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Li Qiao

ADDRESS

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RESEARCH INTERESTS

Professor Qiao's research focuses on the development of new technologies and the understanding of basic science in the areas of fuels, combustion and sustainable energy. Research interests include high performance fuels using nanoscale additives, nanoscale energetic materials, alternative fuels, fuel synthesis by coal and biomass gasification, ultra-lean natural gas combustion, experimental fluid mechanics, and new propellant and propulsion concepts. Research methodologies involve high-speed imaging techniques, advanced laser diagnostics, numerical modeling, and theoretical studies.

EDUCATION

- 2007 Ph.D., Aerospace Engineering, the University of Michigan
Dissertation: *Effects of Inert Gases on Laminar Premixed Flames in Microgravity*
- 2001 M.S., Engineering Mechanics, Tsinghua University
Thesis: *Numerical Modeling of Turbulent Coal Combustion*
- 1999 B.S., Engineering Mechanics, Tsinghua University

PROFESSIONAL EXPERIENCE

- 2013-pre Associate Professor
School of Aeronautics & Astronautics, Purdue University
- 2007-2013 Assistant Professor
School of Aeronautics & Astronautics, Purdue University
- 2011 summer Summer Faculty Fellow
Propulsion System Division, NASA Glenn Research Center, Cleveland, OH
- 2010 summer Summer Faculty Fellow
Propulsion Directorate, Air Force Research Lab, Wright-Patterson, OH
- 2002-2007 Graduate Research Assistant
Department of Aerospace Engineering, University of Michigan
- 1999-2001 Graduate Research Assistant
Department of Engineering Mechanics, Tsinghua University, China

HONORS AND AWARDS

- 2013 NSF CAREER Award
- 2013 AFOSR Young Investigator Award
- 2011 NASA Glenn Summer Faculty Fellowship
- 2011 Combustion Art Competition 2nd Place Prize, "Dr. Combustion," the Combustion Institute
- 2011 Outstanding Mentor Award, Louis Stokes Alliance for Minority Participation-Indiana, Purdue University

- 2010 ARO Young Investigator Award
- 2010 Air Force Summer Faculty Fellowship
- 2010 Combustion Art Competition 2nd Place Prize, “*Flame, Gone with Butterfly*,” the Combustion Institute
- 2006-2007 Rackham Predoctoral Fellowship, University of Michigan
- 2006-2007 Barbour Fellowship, University of Michigan (declined)
- 2006 Engineering Graduate Student Symposium Oral Presentation 1st Place Prize, University of Michigan
- 2005 Margaret Ayers Host Award, University of Michigan
- 2005 Marian Sarah Parker Prize, University of Michigan
- 2004, 2005 Amelia Earhart Fellowship, Zonta International
- 2002-2003 Rackham Engineering Awards Fellowship, University of Michigan
- 1998 Minxue Cai Fellowship, Minxue Cai Foundation
- 1998 Social Work Prize, Department of Engineering Mechanics, Tsinghua University
- 1995-1997 First-Class Scholarship, Tsinghua University

PUBLICATIONS (graduate and undergraduate student advisee are underlined)

Published and Accepted for Publication Refereed Journal Papers

1. L. Qiao, L.X. Zhou, “A USM Turbulence-Chemistry Model for Turbulent Combustion,” *Journal of Combustion Science and Technology* (in Chinese), 8 (4): 297-301, 2002.
2. L.X. Zhou, L. Qiao, X.L. Chen, J. Zhang, “A USM Turbulence-Chemistry Model for Simulating NOx Formation in Turbulent Combustion,” *Fuel*, 81 (13): 1703-1709, 2002.
3. L.X. Zhou, L. Qiao, J. Zhang, “Simulation of NOx Formation in Turbulent Swirling Combustion Using a USM Turbulence-Chemistry Model,” *Acta Mechanica Sinica*, 19 (3): 208-212, 2003.
4. L. Qiao, C.H. Kim, G.M. Faeth, “Suppression Effects of Diluents on Laminar Premixed Hydrogen/Oxygen/Nitrogen Flames,” *Combustion and Flame*, 143: 79-96, 2005.
5. L. Qiao, Y. Gu, W.J.A. Dahm, E.S. Oran, G.M. Faeth, “Near-Limit Laminar Burning Velocities of Microgravity Premixed Hydrogen Flames with Various Chemically Passive Fire Suppressants,” *Proceedings of the Combustion Institute*, 31: 2701-2709, 2007.
6. L. Qiao, Y. Gu, W.J.A. Dahm, E.S. Oran, G.M. Faeth, “A Study of the Effects of Diluents on Near-Limit H₂-Air Flames in Microgravity at Normal and Reduced Pressures,” *Combustion and Flame*, 151: 196-208, 2007.
7. L. Qiao, Y. Gan, T. Nishiie, W. J.A. Dahm, E.S. Oran, “Extinction of Premixed Methane/Air Flames in Microgravity by Diluents: the Effects of Radiation and Lewis Number,” *Combustion and Flame*, 157 (8): 1446-1455, 2010.
8. Y. Gan, L. Qiao, “Combustion Characteristics of Fuel Droplets Containing Micron and Nano-sized Aluminum Particles”, *Combustion and Flame*, 158 (2): 354-368, 2011.
9. D. Sing, T. Nishiie, L. Qiao, “Experimental and Kinetic Modeling Study of the Combustion of n-Decane, Jet-A, and S-8 in Laminar Premixed Flames,” *Combustion Science and Technology*, 183: 1002-1026, 2011.

10. Y. Gan, L. Qiao, "Evaporation Characteristics of Fuel Droplets with the Addition of Energetic Nanoparticles under Natural and Forced Convections", *International Journal of Heat and Mass Transfer*, 54 (23-24), 4913-4922, 2011.
11. L. Qiao, "Transient Flame Propagation Process and Flame-Speed Oscillation Phenomena in a Carbon Dust Cloud," *Combustion and Flame*, 159 (2), 673-685, 2012.
12. D. Singh, T. Nishiie, S. Tanvir, L. Qiao, "Flame Speed and Kinetics Analysis of Syngas Flames at Elevated Temperatures and with Water Addition," *Fuel*, 94: 448-456, 2012
13. L. Qiao, J. Xu, A. Sane, J. Gore "Multiphysics Modeling of Coal Gasification Processes in a Perfectly-stirred Reactor with Detailed Gas-Phase Chemistry," *Combustion and Flame*, 159 (4) 1693–1707, 2012.
14. Y. Gan, Y.S. Lim, L. Qiao, "Combustion of Nanofluid Fuels with the Addition of Boron and Iron particles at Dense and Dilute Concentrations," *Combustion and Flame*, 159 (4), 1732–1740, 2012.
15. L. Qiao, J. Xu, "Detailed Numerical Simulations of Flame Propagation in High-Volatile Dust Clouds," *Combustion Theory and Modeling*, Vol. 7, 1-27, 2012.
16. S. Tanvir, L. Qiao, "Surface Tension of Nanofluid Fuels with Stably Suspended Nanomaterials," *Nanoscale Research Letters*, Vol. 7, 226, 2012.
17. Y. Gan, L. Qiao, "Radiation-enhanced evaporation of ethanol fuel containing suspended metal nanoparticles," *International Journal of Heat and Mass Transfer*, 55 (21-22) 5777-5782, 2012.
18. Y. Gan, L. Qiao, "Optical Properties and Radiation-enhanced Evaporation of Nanofluid Fuels Containing Carbon-based Nanostructures," *Energy&Fuels*, 26 (7), 4224-4230, 2012.
19. J. Xu, L. Qiao, "Mathematical Modeling of Coal Gasification Processes in a Well-Stirred Reactor: Effects of Devolatilization and Moisture Content," *Energy&Fuels*, 26 (9), pp 5759–5768, 2012.
20. J. Xu, L. Qiao, J. Gore, "Multiphysics Well-Stirred Reactor Modeling of Coal gasification Under Intense Thermal Radiation," *International Journal of Hydrogen Energy*, 38 (17), pp 7007-7015, 2013.

CONFERENCE PROCEEDINGS AND PRESENTATIONS

1. C.H. Kim, L. Qiao, O.C. Kwon, G.M. Faeth, "Chemically Passive Suppression of Premixed Flames in Spacecraft Environments at Microgravity," *7th International Workshop on Microgravity Combustion and Reacting Systems*, Cleveland, OH, June 3-6, 2003.
2. L. Qiao, C.H. Kim, G.M. Faeth, "Effects of Chemically Passive Suppressants on Laminar Premixed Hydrogen/Air Flames," *Workshop on Strategic Research to Enable NASA's Exploration Missions*, Cleveland, OH, June 22-23, 2004.
3. L. Qiao, C.H. Kim, G.M. Faeth, "Chemically Passive Suppression of Laminar Premixed Hydrogen/Air Flames," *American Society for Engineering Education (ASEE) Summer Seminar Series*, Ann Arbor, MI, 2004.
4. L. Qiao, C.H. Kim, G.M. Faeth, "Effects of Chemically Passive Suppressants on Laminar Premixed Hydrogen/Air Flames," *Spring Technical Meeting of the Canadian Section of the Combustion Institute*, Kingston, Ontario, May 9-12, 2004.
5. L. Qiao, Y. Gu, W.J.A. Dahm, E.S. Oran, G.M. Faeth, "Effects of Diluents on Near-Limit H₂-Air Flames in Microgravity at Normal and Reduced Pressures", *University of Michigan Engineering Graduate Symposium*, Ann Arbor, MI, Nov 3, 2006.

6. L. Qiao, Y. Gu, W.J.A. Dahm, E.S. Oran, G.M. Faeth, "Near-Limit Laminar Burning Velocities of Microgravity Premixed Hydrogen Flames with Various Chemically Passive Fire Suppressants," *31st International Symposium on Combustion*, Heidelberg, Germany, Aug 6-11, 2006.
7. L. Qiao, Y. Gu, W.J.A. Dahm, E.S. Oran, G.M. Faeth, "Chemically Passive Suppression of Laminar Premixed Hydrogen Flames at Microgravity," *44th AIAA Aerospace Sciences Meeting and Exhibit*, AIAA-2006-741, Reno, NV, Jan 9-12, 2006.
8. S. Heister, S. Fleeter, S. Son, W. Anderson, I. Hrbud, C. Merkle, N. Key, L. Qiao, "Propulsion Education and Research Programs at Purdue University," *43rd AIAA Joint Propulsion Conference*, Cincinnati, OH, July 11-14, 2007.
9. L. Qiao, Y. Gu, W.J.A. Dahm, E.S. Oran, G.M. Faeth, "Laminar Burning Velocity Measurements of Stoichiometric CH₄/O₂/N₂/Diluent Mixtures in Free-Fall Experiments," *5th US Combustion Meeting*, San Diego, CA, March 24-27, 2007.
10. L. Qiao, W.J.A. Dahm, E.S. Oran, G.M. Faeth, "Laminar Burning Velocities and Flammability Limits of Premixed Methane-Air-Diluent Flames in Microgravity," *46th AIAA Aerospace Sciences Meeting and Exhibit*, AIAA-2008-0959, Reno, NV, Jan 7-10, 2008.
11. L. Qiao, "Numerical Modeling of Ignition and Flame Propagation through Pulverized Coal Cloud," *Spring Technical Meeting of the Central States Section of The Combustion Institute*, Tuscaloosa, AL, April 20-21, 2008
12. D. Singh, T. Nishiie, L. Qiao, "Laminar Burning Velocity of Syngas/Air Flames with Water Vapor and Ammonia at Elevated Temperatures," *6th US National Combustion Meeting*, Ann Arbor, MI, May 17-20, 2009.
13. T. Nishiie, D. Singh, L. Qiao, "Laminar Burning Velocity and Markstein Length of Decane/air, Jet-A/air and S-8/air Flames," *6th US National Combustion Meeting*, Ann Arbor, May 17-20, MI, 2009.
14. D. Sing, T. Nishiie, L. Qiao, "Laminar Burning Velocity and Markstein Length of n-Decane/Air, Jet-A/Air and S-8/Air Flames," AIAA-2010-951, *48th AIAA Aerospace Sciences Meeting Including the New Horizons Forum and Aerospace Exposition*, Orlando, Florida, Jan. 4-7, 2010.
15. Y. Gan, L. Qiao, "Burning Characteristics of Fuel Droplets Containing Dilute Energetic Nanoparticles," AIAA-2010-620, *48th AIAA Aerospace Sciences Meeting Including the New Horizons Forum and Aerospace Exposition*, Orlando, Florida, Jan. 4-7, 2010.
16. D. Singh, T. Nishiie, L. Qiao, "Laminar Burning Velocity and Markstein Length of Syngas Flames at Elevated temperatures," *Spring Technical Meeting, the Central State Section of the Combustion Institute*, Champaign, Illinois, March 21-23, 2010.
17. Y. Gan, L. Qiao, "Burning Characteristics of Fuel Droplets Containing Nano-sized and Micron-sized Aluminum Particles," *Spring Technical Meeting, the Central State Section of the Combustion Institute*, Champaign, Illinois, March 21-23, 2010.
18. D. Singh, T. Nishiie, L. Qiao, "Laminar Burning Velocity and Markstein Length of n-Decane/Air and MCH/Air Flames," *Spring Technical Meeting, the Central State Section of the Combustion Institute*, Champaign, Illinois, March 21-23, 2010.
19. B. Palvol, L. Qiao, "Chemical Effect of Reactive Nanoparticles on Laminar Counterflow Flames," Poster, *33rd International Combustion Symposium*, Beijing, Aug 1-7, 2010.
20. Y. Gan, L. Qiao, "Combustion Characteristics of Fuel Droplets with Addition of Nano and Micro-sized Aluminum Particles," Poster, *33rd International Combustion Symposium*, Beijing, Aug 1-7, 2010.

21. L. Qiao, J. Xu, J. Gore “Multiscale Modeling of Coal Gasification Processes in a Perfectly-stirred Reactor with Detailed Chemistry,” *49th AIAA Aerospace Sciences Meeting Including the New Horizons Forum and Aerospace Exposition*, Orlando, Florida, Jan. 4-7, 2011.
22. Y. Gan, L. Qiao, “Ignition and Combustion of Fuel Droplets with Addition of Energetic Nanoparticles at Dilute and Dense Particle Loadings,” *49th AIAA Aerospace Sciences Meeting Including the New Horizons Forum and Aerospace Exposition*, Orlando, Florida, Jan. 4-7, 2011.
23. L. Qiao, J. Xu, J. Gore, “Multiphysics Modeling of Carbon Gasification Processes in a Perfectly-stirred Reactor with Detailed Gas-phase Chemistry,” *7th US Joint Combustion Meeting of the Combustion Institute*, Atlanta, Georgia, March 20-23, 2011.
24. Y. Gan, L. Qiao, “Evaporation and Combustion of Fuel Droplets with Addition of Energetic Nanoparticles at Dilute and Dense Particle Loadings,” *7th US Joint Combustion Meeting of the Combustion Institute*, Atlanta, Georgia, March 20-23, 2011.
25. L. Qiao, J. Xu, J. Gore, “Multiphysics Modeling of Carbon Gasification Processes in a Perfectly-stirred Reactor with Detailed Gas-phase Chemistry,” Poster, *23rd International Colloquium on the Dynamics of Explosives and Reactive Systems*, Irvine, CA, July 24-29, 2011.
26. Y. Gan, L. Qiao, “Combustion Characteristics of Colloidal Fuels with the Additional of Boron and Iron Particles at Dilute and Dense Concentrations,” *23rd International Colloquium on the Dynamics of Explosives and Reactive Systems*, Irvine, CA, July 24-29, 2011.
27. L. Qiao, J. Xu, J. Gore, “Multiphysics Modeling of Carbon Gasification Processes in a Perfectly-stirred Reactor with Detailed Gas-phase Chemistry,” *Fall Technical Meeting, the Eastern State Section of the Combustion Institute*, Univeristy of Connecticut, CT, Oct 10-12, 2011.
28. Y. Gan, L. Qiao, “Radition Enhanced Evaporation of Nanofluid Fuels,” *Fall Technical Meeting, the Eastern State Section of the Combustion Institute*, Univeristy of Connecticut, CT, Oct 10-12, 2011.
29. Y. Gan, L. Qiao, “Combustion Characteristics of Nanofluid Fuels with the Additional of Boron and Iron Particles at Dilute and Dense Concentrations,” *Fall Technical Meeting, the Eastern State Section of the Combustion Institute*, Univeristy of Connecticut, CT, Oct 10-12, 2011.
30. L. Qiao, J. Xu, J. Gore, “Multiphysics Modeling of Carbon Gasification Processes in a Perfectly-stirred Reactor with Detailed Gas-phase Chemistry,” *Fall Technical Meeting, the Western State Section of the Combustion Institute*, Univeristy of Califorina, Riverside, CA, Oct 17-19, 2011.
31. Y. Gan, L. Qiao, “Evaporation Enhanced Evaporation of Nanofluid Fuels,” *Fall Technical Meeting, the Western State Section of the Combustion Institute*, Univeristy of Califorina, Riverside, CA, Oct 17-19, 2011.
32. Y. Gan, L. Qiao, “Combustion Characteristics of Nanofluid Fuels with the Additional of Boron and Iron Particles at Dilute and Dense Concentrations,” *Fall Technical Meeting, the Western State Section of the Combustion Institute*, Univeristy of Califorina, Riverside, CA, Oct 17-19, 2011.
33. L. Qiao, “Flame-speed Oscillation Phenomena in Combustion of Dust Clouds,” *50th AIAA Aerospace Science Meeting*, Nashville, TN, Jan 9-12, 2012.
34. J. Xu, L. Qiao, J. Gore “Multiphysics Well-stirred Reactor Modeling of Solar-driven Coal Gasification,” *50th AIAA Aerospace Science Meeting*, Nashville, TN, Jan 9-12, 2012.
35. Y. Gan, L. Qiao, “Optical Properties and Radiation-enhanced Evaporation of Nanofluid Fuels containing Suspended Nanostructures,” *50th AIAA Aerospace Science Meeting*, Nashville, TN, Jan 9-12, 2012.
36. Y. Gan, L. Qiao, “Combustion Characteristics of Nanofluid Fuels with the Additional of Boron and Iron Particles,” *50th AIAA Aerospace Science Meeting*, Nashville, TN, Jan 9-12, 2012.

37. S. Tanvir, L. Qiao, "Surface Tension of Nanofluid Fuels Containing Suspended Nanomaterials," *Spring Technical Meeting, the Western States Section of the Combustion Institute*, March 19-20, Arizona State University, Tempe, AZ, 2012.
38. Y. Gan, L. Qiao, "Optical Properties and Radiation-enhanced Evaporation of Nanofluid Fuels with Carbon Nanostructures," *Spring Technical Meeting, the Western States Section of the Combustion Institute*, March 19-20, Arizona State University, Tempe, AZ, 2012.
39. Y. Gan, L. Qiao, "Combustion Characteristics of Nanofluid Fuels with Addition of Energetic Particles at Dilute and Dense Concentrations," *Spring Technical Meeting, the Western States Section of the Combustion Institute*, March 19-20, Arizona State University, Tempe, AZ, 2012.
40. J. Xu, L. Qiao, "Modeling of Solar-driven Coal Gasification using a Well-stirred Reactor Model," *Spring Technical Meeting, the Western States Section of the Combustion Institute*, March 19-20, Arizona State University, Tempe, AZ, 2012.
41. B. Pavlov, L. Qiao, "Catalytic Oxidation of Methanol on Platinum Nanoparticles," *Spring Technical Meeting, the Western States Section of the Combustion Institute*, March 19-20, Arizona State University, Tempe, AZ, 2012.
42. S. Tanvir, L. Qiao, "Surface Tension of Nanofluid Fuels Containing Suspended Nanomaterials," *Spring Technical Meeting, the Central States Section of the Combustion Institute*, April 22-24, University of Dayton, Dayton, OH, 2012.
43. Y. Gan, L. Qiao, "Optical Properties and Radiation-enhanced Evaporation of Nanofluid Fuels with Carbon Nanostructures," *Spring Technical Meeting, the Central States Section of the Combustion Institute*, April 22-24, University of Dayton, Dayton, OH, 2012.
44. Y. Gan, L. Qiao, "Combustion Characteristics of Nanofluid Fuels with Addition of Energetic Particles at Dilute and Dense Concentrations," *Spring Technical Meeting, the Central States Section of the Combustion Institute*, April 22-24, University of Dayton, Dayton, OH, 2012.
45. J. Xu, L. Qiao, "Modeling of Solar-driven Coal Gasification using a Well-stirred Reactor Model," *Spring Technical Meeting, the Central States Section of the Combustion Institute*, April 22-24, University of Dayton, Dayton, OH, 2012.
46. B. Pavlov, L. Qiao, "Catalytic Oxidation of Methanol on Platinum Nanoparticles," *Spring Technical Meeting, the Central States Section of the Combustion Institute*, April 22-24, University of Dayton, Dayton, OH, 2012.
47. J. Xu, L. Qiao, "Detailed Numerical Modeling of Solar Coal Gasification in a Perfectly-stirred Reactor," *48th AIAA/ASME/SAE/ASEE Joint Propulsion Conference & Exhibit*, July 30-Aug 1, Atlanta, GA, 2012.
48. B. Pavlov, L. Qiao, "Low-temperature Oxidation of Hydrocarbon Fuels Using Nanocatalysts," *48th AIAA/ASME/SAE/ASEE Joint Propulsion Conference & Exhibit*, July 30-Aug 1, Atlanta, GA, 2012.
49. Y. Gan, L. Qiao, "Combustion of Nanofluid Fuels with the Addition of Boron and Iron Particles," *48th AIAA/ASME/SAE/ASEE Joint Propulsion Conference & Exhibit*, July 30-Aug 1, Atlanta, GA, 2012.
50. Y. Gan, L. Qiao, "Enhanced Evaporation of Nanofluid Fuels under Radiation," *48th AIAA/ASME/SAE/ASEE Joint Propulsion Conference & Exhibit*, July 30-Aug 1, Atlanta, GA, 2012.
51. J. Xu, L. Qiao, "Droplet Breakup of Nano-dispersed Coal-in-Water Colloidal Fuels under Intense Radiation," *8th National Combustion Meeting*, University of Utah, Park City, UT, May 19-22, 2013.

52. S. Tanvir, L. Qiao, "Effect of Droplet Size on the Burning Characteristics of Liquid Fuels with Suspensions of Energetic Nanoparticles," *8th National Combustion Meeting*, University of Utah, Park City, UT, May 19-22, 2013.
53. J. Xu, L. Qiao, "Droplet Breakup of Nano-dispersed Coal-in-Water Colloidal Fuels under Intense Radiation," *49th AIAA Joint Propulsion Conference*, San Jose, CA, July 14-17, 2013.
54. S. Tanvir, L. Qiao, "Effect of Droplet Size on the Burning Characteristics of Liquid Fuels with Suspensions of Energetic Nanoparticles," *49th AIAA Joint Propulsion Conference*, San Jose, CA, July 14-17, 2013.

TEACHING

Courses taught at Purdue.

- AAE 372, *Jet Propulsion Powerplants*
Fall 2007 (20 students), Spring 2008 (71 students), Spring 2009 (98 students), Fall 2009 (40 students), Spring 2010 (107 students), Spring 2011 (144 students), Spring 2012 (115 students), 100% responsibility
- AAE 590, *Advanced Energy Solutions*
Fall 2008 (26 students), Fall 2009 (9 students), 100% responsibility
- AAE 538, *Advanced Air Breathing Propulsion*
Fall 2010 (42 students), Fall 2011 (26 students), Fall 2012 (36 students), 100% responsibility

STUDENT SUPERVISION

Ph.D. Theses Completed

1. Yanan Gan, Ph.D., "Combustion and Evaporation Characteristics of Fuel Droplets Containing Suspended Energetic Nanoparticles," Graduate date: July 2012. (now a Development Specialist at Praxair)

M.S. Theses Completed

1. Deepti Singh, M.S., "Study of Surrogates for Conventional and Synthetic Aviation Jet Fuels." Graduate date: July 2010. (now a PhD student at Stanford University)
2. Takayuki Nishiie, M.S., "Experimental and Kinetics Modeling Study of the Combustion of Jet-A and S-8 Fuels in Laminar Premixed Flames." Graduate date: December 2010. (now an engineer at Japan Aerospace Exploration Agency)
3. Saad Tanvir, M.S., "Rheology and Spray Characteristics of Novel Nanofluid Fuels." Graduate date: July 2011. (now a PhD student at Purdue)
4. Bogdan Pavlov, M.S., "Low-Temperature Oxidation of Methanol over Nanocatalysts." Graduate date: April 2012. (now an engineer at Cummins)

Ph.D. Theses In Progress

1. Jian Xu, Ph.D., "Multiphysics Modeling of Coal and Biomass Gasification Processes for Fuel Synthesis." (passed qualify exam) (*Jian Xu received the Bilsland Dissertation Fellowship of Purdue University for his doctoral research*).
2. Saad Tanvir, Ph.D., "Combustion of Novel Nanofluid Fuels at Elevated Temperatures and Pressures." (passed qualify exam)

3. Guiyuan Mo, Ph.D., “Combustion Chemistry and Dynamics in Nanoscale Confined Environments.” (passed qualify exam)
4. Sayan Biswas, Ph.D., “Turbulent Hot Jet Ignition for Extra-Lean Burning Natural Gas Engines.”
5. Shourya Jian, Ph.D., “Understanding the Unique Thermophysical Properties of Nanofluid Fuels.”

Undergraduate Students Research Projects

1. Saad Tanvir, “Measurements of flame speed of syngas derived from coal gasification”, Purdue SURF Program, summer 2008. (*For this project, Saad Tanvir won the Best Undergraduate Presentation Award of the 2008 AAE Research Symposium Series.*)
2. Richard Wang, “Design and development of a liquid fuel vaporization system,” volunteer, summer 2008.
3. Saad Tanvir, “Combustion of micro and nano alumina particles,” AAE 490 Special Project, Fall 2009.
4. Mark Pfeil, “Non-equilibrium plasma generator for studying plasma/flame interactions,” AAE 490 Special Project, Fall 2009.
5. Abhi Murty, “Research on high energy density fuels for future ramjets and scramjets,” AAE 490 Special Project, Spring 2010.
6. Alex Chong Shao Teng, “Flame speed measurement of syngas/air mixtures,” Purdue SURF program, Summer 2010.
7. Dustin Truesdell, “Ignition delay time of fuel droplets containing energetic particles and gellant,” NSF Research Experiences for Undergraduates (REU) Grant, Summer 2010.
8. Nayanapriya Bohidar, “Development of a droplet stream generator,” NSF Research Experiences for Undergraduates (REU) Grant, Spring 2011.
9. Jamal Enakhimion, “Development of nanoparticle seeder and soot laser diagnostics,” the Purdue-Louis Stokes Alliance for Minority Participation Indiana Program (LSAMP) sponsored by NSF, Spring 2011.
10. Anthony Malito, “Spray pattern characterization of tailored fuels,” AAE 490 Special Project, Spring 2011.
11. Yi-Syuen Lim, “Combustion of droplets containing suspended boron nanoparticles,” Purdue SURF program, summer 2011. (*Lim’s contribution to the project led him to be the second author of a paper published in Combustion and Flame. Lim was later awarded a scholarship by Australia government to pursue his MS degree.*)
12. Mark Danielson, “Auto-ignition of ethanol vapor at room temperature using platinum nanoparticles,” Purdue SURF program, summer 2011.
13. Andrea Exil, “Physical Properties of nanofluid fuels,” the Purdue-Louis Stokes Alliance for Minority Participation Indiana Program (LSAMP) sponsored by NSF, Fall 2011.
14. Jesus Pozo, “Viscosity measurement of liquid fuels containing suspended nanoparticle: the effect of particle aggregation,” AAE 490 Special Project, Spring 2012.
15. Alex Chong Shao Teng, “Development of a high-temperature and pressure apparatus for investigation of turbulent hot jet ignition,” AAE 490 Special Project, Spring 2012.
16. David Kun, “High-speed imaging to visualize prechamber hot jet ignition,” Purdue SURF program, summer 2012.

17. Aaron Johnson, "Droplet stream experiment for studying nanofluid fuels," Purdue SURF program, summer 2012.
18. Jennifer Wu, "Aggregation of nanofluid fuels using Dynamic Light Scattering," volunteer, summer 2012.
19. Ye Nearn Teoh, "Viscosity measurement of nanofluid fuels and the influence of particle aggregation," volunteer, summer 2012.

INVITED SEMINARS

1. "Novel Nanofluid Fuels," Department of Aerospace and Ocean Engineering, *Virginia Tech*, February 2013.
2. "Novel Nanofluid Fuels," Department of Mechanical & Aerospace Engineering, *University of California, San Diego*, February 2013.
3. "Novel Nanofluid Fuels," Department of Mechanical Engineering, *University of Michigan*, October 2012.
4. "Novel Nanofluid Fuels," Department of Mechanical, Aerospace & Materials Engineering, *University of Central Florida*, March 2012.
5. "Novel Nanofluid Fuels," Department of Mechanical Engineering, *Stanford University*, November 2011.
6. "Novel Nanofluid Fuels," School of Aerospace Engineering, *Georgia Institute of Technology*, November 2011.
7. "Novel Nanofluid Fuels," Department of Mechanical Engineering, *University of Connecticut*, October 2011.
8. "Novel Nanofluid Fuels," Department of Mechanical Engineering and Materials Science, *Yale University*, October 2011.
9. "Novel Nanofluid Fuels," Department of Mechanical Engineering, *University of Washington*, Seattle, March 2011.
10. "Novel Nanofluid Fuels," School for Engineering of Mass, Transport and Energy, *Arizona State University*, February 2011.
11. "Effects of Diluents on Laminar Premixed Flames in Microgravity," Department of Aerospace Engineering and Science, *University of Colorado, Boulder*, April 2007.
12. "Effects of Diluents on Laminar Premixed Flames in Microgravity," Department of Mechanical Engineering, *Colorado School of Mines*, March 2007.
13. "Effects of Diluents on Laminar Premixed Flames in Microgravity," *GE Global Research Combustion Lab*, "Niskayuna, NY, February 2007.
14. "Effects of Diluents on Laminar Premixed Flames in Microgravity," Department of Mechanical Engineering, Professor Hanson's Group, *Stanford University*, October 2006.

SERVICE

- Reviewer for
 - *Combustion and Flame*
 - *AIAA Journal*

- *Proceedings of the Combustion Institute*
 - *Combustion Science and Technology*
 - *Journal of Propulsion and Power*
 - *Energy&Fuels*
 - *Fuel*
 - *International Journal of Heat and Mass Transfer*
 - *International Journal of Heat and Fluid Flow*
 - *International Journal of Hydrogen Energy*
 - *ASME Turbo Expo Conference*
 - *Renewable Energy*
 - *Chemical Engineering and Technology*
 - *Special Topics and Review of Porous Media*
- Proposal panelist/reviewer for National Science Foundation, 2008, 2010, 2011; for American Chemical Society, 2012; for Army Research Office, 2012.
 - Session Chair of the 5th US National Combustion Meeting, Ann Arbor, MI, May 18-21, 2009; the Spring Technical Meeting of the Central States Section of the Combustion Institute, IL, 2010; the Fall Technical Meeting of the Eastern States Section of the Combustion Institute, CT, 2011.
 - Coordinator, Midwest Mechanics Seminar, Purdue University, 2009-pre.
 - Member, Colloquium Committee, School of Aeronautics & Astronautics, Purdue University, 2007-pre;
 - Member, Propulsion Committee, School of Aeronautics & Astronautics, Purdue University, 2007-pre;
 - Member, Lab Committee, School of Aeronautics & Astronautics, Purdue University, 2007-pre;
 - Member, Graduate Committee, School of Aeronautics & Astronautics, Purdue University, 2011-pre
 - Member, Faculty Search Committee, School of Aeronautics & Astronautics, Purdue University, 2012;
 - Faculty advisor for Purdue's Summer Undergraduate Research Fellowship (SURF) Program, 2008-pre
 - Faculty mentor for Purdue-Louis Stokes Alliance for Minority Participation Indiana Program (LSAMP) sponsored by NSF, 2011-pre
 - Faculty advisor for Engineering Expo, Purdue University, 2009
 - Keynote speaker "Improving the Access of Women and Girls to Science, Mathematics and Technology Education," Zonta International District 6 Meeting, 2009.

PROFESSIONAL SOCIETY MEMBERSHIP

American Institute of Aeronautics and Astronautics (AIAA)

American Physical Society (APS)

Society of Women Engineers (SWE)

The Combustion Institute