Ajay K. Agrawal

Work:
Department of Mechanical Engineering
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Tuscaloosa, AL 35406
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PERSONAL RECORD

Date of Birth	June 21, 1960
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

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 software to compute fluid flow and heat transfer in complex flow passages.

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 Chair of Mechanical Engineering, Department of Mechanical Engineering, University of Alabama

CURRENT RESEARCH/TEACHING INTERESTS

- Biofuel combustion and alternate fuels
- Combustion and fluid flow in gas turbine systems
- Quantitative rainbow schlieren deflectometry
- Lean premixed combustion of alternate fuels (synthetic gas, bio-fuels)
- Low-emission combustion concepts
- Combustion and fluid flow in microgravity
- Meso-scale combustion
- Auto-ignition and combustion control
- Design of thermal-fluid systems

PROFESSIONAL EXPERIENCE

University of Alabama, Tuscaloosa, Alabama
Professor and Robert F. Barfield Endowed Chair of Mechanical Engineering, January 2005-Present
Teaching Mechanical Engineering Design, Combustion, and related courses

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 the teaching assistant for the measurement laboratory.

HONORS AND AWARDS

- 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

- 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

- 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 two design courses: Design of Thermal Fluid Systems, and Senior Design Practicum. The latter course involves industry sponsored team projects requiring design and

prototyping. Recent projects include:
-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
- Stirling engine prototype, 2000
- Interacting diffusion flames in microgravity, NASA Zero Gravity Student Flight Program, 1998.

Graduate Courses Taught

- Principles of Heat Transfer
- Computational Heat and Fluid Flow
- Combustion Processes II or Computational Combustion
- 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:

- 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, Michellin 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 **45** 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

- Editorial Board, Journal of Combustion, 2009-
- 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 -
- 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

- 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

- Professional Mechanical Engineer registered in Oklahoma PE # 17386
- American Society of Mechanical Engineers (Fellow)
- American Institute of Aeronautics and Astronautics (Associate Fellow)
- The Combustion Institute (Member)

- 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-
- AIAA, Terrestrial Energy Systems Technical Committee, 2007-
- AIAA, Propellants and Combustion Technical Committee, 2003-
- ASME International Gas Turbine Institute, Combustion and Fuels Technical Committee, 1993-
- 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)
- 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, 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 Projects

- Passive Combustion Control for Turbine Engine Noise Reduction, Ultramet Corp (through US Navy), $190,000, Jan 2009 – December 20010, Principal Investigator (100%).
- Small-Scale Flow Experiments to Support Development of Hydrogen Codes and Safety Standards, Sandia National Laboratory, $155,000, July 07 – Dec. 08, Principal Investigator (100%).
- Energy Conversion for Sustainable Environment: Doctoral Fellowships in Mechanical Engineering, Department of Education, $950,000 including match from the University of Alabama, 2006-2009, Principal Investigator (20%).

Completed

- 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, 2005-2007, Principal Investigator (100%).
- Biofuel Combustion, Southern Company, $76,130, Feb 2007 – May 2008, co-Principal Investigator (100%).
- 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%).
- 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. Jiang Lulin, Glycerol combustion
2. Badrul Mazumder, Combustion noise reduction
3. Tanisha Booker (co-adviser with M. Ashford), Characterization of Hydrogen Combustion in a Constant Volume Chamber
4. Troy Dent, Summer 2010 (expected) *Portable Power using Logistic Fuels*
5. Benjamin Simmons, Summer 2010 (expected) *Liquid Biofuel Combustion using a Novel Fuel Injector*
6. Heena Panchasara, Spring 2010 (expected) *Effect of Fuel Temperature on Liquid Biofuel Combustion*
7. Daniel Sequera, Fall 2009 (expected) *Noise Reduction using Porous Inert Media*
8. Pankaj Kolhe, August 2009, *Statistical Tomography for Scalar Turbulence Measurements using Line of Sight Optical Techniques*
9. Vijaykant Sadasivuni, Spring 2008, *Meso-scale Combustion of Liquid Fuels using Porous Inert Media,* Current Position: Engineer, GE Corporation, Greenville, SC.
10. Rajani Satti, November 2006, *Flow Structure of Low-Density Gas Jets and Gas Jet Diffusion Flames.* Current Position: Technical Support Engineer: Exa Corporation, Burlington, MA
11. Timothy Marbach, July 2005, *Meso-scale Porous Media Heat Recirculating Combustor*, Current Position: Assistant Professor, California State University, Sacramento, CA.
12. Donald M. Wicksall, August 2004, *Lean Premixed Swirl-Stabilized Combustion of Gaseous Alternative Fuels*. Current Position: Rolls Royce, Indianapolis.
13. 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.
14. Khalid Al-Ammar, 1998, *Scalar Measurements and Analysis of Hydrogen Gas-Jet Diffusion Flames in Normal and Microgravity*, with S.R. Gollahalli. Current position: Assistant Professor of Mechanical Engineering, King Saud University, Riyadh, Saudi Arabia.
15. 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.
16. 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. Olexandr Ivanchenko, 2008
2. Cosmin Dumitrescu, 2008
3. External Examiner: Atul Srivastava, IIT Kanpur, 2006
4. Kristian Olivero, 2004

5. Xuelei Chen, 2002
6. Mauricio A. Sanchez, 2002
7. External Examiner, Kirti K. Dhawan, IIT Kanpur, 2000
8. Christopher Lawson, 2000

Masters Students

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

22. S. Krishnan, 1992, Use of Subdomains for Inverse Problems in Branching Flow Passages.

Undergraduate Student Supervision (advised more than 40 independent study projects)

1. Travis Midkiff, Thermo-acoustic instabilities, Fall 2009
2. Tim Rose, NSF REU, Summer 2009, Supersonic jet development simulating cryogenic hydrogen leaks
3. Justin Williams, Summer 2009, Effect of porous media configuration on combustion noise
4. Marc Hansen, Fall 2008, Combustion of heated viscous fuels
5. Alex Nguyen, Spring 2008, Data Acquisition System for Combustion Experiments
6. Brian Lozes, Fall 2007, Portable Rainbow Schlieren Deflectometry Apparatus
7. Drew Smith, Fall 2007,Rainbow Schlieren Deflectometry of Sprays and Supersonic Jets
8. Alex Nguyen, Fall 2007, Integrated and Automation of Data Acquisition Systems
9. Ben Simmons, Summer 2006, Combustion using porous inert media
10. Rick Byrne, Spring 2007, Flow-Blurring Fuel Injection System for Biofuel Combustion
11. Benjamin Picone, Fall 2006, Simplified injector for combustion of liquid fuels
12. Tyler House, Fall 2006, Biofuel combustion
13. Sudeep Deb, Summer 2006, Combustion of Liquid Fuels in a Swirl-Stabilized Burner
14. Anil Rathi, Summer 2005, Methane Combustion in a Swirl Stabilized Burner
15. Nathaniel R. Harding, Summer 2004, Lean Premixed Combustion of Alternate Fuels in a Swirl-Stabilized Combustor
16. Will J Dacus, Sp 2004, Effect of Diluents on Lean Premixed Combustion of Hydrocarbon Fuels
17. John R. Siska, Spring 2004, Hybrid Power Generation

10-13. Robert Farrell, Louis Galleciez, Andrew Horner, and Jared DeSellier, Spring 2004, Flow Bench for SAE Formula Car

14. Daniel Sequera, 2003, Fuel Effects on Porous Media Combustion
15. Jarod Kelly, 2003, Flame Stabilization Methods for Lean Premixed Combustion
16. Jeremy DeBons, 2002, Lean-Premixed, Pre-vaporized Kerosene Burner
17. Eric Bartlow, 2001, Calibration of Flow Meters
18. Scott Franke, 2001, Pitot-Tube Calibration Interface for B1-B Bomber
19. Brad Pickle, 2000, Design and Construction of a Stirling Engine with Regeneration
20. Jorge Sanchez, 2000, Data Acquisition System
21. Kristina Diamond, 2000, Premixed and Diffusion Flame Visualization of the Sabatier Reaction
22. Craig Kos, 2000, Pressure Drop Measurements in a Fan Coil
23. Elizabeth Nunes, 2000, Gas Turbine Cycle Performance
24. Chester Biggs, 1999, Coil Testing and Analysis
25. Boe Green, 1999, Instructions for a Premixed Flames
26. Brian Howthone, Spring 1999, Instrumentation for a Lean Premixed Burner.
27. Donald Wicksall, Fall 1998, Flame Interaction in Microgavity.
28. Anthony Ting, Summer 1997, Flow Experiments in the Intercooler Flow Path of Gas Turbines.
29. Burt Albers, Fall 1996, Hydrogen Diffusion Flames in a Low Pressure Combustion Chamber.
30. James D. McCormick, Fall 1995, Design and Manufacturing of a Measuring System for Heat Exchanger Tubes.
31. Gustava Gonzalez, Summer 1995, Research on Rainbow Schlieren Imaging, Funded by the Minority Engineering Program.
32. Ira Bryant, Summer 1995, Wind Tunnel Experiments.
33. John Allen, Summer 1995, Clear Acrylic Molding Process and Design
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