Dr. Eric L. Petersen, Professor and Nelson-Jackson Chair

J. Mike Walker '66 Department of Mechanical Engineering, 3123 TAMU, Texas A&M University, College Station, TX 77843, (979) 845-1257; email: epetersen@tamu.edu; website

Educational Background: Ph.D. in Mechanical Engineering, Stanford University (1998); M.S. in Mechanical Engineering, University of Florida (1990); B.S. in Mechanical Engineering (Magna Cum Laude), University of Central Florida (1988).

Employment History: Texas A&M University (TAMU), Director, TEES Turbomachinery Laboratory (2018 – present); Professor, Mech. Eng. (2012 – present); TAMU, Associate Professor, Mech. Eng. (2008-2012); University of Central Florida (UCF), Associate Professor, MMAE (2006-2007); UCF, Assistant Professor, MMAE (2001-2006); The Aerospace Corp. (El Segundo, CA), Staff Scientist, Space Materials Laboratory (1997-2001); UC, Irvine, Lecturer, Mechanical and Aerospace Eng. (1998-2000); Stanford University, Graduate Assistant (1993-1997); Pratt & Whitney, Analytical Engineer (1990-1993).

Research Interests: Gas dynamics and shock waves, combustion, propulsion, experimental techniques, solid propellants, optical diagnostics and spectroscopy, chemical kinetics.

Teaching Experience: Gas Dynamics, Combustion, Thermo I, Mechanics of Viscous Flow, Mechanical Power Systems, Fluid Mechanics, Rocket Propulsion, Heat Conduction, Mech/Aero Engineering Meas., Thermal-Fluids Meas., Fundamentals of Aerodynamics, Aerothermodynamics of Propulsion, Design of Aerospace Exp., High-Speed Aero, Thermo II; Aerospace Lab.

Research Supervision Activities: Currently supervising 2 Research Professors; 8 Ph.D., 4 M.S., 3 UG students, and 1 visiting scholar; graduated 20 Ph.D. and 59 M.S. students.

Research Funding (Recent): *As PI:* NSF grant: $270K; Autoliv: $248K; LSU/Co-Optima: $300K; UCFER/DOE: $400K; DTRA: $746K; QNRF: $809K; DoD: $600K; Toshiba/PSI: $101K; DOE NETL: $498K; DoD: $616K; NSF REU Site: $444K; Parametric Solutions Inc.: $181K; Turbo Research Consortium: $45K; Rolls-Royce: $269K; Alstom: $169K; DoD: $800K; AFRL: $71K; DOE UTSR: $502K; NSF REU Site: $300K; Rolls-Royce: $234K; GE Energy: $73K; Rolls Royce: $298K; *As Co-PI:* SERDP: $150K; DARPA: $1,950K; NSF grant: $330K.

Publication Record: 182 journal articles in print and 4 in press; 397 conference papers; 13 journal articles currently under review; 9 patents and 1 disclosure; and several published reports.

Honors and Awards: Combustion Institute Fellow (2020); AIAA Associate Fellow (2020); Nelson-Jackson Chair (2019); Dean of Engineering Excellence Award (2019); TEES Senior Faculty Fellow (2017); James J. Cain Graduate Teaching Award (2015); Best Paper Award, X ISHPMIE (2014); Nelson-Jackson Professor (2013); TEES Faculty Fellow (2011); ASME Fellow (2010); Leland T. Jordan Career Development Professorship (2010); Teaching Excellence Award (Fall 2009; Fall 2010); Best Paper Award, ASME Turbo Expo (2009); NSF CAREER Award (2006).

Current Service (TAMU): Currently on Department Tenure & Promotion and Faculty Advisory (Chair) Committees.

Professional Participation: Board Member and Vice President of *Institute for Dynamics of Explosions and Reactive Systems*; Associate Fellow of AIAA; ASME Fellow; member of ASEE and The Combustion Institute; Associate Editor: *Journal of Propulsion and Power*.

Education

1998 Ph.D., Mechanical Engineering, Stanford University. Advisor: Prof. Ronald K. Hanson. Thesis: "*A Shock Tube and Diagnostics for Chemistry Measurements at Elevated Pressures with Application to Methane Ignition*." (April, 1998)

1990 M.S., Mechanical Engineering, University of Florida. Advisor: Prof. Vernon P. Roan. Thesis: "*Experimental and Theoretical Investigation of Ejectors Employing Dissimilar Fluids*." (May, 1990)

1988 B.S., Mechanical Engineering, University of Central Florida, Magna Cum Laude. (August, 1988)

Professional Experience

Director, TEES Turbomachinery Laboratory, Texas A&M University, College Station, TX
(Mar. 2018 – present)

Professor, Texas A&M University, Department of Mechanical Engineering, College Station, TX
(Sept. 2012 – present)

Associate Professor, Texas A&M University, Department of Mechanical Engineering, College Station, TX
(Jan. 2008 – Sept. 2012)

Associate Professor, University of Central Florida, Mechanical, Materials & Aerospace Engineering Department, Orlando, FL
(May 2006 – Dec. 2007)

Assistant Professor, University of Central Florida, Mechanical, Materials & Aerospace Engineering Department, Orlando, FL
(Aug. 2001 – April 2006)

Research Scientist, The Aerospace Corporation, El Segundo, CA
(Sept. 1997 – July 2001)

- Performed a comprehensive review on shock tubes for heterogeneous flows
- Developed research program in combustion synthesis of materials and aerosols
- Conducted research on soot formation and advanced fuel additives
- Rebuilt The Aerospace Corporation's shock-tube and -tunnel program
- Carried out research on the active control of vortex-driven instabilities in SRMs
- Applied optical techniques for the study of reacting and non-reacting flow fields
- Conducted an experimental study of a hypersonic, chemical-laser flow
- Performed fluid and thermal analyses and experiments in support of the AF SMC
- Supervised several students from UC Irvine as part of a summer internship program

Lecturer, University of California, Irvine, Dept. of Mechanical and Aerospace Engineering
(Sept. 1998 – Dec. 2000)
- Taught undergraduate course in applied thermodynamics
- Taught experimental aerodynamics course

Research Assistant, Stanford University, Thermosciences Dept.**,** Stanford, CA
(July 1993 – Aug. 1997)

- Designed and installed high-pressure (1000-atm) shock-tube facility
- Performed experiments and analyses for combustion kinetics and ignition
- Aided ARL Ram Accelerator effort by studying practical CH_4 mixtures
- Developed and applied spectroscopic optical diagnostic techniques
- Investigated non-ideal flows and real-gas effects at high pressures
- Applied optical diagnostics to transient, reacting, high-pressure flows

Analytical Engineer, Pratt & Whitney, West Palm Beach, FL
(May 1990 – July 1993)

- Specialized in injector design, atomization and sprays, and combustion instability
- PI, Liquid Stability Mechanisms research program under AFRL (w/UTRC, UCI)
- Performed fluid/thermal analyses for rocket combustor design and development
- Conducted experiments on advanced gas turbine augmentors and rocket injectors

Research Assistant, University of Florida, Mechanical Engineering, Gainesville, FL
(Aug. 1988 – May 1990)

- Received United Technologies Propulsion Research Fellowship
- Conducted experimental study of supersonic gas/gas ejectors for propulsion
- Researched shear-layer mixing and developed an analytical computer model
- Developed a 2D Euler solver CFD code for turbomachinery cascade analysis

Engineer Associate, Martin Marietta, Electronics Systems Division, Orlando, FL
(Dec. 1986 – Aug. 1988)

- Worked part time while attending school full time
- Designed low-level mechanical components for ADATS electro-optics system
- Developed CAD skills (CADAM) and performed tolerance analyses

Teaching and Related Activities

Texas A&M University

Courses Taught:

Course		Semesters	Level
MEEN 633	Combustion Science	(Sp09,Sp10,F11,Sp14,F15,Sp17-Sp22)	(G)
MEEN 344	Fluid Mechanics	(F08,Spr11,Spr12,Spr13,Spr15,F15)	(UG)
MEEN 404	Engineering Laboratory	(Spr08,F10,F12,F13,F14,F16,F17)	(UG)
MEEN 472/605	Gas Dynamics	(F09 – F18; F20,F21)	(UG/G)

University of Central Florida

Courses Taught:

Course		Semesters	G/UG
EML 6712	Mechanics of Viscous Flow	(F01)	(G)
EML 4411	Mechanical Power Systems	(Spr02)	(UG)
EGN 3343	Thermodynamics	(Spr02, F07)	(UG)
EML 3701	Fluid Mechanics I	(Su02)	(UG)
EML 6154	Conduction Heat Transfer	(Su02)	(G)
EML 3303	Mechanical Engineering Meas.	(F02,Su03,F03,Su04,F04,Su05,F05)	(UG)
EAS 5315	Rocket Propulsion	(F02, F03, F04, F06)	(G)
EAS 3101	Fundamentals of Aerodynamics	(Spr03)	(UG)
EML 4304	Thermal-Fluids Measurements	(Spr03, Spr04, Spr05)	(UG)
EAS 3800	Aerospace Engineering Meas.	(Su03, F03, Su04, F04,Su05,F05)	(UG)
EAS 3810	Design of Aerospace Experiments	(Spr04, Spr05, Spr06, Spr07)	(UG)
EAS 4300	Aerothermodynamics of Propulsion	(Spr04, Spr05, Spr06)	(UG)
EAS 6807	Aerospace Meas./Instrumentation	(F05)	(G)
EAS 4134	High-Speed Aerodynamics	(F06)	(UG)
EAS 3010	Fundamentals of Aerospace Flight	(F07)	(UG)

Directed Research and Independent Study for Undergraduates:

Semester	Student(s), Topic	Hours
Sum 07	M. Davis; H_2O_2 Absorption Diagnostic	3
Fall 06	M. Newhartz; *Design of Safety Wall for Flame Speed Exp.*	1
Fall 06	T. Cannizzaro; *EML 4304 Thermo-Fluids Meas.*	2
Sum06	H. Shah; *EAS 4134 High-Speed Aero*	3
Sum 06	J. Anspach; *Shock-Tube Driver Frame Design*	1
Sum 06	C. Zinner; *Shock-Tube Research and Diaphragm Redesign*	1
Sum 06	R. Santos; *Inertial Mass Design for HP Shock Tube*	1
Sum 06	B. Rotavera; *Discharge Coefficient Measurements of a Coaxial Rocket Injector*	1
Spr 06	B. Mann; *Shock-Tube Port Cap Redesign*	1
Spr 06	J. Thomas; *Divert and Attitude Control System Review*	1
Fall 05	E. Tew; *Diaphragm Cutter Redesign and Fabrication*	3
Fall 05	A. Law; *Modified Endwall Design and Fabrication*	2
Fall 05	R. Mulcahy; *Labview Readout of Wind Tunnel Runs*	3

Fall 05	J. McGowan; *Shock-Tube Leak Check and Vacuum*	2
Fall 05	V. Antonovski and J. Figueroa; *EAS 4300 Propulsion*	3
Fall 05	H. Quereshi; *Explosion Wave Literature Search*	1
Sum 05	A. Barney; *Optical Table Upgrade Design and Fab.*	1
Sum 05	K. Meredith; *Chemkin Calculations of Ignition*	2
Sum 05	J. McGowan; *Shock Tube Laboratory Research*	2
Spr 05	M. Stephens; *Research and Paper on the Effects of Bimodal AP on Burn Rate*; for AIAA Student Conference	1
Spr 05	E. Schwartz; *Literature Search on CFD Models for Combustion in Power Generation Gas Turbines*	1
Fall 04	S. Schembri; *Implementation of a Force Balance on the UCF Subsonic Wind Tunnel*	2
Fall 04	I. Sanchez; *Computer DAQ for the Subsonic Wind Tunnel*	1
Spr 04	R. Simeone, C. Singh; *EAS 4134 High-Speed Aero*	3
Spr 04	J. Arvanetes; *Research in Solid Rocket Propellants*	1
Fall 03	B. Kudrowitz; *Computer DAQ for Meas. Laboratory*	3
Fall 03	M. Hayman; *Design of a High-Pressure Mixing Tank*	2
Spr 03	I. Whiteley, L. Sheehan; *Mars Greenhouse Project*	3
Spr 03	M. Stephens; *Mars Greenhouse Project*	1
Fall 02	D. Joo, C. Borowski; *EAS 4300 Propulsion*	3

University of California, Irvine

Courses Taught:

Course		Quarters	G/UG
MAE 108	Aerospace Laboratory	(F99, F00)	(UG)
MAE 115	Thermodynamics of Mechanical Systems	(F98)	(UG)

Student and Researcher Supervision

Texas A&M University and University of Central Florida

Research Staff – Current

1) Dr. James (Chris) Thomas, Research Assistant Professor (Sept. 21 – present)

2) Dr. Olivier Mathieu, Research Associate Professor (June 18 – present)

Postdoctoral Researchers – Current

none

Graduate Students - Current

1) Mattias Turner (PhD): (Jun. 19 – present)
   Topic: *Laminar and Turbulent Flame Speed Experiments*
2) Sean Cooper (PhD): (Sept. 17 – present)
   Topic: *Shock-Tube Kinetics and Gas Dynamics*
3) Felix Rodriguez (PhD): (May 20 – present)
   Topic: *Solid Propellants and Energetics*
4) Sulaiman Alturaifi (PhD): (Jan. 19 – present)
   Topic: *Shock-Tube Kinetics and Laser Diagnostics for Ammonia Combustion*
5) Tatyana Atherley (PhD – O. Mathieu, Co-Advisor): (May 21 – present)
   Topic: *Shock-Tube Chemical Kinetics and Flammability Limits*
6) Raquel Juarez Funez (PhD): (May 21 – present)
   Topic: *Lube Oil Coking and Ignition*
7) Yousef Almarzooq (PhD): (Sept. 19 – present)
   Topic: *Laminar and Turbulent Flames*
8) Claire Grégoire (PhD): (Sept. 19 – present)
   Topic: *Chemical Kinetics of Large Hydrocarbons*
9) Matthew Sandberg (MS): (Jan. 21 – present)
   Topic: *JP-8 Combustion in a Portable Burner*
10) Darryl Mohr (MS): (June 21 – present)
   Topic: *Gas Dynamics and Chemical Kinetics in a Shock Tube*
11) Noble Gutierrez (MS) (Jan. 22 – present)
   Topic: *Oil Coking Apparatus and Experiments*
12) Nathan Lindblade (MS) (June 22 – present)
   Topic: *Oil Coking Apparatus and Experiments*
13) Matthew Abulail (PhD): (Aug. 22 – present)
   Topic: *Shock-Tube Experiments*

Undergraduate Students – Current

1) Kristen Herder (Jan. 21 – present)
   Topic: *Solid Rocket Propellants*
2) Joey Jacobs (April 22 – present)
   Topic: *Laminar Flame Experiments*

Visiting Scholars – Current

1) Thomas Sammet, RET Teacher Participant (Summers and year round part time)
Topic: *High Burning Rate Solid Rocket Propellants*
2) Panagiotis Andreou, Summer UG Researcher from Cyprus-TAMU Program (Summer 2022)
Topic: *High-Temperature Coking of Gas Turbine Lube Oils*

Graduate Students - Completed

80) Alvin Hong (MS): (May 2022)
Topic: *The Effect of Density on Burning Rates of AP/HTPB Composite Solid Propellants*
79) Catherine Dillier (PhD): (Aug. 2021)
Topic: *High-Pressure Exponent Break of AP/HTPB-Composite Propellants*
78) David Teitge (MS): (May 2021)
Topic: *Design and Characterization of a Hot-Surface Ignition Experiment*
77) Tatyana Atherley (MS – O. Mathieu, Co-Advisor): (May 2021)
Topic: *Laser Absorption Measurements of CO and H_2O from Dimethyl Carbonate Combustion behind Reflected Shock Waves for Safer Li-Ion Battery Applications*
76) Raquel Juarez Funez (MS): (May 2021)
Topic: *Development of a Test Rig to Study the Lubricating Oil Degradation and Solid Deposit Formation Process at High Temperatures*
75) Joshua Hargis (PhD): (Dec. 2020)
Topic: *Design and Characterization of Aerosol Shock Tube Methods for the Study of Long-Chain Hydrocarbon Fuels*
74) Cassio Brunoro Ahumada (PhD – Co-Advisor with Q. Wang): (Dec. 2020)
Topic: *Effects of Unequal Obstacle Configuration on Detonation Initiation in Flammable Gaseous Mixtures*
73) Felix Rodriguez (MS): (May 2020)
Topic: *Burning Rate Characterization of Ammonium Perchlorate Pellets Containing Micro- and Nano-Catalytic Additives*
72) Charles Keesee (PhD): (Dec. 2019)
Topic: *Laminar Flame Speed and Markstein Length Measurements of Various Multi-Component Liquid Fuels with Detailed Uncertainty Analysis*
71) Clayton Mulvihill (PhD): (Aug. 2019)
Topic: *H_2O Laser Absorption and OH* Chemiluminescence Measurements of H_2-NO_2 Oxidation in a Shock Tube*
70) Mattias Turner (MS): (May 2019)
Topic: *Utilizing a New Chemiluminescence Diagnostic to Measure Laminar Flame Speed from Spherically Expanding Flames*
69) Anibal Morones (PhD): (Dec. 2018)
Topic: *Study of Turbulent Spherical Flames in a Reconfigurable Fan-Stirred Flame Bomb*
68) James Thomas (PhD): (Dec. 2018)
Topic: *Mixed HTPB/Paraffin Fuels and Metallic Additives for Hybrid Rocket Applications*
67) Travis Sikes (Ph.D.): (Aug. 2018)
Topic: *Chemical Kinetics of Organophosphorus Fire Suppressants*
66) Sulaiman Alturaifi (MS): (Aug. 2018)
Topic: *Ignition Delay Time Measurements of Jet, Rocket, and Diesel Fuel*
65) Laura Pinzon-Correa (MS): (Aug. 2018)

Topic: *Reaction Rate Measurement of $C_2H_5OH \rightarrow C_2H_4 + H_2O$ During Ethanol Pyrolysis Using H_2O Time History Measurements Behind Reflected Shock Waves*

64) Andrew Tykol (MS): (May 2018)
Topic: *Burning Rate Characterization of Guanidine Nitrate and Basic Copper Nitrate Propellants with Nano- and Micron-Sized Metal Oxide Catalysts*

63) Rachel Rebagay (MS): (Aug. 2017)
Topic: *Heated Shock Tube Design and Characterization for Liquid Fuel Combustion Experiments*

62) Andrew Demko (Ph.D.): (May 2017)
Topic: *Advancements in Composite Solid Rocket Propellant Testing and Evaluation for Formulations Containing Novel Nano-Additives*

61) Gordon Morrow (MS): (May 2017)
Topic: *Correlating the Effects of AP Particle Size and Concentration on AP/HTPB Composite Propellant Burning Rates*

60) Michaela Fasano (MS): (May 2017)
Topic: *Thermal Cook-Off Study of Pressed Nitrotriazolone (NTO) Pellets*

59) Jacob Stahl (MS): (May 2017)
Topic: *Analysis of Hydroxylammonium Nitrate Burning Rates*

58) Catherine Dillier (MS): (Dec. 2016)
Topic: *Development and Characterization of a New Very High-Pressure Strand Burner for Studying Propellant Burning Rates at Extreme Temperatures*

57) James Anderson (MS): (May 2016)
Topic: *Development of a Mid-Infrared Carbon Monoxide Sensor for a High-Pressure Combustor Rig*

56) Matthew Gill (MS): (May 2016)
Topic: *Design of a Large-Scale Detonation Tube*

55) Camilo Martinez Rosas (PhD – Co-Advisor with M. S. Mannan): (May 2016)
Topic: *Deflagration to Detonation Transition Studies*

54) Austin Bond (PhD – Co-Advisor with M. Holtzapple): (Aug. 2016)
Topic: *Making Bombs for Peaceful Purposes: How Explosive Processes Render Lignocellulosic Biomass More Amenable to Biological Digestion*

53) H. Greg Johnston (MS): (Dec. 2015)
Topic: *Experimental Effects of Coal-Limestone Mixtures on Dust-Layer Dispersion Behind a Moving Shock Wave*

52) Gabriel Homan-Cruz (MS): (Dec. 2015)
Topic: *Experimental Techniques to Study the Combustion of Aqueous Solutions of Hydroxylammonium Nitrate With Additives*

51) Anibal Morones (MS): (Aug. 2015)
Topic: *Turbulence Measurements in a Fan-Stirred Bomb using Laser Doppler Velocimetry*

50) Amira Chowdhury (PhD – Co-Advisor with M. S. Mannan): (Aug. 2015)
Topic: *Shock Interaction with Dust Layers*

49) Joshua Hargis (MS): (May 2015)
Topic: *Methane Ignition in a Shock Tube with High Levels of CO_2 Dilution*

48) Charles Keesee (MS): (May 2015)
Topic: *Laminar Flame Speed Measurements of Synthetic Gas Blends with Hydrocarbon Impurities*

47) Clayton Mulvihill (MS): (May 2015)
Topic: *Shock-Tube Time-History Measurements of H_2O in the H_2/O_2 System Using IR*

Laser Absorption Spectroscopy

46) Travis Sikes (MS): (MKOPSC Fellow student): (Dec. 2014)
Topic: *Laminar Flame Speeds of Nano-Aluminum/Methane Hybrid Mixtures*

45) James Thomas (MS): (Dec. 2014)
Topic: *Hybrid Rocket Burning Rate Enhancement by Nano-Scale Additives in HTPB Fuel Grains*

44) Jose Emiliano Vivanco (MS): (Aug. 2014)
Topic: *A New Shock-Tube Facility for the Study of High-Temperature Chemical Kinetics*

43) Kenneth McCown (MS): (May 2014)
Topic: *Experimental Techniques to Study the Effects of Nanoparticle Additives on Heterogeneous Monopropellant Combustion*

42) Alejandro Camou (MS): (May 2014)
Topic: *Design and Development of a Mid-Infrared Carbon Monoxide Sensor for a High-Pressure Combustor Rig*

41) Sankar Ravi (PhD): (May 2014)
Topic: *Measurement of Turbulent Flame Speeds of Hydrogen and Natural Gas Blends (C1-C5 Alkanes) Using a Newly Developed Fan-Stirred Vessel*

40) Carmen Helena Osorio (PhD): (Aug. 2013)
Co-Advisor with: Dr. Sam Mannan, Chemical Engineering
Topic: *Chemical Experimental and Computational Study of Flame Inhibition Mechanisms in C1-C3 Alkanes Flame*

39) Brandon Marks (MS): (Aug. 2013)
Topic: *A New Facility for Studying Shock Wave Passage Over Dust Layers*

38) Andrew Demko (MS): (Aug. 2013)
Topic: *Tailoring Composite Solid Propellants to Produce a Plateau Burning Profile*

37) Tyler Allen (MS): (May 2013)
Topic: *Laboratory-Scale Burning and Characterization of Composite Solid Propellants for Studying Novel Nanoparticle Synthesis Methods*

36) Christopher Aul (PhD): (May 2013)
Topic: *Measuring Hydroxyl Radicals During the Oxidation of Methane, Ethane, Ethylene, and Acetylene in a Shock Tube Using UV Absorption Spectroscopy*

35) Lori Sandberg (MS): (May 2013)
Topic: *Characterization of an Aerosol Shock Tube Facility for Heterogeneous Combustion Studies*

34) Drew Plichta (MS): (May 2013)
Topic: *Enhancements of a Combustion Vessel to Determine Laminar Flame Speeds of Hydrocarbon Blends with Helium Dilution at Elevated Temperatures and Pressures*

33) Madeleine Kopp (MS): (Dec. 2012)
Topic: *Rate Determination of the CO_2* Chemiluminescence Reaction $CO+O+M \rightarrow CO_2^*+M$*

32) Marissa Brower (MS): (Aug. 2012)
Topic: *Ignition Delay Times of Natural Gas/Hydrogen Blends at Elevated Pressures*

31) Andrew Vissotski (MS): (Aug. 2012)
Topic: *Development of an Experimental Facility for Flame Speed Measurements in Powdered Aerosols*

30) Brandon Rotavera (PhD) (May 2012; Interdisciplinary Engineering major)
Topic: *Oxidation Kinetics of Pure and Blended Methyl Octanoate/n-Nonane/Methylcyclohexane: Measurements and Modeling of OH*/CH* Chemiluminescence, Ignition Delay Times and Laminar Flame Speeds*

29) William Warren (MS): (May 2012)
Topic: *Experimental Techniques for the Study of Liquid Monopropellant Combus*tion
28) Michael Krejci (MS): (May 2012)
Topic: *Development of a New Flame Speed Vessel to Measure the Effect of Steam Dilution on Laminar Flame Speeds of Syngas Fuel Blends at Elevated Pressures and Temperatures*
27) Corey Frazier (PhD): (Dec. 2011)
Topic: *Modeling of Composite Solid Propellant Experiments Containing Nanoadditives*
26) John Pemelton (MS): (Aug. 2011)
Topic: *Shock-Tube Study of Methane Ignition with NO_2 and N_2O*
25) Nolan Polley (MS): (Dec. 2010)
Topic: *Detonation Diffraction into a Confined Volume*
24) Kevin Kreitz (MS): (Dec. 2010)
Topic: *Catalytic Nanoparticle Additives in the Combustion of AP/HTPB Composite Solid Propellant*
23) William Lowry (MS): (Dec. 2010)
Topic: *Effect of Blending on High-Pressure Laminar Flame Speed Measurements, Markstein Lengths, and Flame Stability of Hydrocarbons*
22) Mouna Lamnaouer (PhD, UCF) (May 10)
Co-Advisor: Alain Kassab (UCF)
Topic: *Numerical Modeling of the Shock Tube Flow Fields Before and During Ignition Delay Time Experiments at Practical Conditions*
21) Nicole Donato (MS) (Dec. 2009)
Topic: *OH* Chemiluminescence: Pressure Dependence of $O + H + M = OH^* + M$*
20) Alexander Barrett (MS) (Dec. 2009)
Topic: *Measurement of Water Vapor Concentration Using Tunable Diode Laser Absorption Spectroscopy*
19) Brandon Rotavera (MS) (Dec. 2009)
Topic: *Chemiluminescence and Ignition Delay Time Measurements of C_9H_{20} Oxidation in O_2-Ar Behind Reflected Shock Waves*
18) Christopher J. Aul (MS) (Dec. 2009)
Topic: *An Experimental Study into the Ignition of Methane and Ethane Blends in a Shock-Tube Facility*
17) Jaap de Vries (PhD): (May 2009)
Topic: *A Study on Spherical Expanding Flame Speeds of Methane, Ethane, and Methane/Ethane Mixtures at Elevated Pressures*
16) Matthew Stephens (MS) (May 2009)
Topic: *Tailoring the Plateau Burning Rates of Composite Propellants by the Use of Nanoscale Additives.*
15) Troy Flaherty (MS—ME, UCF): (May 2009)
Topic: *Characterization of a Hydrogen-Based Synthetic Fuel in a Shock Tube*
14) Christopher Zinner (MS—ME, UCF): (May 2008)
Topic: *Methane and Dimethyl Ether Oxidation at Elevated Temperatures and Pressure*
13) Danielle Kalitan (Ph.D. – ME, UCF) (Dec. 2007)
Topic: *A Study of Syngas Oxidation at High Pressures and Low Temperatures*
12) Brian Walker (MS – AE, UCF) (Dec. 2007)
Topic: *Shock-Tube Investigation of Ignition Delay Times of Blends of Methane and Ethane with Oxygen*
11) Rodolphe Carro (MS – ME, UCF) (Dec. 2007)
Topic: *High Pressure Testing of Composite Solid Rocket Propellant Mixtures: Burner*

Facility Characterization

10) Corey Frazier (MS – AE, UCF) (May 2007) (Co-Advisor with Alain Kassab)
Topic: *Wall Heat Transfer Effects in the Endwall Region behind a Reflected Shock Wave at Long Test Times*

9) Peter Himmerich (MS – AE, UCF) (May 2007)
Topic: *Supersonic Crossflow Visualization at the UCF Supersonic Wind Tunnel*

8) Anthony Amadio (MS—ME, UCF): (July 2006)
Topic: *Driver-Gas Tailoring for Test-Time Extension using Unconventional Driver Mixtures*

7) Jason Arvanetes (MS—ME, UCF): (May 2006)
Topic: *Design and Implementation of an Emission Spectroscopy Diagnostic in a High-Pressure Strand Burner for the Study of Solid Propellant Combustion*

6) Kyle Platt (MS—AE, UCF): (May 2006) (Co-Advisor with J. Brandenburg)
Topic: *Design and Fabrication of a Full-Featured Labscale Hybrid Rocket Engine*

5) Joel Hall (MS—ME, UCF): (Dec. 2005)
Topic: *Optimization of a Kinetics Model for OH Chemiluminescence*

4) Jaap deVries (MS—AE, UCF): (Dec. 2005)
Topic: *Autoignition of Fuel Blends for Power Generation Gas Turbines*

3) Jami Ward (MS—AE, UCF): (July 05) (Co-Advisor with A. Leonessa)
Topic: *Active Control of a Cold-Flow Solid Rocket Motor*

2) Zaher El-Zahab (MS—ME, UCF): (Dec. 2003)
Topic: *An Experimental Study of Spray Ignition behind Reflected Shock Waves*

1) Sandeep Bhosale (MS—ME, UCF): (May 2003)
Topic: *Design and Operation of a Shock Tube for Combustion and Imaging Applications*

<u>Postdoctoral Researchers – Past</u>

4) Dr. James (Chris) Thomas (Ph.D., ME, Texas A&M University) (Jan. 19 – Aug. 21)

3) Dr. Charles Keesee (Ph.D., ME, Texas A&M University) (Jan. 20 – Aug. 20)

2) Dr. Clayton Mulvihill (Ph.D., ME, Texas A&M University) (Sept. 19 – June 20)

1) Dr. Olivier Mathieu (Ph.D., Chemistry, Orleans, France) (Mar. 11 – May 18)

<u>Visiting Scholars – Past</u>

42) Charlotte Rudolph, Ph.D. Student Researcher, Univ. of Duisburg-Essen (Sept. – Dec. 2021)
Topic: *Shock-Tube Kinetics for Polygeneration Applications*

41) Nathan Lindblade, Visiting UG Researcher from La Tech, USRG Program (Summer 2021)
Topic: *Flame Speed Experiments for Advanced Fuels*

40) Justo Rodriguez, Visiting UG Researcher from Chile-TAMU Program (Spring 2020)
Topic: *Shock-Tube Endwall Design*

39) Kyprianos Dimou, Summer UG Researcher from Cyprus-TAMU Program (Summer 2019)
Topic: *Flame Speed Measurements in a Constant-Volume Vessel*

38) Hannah Zukowski, REU Summer Participant, Trinity College (Summer 2019)
Topic: *Shock-Tube Chemical Kinetics*

37) Matthew Sandberg, REU Summer Participant, Southern Illinois University (Summer 2019)
Topic: *Detonation Tube Design and Fabrication*

36) Chase Johnston, REU Summer Participant, SFA State Univ. (Summer 2018)
Topic: *High-Pressure Shock Tube Experiments*

35) Farhan Rozaidi, REU Summer Participant, Trinity College (Summer 2018)
Topic: *DMMP Pyrolysis Experiments Using a Shock Tube*
34) Donovan Palmer, REU Summer Participant, Trinity College (Summer 2018)
Topic: *DMMP Pyrolysis Experiments Using a Shock Tube*
33) Felix Rodriguez, REU Summer Participant, Central Florida (Summer 2017)
Topic: *Implementation of a Rapid Depressurization System for a Strand Burner*
32) Kaleb Fields, REU Summer Participant, SFA State University (Summer 2017)
Topic: *Laser Absorption Measurements of TEP Concentration*
31) Abdoul Adjagbe, Visiting Student Researcher from Paris (Fall 2016)
Topic: *Design of an Aerosol Production and Containment Vessel*
30) Saadat Khan, TAMU-Qatar Undergraduate Research Intern participant (Summer 2016)
Topic: *Shock-Tube Ignition of 1,3 Butadiene*
29) Victor Leon, REU Summer Participant (Summer 2015) from Texas A&M University
Topic: *Design of a New Turbulent Flame Speed Fan System*
28) Rodolfo Spinelli Teixeira; Undergraduate Researcher from Brazil (June 2015 – July 2015)
Topic: *Laminar Flame Speeds of Methane with H_2S Impurities*
27) Binod Giri, Undergraduate Researcher from Trinity College, CT (June 2014 – Aug. 2014)
Topic: *Oxidation Kinetics of Nitromethane*
26) Claire Gregoire, Graduate student from Univ. of Orleans, France (April 2014 – Aug. 2014)
Topic: *Chemical Kinetics of neo-Pentane and Fire Suppressants*
25) Gordon Morrow, REU Summer Participant (Summer 2014) from Sam Houston State Univ.
Topic: *High-Strength Solid Rocket Propellants*
24) Sebastien Thion, Graduate student from Univ. of Orleans, France (Mar. 2013 – Aug. 2013)
Topic: *Chemical Kinetics of Hydrocarbon Mixtures*
23) James Anderson, REU Site participant from Angelo State Univ., San Angelo (Summer 2013)
Topic: *New Shock-Tube Design and Vacuum System*
22) Irmis Osorio, Undergraduate Student from Universidad Industrial de Santander, Bucaramanga, Colombia (Dec. 2012 – May 2013)
Topic: *Shock-Tube Experiments of Propene Ignition Delay Times*
21) Fiona DeGuillaume, Grad. student from Univ. of Orleans, France (April 2012 – Aug. 2012)
Topic: *Chemical Kinetics of H_2S in Syngas Mixtures*
20) Alexander Gerds, (Sept. 2011 – Oct. 2011) RISE scholar from Germany
Topic: *Temperature Measurement in Shock Tubes Using Sound Waves*
19) Lacy Dunn, REU Site participant from Texas Southern University (May – Aug. 2011)
Topic: *Initial Design of a Fiber Optic System for a TDLAS Setup*
18) Carlton Doestch, REU Site participant from Baylor University (Summer, 2011)
Topic: *Fast-Acting Valves for Shock-Tube Soot Formation and Collection*
17) Rachel Archuleta, REU Site participant from Oregon State University (June – Aug. 2011)
Topic: *Shock-Tube Measurement of Pentane Ignition*
16) Anthony Levacque, Graduate student from Univ. of Orleans, France (April – Aug. 2011)
Topic: *Effect of NO_2 and N_2O Addition on H_2-O_2 Oxidation Chemistry*
15) Daniel Pastrich, RISE Scholar Participant (German-sponsored program) (July – Sept. 2009; July – Oct. 2010; Aug. – Nov. 2013)
Topic: *Soot Collection Experiments in a Shock Tube*
14) Oliver Seidel, RISE Scholar Participant (German-Sponsored program) (July - Oct. 2010)
Topic: *Transient Pressure Measurements in a Shock-Induced Flow Through a Nozzle*
13) Nicolas Marquet, Graduate Student from University of Orleans, France (May – Aug 2010)
Topic: *Ignition Measurements of DME and CH_4/DME Mixtures*
12) Linda Kelly, RET Teacher Participant (Summer 2009)

Topic: *Effect of Oxidizer Particle Distribution on Propellant Burning Rates*

11) Jonas Trevino, RET Teacher Participant (Summer 2009)
Topic: *Pressure Oscillations in Constant-Volume Flame Speed Experiments*

10) Dr. Mustapha Fikri, Physical Chemist from University of Duisburg-Essen, Germany (Oct. – Nov. 07)
Topic: *Optical diagnostics and shock tube ignition experiments*

9) Matthew Janish, REU NanoPAC student (Sum 07)
Topic: *Investigation of Tailoring Effects of Doped Nano-Crystalline Titania on Solid Rocket Propellant Burning Rate*

8) Suraj Thulkar, Summer Scholar from IIT, India (Sum 07)
Topic: *Reflected-Shock Bifurcation Analysis and Experiments*

7) Dr. Gilles Bourque, Combustion Specialist from Rolls-Royce (Nov. 06—Dec. 06)
Topic: *Chemical Kinetics and Flame Speeds*

6) Allison Redd, RET Teacher Participant (Sum 06, Sum 07)
Topic: *Shock Tube Experiments and Ignition Measurements*

5) Antonio Russo, REU NanoPAC student (Sum 06; co-advisor with S. Seal)
Topic: *Effect of Titania Additives of Burning Rate of Composite Solid Propellants*

4) Nicholas Eliason, RET Teacher Participant (Sum 05, Sum 06, Sum 07)
Topic: *Laser Extinction Measurements of Soot Formation in a Shock Tube*

3) Thanh Hoang, REU NanoPAC student (Sum 05; co-advisor with S. Seal)
Topic: *Performance Assessment of Solid Propellants Containing Nano-Particle Additives*

2) Jennifer Small, REU NanoPAC student (Sum 04; co-advisor with S. Seal)
Topic: *Performance Assessment of Solid Rocket Propellants Containing Titania-Based Nano-Particle Additives*

1) Patrick Mack, Diploma Thesis candidate from University of Munich (Oct. 02—March 03)
Topic: *Design, Assembly and Initial Operation of a Shock-Tube Facility*

<u>Undergraduate Students – Past</u>

62) Matthew Abulail (Feb. 22 – May 22)
Topic: *Shock-Tube Experiments*

61) Lorenzo Martinez (Jan. 21 – Dec. 21)
Topic: *Flame Speed Measurements*

60) Noble Gutierrez (Oct. 19 – Dec. 21)
Topic: *Oil Coking Apparatus and Experiments*

59) Kristina Viro (Jan. 21 – Aug. 21)
Topic: *Hydrocarbon Fuel Ignition and Combustion*

58) Shaelyn Stacy (Jun. 21 – Sept. 21)
Topic: *Shock-tube experiments*

57) Zachary Browne (Mar. 19 – May 21)
Topic: *Mechanical Design and Manufacturing*

56) Erica Petersen (Jun. 17 – Dec. 19)
Topic: *Advanced Solid Propellant Rocket Formulations*

55) Julio Garza Alvarez (Jan. 20 – May 20)
Topic: *Flame Speed Vessel and Experiments*

54) Megan Coutoumanos (July 19 – Dec. 19)
Topic: *Shock-Tubes and Gas Dynamics*

53) Kyle Ruehle (Jun. 18 – May 19)
Topic: *High-Temperature High-Pressure Turbulent Flame Speed Tests*

52) Saadat Khan (Sept. 18 – May 19)

Topic: *Shock-Tube Experiments*

51) Tatyana Atherley (Jan. 18 – Dec. 18)
Topic: *Shock-Tube Experiments*

50) William Caraway (Oct. 17 – May 18)
Topic: *Laminar Flame Speed Experiments*

49) Victor Leon, (Sept. 15 – May 17)
Topic: *Design and Use of a New Turbulent Flame Speed System*

48) Mattias Turner, (Oct. 16 – May 17)
Topic: *Laminar Flame Speed Experiments*

47) Catherine Dillier (Mar. 14 – Dec. 14)
Topic: *Solid Propellants with Advanced Nano-Additives*

46) Katherine Letourneau (Jan. 14 – Sept. 14)
Topic: *Shock-Tube Chemical Kinetics*

45) Thuy Tran (Jan. 13 – Dec. 13)
Topic: *Solid Rocket Propellants*

44) James Christopher Thomas (Jan. 12 – May 13)
Topic: *Solid Rocket Propellants and Hybrid Rockets*

43) Clayton Mulvihill (Feb. 11 – May 13)
Topic: *Shock Tube Gas Dynamics*

42) Travis Sikes (Mar. 11 – Dec. 12)
Topic: *Flame Speed Experiments and Analysis*

41) Jose Emiliano Vivanco (Aug. 11 – Aug. 12)
Topic: *Shock-Tube Experiments*

40) Kenneth McCown (Oct. 10 – May 12)
Topic: *Liquid Monopropellant Chemistry*

39) Mitch Johnson (May 10 – July 12)
Topic: *Solid Rocket Propellant Burning Rates*

38) Rigoberto Lopez (Feb. 11 – Dec. 11)
Topic: *Detonation Wave Propagation and DDT Transition*

37) Alejandro Camou (Sept. 11 – Dec. 11)
Topic: *Aerosol Flame Speed Measurements*

36) Sean Baker (Feb. 09 – Aug. 11)
Topic: *High-Pressure Gas Dynamics*

35) Tyler Allen (June 09 – May 11)
Topic: *Solid Rocket Propellants*

34) Miles Egbert (Aug. 09 – May 11)
Topic: *Detonations and Shock Tubes*

33) Madeleine Kopp (May 09 – Dec 10)
Topic: *Shock Tube Ignition Measurements*

32) Jeffrey Johnson (Jan. 09 – May 10)
Topic: *Solid Rocket Propellant Burning Rates*

31) Rodrigo Garza Urquiza (Feb. 09 – May 10)
Topic: *Shock Tube Studies of Ignition and Oxidation*

30) Michael Krejci (July 09 – May 10)
Topic: *Laminar Flame Speed Measurements*

29) William Lowry (Aug. 08 – Dec. 08)
Topic: *Laminar Flame Speed Experiments*

28) Kevin Kreitz (May 08 – Dec. 08)
Topic: *Composite Solid Rocket Propellants*

27) Shatra Reehal (UCF, Jan. 06 – Dec. 07)
Topic: *High-Temperature Chemical Kinetics.*
26) Alex LePage (UCF, April 05 – Dec. 07)
Topic: *Solid Propellant Burn Rate Experiments.*
25) Benjamin Corbin (UCF, May 06 – Dec. 07)
Topic: *Flame Speed Experiment.*
24) Nicole Donato (UCF, Jan. 07 – Dec. 07)
Topic: *Chemical Kinetics and Shock Tubes.*
23) Zachary Dyer (UCF, Aug. 07 – Dec. 07)
Topic: *Solid Rocket Propellant Burning Rates*
22) Edric Gonzalez (UCF, May 07 – Dec. 07)
Topic: *Shock Tube Ignition Experiments*
21) Derek Lambe (UCF, Aug. 06 – Aug. 07)
Topic: *Shock Tube design improvements*
20) Kareem Moslehy (UCF, Oct. 06 – May 07)
Topic: *RAMP student—Solid Rocket Propellant Combustion*
19) Christopher Aul (UCF, Sept. 06 – Dec. 06)
Topic: *High-Pressure Shock Tube Design and Construction*
18) Matthew Stephens (UCF, Oct. 03 – April 06)
Topic: *High Burn Rate solid propellant mixing chemistry.*
17) Andreiev Powell, RAMP Fellowship (UCF, Oct. 03 – June 06)
Topic: *Solid Propellant Burn Rate Experiments and propellant characterization.*
16) Stefanie Simmons (UCF, July 05 – April 06)
Topic: *Shock Tube Experiments of Fuel Blend Ignition.*
15) Michael Hellmann (UCF, Aug. 05 – April 06)
Topic: *Shock-Tube Velocity Diagnostics and Heterogeneous Flows.*
14) Brandon Rotavera (UCF, Jan. 06 – Aug. 06)
Topic: *Rocket Injector Experiment.*
13) Victor Antonovski (UCF, July 05 – Dec. 05)
Topic: *Flame Speed Experiment and Rocket Injection for Shock Tubes.*
12) Steven Wolf (UCF, May 04 – April 05)
Topic: *Solid Propellant Burn Rate Experiments.*
11) Alison Kraft (UCF, Dec. 04 – May 05)
Topic: *Shock tube operation and design of diaphragm cutter.*
10) Troy Flaherty (UCF, Sept. 04 – May 05)
Topic: *Shock tube operation and hardware design to support facility.*
9) Joel Hall (UCF, Jan. 03 – May 04)
Topics: a) *Chemical kinetics modeling of hydrocarbon ignition*; b) *Kinetics model of OH* chemiluminescence in the presence of hydrocarbons.*
8) Schuyler Smith (UCF, May 03 – Nov. 04)
Topics: a) *Shock tube operation and design*; b) *support of solid propellant mixing experiments.*
7) Ray Simeone (UCF, Oct. 03 – April 04)
Topic: *Solid propellant burn rate experiments.*
6) Jason Arvanetes, Honors Project (UCF, Jan. 04 – April 04)
Topic: *High Burn Rate Solid Propellant Mixing and Burning.*
5) Matthew Drake, Honors Project: (UCF, Jan. 04 – May 04)
Topic: *Chemical Kinetics of Natural Gas Blends for Power Generation Gas Turbines.*
4) Joshua Bellotti, Honors Project: (UCF, Jan. 04 – May 04)

Topic*: Use of Design of Experiments for Testing the Effects of Variations in Fuel Composition on Gas Turbine Performance.*

3) Bryan Gartner, Honors Project: (UCF, Jan. 04 – May 04)

Topic*: A Survey of Combustion Characteristics of Synthetic Fuels for Stationary Gas Turbines.*

2) Danielle Kalitan (UCF, Jan. 02 – Aug. 03)

Topics: a) *Evaluation of Modern Chemical Kinetics Mechanisms of Silane Combustion*; b) *Ignition of ethylene/O_2/Ar mixtures with and without silane addition* (at Aerospace)

1) Barry Kudrowitz, Honors Project and Independent Study: (UCF, Jan. 03 – April 04)

Topics: a) *Amusement Park Rides*; b) *Implementation of Labview and Components for Data Acquisition in the ME Measurements Laboratory.*

University of California, Irvine/The Aerospace Corporation

Undergraduate and Graduate Students

1) Matthew Rickard (UG, G): (Sum99, Sum 00-May 04)

Topics: a) *Design of hardware for shock tube facility; b*) *Ignition of acetylene and ethane mixtures with and without silane addition.*

2) Matthew Traum (UG): (Sum00)

Topics: a) *Detail Design of a Vacuum System for The Aerospace Shock Tube Facility*; b) *Some Issues on Powdered-Aerosol Handling on the Aerospace Shock Tube Facility*

3) Erin Abbey (G): (Sum00)

Topic: *Analysis and Optimization of the Aerospace Shock Tube Velocity-Detection Scheme and its Impact on Test-Temperature Uncertainty*

4) Mike Papac (UG): (Sum00—Co-advisor with T. Moore, B. Brady)

Topic: *Recent Improvements to the Low-Pressure Flame Experiment*

Funded Research

Texas A&M University

Funded Proposals
Total TAMU/TEES credit for funded proposals to date, external only: **$9,406,056**
Total worth of contracts as PI at TAMU: **$9,879,224**
Total worth of all (TAMU) contract involvement as PI or Co-PI at TAMU: **$12,309,042**
Internal Funding (not included in totals above): **$45,000** (TRC)

58) Mesodyne, Inc. (Air Force Phase II STTR); Principal Investigator (B. Wilhite, CHEN; O. Mathieu, MEEN Co-PIs); $167,000 ($41,750 credit); "A Silent Man-Wearable Expeditionary Power Generator," Sept. 29, 2020 – Sept. 30, 2021.

57) Parametric Solutions, Inc. (DOE sponsor); Principal Investigator (O. Mathieu, MEEN, Co-PI); $248,654 ($124,327 credit); "Zero Emissions Syngas Combustor Test," Oct. 1, 2020 – Feb. 28, 2023.

56) CNS (Consolidated Nuclear Security); Principal Investigator (Chad Mashuga, CHEN, Co-PI); $100,001 ($5,000 credit); "Seismo Acoustic Study," Nov. 28, 2018 – Sept. 30, 2020

55) NSF; Principal Investigator; $10,000; "RET Supplement: Undergraduate Research in Energy and Propulsion," Sept. 15, 2016 – Dec. 31, 2019

54) University Coalition for Fossil Fuel Energy Research (Department of Energy); Principal Investigator (Kulatilaka, MEEN, Co-PI); $398,832 ($199,416 credit); "Validation of CFD Models for Turbulent, Supercritical CO_2 Combustion," Aug. 1, 2017 – Oct. 31, 2020

53) NSF; Principal Investigator; $269,999; "Chemical Kinetics of Phosphorus-Containing Compounds Used as Fire Suppressants Chemical Agents Surrogates," July 1, 2017 – June 30, 2020

52) Autoliv; Principal Investigator; $97,125; "Kinetics Modeling of Airbag Propellant Exhaust Gases," Jan. 1, 2017 – Sept. 30, 2017

51) Autoliv; Principal Investigator; $173,966; "Advanced Burning Rate Additives for Airbag Propellants," June 1, 2017 – May 31, 2018

50) Lynntech (SBIR Phase 2 to Air Force); Principal Investigator; $47,110; "Aerosol Experiments Supporting the Next Generation Organ-on-a-Chip," Oct. 7, 2016 – Nov. 20, 2018

49) NSF; Principal Investigator; $10,000; "RET Supplement: Undergraduate Research in Energy and Propulsion," Sept. 15, 2016 – Dec. 31, 2019

48) NSF; Principal Investigator; $10,000; "Veteran's Research Supplement: Undergraduate Research in Energy and Propulsion," Sept. 15, 2016 – Dec. 31, 2019

47) Louisiana State University (prime: DOE Co-Optima); Principal Investigator; $299,778; "Micro-Liter Fuel Characterization and Property Prediction," Mar. 1, 2017 – Feb. 28, 2021

46) National Science Foundation; Principal Investigator; $406,120; "REU Site: Undergraduate Research in Energy and Propulsion," Sept. 15, 2016 – Dec. 31, 2019

45) Siemens Canada; Principal Investigator; $138,420; "Siemens Chemical Kinetics and Flame Speed Data," Feb. 1, 2016 – May 31, 2017

44) Helicon Chemical Company, LLC (U.S. Navy JIMTP grant); Principal Investigator; $158,968; "Nanocomposite Propellant for Fragment Impact Violence Reduction," Nov. 1, 2016 – Aug. 15, 2019

43) Defense Threat Reduction Agency (DTRA); Principal Investigator (Co-PI: W. Kulatilaka); $746,397 ($373,199 credit); "High-Temperature Chemical Kinetics and Combustion of Chemical Agents in a c-WMD Environment," Mar. 1, 2016 – Feb. 28, 2020

42) Helicon Chemical Company, LLC (Navy SBIR, Phase 2); Principal Investigator; $88,993; "Solid Ramjet Fuel Containing in Situ Grown Aluminum Nanoparticles," Feb. 1, 2017 – Feb. 28, 2021

41) Helicon Chemical Company, LLC (Navy SBIR, Phase 2); Principal Investigator; $55,007; "Temperature-Insensitive Composite Propellants with Tunable Plateau Burning Using *in situ* Energetic Nanoparticles," Oct. 27, 2015 – Mar. 31, 2017

40) Strategic Environmental Research and Development Program (SERDP); Co-PI (PI: W. Kulatilaka); $150,000 ($75,000 credit); "Novel Laser Diagnostic Approaches for Evaluating Emissions from Metal-Based Energetic Formulations," Mar. 4, 2016 – Aug. 14, 2017

39) Department of Defense; Principal Investigator; $200,000; "Propellant Formulations for Suppressing Combustion Instability in Solid Rocket Motors," Feb. 3, 2016 – Feb. 2, 2017

38) Parametric Solutions, Inc. (Toshiba, Prime); Principal Investigator; $63,000; "Process 2 CO Measurements for Oxy-Fuel Combustor," Sept. 1, 2015 – Dec. 31, 2015

37) Qatar National Research Fund; Principal Investigator (Co-PI: B. Guo); $809,390 ($271,072 credit); "Liquid-Fuel Combustion at Engine Conditions Using Laminar Flames and an Aerosol Shock Tube in Qatar," Feb. 2, 2016 – Mar. 31, 2020

36) National Science Foundation; Principal Investigator; $10,000; "Veterans Research Supplement," April, 2015 – Mar. 2016

35) National Science Foundation; Principal Investigator; $10,000; "RET Supplement for REU Site," April, 2015 – Mar. 2016

34) Helicon Chemical Company, LLC (Navy SBIR, Phase I); Principal Investigator; $19,000; "Solid Ramjet Fuel Containing *in Situ* Grown Aluminum Nanoparticles," May 2014 – June 2015

33) Parametric Solutions, Inc. (Toshiba, prime); Principal Investigator; $101,130; "Diagnostic Support for CO_2-CH_4 Combustor," Aug. 1, 2014 – June 30, 2015

32) National Science Foundation; Principal Investigator; $10,000; "RET Supplement: Texas Center for Undergraduate Research in Energy and Propulsion," June 1, 2014 – May 31, 2015

31) Rolls-Royce Canada; Principal Investigator; $29,452; "Laminar and Turbulent Flame Speed Measurements for Gas Turbine EGR Applications," Aug. 1, 2013 – April 30, 2014

30) Turbomachinery Research Consortium (Internal); Principal Investigator; $45,000; "Effect of Exhaust Gas Recirculation on Gas Turbine Combustion Chemistry at Elevated Pressures," Feb. 2014 – Jan. 2015

29) Helicon Chemical Company, LLC (Navy SBIR, Phase I); Principal Investigator; $25,000; "Temperature-Insensitive Composite Propellants with Tunable Plateau Burning Using *in situ* Energetic Nanoparticles," Dec. 2013 – Nov. 2014

28) Alstom Power; Principal Investigator; $59,822; "Turbulent Flame Speed Measurements and FGR Calculations," Aug. 1, 2013 – July 31, 2014

27) DOE-NETL; Principal Investigator; $498,382; "High-Pressure Turbulent Flame Speeds and Chemical Kinetics of Syngas Blends with and Without Impurities," Oct. 1, 2013 – Sept. 30, 2017

26) University of Central Florida; Principal Investigator (Co-PI: T. Jacobs); $15,000 ($7,500 credit); "GAP Project: Use of Oxide Nanoparticles in Soot Reduction," June 3, 2013 – Dec. 3, 2013

25) National Science Foundation; Principal Investigator; $10,000; "RET Supplement: Texas Center for Undergraduate Research in Energy and Propulsion," May 1, 2013 – April 30, 2014

24) Department of Defense; Principal Investigator; $616,516; "Ignition of Composite Propellants with Advanced Additives," June 19, 2013 – Dec. 18, 2016

23) National Science Foundation; Principal Investigator; $403,921; "REU Site: Texas Center for Undergraduate Research in Energy and Propulsion," April 1, 2013 – March 31, 2016

22) Alstom Power; Principal Investigator; $38,500; "High-Temperature, High-Pressure Laminar Flame Speeds," Jan. 14, 2013 – Sept. 30, 2013

21) Parametric Solutions, Inc.; Principal Investigator; $209,106; "Diagnostic Support for CO_2-CH_4 Combustor," Sept. 1, 2012 – Mar. 31, 2014

20) National Science Foundation; Principal Investigator; $10,000; "RET Supplement: Texas Center for Undergraduate Research in Energy and Combustion," Mar. 1, 2012 – Feb. 28, 2013

19) Rolls-Royce Canada; Principal Investigator; $268,562; "Hydrocarbon Fuel Ignition and Flame Speed Measurements at Gas Turbine Conditions," Oct. 1, 2011 – December 31, 2012

18) Alstom Power; Principal Investigator; $113,740; "Kinetics of High-Hydrogen, CH_4-Based Fuels," Oct. 1, 2011 – September 30, 2012

17) Department of Defense; Principal Investigator; $800,000; "Solid Propellant Additives for DACS Applications," March 15, 2011 – March 14, 2015

16) National Science Foundation; Principal Investigator; $10,000; "RET Supplement: Texas Center for Undergraduate Research in Energy and Combustion," Sept. 30, 2011

15) Department of Energy; Principal Investigator; $501,712; "Turbulent Flame Speeds and NOx Kinetics of HHC Fuels with Contaminants and High Dilution Levels," Oct. 1, 2010 – Sept. 30, 2013

14) Air Force Research Laboratory (via Gray Research); Principal Investigator; $71,200; Ignition Kinetics of Ionic-Liquid-Based Monopropellants," Oct. 1, 2010 – July 29, 2011

13) Alstom Power; Principal Investigator; $24,699; "Chemiluminescence of CO_2* and OH* at Elevated Pressure," June, 2010 – May 2011

12) National Science Foundation; Principal Investigator; $5,950; "REU Supplement for Career Award," July, 2010 – January, 2011

11) National Science Foundation; Principal Investigator; $300,000; "REU Site: Texas Center for Undergraduate Research in Energy and Combustion," July, 2010 – June 2013

10) Rolls-Royce Canada; Principal Investigator; $272,213; "Flame Speed, Ignition, and NOx Kinetics Measurements for High Water Content Mixtures and Biodiesel Fuels," Oct., 2009 – Dec. 31, 2010

9) National Science Foundation; Principal Investigator; $37,144; Graduate Research Supplement: Shock-Tube Studies of Ignition and Oxidation at Practical Conditions," Sept. 2009 – Jan. 2011

8) National Science Foundation; Co-PI (PI: Renyi Zhang, Atmospheric Sciences); $330,000 ($146,984 credit); "Generation, Characterization, and Atmospheric Aging of Soot Particles from Diesel Combustion," Sept. 2009 – Aug. 2013

7) DARPA (via Army AMRDEC); Co-Principal Investigator (PI: Terry Creasy, ME); $1,950,000 ($975,000 credit); "Nastic Materials Program – Phase 3," May 2009 – April 2010

6) Alstom Ltd.; Principal Investigator; $31,400; "Experiments and Kinetics Modeling of Chemiluminescence at Gas Turbine Relevant Conditions," May 2009 – Dec. 2009

5) Rolls-Royce Canada; Principal Investigator; $234,506; "Shock Tube and Flame-Speed Measurements at Engine-Relevant Conditions," May 2008 – Dec. 2009

4) National Science Foundation; Principal Investigator; $219,472 (Transfer from UCF in 3rd year); "CAREER: Shock-Tube Studies of Ignition and Oxidation at Practical Conditions," Jan. 2008 – Jan. 2011

3) General Electric; Principal Investigator; $73,016; Topic: Natural Gas Sample Autoignition Testing," May 2008 – March 2009

2) University of Central Florida (DOD, parent); Principal Investigator; $237,250; "High Impulse Rocket Propellants Using Nanoparticle Additives," Jan. 2008 – March 2010

1) University of Central Florida; Principal Investigator; Funding: $5,479; "Analysis of High Pressure Methane/Hydrocarbon/Air Ignition Experiments," Jan. 2008 – May 2008

University of Central Florida

Funded Proposals
Total UCF credit for funded proposals to date, internal and external: **$2,124,844**
Total worth of contracts as PI: **$2,128,914**
Total worth of all contract involvement as PI or Co-PI: **$2,600,774**

1) National Science Foundation; Principal Investigator; $434,962; Topic: CAREER: Shock-Tube Studies of Ignition and Oxidation at Practical Conditions," Feb. 2006 – Jan. 2011

2) Siemens Westinghouse Power Corporation; Principal Investigator; $121,000; "Ignition of Hydrogen-Based Mixtures at Gas Turbine Pressures," Feb. 2006 – Sept. 2007

3) Florida High-Tech Corridor (I-4 match for Siemens above); Principal Investigator; $60,534; "Ignition of Hydrogen-Based Mixtures at Gas Turbine Pressures," Feb. 2006 – Sept. 2007

4) Rolls-Royce Canada; Principal Investigator; $298,338; "Methane-Blend Ignition and Flame Speed Experiments," May 2006 – Dec. 2007

5) National Science Foundation; Principal Investigator; $20,000; "RET Supplement for CAREER Award," Feb. 2006 – Jan. 2011

6) Power Systems Manufacturing; Principal Investigator; $19,950; "Natural Gas Ignition at Gas Turbine Premixer Conditions," June 2006 – Oct. 2006

7) SFTI Phase I; Principal Investigator; $60,000; "Fundamental Combustion Measurements of Synthetic Fuels at Gas Turbine Temperatures and Pressures," Dec. 2006 – Dec. 2007

8) Rolls Royce via National University of Ireland, Galway; Principal Investigator; $15,225; "High-Pressure Methane/Propane/Air Ignition Experiments," Aug. 2005 – Jan. 2006

9) Florida Space Grant Consortium (NASA); Principal Investigator; $24,950; Topic: Characterization of Cryogenic Rocket Injectors for High Performance and Combustion Instability," Aug. 2005 – July 2006

10) Florida Space Grant Consortium (NASA); Principal Investigator; $12,000; "FSGC Fellowship for Danielle Kalitan," Aug. 2005 – July 2006

11) Department of Defense; Principal Investigator (S. Seal, Co-PI); $600,000 ($360,000 credit) "High Impulse Rocket Propellants Using Nanoparticle Additives," Sept. 2005 – May 2009

12) National Science Foundation; Co-PI (R. Kumar, PI); $22,000 ($11,000 credit); " RET: Central Florida Space Science Institute (CFSSI), Supplements (x2)," May 2005 – April 2006, May 2006 – April 2007

13) Department of Energy via SCIES/UTSR; Principal Investigator; $405,990; "Combustion Characterization and Modeling of Fuel Blends for Power Generation Gas Turbines," May, 2004 – April, 2008

14) National Science Foundation; Co-PI (R. Kumar, PI); $449,860 ($224,930 credit); "NSF RET Site—Central Florida Space Science Institute," May, 2004 – April, 2007

15) Space Launch Corporation; Principal Investigator; $29,965; "High Burn Rate Solid Propellant Research," Dec., 2003 – May, 2004

16) Nelson Engineering (Donation); Principal Investigator; $10,000 ($10,000 + $20,000 match); "Research and Teaching Laboratory Improvement," Nov., 2003 – May, 2004

17) Florida Space Grant Consortium; Principal Investigator; $3,000; "Undergraduate Research on Heterogeneous Combustion for Aerospace Applications," May – Aug., 2003

18) UCF – In-house Research Grant; Principal Investigator; Funding: $10,000; "Injector System for Fast Liquid-Spray Combustion Studies," May – Aug., 2002

19) Florida Space Grant Consortium; Principal Investigator; $3,000; "Silane Combustion for Space Applications," May – Aug., 2002

Patents

U.S. 7,419,516 B1 (9/2/2008) "Use of Oxide Nanoparticles in Soot Reduction," Seal, Petersen, Deshpande, Patil, Kuiry

U.S. 7,931,763 B2 (4/26/2011) "Burn Rate Sensitization of Solid Propellants Using a Nano-Titania Additive," Seal, Petersen, Small, Stephens, Arvanetes, Deshpande

U.S. 7,959,690 B1 (6/14/2011) "Nanoparticles for Soot Reduction," Seal, Petersen, Deshpande, Patil, Chandrakuiry

U.S. 8,114,229 B1 (2/14/2012) "Self-Extinguishable Solid Propellant," Petersen, Seal, Stephens, Reid, Carro, Sammet, LePage

U.S. 8,336,287 (12/25/2012) "Solid Propellant Rocket Motor Having Self-Extinguishing Propellant Grain and Systems Therefrom," Petersen, Seal, Stephens, Reid, Carro, Sammet, LePage

U.S. 9,573,857 B2 (2/21/2017) "Compositions Having Aluminum Particles Dispersed in a Continuous Phase," Reid, Seal, Petersen

Japanese Patent Number 6055539 (12/9/2016) "Compositions Having Aluminum Particles Dispersed in a Continuous Phase and a Method of Forming Thereof," Reid, Seal, Petersen

U.S. 10,370,306 B2 (8/6/2019) "Polymer Composite Having Dispersed Transition Metal Oxide Particles," Reid, Seal, Petersen, Draper

U.S. 10,981,843 B2 (4/20/2021) "Polymer Composite Having Dispersed Transition Metal Oxide Particles," Reid, Seal, Petersen, Draper

U.S. Patent Application 62/580,997 (filed 11/2/2017) "Method for Semi-Continuous Shock Treatment," Holtzapple, Bond, and Petersen

Committees, Service, and Awards

Committee Membership and Service– Texas A&M University

- MEEN Search Committee, Chair (2021 – present)
- Faculty Advisory Committee, MEEN, Chair (2021 – present)
- FASC, MEEN program, TAMU-Q (2020 – present)
- College Tenure and Promotion Committee (CETPAC) (2021)
- Tenure and Promotion Committee (2020 – 2021)
- Academic Program Review Committee (2019 – 2020)
- Post-Tenure Review Committee (2019)
- MEEN Faculty Search Committee (2017-2018)
- College Tenure and Promotion Committee, CETPAC (2017 – 2019)
- Tenure and Promotion Committee, Chair (2016 – 2019)
- Post-Tenure Review Committee (2014 – 2017)
- Chair, Mentoring Committee (2014 – 2016)
- Tenure and Promotion Committee (2013 – 2015)
- Department Advisory Committee (2013-2016)
- Chair, Strategic Planning Committee (2013 – 2018)
- National Security Task Force committee (College) (Spring 2013)
- Faculty Search Committees (2010-11; 2011-12; 2012-13; 2013-14)
- Chair, Graduate Program Review Committee (2012-2018)
- Graduate Studies Committee (2009 – 2015)
- PI of REU Site: Undergraduate Research in Energy and Propulsion (2010 – 2019)
- Pi Tau Sigma Faculty Advisor (2008-2012)
- Diversity Fellowship reviewer (Spr11)

Committee Membership – University of Central Florida

<u>For the University and College (UCF)</u>

- Honors Committee (F05 – F07)
- Undergraduate Research Council (F05 – F07)
- Undergraduate Course Review Committee (F01 – Spr03)

<u>For MMAE Department (UCF)</u>

- Steering Committee (F06 – F07)
- Performance Evaluation Committee (F05 – F07)
- Undergraduate Committee (Fall04 – Sum05)
- Graduate Committee (F03 – Sum04)
- Honor and Awards Committee (Fall 01 – Sum04)
- Undergraduate Course Committee (Fall 02 – Spr03)
- Laboratory Improvement Committee (Spring 03 – present)

Professional Service Activities

- Colloquium Co-Chair, Laminar Flames Colloquium, 39th International Symposium on Combustion, July 24 – 29, 2022, Vancouver, Canada.
- NSF Panel Proposal Peer Reviewer, Sept. 2021, CBET program

- Meeting Host, 12th U.S. National Combustion Meeting (Virtual), May 24 – 26, 2021.
- Session Chair, 12th U.S. National Combustion Meeting (Virtual), May 24 – 26, 2021
- Proposal Reviewer, Israel Science Foundation, March 2021.
- Session Co-Chair, 2 sessions, 38th International Symposium on Combustion, Jan. 25 – 29, 2021, Adelaide, Australia (Virtual); originally scheduled for July 2020
- NSF Panel Proposal Peer Reviewer, June 2020, CBET program
- Session Co-Chair, 2020 AIAA SciTech Forum, Jan. 6 – 10, 2020, Orlando, FL.
- Colloquium Co-Chair, Laminar Flames, 38th International Symposium on Combustion, Jan. 25 – 29, 2021, Adelaide, Australia (Virtual); originally scheduled for July 2020.
- Session Chair, 27th International Colloquium on Detonations, Explosions, and Reactive Systems, July 28 – Aug. 2, 2019, Beijing, China.
- Colloquium Co-Chair, 27th International Colloquium on Detonations, Explosions, and Reactive Systems, July 28 – Aug. 2, 2019, Beijing, China.
- Session Chair, 32nd International Symposium on Shock Waves, July 14 – 19, 2019, Singapore.
- Proposal Peer Reviewer, *SERDP*, May 2019.
- Session Chair, 37th International Symposium on Combustion, July 29 – Aug. 3, 2018, Dublin, Ireland.
- Session Chair, AIAA Propulsion and Energy Forum, July 9-11, 2018, Cincinnati, OH.
- Conference Co-Organizer, 2018 Spring Technical Meeting, Central States Section of the Combustion Institute, Minneapolis, MN, May 20-22, 2018.
- External proposal reviewer for NSERC (Canada), Jan. 2018.
- Session Co-Chair, 26th International Colloquium on Detonations, Explosions, and Reactive Systems, July 30 – Aug. 4, 2017, Boston, MA, USA.
- Session Chair, 31st International Symposium on Shock Waves, July 9 – 15, 2017, Nagoya, Japan.
- Proposal Peer Reviewer, *SERDP*, May 2017.
- External examiner, Ph.D. thesis defense, Department of Mechanical Engineering, McGill University, Montreal, Canada, Jan., 2017.
- Proposal Review Panel, *National Science Foundation*, Oct., 2016
- Session Co-Chair, *36th International Symposium on Combustion*, Seoul, Korea, Aug. 2016.
- Associate Editor, *Journal of Propulsion and Power* (2016 – present)
- Program Co-Chair, *2016 Spring Technical Meeting of the Central States Section of the Combustion Institute*, May 15-17, Knoxville, TN.
- Proposal Review Panel, *National Science Foundation*, March, 2016.
- External examiner, Thesis Defense, CNRS and University of Orleans, Orleans, France, Dec. 14, 2015.
- Session Organizer and Co-Chair, *25th International Colloquium on the Dynamics of Explosions and Reactive Systems*, Aug. 2 – 7, 2015, Leeds, UK.
- Associate Editor, *Journal of Engineering for Gas Turbines and Power* (2015 – present)
- Program Co-Chair, *9th U.S. National Combustion Meeting*, May 17-20, 2015, Cincinnati, OH.
- Session Chair, *9th U.S. National Combustion Meeting*, May 17-20, 2015, Cincinnati, OH.
- Proposal Review Panel, *National Science Foundation*, Nov. 2014.

- Session Chair, *35th International Symposium on Combustion*, Aug. 4-8, 2014, San Francisco, CA.
- Session Chair, *Spring Technical Meeting of the Central States Section of the Combustion Institute*, Mar. 16-18, 2014, Tulsa, OK.
- External Thesis Examiner, *National University of Ireland Galway*, Ireland, Department of Chemistry – Fiona Gillespie, Ph.D. Candidate (Feb. 2014)
- Invited External Reviewer, *Argonne National Laboratory*, Chemical Sciences and Engineering Division, Nov. 2013
- Proposal Review Panel, *National Science Foundation*, Nov. 2013
- Proposal Review Panel, *American Association for the Advancement of Science*, Sept. 2013
- Editorial Board Member, *Combustion and Flame* (2013 – 2018)
- Board Member and Vice President, *Institute for Dynamics of Explosions and Reactive Systems* (Aug. 2017 – present; board member since 2009)
- Colloquium Co-Chair, *ICDERS 2013 – 24th International Colloquium on the Dynamics of Explosives and Reactive Systems*, July 28 – Aug. 2, 2013, Taipei, Taiwan
- Board Member, *Shock Wave Institute* (July 2013 – July 2015)
- Session Chair, *29th International Symposium on Shock Waves*, July 14-19, 2013, Madison, WI, USA
- Board Member, *Central States Section of the Combustion Institute* (May 2013 – present)
- Session Chair, *8th U.S. National Combustion Meeting*, May 19-22, 2013, Ogden, UT.
- External Thesis Examiner, *McGill University*, Montreal, Canada, Mechanical Engineering Department – Jimmy Vereault, Ph.D. Candidate (Mar. 2011)
- Session Co-Chair, 49th AIAA Aerospace Sciences Meeting and Exhibit, Orlando, FL (Jan. 2011)
- Session Chair, 33rd International Symposium on Combustion, Beijing, China (Aug. 2010)
- External Thesis Examiner, *National University of Ireland Galway*, Ireland, Department of Chemistry – Darren Healy, Ph.D. Candidate (Oct. 2009)
- Faculty Advisor, TAMU Pi Tau Sigma (Aug. 2008 – May 2012)
- Board Member and Secretary, *Institute for Dynamics of Explosions and Reactive Systems* (Aug. 2009 – Aug. 2013)
- Session Chair, 2009 ASME Turbo Expo, Orlando, FL (June 2009)
- NSF Review Panels, CBET Division
- Invited Session Chair, NSF Hydrogen Combustion Workshop (April 2006)
- Co-Organizer, Fall 2005 Meeting of the Eastern States Section of the Combustion Institute, UCF, Orlando, FL (Nov. 2005)
- Session Chair, Fall 2005 Meeting of the Eastern States Section of the Combustion Institute, Orlando, FL (Nov. 2005)
- Session Chair, 20th International Colloquium on the Dynamics of Explosions and Reactive Systems, Montreal, Canada (Aug. 2005)
- NSF Review Panel, CST Division (April 2005)
- Session Chair, 4th Joint Meeting of the U.S. Sections of the Combustion Institute, Philadelphia, PA (Mar. 2005)
- Faculty Advisor, UCF AIAA (Fall 2002-Dec. 2008)
- Faculty Advisor, UCF *Sigma Gamma Tau* Honor Society (May 2004-Dec. 2008)

- Judge, Florida Science Olympiad, Cypress Creek HS, Orlando, FL (Mar. 2005)
- Faculty Advisor, SAE Heavy Lift Airplane Team (2003, 2004, 2005)
- Faculty Advisor, AIAA DBF/Electric Airplane Team (2003, 2004, 2005)
- Open House Mock Lecture, "Rocket Science at UCF," (April 2004)
- Board member, local ASME chapter (Florida section, Region XI) (2002-2003)
- Career Day, Winter Park High School, presenter (Fall 2003, Fall 2002)
- Represented Florida section of ASME at Regional Administrative Conference (April 2002, Jackson, MS)
- Judge for SAE AeroEast Heavy Lift Airplane design competition, Cocoa/Deland, FL (2002, 2004, 2005)

Honors and Awards

2020 *Combustion Institute Fellow*
2020 *AIAA Associate Fellow*
2019 *Holder of the Nelson-Jackson Chair* in Mechanical Engineering
2019 *Dean of Engineering Excellence Award*, Professor level
2017 *Mercator Fellow*, Germany, University of Duisburg-Essen (2017 – 2021)
2017 *TEES Senior Faculty Fellow Award*
2015 *The James J. Cain Graduate Teaching Award*, Dept. of Mechanical Engineering
2014 *Best Paper Award*, X ISHPMIE (Tenth International Symposium on Hazards, Prevention, and Mitigation of Industrial Explosions), Bergen, Norway, June 2014.
2013 *Nelson-Jackson Professor*
2011 *TEES Fellow Award*
2011 *Teaching Excellence Award* for Fall 2010
2010 *ASME Fellow*
2010 *Faculty Fellow, Mary Kay O'Connor Process Safety Center*
2010 *Leland T. Jordan Career Development Professorship*
2010 *Teaching Excellence Award* for Fall 2009
2009 *Best Paper Award*, 2008 ASME Turbo Expo, Combustion & Fuels Subcommittee
2009 *Outstanding Laboratory Safety Inspection of the Month*, Texas A&M, May 2009
2007 *Research Incentive Award*, UCF
2007 *Best Paper*, AIAA Annual Southeastern Regional Conference, UG Category
2006 *Outstanding Researcher Award*, Assistant Professor, CECS, UCF
2006 *Teaching Incentive Program Award*, UCF
2006 *Pi Tau Sigma Professor of the Year*, UCF
2006 *NSF CAREER Award*
2005 *Pi Tau Sigma Professor of the Year*, UCF
2005 *Best Paper*, AIAA Annual Southeastern Regional Conference, Graduate Category
2005 *Best Paper*, AIAA National Student Conference, Undergraduate Category
2004 *Pi Tau Sigma Advisor of the Year,* UCF
2004 *Best Paper*, AIAA Annual Southeastern Regional Conference, UG Category
2003 *CECS Professor of the Year* (for MMAE), UCF
2003 *Pi Tau Sigma Professor of the Year,* UCF
2000, 1998 *Performance Award* (2); outstanding efforts, The Aerospace Corporation.
1995 *Chuck Hawley Seminar Award*; best seminar, '94-'95 school year, Stanford.
1993, 1991 *Incentive Award* (2); outstanding accomplishments, Pratt & Whitney.
1991 *NASA Group Achievement Award*; NLS Subscale Injector test team.
1991 *Special Award*; Pratt & Whitney, NLS injector design and analysis.

1988 - 1990	*Florida Graduate Scholars Fund Fellowship*, University of Florida.
1988 - 1990	United Technologies *Propulsion Research Fellowship*, University of Florida.
1986 - 1988	INPO Scholarship, U. of Central Florida.
Other	Member of *Tau Beta Pi*, *Pi Tau Sigma*, and *Sigma Gamma Tau* engineering honor societies.

Consulting

- Solar Turbines (2019) Consultant on auto-ignition

- ATA Engineering (2019 – present) Consultant on shock-tube technology for SBIR project

- IMS Expert Services (2017 – 2018) Professional consultant on rocket propulsion

- Parametric Solutions, Inc. (2012 – 2014) Consultant on high-pressure combustion chemistry and experimental diagnostics for combustion and reacting flows

- The Aerospace Corporation. (2001-present) Consultant on matters related to rocket propulsion and experiments related to fluid mechanics, combustion, and propulsion

- Power Systems Manufacturing (PSM). (2006) Performed calculations related to gas turbine combustion system.

- SATOP (Space Alliance Technology Outreach Program). (2003-2007) Served as a consultant on NASA/SATOP program projects, mostly related to fluid flow properties, etc.

- Space Launch Corporation. (2001-2003) Consultant on matters involving space launch using chemical propulsion.