

Umit O. Koylu, Ph. D.

Professor

*Department of Mechanical and Aerospace Engineering
Missouri University of Science and Technology
290A Toomey Building, 400 West 13th Street
Rolla, MO 65409-0050
Phone: (573) 341-6601; Fax: (573) 341-4607
E-mail: koyluu@mst.edu*

EDUCATION

- **Ph.D. Degree**
The University of Michigan, Ann Arbor, Michigan
Department of Aerospace Engineering
Graduation Date: 1992
Dissertation Title: Emission, Structure and Optical Properties of Overfire Soot
From Buoyant Turbulent Diffusion Flames
Thesis Advisor: Prof. Gerard M. Faeth
- **M.S. Degree**
The University of Michigan, Ann Arbor, Michigan
Department of Aerospace Engineering
Graduation Date: 1989
Major: Gas Dynamics
- **B.S. Degree**
Istanbul Technical University, Istanbul, Turkey
Department of Aeronautical Engineering
Graduation Date: 1986

WORK EXPERIENCE

- **Professor**
Missouri University of Science and Technology, Rolla, Missouri
Department of Mechanical and Aerospace Engineering
2009– present
- **Visiting Professor**
Koc University, Istanbul, Turkey
Department of Mechanical Engineering
2011-2012

- **Associate Professor**
Missouri University of Science and Technology, Rolla, Missouri
Department of Mechanical and Aerospace Engineering
2002 – 2009
- **Assistant Professor**
Florida International University, Miami, Florida
Department of Mechanical Engineering
1996 – 2001
- **Research Associate**
Yale University, New Haven, Connecticut
Department of Chemical Engineering
1995 – 1996
- **Research Fellow**
The University of Michigan, Ann Arbor, Michigan
Department of Aerospace Engineering
1992 – 1994
- **Research Assistant**
The University of Michigan, Ann Arbor, Michigan
Department of Aerospace Engineering
1990 – 1992
- **Teaching Assistant**
The University of Michigan, Ann Arbor, Michigan
Department of Aerospace Engineering
1989 – 1990

HONORS AND AWARDS

- School of Engineering Excellence in Teaching Award, 2004
- University Outstanding Teaching Award, 2003
- Silver Slide Rule Award for Teaching Excellence, Pi Tau Sigma, 2003, 2005
- National Science Foundation CAREER Award, 1999
- Graduate and Post-Graduate Fellowships, The University of Michigan, 1989, 1992
- Ph.D. Scholarship, Turkish Ministry of Education, 1987

RESEARCH BACKGROUND AND INTERESTS

As the Director of Energy Research Laboratory at Missouri S&T, I have the background and the expertise in the following interdisciplinary fields:

- Conventional Energy (combustion, IC engines, coal power plants, thermal/fluid transport)
- Alternative Energy (hydrogen technologies, PEM fuel cells, solid oxide fuel cells, bio-inspired fuel cells, alternative fuels, electric vehicles, clean coal technologies)
- Environmental Science & Technology (air pollutants, particulates, measurement techniques)
- Various Fields (synthesis of nanoparticles, laser diagnostics, fire safety, thermal engineering)

PUBLICATIONS

Refereed Archival Papers

The total number of citations received for the publications listed below is currently 5089 with an h-index of 35 (Source: Google Scholar). Also, one of the top 2 percent of the world's most-cited scientists published by Stanford University.

1. J. D. Heck, U. O. Koylu, and M. C. Leu, "Bio-inspired Flow Fields for Proton Exchange Membrane Fuel Cells: Identifying Opportunities and Demonstrating Application," *Applied Energy*, submitted (2022).
2. A. I. Jabbr, H. Gaja, and U. O. Koylu, "Multi-objective Optimization of Operating Parameters for a H₂/Diesel Dual-Fuel Compression-Ignition Engine," *International Journal of Hydrogen Energy* 45: 19965-19975 (2020).
3. J. D. Heck, W. S. Vaz, U. O. Koylu, and M. C. Leu, "Decoupling Pressure and Distribution Effects on the Performance of PEMFCs with Different Flow Fields", *Sustainable Energy Technologies and Assessments* 36: 100551 (2019).
4. A. I. Jabbr and U. O. Koylu, "Influence of Operating Parameters on Performance and Emissions for a Compression-Ignition Engine Fueled by Hydrogen/Diesel Mixtures," *International Journal of Hydrogen Energy* 44: 13964-13973 (2019).
5. J. D. Heck, W. S. Vaz, U. O. Koylu, and M. C. Leu, "Decoupling Pressure and Distribution Effects on the Performance of PEMFCs with Different Flow Fields", *Sustainable Energy Technologies and Assessments* 36: 100551 (2019).
6. Y. Karagoz, T. Sandalci, U. O. Koylu, A. S. Dalkilic, S. Wongwises, "Effect of the Use of Natural Gas-Diesel Fuel Mixture on Performance, Emissions and Combustion Characteristics of a Compression-Ignition Engine," *Advances in Mechanical Engineering* 8: 1-13 (2016).
7. W. S. Vaz, A. K. Nandi, and U. O. Koylu, "A Multi-Objective Approach to Find Optimal

- Electric Vehicle Accelerations: Simultaneous Minimization of Acceleration Duration and Energy Consumption,” *IEEE Transactions on Vehicular Technology* 65: 4633-4644 (2016).
8. B. P. Saripella, U. O. Koylu, and M. C. Leu, “Experimental and Computational Investigation of Performance and Water Management Characteristics of a Bio-inspired PEM Fuel Cell,” *ASME Journal of Fuel Cell Science and Technology* 12: 061007-1-061007-9 (2015).
 9. W. S. Vaz, A. K. Nandi, R. G. Landers, and U. O. Koylu, “Electric Vehicle Range Prediction for Constant Speed Trip Using Multi-Objective Optimization,” *Journal of Power Sources* 275: 435-446 (2015).
 10. N. Guo, M. C. Leu, and U. O. Koylu, “Optimization of Parallel and Serpentine Configurations for Polymer Electrolyte Membrane Fuel Cells,” *Fuel Cells* 14: 876-885 (2014). 1
 11. N. Guo, M. C. Leu, and U. O. Koylu, “Bio-inspired Flow Field Designs for Polymer Electrolyte Membrane Fuel Cells,” *International Journal of Hydrogen Energy* 39: 21185-21195 (2014).
 12. W. S. Vaz, R. G. Landers, and U. O. Koylu, “Neural Network Strategy for Driving Behavior and Driving Cycle Classification,” *International Journal of Electric and Hybrid Vehicles* 6: 255-275 (2014).
 13. N. Guo, M. C. Leu, and U. O. Koylu, “Network Based Optimization Model for Pin-Type Flow Field of Polymer Electrolyte Membrane Fuel Cell,” *International Journal of Hydrogen Energy* 38: 6750-6761 (2013).
 14. U. O. Koylu, S. F. Rodgers, and S. E. Grasman, “PEM Fuel Cell Basics and Computational Modeling,” *Hydrogen Energy and Vehicle Systems* (Edited by S. E. Grasman), CRC Press, pp. 45-77 (2012).
 15. S. K. Vudumu and U. O. Koylu, “Computational Modeling, Validation, and Utilization for Predicting the Performance, Combustion and Emissions Characteristics of Hydrogen IC Engines,” *Energy* 36: 647-655 (2011).
 16. I. D. Kellogg, U. O. Koylu, and F. Dogan, “Solid Oxide Fuel Cell Bi-layer Anode with Gadolinia-Doped Ceria for Utilization of Solid Carbon Fuel,” *Journal of Power Sources* 195: 7238-7242 (2010).
 17. S. F. Rodgers, S. K. Vudumu, U. O. Koylu, S. L. Murray, and S. E. Grasman, “Hydrogen Safety: A Focus on Power Generation Applications,” *Professional Safety* 55: 39-44 (2010).
 18. Y. Teng, U. O. Koylu, D. E. Hagen, and P. D. Whitefield, “Performance of the Mobility

- Sizing Technique Relative to Independent Diagnostics for the Characterization of Polydisperse Soot Aggregates,” *Combustion Science and Technology* 181: 1526-1548 (2009).
19. J. W. Sheffield and U. O. Koylu, “A Rural Hydrogen Transportation Test Bed,” *International Journal of Hydrogen Energy* 34: 6000-6004 (2009).
 20. I. D. Kellogg, U. O. Koylu, V. Petrovsky, and F. Dogan, “Effectiveness of Anode in a Solid Oxide Fuel Cell with Hydrogen/Oxygen Mixed Gases,” *International Journal of Hydrogen Energy* 34: 5138-5143 (2009).
 21. S. K. Vudumu and U. O. Koylu, “Detailed Simulations of the Transient Hydrogen Mixing, Leakage and Flammability in Air in Simple Geometries,” *International Journal of Hydrogen Energy* 34: 2824-2833 (2009).
 22. I. D. Kellogg, U. O. Koylu, and F. Dogan, “Performance of Single-Chamber Solid Oxide Fuel Cells,” *Assessment of Hydrogen Energy for Sustainable Development* (Edited by J. W. Sheffield), Springer, pp. 123-134 (2007).
 23. M. Chandler, Y. Teng, and U. O. Koylu, “Diesel Engine Particulate Emissions: A Comparison of Mobility and Microscopy Size Measurements,” *Proceedings of the Combustion Institute* 31: 2971-2979 (2007).
 24. I. D. Kellogg, F. Dogan, T. Suzuki, U. O. Koylu, H. U. Anderson, and V. Petrovsky, “Single-Chamber SOFC Operating with Hydrocarbon-Air and Hydrogen-Oxygen Gas Mixtures,” *Electrochemical Society Transactions* 7: 971-980 (2007).
 25. A. Neer and U. O. Koylu, “Effect of Operating Conditions on the Size, Morphology, and Concentration of Sub-micron Particulates Emitted from a Diesel Engine,” *Combustion and Flame* 146: 142-154 (2006).
 26. Y. Teng and U. O. Koylu, “Optical Sizing of Aggregated Particles: Computational Development of a Two-angle Laser Scattering Technique,” *Applied Optics* 45: 4396-4403 (2006).
 27. B. Yang, B. Hu, and U. O. Koylu, “Mean Soot Volume Fractions in Turbulent Hydrocarbon Flames: A Comparison of Sampling and Laser Measurements,” *Combustion Science and Technology* 177: 1603-1626 (2005).
 28. B. Yang and U. O. Koylu, “Detailed Soot Field in a Turbulent Non-premixed Ethylene/Air Flame from Laser Scattering and Extinction Experiments,” *Combustion and Flame* 141: 55-65 (2005).
 29. B. Yang and U. O. Koylu, “Soot Processes in a Strongly-Radiating Turbulent Acetylene Flame Using Laser Scattering/Extinction Experiments,” *Journal of Quantitative Spectroscopy and Radiative Transfer* 93: 289-299 (2005).

30. B. Hu and U. O. Koylu, "Size and Morphology of Soot Particles Sampled from a Turbulent Non-premixed Acetylene Flame," *Aerosol Science and Technology* 38: 1009-1018 (2004).
31. B. Hu, B. Yang, and U. O. Koylu, "Soot Measurements at the Axis of an Ethylene/Air Non-premixed Turbulent Jet Flame," *Combustion and Flame* 134: 93-106 (2003).
32. A. M. Brasil, T. L. Farias, M. G. Carvalho, and U. O. Koylu, "Numerical Characterization of the Morphology of Aggregated Particles," *Journal of Aerosol Science* 32: 489-508 (2001).
33. Y. Xing, U. O. Koylu, and D. E. Rosner, "In Situ Light-Scattering Measurements of Morphologically Evolving Flame-Synthesized Oxide Nanoaggregates," *Applied Optics* 38: 2686-2697 (1999).
34. T. L. Farias, M. G. Carvalho, and U. O. Koylu, "Radiative Heat Transfer in Soot-Containing Combustion Systems with Aggregation," *International Journal of Heat Mass Transfer* 41: 2581-2587 (1998).
35. Y. Xing, D. E. Rosner, U. O. Koylu, and P. Tandon, "Morphological Evolution of Nanoparticles in Diffusion Flames: Measurements and Modeling," *AIChE Journal* 43: 2641-2649 (1997).
36. U. O. Koylu, C. S. McEnally, D. E. Rosner, and L. D. Pfefferle, "Simultaneous Measurements of Soot Volume Fraction and Particle Size/Microstructure in Flames Using a Thermophoretic Sampling Technique," *Combustion and Flame* 110: 494-507 (1997).
37. C. S. McEnally, U. O. Koylu, L. D. Pfefferle, and D. E. Rosner, "Soot Volume Fraction and Temperature Measurements in Laminar Non-premixed Flames Using Thermocouples," *Combustion and Flame* 109: 701-720 (1997).
38. U. O. Koylu, "Quantitative Analysis of In Situ Optical Diagnostics for Inferring Particle/Aggregate Parameters in Flames: Implications for Soot Surface Growth and Total Emissivity," *Combustion and Flame* 109: 488-500 (1997).
39. T. L. Farias, U. O. Koylu, and M. G. Carvalho, "Range of Validity of the Rayleigh-Debye-Gans Theory for Optics of Fractal Aggregates," *Applied Optics* 35: 6560-6567 (1996).
40. Y. Xing, U. O. Koylu, and D.E. Rosner, "Synthesis and Restructuring of Inorganic Nanoparticles in Laminar Counterflow Diffusion Flames," *Combustion and Flame* 107:85-102 (1996).

41. G. M. Faeth and U. O. Koylu, "Structure and Optical Properties of Flame-Generated Soot," *Transport Phenomena in Combustion* (Edited by S. H. Chan), Taylor&Francis, New York, pp. 19-44 (1996).
42. A. V. Neimark, U. O. Koylu, and D. E. Rosner, "Extended Characterization of Combustion-Generated Aggregates: Self-Affinity and Lacunarities," *Journal of Colloid and Interface Science* 180: 590-597 (1996).
43. U. O. Koylu and G. M. Faeth, "Spectral Extinction Coefficients of Soot Aggregates from Turbulent Diffusion Flames," *ASME Journal of Heat Transfer* 118: 415-421 (1996).
44. T. L. Farias, U. O. Koylu, and M. G. Carvalho, "Effects of Polydispersity of Primary Particle and Aggregate Sizes on Radiative Properties of Simulated Soot," *Journal of Quantitative Spectroscopy and Radiative Transfer* 55: 357-371 (1996).
45. G. M. Faeth and U. O. Koylu, "Soot Morphology and Optical Properties in Non-premixed Turbulent Flame Environments," *Combustion Science and Technology* 108: 207-229 (1995).
46. T. L. Farias, M. G. Carvalho, U. O. Koylu, and G. M. Faeth, "Light Scattering from Soot Aggregates with Radially-Inhomogeneous Primary Particles," *International Journal of Heat Technology* 13: 27-42 (1995).
47. U. O. Koylu, Y. Xing, and D. E. Rosner, "Fractal Morphology Analysis of Combustion-Generated Aggregates Using Angular Light Scattering and Electron Microscope Images," *Langmuir* 11: 4848-4854 (1995).
48. T. L. Farias, M. G. Carvalho, U. O. Koylu, and G. M. Faeth, "Computational Evaluation of Approximate Rayleigh-Debye-Gans/Fractal Aggregate Theory for the Absorption and Scattering Properties of Soot," *ASME Journal of Heat Transfer* 117: 152-159 (1995).
49. U. O. Koylu, G. M. Faeth, T. L. Farias, and M. G. Carvalho, "Fractal and Projected Structure Properties of Soot Aggregates," *Combustion and Flame* 100: 621-633 (1995).
50. P. B. Sunderland, U. O. Koylu, and G. M. Faeth, "Soot Formation in Weakly-Buoyant Acetylene-Fueled Laminar Jet Diffusion Flames Burning in Air," *Combustion and Flame* 100: 310-322 (1995).
51. U. O. Koylu and G. M. Faeth, "Optical Properties of Soot in Buoyant Laminar Diffusion Flames," *ASME Journal of Heat Transfer* 116: 971-979 (1994).
52. U. O. Koylu and G. M. Faeth, "Optical Properties of Overfire Soot in Buoyant Turbulent Diffusion Flames at Long Residence Times," *ASME Journal of Heat Transfer* 116: 152-159 (1994).

53. U. O. Koylu and G. M. Faeth, "Radiative Properties of Flame-Generated Soot," *ASME Journal of Heat Transfer* 115: 409-417 (1993).
54. G. M. Faeth, P. B. Sunderland, U. O. Koylu, and D. L. Urban, "Laminar Jet Diffusion Flames in Microgravity: A Paradigm for Soot Processes in Turbulent Flames," *International Symposium on Aerospace and Fluid Sciences*, Sendai, Japan, pp. 185-198 (1993).
55. U. O. Koylu and G. M. Faeth, "Structure of Overfire Soot in Buoyant Turbulent Diffusion Flames at Long Residence Times," *Combustion and Flame* 89: 140-156 (1992).
56. U. O. Koylu and G. M. Faeth, "Carbon Monoxide and Soot Emissions from Liquid-Fueled Buoyant Turbulent Diffusion Flames," *Combustion and Flame* 87: 61-76 (1991).
57. U. O. Koylu, Y. R. Sivathanu, and G. M. Faeth, "Carbon Monoxide and Soot Emissions from Buoyant Turbulent Diffusion Flames," *Third International Symposium on Fire Safety Science*, Elsevier, London, pp. 625-634 (1991).

Conference Papers and Presentations

1. A. I. Jabbr and U. O. Koylu, "Effects of Hydrogen and EGR Variations on Performance and Emissions of a Dual-fuel Compression-Ignition Engine," *23rd World Hydrogen Energy Conference*, Istanbul, TURKEY, July 5-9, 2020.
2. H. Farhangi, D. Konur, Warren S. Vaz, U. O. Koylu, "A Realistic Driving Profile Optimization for Electric Vehicles," *Annual Conference of the Institute of Industrial Engineers*, Anaheim, CA, May 21-24, 2016.
3. H. A. Khairallah and U. O. Koylu "Advanced Simulations of Internal Combustion Engines Fueled by Hydrogen and Conventional Fuels," *International Conference on Energy Systems*, Istanbul, TURKEY, December 23-25, 2015.
4. H. A. Khairallah and U. O. Koylu, "Influence of Ignition Timing and EGR on the NO_x Emission and Performance of a SI Engine Fueled with Hydrogen," *ASME IMECE 2015*, Houston, TX, November 13-19, 2015.
5. H. A. Khairallah and U. O. Koylu, "A Computational Study of In-cylinder NO_x Reduction Strategies for a Compression-Ignition Engine Fueled with Diesel/Hydrogen Mixtures," *ASME Power & Energy 9th International Conference on Energy Sustainability*, San Diego, CA, June 28-July 2, 2015.
6. W. Vaz, A. K. Nandi, and U. O. Koylu, "Finding an Optimal Driving Strategy for an Electric Bus Based on Operational Data," *ASME Power & Energy 9th International Conference on Energy Sustainability*, San Diego, CA, June 28-July 2, 2015.

7. B. P. Saripella, U. O. Koylu, and M. C. Leu, "Comparisons of Performances and Liquid Water Distributions within Bio-inspired and Single Serpentine PEM Fuel Cell Channels," *ASME Power & Energy 13th Fuel Cell Science, Engineering, and Technology Conference*, San Diego, CA, June 28-July 2, 2015.
8. U. O. Koylu, "GM PACE Program at the Department of Mechanical and Aerospace Engineering at Missouri S&T," *GM PACE Global Forum*, Turin, ITALY, July 26-August 1, 2014.
9. H. A. Khairallah and U. O. Koylu, "Combustion Simulation of a Direct-Injection Diesel Engine with Hydrogen Fuel Using a 3D Computational Model with Multi-fuel Chemical Kinetics," *SAE World Congress & Exhibition*, Detroit, MI, April 8-10, 2014.
10. H. A. Khairallah and U. O. Koylu, "Combustion Simulation of Hydrogen-Fueled Diesel Engines Using Detailed Chemical Kinetics," *ASME IMECE*, San Diego, CA, November 15-21, 2013.
11. N. Guo, M. C. Leu, M. Muradoglu, and U. O. Koylu, "Bio-inspired Computational Design of Flow Fields for Polymer Electrolyte Membrane Fuel Cells," *NuRER 2012 – Third International Conference on Nuclear & Renewable Energy Resources*, Istanbul, TURKEY, May 20-23, 2012.
12. S. L. Puthran, U. O. Koylu, S. Hosder, and F. Dogan, "Three-Dimensional CFD Modeling of Tubular Solid Oxide Fuel Cells with Different Fuels," *ASME 5th International Conference on Energy Sustainability & 9th Fuel Cell Science, Engineering and Technology Conference*, Washington, DC, August 7-10, 2011.
13. S. K. Vudumu, U. O. Koylu, S. Hosder, and J. W. Sheffield, "High-Pressure Unsteady Hydrogen Leak from a Storage Cylinder in a Mobile Hydrogen Unit," *AIAA 40th Fluid Dynamics Conference*, Chicago, IL, June 28-July 1, 2010.
14. S. F. Rodgers, U. O. Koylu, and S. E. Grasman, "Validation of Software for Simulating PEM Fuel Cells," *2009 Fuel Cell Seminar & Exposition*, Palm Springs, CA, November 16-19, 2009.
15. S. K. Vudumu and U. O. Koylu, "A Computational Study on the Performance, Combustion, and Emission Characteristics of a Hydrogen-Fueled Internal Combustion Engine," *ASME IMECE*, Lake Buena Vista, FL, November 13-19, 2009.
16. S. K. Vudumu and U. O. Koylu, "Development and Integration of Engine Simulation Software GT-POWER into the Mechanical Engineering Curriculum at Missouri S&T," *ASME IMECE*, Lake Buena Vista, FL, November 13-19, 2009.
17. E. A. Anculle Arauco, J. W. Sheffield, U. O. Koylu, A. L. Meintz, and K. B. Martin, "Fault Tree Analysis of Hydrogen Fuel Cell Plug-in Hybrid Electric Vehicle Powertrain,"

HYSYDAYS – 3rd World Congress of Young Scientists on Hydrogen Energy Systems, Turin, ITALY, October 7-9, 2009.

18. I. D. Kellogg, U. O. Koylu, and F. Dogan, "Removal of Carbon Deposition with Simultaneous Power Generation in SOFC," *ASME 7th International Fuel Cell Science, Engineering and Technology Conference*, Newport Beach, CA, June 8-10, 2009.
19. J. A. Drallmeier, U. O. Koylu, and J. Sarangapani, "Implementation of Advanced Fuels and Combustion for Internal Combustion Engines," *University of Missouri Energy Summit*, Columbia, MO, April 22-23, 2009.
20. U. O. Koylu, S. K. Vudumu, and J. W. Sheffield, "Hydrogen Safety in Accidental Release Scenarios," *University of Missouri Energy Summit*, Columbia, MO, April 22-23, 2009.
21. S. E. Grasman, F. Dogan, U. O. Koylu; S. Lee, J. W. Sheffield, "Fuel Cell Policy Recommendations," *University of Missouri Energy Summit*, Columbia, MO, April 22-23, 2009.
22. S. K. Vudumu and U. O. Koylu, "CFD Modeling of Hydrogen Dispersion and Flammability in Air in Simple Enclosures," *32nd International Symposium on Combustion*, Montreal, CANADA, August 3-8, 2008.
23. S. K. Vudumu, U. O. Koylu, and J. A. Drallmeier, "GT-POWER for the Simulations of IC Engines in Combustion Courses at Missouri S&T," *2008 PACE Global Annual Forum*, Detroit, MI, July 28-August 2, 2008.
24. J. W. Sheffield, F. Dogan, S. Grasman, U. O. Koylu, S. Lee, A. B. Rolufs, S. Tupper, and Y. Xing, "Show Me the Road to Hydrogen," *National University Transportation Center Conference*, Rolla, MO, April 15, 2008.
25. S. K. Vudumu and U. O. Koylu, "Hydrogen Dispersion and Flammability Limits in Simple Enclosures for Developing Safety Codes and Standards," *19th NHA Annual Hydrogen Conference*, Sacramento, CA, March 30-April 3, 2008.
26. U. O. Koylu, A. B. Rolufs, and J. W. Sheffield, "Show Me the Road to Hydrogen," *6th Fort Carson Community Sustainability Conference & Exposition*, Colorado Springs, CO, October 30-31, 2007.
27. I. D. Kellogg, U. O. Koylu, V. Petrovsky, and F. Dogan, "Thermodynamic Modeling and Testing of the H₂/O₂/Ni/NiO System," *Material Science and Technology Conference & Exhibition*, Detroit, MI, September 16-20, 2007.
28. J. W. Sheffield and U. O. Koylu, "A Rural Hydrogen Transportation Test Bed," *2nd International Conference on Hydrogen Safety*, San Sebastian, SPAIN, September 11-13, 2007.

29. Y. Teng, U. O. Koylu, and F. Dogan, "Comparison of Light Scattering and Mobility Sizing Techniques for Characterization of Aggregated Particles," *5th International Symposium on Radiative Transfer/10th Electromagnetic and Light Scattering Conference*, Bodrum, TURKEY, June 17-22, 2007.
30. I. D. Kellogg, F. Dogan, T. Suzuki, U. O. Koylu, H. U. Anderson, and V. Petrovsky, "Single-Chamber SOFC Operating with Hydrocarbon-Air and Hydrogen-Oxygen Gas Mixtures," *10th International Symposium on Solid Oxide Fuel Cell*, Nara, JAPAN, June 3-8, 2007.
31. M. F. Chandler, U. O. Koylu, J. A. Drallmeier, F. S. Miller, "Comparisons of Sub-micron Particulate Structures Emitted from a Diesel Engine, a Gasoline Engine and a Power Plant," *5th U.S. Combustion Meeting*, San Diego, CA, March 25-28, 2007.
32. Y. Teng and U. O. Koylu, "Performance of a Differential Mobility Analyzer for the Size Classification of Aggregated Soot Particles from a Laboratory Flame," *5th U.S. Combustion Meeting*, San Diego, CA, March 25-28, 2007.
33. I. D. Kellogg, V. Petrovsky, U. O. Koylu, and Fatih Dogan, "Performance of Single-Chamber SOFC Using Hydrogen/Air Mixed-Gas Fuels," *Materials Science & Technology Conference and Exhibition*, Cincinnati, OH, October 15-19, 2006.
34. M. F. Chandler, U. O. Koylu, J. A. Drallmeier, and F. S. Miller, "Investigation of Particulate Emissions from Two IC Engines and a Utility Power Plant Using Direct Sampling and Electron Microscopy," *7th International Aerosol Conference*, St. Paul, MN, September 10-15, 2006.
35. Y. Teng and U. O. Koylu, "Experimental Evaluation of Mobility, Microscopy and Optical Techniques for the Characterization of Flame Particulates," *7th International Aerosol Conference*, St. Paul, MN, September 10-15, 2006.
36. M. Chandler, Y. Teng, and U. O. Koylu, "Diesel Engine Particulate Emissions: A Comparison of Mobility and Microscopy Size Measurements," *31st International Symposium on Combustion*, Heidelberg, GERMANY, August 6-11, 2006.
37. B. Yang and U. O. Koylu, "Comparison of Soot Processes inside Turbulent Acetylene Flames under Atmospheric-Pressure Conditions," *Society of Automotive Engineers Paper No. 2005-06P-627*, Detroit, MI, April 3-6, 2006.
38. U. O. Koylu, "Clean Energy Research at the University of Missouri-Rolla," *TUBITAK-TASSA Workshop on Research Collaboration between Turkey and USA*, Gebze, TURKEY, November 21-23, 2005.
39. M. F. Chandler and U. O. Koylu, "Size and Morphology of Particulates Emitted from a Spark-Ignition Engine," *AAAR Annual Conference*, Austin, TX, October 17-21, 2005.

40. F. Dogan, T. Suzuki, H. U. Anderson, I. D. Kellogg, and U. O. Koylu, "Recent Developments on Single-Chamber Solid Oxide Fuel Cells," *International Hydrogen Energy Congress & Exhibition*, Istanbul, Turkey, July 13-15, 2005.
41. U. O. Koylu, "Soot Formation within Turbulent Jet Diffusion Flames," *Workshop on Heat Transfer in Pool Fires*, Combustion Research Facility, Sandia National Labs, Livermore, CA, April 12-13, 2005.
42. A. Neer and U. O. Koylu, "Comprehensive Measurements of Sub-micron Particulate Emissions from a Diesel Engine," *4th Joint Meeting the U.S. Sections of the Combustion Institute*, Philadelphia, PA, March 20-23, 2005.
43. Y. Teng and U. O. Koylu, "Comparisons of Independent Particulate Sizing Methods in Laminar Flames," *4th Joint Meeting the U.S. Sections of the Combustion Institute*, Philadelphia, PA, March 20-23, 2005.
44. Y. Teng, M. F. Chandler, U. O. Koylu, D. E. Hagen, and P. D. Whitefield, "Comparison of Particulate Measurement Methods in Laboratory Flames," *AAAR Annual Conference*, Atlanta, GA, October 4-8, 2004.
45. A. Neer and U. O. Koylu, "Comprehensive Characterization of Particulates Sampled from the Exhausts of Internal Combustion Engines," *AAAR Annual Conference*, Atlanta, GA, October 4-8, 2004.
46. B. Yang and U. O. Koylu, "Experimental Investigation of Soot Formation in Turbulent Hydrocarbon Flames," *30th International Symposium on Combustion*, Chicago, IL, July 25-30, 2004.
47. B. Yang and U. O. Koylu, "Soot Processes in a Strongly-Radiating Turbulent Acetylene Flame Using Laser Scattering/Extinction Experiments," *4th International Symposium on Radiative Transfer*, Istanbul, TURKEY, June 20-25, 2004.
48. B. Yang and U. O. Koylu, "Soot Processes in a Turbulent Non-premixed Acetylene/Air Flame from Qualitative Optical Characterizations," *Proceedings of the Spring Technical Meeting of the Western States Section of the Combustion Institute*, University of California, Davis, CA, March 29-30, 2004.
49. B. Yang, B. Hu, and U. O. Koylu, "Soot Volume Fraction Measurements in Turbulent Non-premixed Flames: A Comparison of In-situ Laser and Ex-situ Sampling Experiments," *Proceedings of the Fall Technical Meeting, Eastern States Section of the Combustion Institute*, University Park, PA, October 26-29, 2003.
50. Y. Teng, K. Yu, and U. O. Koylu, "A Computational and Experimental Study on the Optical Sizing of Combustion Particulates Using Two-angle Laser Scattering Measurements," *22nd Annual AAAR Conference*, Anaheim, CA, October 20-24, 2003.

51. K. Yu, Y. Teng, and U. O. Koylu, "Computations and Experiments on Aggregated Soot Particles in Flames," *Proceedings of the Third Joint Meeting of the U.S. Sections of the Combustion Institute*, Chicago, IL, March 16-19, 2003.
52. B. Yang and U. O. Koylu, "Detailed Soot Field in an Ethylene/Air Non-premixed Turbulent Jet Flame from Laser Scattering and Extinction Experiments," *Proceedings of the Third Joint Meeting of the U.S. Sections of the Combustion Institute*, Chicago, IL, March 16-19, 2003.
53. B. Hu and U. O. Koylu, "Thermophoretic Deposition for the Characterization of Soot Particles in a Non-premixed Turbulent Flame Burning C_2H_2/Air ," *Proceedings of the Third Joint Meeting of the U.S. Sections of the Combustion Institute*, Chicago, IL, March 16-19, 2003.
54. B. Yang and U. O. Koylu, "An Experimental Investigation of Soot Formation During Non-premixed Turbulent Combustion of Hydrocarbon Fuels," *ASME International Mechanical Engineering Conference and Exposition*, New Orleans, LA, November 17-22, 2002.
55. K. Yu, Y. Teng, and U. O. Koylu, "Characterization of Aggregated Nanoparticles in Flames Using Dissymmetry Ratio and Cross-Polarized Light Scattering," *21st Annual AAAR Conference*, Charlotte, NC, October 7-11, 2002.
56. B. Hu and U. O. Koylu, "Soot Properties within Turbulent Non-premixed Ethylene and Acetylene/Air Flames from Thermophoretic Sampling Measurements," *21st Annual AAAR Conference*, Charlotte, NC, October 7-11, 2002.
57. B. Yang, B. Hu, K. Yu, and U. O. Koylu, "Soot Measurements at the Centerline of an Ethylene/Air Non-premixed Turbulent Jet Flame," *Proceedings of the Spring Technical Meeting of the Central States Section of the Combustion Institute*, Knoxville, TN, April 7-9, 2002.
58. U. O. Koylu and H. S. Sapmaz, "Optical Experiments in Luminous Flames and Implications on Soot Refractive Index," *The Third International Symposium on Radiative Transfer*, Antalya, TURKEY, June 17-21, 2001.
59. H. S. Sapmaz and U. O. Koylu, "Soot Particle Sizing in Flames Using a Two-Angle Scattering Technique," *Proceedings of the Second Joint Meeting of the U.S. Sections of the Combustion Institute*, Oakland, CA, March 15-18, 2001.
60. H. S. Sapmaz and U. O. Koylu, "Experimental Study of Soot by Means of Extraction and Angular Scattering Measurements in a Laminar Non-premixed Flame," *Twenty-Eighth Symposium (International) on Combustion*, Edinburgh, SCOTLAND, August 6-8, 2000.
61. U. O. Koylu, "A Simple Two-Angle Laser-Scattering Technique for Characterization of

- Soot in Flames,” *Fall Technical Meeting, Eastern States Section of the Combustion Institute*, Raleigh, NC, October 1999.
62. U. O. Koylu, Y. Xing, and D. E. Rosner, “Light-Scattering Measurements of Morphologically Evolving Flame-Synthesized Oxide Aggregates,” *Fall Technical Meeting, Eastern States Section of the Combustion Institute*, Raleigh, NC, October 1999.
 63. U. O. Koylu, “Determination of Soot Spherule Diameter, Aggregate Size, and Number Density from Two-Angle Scattering Experiments,” *International Mediterranean Combustion Symposium*, Antalya, TURKEY, June 1999.
 64. U. O. Koylu, “A Simplified Approach to the Light-Scattering Characterization of Agglomerate Dynamics in Flames,” *AIChE Annual Meeting*, Miami, FL, November 1998.
 65. A. M. Brasil, T. L. Farias, U. O. Koylu, and M. G. Carvalho, “A Recipe for Image Characterization of Fractal-like Aggregates,” *Fifth International Aerosol Conference*, Edinburgh, SCOTLAND, September 1998.
 66. U. O. Koylu, T. L. Farias, and M. G. Carvalho, “An Inverse Method for In-Situ Characterization of Combustion-Generated Aggregates Based on Light Scattering Measurements,” *Fifth International Congress on Optical Particle Sizing*, Minneapolis, MN, August 1998.
 67. D. E. Rosner, U. O. Koylu, T. L. Farias, and P. Tandon, “Recent Studies of the Morphology and Transport Properties of Combustion-Generated Particles,” *Third Particle Technology Forum*, Brighton, UK, July 1998.
 68. U. O. Koylu, and T. L. Farias, “The Effect of Partial Overlapping of Primary Particles on the Fractal Morphology of Simulated Aggregates,” *17th Annual AAAR Meeting*, Cincinnati, OH, June 1998.
 69. Y. Xing, D. E. Rosner, U. O. Koylu, P. Tandon, and D. S. Vaidya, “Measuring/Modeling the Morphological Evolution and Transport of Oxide Nano-Particles in Laminar Flames,” *AIChE Annual Meeting*, Los Angeles, CA, November 1997.
 70. Y. Xing, U. O. Koylu, and D. E. Rosner, “Light Scattering Measurements of Inorganic Aerosol Restructuring in Flames,” *16th Annual AAAR Meeting*, Denver, CO, October 1997.
 71. U. O. Koylu, C. S. McEnally, D. E. Rosner, and L. D. Pfefferle, “Thermophoretic Deposition Techniques for Measuring Soot Volume Fraction in Non-premixed Flames,” *Fourth International Conference on Technologies and Combustion for a Clean Environment*, Lisbon, PORTUGAL, July 1997.
 72. U. O. Koylu, “Quantitative Interpretation of Laser Scattering/Extinction Measurements in

- Soot-Laden Flames,” *Fall Technical Meeting, Eastern States Section of the Combustion Institute*, Hilton Head, SC, December 1996.
73. U. O. Koylu, C. S. McEnally, D. E. Rosner, and L. D. Pfefferle, “Soot Diagnostics Based on Thermophoretic Particle Deposition,” *Fall Technical Meeting, Eastern States Section of the Combustion Institute*, Hilton Head, SC, December 1996.
 74. D. E. Rosner, P. Tandon, and U. O. Koylu, “Heat Transfer Properties of Large Multi-Particle Aggregates; Pseudo-Continuum Estimation/Correlation of Orientation-Averaged Nusselt Number,” *AIChE Annual Meeting*, Chicago, IL, November 1996.
 75. U. O. Koylu, “Qualitative Analysis of Laser Diagnostics for Inferring Particle/Aggregate Parameters in Flames,” *15th Annual AAAR Meeting*, Orlando, FL, October 1996.
 76. C. S. McEnally, U. O. Koylu, L. D. Pfefferle, and D. E. Rosner, “Soot Volume Fraction and Temperature Measurements in Laminar Non-premixed Flames Using Thermocouples,” *15th Annual AAAR Meeting*, Orlando, FL, October 1996.
 77. T. L. Farias, M. G. Carvalho, U. O. Koylu, and D. E. Rosner, “Light Scattering Analysis of Inorganic Oxide Aggregates Undergoing Restructuring in Flames,” *15th Annual AAAR Meeting*, Orlando, FL, October 1996.
 78. U. O. Koylu, T. L. Farias, M. G. Carvalho, and D. E. Rosner, “Soot Radiative Transfer in Combustion Systems—Effects of Particle Aggregation,” *Work-in-Progress Session at the Twenty-Sixth Symposium (International) on Combustion*, Naples, ITALY, July 1996.
 79. C. S. McEnally, U. O. Koylu, L. D. Pfefferle, and D. E. Rosner, “Simultaneous Measurements of Soot Volume Fraction and Temperature in Non-premixed Flames Using Thermocouples,” *Work-in-Progress Session at the Twenty-Sixth Symposium (International) on Combustion*, Naples, ITALY, July 1996.
 80. Y. Xing, U. O. Koylu, P. Tandon, and D. E. Rosner, “Measuring and Modeling the Synthesis and Morphology Evolution of Particles in Counterflow Diffusion Flames,” *Fifth World Congress of Chemical Engineering*, San Diego, CA, July 1996.
 81. T. L. Farias, M. G. Carvalho, U. O. Koylu, and G. M. Faeth, “Computational and Experimental Study of the Structure of Soot Aggregates,” *Joint Meeting of the Portuguese, British, Spanish and Swedish Sections of the Combustion Institute*, Madeira, PORTUGAL, April 1996.
 82. A. V. Neimark, U. O. Koylu, and D. E. Rosner, “Self-Affinity of Combustion-Generated Aggregates,” *Fall Meeting of the Material Research Society*, Boston, MA, November 1995.
 83. U. O. Koylu, P. Tandon, Y. Xing, and D. E. Rosner, “Experimental and Theoretical Studies of the Structure of Inorganic Particle-Producing Seeded Laminar Counterflow

- Diffusion Flames,” *AICHE Annual Meeting*, Miami, FL, November 1995.
84. U. O. Koylu, A. V. Neimark, and D. E. Rosner, “Extended Characterization Methods for Fractal Aggregates: Lacunarities and Self-Affinity,” *AICHE Annual Meeting*, Miami, FL, November 1995.
 85. Y. Xing, U. O. Koylu, and D. E. Rosner, “Synthesis and Morphology Evolution of Al₂O₃ Particles in Laminar Counterflow Diffusion Flames,” *Fall Technical Meeting, Eastern States Section of the Combustion Institute*, Worcester, MA, October 1995.
 86. T. L. Farias, U. O. Koylu, and M. G. Carvalho, “A Computational Study of the Radiative Properties of Polydisperse Soot Populations,” *Fall Technical Meeting, Eastern States Section of the Combustion Institute*, Worcester, MA, October 1995.
 87. U. O. Koylu and G. M. Faeth, “Spectral Extinction Coefficients of Soot Aggregates from Turbulent Diffusion Flames,” *Fall Technical Meeting, Eastern States Section of the Combustion Institute*, Worcester, MA, October 1995.
 88. U. O. Koylu, Y. Xing, and D. E. Rosner, “Fractal Morphology Analysis of Combustion-Generated Aggregates Using Angular Light Scattering and Electron Microscope Images,” *Fall Technical Meeting, Eastern States Section of the Combustion Institute*, Worcester, MA, October 1995.
 89. Y. Xing, U. O. Koylu, and D. E. Rosner, “Formation and Restructuring of Al₂O₃ Particles in Laminar Counterflow Diffusion Flames,” *14th Annual AAAR Meeting*, Pittsburgh, PA, October 1995.
 90. U. O. Koylu, “On the Fractal Morphology of Combustion-Generated Soot Aggregates,” *14th Annual AAAR Meeting*, Pittsburgh, PA, October 1995.
 91. T. L. Farias, M. G. Carvalho, U. O. Koylu, and G. M. Faeth, “The Range of Validity of the Rayleigh-Debye-Gans/Fractal Aggregate Theory for Computing the Optical Properties of Soot,” *International Conference on Heat and Mass Transfer*, Kusadasi, TURKEY, August 1995.
 92. T. L. Farias, M. G. Carvalho, U. O. Koylu, and G. M. Faeth, “Scattering Properties of Polydisperse Soot Aggregates,” *Proceedings of the 37th Eurotherm Seminar on Heat Transfer in Radiating and Combusting Systems-2*, Saluggia, ITALY, (1994).
 93. U. O. Koylu, G. M. Faeth, T. L. Farias, and M. G. Carvalho, “Computational Evaluation of an Approximate Theory for the Optical Properties of Soot,” *Annual Conference on Fire Research*, NIST, Gaithersburg, MD, November 1994.
 94. P. B. Sunderland, U. O. Koylu, and G. M. Faeth, “Soot Formation in Hydrocarbon-Fueled Laminar Jet Diffusion Flames Burning in Air,” *Work-in-Progress Session at the Twenty-Fifth Symposium (International) on Combustion*, Irvine, CA, August 1994.

95. P. B. Sunderland, U. O. Koylu, and G. M. Faeth, "Soot Formation in Weakly-Buoyant Acetylene-Fueled Laminar Jet Diffusion Flames Burning in Air," *Twenty-Fifth Symposium (International) on Combustion*, Irvine, CA, August 1994.
96. T. L. Farias, M. G. Carvalho, U. O. Koylu, and G. M. Faeth, "Computational Evaluation of Approximate Rayleigh-Debye-Gans/Fractal Aggregate Theory for the Absorption and Scattering Properties of Soot," *6th AIAA/ASME Thermophysics and Heat Transfer Conference*, Colorado Springs, CO, April 1994.
97. P. B. Sunderland, U. O. Koylu, and G. M. Faeth, "Soot Formation in Acetylene-Fueled Laminar Jet Diffusion Flames Burning in Air," *Spring Technical Meeting, Central States Section of the Combustion Institute*, Pittsburgh, PA, March 1994.
98. U. O. Koylu, P. B. Sunderland, S. Mortazavi, and G. M. Faeth, "Soot Nucleation and Growth in Weakly-Buoyant Laminar Jet Diffusion Flames," *AIAA 32nd Aerospace Sciences Meeting and Exhibit*, Reno, NV, Paper No. 94-0428, Reno, NV, January 1994.
99. T. L. Farias, M. G. Carvalho, U. O. Koylu, and G. M. Faeth, "A Computational Study of the Absorption and Scattering Properties of Soot," *Fall Technical Meeting, Eastern States Section of the Combustion Institute*, Pittsburgh, PA, October 1993.
100. U. O. Koylu and G. M. Faeth, "Optical Properties of Soot in Diffusion Flames," *Annual Conference on Fire Research*, NIST, Gaithersburg, MD, October 1993.
101. U. O. Koylu and G. M. Faeth, "Optical Properties of Soot in Buoyant Laminar Diffusion Flames," *Proceedings of 29th National Heat Transfer Conference on Heat Transfer in Fire and Combustion Systems*, Atlanta, GA, August 1993.
102. G. M. Faeth and U. O. Koylu, "Soot Morphology and Optical Properties in Nonpremixed Turbulent Flame Environments," *Second International Conference on Combustion Technologies for a Clean Environment*, Lisbon, PORTUGAL, July 1993.
103. U. O. Koylu and G. M. Faeth, "Soot Scattering Properties at Fuel-Rich Conditions in Buoyant Laminar Diffusion Flames," *Spring Technical Meeting, Central and Eastern States Section of the Combustion Institute*, New Orleans, LA, March 1993.
104. U. O. Koylu and G. M. Faeth, "Carbon Monoxide Emissions and Soot Properties in Buoyant Diffusion Flames," *Second Workshop on Developing a Predictive Capability for CO Formation in Fires*, NIST, Gaithersburg, MD, March 1993.
105. S. Mortazavi, P. B. Sunderland, J. Jurng, U. O. Koylu, and G. M. Faeth, "Structure of Soot-Containing Laminar Jet Diffusion Flames," *AIAA 31st Aerospace Sciences Meeting and Exhibit*, Reno, NV, Paper No. 93-0708, Reno, NV, January 1993.
106. U. O. Koylu and G. M. Faeth, "Structure and Optical Properties of Overfire Soot in

Buoyant Turbulent Diffusion Flames,” *Annual Conference on Fire Research*, National Institute of Science and Technology, Gaithersburg, MD, October 1992.

107. U. O. Koylu and G. M. Faeth, “Radiative Properties of Flame-Generated Soot,” *Proceedings of the 28th National Heat Transfer Conference on Heat Transfer in Fire and Combustion Systems*, San Diego, CA (1992).
108. U. O. Koylu and G. M. Faeth, “Properties of Soot Emissions from Buoyant Turbulent Diffusion Flames at Long Residence Times,” *Spring Technical Meeting, Central States Section of the Combustion Institute*, Columbus, OH, April 1992.
109. U. O. Koylu and G. M. Faeth, “Emissions of Soot and Carbon Monoxide from Liquid-Fueled Buoyant Turbulent Diffusion Flames,” *Fall Technical Meeting, Eastern States Section of the Combustion Institute*, Ithaca, NY, October 1991.
110. U. O. Koylu and G. M. Faeth, “Properties of CO and Soot Emissions from Buoyant Turbulent Diffusion Flames,” *Annual Conference on Fire Research*, National Institute of Science and Technology, Gaithersburg, MD, April 1991.

INVITED TALKS AND SEMINARS

1. “Advanced Simulations of Internal Combustion Engines Fueled by Hydrogen and Conventional Fuels,” *Invited Plenary Speaker*, International Conference on Energy Systems, Istanbul, Turkey, December 24, 2015.
2. “Search for Cleaner Energy in Combustion Systems, Hydrogen Technologies and Fuel Cells,” *Invited Seminar, Istanbul Technical University*, Istanbul, Turkey, May 9, 2012.
3. “Cleaner Energy for Conventional and Alternative Power Technologies,” *Invited Seminar, Ozyegin University*, Istanbul, Turkey, March 21, 2012.
4. “Search for Cleaner Energy in Traditional Combustion, Alternative Fuels, and Fuel Cells,” *Invited Seminar, Koc University*, Istanbul, Turkey, November 30, 2011.
5. “Conventional and Sustainable Energy Systems,” *Invited Physics Colloquium, Truman State University*, Kirksville, MO, May 8, 2011.
6. “EcoCAR,” *Missouri S&T Transfer Conference*, Rolla, MO, October 8, 2009.
7. “Missouri’s First Hydrogen-Powered Transit Project,” *Missouri Alternative Fuel Commission*, Jefferson City, MO, April 10, 2008.
8. “Hydrogen Safety Training Material,” *Hydrogen Executive Leadership Panel*, Fall 2007 Meeting, Arlington, VA, November 7, 2007.

9. "Research on Energy and Environment," *Global Research Invited Lecture, University of Missouri–Rolla*, Rolla, MO, September 20, 2007.
10. "Energy-Related Research Projects," *Pi Tau Sigma Invited Lecture, University of Missouri–Rolla*, Rolla, MO, March 6, 2007.
11. "Clean Energy Research at the University of Missouri-Rolla," *TUBITAK-TASSA Workshop on Research Collaboration between Turkey and USA*, Gebze, TURKEY, November 22, 2005.
12. "Particulate Pollutant Formation in Turbulent Flames and Diesel Engines", *Invited Chemical and Biological Engineering Seminar, University of Missouri–Rolla*, Rolla, MO, March 8, 2005.
13. "Soot Formation in Turbulent Non-premixed Hydrocarbon-Fueled Flames" *Invited Mechanical Engineering Seminar, University of Kentucky*, Lexington, TN, November 6, 2003.
- 13-16. "Control of Combustion-Generated Particles Using Laser Diagnostics," *Mechanical Engineering Seminars, University of Florida*, Gainesville, FL, September 1999; *University of Missouri*, Rolla, MO, March 2000; *Rutgers*, Piscataway, NJ, March 2000; *University of Arizona*, Tucson, AZ, April 2000.
17. "Combustion-Generated Nanoparticles: Implications on Material Synthesis, Laser Diagnostics, Heat Transfer, and Pollution," *Aerospace Engineering Seminar, Georgia Institute of Technology*, Atlanta, GA, July 1999.
18. "Experimental Investigations of Morphologically Evolving Flame-Synthesized Nanoparticles," *Mechanical and Aerospace Engineering Seminar, Rensselaer Polytechnic Institute*, Troy, NY, April 1999.
19. "Recent Experimental Studies of Combustion-Generated Nano-Particles," *Fire Safety Seminar, National Institute of Standards and Technology*, Gaithersburg, MD, October 1997.
20. "Laser Diagnostics of Particulates in Flames: Implications for Soot Growth and Emissivity," *Mechanical Engineering Seminar, University of Connecticut*, CT, February 1996.
21. "Light Scattering and Extinction Measurements for Investigating the Formation and Radiation Characteristics of Particulates in Flames," *Consultation Program Sponsored by AGARD/NATO, Institute Superior Tecnico*, Lisbon, PORTUGAL, August 1995.

RESEARCH FUNDING

1. "I-Corps: Bio-Inspired Flow Field Designs for Polymer Electrolyte Membrane (PEM) Fuel Cells," *National Science Foundation*, 07/15-12/15, \$50,000.
2. "Bio-inspired Design, Fabrication and Testing of Bipolar Plates for PEM Fuel Cells," *National Science Foundation*, 08/11-07/16, \$337,061.
3. "Research Experiences for Undergraduates: Bio-inspired Design, Fabrication and Testing of Bipolar Plates for PEM Fuel Cells," *National Science Foundation*, 05/13-08/13 and 5/14-08/14, \$20,000.
4. "Computational Modeling and Optimization of Flow Fields for Bio-inspired Polymer Electrolyte Membrane Fuel Cells," *Tubitak (Turkish National Science Foundation)*, 12/11-07/12, \$8,000.
5. "Computer-Aided Engineering of Solid Oxide Fuel Cells for Stationary, Transportation and Portable Applications," *Energy Research and Development Center*, 08/10-07/11, \$20,000.
6. "Advanced Military Installations that Integrate Renewable Energy and Advanced Energy Storage Technologies," *Air Force Research Laboratory*, 07/09-07/12, \$3,450,000.
7. "Hydrogen Fuel Cell Analysis: Lessons Learned from Stationary Power Generation," *Department of Energy*, 10/07-04/10, \$387,000.
8. "Development of Teaching Material to Integrate GT-POWER into Combustion Courses for IC Engine Simulations," *General Motors PACE Program*, 08/07-12/08, \$27,552.
9. "Simulation of IC Engine Burning Alternative Fuels," *Department of Transportation*, 05/07-12/08, \$13,776.
10. "Transportation Fuel Research and Development Phase II", *Department of Transportation*, 06/07-12/09, \$250,000.
11. "Hydrogen Infrastructure Technologies," *Air Force Research Laboratory*, 10/06-04/10, \$1,940,000
12. "UTC/Transportation Fuel Research Development," *Department of Transportation*, 05/06-12/07, \$27,232.
13. "Characterization of Engine Particulate Emissions," *University of Missouri Research Board*, 09/05-09/06, \$28,600.
14. "The University of Missouri Center of Excellence for Aerospace Particulate Emissions Reduction Research," *NASA Glenn Research Center*, 07/03-12/07, \$2,664,301.

15. “Laser Diagnostics of Flame-Synthesized Nanoparticles,” *University of Missouri Research Board*, 08/01-08/02, \$29,012.
16. “CAREER Award - Formation and Evolution of Soot Particles during Turbulent Non-premixed Combustion,” *National Science Foundation*, 04/99-04/05, \$210,000.
17. “Research Experiences for Undergraduates,” *National Science Foundation*, 06/99-06/00, \$10,000.
18. “Soot Properties in Steady and Unsteady Nonpremixed Counter-flow Flames,” *National Science Foundation*, 09/97-09/01, \$135,000.
19. “Particle Diagnostics in Combustion Systems,” *NATO Advisory Group for Aerospace Research and Development*, 07/97, \$2,026.
20. “Energy-Related Laboratory Equipment: Acquisition of a Gas Chromatograph,” *Department of Energy*, 05/97, \$29,656.

GRADUATE STUDENT THESIS ADVISING

1. Abdulhakim I. Jabbr, “Combustion and Emission Characteristics of IC Engines Fueled by Hydrogen and Hydrogen/Diesel Mixtures and Multi-objective Optimization of Operating Parameters,” Ph.D. Thesis, Missouri University of Science and Technology, April 2020.
2. Suleyman Kose, “Computational Investigation of Polymer Electrolyte Membrane Fuel Cell with Nature-Inspired Fibonacci Spiral Flow Field, M.S. Thesis, Missouri University of Science and Technology, April 2018.
3. Joshua D. Heck, “Bio-inspired Flow Fields for PEM Fuel Cells-Decoupling Pressure and Distribution Effects on Performance and Identifying Design Opportunities,” M.S. Thesis, Missouri University of Science and Technology, April 2017.
4. Hassan A. Khairallah, “Combustion and Pollutant Characteristics of IC Engines Fueled with Hydrogen and Diesel/Hydrogen Mixtures Using 3D Computations with Detailed Chemical Kinetics,” Ph.D. Thesis, Missouri University of Science and Technology, July 2015.
5. Warren S. Vaz, “Energy Management in Electric Vehicles: Development and Validation of an Optimal Driving Strategy,” Ph.D. Thesis, Missouri University of Science and Technology, April 2015.
6. Bhaskar P. Saripella, “Experimental and Computational Evaluation of Water Management and Performance of a Bio-inspired PEM Fuel Cell in Comparison to a

- Conventional Flow Field,” M.S. Thesis, Missouri University of Science and Technology, December 2014.
7. Brian L. Catron, “Analysis and Implementation of PM Sampling Methodology Protocols to Aid in the Development of an ARP (Aerospace Recommended Practice) for Aircraft Non-volatile PM Measurements,” M.S. Thesis, Missouri University of Science and Technology, July 2014.
 8. Nannan Guo, “Bio-inspired Design, Fabrication and Testing of Bipolar Plates for PEM Fuel Cells,” Ph.D. Thesis, Missouri University of Science and Technology, July 2013.
 9. Nicholas W. Freer, “Water Management Capabilities of Bio-inspired Flow Field Configurations for Polymer Electrolyte Membrane Fuel Cells,” M.S. Thesis, Missouri University of Science and Technology, May 2013.
 10. Sachin L. Puthran, “Three-Dimensional CFD Modeling of Tubular Solid Oxide Fuel Cells Using Different Fuels,” M.S. Thesis, Missouri University of Science and Technology, August 2011.
 11. Isaiah D. Kellogg, “Solid Oxide Fuel Cell Electrode Characterization and Improvement for Fuel Flexibility and Supplemental Power Production,” Ph.D. Thesis, Missouri University of Science and Technology, June 2010.
 12. Shravan K. Vudumu, “Experimental and Computational Investigations of Hydrogen Safety, Dispersion, and Combustion for Transportation Applications,” Ph.D. Thesis, Missouri University of Science and Technology, May 2010.
 13. Steven F. Rodgers, “Simulation of PEM Fuel Cells: Validation of Model and Incorporation of Humidity Dynamics,” M.S. Thesis, Missouri University of Science and Technology, May 2010.
 14. Matthew F. Chandler, “Comparison of Combustion Sources and Measurement Techniques for Particulates Emitted from Engines and a Power Plant,” M.S. Thesis, University of Missouri-Rolla, May 2006.
 15. Yingwu Teng, “A Computational and Experimental Study on Particulate-Sizing Diagnostics in Laboratory Flames,” Ph.D. Thesis, University of Missouri-Rolla, December 2006.
 16. Adam Neer, “Effect of Engine Operating Conditions on the Size and Morphology of Diesel Particulate Emissions,” M.S. Thesis, University of Missouri-Rolla, May 2005.
 17. Bo Yang, “Investigation of Soot Processes in Turbulent Non-premixed Hydrocarbon Flames Based on Laser Scattering and Extinction Experiments,” Ph.D. Thesis, University of Missouri-Rolla, May 2004.

18. Glen Curten, "Laser Diagnostics of Flame-Synthesized Nanoparticles," M.S. Degree, University of Missouri-Rolla, May 2003.
19. Bing Hu, "Thermophoretically-Sampled Soot Morphology at Axes of Non-premixed Turbulent Jet Flames at Atmospheric Pressure," M.S. Thesis, University of Missouri-Rolla, December 2002.
20. Huan Qi, "Soot Particle Properties in Laminar Non-premixed Flames Using A Thermophoretic Sampling Technique," M.S. Thesis, Florida International University December 2000.
21. Hayri S. Sapmaz, "Experimental Study of Soot by Means of Extinction and Angular Scattering Measurements in Laminar Non-premixed Flames," M.S. Thesis, Florida International University, June 2000.

In addition to being a thesis advisor to the above graduate students, I was on the thesis committee of 15 M.S. students and 10 Ph.D. students. Moreover, I also supervised more than 30 undergraduate students (REU) involved in our research projects.

TEACHING

- Combustion Processes (graduate/undergraduate)
- Fuel Cell Principles (graduate/undergraduate)
- Energy Systems (graduate)
- Applied Thermodynamics (undergraduate)
- Heat Transfer (undergraduate)
- Design of Thermal/Fluid Systems (undergraduate)
- Thermodynamics I (undergraduate)
- Transport Phenomena (undergraduate)
- Transport Phenomena Laboratory (undergraduate)
- Radiation Heat Transfer (graduate)

DEPARTMENT AND UNIVERSITY SERVICE

- Chair of the College of Engineering Promotion and Tenure Committee, 2021-2022
- Campus Promotion and Tenure Committee, 2021-2022
- Co-Chair of NTT Campus Promotion Committee, 2021-2022
- University Faculty Senate Representative, 2014-2016, 2019-2023
- Academic Freedom and Standards Committee, 2021-2023
- The University Faculty Committee on Tenure (Alternate), 2021-2023
- Ad hoc P&T Committee, Nuclear Engineering Department, 2021-2022
- Third-year Review Committee, 2021-2022
- Missouri State University, Faculty Review Committee, 2021-2022

- Department Faculty Search and Screen Committee, 2019-2020
- Department NTT Faculty Search and Screen Committee, 2018-2019
- President of Graduate Faculty and Chairman of Graduate Council, 2016-17
- Campus Tenure Policy Committee, 2019-2021
- Campus Task Force for Promoting Diversity&Inclusion in Graduate Education, 2016-17
- Campus Ad-Hoc Committee to Streamline Graduate Certificates, 2016-17
- Campus Third Year Review Committee, 2015-2016
- Campus NTT Faculty Promotion Committee, 2015-2017
- Chair of Department Lab Space and Safety Committee, 2015-present
- Department Promotion and Tenure Committee, 2014-2016, 2018-2022
- Chair of Department Energy Conversion and Transport Committee, 2013-14, 2016-17
- Chair of Department Faculty Search and Screen Committee, 2013-2014
- Department Graduate Committee, 2013-2018
- Department Curriculum Committee, 2013-2014, 2016-2017
- Department Advisory Committee, 2013-2014
- Campus Tenure Committee, 2012-2013, 2015-2016
- Department Faculty Search and Screen Committee, 2012-2013
- Freshman Engineering Faculty Advisor, 2012-present
- Senior Investigator, Energy Research and Development Center, 2009-present
- Faculty Advisor, EcoCAR Student Design Team, 2008-2012
- Faculty Advisor, ASME Student Chapter, 2007-2012
- Faculty Advisor, Student Chapter of Society of Fire Protection Engineers, 2018-present
- University Graduate Faculty, 2000-present
- Undergraduate Student Advisor (to currently 45 students), 2000-2012
- Department Faculty Search and Screen Committee, 2006-2007
- Department Graduate Affairs Committee, 2004-2008
- Faculty Advisor, Turkish Student Association, 2005-2009
- Chair of Department Thermal Science Committee, 2004-2005
- Department Curriculum Committee, 2004-2005
- School of Engineering Agenda and Nominating Committee, 2001-2005
- Academic Council Parking, Security and Traffic Committee, 2002-2004
- Academic Council Campus Safety Committee, 2001-2004
- Department Thermal Science Faculty Search and Screen Committee, 2001-2002
- Department Energy Conversion/Thermal Science Committee, 2000-present
- Faculty Advisor, Triangle Fraternity, 2001-2007
- Faculty Council Alternate, FIU, 1998-2000
- Department Faculty Search and Screen Committee, FIU, 1998-2000
- College of Engineering Curriculum Committee, FIU, 1997-1999
- Chemical Engineering Program Committee, FIU, 1997-2000
- United Way Ambassador, FIU, 1997-2000

PROFESSIONAL SERVICE AND SOCIETIES

Editorial

- Associate Editor and Editorial Board of International Journal of Hydrogen Energy, 2015-present

Scientific Program and Technical Committees

- 23rd World Hydrogen Energy Conference, International Scientific Committee, TURKEY, 2022
- 5th International Anatolian Energy Symposium, Scientific Committee, TURKEY, 2020
- ASME K-2 Committee on Long Range Directions & Issues in Heat Transfer, 2008-present
- 5th International Symposium on Radiation Transfer, Bodrum, TURKEY, 2007
- 31st International Symposium on Combustion, Heidelberg, GERMANY, 2006
- 30th International Symposium on Combustion, Chicago, IL, 2004

Session Chair

- 32nd International Symposium on Combustion, 2008
- Central and Eastern States Sections of the Combustion Institute, 1996, 1997, 2002, 2003
- American Association for Aerosol Research Conferences, 1996, 2002
- 3rd International Symposium on Radiative Transfer, 2000
- 4th International Conference on Technologies&Combustion for a Clean Environment, 1997

Consultant and Panel Reviewer

- Swiss National Science Foundation, 2015, 2019
- Natural Sciences and Engineering Research Council of Canada, 2012-2015, 2019
- Hydrogen Executive Leadership Panel, Scientific Consultant, 2007-2009
- NSF Review Panel for the Combustion and Thermal Plasmas Program, 2001, 2006
- Strategic Environmental Research and Development Program Review Panel, 2000, 2006
- Canada Foundation for Innovation, Aerospace Expert Committee Review Panel, 2003
- NSF/EPA Program Review Panel, 1999
- NSF SBIR Program Review Panel, 1998
- NATO Advisory Group for Aerospace Research and Development, 1996-1998

Proposal and Paper Reviewer

- DOE Office of Technology Transfer
- National Science Foundation
- NSF SBIR/STTR

- ARPA-Energy
- Environmental Protection Agency
- Department of Energy
- University of Missouri Research Board
- International Journal of Hydrogen Energy
- Combustion and Flame
- Journal of Energy
- Fuel
- ASME Journal of Fuel Cell Science and Technology
- Journal of Energy and Fuels
- ASME Journal of Heat Transfer
- Aerosol Science and Technology
- Combustion Science and Technology
- AIAA Journal
- Journal of Quantitative Spectroscopy and Radiative Transfer
- Journal of Aerosol Science
- AIAA Journal of Thermophysics and Heat Transfer
- Applied Optics
- Journal of Colloid and Interface Science
- Journal of Combustion Technologies for a Clean Environment
- International Symposiums on Combustion
- International Symposiums on Radiative Transfer
- International Symposiums on Fire Safety Science
- International Symposium on Heat and Mass Transfer
- Experimental Thermal Fluid Science
- Journal of the Brazilian Chemical Society
- Arabian Journal for Science and Engineering
- ASME Journal of Engineering for Gas Turbines and Power
- ASME Journal Thermal Science and Engineering
- Society of Automotive Engineers

Professional Societies

- Combustion Institute
- American Society of Mechanical Engineers
- Society of Automotive Engineers
- American Institute of Aeronautics and Astronautics
- American Association for Aerosol Research
- American Society of Engineering Education
- Sigma Xi, The Scientific Research Society