Conference, Waikoloa, Hawaii, October 22–24.
- D.97 Tran, M.K., Zhou, W., Seeker, W.R., and Dunn-Rankin, D. (2008) "CFD Investigation of Carbon Burnout in a Full-Scale Coal-Fired Boiler," Western States Section/The Combustion Institute Spring Meeting paper 08S-42, University of Southern California, Los Angeles, March 17–18.
- D.98 Puranam, S., Colcord, B., Arici, J., Dunn-Rankin, D., and Sirignano, W.A. (2008) "Experimental and Numerical Investigation of a Model Turbine-Burner," Western States Section/The Combustion Institute Spring Meeting paper 08S-41, University of Southern California, Los Angeles, March 17–18.
- D.99 Jepsen, A., Miller, C., Therkelsen, P., Garman, J., and Dunn-Rankin, D. (2008) "Development and Characterization of a Small IC Engine Dynamometer," Western States Section/The Combustion Institute Spring Meeting paper 08S-32, University of Southern California, Los Angeles, March 17–18.
- D.100 Therkelsen, P. and Dunn-Rankin, D. (2008) "Comparison of Coal Burnout Predictions from a Computational Fluid Dynamics Model and a Detailed Kinetics Model," Western States Section/The Combustion Institute Spring Meeting paper 08S-22, University of Southern California, Los Angeles, March 17–18.
- D.101 Karnani, S., Bennett, M., and Dunn-Rankin, D. (2008) "Electrical Properties of Small Diffusion Flames," Western States Section/The Combustion Institute Spring Meeting paper 08S-4, University of Southern California, Los Angeles, March 17–18.
- D.102 Rohani, M., Jabbari, F., and Dunn-Rankin, D. (2008) "Investigating the Response of a Piezoelectric Actuator to Different Waveforms and its Effects on Capillary Jet Breakup," – Institute for Liquid Atomization and Spray Systems (ILASS) 21st Annual Meeting, Orlando, May 18–21.
- D.103 Kriesel, J.M., Garman, J.D., Hagglund, G.M., Gat, N., Papac, M.J., Dunn-Rankin, D., and Danczyk, S.A. (2008) "Compact and Rugged Coherent Anti-Stokes Raman Spectroscopy (CARS) System for Measurements of Temperature in Rocket Test Stands and Other Harsh Operating Environments," Joint meeting of the 55th JANNAF Propulsion Meeting / 42nd Combustion Subcommittee / 30th Airbreathing Propulsion Subcommittee / 30th Exhaust Plume Technology Subcommittee / 24th Propulsion Systems Hazards Subcommittee / 12th Spectral and In-band Radiometric Imaging of Targets and Scenes User Group Joint Meeting, May.
- D.104 Ardekani, A.M., Rangel, R.H., Garman, J., Dunn-Rankin, D., and Joseph, D.D. (2008) "Particle-wall interaction in a viscoelastic fluid," The XVth International Congress on Rheology, Monterey, California, August 3-8.
- D.105 Chueh, P., Darbar, R., D'Orth, Dunn-Rankin, D., and Rizoiu, I. (2008) "Pain Investigations for Dental Procedures using Conventional and Laser Modalities," The World Association of Laser Therapy Conference, Johannesburg, South Africa, October 19–22.
- D.106 Dunn-Rankin, D. (2008) "Electrical Manipulation of Flames," invited lecture, Japanese Combustion

- Symposium, Kyoto, Japan, December 4.
- D.107 Karnani, S. and Dunn-Rankin, D. (2009) "Electric Field Effects on a Small Co-Flow Diffusion Flame," Paper 13A1, U.S. Combustion Meeting, Ann Arbor, Michigan, May 18–20.
- D.108 Li, Y.-H., Li, H.-Y., Dunn-Rankin, D., and Chao, Y.-C. (2009) "Enhancing Thermal and Electrical Efficiency of a Miniature TPV System," Paper 10098, Asia-Pacific Combustion Conference, National Taiwan University, Taipei, Taiwan, May 24–27.
- D.109 Rohani, M., Dunn-Rankin, D., and Jabbari, F. (2009) "Applying Composite Disturbances to Control Breakup of Capillary Circular Liquid Jets," Paper ICLASS2009-115, 11th Triennial International Meeting on Liquid Atomization and Spray Systems, Vail, Colorado, July 26–30.
- D.110 Bolszo, C.D., Narvaez, A.A., Abbilian, S., Jepsen, A., Dunn-Rankin, D., McDonell, V.G., and Sirignano, W.A. (2009) "Generation and Pressure Atomization of Water-in-Oil Emulsions for Gas Turbines," Paper ICLASS2009-275, 11th Triennial International Meeting on Liquid Atomization and Spray Systems, Vail, Colorado, July 26–30.
- D.111 Sirignano, W.A., Dunn-Rankin, D., Liu, F., Colcord, B., and Puranam, S. (2009) "Turbine Burners: Flameholding in Accelerating Flow," AIAA Joint Propulsion Conference Paper AIAA-2009-5410, Denver, CO, August 2-5.
- D.112 Sirignano, W.A. and Dunn-Rankin, D. (2009) "UCI Liquid Film Miniature Combustor," AIAA Joint Propulsion Conference Paper AIAA-2009-5317, Denver, CO, August 2-5.
- D.113 Puranam, S.V. and Dunn-Rankin, D. (2009) "Turbulent combustion in cavity stabilized accelerating flows," Paper 09F-19 at the Western States Section/The Combustion Institute Fall Meeting, University of California, Irvine, October 26–27.
- D.114 Therkelsen, P. and Dunn-Rankin, D. (2009) "SI to HCCI Operation of a Small Scale IC Engine," Paper 09F-77 at the Western States Section/The Combustion Institute Fall Meeting, University of California, Irvine, October 26–27.
- D.115 Karnani, S., Coffin, P., Schoen, M., Dunn-Rankin, D., Takahashi, F., Yuan, Z.-Y., and Stocker, D. (2009) "Exploring the effects of gravity on a coflow diffusion flame in an electric field," Paper 09F-79 at the Western States Section/The Combustion Institute Fall Meeting, University of California, Irvine, October 26–27.
- D.116 Kim, K.-M., Jiang, F., Garman, J.D., and Dunn-Rankin, D. (2009) "Comparison of Mercury Capture by Sorbents and Ash from Coal Combustion Flue Gas," Paper 09F-71 at the Western States Section/The Combustion Institute Fall Meeting, University of California, Irvine, October 26–27.
- D.117 Lim, J.H. and Dunn-Rankin, D. (2009) "Fuel Efficiency and Emission Study of a Small Scale Spark Assisted Compression Ignition (SACI) Engine," Paper 09F-06 at the Western States Section/The Combustion Institute Fall Meeting, University of California, Irvine, October 26–27.
- D.118 Tran, M.K., Dunn-Rankin, D., and Pham, T.K. (2009) "Laser-Induced Incandescence Measurements of Soot Profile in a Biodiesel Diffusion Flame," Paper 09F-74 at the Western States Section/The Combustion Institute Fall Meeting, University of California, Irvine, October 26–27.
- D.119 Bolszo, C.D., Narvaez, A.A., Abbilian, S., Jepsen, A., McDonell, V.G., Dunn-Rankin, D., and Sirignano, W.A. (2009) "Pressure Atomization of Water-in-Oil Emulsions for Gas Turbines," Paper 09F-46 at the Western States Section/The Combustion Institute Fall Meeting, University of California, Irvine, October 26–27.
- D.120 Menasha, J., Dunn-Rankin, D., Muzio, L., and Stallings, J. (2010) "Ammonium Bisulfate Formation Temperature in a Bench-Scale Single-Channel Air Preheater," Paper 10S-06 at the Western States Section/The Combustion Institute Spring Meeting, University of Colorado, Boulder, March 22–23.
- D.121 Bolszo, C.D., Rohani, M., Narvaez, A.A., Dunn-Rankin, D., McDonell, V.G., and Sirignano, W.A. (2010) "Breakup of Water-in-Oil Emulsions in Liquid Jets and Conical Sheets," 22nd Annual Conference on Liquid Atomization and Spray Systems, Cincinnati, OH, May 16-19.
- D.122 Bolszo, C.D., Narvaez, A.A., Dunn-Rankin, D., McDonell, V.G., and Sirignano, W.A. (2010) "Pressure Swirl Atomization of Water-in-Oil Emulsions," 22nd Annual Conference on Liquid Atomization and Spray Systems, Cincinnati, OH, May 16-19.
- D.123 Kebria, M.M., Palencia, M., Garman, J., Dunn-Rankin, D., and Swanson, L. (2010) "Char Burnout Kinetics in an Entrained Flow Reactor," American Flame Research Council Annual Meeting, Maui, Hawaii, September 27–29.
- D.124 Li, Y.-H., Dunn-Rankin, D., and Chao, Y.-C. (2010) "A Tubular-Flame Combustor for Thermophotovoltaic Power Systems, Asia-Pacific Combustion Conference, Hyderabad, India, Dec. 10–13.
- D.125 Dunn-Rankin, D. (2011) "Experimental Developments in Group Combustion of Many Droplet Systems: Droplet Stream Flames," International Conference on Group Combustion of Droplets and Sprays, Keynote Presentation, National Cheng-Kung University, Tainan, Taiwan, January 19–21.
- D.126 Swenson, K., Karnani, S., Dunn-Rankin, D., Takahashi, F., Stocker, D., and Guang, Z.-G. (2011) "Electric Field Induced Convection in Microgravity Combustion," 7th US National Combustion

- Meeting, Georgia Institute of Technology, Atlanta, GA, March 20–23.
- D.127 Roshandell, M., Glassman, J., Khalil, M., Taborek, P., and Dunn-Rankin, D. (2011) “Burning Ice - Direct Combustion of Fuel Clathrates,” 7th US National Combustion Meeting, Georgia Institute of Technology, Atlanta, GA, March 20–23.
- D.128 Roshandell, M., Glassman, J., Khalil, M., Taborek, P., and Dunn-Rankin, D. (2011) “Combustion of Methane Hydrate,” 23rd International Colloquium on the Dynamics of Explosions and Reactive Systems, Irvine, CA, July 24–29.
- D.129 Karnani, S., Dunn-Rankin, D., Takahashi, F., Yuan, Z.G., and Stocker, D. (2011) “Simulated Gravity Using Electric Fields in Microgravity Combustion,” 23rd International Colloquium on the Dynamics of Explosions and Reactive Systems, Irvine, CA, July 24–29.
- D.130 Giani, C., Dunn-Rankin, D., and Garman, J. (2011) “Swirl Vane Design for Miniature Fuel Film Combustor,” Paper 11F-27, Fall Technical Meeting of the Western States Section/The Combustion Institute, Riverside, CA, October 17-18.
- D.131 Padilla, R., Jaimes, D., Pham, T., and Dunn-Rankin, D. (2011) “Experimental Study of Water-Laden Fuel Mixtures Burning in a Counterflow Configuration,” Paper 11F-22, Fall Technical Meeting of the Western States Section/The Combustion Institute, Riverside, CA, October 17-18.
- D.132 Chien, Y.-C., Garman, J., and Dunn-Rankin, D. (2011) “Tomographic Analysis of Quantum Cascade Laser Absorption by Carbon Monoxide,” Paper 11F-41, Fall Technical Meeting of the Western States Section/The Combustion Institute, Riverside, CA, October 17-18.
- D.133 Kebria, M., Dunn-Rankin, D., Descours, J., Garman, J., and Swanson, L. (2011) “Entrained Flow Reactor Characterization of Pulverized Coal Combustion,” Paper 11F-48, Fall Technical Meeting of the Western States Section/The Combustion Institute, Riverside, CA, October 17-18.
- D.134 Roshandell, M., Chiang, D., Gutman, S., Taborek, P., and Dunn-Rankin, D. (2011) “Combustion of Methane Hydrate,” Paper 11F-59, Fall Technical Meeting of the Western States Section/The Combustion Institute, Riverside, CA, October 17-18.
- D.135 G. Bisht, G. Canton, A. Mirsepassi, D. Dunn-Rankin, L. Kulinsky and M. Madou (2011) “Novel Polymeric Inks for Precision Patterning of Carbon Micro/Nano-Fibers Using Near-Field Electrospinning”, Proceedings of Technologies for Future Micro-Nano Manufacturing, Napa, CA, Aug 8-10.
- D.136 D. Dunn-Rankin, O.C. Kwon, S. Lee, R. Padilla, and T.K. Pham (2012) “Counterflow Water-Laden Flames to Simulate Fuel Hydrate Combustion,” Western States Section/The Combustion Institute Spring Meeting Paper 12S-32, Arizona State University, Tempe, March 19–20.
- D.137 M.M. Kebria and Dunn-Rankin, D. (2012) “Temperature measurement with a suction pyrometer in an entrained flow reactor,” Western States Section/The Combustion Institute Spring Meeting Paper 12S-05, Arizona State University, Tempe, March 19–20.
- D.138 Mirsepassi, A. and Dunn-Rankin, D. (2012) “Particle Image Velocimetry in Viscoelastic Fluids and Particle Interaction Effects,” 16th International Symposium on Laser Measurements in Fluid Mechanics, Lisbon, Portugal, July 9–12.
- D.139 Chien, Y.-C. and Dunn-Rankin, D. (2013) “Electric Field Effects on Carbon Monoxide Release from Impinging Flames,” Paper 070MI-0360, US Combustion Meeting, Park City, Utah, May 20–23.
- D.140 Padilla, R., Minniti, M., Jaimes, D., Garman, J., Dunn-Rankin, D., and Pham, T.K. (2013) “Thin Filament Pyrometry for Temperature Measurements in Fuel Hydrate Flames and Non-Premixed Water-Laden Methane-Air Flames,” Paper 070LT-0361, US Combustion Meeting, Park City, Utah, May 20–23.
- D.141 Chien, Y.-C., Yamashita, K., Karnani, S., and Dunn-Rankin, D. (2013) “The Influence of Electric Field Power Systems on Flame Behavior,” Paper 070MI-0368, US Combustion Meeting, Park City, Utah, May 20–23.
- D.142 Karnani, S. and Dunn-Rankin, D. (2013) “Visualizing CH\* Chemiluminescence in Sooting Flames via Image Post-Processing,” Paper 070DI-0393, US Combustion Meeting, Park City, Utah, May 20–23.
- D.143 Ricchiuti, V., Padilla, R., Karnani, S., and Dunn-Rankin, D. (2013) “CANTERA Simulations of Water-Laden Methane/Air Nonpremixed Counterflow Flames,” Paper 070RK-0378, US Combustion Meeting, Park City, Utah, May 20–23.
- D.144 Chien, Y.-C., Yamashita, K., and Dunn-Rankin, D. (2013) “Electrical Aspects of Impinging Flames,” 24th International Colloquium on the Dynamics of Explosions and Reactive Systems, Paper 126, Taipei, Taiwan, July 28–August 2.
- D.145 Padilla, R.E., Kwon, O.C., Lee, S., Dunn-Rankin, D., and Pham, T.K. (2013) “Extinction Limits and Structure of Counterflow Nonpremixed Water-Laden Methane/Air Flames,” 24th International Colloquium on the Dynamics of Explosions and Reactive Systems, Paper 175, Taipei, Taiwan, July 28–August 2.
- D.146 Kebria, M., Jacobo, J., Zavar, A., Garman, J., and Dunn-Rankin, D. (2013) “Char Burnout Kinetics in an Entrained Flow Reactor,” Paper presented at the American Flame Research Council Meeting,

- Lihue, HI, September 23-25.
- D.147 Sauer, V.M., Padilla, R.E., and Dunn-Rankin, D. (2013) "Analyzing Water-Laden Non-Premixed Counterflow Flames Using the Mixture Fraction/ Excess-Enthalpy Approach," Western States Section/The Combustion Institute Fall Meeting Paper 084LF-0060, Colorado State University, Fort Collins, CO, October 9-10.
- D.148 Ziaee, A., Lemoine, A., Garman, J., and Dunn-Rankin, D. (2013) "Picosecond Digital Holography for Multi-Phase Flows," Western States Section/The Combustion Institute Fall Meeting Paper 084DI-0058, Colorado State University, Fort Collins, CO, October 9-10.
- D.149 Karnani, S., Botimer, J., Gutman, S., Bervas, Q., Fillon, C., Taborek, P., and Dunn-Rankin, D. (2013) "Effects of Sediment and Salinity on Methane Hydrate Combustion," Western States Section/The Combustion Institute Fall Meeting Paper 084NT-0059, Colorado State University, Fort Collins, CO, October 9-10.
- D.150 Takahashi, F., Nagapetyan, H., Stocker, D.P., and Dunn-Rankin, D. (2014) "Transient Responses of Jet Diffusion Flames to a DC Electric Field in Microgravity," Spring Technical Meeting of the Central States Section/The Combustion Institute, Tulsa, OK, March 16-18.
- D.151 Escofet-Martin, D., Chien, Y.C., and Dunn-Rankin, D. (2014) "OH PLIF of an Impinging Flame," Western States Section/The Combustion Institute Spring Meeting paper 087DI-0032, California Institute of Technology, Pasadena, CA, March 24-25.
- D.152 Tinajero, J., Dunn-Rankin, D., Jie, B., and Plascencia, M. (2014) "Schlieren Imaging of Chemi-Ion Driven Flows in a Time Varying Electric Field," Western States Section/The Combustion Institute Spring Meeting paper 087LF-0048, California Institute of Technology, Pasadena, CA, March 24-25.
- D.153 Chien, Y.C. and Dunn-Rankin, D. (2014) "Temperature measurement over a quenching plate with electric field flames," Spring Meeting, Western States Section/The Combustion Institute, Paper 087LF-0060, California Institute of Technology, Pasadena, CA, March 24-25.
- D.154 Ziaee, A. and Dunn-Rankin, D. (2014) "Time-Gated Digital Holography for Dense Sprays using Hydrosols," Paper #21, 26th Annual ILASS-Americas Conference, Portland, OR, May 18-21.
- D.155 Sauer, V. and Dunn-Rankin, D. (2015) "Impinging Coflow Nonpremixed Methane-Air Flames with Unity Lewis Number," 9th U.S. National Combustion Meeting, Cincinnati, OH, May 17-20.
- D.156 Escofet-Martin, D., Chien, Y.-C., and Dunn-Rankin, D. (2015) "Two-Photon CO PLIF of Flames near a Quenching Plate," 9th U.S. National Combustion Meeting, Cincinnati, OH, May 17-20.
- D.157 Aguilar, A., Tinajero, J., and Dunn-Rankin, D. (2015) "Relating CH\* Chemiluminescence with Charged Species in a Non-Premixed Methane Flame," 9th U.S. National Combustion Meeting, Cincinnati, OH, May 17-20.
- D.158 Lladó-Gambin, A., Padilla, R.E., Dunn-Rankin, D., and Pham, T.K. (2015) "Color-Ratio Pyrometry for Temperature Measurements in Methane/Air Counterflow Flames," 9th U.S. National Combustion Meeting, Cincinnati, OH, May 17-20.
- D.159 Chien, Y.-C., Escofet-Martin, D., and Dunn-Rankin, D. (2015) "CO Emission from an Impinging Non-Premixed Flame under the Influence of an Electric Field," 9th U.S. National Combustion Meeting, Cincinnati, OH, May 17-20.
- D.160 Santacana-Vall, J. and Dunn-Rankin, D. (2015) "Methane Hydrate Combustion," 25<sup>th</sup> International Colloquium on the Dynamics of Explosions and Reactive Systems, Leeds University, England, August 2-7.
- D.161 Escofet-Martin, D., Chien, Y.-C., and Dunn-Rankin, D. (2015) "Two-Line OH PLIF Temperature Measurements of Flames Near a Quenching Plate," 25<sup>th</sup> International Colloquium on the Dynamics of Explosions and Reactive Systems, Leeds University, England, August 2-7.
- D.162 Chien, Y.-C., Escofet-Martin, D., and Dunn-Rankin, D. (2015) "Non-Premixed Impinging Flames and CO Release under the Influence of an Electric Field," 25<sup>th</sup> International Colloquium on the Dynamics of Explosions and Reactive Systems, Leeds University, England, August 2-7.
- D.163 Lopez-Camara, C-F., Eplénier, G., Tinajero, J., and Dunn-Rankin, D. (2015) "Numerical Simulation of Methane/Air Flames Including Ions and Excited Species," Western States Section/The Combustion Institute Fall Meeting Paper 134CK-0055, Brigham Young University, Provo, UT, October 5-6.
- D.164 Dang, J., Dunn-Rankin, D., and Edwards, R. (2015) "Solid Fuel Cookstove Emissions: Effect of Intermittent Use," Western States Section/The Combustion Institute Fall Meeting Paper 134HC-0054, Brigham Young University, Provo, UT, October 5-6.
- D.165 Pereira da Silva, A., Sauer, V.M., and Dunn-Rankin, D. (2015) "Experimental Evaluation of a Miniature Liquid Film Combustor with Secondary Air Injection," Western States Section/The Combustion Institute Fall Meeting Paper 134DI-0063, Brigham Young University, Provo, UT, October 5-6.
- D.166 Chien, Y.-C. and Dunn-Rankin, D. (2017) "The visualization and combustion characteristics of artifi-



- cial methane hydrate flames,” Paper 2K17 - 10th U.S. National Combustion Meeting, College Park, Maryland, April 23-26, 2017.
- D.167 Sauer, V.M., Fachini, F.F. and Dunn-Rankin, D. (2017) “Structure of Nonpremixed Swirl-Type Tubular Flames Burning Condensed Fuels with Unity Lewis Numbers,” Paper 2G05 - 10th U.S. National Combustion Meeting, College Park, Maryland, April 23-26, 2017.
- D.168 Tinajero, J., Bernard, G., Autef, L., and Dunn-Rankin, D. (2017) “Enhanced Flame Ion Production Through External Electric Fields,” 10th Paper 1G13 - U.S. National Combustion Meeting, College Park, Maryland, April 23-26, 2017.
- D.169 Escofet-Martin, D., Chien, Y.-C., and Dunn-Rankin, D. (2017) “High pressure effects on PLIF of a nonpremixed coflow flame,” 10th Paper 1J17 - U.S. National Combustion Meeting, College Park, Maryland, April 23-26, 2017.
- D.170 Minniti, M., Ziaee, A., Trolinger, J., and Dunn-Rankin, D. (2017) “Ultra-short Pulse Off-axis Digital Holography for Imaging the Core Structure of Transient Sprays,” Paper 085 - 29th Institute of Liquid Atomization and Spray Systems Annual Conference, Atlanta, GA, May 14-18.
- D.171 Sauer, V.M. and Dunn-Rankin, D. (2017) “Porous Wall Fed Liquid Fuel Nonpremixed Swirl-Type Tubular Flames,” Paper 1114, International Colloquium on the Dynamics of Explosions and Reactive Systems, Boston, MA, July 30–Aug. 4.
- D.172 Sauer, V.M., Batther, J.S., and Dunn-Rankin, D. (2017) “Porous Wall-Fed Liquid Fueled Miniature Tubular Flame Burner,” Paper 29LF-0093, Western States Section/The Combustion Institute Fall Meeting, University of Wyoming, Laramie, WY, October 1-3.
- D.173 Vicariotto, M., Martinez, P., and Dunn-Rankin, D. (2017) “Temperature Profiles and Extinction Limits of a Coflow Water-Laden Methane/Air Diffusion Flame,” Paper 29LF-0021, Western States Section/The Combustion Institute Fall Meeting, University of Wyoming, Laramie, WY, October 1-3.
- D.174 Urban, J.L., Sirazi, D., Vicariotto, M., Murphy, D., Dunn-Rankin, D., and Fernandez-Pello, C. (2017) “Temperature Measurement of Glowing Firebrands with Multi-Color Pyrometry,” Paper 29FI-0090, Western States Section/The Combustion Institute Fall Meeting, University of Wyoming, Laramie, WY, October 1-3.
- D.175 Biasioli, A., Chien, Y.-C., and Dunn-Rankin, D. (2017) “Exploring Continuous Monitoring Methods for SO<sub>3</sub> in Flue Gas Conditions,” Paper 29DI-0028, Western States Section/The Combustion Institute Fall Meeting, University of Wyoming, Laramie, WY, October 1-3.
- D.176 Escofet-Martin, D., Torredemer, A., Chien, Y.-C., and Dunn-Rankin, D. (2017) “Direct Comparison of Simulated OH Fluorescence and Experimental Results in a Non-Premixed Laminar Diffusion Coflow Flame at High Pressure Conditions,” Paper 29DI-0086, Western States Section/The Combustion Institute Fall Meeting, University of Wyoming, Laramie, WY, October 1-3.
- D.177 Lopez-Camara, C.-F. and Dunn-Rankin, D. (2017) “Numerical Simulations of a Co-Flow Methane/Air Flame including Ions and Excited Species under Different Gravity Conditions,” Paper 29LF-0053, Western States Section/The Combustion Institute Fall Meeting, University of Wyoming, Laramie, WY, October 1-3.
- D.178 Ziaee, A., Minniti, M., and Curran, D., Porter, J., Parker, T., and Dunn-Rankin, D. (2018) “” 19th Lisbon Symposium for Laser and Optical Measurements in Fluid Mechanics, Lisbon, Portugal, July 12-15.
- D.179 Chien, Y.-C., Tinajero, J., Stocker, D., Hegde, U., and Dunn-Rankin, D. (2018) “Electric-Field Effects on Flames in Microgravity on the International Space Station,” Spring Technical Meeting, Central States Section/The Combustion Institute, Minneapolis, MN, May 20- 22.
- D.180 Minniti, M., Ziaee, A., Curran, D., Porter, J., Parker, T., and Dunn-Rankin, D. (2018) “Ultra-short Pulse Off-axis Digital Holography Imaging under Realistic Diesel Spray Conditions,” ICLASS-2018, 14th Triennial International Conference on Liquid Atomization and Spray Systems, Chicago, IL, July 22-26.

#### Conference Papers (only abstract required)

- E.1 Dunn-Rankin, D. and Sawyer, R.F. (1984). “Flame Induced Flow—‘Tulip’ Flame Formation.” Poster session, 20th International Symposium on Combustion, Dearborn, Michigan.
- E.2 Dunn-Rankin, D., Hoornstra, J., Fletcher, T., and Holve, D.J. (1986). “Evolution of Particle Size Distributions of Pulverized Coal and Coal/Water Slurries During Combustion.” Poster session, 21st International Symposium on Combustion, Munich, W. Germany. Sandia National Laboratories Report SAND86-8634.
- E.3 Dunn-Rankin, D. and Lucht, R.P. (1988). “Thermal Boundary Layer Development During the Expansion Stroke of an Internal Combustion Engine,” Paper 54, Poster Session, 22nd International Symposium on Combustion, Seattle, Washington, August 14-19.

- E.4 Schum, G.M., Phalen, R.F., and Dunn-Rankin, D. (1989) "Airborne Dust Inhalation Exposure Assessments for Children and Adults," The Society of Toxicology Annual Meeting, Atlanta, GA, May.
- E.5 Phalen, R.F., Oldham, M.J., Dunn-Rankin, D., Chung, I.P., and Schum, G.M. (1989) "Aerosol Inspirability Measurements using Mannequins of Various Sizes," The Seventh Annual Meeting of the American Association for Aerosol Research, Reno, Nevada, October 9–13.
- E.6 Chung, I.P., Dunn-Rankin, D., Phalen, R.F., and Oldham, M.J. (1989) "Low Cost Wind Tunnel for Aerosol Inhalation Studies," The Seventh Annual Meeting of the American Association for Aerosol Research, Reno, Nevada, October 9–13.
- E.7 Dunn-Rankin, D., Chung, I.P., Phalen, R.F., and Oldham, M.J. (1989) "Comparison of Inspirability in Realistic Mannequins and Simple Samplers," The Seventh Annual Meeting of the American Association for Aerosol Research, Reno, Nevada, October 9–13.
- E.8 Dunn-Rankin, D. (1990). "Robust Fitting of CARS Spectra for Temperature Measurement in Hostile Combustion Environments," The Optical Society of America Topical Meeting on Laser Applications to Chemical Analysis, Incline Village, NV, February 5–8.
- E.9 Chung, I.P. and Dunn-Rankin, D. (1990) "Numerical Simulation of Two-Dimensional Blunt Body Sampling," The 21st Annual Meeting of the Fine Particle Society, San Diego, CA, August 21–25.
- E.10 Dunn-Rankin, D. and Chung, I.P. (1990) "Fiber Optic Particle Counter for *In Situ* Measurement of Inspirability," The 21st Annual Meeting of the Fine Particle Society, San Diego, CA, August 21–25.
- E.11 Huang, L. and Dunn-Rankin, D. (1990) "Gradient Index Lens Based Optical Particle Sizer," Paper TuD2 of the Optical Society of America's Gradient-Index Optical Systems Topical Meeting, Monterey, CA, April 8–9.
- E.12 Zhu, J. and Dunn-Rankin, D. (1991) "Experimental Study of a Combusting Droplet Stream by Coherent Anti-Stokes Raman Scattering (CARS)," Poster session, Gordon Research Conference on the Physics and Chemistry of Laser Diagnostics in Combustion, Plymouth, NH, July 15–19.
- E.13 Chung, I.P. and Dunn-Rankin, D. (1992) "The Experimental Analysis of Two-Dimensional Cylindrical Blunt Body Sampling," *23rd Annual Meeting of the Fine Particle Society*, Las Vegas, NV, July 13–17.
- E.14 Gray, A.L. and Dunn-Rankin, D. (1992) "Mainstream Cigarette Smoke Characteristics during a Standard Inhalation Cycle," *11th Annual Meeting of the American Association for Aerosol Research*, San Francisco, CA, October 12–16.
- E.15 Chung, I.P. and Dunn-Rankin, D. (1992) "Experimental Investigation of a Two-Dimensional Blunt Body Sampler Oriented at an Angle to the Oncoming Flow," *11th Annual Meeting of the American Association for Aerosol Research*, San Francisco, CA, October 12–16.
- E.16 Phalen, R.F., Dunn-Rankin, D., and Chung, I.P. (1993) "Particle Size-Selective Sampling Criteria: Possible Body-Size Effects," *American Industrial Hygiene Conference and Exposition*, New Orleans, May 15–21.
- E.17 Garman, J.D., Dunn-Rankin, D., Farrow, R.L, and Rakestraw, D.J. (1993) "Laser Induced Fluorescence and Degenerate Four-Wave Mixing of NO in a 100,000 Btu/hr Atmospheric Pressure Natural Gas Burner," Poster session, Gordon Research Conference on the Physics and Chemistry of Laser Diagnostics in Combustion, Plymouth, NH, July 12–16.
- E.18 Dunn-Rankin, D. and Jones, R.D. (1993) "Neural Networks Fitting CARS Spectra," Poster session, Gordon Research Conference on the Physics and Chemistry of Laser Diagnostics in Combustion, Plymouth, NH, July 12–16.
- E.19 Chang, E., Dunn-Rankin D., Hoag, J.H., and Holve, D.J. (1993) "Evolution of Environmental Tobacco Smoke Particle Size Distribution," *12th Annual Meeting of the American Association for Aerosol Research*, Oak Park, IL, October 11–15.
- E.20 Dunn-Rankin, D., Buchanan, C.R., and Chung, I.P. (1993) "Tobacco Smoke Transport in Two- and Three-Dimensional Enclosures," Poster session of the Tobacco Related Disease Research Program Conference, San Francisco, CA, December 2–3.
- E.21 Dunn-Rankin and Chung, I.P. (1993) "In-situ Sizing of Tobacco Smoke in Real-Time," Poster session of the Tobacco Related Disease Research Program Conference, San Francisco, CA, December 2–3.
- E.22 Buchanan, C.R., Chung, I.P., and Dunn-Rankin, D. (1994) "Aerosol Dispersion in the Indoor Environment," *Fourth International Aerosol Conference*, UCLA, Los Angeles, CA, August 28–September 2.
- E.23 Chung, I.P. and Dunn-Rankin, D. (1994) "The Flowfield near a Spherical Blunt Body Sampler," Poster session of the *Fourth International Aerosol Conference*, UCLA, Los Angeles, CA, August 28–September 2.
- E.24 Beck, A.K., Dunn-Rankin, D. and Jabbari, F. (1994) "Active Control of a Diffusion Flame Sheet," Poster session of the *25th Symposium (International) on Combustion*, UCI, Irvine, CA, July 31–August 5.

- E.25 Dimalanta, R.J. and Dunn-Rankin, D. (1994) "Vaporization of Multi-Component Waste Oil Droplets: I. Isolated Suspended Droplets II. Droplet Stream," Poster session of the *25th Symposium (International) on Combustion*, UCI, Irvine, CA, July 31–August 5.
- E.26 Dimalanta, R.J. and Dunn-Rankin, D. (1995) "Flame Structure around Chlorinated Hydrocarbon Droplet Streams," Poster session of the Fourth International Congress on Toxic Combustion Byproducts, Berkeley, CA, June 5–7.
- E.27 Buchanan, C.R. and Dunn-Rankin, D. (1995) "Dispersion of Surgically Produced Aerosols," 14th annual AAAR meeting, Pittsburgh, PA, October 9–13.
- E.28 Beck, A., Strayer, B., Dunn-Rankin, D., and Jabbari, F. (1995) "Control Based Modeling of Acoustically Forced Diffusion Flame Flicker," International Mechanical Engineering Congress and Exposition, ME'95, San Francisco, CA, November 12–17.
- E.29 Garman, J.D., Dunn-Rankin, D., Farrow, R., and Rakestraw, D. (1995) "A Comparison of Temperature Measurements in Low Pressure Flames using Coherent Anti-Stokes Raman Spectroscopy (CARS), Laser-Induced Fluorescence (LIF), and Degenerate Four-Wave Mixing (DFWM)," Gordon Conference on Chemistry and Physics of Laser Diagnostics in Combustion, Plymouth, NH, July 9–14.
- E.30 Buchanan, C.R. and Dunn-Rankin, D. (1996) "Numerical Simulation of Surgically Produced Aerosol Dispersion," Poster session of the 15th Annual AAAR Conference, Orlando, FL, October 14–18.
- E.31 Chung, I.P. and Dunn-Rankin, D. (1996) "Numerical Simulation of Air Mixing in a Model Room," Poster paper #96-055, IAQ 96: Paths to Better Building Environments, Baltimore, MD, October 6–8, 1996.
- E.32 Dimalanta, R., Connon, C., and Dunn-Rankin, D. (1996) "Characterization of Droplet Stream Flames," Poster Session of the 26th International Combustion Symposium, Naples, Italy, July 28–August 2.
- E.33 Garman, J.D. and Dunn-Rankin, D. (1996) "Spatial Averaging in CARS Measurements," Poster Session of the 26th International Combustion Symposium, Naples, Italy, July 28–August 2.
- E.34 Lauder, G.V., Connon, C. and Dunn-Rankin, D. (1996) "Visualization of Flow behind the Tail of Swimming Fish: New Data using DPIV Techniques," presented at the American Society of Zoologists Annual Meeting, abstracts published in *American Zoologist*, **36**, *5*, 7A.
- E.35 Garman, J.D. and Dunn-Rankin, D. (1997) "Spatial Averaging Effects in CARS Thermometry of a Non-Premixed Flame," Institute of Physics Topical Meeting: Optics and Optical Diagnostics in Combustion, London, England, February 26.
- E.36 Dunn-Rankin, D. and Weinberg, F.J. (1997) "Light Deflection by Axially Symmetrical Flames," Institute of Physics Topical Meeting: Optics and Optical Diagnostics in Combustion, London, England, February 26.
- E.37 Lee, H., Kim, S., and Dunn-Rankin, D. (1997) "Control of Indoor Air Quality through Modifications to the Indoor Space," *Proceedings of the 25th Annual Meeting of the Korean-American Scientists and Engineers Association (KSEA)*, McLean, VA, February.
- E.38 Connon, C.S. and Dunn-Rankin, D. (1997) "Observations of Droplet Streams at High Temperature and Pressure," Proceedings of ILASS Americas 10th Annual Conference on Liquid Atomization and Spray Systems, Ottawa, Canada, May 18–21.
- E.39 Dunn-Rankin, D., Buchanan, C.R., and Chung, I.P. (1997) "Sizing and Transport of Tobacco Smoke," TRDRP Annual Meeting, San Francisco, CA, Dec. 2.
- E.40 Vu, K.T., Krasieva, T., Venugopalan, V., and Dunn-Rankin, D. (1998) "Photochromic Films for Characterizing Biomedical Microbeams," OSA Topical Meeting in Biomedical Optics, Orlando, FL, March 9–11.
- E.41 Dimalanta, R., Brock, N., DeBarber, P., and Dunn-Rankin, D. (1998) "Sodium Concentration Measurements with Resonant Holographic Interferometry for Gas and Multi-Phase Environments," Topical Meeting in Laser Applications to Chemical and Environmental Analysis, Orlando, FL, March 9–11.
- E.42 Dimalanta, R. and Dunn-Rankin, D. (1999) "Spacing Considerations in Droplet Stream Flames," Joint Meeting of the U.S. Sections/The Combustion Institute, George Washington University, Washington D.C., March 15–17.
- E.43 Dunn-Rankin, D., B.Strayer, Weinberg, F.J., and Carleton, F. (1999) "Electrical Aspects of Flames in Microgravity," *Proceedings of the 5th International Microgravity Combustion Workshop*, NASA/CP-1999-208917, 515–517.
- E.44 Posner, J.D., Dunn-Rankin, D., DeBarber, P. and Brock, N. (1999) "Using Resonant Holographic Interferometry as a Multi-Phase Combustion Diagnostic," Poster Session of the Gordon Conference on Laser Diagnostics in Combustion, Barga, Italy, June 20–25.
- E.45 Posner, J.D. and Dunn-Rankin, D. (2000) "Resonant Holographic Interferometry: Towards a Quantitative Diagnostic for Combustion Systems," Poster Session, *28th International Symposium on Combustion*, Edinburgh, July 30–August 4.
- E.46 Carleton, F., Dunn-Rankin, D., and Weinberg, F.J. (2000) "Electrical Spraying of Extinguishants for

- use in Microgravity,” Poster Session, *28th International Symposium on Combustion*, Edinburgh, July 30–August 4.
- E.47 Strayer, B.A., Posner, J.D., Dunn-Rankin, D., and Weinberg, F.J. (2000) “Further Studies on Simulating Microgravity Flames using Electric Fields,” Poster Session, *28th International Symposium on Combustion*, Edinburgh, July 30–August 4.
- E.48 Co, T., Papac, J., Rickard, M., and Dunn-Rankin D. (2002) “Emissions from a Propane-fueled Oscillating Combustor,” *29th International Symposium on Combustion*, Sapporo, Japan, August.
- E.49 Papac, J. and Dunn-Rankin, D. (2004) “Combustion in a Small Scale Reciprocating Engine,” *Poster Session – 30th International Symposium on Combustion*, University of Illinois, Chicago, August.
- E.50 Papac, M.J. and Dunn-Rankin, D. (2004) “Ion current measurements and schlieren imagery of acetylene, ethylene, ethane and methane diffusion flames exposed to electric field”, *Poster Session – 30th International Symposium on Combustion*, University of Illinois, Chicago, August.
- E.51 Pham, T.K., Dunn-Rankin, D., and Sirignano, W.A. (2004) “Further developments in miniature liquid fuel film combustors,” *Poster Session – 30th International Symposium on Combustion*, University of Illinois, Chicago, August.
- E.52 Gowadia, N., Oldham, M., Dunn-Rankin, D. (2005) “Size Segregated Chemical Composition of Mainstream Tobacco Smoke Aerosol from Regular Cigarettes and Potentially Reduced Exposure Products (PREPs),” *2005 Research Symposium on Tobacco Science and Health*, St. Louis, MO, February.
- E.53 Gowadia, N., Oldham, M., and Dunn-Rankin, D. (2006) “Carbon Monoxide and Nitrogen Oxides in mainstream smoke of Potentially Reduced Exposure Products (PREPs), commercial, and research cigarettes under different puffing regimens,” Poster Session, Society of Toxicology Annual Meeting, San Diego, CA, March 5-9.
- E.54 Gowadia, N., Oldham, M., and Dunn-Rankin, D. (2006) “Comparison Between Carbon Monoxide, Nitrogen Oxides, and Nicotine in the Mainstream Smoke of Research, Commercial, and PREP Cigarettes,” Oral and Poster Session, Institute for Science and Health Annual Symposium Tobacco Harm Reduction and Perception of Risk, Vienna, Austria, March 9-10.
- E.55 Weinberg, F.J., Carleton, F.A., and Dunn-Rankin, D. (2006) “Electric Field-Controlled Mesoscale Burners,” Poster 1A14, *31st International Combustion Symposium*, Heidelberg, Germany, August 7-13.
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### Patents

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