MOHAMAD (HAMEED) METGHALCHI

BUSINESS ADDRESS

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EDUCATION

Sc.D. Massachusetts Institute of Technology (1980)
Major: Mechanical Engineering: Minor: Economics
M.S. Massachusetts Institute of Technology (1977)
Major: Mechanical Engineering
B.S. University of Oklahoma (1975)
Major: Mechanical Engineering

PROFESSIONAL SOCIETIES

Honorary member of American Society of Mechanical Engineers (ASME)
Life Fellow, American Society of Mechanical Engineers (ASME)
Member, Society of Automotive Engineers (SAE)
Member, Combustion Institute
Member, American Society of Engineering Education (ASEE)

HONOR SOCIETIES

Tau Beta Pi
Pi Tau Sigma

PROFESSIONAL EXPERIENCE

NORTHEASTERN UNIVERSITY, BOSTON, MA 02115

Employment

- January 2016 - 2019: Director of Energy Systems program.

- September 2006 to August 2007: Interim Dean of College of Engineering
- September 2006 to July 2009: Senior Associate Dean of College of Engineering
- July 2004 to 2011: Chair of Mechanical and Industrial Engineering Department.
- July 2003 to June 2004: Interim Chair of Mechanical, Industrial and Manufacturing Engineering Department.
- July 1999 to January 2000: Acting Chair of Mechanical, Industrial and Manufacturing Engineering Department
- September 1995 to 2003: Associate Chair of Mechanical, Industrial and Manufacturing Engineering Department.
- September 1991 to 1995: Associate Chair of Mechanical Engineering Department.

Activities

- **Administration:**

A. Interim Dean of College of Engineering, 2006-2007

In charge of total operation of the college such as Advancement, Alumni Relation, Academic, Recruiting undergraduate and graduate students as well as faculty members. Effective in increasing retention rate and fund raising.

B. Chair of Mechanical and Industrial Engineering Department: 2004-2012

Increasing number of undergraduate students from 400 to 900, graduate students from 200 to 450 and doctoral students from 35 to 135. Increasing number of faculty members from 24 to 44.

1. Developing long term plan for the department.
2. Chair of Undergraduate Curriculum Committee.
3. Development of semester-based curricula for both Mechanical and Industrial Engineering programs as well as quarter-based curricula (curriculum 2000 and 2003) for both programs.
4. Scheduling courses for BS, MS and Ph.D. programs in Mechanical and Industrial Engineering, MS program in Engineering Management and MS and Ph.D. programs in Computer System Engineering programs.
5. Assigning faculty teaching loads, hiring and assigning teaching assistants.
6. Daily operations of the department.
7. Advisor to all Honors, transfer and part time students.
8. During my tenure, annual research support of the department increased from $1.5M to $10M annually.
9. During my tenure, number of Ph.D. candidates increased from 35 to 110 annually.

C. Director of Interdisciplinary Master of Science in Energy System: 2015-2019

Improving curriculum composing of Engineering, Science, Business and Public Policy. Number of students was increased by over 200% in two year.

- **Research:**
    1. Laminar burning speed measurement under 1-g and microgravity conditions.
    2. Simplifying combustion chemistry using Rate-Controlled Constrained-equilibrium method.
    3. Autoignition and detonation studies.
    4. Experimental study of combustion instabilities.
    5. Pulse detonation engine.
    6. Fundamentals of thermodynamics.
    7. Flame stability and structure.
    8. Educational research in STEM (Science, Technology, Engineering and Mathematics)
    9. Fundamental investigation of burning natural gas in internal combustion engines.

- **Teaching:**
    1. Courses in thermodynamics (undergraduate and graduate), thermal system analysis and design, fluid mechanics, internal combustion engine and combustion.
    2. Development of courses in theory of internal combustion engines and graduate level combustion fundamentals.
    3. Laboratory development for thermal science undergraduate courses.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY, CAMBRIDGE, MA 02139

Academic Year 1987-88 Visiting Associate Professor
Academic Year 1993-94 Visiting Associate Professor

FUNDING AWARDS (all at NU)

1. Awarded $32,000 by NSF (Grant No. PRM-8203101) for "Acquisition of a Gas Analysis System for Air Pollutants", two years, (1982).

2. Awarded $3,500 by Research and Scholastic Development Fund (RSDF) for research on "Prediction of Laminar Burning Velocities of Fuel-Air Mixtures", one year, (1982).

3. Awarded $4,000 by Research and Scholastic Development Fund (RSDF) for research on "Modeling of Coal-Fueled Diesel Engine Combustion", one year, (1984).

4. Awarded $4,975 by Instructional Development Fund (IDF) for research on "A Data Acquisition System for the Mechanical Engineering Laboratory", one year, (1985).

5. Awarded $19,734 by Integrated Genetics for research on "Fluid Mechanic Characterization of Mammalian Cell Bioreactors", with Professor McMillan, one year, (1987).

6. Awarded $10,000 by Stone and Webster Corporation for research on "Modeling of Coal-Fueled Diesel Engine Combustion", one year, (1988).

7. Awarded 50 hours of CPU time in the John Von Neumann National Supercomputer Center for research on "Use of the Rate-Controlled Constrained Equilibrium in Autoignition Study", one year, (1988).

8. Awarded $20,000 by Stone and Webster Corporation for research on "Calcium Magnesium Acetate for Sulfur Emissions Control in Selected Coal-Fired Systems" with professors Levendis and Wise, one year, (1989).

9. Awarded $200,000 by Department of Energy for research on "Effects of Calcium Magnesium Acetate on the Combustion of Coal-Water slurries" with professors Levendis and Wise, three years, (1989).

10. Awarded $30,582 by NSF (Grant No. EID-8950688) for "Use of Laser-Doppler Velocimetry in Fluid Mechanics Laboratory", two years, (1989).

11. Awarded $20,000 by Stone and Webster Corporation for research on "Coal Combustion" with Professors Levendis and Wise, one year, (1990).

12. Awarded $16,000 by Genzyme Inc. for research on "Hydrodynamic Evaluation of a Bioreactor" with Professor Barabino, one year, (1995).

13. Awarded $50,000 by Ford Motor Company for research on “Laminar Burning

Velocity Determination", one year, (1996).

14. Awarded $20,000 by Northeastern University for research on "Educational Goals and Assessment Framework" with Professors Cullinane and Kowalski, one year, (1997).

15. Awarded $50,000 by Ford Motor Company for research on "Laminar Burning Velocity of Methane-Oxygen-Argon Mixture", one year, (1998).

16. Awarded $50,000 by Ford Motor Company for research on "Burning Velocity Measurements at High Temperatures", one year, (1999).

17. Awarded $100,000 by Northeastern University for research on "Development of a Student Centered Information Technology Based Advising System" with Professors Cullinane, Kowalski and Lee, two years, (2000).

18. Awarded $265,000 by Army Research Office for research on "Autoignition and Burning Speeds of JP-8 Fuel at High Temperatures and Pressures", three years, (2001).

19. Awarded $82,125 by DOD (DURIP) for: "To Purchase a Gas Chromatograph and Enhancing Flame Capturing Facilities Using A High Speed CCD Camera", (2002).

20. Awarded $50,000 from Caterpillar Co. for research on "Burning Speed Measurement of Natural Gas at Internal Combustion Engine Conditions", (2002).

21. Awarded $197,223 from Office of Naval Research for "Burning Speed and Autoignition Characteristics of JP-10 Fuel at High pressures and Temperatures", (2003).

22. Awarded $300,000 by Army Research Office for research on **"**Experimental and Theoretical Studies of Autoignition and Burning Speed of JP-8 and DF-2", (2005).

23. Awarded $250,000 by DOD (DURIP) for: "Proposal to Purchase a Planar Laser Induced Florescence (PLIF) System Including the Laser, Optics and the gated CCD camera", (2005).

24. Awarded $250,000 by Elizabeth Lufkin Trust for: "Mechanical Engineering Equipment", (2005).

25. Awarded $25,000 by Environ for "Energy Research", (2006).

26. Awarded $1,995,000 by NSF for "NU-STEP-UP" PI: C. Zahopoulos, Co-PI Metghalchi, (2007)

27. Awarded $84,500 by Environ for "Energy Research", (2007).

28. Awarded $234,000 by Elizabeth Lufkin trust for: ”Purchase of Machinery for the Mechanical and Industrial Engineering Department”, (2008).

29. Awarded $95,000 by Environ for “Thermal Systems”, (2008)

30. Awarded $50,000 by Army Research Office for research on “Rate-Controlled Constrained-Equilibrium (RCCE) Modeling of Propulsive Performance of Energetic Materials in a Hypersonic Nozzle”, (2008).

31. Awarded $299,903 by Office of Naval Research for research on “Burning Speed, Autoignition and Flame Structure of Bio-Jet Fuels” (2009).

32. Awarded $574,462 by NSF for “Investing in Tomorrow’s Engineering Leaders” PI: A. Zeid, Co-PI: Metghalchi (2009).

33. Awarded $20,000 by Aspen Products for “Efficient, Low Emission Generator” (2009).

34. Awarded $45,000 by Novatio Engineering for “JP-8 Combustion” (2010).

35. Awarded $298,370 by NSF for “2012 NSF CMMI Grantee Conference” PI: M. Bernstein, Co-PI: Metghalchi (2010)

36. Awarded $199,199 by NSF for “LSAMP Educational Research Project: Retention of URM Engineering Students through Practice-Oriented Experiential Education” (2011).

37. Awarded $300,000 by NSF for “LSAMP Phase III”. Northeast Alliance with UMass Amherst as Lead. Other members: UConn, URI and WPI (2011)

38. Awarded $45,000 by Novatio Engineering for “Fundamental of Combustion of Practical Fuels” (2011).

39. Awarded $59,922 by ASHRAE for “Assessment of Alternative Approaches to Predicting the Burning Velocity of a Refrigerant” (2011).

40. Awarded $45,000 by Novatio Engineering for “Small Power Generation” (2012).

41. Awarded $230,000 by Qatar Foundation for “Combustion Properties of Gas to Liquid (GTL) Fuel” (2015).

42. Awarded $300,329 by Qatar Foundation for “Experimental and Computational Investigations of the Ignition and Combustion of GTL and Jet Fuel Blends” (2015).

43. Awarded $335,000 by NSF for “LSAMP”. Northeast Alliance with University of Connecticut as Lead. Other members: UMass, URI, Tufts and WPI, (2016).

44. Awarded $42,509 by Novatio Engineering for "Fundamental Studies of JP8/Syngas Combustion". (2017)

45. Awarded $1,000,000 by NSF for "Bridge to Doctorate", Co-PI (2018)

46. Awarded $110,000 by American Chemical Society, Petroleum Research Fund for, "Containment of Greenhouse Gases Through Use of Refrigerants That are based on Petroleum-Derived Products and recycled CO_2", Co-PI (2018).

47. Awarded $181,300 by Shell Oil Company for, "Hydrocarbon-CO2 blends: An Environmentally-Benign Alternative Refrigerant", (2018).

48. Awarded $248,073 by National Science Foundation for, "Louis Stoke Renewal STEM Pathways and Research Alliance: Northeast SLAMP", 2021-2026.

49. Awarded $250,000 by NSF for "LSAMP". Northeast Alliance with University of Connecticut as Lead. Other members: UMass, URI, Tufts and WPI, (2021).

50. Awarded $265,583 by National Renewable Energy Laboratory for, "An Educational Program on Concentrated Solar Power and Heliostats for Power Generation and Industrial Processes", 2023.

51. Awarded $594,820 by National Science Foundation for, "A Study on Burning Iron Particles as Carbon-Free Circular Fuels with co-Generation of Value-Added Nanomaterials", Co-PI, 2023.

52. Awarded $288,040 by National Renewable Laboratory for, "Advancing University Level Education on Heliostat Design and Operation", 2024

PROFESSIONAL ACTIVITIES

1. **Honorary Member of ASME 2021.**
2. **Editor-in-Chief ASME Journal of Open Access of Engineering, 2022-**
3. **RECIPIENT of 2011 ASME HARRY POTTER GOLD MEDAL.**
4. **RECIPIENT of 2014 ASME EDWARD OBERT AWARD**
5. **RECIPIENT of 2019 ASME GEORGE WESTINGHOUSE AWARD.**
6. **Life Fellow of ASME, 2018.**
7. **ASME Fellow, 2000.**
8. **Honorary Fellow, International Society of energy, Environment and Sustainability 2020.**
9. **Editor-in-Chief ASME Journal of Energy Resources Technology 2012-2022**
10. **ASME 2011 Dedicated Service Award**
11. **Member of Editorial Board of Energies**
12. **Associate Editor of ASME Journal of Energy Resources Technology 2001- 2006.**
13. **Member of the Editorial Board of the International Journal of**

Thermodynamics.

14. **Member of the Editorial Board of the International Journal of Exergy.**
15. **ASME Energy Conversion Group Member 2008 – 2012**
16. **Member of ASME Committee on Operation and Training 2008-2012**
17. **Member of ASME Department Head Executive Committee 2009-2012**
18. **Member of Eastern Section of Combustion Institute Executive Committee.**
19. **Member of ASME Obert's Award Committee 2009-2013**
20. **Member of ASEE Clement J. Freund Award Committee 2012-2015**
21. **Member of ASEE Chester F. Carlson Award Committee 2012-2015**
22. **Member of ASME Harry Potter Gold Medal Award Committee 2012-2016**
23. **Member of ASEE Mechanical Department Heads Committee 2004-2011**
24. Combustion Institute:

    Served as an invited member of Combustion Scientists delegation who visited the People's Republic of China in October 1984. Lectures were given in Universities and research institutes in Tianjin, Beijing, Xian, Nanjing, and Shanghai.

11. Article and Proposal Reviewer:
    a) National Science Foundation
    b) Combustion Science Technology
    c) Combustion Institute
    d) ASME Journal of Energy Resource Technology
    e) ASME Journal of Engineering for Gas Turbine and Power
    f) Combustion and Flame
    g) Biotechnology
    h) American Chemical Society - The Petroleum Research Fund
    i) Army Research Office
    k) Office of Naval Research
    l) Applied Energy
12. Session Chair, ASME International Mechanical Engineering Congress and Exposition annually since 1994.
13. In charge of all sessions (10) of the System Analysis Technical Committee of the Advanced Energy Systems Division of ASME for 1998 International Congress and Exposition.
14. Chair of the System Analysis Technical Committee of the Advanced Energy Systems Division of ASME for two years period of 1999 and 2000.
15. Sessions Chair of Fall and Spring Technical Conference of the ASME Internal Combustion Engine Division since 1998.
16. Member of Advanced Energy Systems Division Executive Committee of ASME, 2000-2005.
17. In charge of all sessions (19) of the Advanced Energy Systems Division of ASME for 2001 International Congress and Exposition.
18. Vice-Chair of Advanced Energy Systems Division (AESD) Executive Committee of ASME, 2003-2004.
25. Chair of AESD of ASME, 2004- 2005
26. Recipient of Northeastern University College of Engineering Mentoring Award 2012.

THESES DIRECTED

A. Completed

I. Doctoral Students (Completed)

1. Ph.D. Thesis of Robert Whey Law, "Rate-Controlled Constrained Equilibrium Calculations of Ignition Delay Times in H/O mixtures - Low Pressure and High Temperature Regime" (1988).

2. Ph.D. Thesis of Partha Bishnu, "Constrained Equilibrium Modeling for Complex Chemical System" (1997).

3. Ph.D. Thesis of Djamel Hamiroune, "Rate Controlled Constrained Equilibrium Using Constraint Potentials and Constraints Factors" (1997).

4. Ph.D Thesis of Hui He, "Estimation of the Thermodynamic Properties of Hydrocarbons" (1999).

5. Ph.D. Thesis of Faranak Rahim, "Determination of Burning Speed for Methane/Oxidizer/Diluent Mixtures" (2002).

6. Ph.D. Thesis of Yue Gao, " Rate-Controlled Constrained-Equilibrium (RCCE) Calculation of Formaldehyde Oxidation", (2003)

7. Ph.D. Thesis of Sergio Ugarte, "Modeling of Combustion for Mono-Carbon Fuels Using the Rate-Controlled Constrained-Equilibrium Method", (2004)

8. Ph.D. Thesis of Philip Pedros, "A Study of a Multispecies Biofilm in a Submerged Attached Growth Bioreactor ", (2004)

9. Ph.D. Thesis of Farzan Parsinejad, "Experimental and Theoretical Studies on Flame Propagation and Burning Speeds of JP-8, JP-10 and Reformed Fuels at High Temperatures and Pressures", (2005)

10. Ph.D. Thesis of Donald Golthwaite, "The Application of the Rate-Controlled Constrained-Equilibrium Technique to Chemical Mechanisms for n-Heptane and iso-Octane ", (2007)

11. Ph.D. Thesis of Kian Eisazadeh-Far, "Burning Speeds, Flame Kernel Formation and Flame Structure of Bio-Jet and JP-8 Fuels at High Temperatures and Pressures", (2010)

12. Ph.D. Thesis of Mohammad Janbozorgi, "Rate-Controlled Constrained-Equilibrium (RCCE) Modeling of C1-Hydrocarbon Fuels", (2011)

13. Ph. D. Thesis of Ghassan Nicholas, "The Rate-Controlled Constrained-Equilibrium Modeling of C_1-C_2/O_2/Diluent Mixtures", (2012).

14. Ph.D. Thesis of Ali Moghaddas, “Laminar Burning Speed Measurement, Auto-ignition and Flame Structure Study of Spherically Expanding Flames”, (2015).

15. Ph.D. Thesis of Mimmo Elia, “Measurement Apparatus and Modelling of Laminar Burning Speed and Mass Burning Rate of Syngas and Onset of Auto-ignition of n-Heptane and Gas to Liquid Fuel (2106)

16. Ph.D. Thesis of Fatemeh Hadi, “Rate-Controlled Constrained-Equilibrium Modeling of Chemical Kinetics and Mixing”, (2016).

17. Ph.D. Thesis of Omid Askari, “On the Experimental and Theoretical Investigations of Lean Partially Premixed Combustion, Burning Speed, Flame Instability and Plasma Formation of Alternative Fuels at High Temperatures and Pressures”, (2016).

18. Ph.D. Thesis of Ronak Ghandriz, “Numerical Simulation of Coal Fluidization and Gasification in Fluidized Beds “, (2016).

19. Ph.D. Thesis of Mohammed Alswat, “Laminar Burning Speeds and Flame Structure of Gas to Liquid (GTL) Fuel at High Temperatures and Pressures”, (2017).

20. Ph.D. Thesis of Guangying Yu, “Combustion Characteristics of Hydrocarbon Fuels and Fundamentals of Rate-Controlled Constrained-Equilibrium and its Applications”, 2019.

21. Ph.D. Thesis of Ziyu Wang, “Experimental and Theoretical Studies of Laminar Burning Speed and Flame Stability of Alternative Fuels and Refrigerants”, 2020.

22. Ph.D. Thesis of Akif Eren Tatli, “Supercritical Carbon Dioxide Recompression Cycles: Theoretical Insight, Modified Configurations, and Efficiency Optimization”, 2024

23. Ph. D. Thesis of Zhenyu Lu, “Determination of Burning Speed of Methane/Hydrogen/Air, Propane/Hydrogen/Air, Normal Decane/Air and Propylene/Carbon Dioxide?Air Mixtures, 2025.

II. Master Students (Completed)

1. M.Sc. Thesis of Lorenzo C. Ochoa, “Effect of Nitrogen Dilution on the Emission of Nitric Oxides from a Spark Ignition Engine” (1980).

2. M.Sc. Thesis of Yahya M. Adada, “Simulation Studies of the Effect of Nitrogen Dilution on The Emission of Nitrogen Oxides from the Spark Ignition Engine” (1983).

3. M.Sc. Thesis of Tien-Yu Tom Lee, “An One Dimensional Turbulent Flame

Model" (1984).

4. M.Sc. Thesis of Frederick J. Ross, "Analysis of Combustion Stability in the Spark Ignition Engine" (1989).

5. M.Sc. Thesis of Pyongwon Yim, "Modeling of Coal-Fueled Diesel Engine Combustion" (1989).

6. M.Sc. Thesis of Andrius A. Keturakis, "Regression Analysis of Spark Ignition Engine Performance Data" (1991).

7. M.Sc. Thesis of Linghong Zhang, "Rate-Controlled Constrained Equilibrium Calculation Using Constraint Potentials" (1991).

8. M.Sc. Thesis of Bhaskaran Natarajan, "Hydrodynamic Evaluation of a Novel Bioreactor" (1992).

9. M.Sc. Thesis of Partha Sarathi Bishnu, "A Detailed Kinetic Model of Ionized Mixture of Hydrogen-Oxygen Gases" (1992).

10. M.Sc. Thesis of Douglas Robert Nichols, "An Advanced Thermodynamic Simulation With a Graphic User Interface" (1995).

11. M.Sc. Thesis of Erik Thomas Mankarios, "Dynamic Simulation and Feasibility Study of Absorption Refrigeration Cycle with Refrigerant Storage" (1996).

12. M.Sc.Thesis of Dulith Sathsara Wijewardene, "Hydrodynamic Study of Bioreactor Systems" (1997).

13. M.Sc. Thesis of Tewodros Menisher, "Mixing Studies in Bioreactors" (1997).

14. M. Sc. Thesis of Mimmo Elia, "Laminar Burning Velocity of Methane-Air Diluent-Argon Mixtures" (1999).

15. M.Sc. Thesis of Cedric Fletcher, "Laminar Burning Velocity of Methane-Air Diluent Under Micro-Gravity Conditions" (1999)

16. M.Sc. Thesis of Matthew David Ulinski, "Laminar Burning Velocity of Methane/Air Mixtures at High Pressures and Temperatures" (2001).

17. M.Sc. Thesis of Patrice Moore, "Computer Control of Laminar Burning Speed Determination Experiments" (2001).

18. M.Sc. Thesis of Soner Kahraman, "Determination of Burning Speed for Blends of Methane/Ethane/Propane/Butane-Air Mixtures", (2003).

19. M.Sc. Thesis of Christian David Arcari, "Burning Speed Measurement of Liquid Fuel: Methods and Analysis of JP-10", (2005).

20. M.Sc. Thesis of Edwin Shirk, “Experimental Burning Speed Study of JP-8 at High Temperatures and Pressures”, (2006)

21. M.Sc. Thesis of Raymond James Andrews, “Measurement of Hydroxyl (OH) Concentration of Transient Premixed Methane-Air Flame by Planar Induced Fluorescence (PLIF) Method”, (2008).

22. M.Sc.Thesis of Colin Francis Fredette, “Quantitative Hydroxyl (OH) Concentration Calibration by Use of a Flat Flame Burner, Thermocouple and Planar Laser Induced Fluorescence (PLIF) System”, (2009)

23. M.Sc. Thesis of Adrienn Murphy Jalbert, “A Study of Quantitative Concentrations of Hydroxyl (OH) in Laminar Flat Flames Using Planar Laser Induced Fluorescence (PLIF)”, (2011).

24. M.Sc. Thesis of Casey Bennett, “Flame Speed Measurement of Refrigerant”, (2011).

25. M.Sc. Thesis of Emad Rokni,“Measurement of Laminar Burning Speed and Investigation of Flame Stability of Acetylene (C_2H_2)/air Mixtures” (2014).

26. M.Sc. Thesis of Alden Ahlholm, “An Investigation of the Flame Structure and Burning Speeds of H_2/CO/Air Mixtures” (2015).

27. M.Sc. Thesis of Bander Nafe Alhazmi, “Measurement of Laminar Burning Speeds and Investigation of Flame Stability of Syngas/Air Mixture” (2015).

28. M.Sc. Thesis of Kevin Vien, “Experiments on the Effects of Exhaust Gas Recirculation Diluent on the Laminar Burning Speed and Stability of Syngas/Air Flames” (2016).

29. M.Sc. Thesis of Ziyu Wang, “Measurement of Laminar Burning Speed and Flame Instability Study of Syngas/Oxygen/Helium Premixed Flame” (2016).

30. M.Sc. Thesis of Moaz Omar Allehaibi, “Laminar Burning Speed Measurement of Methane/Air/Carbon Dioxide Mixtures” (2017).

31. M.Sc. Thesis of Bassam S. Aljohani, “Performance Assessment of Vapor Compression Systems Utilizing Low Global Warming Potential Hydrocarbons and Carbon Dioxide as Working Fluid”. (2018).

32. M.Sc. Thesis of Khalid Aljohani, “Measurements of Laminar Burning Speed of Mixtures of Propane and Carbon Dioxide at Elevated Temperatures and Pressures”. (2108).

33. M.Sc. Thesis of Yeqing Zhang, “The Rate-Controlled Constrained-Equilibrium Modeling of nC_4H_{10}/O_2/Diluent Mixtures”, (2018).

34. M.Sc. Thesis of Linghao Du, “Rate-Controlled Constrained-Equilibrium Modelling of normal Pentane’, (2018).

35. M.Sc. Thesis of Zhenyu Lu, “Measurement of Laminar Burning Speed of Isobutane and Carbon Dioxide Mixture”, 2019.

36. M. Sc. Thesis of Sai Chandra Yelishala, “Thermodynamic and Combustion Study on Blends of Hydrocarbons and Carbon Dioxide as Alternative Refrigerant”, 2019.

37. M. Sc. Thesis of Chikpezili Ebubechukwu Ajulu, “Automated Generation of Chemical Kinetic Mechanisms of Fischer-Tropsch (F-T) Gas-to-Liquid Fuel Surrogates”, 2020.

38. M. Sc. Thesis of Maximilian Ulbert, “Practical Fiber Batteries for Wearable Based on Thermally-Drawn Zn-MnO_2”, 2021.

39. M. Sc. Thesis of Dongchuan You, “Design and Analysis of Tri-Generation Plant for Heating, Cooling and Power”, 2021.

40. M. Sc. Thesis of Yusheng Zheng, “Measurement of Laminar Burning Speed of Mixtures of Methane, Hydrogen and Air”, 2023.

41. M. Sc. Thesis of Suchi Patel, “An Energy and Exergy Analysis of Power Generation Cycles Using Powdered Iron as a Fuel Source”, 2025.

III. Bachelor Students (Completed)

1. B.S. Thesis of Hek-Jin Song, “An Automotive Air Conditioning System Using Lithium Bromide-Water Absorption Refrigeration Cycle” (1993).

2. B.S. Thesis of Bouke Noordij, “Laminar Flame Velocity” (1994).

3. B.S. Thesis of Robert G. Barry, “Dynamic Simulation of a Two Stage Parallel Flow Absorption Refrigeration Cycle” (1996).

4. B.S. Thesis of Hans Valencia, “Numerical Modeling of a Vertical Tube Absorber and a Closed Plate Solar Regenerator with an Aqueous Solution of LiBr” (1996).

5. B.S. Thesis of Matt Ulinski, “Design of a Combustion Vessel for Measuring Laminar Burning Velocities in a Micogravity Environment” (1996).

6. 6. B.S. Thesis of Thier Truong, “Design of Data Acquisition System for the Experiments to be Performed on the Spherical Combustion Vessel” (1997).

7. B.S. Thesis of Faiz Hussin, “Dynamic Simulation of Double Effect Parallel Flow Absorption Refrigeration Cycle Using Storage Component” (1997).

8. B.S. Thesis of Mimmo Elia, “A Computer Program to Determine Laminar Burning Velocity of Stoichiometric Methane - Air Mixture in a Constant Volume Combustion Vessel” (1997).

9. B.S. Thesis of Ricardo Cabra, “Numerical Model for the Transient Performance of a Vertical Coil Absorber with an Aqueous Solution of LiBr” (1998).

10. B.S. Thesis of Dan McAuliffe, “Comparison of Laminar Burning Velocity for CH_4-O_2-Ar Mixtures with CH_4-Air Mixtures” (1998).

11. B.S. Thesis of Zhuoyan Li, “Laminar Burning Velocity under Microgravity” (1999).

12. B.S. Thesis of Yiyan Wang, “Pulse Detonation Engine Analysis” (1999).

13. B.S. Thesis of Fatima Haq, “Study of Lithium-Bromide Absorption Refrigeration Cycles” (1999)

14. B. S. Thesis of Timothy Roberts, “Design of a Cylindrical Combustion Vessel” (2000).

15. B.S. Thesis of Suzanne Brunetti, “Methane Fueled Pulse Detonation Engine” (2000).

16. B. S. Thesis of James Masters, “Fuel Injection System Design” (2001).

17. B.S. Thesis of Nazif Mohdazhar, “Temperature-Controlled Oven for Burning Velocity Measurement” (2001).

18. B.S. Thesis of David Widomski, “Design and Construction of a Patent Foramen Ovale Heart Defect Model” (2002).

19. B.S. Thesis of Matyas Matlo, “Schlieren and Shaowgraph Images of Transient Expanding Spherical Flames” (2002).

20. B.S. Thesis of Timothy Hutchins, “Energy and Exergy Analyses of the Pulse Detonation Engine” (2002).

21. B.S. Thesis of Peter Rezac, “Historical Evolution and Present State of Exergy Analysis” (2004).

22. B.S. Thesis of Andrew Jerome Muto, “Intense Heating of Fluid in a Capillary Tube” (2004).

23. B.S. Thesis of Edwin Shirk, “Burning Speed Measurement of Reformed Fuel Matrix” (2004).

PUBLICATIONS

BOOKS

1. "Calcium Magnesium Acetate", Edited by D. L. Wise, Y.A. Levendis, and M. Metghalchi, Elsevier, 1990.

2. “Proceedings of the ASME Advanced Energy Systems Division 1998”, Edited by M. Metghalchi, E. Kweller, M. L. Ramalingam and J. N. Chapman, AES-Vol. 38, 1998.

3. “Proceedings of the ASME Advanced Energy Systems Division 2001”, Edited by A. Hernandez, M. Metghalchi, R. B. Peterson, M. M. Rahman and B. G. Shiva Prasad, AES-Vol. 41, 2001.

4. “Energy for Propulsion “, Edited by A. Ruchal, A. Gupta, 2018, “Fundamentals of Rate-Controlled Constrained-Equilibrium Method” By F. Hadi, G. Yu and H. Metghalchi.

BOOK CHAPTERS

1. Metghalchi, M. and Scott, R. M., Chapters for review of Thermodynamics and Fluid Mechanics in How to Prepare for Fundamental of Engineering FE/EIT Exam, edited by M. Olia, Barron’s 2000.

2. Metghalchi, M. and Scott, R. M., “Fluid Mechanics” in How to Prepare for Fundamental of Engineering FE/EIT Exam, edited by M. Olia, Barron’s 2000.

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