Ajay K. Agrawal

Work:
Department of Mechanical Engineering
359 HM Comer Hall
The University of Alabama
Tuscaloosa, AL 35487
Phone: (205) 348-4964, e-mail: aagrawal@eng.ua.edu

Home:
6122 Lake Vista Drive
Tuscaloosa, AL 35406
(205) 366-0966

EDUCATION

Ph.D., Mechanical Engineering, University of Miami 1988
Dissertation Title: *Fluid Flow and Heat Transfer in Variable Cross-Section Annular Passages*
Dissertation Advisor: Professor Subrata Sengupta

Dissertation work studied heat exchangers with enhanced surfaces. Developed computer software to analyze fluid flow and heat transfer in complex heat exchange passages for high efficiency.

M.S., Mechanical Engineering, Indian Institute of Technology, Kanpur 1983
Thesis Title: *Temperature Response of Water Body with Thermal Effluent Disposal.*

Performed simulated experiments to study thermal response of water ponds subjected to thermal discharge from power plants.

B.S., Mechanical Engineering, Indian Institute of Technology, Roorkee, India 1980

CURRENT POSITION

January 2005- Professor and Robert F. Barfield Endowed Chair of Mechanical Engineering, Department of Mechanical Engineering, University of Alabama

CURRENT RESEARCH/TEACHING INTERESTS

- Biofuel combustion and alternate fuels
- Lean premixed and lean direct injection combustion
- Passive mitigation of thermo-acoustic instabilities
- Quantitative rainbow schlieren deflectometry
- Low-emission combustion concepts
- Combustion and fluid flow in microgravity
- Meso-scale combustion
- Auto-ignition and combustion control
- Design of thermal-fluid systems
- Computational Fluid Dynamics

PERSONAL RECORD

Marital Status Married; wife Rachna, son Saahil (born 9/91) and son Paaras (born 2/95)
Citizenship Status US Citizen (Naturalized)
Country of Birth India

PROFESSIONAL EXPERIENCE

University of Alabama, Tuscaloosa, Alabama
Professor and Robert F. Barfield Endowed Chair of Mechanical Engineering, January 2005-Present
Major responsibility of teaching ME Senior Design, a capstone course at undergraduate level and Combustion and Computational Fluid Dynamics courses at the graduate level

University of Oklahoma, Norman, Oklahoma

Lloyd G. and Joyce Austin Presidential Professor	April 2004- December 2004
Associate Professor	July 2000 – December 2004
Assistant Professor	August 1993-June 2000

Major responsibility of teaching "thermal-fluid design courses" at the undergraduate level, and "computational heat transfer/combustion" courses at the graduate level. Developed and directs "Gas Turbine Systems Laboratory" and "Microgravity Combustion Laboratory." Coordinator of Senior Design Practicum Program in Mechanical Engineering

Solar Turbines Inc., San Diego, California
Advanced Gas Turbine Systems Research (AGTSR) Faculty Fellow July 1999

Worked with staff engineers to analyze fuel composition effects on lean premixed combustion, and supervised experiments in high-pressure combustion test cells for industrial gas turbines.

Clemson University, Clemson, South Carolina
Visiting Assistant Professor August 1989 - June 1993

Responsibilities included teaching (0.25FTE) and research (0.75FTE) in thermal-fluid systems. Taught course on Fluid Mechanics, Thermodynamics, and Heat Transfer. Developed computer codes for low-Btu coal gas combustion in gas turbines. Senior group leader in-charge to develop the Gas Turbine Laboratory. Led design and development of a major gas turbine research facility to simulate combustor-diffuser flow in power generating gas turbines. Actively participated in workshops leading to the creation of Department of Energy Advanced Turbine Systems (ATS) Program in 1993.

Michigan Technological University, Houghton, Michigan
Visiting Assistant Professor August 1988-July 1989

Responsibilities included teaching undergraduate courses in Thermodynamics, Fluid Mechanics, Heat Transfer, and Numerical Methods in Engineering.

University of Miami
Teaching Assistant August 1982-July 1987

Responsibilities included assisting and teaching courses on Heat Exchanger Fundamentals and Design, and Thermodynamics. Served as teaching assistant for the measurements laboratory.

HONORS AND AWARDS

- 2013 Blackmon-Moody Outstanding Professor Award, University of Alabama, 2013
- National Academy of Inventors Hall of Fame, 2013
- Honorary Award, Alabama India Business Partnership, 2010
- Fellow, ASME
- Associate Fellow, AIAA
- Lloyd G. and Joyce Austin Presidential Fellowship, University of Oklahoma, 2004-2008
- CASI Summer Faculty Fellow, 2000
- Advanced Gas Turbine Systems Research Faculty Fellowship, US Department of Energy, 1999
- NASA EPSCoR Travel Grant, 1999
- Junior Faculty Research Award, University of Oklahoma, 1995
- Travel Award, 2nd Int. Microgravity Combustion Workshop, NASA Lewis, 1992
- Dorgan Research Fellowship, University of Miami, 1987-88
- NATO Advanced Study Institute Travel Award to Portugal, 1987.
- IIT Post Graduate Scholarship, India, 1980-82
- Merit Scholarship, University of Roorkee, 1977-May 80.
- National Merit Scholar, 1976
- Listed in Marquis Who's Who in Science and Engineering, Who's Who in the East

STUDENTS AWARDED

- William Cox, Best College Poster Award, UA Undergraduate Research Day, 1st Place winner, 2013
- Dan Mitchell, Combustion Art Winner, 1st Place, 2012
- Tanisha Booker, Combustion Art Competition, 3rd place winner, 2010
- Justin Williams, Combustion Art Competition, 1st place winner, 2010
- Daniel Sequera, Excellence in MS Thesis, 1st Place at University of Alabama, 2007
- Cristina Dumitrescu, Graduate Student of the Year in ME, Engineering Council of Birmingham, 2007
- ASME Fluid Engineering Senior Capstone Project Report Competition, **1st Place award**, 2004
- Undergraduate Research Opportunity Program, University of Oklahoma, William Dacus, 2004
- Undergraduate Research Day at the Oklahoma Capitol, one of two students from OU campus, William Dacus, 2004
- NSF Graduate Fellowship, Jarod Kelly, 2004
- ASME Fluid Engineering Senior Capstone Project Report Competition, **1st Place award**, 2003
- GAANN Fellowship, Timothy Marbach, 2003

EDUCATIONAL ACTIVITIES

Undergraduate Courses Taught

- Mechanical Engineering Design (ME 490)
- Heat Transfer
- Design of Thermal-Fluid Systems
- Senior Design Practicum (Energy Systems)
- Numerical Methods in Engineering
- Thermodynamics I
- Thermodynamics II
- Introduction to Fluid Mechanics
- Introduction to Heat Transfer
- Air Conditioning Systems

Recently taught courses include: Design of Thermal Fluid Systems, and Senior Design Practicum. The latter course involves industry sponsored team projects requiring design and prototyping such as:

-Bird's Eye View, Sutton Avian Research Center, Best Project Award, 1st Place, 2004
-Automation of Air Entrainment Device, Halliburton, patent in progress, 2004
-Flowtran, Omniplex Science Museum, Full-scale exhibit to display flow concepts, 2004
- Proppant Delivery System Design: Schlumberger, 1st Place at ASME IMECE Fluid Eng, 2004
- Air entrainment measurements in slurries, Halliburton, 1st Place at ASME IMECE Fluid Eng, 2003
- SureFlow short circuit identification, International Environmental Corp, 2003
- Heat-pipe air-conditioning system, ASHRAE, 2003
- Heat exchanger coil testing, York International, Special recognition from the sponsor, 2003
- Fuel cell kerosene pre-burner, University of Oklahoma, Best Project Award, 1st Place, 2002
- Automated measurements in an instructional diesel engine, University of Oklahoma, 2002
- Pitot-static Tube Calibration System for B-1 Bomber Aircraft, Later on adapted by Air Force, 2001
- Aircraft fuel flow meter calibration test stand, Tinker Air Force Base, 2001
- Design/construction of a Super Gas fuel station, University of Oklahoma/OCAST, 2000
- Sabatier reactor for in-situ fuel utilization on Mars, 2000
- Air-cycle cooling system, 2000
- Residential furnace with feedback control of combustion emissions, 2000
- Interacting diffusion flames in microgravity, NASA Zero Gravity Student Flight Program, 1998.

Graduate Courses Taught

- Computational Heat and Fluid Flow
- Combustion Processes II or Computational Combustion
- Principles of Heat Transfer
- Finite Difference Methods in Engineering
- Computational Fluid Dynamics

The first two courses were developed and they are required by all graduate students in thermal sciences. The course on Combustion II was developed to introduce advanced computational concepts in combustion including use of commercial software.

Additional Educational Activities:

- Re-organized Mechanical Engineering Senior Design Program at the University of Alabama to involve industrial sponsors providing projects and financial support
- Facilitated industrial funding of about $50,000 for Senior Capstone Projects in Mechanical Engineering during academic year 2003-2004. Sponsors include Schlumberger, Halliburton, Hitachi Computer Products, Michelin Tire, Omniplex Science Museum, National Instruments, Eaton Corporation, etc.
- Undergraduate Senior Project Grant, $4,000, ASHRAE, 2002-2003.
- Developed Senior Design Practicum Program with project option in Energy Systems.
- Advised independent research projects of about **65** undergraduate students.
- Undergraduate Senior Project Grant, $4700, ASHRAE, 1999-2000.
- NASA Zero-Gravity Student Flight Opportunity Program, 1998.
- Undergraduate Senior Project Grant, $4,800, ASHRAE, 1996-1997.
- Gas Turbine Education, Panelist, Advanced Turbine Systems Meeting, Arlington, Virginia, 1994.

SERVICE ACTIVITIES

Technical Leadership

- Chair, US Sections of the Combustion Institute, 2015-present
- Past chair, Central States Section of the US Combustion Institute, 2015-present
- Chair, Coal, Biomass, an Alternative Fuels Committee, ASME International Gas Turbine Institute, 2016 - present
- Vice Chair, US Sections of the Combustion Institute, 2014-15
- Chair, Central States Section of the Combustion Institute, 2013-15
- Co-Chair, Coal, Biomass, an Alternative Fuels Committee, ASME International Gas Turbine Institute, 2014 – 16.
- Member, US Board of the Combustion Institute, 2013-
- ASME IGTI Turbo Expo, 2014, CBAF Committee Vanguard Chair, 2013-2014
- AIAA Aerospace Science Meeting 2012, Terrestrial Energy Systems (TES) Committee Point of Contact.
- Editorial Board, Journal of Combustion, 2009-2012
- Co-organizer, 2008 Technical Meeting of the Central States Section of the Combustion Institute.
- On-site Reviewer, Combustion Research, National Energy Technology Laboratory, 2006
- Member, Board of Advisors, U.S. Central States Section of The Combustion Institute, 2004-
- Co-Chair (with R. Parthasarathy), *23rd Oklahoma AIAA/ASME Symposium*, Norman, OK, 2003
- Organizer, Annual Mechanical Engineering Capstone Design Fair, Norman, 2002, 2003, 2004

Departmental Committees

- Chair, ME Assessment Committee, 2009 - 2011
- Member, ME Assessment Committee, 2007-2008
- Member, Graduate Education Committee, Jan. 05 – Dec 05
- Chair, Undergraduate Design Committee, Jan. 03-Dec. 05
- Member, Thermal Science Faculty Search Committee, Sep. 03-April 04.
- Member, Ad-Hoc Committee on Efficient Use Resources in AME, Jan 03-June 03
- Chair, Undergraduate Design and Computing Committee, Aug 98-Dec. 02
- Faculty Advisor, ASHRAE Student Chapter, 1997-2004
- Member, Undergraduate Design and Computer Committee, 96-98
- Member, Graduate Studies Committee, 93-96
- Member, Undergraduate Design Committee, 94-96
- Member, Computer Network Committee, 93-96
- Member, Technical Support Committee, 93-96

College of Engineering Committee

- Member, College Undergraduate Research Committee, 2009
- Convocation Field Marshall, 2002

University Committees

- Chair, Research Advisory Committee, 2012-2103
- Information Technology User Services Representative, 2002

- Consultant Interview Committee, HVAC Improvement Projects, 1999
- Faculty Senate, 1998-2000

Community Service
- Featured Participant, Books That Inspire Exhibit, OU Library, 2003
- Judge, Oklahoma State Science Fair, 2002, 2003
- Faculty Advisor, Oklahoma Undergraduate India Society, 2002-2003.

Society Memberships
- American Society of Mechanical Engineers (Fellow)
- American Institute of Aeronautics and Astronautics (Associate Fellow)
- The Combustion Institute (Member)
- Professional Mechanical Engineer registered in Oklahoma PE # 17386
- American Society of Engineering Education (Member)
- American Society of Heating, Ventilating, and Air Conditioning Engineers (Member)
- Member, Tau Beta Pi, National Honors Society

Technical Committee Memberships
- ASME International Gas Turbine Institute, Coal, Alternative, and Biomass Fuels Committee, 2007-
- ASME International Gas Turbine Institute, Combustion, Fuels, and Emissions Technical Committee, 1993-
- AIAA, Terrestrial Energy Systems Technical Committee, 2007-
- AIAA, Propellants and Combustion Technical Committee, 2003-2014
- ASME Fluid Engineering Division's Coordinating Group on CFD, 1991-1995.

Technical Reviews (numbers tracked since 2004 only)
- Atomization and Spray, 2008 (1)
- Journal of Aerospace Engineering, 2008 (1)
- ASME Journal of Heat Transfer 2008 (1)
- Chemical Engineering Research and Design 2008 (1)
- Clean Air, 2008 (1)
- Energy and Fuels, 2008 (1)
- Experimental Thermal and Fluid Science, 2008 (1), 2009(1)
- Journal of Physics D: Applied Physics, 2008 (2)
- Progress in Energy and Combustion Science, 2007 (1)
- Measurement Science and Technology, 2007 (1)
- Industrial and Engineering Chemistry, 2007 (1)
- International Journal of Thermal Sciences, 2007 (1)
- Physics of Fluids, 2006 (1), 2008 (1)
- Journal of Mechanical Engineering Science, 2006 (1)
- ASME IDETC/CIE 2006 (2), 2007 (1)
- International Journal of Heat and Fluid Flow, 2006 (1)
- Experiments in Fluids, 2004 (1), 2005 (2), 2006 (1), 2007 (2), 2008 (1), 2009 (1)

- International Journal of Hydrogen Energy, 2006 (1), 2008 (4)
- Society of Automotive Engineers (SAE), 2005(1)
- Applied Optics, 2004 (1)
- Combustion Science and Technology, 2004(1)
- Combustion Symposium (International), 2004 (1), 2006 (7), 2008(6), 2010 (6), 2012 (6), 2014 (6)
- CRC Press, 2004 (1)
- Combustion and Flame, 2007 (1)
- Journal of Engineering for Gas Turbines and Power, 2005 (5), 2006 (5), 2007 (6), 2008 (6+1)
- ASME Journal of Fluids Engineering, 2007 (1)
- ASME Journal of Energy Resources Technology
- AIAA Journal, 2005 (2), 2006 (1)
- AIAA Journal of Propulsion and Power, 2004 (2), 2005 (4), 2006(2), 2007 (2), 2008 (2), 2009(2)
- IEEE Transactions on Control Systems Technology
- International Journal of Heat and Mass Transfer
- ASME IMECE and Heat Transfer Division Meetings
- AIAA Joint Propulsion Conference, 2005 (6)
- AIAA Aerospace Science Meeting, 2006 (6), 2007 (11)

Technical Proposal Review

- National Science Foundation, Combustion, Plasma, and Fire Sciences, 2013
- National Science Foundation, Combustion, Plasma, and Fire Sciences, 2012
- National Science Foundation, IDC, 2010
- National Science Foundation, Chemical Sciences, 2007
- National Science Foundation, Ethics Education in Science and Engineering, 2006
- US Civilian Research and Development Foundation, 2005
- American Chemical Society, 2005, 2006, 2007
- National Science Foundation, SBIR Program, Washington, DC, 2001, 2004, 2005, 2006
- NASA Microgravity Combustion Proposal Review Panel, Washington, DC, 1996, 2002
- University of California Energy Institute, 2002
- Arkansas Science and Technology Authority, 2000
- US Department of Energy, SBIR Program, 1998, 1999.

Conference Session Organization/Chair

- Session Organizer and Chair, Liquid Biofuels, 54th ASME Turbo Expo, Orlando, June 2009.
- Session Organizer and Chair, Combustion Experiments, 54th ASME Turbo Expo, Orlando, June 2009.
- Session Chair, Combustion Dynamics I, AIAA ASM Meeting, Orlando, FL, January 2009
- Session Chair, Biofuel Combustion, AIAA ASM Meeting, Orlando, FL, January 2009
- Session Chair, Novel Combustion, International Symp. on Combustion, Montreal, July 2008.
- Session Organizer and Chair, Alternate Fuels, 53th ASME Turbo Expo, Berlin, June 2008.
- Session Organizer and Chair, Fuel Flexibility, 53rd ASME Turbo Expo, Berlin, June 2008.
- Session Chair, Combustion Applications, AIAA Aerospace Science Meeting, Reno, 2008.

- Session Organizer and Chair, Liquid Biofuels Utilization, 52nd ASME Turbo Expo, Montreal, May 2007.
- Session Organizer and Chair, Fuel-Flexibility-Combustion Systems, 52nd ASME Turbo Expo, Montreal, May 2007.
- Session Chair, Turbulent Combustion Modeling, AIAA Aerospace Science Meeting, Reno, 2007.
- Session Chair, Constant Pressure Combustion I, *2006 Spring Technical Meeting of the Central States Section of the Combustion Institute*, Cleveland, OH, May 2006.
- Session Organizer and Chair, *Fuel Flexible Combustion*, 51st ASME IGTI Turbo Expo, Barcelona, Spain, 2006
- Session Chair, *Gas Turbine Combustion*, AIAA Aerospace Science Meeting, Reno, 2006.
- Session Organizer and Chair, *Combustion Measurements and Modeling*, 50th ASME IGTI Turbo Expo, Reno, 2005
- Session Chair, *Catalytic Combustion*, 49th ASME IGTI Turbo Expo, Vienna, Austria, 2004
- Session Chair, *Flame Diagnostics and Combustion Control*, 2004 Spring Technical Meeting of the Central States Section of the Combustion Institute, Austin, TX, 2004.
- Session Chair, Thermal and Fluid Sciences I, *24th AIAA/ASME Oklahoma Symposium*, Oklahoma Christian University, Oklahoma City, 2004.
- Session co-Chair (with Robert Tacina), *Gas Turbine Combustion*, AIAA Aerospace Science Meeting, Reno, Nevada, 2004.
- Session Chair, Mechanical Engineering, OU Undergraduate Research Day, 2003
- Session Chair, *Diagnostics IV,* 3rd Joint Meeting of the Combustion Institute, Chicago, 2003.
- Session Organizer and Chair, *Catalytic Combustion*, 48th ASME Turbo Expo, Atlanta, GA, 2003
- *Premixed Flames,* Session Chair, 2002 Spring Technical Meeting of the Central States Section of the Combustion Institute, Knoxville, TN, 2002.
- *Fuel Properties and Kinetics*, Session Organizer, 46th ASME Gas Turbine and Aeroengine Technical Congress and Users Symposium, New Orleans, Louisiana, 2001.
- *Alternative Fuels*, Session co-organizer, 46th ASME Gas Turbine and Aeroengine Technical Congress and Users Symposium, New Orleans, Louisiana, 2001
- *Spreading Flames, Fire Detection, Measurement, and Control*, Session Chair, 2000 Technical Meeting of the Central States Section of the Combustion Institute, Indianapolis, Indiana, 2000.
- *Numerical Modeling*, Session Organizer, 42nd ASME Gas Turbine and Aeroengine Technical Congress and Users Symposium, Orlando, Florida, 1997.
- *Combustion Modeling*, Session Organizer, 41st ASME Gas Turbine and Aeroengine Technical Congress and Users Symposium, Birmingham, UK, 1996.
- *Gas Turbine NOx Emission*, Session Co-Chairman, 40th ASME Gas Turbine and Aeroengine Technical Congress and Users Symposium, Houston, Texas, 1995.
- *NATO Advanced Study Institute on Thermal-Hydraulics of Two-Phase Flow Heat Exchangers,* Scientific Program Organizer, Povoa de Varzim, Portugal, 1987.

SPONSORED RESEARCH

Current (at UA)

- Unsteady Flow Field Measurements In the Combustor, Diffuser And Bypass Mixer, US Department of Energy, $600,000 include UA match, September 1, 2016-Feb 28, 2019, Principal Investigator (60%).
- Development and Validation of Physics-Based Sub-models of High Pressure Supercritical Fuel Injection at Diesel Conditions, US Department of Energy, $662,485 including UA match, Jan 1, 2016-Dec 31, 2019, Principal Investigator (40%).
- Experimental Investigation of Noise and Thermo-Acoustic Instabilities in Low-Emission, High-Efficiency Combustion Systems for Aviation, NASA, $675,000 plus $337,500 in UA match, September 2013-August 2016. Principal Investigator (100%).

Completed (at UA)

- Frontiers in Mechanical Engineering: Doctoral Fellowships in Mechanical Engineering, Department of Education, $700,000 including $175,000 match from the University of Alabama, August 2010 – August 2015, Principal Investigator (40%) with co-PIs K. Chou, B. Todd, and B. Taylor.
- Institute for Sustainable Energy, US Department of Energy, $1,250,000 including $250,000 match from the University of Alabama, June 2010 – May 2014, Principal Investigator (60%), with Co-PIs A. Lane and P. Puzinauskas.
- MRI-R2 Acquisition of a Volumetric 3-Component Velocimetry (V3C) System, $501,685, June 2010 – May 2011, co-Principal Investigator (16%) with A. Lang (PI) and co-PIs P. Hubner, S. Olcmen, P. Puzinauskas.
- Low Emissions Burner Technology for Metal Processing Industry using Byproducts and Biomass Derived Liquid Fuels, Department of Energy, $831,625 including $331,625 match from the University of Alabama ($281,625) and Wise Alloys ($50,000), August 2010 – July 2014, Principal Investigator (60%) with B. Taylor (co-PI).
- Passive Combustion Control for Turbine Engine Noise Reduction, Ultramet Corp (through US Navy), $190,000, Jan 2009 – December 2010, Principal Investigator (100%).
- Energy Conversion for Sustainable Environment: Doctoral Fellowships in Mechanical Engineering, Department of Education, $957,952 including $191,590 match from the University of Alabama, August 2006- August 2011, Principal Investigator (20%) with co-PIs M. Ashford, J. Baker, K.C. Midkiff and B. Taylor.
- Small-Scale Flow Experiments to Support Development of Hydrogen Codes and Safety Standards, Sandia National Laboratory, $155,000, July 07 – Dec. 09, Principal Investigator (100%).
- High-Speed Rainbow Schlieren Deflectometry to Quantify Buoyancy Effects in Transitional/Turbulent Gas Jet Flames, NASA, $300,000 including $40,320 match from the University of Alabama, January 2005- June 2008, Principal Investigator (100%).
- Biofuel Combustion, Southern Company, $76,130, Feb 2007 – May 2008, Principal Investigator (100%), with Dan Daly (co-PI).

- Passive Combustion Control for Turbine Engine Noise Reduction, Ultramet Corp (through US Navy), $39,000, Jan 2007 – December 2007, Principal Investigator (100%).
- Porous Media Combustor Concepts for Propulsion Gas Turbines, Army Research Office, US Department of Defense (through University of Oklahoma), $59,996 including $18,996 match from the University of Alabama, 2005-2006, Principal Investigator (100%).

Completed (prior to UA)

- Porous Media Combustor Concepts for Propulsion Gas Turbines, Army Research Office, US Department of Defense, $450,000 including $150,000 match the University of Oklahoma and Oklahoma Regents for Higher Education, with S.R. Gollahalli (co-PI), 2002-2005, Principal Investigator (60%), Retained at the University of Oklahoma.
- Environmentally Benign Energy Utilization: Doctoral Fellowships in Mechanical Engineering, US Department of Education, $719,925, including $127,985 match from the University of Oklahoma, with Fink, Gollahalli, Lai, and Parthasarathy, 2003-2006, Principal Investigator (43%), Retained at the University of Oklahoma.
- Gravitational Effects on Flow Stability and Transition in Low Density Jets, NASA, $407,000, including $62,000 match from University of Oklahoma, with R. Parthasarathy (co-Investigator), April 2000-August 2004, Principal Investigator (60%)
- Advanced Hybrid Power, CASI Oklahoma, $80,924, 2003-2004. Principal Investigator (100%)
- Evaluation of Porous Media Combustion Concept for Fuel Flexible Gas Turbines, University of Oklahoma Research Council, $6,000, Nov. 2001-August 2002. Principal Investigator (100%)
- Development of a Calibration System for the Pitot Static Probes on the B-1B Aircraft, CACI-ASG (funded through Tinker Air Force Base), $45,188, with R. Parthasarathy, June-August 2001, co-Principal Investigator (40%)
- Test Apparatus for Jet Engine Fuel Flow Meter Calibration, CACI-ASG, Oklahoma City (funded through Tinker Air Force Base), $115,356 with W. Sutton (co-Principal Investigator), January 2001- May 2001, Principal Investigator (60%)
- Non-Catalytic Porous Combustion for Turbine Burner Applications, MER Corporation, Tucson, (funded through Wright Patterson Air Force Base), $25,000, October 2000-August 2001, Principal Investigator (100%)
- Advanced Hybrid Power at Tinker Air Force Base, CACI-ASG, Oklahoma City (funded through Tinker Air Force Base), $25,200, June 2000-May 2001, Principal Investigator (100%)
- Alternate Fuels for Gas Turbine Combustion, South Carolina Institute for Energy Studies (SCIES), Clemson, SC, $18,419, May 1999-May 2000, Principal Investigator (100%)
- Transitional Flames in Microgravity, University of Oklahoma, $12,000 (with College of Engineering Match), January 1999-January 2000, Principal Investigator (100%)
- Effects of Energy Release on Near Field Flow Structure of Gas Jets, NASA Headquarters, $450,000, with S.R. Gollahalli (co-Investigator), June 1994-Nov 1998, PI (60%)
- Improving Aerodynamics of the Intercooler Flow Path for the Development of High Efficiency

Gas Turbines, $322,512 including $25,000 share from University of Oklahoma, with S.R. Gollahalli (co-Principal Investigator), July 1994-June 1997, Principal Investigator (60%)

- Laser System for Combustion Diagnostics, National Science Foundation, $147,000 including $92,000 match from University of Oklahoma, with S.R. Gollahalli, 1995-1996, co-Principal Investigator (50%)
- Liquid Natural Gas as a Transportation Fuel in the Heavy Trucking Industry, US Department of Energy, Bartlesville, OK, $700,000, with W. Sutton, May 1993-Sept.1996. Personal Role/Share: co-Principal Investigator (10%)
- Flow Experiments in a Mixer-Ejector, University of Oklahoma, $5,000, 1995.
- Experimental Research on Gas Turbine Combustors, University of Oklahoma, $7500, 1994.

Co-Investigator on the Following Grants

- Experimental Verification of a Compressor Diffuser Flow Field with Air Extraction in a State-of-the Art American Made Industrial Gas Turbine for IGCC System, Department of Energy, Morgantown, WV, $1,208,491, with T.T. Yang, 1991-1993.
- Systems Study on Integration of Air-Blown Coal Gasification System with a High Performance Gas Turbine, Department of Energy, Morgantown, WV, $551,428, with T.T. Yang, 1989-1990.
- Low-Btu Gas Combustion Model Evaluation, GE Corporate Research and Development Center, Schenectady, NY, $253,435, with T.T. Yang, 1989-1990.

GRADUATE STUDENT SUPERVISION

Doctoral

1. Jonathan Tobias, TBD
2. Daniel Depperschmidt, Flow field measurements in a rotating detonation engine
3. Christopher Wanstall (with J. Bittle), Schlieren measurements in jets at diesel engine conditions
4. James Allen, Optical Diagnostics of Reaction Zones in Combustion, December 2016 (expected)
5. John Kornegay, Lean Direct Injection Combustion, Spring 2017 (expected)
6. Yonas Niguse, *Fuel Flexible Clean Combustion of Liquid Fuels by a Novel Twin-fluid Atomizer*, Summer 2015, Current Position: Assistant Professor, University of Louisiana, Lafayette, LA.
7. Jiang Lulin, Fall 2014, *Investigation of Atomization Mechanisms and Flame Structure of a Twin-Fluid Injector for Different Liquid Fuels*. Current position: Assistant Professor (tenure track), University of Louisiana, Lafayette, LA.
8. Joseph Meadows, Summer 2014, *Flow Diagnostics of Swirl Stabilized Combustion Without and With Porous Inert Media For Mitigation of Combustion Noise and Thermo-Acoustic Instabilities.* Current Position: Research Engineer, Siemens Energy, Inc., Charlotte, North Carolina.
9. Troy J. Dent, Jr., Spring 2012*, Meso-scale Power Generation Incorporating Heat Recirculation, Porous Inert Media, and Thermoelectric Modules*.
10. Tanisha Booker (co-adviser with M. Ashford), Fall 2011, *Characterization of Hydrogen Combustion in a Direct Injected Constant Volume Combustion Chamber Using Rainbow Schlieren Deflectometry*, Technical Project Manager, E34 Expeditionary Warfare Systems Development, NSWC-PCD.
11. Benjamin Simmons, Summer 2011 *Atomization and Combustion of Liquid Biofuels*, Current Position: Instructor/Assistant Professor, Department of Mech. Eng., South Dakota School of Mines, SD.
12. Daniel Sequera, Fall 2010, *Reduction of Combustion Noise and Instabilities using Porous Inert Material with a Swirl-Stabilized Burner,* Current position: Baker Oil, Houston, TX.
13. Heena Panchasara, August 2010, *Spray Characteristics and Combustion Performance of Unheated and Preheated Liquid Biofuels,* Current Position: GE Corporation, Greenville, SC.
14. Pankaj Kolhe, August 2009, *Statistical Tomography for Scalar Turbulence Measurements using Line of Sight Optical Techniques*
15. Vijaykant Sadasivuni, Spring 2008, *Meso-scale Combustion of Liquid Fuels using Porous Inert Media,* Current Position: Engineer, Air Liquide, Allentown, PA.
16. Rajani Satti, November 2006, *Flow Structure of Low-Density Gas Jets and Gas Jet Diffusion Flames.* Current Position: Baker Oil, Houston, TX.
17. Timothy Marbach, July 2005, *Meso-scale Porous Media Heat Recirculating Combustor*, Current Position: Associate Professor, California State University, Sacramento, CA.
18. Donald M. Wicksall, August 2004, *Lean Premixed Swirl-Stabilized Combustion of Gaseous Alternative Fuels*. Current Position: Rolls Royce, Indianapolis.

19. Kasyap Pasumarthi, May 2004, *Buoyancy Effects on Flow Structure and Instability of Low-Density Gas Jets,* with R. Parthasarathy. Current Position: Intel Corporation, Seattle, WA.
20. Khalid Al-Ammar, 1998, *Scalar Measurements and Analysis of Hydrogen Gas-Jet Diffusion Flames in Normal and Microgravity*, with S.R. Gollahalli. Current position: Associate Professor of Mechanical Engineering, King Saud University, Riyadh, Saudi Arabia.
21. Nelson K. Butuk, 1997, *Fluid Flow Diagnostics Using Rainbow Schlieren Imaging and Computer Tomography*, with S.R. Gollahalli. Current Position: Assistant Professor of Mathematics, Prairie View A & M University, Prairie View, Texas.
22. Irish Hu, 1994, *A Presumed and Synthesized Probability Density Function Method for Non-Premixed Turbulent Reacting Flow Calculations*, with T.T. Yang. Current Position: Staff Engineer, General Electric Power Systems, Schenectady, New York.

Doctoral Committee Member:

1. Venkateswara Dantuluri, 2013
2. Olexandr Ivanchenko, 2008
3. Cosmin Dumitrescu, 2008
4. External Examiner: Atul Srivastava, IIT Kanpur, 2006
5. Kristian Olivero, 2004
6. Xuelei Chen, 2002
7. Mauricio A. Sanchez, 2002
8. External Examiner, Kirti K. Dhawan, IIT Kanpur, 2000
9. Christopher Lawson, 2000

Masters Students

1. Daniel Depperschmidt, 3D printed porous inert media for combustion, Dec 2015
2. William C. Thompson, Pressure effects on combustion with heat recirculation, May 2015
3. Dan Mitchell, Full Flow Field Measurements Correlated to Acoustic Wave Propagations using High Speed Rainbow Schlieren Deflectometry, December 2013.
4. Yonas Niguse, non-thesis, May 2014.
5. Lulin Jiang, non-thesis, May 2013.
6. Joseph Meadows, May 2013.
7. L. Justin Williams, Passive Mitigation of Combustion Noise and Instability using Porous Inert Media in an Elevated Pressure Test Rig, May 2012.
8. Allison Copus, non-thesis, August 2011.
9. Zack Smith, Passive Control of Combustion Noise and Thermo-Acoustic Instability with Porous Inert Media, May 2011.
10. Tanisha Booker, non-thesis, August 2010.
11. Troy Dent, non-thesis, August 2010.
12. Benjamin Simmons, non-thesis December 2009,

13. Seydou Diop, December 2008, A Parametric Study of Jet-Wall Interactions for Compressed Hydrogen Gas Leak Scenarios.
14. Pankaj Kolhe, non-thesis, May 2008
15. Daniel Sequera, May 2007, Fuel Composition Effects in Low Swirl Combustion Systems
16. Cristina Dumitrescu, December 2006, Experimental Study of Combustion of Gaseous and Liquid Fuels Using Porous Inert Media with Heat Recirculation.
17. Vijaykant Sadasivuni, November 2004, Effect of Porous Media Configuration on Pre-Vaporization, Pre-Mixing and Combustion of Kerosene
18. Eric Newburn, December 2004, Lean Premixed Combustion of Gaseous and Liquid Fuels using Heat Recirculation Through Annular Porous Media
19. Sandeep Alavandi, November 2004, Effects of Fuel Composition on Combustion using Porous Inert Media.
20. Tommy S. Wong, October, 2004, Scalar Measurements in Flames using High-Speed Rainbow Schlieren Deflectometry
21. B. Sedat Yildirim, September, 2004, Concentration Measurements in a Momentum-Dominated Low-Density Jet
22. Ryan Heatly, Spring, 2004, Combustion of Pre-Vaporized, Premixed Kerosene Fuel using Porous Inert Media
23. Peter Leptuch, 2002, Measurements of Buoyancy Effects in Momentum-Dominated Helium Jets using High Speed Rainbow Schlieren Deflectometry
24. Tze-Wing Yep, 2001, Scalar Measurements and Analysis of Helium Jets in Earth Gravity and Microgravity using Rainbow Schlieren Deflectometry
25. Kasyap Pasumarthi, 2000, Full Field Scalar Measurements in a Pulsating Helium Jet using Rainbow Schlieren Deflectometry
26. Mathew Jackson, 1999, Active Control of Combustion for Optimal Performance
27. Burt Albers, 1999, Schlieren Analysis of Time-Dependent Laminar and Transitional Gas-Jet Diffusion Flames
28. Anil K. Shenoy, 1998, Effects of Non-unity Lewis Number and Buoyancy in Hydrogen Jet Diffusion Flames
29. Alhendro Tinneti, 1998, Flow Experiments in the Annular Diffuser and Contraction Passages of an Intercooler System for Gas Turbines
30. Steve M. Cherry, 1997, Scaling of Buoyancy Effects in Hydrogen Gas Jet Diffusion Flames using Rainbow Schlieren Deflectometry
31. Yanming Gao, 1997, Aerodynamic Optimization of Axisymmetric Annular Flow Passages
32. Hongfeng Bi, 1995, Autoignition of Natural Gas in Diesel Environments
33. S. Krishnan, 1992, Use of Subdomains for Inverse Problems in Branching Flow Passages.

Undergraduate Student Supervision (advised more than 70 independent study projects)

1. Mitch Johnson
2. Will Sparkman
3. Robert Miller
4. Karl Anderson, Emerging Scholar, Thermo-acoustic instabilities in LPM combustion, Fall 2014
5. Zack Ayer, Fuel flexible combustion, Fall 2014
6. James LeCroy, Fuel flexible combustion, Fall 2014
7. Taber Wanstall, High-pressure liquid fuel combustion, Fall 2014
8. Carolina Vega Recalde, NSF REU student, Particle Image Velocimetry, Summer 2014
9. Matthew Mercatante, Spring 2014
10. Sahil Kansal, Twin-fluid atomization, Summer 2013
11. Stewart Carpenter, NSF REU student, Thermo-acoutic instabilities in combustion, Summer 2013
12. Daniel Brown, Lean premixed combustion, Spring 2013
13. William Cox, Glycerol combustion, Fall-Spring, 2013
14. Mathew Norrell, Glycerol combustor re-design
15. Daniel Hershman, Liquid fuel reformation using thermal partial oxidation, summer 2011
16. Alex Borsek, NSF REU student, Effect of Swirl Number of Lean Premixed Combustion, Summer 2011.
17. Cody Osmer, Combustion noise and thermo-acoustic instabilities, NSF REU, Summer 2010.
18. Travis Midkiff, Thermo-acoustic instabilities, Fall 2009 and Spring 2010
19. Tim Rose, NSF REU, Summer 2009, Supersonic jet development simulating cryogenic hydrogen leaks
20. Justin Williams, Summer 2009, Effect of porous media configuration on combustion noise
21. Marc Hansen, Fall 2008, Combustion of heated viscous fuels
22. Alex Nguyen, Spring 2008, Data Acquisition System for Combustion Experiments
23. Brian Lozes, Fall 2007, Portable Rainbow Schlieren Deflectometry Apparatus
24. Drew Smith, Fall 2007,Rainbow Schlieren Deflectometry of Sprays and Supersonic Jets
25. Alex Nguyen, Fall 2007, Integrated and Automation of Data Acquisition Systems
26. Ben Simmons, Summer 2006, Combustion using porous inert media
27. Rick Byrne, Spring 2007, Flow-Blurring Fuel Injection System for Biofuel Combustion
28. Benjamin Picone, Fall 2006, Simplified injector for combustion of liquid fuels
29. Tyler House, Fall 2006, Biofuel combustion
30. Sudeep Deb, Summer 2006, Combustion of Liquid Fuels in a Swirl-Stabilized Burner
31. Anil Rathi, Summer 2005, Methane Combustion in a Swirl Stabilized Burner
32. Nathaniel R. Harding, Summer 2004, Lean Premixed Combustion of Alternate Fuels in a Swirl-Stabilized Combustor
33. Will J Dacus, Sp 2004, Effect of Diluents on Lean Premixed Combustion of Hydrocarbon Fuels
34. John R. Siska, Spring 2004, Hybrid Power Generation
35. Robert Farrell,
36. Louis Galleciez,
37. Andrew Horner, and
38. Jared DeSellier, Spring 2004, Flow Bench for SAE Formula Car
39. Daniel Sequera, 2003, Fuel Effects on Porous Media Combustion
40. Jarod Kelly, 2003, Flame Stabilization Methods for Lean Premixed Combustion
41. Jeremy DeBons, 2002, Lean-Premixed, Pre-vaporized Kerosene Burner
42. Eric Bartlow, 2001, Calibration of Flow Meters

43. Scott Franke, 2001, Pitot-Tube Calibration Interface for B1-B Bomber
44. Brad Pickle, 2000, Design and Construction of a Stirling Engine with Regeneration
45. Jorge Sanchez, 2000, Data Acquisition System
46. Kristina Diamond, 2000, Premixed and Diffusion Flame Visualization of the Sabatier Reaction
47. Craig Kos, 2000, Pressure Drop Measurements in a Fan Coil
48. Elizabeth Nunes, 2000, Gas Turbine Cycle Performance
49. Chester Biggs, 1999, Coil Testing and Analysis
50. Boe Green, 1999, Instructions for a Premixed Flames
51. Brian Howthone, Spring 1999, Instrumentation for a Lean Premixed Burner.
52. Donald Wicksall, Fall 1998, Flame Interaction in Microgavity.
53. Anthony Ting, Summer 1997, Flow Experiments in the Intercooler Flow Path of Gas Turbines.
54. Burt Albers, Fall 1996, Hydrogen Diffusion Flames in a Low Pressure Combustion Chamber.
55. James D. McCormick, Fall 1995, Design and Manufacturing of a Measuring System for Heat Exchanger Tubes.
56. Gustava Gonzalez, Summer 1995, Research on Rainbow Schlieren Imaging, Funded by the Minority Engineering Program.
57. Ira Bryant, Summer 1995, Wind Tunnel Experiments.
58. John Allen, Summer 1995, Clear Acrylic Molding Process and Design
59. Frank Carter, Spring 1995, Design and Fabrication of Flow Conditioning Sections for Wind Tunnel Testing of Intercooler Flow Path in Industrial Gas Turbines.
60. James Dockery, Spring 1995, Data Acquisition System for Gas Turbine Research Project
61. Barnabas Ling, Spring 1995, Design of a Fuel Supply System for Drop Tower.
62. Mathew Jackson, Spring 1995, Computer Controlled Traversing System.
63. Rocky Turley, Fall 1994, Characteristics of Hydrogen Gas Jet Flames.
64. Aron Harrington, Fall 1994, Design & Production of a Calibration System for Hot-Wire Probes.
65. James McKillen, Fall 1994, Smoke Machine for Flow Visualization.
66. Patrick Caudill, Summer 1994, Rainbow Schlieren and Its Uses.
67. Jon D. Currier, Spring 1994, Testing Flame Intensity with a Flame Swirling Apparatus.

PUBLICATIONS

Patents

- A.K. Agrawal, and S. Vijaykant, Passive Noise Attenuation System, U.S. Patent No. 8,109,362, University of Alabama, 2012.
- A.K. Agrawal, and S. Vijaykant, Meso-Scale Combustion System, U.S. Patent 9,091,434, University of Alabama, 2015.
- A.K. Agrawal, Fuel Injector for Low-Emissions and Alternate Liquid Fuels, UAIPD 10-0015.
- A.K. Agrawal, and T. Dent, Thermoelectric Device Design for High System Efficiency, UAIPD12-0022
- C.M. Vickery, and A.K. Agrawal, "Means for On-Line, In-Situ Measurement of Entrained Air in Fluids, Slurries, and Mixtures," Invention Disclosure No. 04NOR019, University of Oklahoma, February 2004.

Archival Journal Papers/Book Chapter

Published/In Press

1. Williams, L. Justin, Meadows, J., and Agrawal, A.K., "Passive Control of Thermo-acoustic Instabilities in Swirl-Stabilized Combustion at Elevated Pressures," *Journal of Spray and Combustion Dynamics*, accepted, October 2015.

2. Niguse, Y., and Agrawal, A.K., 2016, "Low-Emission, liquid fuel combustion system for conventional and alternative fuels developed by the scaling analysis," *Journal of Engineering for Gas Turbines and Power, 138(4), 041502.*

3. Dantuluri, V.R., Puzinauskas, P., Agrawal, A.K., 2015, "Intra-cycle recirculation of partial oxidation products: A concept for internal combustion engine combustion control," *International Journal of Engine Research*, 1-21, DOI: 10.1177/1468087415583207

4. Jiang, L., and Agrawal, A.K., 2015, "Spray Features in the Near Field of a Flow-Blurring Injector Investigated by High-Speed Visualization and Time-Resolved PIV," in print, *Experiments in Fluids*, accepted April 27, 2015.

5. Meadows, J., and Agrawal, A.K., 2015, "Porous Inserts for Passive Control of Noise and Thermo-acoustic Instabilities in LDI Combustion," *Combustion Science and Technology*, vol. 187:7, pp 1021-1035, doi=10.1080/00102202.2014.993031

6. Agrawal, A.K., 2015, "Low-Emission, Fuel-Flexible Combustion of Liquid Biofuels," Book Chapter in *Novel Combustion Concepts for Sustainable Energy Development*, Gupta, Agrawal, Pandey (eds), Springer.

7. Borsuk, A., Williams, L.J., Meadows, J., and Agrawal, A.K., 2015, "Swirler Effects on Passive Control of Combustion Noise and Instability in a Swirl-Stabilized Combustor," *ASME Journal of Engineering for Gas Turbines and Power*, vol. 137, pp. 041504-1 to 7,

DOI: 10.1115/1.4028613.

8. Meadows, J., and Agrawal, A.K., 2015, Time-Resolved PIV Measurements of Non-Reacting Flow Field in a Swirl-Stabilized Combustor Without and With Porous Inserts for Acoustic Control," *ASME Journal of Engineering for Gas Turbines and Power*, vol. 137, pp. 041501-1 to 10, DOE: 10.1115/1.4028381.

9. Meadows, J., and Agrawal, A.K., 2015, "Time-Resolved PIV of Lean Premixed Combustion Without and With Porous Inert Media for Acoustic Control," *Combustion and Flame*, vol. 162, pp. 1063-1077. http://dx.doi.org/10.1016/j.combustflame.2014.09.028

10. Jiang, L., and Agrawal, A.K., 2015, "Investigation of Glycerol Atomization in the Near-Field of a Flow-Blurring Injector using Time-Resolved PIV and High-Speed Visualization," *Flow, Turbulence, and Combustion*, vol. 94, pp. 323-337. DOI 10.1007/s10494-014-9572-2.

11. Jiang, L., and Agrawal, A.K., 2014, "Combustion of Straight Glycerol With/Without Methane Using a Fuel-Flexible, Low-Emissions Burner," *Fuel*, vol. 136, pp 177-184.

12. Jiang, L., Agrawal, A.K., and Taylor, R.P., 2014, "Clean Combustion of Different Liquid Fuels using a Novel Fuel Injector," *Experimental Thermal and Fluid Science*, vol. 57, 275-284.

13. Dent., T., Marbach. T., and Agrawal, A.K., 2012, "Computational Study of Mesoscale Combustor with Annular Heat Recirculation and Porous Inert Media," *Numerical Heat Transfer Part A*, Part A, 61: 873-890.

14. Simmons, B., and Agrawal, A.K, 2012, "Flow Blurring Atomization for Low-Emission Combustion of Liquid Biofuels," *Combustion Science and Technology*, vol. 184, 660-675.

15. Sequera, D., and Agrawal, A.K., 2012, "Passive Control of Noise and Instability in a Swirl-Stabilized Combustor with the Use of High-Strength Porous Insert," *Journal of Engineering for Gas Turbines and Power*, vol. 134, 051505, (11pp).

16. Simmons, B., and Agrawal, A.K., 2010, "Spray Characteristics of a Flow-Blurring Atomizer," *Atomization and Spray*, vol. 20, 821-835.

17. Williams, L.J., and Agrawal, A.K., 2010, "Noise Mitigation by Manipulating Combustion using Porous Inert Media," *Journal of Science and Health at the University of Alabama (JOSHUA)*, vol. 7, pp 19-23.

18. Kolhe, P., and Agrawal, A.K., 2010, "Investigation of Cross-Beam Correlation Algorithm to Reconstruct Local Scalar Field Statistics from Line-of-Sight Measurements in Turbulent Flows," *Flow, Turbulence, and Combustion*, vol. 84, 617-638.

19. Kolhe, P., and Agrawal, A.K., 2009, "A Novel Spectral Analysis Algorithm to Obtain Scalar

Field Statistics from Line of Sight Measurements in Turbulent Flows," *Measurement Science and Technology*, vol. 20, 115402 (10pp).

20. Agrawal, A.K., 2009, "Innovative Combustion and Emissions Reduction Techniques," in *Combustion Science and Technology: Recent Advances*, (eds.) A.K. Agarwal, A. Kushari, S.K. Aggarwal, and A.K. Runchal, pp. 1-36, Narosa Publishing House, New Delhi.

21. Panchasara, H., Sequera, D., Schreiber, W., and Agrawal, A.K., 2009, "Emission Reductions in Diesel and Kerosene Flames using a Novel Fuel Injector," *Journal of Propulsion and Power*, vol. 25, no. 4, pp 984-986.

22. Kolhe, P., and Agrawal, A.K., 2009, "Abel Inversion of Deflectometric Data: Comparison of Accuracy and Noise Propagation of Existing Techniques," *Applied Optics*, vol. 48, No., 20, pp 3894-3902.

23. Panchasara, H., Simmons, B., Agrawal, A.K., Spear, S., and Daly, D., 2009, "Combustion Performance of Bio-Diesel and Diesel-Vegetable Oil Blends in a Simulated Gas Turbine Burner," *Journal of Engineering for Gas Turbines and Power*, vol. 131, 031503, 11p.

24. Kolhe, P., and Agrawal, A.K., 2009, "Density Measurements in a Supersonic Microjet using Miniature Rainbow Schlieren Deflectometry," *AIAA Journal*, vol. 47, vol. 4, pp. 830-838.

25. Dumitrescu, C., Puzinauskas, P.V., Agrawal, A.K., Liu, H., and Daly, D.T., 2009, "A Computational Study of a Fast Sampling Valve Designed to Sample Soot Precursors Inside a Forming Diesel Spray Plume," *Applied Thermal Engineering*, vol., 29, pp. 1253-1258.

26. Sadasivuni, V., and Agrawal, A.K., 2009, "A Novel Meso-Scale Combustion Concept for Operation with Liquid Fuels," *Proceedings of the Combustion Institute*, vol. 32, pp. 3155-3162.

27. Sequera, D., Agrawal, A.K., Spear, S., and Daly, D., 2008, "Combustion Performance of Liquid Bio-fuels in a Model Burner," *Journal of Engineering for Gas Turbines and Power*, vol. 130, pp. 032810: 1-9.

28. Satti, R., and Agrawal, A.K., 2008, "Computational Study of Buoyancy Effects in a Laminar Starting Jet," *International Journal of Heat and Fluid Flow*, vol. 29, pp. 527-539.

29. Alavandi, S., and Agrawal, A.K., 2008, "Experimental Study of Combustion of Hydrogen-Syngas/Methane Fuel Mixtures in a Porous Burner," *International Journal of Hydrogen Energy*, vol. 33, pp. 1407-1415.

30. Kolhe, P., and Agrawal, A.K., 2007, "Role of Buoyancy on Instabilities and Structure of Transitional Gas Jet Diffusion Flames," *Flow, Turbulence and Combustion*, vol. 79, pp 343-360.

31. Vijaykant, S., and Agrawal, A.K., 2007, "Liquid Fuel Combustion within Silicon-Carbide

Coated Carbon Foam," *Experimental Thermal and Fluid Science*, vol. 32, pp 117-125.

32. Marbach, T.L., S. Vijaykant, and Agrawal, A.K., 2007, "Investigation of a Miniature Combustor Using Porous Media Surface Stabilized Flame," *Combustion Science and Technology*, vol. 179, pp. 1901-1922.

33. Newburn, E.R., and Agrawal, A.K., 2007, "Liquid Fuel Combustion using Heat Recirculation through Annular Porous Media," *Journal of Engineering for Gas Turbines and Power*, Vol. 129, pp. 914-919.

34. Satti, R., Kolhe, P., Olcmen, S., and Agrawal, A.K., 2007, "A Miniature Rainbow Schlieren Deflectometry System for Scalar Measurements in Micro Jets and Flames," *Applied Optics*, vol. 46, No. 15, pp. 2954-2962.

35. Wicksall, D.M., and Agrawal, A.K., 2007, "Acoustics Measurements in a Lean Premixed Combustor Operated on Hydrogen-Hydrocarbon Fuel Mixtures," *International Journal of Hydrogen Energy*, Vol. 32, pp. 1103-1112.

36. Satti, R., and Agrawal, A.K., 2006, "Computational Analysis of Gravitational Effects in Low-Density Gas Jets," *AIAA Journal*, vol. 44, pp. 1505-1515.

37. Wong, T., and Agrawal, A.K., 2006, "Quantitative Measurements in an Unsteady Flame using High-Speed Rainbow Schlieren Deflectometry," *Measurement Science and Technology*, vol. 17, pp. 1503-1510.

38. Leptuch, P.A., and Agrawal, A.K., 2006, "High-Speed Rainbow Schlieren Visualization of an Oscillating Helium Jet Undergoing Gravitational Change," *Journal of Visualization*, vol. 9, pp. 101-110.

39. Satti, R., and Agrawal, A.K., 2006, "Flow Structure in the Near-Field of Buoyant Low-Density Gas Jets," *International Journal of Heat and Fluid Flow*, vol. 27, pp. 336-347.

40. Marbach, T., and Agrawal, A.K., 2006, "Heat Recirculating Combustor Using Porous Inert Media for Mesoscale Applications," *Journal of Propulsion and Power*, vol. 22, pp. 145-150.

41. Wicksall, D.W., Agrawal, A.K., Schefer, R.W., and Keller, J.O., 2005, "The Interaction of Flame and Flow Field in a Lean Premixed Swirl-Stabilized Combustor Operated on H_2/CH_4/Air, *Proceedings of the Combustion Institute*, vol. 30, pp. 2875-2883.

42. Pasumarthi, K., and Agrawal, A.K., 2005, "Buoyancy Effects on Flow Transition in Low-Density, Inertial Gas Jets," *Experiments in Fluids*, vol. 38, pp. 541-544.

43. Marbach, T. and Agrawal, A.K., 2005, "Experimental Study of Surface and Interior Combustion using Composite Porous Inert Media," *Journal of Engineering for Gas Turbines and Power*, vol. 127, pp 307-313.

44. Agrawal, A.K., Albers, B.W., and Alammar, K.N., 2005, "Effects of Buoyancy on Transitional Hydrogen Gas Jet Diffusion Flames," *Combustion Science and Technology*, vol. 177, pp. 305-322.

45. Yildirim, B.S., and Agrawal, A.K., 2005, "Full-Field Concentration Measurements of Self-Excited Oscillations in Momentum-Dominated Helium Jets," *Experiments in Fluids*, vol. 38, pp 161-173.

46. Wicksall, D.M., Agrawal, A.K., Schefer, R.W., and Keller, J.O., 2005, "Influence of Hydrogen Addition on Flow Structure in Enclosed Swirling Methane Flame," *AIAA Journal of Propulsion and Power*, vol. 21, pp. 16-24.

47. K.S. Pasumarthi, and A.K. Agrawal, 2003, "Schlieren Measurements and Analysis of Concentration Field in Self-Excited Helium Jets," *Physics of Fluids*, vol. 15, pp. 3683-3692.

48. T.W. Yep, A.K. Agrawal, and D.W. Griffin, 2003, "Gravitational Effects on Near Field Flow Structure of Low-Density Gas Jets," *AIAA Journal*, vol. 41, pp. 1973-1979.

49. R.W. Schefer, D.W. Wicksall, and A.K. Agrawal, 2002, "Combustion of Hydrogen-Enriched Methane in a Lean Premixed Swirl-Stabilized Burner," *Proc. of the Combustion Institute*, vol. 29, pp. 843-851.

50. A.K. Agrawal, K.N. Alammar, and S.R. Gollahalli, 2002, "Application of Rainbow Schlieren Deflectometry to Measure Temperature and Oxygen Concentration in a Laminar Jet Diffusion Flame," *Experiments in Fluids*, vol. 32, pp. 689-691.

51. X. Xiao, I.K. Puri, and A.K. Agrawal, 2002, "Temperature Measurements in Steady Axisymmetric Partially Premixed Flames using Rainbow Schlieren Deflectometry," *Applied Optics*, vol. 41, pp.1922-1928.

52. K. Alammar, A.K. Agrawal, and S.R. Gollahalli, 2000, "Quantitative Measurements of Laminar Hydrogen Gas-Jet Diffusion Flames in 2.2s Drop Tower," *Proc. of the Combustion Institute*, vol. 28, pp. 1997-2004.

53. B. Albers, and A.K. Agrawal, 1999, Schlieren Analysis of Flicker in an Oscillating Gas-Jet Diffusion Flame, *Combustion and Flame*, vol. 119, pp. 84-94.

54. M.D. Jackson, and A.K. Agrawal, 1999, "Active Control of Combustion for Optimal Performance," *Journal of Engineering for Gas Turbines and Power*, vol. 121, pp. 437-443.

55. A.K., Agrawal, A. Tinneti, and S.R. Gollahalli, 1999, "Flow Measurements in a Curved Wall Annular Contraction," *Journal of Engineering for Gas Turbines and Power*, vol. 121, pp. 444-450.

56. A.K. Agrawal, B. Albers, D.W. Griffin, 1999, "Abel Inversion of Deflectometric Measurements in Dynamics Flows," *Applied Optics*, vol. 38, pp. 3394-3398.

57. A.K. Agrawal, S.M. Cherry, and S.R. Gollahalli, 1998, "Effects of Buoyancy on Steady Gas Jet Diffusion Flames," *Combustion Science and Technology*, vol. 140, pp. 51-68.

58. A.K. Shenoy, A.K. Agrawal, and S.R. Gollahalli, 1998, "Quantitative Evaluation of Flow Computations by Rainbow Schlieren Deflectometry," *AIAA Journal*, vol. 36, pp. 1953-1960.

59. K. Al-Ammar, A.K. Agrawal, S.R. Gollahalli, and D. Griffin, 1998, "Application of Rainbow Schlieren Deflectometry for Concentration Measurements in an Axisymmetric Helium Jet," *Experiments in Fluids*, vol. 25, pp. 89-98.

60. A.K. Agrawal, N. Butuk, S.R. Gollahalli, and D. Griffin, 1998, "Three-Dimensional Rainbow Schlieren Tomography of Temperature Field in Gas Flows," *Applied Optics*, vol. 37, pp. 479-485.

61. H. Bi, and A.K. Agrawal, 1998, "Study of Auto-ignition of Natural Gas at Diesel Environments using Computational Fluid Dynamics with Detailed Chemical Kinetics," *Combustion and Flame*, vol. 113, pp. 289-302.

62. A.K. Agrawal, J.S. Kapat, and T.T. Yang, 1998, "An Experimental/Computational Study of Airflow in the Combustor-Diffuser System of Power Generating Gas Turbines," *Journal of Engineering for Gas Turbines and Power*, vol. 120, pp. 1-10.

63. J.S. Kapat, A.K. Agrawal, and T.T. Yang, 1997, "Air Extraction in a Gas Turbine for IGCC: Experiments and Analysis," *Journal of Engineering for Gas Turbine and Power*, vol. 119, pp. 20-26.

64. A.K. Agrawal, S. Krishnan, and T.T. Yang, 1993, "Use of Sub-Domains for Inverse Problems in Branching Flow Passages," *Journal of Fluids Engineering*, vol. 115, pp. 227-232.

65. A.K. Agrawal, and S. Sengupta, 1993, "Laminar Fluid Flow and Heat Transfer in an Annulus with Externally Enhanced Inner Tube," *International Journal of Heat and Fluid Flow*, vol. 14, pp. 54-63.

66. A.K. Agrawal and S. Kakac, 1991, "Fouling in Heat Exchangers," Chapter 4 in *Boilers, Condensers, and Evaporators*, John Wiley & Sons Inc., New York.

67. A.K. Agrawal, and S. Sengupta, 1990, "Laminar Flow and Heat Transfer in a Finned Tube Annulus," *International Journal of Heat and Fluid Flow*, vol. 11, No. 1, pp. 54-59.

68. A.K. Agrawal, and S. Sengupta, 1989, "Fluid Flow and Heat Transfer in Blocked Annuli," *Numerical Heat Transfer*, Part A, vol. 15, No. 4, pp. 489-508.

69. V.K. Gupta, M. Prasad, and A.K. Agrawal, 1989, "Transient Temperature Behavior of a Cooling Pond for a Thermal Power Generator," *IE(I) Journal-MC*, Vol. 70, pp. 62-66.

Full Refereed Conference Papers

1. Kornegay, J., Depperschmidt, D., and Agrawal, A.K., 2015, "Passive control of thermo-acoustic instability in different length combustors using a high-strength metallic porous insert," *ASME Paper 2015-43890*.

2. Niguse, Y., and Agrawal, A.K., 2015,"Low-Emission, liquid fuel combustion system for conventional and alternative fuels developed by the scaling analysis," *ASME Paper 2015-43889*.

3. Meadows, J., and Agrawal, A.K., 2014, Time-Resolved PIV Measurements of Non-Reacting Flow Field in a Swirl-Stabilized Combustor Without and With Porous Inserts for Acoustic Control," *ASME Paper 2014-27203*.

4. Jiang, L., Agrawal, A.K., and Taylor, R.P., 2014, "High Speed Visualization and PIV Measurements in the Near Field of Spray Produced by Flow-Blurring Atomization," *ASME Paper GT2014-27199*.

5. Borsuk, A., Williams, L. Justin, Meadows, J., and Agrawal, A.K., 2012, "Swirler Effects on Passive Control of Noise and Instability in Lean Premixed Combustion," *ASME Paper GT2012-69668*.

6. Meadows, J. and Agrawal, A.K., 2012, "Passive Mitigation of Noise and Instabilities in Liquid Fueled Combustion using Porous Inert Media," *ASME Paper GT2012-69651*.

7. Sequera, D., and Agrawal, A.K., 2011, "Passive Control of Noise and Instability in a Swirl-Stabilized Combustor with the Use of High-Strength Porous Insert," *ASME Paper GT 2011-46835*.

8. Simmons, B., and Agrawal, A.K., 2011, "Drop Size and Velocity Measurements in Bio-Oil Sprays Produced by the Flow-Blurring Injector, *ASME Paper GT-2011-46832*.

9. Panchasara, H., and Agrawal, A.K., 2010, "Effect of Inlet Temperature on Spray Characteristics of Bio-fuels," *ASME Paper 2010-GT 23397*.

10. Simmons, B., Panchasara, H., and Agrawal, A.K., 2009, A Comparison of Air-Blast and Flow-Blurring Injectors using the Phase Doppler Particle Analysis Technique, *ASME Paper 2009-GT-60239*.

11. Sadasivuni, V., and Agrawal, A.K., 2008, "A Novel Meso-Scale Combustion Concept for Operation with Liquid Fuels," 32nd International Symposium on Combustion, Montreal, Canada.

12. H. Panchasara, B. Simmons, A.K. Agrawal, S. Spear, and D. Daly, 2008, "Combustion Performance of BioDiesel and Diesel-Vegetable Oil Blends in a Simulated Gas Turbine Burner," *ASME Paper 2008-51496*.

13. D. Sequera, and A.K. Agrawal, 2007, "Effect of Fuel Composition on Emissions From a Low-Swirl Burner," *ASME Paper GT2007-28044*.

14. D. Sequera, A.K. Agrawal, S. Spear, and D. Daly, 2007, "Combustion Performance of Liquid Bio-fuels in a Swirl-Stabilized Burner," *ASME Paper GT2007-28326*.

15. S.K. Alavandi and A.K. Agrawal, 2005, "Lean Premixed Combustion of CO/H2/CH4 Mixtures using Porous Inert Media," *ASME Paper GT2005-68586*.

16. E.R. Newburn and A.K. Agrawal, 2005, "Liquid Fuel Combustion using Heat Recirculation through Annular Porous Media," *ASME Paper GT2005-68588*.

17. R.P. Satti, and A.K. Agrawal, 2004, "Numerical Analysis of Flow Evolution in a Helium Jet Injected into Air," *ASME HT-FED2004-56811*.

18. K. Pasumarthi, and A.K. Agrawal, 2004, "Schlieren Analysis of Buoyancy Effects on Flow Transition in Low-Density Gas Jets," *ASME HT-FED2004-56810*.

19. A.K. Agrawal, and Z. Siddique, 2004, From Goals to Products in a Senior Design Practicum Course, ASEE 2004 Annual Conference and Exposition, Session 2425.

20. S.K. Alavandi, and A.K. Agrawal, 2004, Lean Premixed Combustion of Methane and Hydrogen-Enriched Methane using Porous Inert Media, *ASME Paper GT2004-53231*.

21. D. Wicksall, B. Schefer, A.K. Agrawal, and J. Keller, 2003, Fuel Composition Effects on the Velocity Field in a Lean Premixed Swirl Stabilized Combustor, *ASME Paper 2003-GT-38172*.

22. T. Marbach and A.K. Agrawal, 2003, Experimental Study of Surface and Interior Combustion using Composite Porous Inert Media, *ASME Paper 2003-GT-38713*.

23. D. Wicksall, and A.K. Agrawal, 2001 "Effects of Fuel Composition on Flammability Limit of a Lean Premixed Combustor," *ASME Paper 2001-GT-0007*.

24. M.D. Jackson, and A.K. Agrawal, 1998, "Active Control of Combustion for Optimal Performance," *ASME Paper 98-GT-576*.

25. A.K. Agrawal, A. Tinneti, and S.R. Gollahalli, 1998, "Flow Characteristics of an Annular Intercooler Diffuser for Gas Turbines," *ASME Paper 98-GT-283*.

26. A.K. Agrawal, A. Tinneti, and S.R. Gollahalli, 1998, "Flow Development in an Annular Contraction," *ASME Paper 98-GT-306*.

27. A.K. Agrawal, J.S. Kapat, and Yang, T.T., 1996, "Flow Interactions in the Combustor-Diffuser System of Industrial Gas Turbines," *ASME Paper 96-GT-454*.

28. J.S. Kapat, A.K. Agrawal, and T.T. Yang, 1994, "Air Extraction in a Gas Turbine for IGCC: Experiments and Analysis," *ASME Paper GT-94-193*.

29. S. Krishnan, A.K. Agrawal, and T.T. Yang, 1992, "Use of Sub-domains for Inverse Problems in Branching Flow Passages," *ASME Paper 92-GT-287*.

30. A.K. Agrawal, and T.T. Yang, 1991, "Viscous Flow Computations for Compressor/Combustor Diffuser Design to allow Air Extraction for IGCC Systems," *ASME Paper 91-GT-62*.

31. A.K. Agrawal, and T.T. Yang, 1991, "Numerical Simulations of Low-Btu Coal Gas Combustion in Gas Turbine Combustors," *ASME Paper 91-GT-42*.

32. T.J. Overcamp, A.K. Agrawal, W.S. Cheng, and T.T. Yang, 1991, "Calculations of Fuel NO Formation in a Gas Turbine Combustor," *ASME Paper 91-GT-361*.

33. T.T. Yang, and A.K. Agrawal, 1991, "Comparative Evaluation of Commercial Combustion Codes for Low-Btu Gas Application," *ASME Paper 91-GT-110*.

34. A.K. Agrawal, and S. Sengupta, 1989, "Fluid Flow and Heat Transfer in Blocked Annuli," *ASME Paper 87-HT-36*.

35. A.K. Agrawal, and S. Sengupta, 1988, "Pressure Drop and Heat Transfer in Annuli with Periodic Enhancements: Effects of Flow and Geometric Parameters," in Symp. on *Fundamentals of Forced Convection Heat Transfer*, eds. M.A. Ebadian and J.L.S. Chen, ASME HTD-Vol. 101, pp 113-121.

36. A.K. Agrawal, and S. Sengupta, 1987, "Recirculating Flow and Heat Transfer in an Axisymmetric Cavity Bounded by a Cylinder," in *Convective Transport*, ed. Y. Gallery et al., ASME HTD-Vol.82, pp. 1-7.

Full Abstract Refereed/Reviewed Conference Papers

1. Jiang, L., and Agrawal, A.K., 2014, “Impact of Air to Liquid Mass Ratios on the Spray Features in the Near Field of a Flow-Blurring Atomizer,” Proc. of Spring Technical Meeting of the Central States Section of the Combustion Institute, Tulsa, OK, March 16-18, 2014.

2. Meadows, J., and Agrawal, A.K., 2014, “Time-Resolved PIV Measurements in Lean Premixed Swirl-Stabilized Combustor without and with Porous Inert Media for Acoustic Control,” Proc. of Spring Technical Meeting of the Central States Section of the Combustion Institute, Tulsa, OK, March 16-18, 2014.

3. Niguse, Y., and Agrawal, A.K., 2014, "Effects of Fuels' Heating Value and Air to Liquid Mass Ratio on Twin Fluid Atomizer Spray Combustion," Proc. of Spring Technical Meeting of the Central States Section of the Combustion Institute, Tulsa, OK, March 16-18, 2014.

4. Mitchell, D., and Agrawal, A.K., 2014, "Investigation of acoustic waves emanated from a supersonic jet using ultra-high speed whole-field optical measurements," AIAA SciTech 2014, AA-07, Jet Noise IV, Control ID: 1756211

5. Kolhe, P.S., and Agrawal, A.K., 2014, "Turbulence Measurements for Numerical Validation Acquired by Ultra High-speed Rainbow Schlieren Deflectometry," AIAA SciTech 2014, AMT-04, Supersonic Flow Diagnostics, Control ID 1754067.

6. Niguse, Y.G., Agrawal, A.K., Taylor, R.P., and Cox, W.F., 2013, "A Novel Fuel-Flexible Combustor for Industrial Applications," AFRC Industrial Combustion Symposium, Sheraton Kauai, Hawaii, 22-23 September 2013.

7. Meadows, J., and Agrawal, A.K., 2013, "Time-Resolved Particle Image Velocimetry of Non-Reacting Flow in a Swirl-Stabilized Combustor without and with Foam Inserts for Acoustic Control," 8th U. S. National Combustion Meeting, Diagnostics: 070-DI-0287, Paper May 19-22, 2013, Utah.

8. Kolhe, P.S., and Agrawal, A.K., 2013, "Ultra High Speed Rainbow Schlieren Deflectometry for Statistical Description of Turbulent Low-Density Jets," 8th U. S. National Combustion Meeting, Diagnostics: 070-DI-0315, Paper May 19-22, 2013, Utah.

9. Mitchell, D., and Agrawal, A.K., 2013, "Whole-Field Optical Measurements of Sound Wave Propagation from High-Speed Exhaust Jets," 8th U. S. National Combustion Meeting, Diagnostics: 070-DI-0323, Paper May 19-22, 2013, Utah.

10. Thompson, W.C., and Agrawal, A.K., 2013, "Analysis of a Mesoscale Fuel Reformer with Heat Recirculation and Porous Surface Stabilized Flame," 8th U. S. National Combustion Meeting, Microcombustion and New Combustion Devices: 070-MI-0285, Paper May 19-22, 2013, Utah.

11. Jiang, L., Agrawal, A.K., and Taylor, R.P., 2013, "Alternate Fuel Combustor Operated on Glycerol and Methane," 8th U. S. National Combustion Meeting, Stationary Combustion Systems: 070-ST-0305, Paper May 19-22, 2013, Utah.

12. Agrawal, S.R., Jiang, L., Agrawal, A.K., and Midkiff, K.C., 2013, High-Speed Visualization of Two-Phase Flow inside a Transparent Fuel Injector, 8th U. S. National Combustion Meeting, Heterogeneous Combustion, Sprays & Droplets: 070-HE-0317, Paper May 19-22, 2013, Utah.

13. Thompson, W.C., Hershman, D., and Agrawal, A.K., 2012, "Innovative Reforming Reactor System for Partial Oxidation and Autothermal Fuel Reforming," Proceedings of the 2012 Central States Meeting of the Combustion Institute, Paper 12S-27, April 20-22, 2012.

14. Dent, T.J., and Agrawal, A.K., 2012," Computational Analysis of Integrated Mesoscale Combustor-Thermoelectric (MSE-TE) System," Proceedings of the 2012 Central States Meeting of the Combustion Institute, Paper 12S-57, April 20-22, 2012.

15. Jiang, L., Taylor, R.P., and Agrawal, A.K., 2012," Emissions and Temperature Measurements in Glycerol Flames," Proceedings of the 2012 Central States Meeting of the Combustion Institute, Paper 12S-55, April 20-22, 2012.

16. Niguse, Y., Agrawal, A.K., Taylor, R.P., 2012 "Combustion Performance of a Scaled-up Flow Blurring Injector," Proceedings of the 2012 Central States Meeting of the Combustion Institute, Paper 12S-127, April 20-22, 2012.

17. Kolhe, P.S., and Agrawal, A.K., 2012, "Ultra High-Speed Rainbow Schlieren Deflectometry of Turbulence Measurements in Jets and Flames," Proceedings of the 2012 Central States Meeting of the Combustion Institute, Paper 12S-124, April 20-22, 2012.

18. Meadows, J., Agrawal, A.K., 2012, "Passive Mitigation of Combustion Noise in Liquid Fuel Combustion Using Porous Inert Media," *AIAA Paper 2012-0206*.

19. Williams, L., and Agrawal, A.K., 2012, "Acoustic Effects of Porous Insert Media on Lean Premixed Combustion at Elevated Pressures," *AIAA Paper 2012-0207*.

20. Dent, T., and Agrawal, A.K., 2012, "Role of Thermal Strategies in Thermoelectric Power Generation," *AIAA Paper 2012-0520*.

21. Simmons, B., and Agrawal, A.K., 2012, "Flow and Drop size Measurements in Highly Viscous Alternative Fuel Spray Flames," *AIAA Paper 2012-0523*.

22. Jiang, L., Kolhe, P., Taylor, R.P., and Agrawal, A.K., 2012, "Measurements in a Combustor Operated on Alternative Liquid Fuels," *AIAA Paper 2012-0524*.

23. Sequera, D., and Agrawal, A.K., 2010, "Reduction of Combustion Noise in a Swirl-Stabilized Burner with the Use Porous Material," Proceedings of the 2010 Central States Meeting of the Combustion Institute, March, 2010.

24. Simmons, B.M., Kolhe, P.S., Taylor, R.P., and Agrawal. A.K., 2010, "Glycerol Combustion using Flow-Blurring Atomization," Proceedings of the 2010 Central States Meeting of the Combustion Institute, March, 2010.

25. Booker, T., Ashford, M., and Agrawal, A.K., 2010, "Combustion Characteristics of a Hydrogen Jet Injected into a Closed Vessel," Proceedings of the 2010 Central States Meeting of the Combustion Institute, March, 2010.

26. Dent, T., and Agrawal, A.K., 2010, "Computational Study of Thermoelectric Power Generation with a Heat Recirculating Combustor," Proceedings of the 2010 Central States

Meeting of the Combustion Institute, March, 2010.

27. Simmons, B., and Agrawal, A.K., 2009, "Drop Size Measurements in Biofuel Sprays Produced by a Novel Flow-Blurring Injector," Proceedings of the 6th U.S. National Combustion meeting, May 17-20, 2009.

28. Dent, T., and Agrawal, A.K., 2009, "Meso-scale Fuel-flexible Combustor with Glass-mica Composite Shell," Proceedings of the 6th U.S. National Combustion meeting, May 17-20, 2009.

29. Sequera, D., and Agrawal, A.K., 2009, "Numerical Simulations of Swirl-Stabilized Combustion Coupled with Porous Inert Medium," Proceedings of the 6th U.S. National Combustion meeting, Paper 11C3, May 17-20, 2009.

30. Panchasara, H. and, Agrawal, A.K., 2009, "Effect of Fuel Preheating on Emissions from Combustion of Viscous Biofuels," Proceedings of the 6th U.S. National Combustion meeting.

31. Kolhe, P.S., and Agrawal, A.K., 2009, A Spectral Analysis Algorithm to Obtain Scalar Turbulence Data from Deflectometric Measurements, AIAA Paper 2009-0073.

32. Diop, S., and Agrawal, A.K., 2009, "A Parametric Study of Jet-Wall Interactions for Compressed Hydrogen Gas Leak Scenarios," AIAA Paper 2009-1209.

33. Sequera, D., and Agrawal, A.K., 2008, "Visual Flame Structure of Hydrogen-Rich Flames in a Low-Swirl Burner," 2008 Technical Meeting of the Central States Section of the Combustion Institute, April 20-22, Tuscaloosa, AL.

34. Diop, S., Agrawal, A.K., and Schefer, R., 2008, "Barrier Optimization by Optical Analysis of Compressed Hydrogen Gas Leaks," 2008 Technical Meeting of the Central States Section of the Combustion Institute, April 20-22, Tuscaloosa, AL.

35. Vijaykant, S., and Agrawal, A.K., 2008, "A Novel Fuel-Flexible Meso-Scale Combustor," 2008 Technical Meeting of the Central States Section of the Combustion Institute, April 20-22, Tuscaloosa, AL.

36. Simmons, B.M., Panchasara, H.V., and Agarwal, A.K., 2008, "Effect of Fuel Injection Concept on Combustion Performance of Liquid Biofuels," 2008 Technical Meeting of the Central States Section of the Combustion Institute, April 20-22, Tuscaloosa, AL.

37. Agrawal, A.K., 2008, Innovative Combustion and Emission Reduction Techniques, International Workshop on Advances in Combustion Science and Technology, IIT Kanpur, Dec 31, 2007-January 2, 2008.

38. Kolhe, P.S., and Agrawal, A.K., 2008, "Scalar Measurements in Under-Expanded Micro-Jets," 45th AIAA Aerospace Science Meeting, Reno, Nevada, *AIAA Paper 2008-238.*

39. Kolhe, P.S., Ivanchenko, O., Agrawal, A.K., and, Olcmen, S., 2008, "Experimental Measurement of Density, Pressure, and Temperature Fields in a Supersonic Free Jet using Rainbow Schlieren Deflectometry," 45th AIAA Aerospace Science Meeting, Reno, Nevada, *AIAA Paper 2007-237.*

40. Vijaykant, S., Agrawal, A.K., and Stewart, T., 2008, "Combustion Noise Reduction using Porous Inert Media," 45th AIAA Aerospace Science Meeting, Reno, Nevada, *AIAA Paper 2008-1057.*

41. Stewart, T.R., Vijaykant, S., and Agrawal, A.K., 2007, "Passive Combustion Control Device for Noise Reduction and Improved Life in Turbine Engines," 20th ONR Propulsion Meeting, December 12-14, 2007, Washington, DC.

42. Dumitrescu, Cosmin, Puzinauskas, P.V., Agrawal, A.K., Liu, H., and Daly, D.T., 2007, "A Chemkin Study of a Fast Sampling Valve Designed to Sample Soot Precursors inside a Forming Diesel Spray Plume," 5th US Combustion Meeting, San Diego, CA, Paper D-30 - Diagnostics.

43. Dumitrescu, C., and Agrawal, A.K., 2007, "Combustion of Liquid Fuels using Porous Inert Media with Heat Recirculation," 5th US Combustion Meeting, San Diego, CA, Paper H-18-New Technology.

44. Kolhe, P.S., and Agrawal, A.K., 2007, "Role of Buoyancy on Instabilities in Transitional Gas Jet Diffusion Flames," 5th US Combustion Meeting, San Diego, CA, Paper D-04-Fundamentals.

45. Panchasara, H., Sequera, D., Schreiber, W., and Agrawal, A.K., 2007, "Combustion Performance of a Novel Injector using Flow-Blurring for Efficient Fuel Atomization," 5th US Combustion Meeting, San Diego, CA, Paper G-12-Spray.

46. Satti, R., and Agrawal, A.K., 2007, "Quantitative Scalar Measurements in Micro Jets and Flames," 44th AIAA Aerospace Science Meeting, Reno, Nevada, *AIAA Paper 2007-0933.*

47. Sequera, D., and Agrawal, A.K., 2007, "Emissions and Acoustics Measurements in a Low-Swirl Burner," 44th AIAA Aerospace Science Meeting, Reno, Nevada, *AIAA Paper 2007-1347.*

48. Vijaykant, S., and Agrawal, A.K., 2007, "Meso-Scale Burner Using Combustion Inside Porous Inert Media," 44th AIAA Aerospace Science Meeting, Reno, Nevada, *AIAA Paper 2007-0582.*

49. Satti, R., Kolhe, P.S., Olceman, S., and Agrawal, A.K., 2006, "Rainbow Schlieren Deflectometry Apparatus for Diagnostics in Micro-Scale Flow Systems," *2006 Spring Technical Meeting of the Central States Section of the Combustion Institute*.

50. Dumitrescu, C., and Agrawal, A.K., 2006, "An Investigation of Lean Premixed Combustion Using Porous Inert Media with Heat Recirculation," *2006 Spring Technical Meeting of the Central States Section of the Combustion Institute*.

51. Marbach, T.L., Vijaykant, S., and Agrawal, A.K., 2006, "Experimental and Computational Study of a Miniature Combustor using Heat Recirculation," *2006 Spring Technical Meeting of the Central States Section of the Combustion Institute*.

52. Marbach, T.L., and Agrawal, A.K., 2006, "A Computational Study of Heat Recirculating Combustor using Porous Inert Media," *AIAA Paper-2006-1443*, 43rd AIAA Aerospace Science Meeting, Reno, Nevada.

53. Vijaykant, S., and Agrawal, A.K., 2006, "Effect of Porous Media Configuration on Combustion of Kerosene," *AIAA Paper-2006-0964,* 43rd AIAA Aerospace Science Meeting, Reno, Nevada.

54. Satti, R., Kolhe, P.S., and Agrawal, A.K., 2006, "Crossbeam Rainbow Schlieren Deflectometry Technique for Scalar Measurements in Turbulent Flows," *AIAA Paper-2006-1096*, 43rd AIAA Aerospace Science Meeting, Reno, Nevada.

55. Kolhe, P.S., Wong, T., and Agrawal, A.K., 2005, "An Investigation of Flickering Behavior in Transitional Gas Jet Diffusion Flames," 4th Joint Meeting of the Combustion Institute, March 20-23, Philadelphia, PA, Paper D16.

56. Marbach, T., and Agrawal, A.K., 2005, "Numerical and Experimental Study of a Heat Recirculating Combustor for Meso-Scale Applications," 4th Joint Meeting of the Combustion Institute, March 20-23, Philadelphia, PA, Paper D01.

57. Vijaykant, S., and Agrawal, A.K., 2005, "Computational Study of Swirl Stabilized Combustion of Lean Premixed Methane and Hydrogen Enriched Methane," 43rd AIAA Aerospace Science Meeting, Reno, Nevada, *AIAA Paper 2005-0167*.

58. Marbach, T., and Agrawal, A.K., 2005, "Meso-Scale Combustor Using Annular Porous Inert Media for Heat Recirculation," 43rd AIAA Aerospace Science Meeting, Reno, Nevada, *AIAA Paper 2005-0943*.

59. Newburn, E.R., and Agrawal, A.K., 2005, "Lean Premixed Combustion using Heat Recirculation through Annular Porous Media," 43rd AIAA Aerospace Science Meeting, Reno, Nevada, *AIAA Paper 2005-0934*.

60. Wong. T., and Agrawal, A.K., 2004, "Full Field Temperature Measurements in a Flickering Hydrogen Diffusion Flame using High-Speed Rainbow Schlieren Deflectometry," 26th International Congress on High-Speed Photography and Photonics, September 19-24, 2004 Alexandria, Virginia, USA, *SPIE Paper # HS04-HS101-12*.

61. Alavandi, S.K., and Agrawal, A.K., 2004, "Effect of Hydrogen Addition to Methane Reacting Inside Porous Inert Media," *Proc. of the 2004 Spring Technical Meeting of the Central States Section of the Combustion Institute*.

62. Wicksall, D.M., and Agrawal, A.K., 2004, "Emissions and Noise Measurements in a Swirl-Stabilized, Lean Premixed Burner Operated on Multi-Component Gaseous Fuels," *Proc. of the 2004 Spring Technical Meeting of the Central States Section of the Combustion Institute*.

63. Yildrim, B.S., Pasumarhti, K.S., and Agrawal, A.K., 2004, "Measurements of Flow Structure in Self-Excited Momentum-Dominated Helium Jets in Air," *AIAA Paper-2004-1279*.

64. Satti, R., Pasumarthi, K.S., and Agrawal, A.K., 2004, "Numerical Simulations of Buoyancy Effects in Low-Density Jet Injected into a High Density Ambient," *AIAA Paper-2004-1317*.

65. Heatly, R.J., Marbach, T.L., and Agrawal, A.K., 2003, "Combustion of Pre-vaporized, Pre-mixed Kerosene using Porous Inert Media," *3rd Joint Meeting of the U.S. Sections of the Combustion Institute, Chicago*, IL.

66. Wicksall, D.M., Schefer, R.W., Agrawal, A.K., and Keller, J.O., 2003, "Effects of Fuel Composition on Simultaneous PIV-OH PLIF Measurements in a Lean Premixed Swirl Stabilized Combustor," *3rd Joint Meeting of the U.S. Sections of the Combustion Institute, Chicago*, IL.

67. Heatly, R.J., and Agrawal, A.K., 2003, "Combustion of Pre-vaporized, Premixed Fuels using Porous Inert Media," *AIAA Paper 2003-5089*.

68. Marbach, T.L., and Agrawal, A.K., 2003, "Fuel Vaporization and Combustion with the Use of Porous Inert Media," *AIAA Paper 2003-5090*.

69. Agrawal, A.K. 2002, "From Goals to Products in a Senior Design Practicum Course," 37th ASEE Midwest Section Conference, Sep 12-13, Norman, Oklahoma.

70. Agrawal, A.K. 2002, "An Organizational Structure for Design Practicum Teams," 37th ASEE Midwest Section Conference, Sep 12-13, Norman, Oklahoma.

71. Marbach, T.L., and Agrawal, A.K., 2002, "Combustion Characteristics of a Natural Gas Burner using Inert Porous Media," Proc. of the 2002 Spring Technical Meeting of the Central States Section of the Combustion Institute, Paper A5.5.

72. Yep, Tze-Wing, Agrawal, A.K., and Griffin, D.W., 2002, "Gravitational Effects on Near Field Flow Structure of Low-Density Gas Jets," *AIAA Paper 2002-0761*.

73. Nasir, S., Agrawal, A.K., McGregor, I., and Tuchinskiy, L., 2001, "Characteristics of Confined Diffusion Flames Stabilized over Porous Plates in a Flow Channel," *2nd Joint Meeting of the US Sections of Combustion Institute*, Paper 119.

74. Schefer, R.W., Wicksall, D.M., and Agrawal, A.K., 2001, "Combustion of Hydrogen-Enriched Methane in a Lean Premixed Swirl Burner," *2nd Joint Meeting of the US Sections of Combustion Institute*, Paper 110.

75. Agrawal, A.K., Wicksall, D.M., and Merchant, C., 2001, "Effects of Buoyancy on Diffusion Flames from an Inline Array of Burner Tubes," *2nd Joint Meeting of the US Sections of Combustion Institute*, Paper 235.

76. Wicksall, D., and A.K. Agrawal, 2000, "Lean Premixed Combustion of Hydrogen-Enriched Natural Gas," *Proc. of the 2000 Central States Meeting*, pp. 300-305.

77. A.K. Agrawal, K. Al-Ammar, S.R. Gollahalli, 2000, "Transitional Gas Jet Diffusion Flames in Microgravity," *Proc. of the 2000 Central States Meeting*, pp. 127-132.

78. B. Albers, and A.K. Agrawal, 2000, "Buoyancy Effects on Flow Transition in Hydrogen Gas Jet Diffusion Flames," *Proc. of the 2000 Central States Meeting*, pp. 113-118.

79. A.K. Agrawal, K. Al-Ammar, S.R. Gollahalli, and D. Griffin, 1999, "Effects of Buoyancy in Hydrogen Jet Diffusion Flames," *5th int. Microgravity Combustion Workshop, NASA CP-208917*, pp. 109-112.

80. B. Albers, and A.K. Agrawal, 1998, "Schlieren Analysis of Flicker in a Hydrogen Diffusion Flame," *Proc. of the 1998 Central States Section Meeting*, pp. 172-177.

81. A.K. Agrawal, 1998, "Intercooler Flow Path Optimization for Gas Turbines, "*Proc. of 1997 Advanced Turbine Systems Meeting*, DOE/FETC-98/1057, Paper P18, 28 pages.

82. S.M. Cherry, A.K. Agrawal, and S.R. Gollahalli, 1997, "Effects of Buoyancy on Laminar Hydrogen Jet Diffusion Flames," *Proc. of 1997 Central States Section Meeting*, pp. 49-54.

83. A.K. Agrawal, S.R. Gollahalli, and D. Griffin, 1997, "Study of Buoyancy Effects in Diffusion Flames using Rainbow Schlieren Deflectometry," *4th Int. Microgravity Combustion Workshop*, NASA CP 10194, pp. 117-122.

84. A.K. Shenoy, A.K. Agrawal, and S.R. Gollahalli, 1996, "Visualizing Reacting Flow Computations by Rainbow Schlieren Imaging," *Proc. of the 1996 Central States Section Meeting*, pp. 322-327.

85. A.K. Agrawal, and S.R. Gollahalli, 1996, "Flow Characteristics of an Intercooler System for Power Generating Gas Turbines," *Proc. of the Advanced Turbine Systems Meeting*, DOE/OR-2048, pp. 357-369.

86. H. Bi and A.K. Agrawal, 1995, "Influence of Fluid Dynamics on Ignition of Natural Gas at Diesel Environments," *Proc. of the Central and Western Sections 1995 Joint Technical Meeting*, Paper 95-S-092, pp. 491-496.

87. A.K. Agrawal, S.R. Gollahalli, F.L. Carter, and J.E. Allen, 1995, "Intercooler Flow Path for Gas Turbines: CFD Design and Experiments," *Proc. of the Advanced Turbine Systems Meeting*, DOE/METC-96/1023, vol. 2, pp. 529-538.

88. A.K. Agrawal, S.R. Gollahalli, and D. Griffin, 1995, "Effects of Energy Release on Near Field Flow Structure of Gas Jet Flames," *3rd International Microgravity Combustion Workshop*, NASA CP 10174, pp. 311-317.

89. A.K. Agrawal, and S.R. Gollahalli, 1994, "Improving Aerodynamics of the Intercooler Flow Path for the Development of High Efficiency Gas Turbines," *Proc. of the Advanced Turbine Systems Meeting*, DOE/OR-2025, pp. 395-404.

90. A.K. Agrawal, and Tah-teh Yang, 1993, "3D Calculations of Airflow in the Compressor/-Combustor Prediffuser and Dump Diffuser of Industrial Gas Turbines," *5th Annual Thermal and Fluid Analysis Workshop*, NASA CP 10122, pp. 395-409.

91. T.T. Yang, A.K. Agrawal, and J. Kapat, 1993, "Air Extraction in Gas Turbines Burning Coal-Derived Gas," *Proc. of the Joint Contractors Meeting*, D.W. Geiling (ed.), DOE/METC-93/6132, pp. 335-344.

92. T.T. Yang, A.K. Agrawal, and J. Kapat, 1992, "Air Extraction and LBtu Coal Gas Combustion in Gas Turbines for IGCC Systems," in *Proc. of the 9th Annual Coal Fueled Heat Engines and Gas Stream Cleanup Systems Meeting*, Ed. D.W.Geiling, DOE/METC-93/6129, pp. 97-107.

93. Z. Hu, A.K. Agrawal, and T.T. Yang, 1992, "Predictions of Radical Pool in Hydrogen/Air Diffusion Flames using a Conditional Probability Density Function," *Technical Meeting of the Western States Section*, The Combustion Institute, Paper No. WSS/CI 92-50.

94. Z. Hu, A.K. Agrawal, and T.T. Yang, 1992, "Turbulent Reacting Flow Calculations by Synthesizing Multivariate Probability Density Function," *Proc of the Technical Meeting of the Central States Section, The Combustion Institute*, pp. 245-252.

95. T.T. Yang, and A.K. Agrawal, 1991, "Integration of Air-Blown Coal Gasification Systems with High Performance Gas Turbines," in *Proc of the 8th Annual Coal-Fueled Heat Engines and Gas Stream Cleanup Systems Meeting*, Eds. H.A.Webb, R.C. Bedick, D.W. Geiling, D.C. Cicero, DOE/METC-91/6122,pp. 110-119.

96. T.T. Yang, and A.K. Agrawal, 1990, "Comparative Evaluation of Commercial Combustion Codes for Low-Btu Gas Application," *7th Annual Coal-Fueled Heat Engines and Gas Stream Cleanup Systems Contractors Review Meeting*, Morgantown, March 1990.

97. S. Kakac, A.K. Agrawal, and H.Y. Zhang, 1990, "Impact of Fouling in Design of Heat Exchangers," in *Heat Transfer Enhancement and Energy Conservation*, ed., Song-Jin Deng, Hemisphere, Washington,D.C., pp. 609-616.

98. S. Kakac, and A.K. Agrawal, 1988, "Basic Relationships for Heat Exchangers and Impact of Fouling on Design," *Fouling Science and Technology*, eds. L.F. Melo et al., Kluwer Academic Publishers, Boston, pp. 437-462.

99. A.K. Agrawal, R. Raghunath, and S. Sengupta, 1987, "Heat Transfer in the Entrance Region of Multiply Connected Ducts of Arbitrary Shape," *Proc of the 30th Heat Transfer and Fluid Mechanics Institute*, Sacramento, CA, pp. 155-171.

100. A.K. Agrawal, and M. Prasad, 1983, "Heat Rejection from Cooling Water of a Thermal Power Plant by Recirculation in Water Body," *Waste Heat: Utilization and Management*, eds. S. Sengupta and S.S.Lee, Hemisphere, Washington, pp. 599-606.

Presentations at Seminars/Conferences

1. Agrawal, A.K., 2014, "A Low Emission Combustion System for Liquid Biofuels," Invited Speaker, International Workshop on Novel Combustion Concepts for Sustainable Energy Development, IIT Kanpur, India, January 2-4, 2014.

2. Agrawal, A.K., 2012, "Clean Combustion Strategies for Sustainable Use of Biofuels," Invited Speaker at the Inaugural SEC Symposium on Impact of the Southeast in the World's Renewable Energy Future, Atlanta, GA, Feb 10-12, 2012.

3. Agrawal, A.K., 2012, "Ultra-High Speed Rainbow Schlieren Deflectometry for Measurements of Jet Noise," Naval Research Laboratory, Washington, DC, May 9, 2012.

4. Agrawal, A.K., 2012, "Fuel-Flexible Meso-Scale Combustion and Thermoelectric Generation for Portable Power," Army Research Laboratory, Adelphi, MD, May 10, 2012.

5. Agrawal, A.K., 2012, "Role of Thermal Strategies on Clean Combustion of Liquid Biofuels," seminar presented at University of Texas at El Paso, April 27, 2012.

6. Agrawal, A.K., 2012, "Role of Thermal Strategies on Thermoelectric Power Generation," 3rd Thermoelectric Conference, Baltimore, MD, March 20-22, 2012.

7. Agrawal, A.K., 2011, "Low-Emission, Fuel Flexible Combustion," Seminar presented at University of Alabama at Birmingham, 2011.

8. Agrawal, A.K., 2011, "Role of Atomization on Clean Combustion of Liquid Biofuels," MCCCR Meeting, Argonne National Laboratory, October, 2011.

9. Stewart, T., and Agrawal, A.K., 2008, Passive Combustion Control Device for Noise Reduction and Improved Life in Turbine Engines, Office of Naval Research Contractor's Review Meeting, December, 2008.

10. Agrawal, A.K. 2008, Innovative Concepts for Fuel Flexible, Low-Emission Combustion, Indian Institute of Technology Roorkee, India, June, 2008.

11. Kolhe, P.S., and Agrawal, A.K., 2008, Turbulent Scalar Measurements in Flames using Rainbow Schlieren Deflectometry, Work-in-progress poster, International Symposium on Combustion, Montreal, July 2008.

12. Dent, T., and Agrawal, A.K., 2008, Turbulent Scalar Measurements in Flames using Rainbow Schlieren Deflectometry, Work-in-progress poster, International Symposium on Combustion, Montreal, July 2008.

13. Agrawal, A.K., 2008, "Innovative Combustion and Emissions Reduction Techniques," Invited Speaker, International Workshop on Advances in Combustion Science and Technology, IIT Kanpur, India, January 1, 2008

14. Agrawal, A.K., 2007, "University Bio-Energy Initiatives," Alabama Agricultural Energy Conference, Auburn University, November 7-8, 2007.

15. Agrawal, A.K., and Sequera, D., 2007, Effects of Fuel Composition on Performance of Low-Swirl Combustor, UTSR Workshop V, Clemson, SC, October, 2007.

16. Agrawal, A.K., 2007, "Novel Approaches for Fuel Flexible Lean Premixed Combustion Systems," Seminar presented at Siemens Power Generation, Orlando, FL, July 2007.

17. Sequera, D., Agrawal, A.K., Spears, S.K., and Daly, D., 2006, Emissions Measurements in Flames of Liquid Biofuels, Alternate Energy Solutions from Alabama's Natural Resources Conference, Poster Presentation, Auburn University, Auburn, AL, Oct., 2006.

18. Agrawal, A.K., 2006, Lean Premixed Combustion of Hydrogen-Enriched Fuels in Advanced Gas Turbines, Seminar, Department of Mechanical Engineering, Mississippi State University.

19. Agrawal, A.K., and Sequera, D., 2006, Combustion Measurements in Premixed Hydrogen Syngas Flames Using a Low-Swirl Injector, UTSR Workshop IV, Clemson, SC, October, 2006.

20. Agrawal, A.K., and Gollahalli, S.R., 2006, "Liquid Fuel Combustion using Porous Inert Media," ARO-AFOSR Contractors' Meeting, June 12-14, Arlington, VA.

21. Agrawal, A.K., 2006, "Lean Premixed Combustion of Hydrogen-Enriched Fuels in Advanced Gas Turbines," Invited Speaker, NSF Hydrogen Combustion Workshop, Washington, DC, March 9-10.

22. A.K. Agrawal, 2005, Quantitative Rainbow Schlieren Deflectometry for Scalar Measurements in Gas Jets and Flames," Seminar Presentation, Building and Fire Research Laboratory, NIST, July 14, 2005.

23. Gollahalli, S.R., and Agrawal, A.K., 2005, "Pre-vaporization, Mixing, and Combustion of Kerosene using Porous Inert Media," ARO-AFOSR Contractors' Meeting, June 20-22, Indianapolis, Indiana.

24. Agrawal, A.K., and Gollahalli, S.R., 2004, "Porous Media Combustion Concepts for Propulsion Gas Turbines," ARO-AFOSR Contractors' Meeting, Phoenix, AZ.

25. Wong, Tommy, and Agrawal, A.K., 2004, "Study of Flow Oscillations using High-Speed Rainbow Schlieren Deflectometry System, 24th OK *AIAA/ASME Symposium*, OKC, OK.

26. Satti, R., and Agrawal, A.K., 2004, "Computational Analysis of Gravitational Effects in Buoyant and Momentum-Dominated Helium Gas Jets," 24th Oklahoma *AIAA/ASME Symposium*, Oklahoma City, OK.

27. Alavandi, S.K., and Agrawal, A.K., 2004, 'Porous Inert Media Combustion of Methane and

Hydrogen Enriched Methane," 24th Oklahoma *AIAA/ASME Symposium*, Oklahoma City, OK.

28. Yildrim, B.S., and Agrawal, A.K., 2003, "Analysis of Flow Structure in Momentum-Dominated Helium Jets," 23rd Oklahoma *AIAA/ASME Symposium*, Norman, OK.

29. Kelly, J., and Agrawal, A.K., 2003, "Comparison of Flame Stabilization Techniques for Lean Premixed Combustion of Natural Gas," 23rd Oklahoma *AIAA/ASME Symposium*, Norman, OK.

30. Pasumarthi, K.S., Agrawal, A.K., and Parthasarathy, R., 2003, "Computational Analysis of Buoyancy Induced Instability in a Helium Jet," 23rd Oklahoma *AIAA/ASME Symposium*, Norman, OK.

31. Heatly, R., Marbach, T.L., and Agrawal, A.K., 2003, "Combustion of Kerosene Fuel using Porous Inert Media," 23rd Oklahoma *AIAA/ASME Symposium*, Norman, OK.

32. Wicksall, D.M., and Agrawal, A.K., 2003, "Fuel Composition Effects on the Flowfield of a Lean Premixed Swirl-Stabilized Combustor," 23rd Oklahoma *AIAA/ASME Symposium*, Norman, OK..

33. Agrawal, A.K., and Gollahalli, S.R., 2003, "Porous Media Combustion Concepts for Propulsion Gas Turbines," ARO-AFOSR Contractors' Meeting, Williamsburg, VA.

34. Agrawal, A.K., Parthasarathy, R.P., and Griffin, D.W., 2002, "Effects of Gravity on the Near Field Flow Structure of Helium Jet in Air," *6th int. Microgravity Combustion Workshop*

35. Marbach, T., and Agrawal, A.K., 2002, Investigation of Porous and Surface Combustion Stabilized with SiC Coated Composite Foam, *29th International Combustion Symposium*, Nagoya, Japan.

36. Wicksall, D.W., and Agrawal, A.K., 2002, "Combustion Characteristics of a Lean Premixed Swirl-Stabilized Burner Utilizing Gaseous Fuels," 22nd *AIAA/ASME Symposium*, Tulsa, OK.

37. Leptuch, P.A., and Agrawal, A.K., 2002, "Characteristics of Helium Jets Flowing Into Air Upon Removal of Gravitational Forcing," 22nd *AIAA/ASME Symposium*, Tulsa, OK

38. Marbach, T., and Agrawal, A.K., 2002, "An Experimental Study of Combustion in Inert Porous Media," 22nd *AIAA/ASME Symposium*, Tulsa, OK

39. A.K. Agrawal, "Fuel Composition Effects on Lean Premixed Combustion in Gas Turbines," Invited Presentation, Advanced Gas Turbine Combustion Research, Combustion Workshop VIII, Charleston, SC, July-August 2001.

40. A.K. Agrawal, "Buoyancy Effects on Hydrogen Gas-Jet Diffusion Flames," Invited Seminar, Oklahoma State University, January 2001.

41. A.K. Agrawal, "Hydrogen Gas-Jet Diffusion Flames in Microgravity," Invited Seminar, Indian Institute of Technology, Kanpur, June 2000,

42. A.K. Agrawal, K. Parthasarathy, K. Pasumarthi, and D.W. Griffin, August 2000, "Gravitational Effects on Flow Instability and Transition in Low Density Jets," Poster Presentation at *5th Microgravity Fluid Physics and Transport Phenomena Conference*, Cleveland, OH, pp. 143-144.

43. K. Paumarthi, and A.K. Agrawal, 2000, "An Investigation of Pulsations in Self-Excited Helium Jets," *AIAA/ASME Symposium XX*, Stillwater, OK

44. A.K. Agrawal, 1997, "Flow Characteristics of an Intercooler System for Power Generating Gas Turbines," Invited Speaker, Advanced Gas Turbine Systems Research Heat Transfer Workshop II, Wild Dunes, South Carolina.

45. K. Al-Ammar, A.K. Agrawal, and S.R. Gollahalli, April 1996, "Quantitative Measurements in Hydrogen Flames by Rainbow Schlieren Imaging," Presented at *the 1996 Central States Section of the Combustion Institute Technical Meeting*.

46. A.K. Agrawal, March 1996, "Hydrogen Diffusion Flames in Normal Gravity and Microgravity," Invited Presentation, Space Experiments Division, NASA Lewis Research Center, Cleveland, OH.

47. K. Al-Ammar, and A.K. Agrawal, 1996, "Use of Hermite Polynomials for Inverting Rainbow Schlieren Images," *AIAA/ASME Symposium XVI*, Tulsa, OK.

48. A.K. Shenoy, and A.K. Agrawal, 1996, "Computational Rainbow Schlieren Imaging," *AIAA/ASME Symposium XVI*, Tulsa, OK.

49. H. Bi, and A.K. Agrawal, 1995, "Ignition Characteristics of Natural Gas at Diesel Environments," *Oklahoma AIAA/ASME Symposium XV*, Stillwater, OK.

50. A.K. Agrawal, S.R. Gollahalli, and D. Griffin, 1995, "Nonsooting Diffusion Flames at Normal and Low Gravity," 1st *Joint Meeting of Combustion Institute (US)*, Paper 95PS-010.

51. A.K. Agrawal, Jan. 1995, "Effects of Heat Release on Near Field Flow Structure of Gas Jets," Invited Presentation, NASA Glenn Research Center, Cleveland, OH.

52. A.K. Agrawal, November 1994, "A Curriculum on Advanced Power Generation," Invited Panelist, DOE Advanced Turbine Systems Meeting, Arlington, VA.

Technical Reports

1. Agrawal, A.K., and Taylor, R.P., 2014, "Low Emissions Burner Technology for Metal Processing Industry using Byproducts and Biomass Derived Liquid Fuels," Final Report submitted to the US Department of Energy, DOE Award Number EE0001733.
2. Gollahalli, S.R., and Agrawal, A.K., 2006, Porous Media Combustion Concepts for Propulsion Gas Turbines, Final Report submitted to Army Research Office.

3. Agrawal, A.K., “Advanced Hybrid Power Generation, Phase II,” Tinker Air Force Base.

4. Agrawal, A.K., and Parthasarathy, R.N., 2004, “Gravitational Effects on Flow Instability and Transition in Low Density Jets,” Final Report to NASA on Grant NAG3-2388.

5. Parthasarathy, R.N., Agrawal, A.K., Koepp, A.K., and Franke, S., 2001, “B-1B Avionics, Pitot-Static Interface Manifold Proposal and Evaluation,” Final Report to Oklahoma Air Logistics Center, Tinker Air Force Base, Midwest City, Oklahoma.

6. Agrawal, A.K., 2000, “Non-Catalytic Porous Combustion for Turbine Burner Applications,” Final Report to MER Corporation, Tucson, Arizona

7. A.K. Agrawal, and S.R. Gollahalli, 2001, Effects of Energy Release on Near Field Flow Structure of Gas Jets,” Final Report submitted to NASA on Grant NAG3-1594.

8. A.K. Agrawal, 2001, “Advanced Hybrid Power Unit Study,” CACI-ASG, Oklahoma City.

9. A.K. Agrawal, 2000, “Alternate Fuels for Gas Turbine Combustion,” South Carolina Institute for Energy Studies (SCIES), Clemson, SC.

10. A.K. Agrawal, S.R. Gollahalli, A. Tinneti, and Y. Gao, 1998, “Improving Aerodynamics of the Intercooler Flow Path for the Development of High Efficiency Gas Turbines, Final Report Submitted to South Carolina Energy Research and Development Center, 300 pages.

11. T.T. Yang, A.K. Agrawal, and J.S. Kapat, "Identifying Technology Barriers in Adapting a State-of-the Art Gas Turbine for IGCC Applications and an Experimental Investigation of Air Extraction Schemes for IGCC Operations," Final report to the Morgantown Energy Technology Center, U.S. Department of Energy.

12. T.T. Yang, A.K. Agrawal, 1993, "Air Extraction from the Compressor Discharge of a Heavy-Frame Gas Turbine for an IGCC Systems Gasifier: Experiments and Analysis," Topical report tothe Morgantown Energy Technology Center, U.S. Department of Energy.

13. T.T. Yang, A.K. Agrawal, and T.J. Overcamp, 1991, "Analysis to Predict Combustion and Fuel Nitric Oxide in Gas Turbine Combustors Operating on Low Btu Gasified Coal," Topical report to the Morgantown Energy Technology Center, U.S. Department of Energy.

14. T.T. Yang, and A.K. Agrawal, 1991, "Air Extraction from GE MS-7001F Compressor Diffuser for IGCC Systems Gasifer," Topical report to the Morgantown Energy Technology Center, U.S. Department of Energy.

15. T.T. Yang, A.K. Agrawal, and D.M. Smith, 1991, "Potential Problems, Material and Design Alternations and Recommendation for Subscale Testing on GE MS7001-F Combined Cycle Plant Fueled by an Air-Blown Coal Gasifier," Topical report to the Morgantown Energy Technology Center, U.S. Department of Energy.

16. T.T. Yang, A.K. Agrawal, and M-J Sheu, 1990, "Low Btu Combustion Model Evaluation," Final Report (A02-J0219200) to the General Electric Company.