CURRICULUM VITAE

Srinibas Karmakar

Associate Professor, Dept. of Aerospace Engineering,
IIT Kharagpur, P.O. Technology, Dist. Paschim Medinipur, W.B., India, PIN- 721302
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EDUCATION

Ph.D. in Mechanical Engineering, Louisiana State University, 2012
M.Tech. in Aerospace Engineering, IIT Kanpur, 2005
B.E. in Mechanical Engineering, Jadavpur University, 2003

EMPLOYMENT/ACADEMIC EXPERIENCE

Associate Professor, Dept. of Aerospace Engineering, IIT Kharagpur, May 2019-present
Assistant Professor, Dept. of Aerospace Engineering, IIT Kharagpur, September 2015-May 2019
Assistant Professor on Tenure Track, Dept. of Aerospace Engineering, IIT Kharagpur, June 2013-August 2015
Assistant Professor, Dept. of Space Engineering and Rocketry, BIT Mesra, September 2012-June 2013
Research Assistant, Turbine Innovation and Energy Research (TIER) Center, Louisiana State University, August 2007-July 2012
Teaching Assistant, Louisiana State University, August 2007-May 2008
Assistant System Engineer, Tata Consultancy Services, July 2005-July 2007
Teaching Assistant, IIT Kanpur, July 2003-May 2005

RESEARCH GUIDANCE

Doctoral:

1. D. Chaitanya Kumar Rao (single guidance), C**ompleted in December, 2018**
   Thesis: Atomization of burning multi-component droplets with wide volatility differential
   Present employment: Assistant Professor, IIT Kanpur
2. Syed Alay Hashim (joint guidance), C**ompleted in August, 2019**
   Thesis**:** Experimental Investigations on Boron-Loaded Solid Fuels for Hybrid Gas Generator in Ducted Rocket Applications
   Present employment: Associate Professor, Alliance University Bengaluru
3. Pawan Kumar Ojha (single guidance), C**ompleted in July, 2020**
   Thesis: Experimental investigation on combustion characteristics of boron laden jet fuel
   Present employment: Post-Doctoral Fellow, Technion-Israel Institute of Technology
4. Syam Sasidharan (joint guidance), C**ompleted in October, 2020**
   Thesis: An experimental investigation on combustion characteristics of Jet A-1/ethanol droplets and numerical simulation of droplet evaporation using the two-fluid model
   Present employment: Post-Doctoral Fellow, USA

5. Manish Kumar (single guidance), C**ompleted in November, 2022**
   Thesis: Spray and combustion characteristics of potential alternative aviation fuels and Jet A-1 in swirl-stabilized combustor
   Present employment: Post-Doctoral Fellow, Technion-Israel Institute of Technology
6. R. Madhumitha (single guidance)
   Thesis: Synthesis, characterization, and combustion of energetic particles loaded gel fuels
   Status: **In progress**
7. P. Prabhudeva (single guidance)
   Thesis: Spray and combustion characteristics of slurry fuel
   Status: **In progress**
8. Suagata Mandal (single guidance)
   Thesis: Combustion of solid fuels/propellants in hybrid/ducted rockets
   Status: **In progress**
9. Jayashri Sehajpal (single guidance)
   Thesis: Synthesis and characterization of green oxidizers for solid propellant rockets
   Status: **In progress**
10. Saurabh Singh (single guidance)
    Thesis: Spray and Combustion study of alternative fuels for energy and aviation
    Status: **In progress**
11. Sumit Kumar Gupta (single guidance)
    Thesis: Evaporation and breakup characteristics of droplet under various operating conditions
    Status: **In progress**

M.Tech.:
Completed - 10

TEACHING EXPERIENCE

1. Developed a new course ‘Combustion of Solid Fuels and Propellants’ (for PG and senior UG students)
2. Rocket Propulsion (for PG and senior UG students)
3. Theory of Jet Propulsion (for UG students)
4. Thermodynamics & Aerospace Propulsion system (for UG students)
5. Propulsion Laboratory (for UG students)-Developed multiple experimental facilities which are now part of UG laboratory curriculum
6. Conducted a course titled Turbomachinery for sustainable power and aviation: a system approach under GIAN programme during December, 2017 (Prof. Jayanta Kapat from University of Central Florida was involved as foreign faculty member)
7. Conducted a micro-credit course on ‘Measurements in Propulsion Systems’ during Spring, 2016-17 (Dr. Subir Mozumder, retired gas turbine expert from USA was involved as foreign faculty member)

PUBLICATIONS

Journal papers (latest first)

1. S. Mandal, S.A. Hashim, A. Roy, S. Karmakar, A short review of challenges and prospects of boron-laden solid fuels for ramjet applications, **FirePhysChem**, 2023, https://doi.org/10.1016/j.fpc.2023.06.001
2. M. Kumar, S. Karmakar, Butyl butyrate, Jet A-1 and their blends: Combustion Performance in the Swirl Stabilized Burner at different Inlet Air Temperature, **Biomass and Bioenergy (I.F. 5.774)** 168, 106651, **2023**
3. M. Kumar, S. Karmakar, C. T. Chong, Investigation on combustion characteristics of acetone-butanol-ethanol/Jet A-1 mixture in a Swirl-stabilized combustor for its potential application in gas turbine engines, **Fuel (IF: 8.035)**, 340, 127610, **2023**
4. P. Prabhudeva, P.K. Ojha, S. Karmakar, Spray characterization of boron-loaded slurry fuels using high-speed imaging technique, **International Journal of Spray and Combustion Dynamics (IF: 2.088)**, 15(1), 70-87, **2023**
5. S. Mohapatra, R. Alsulami, S. Karmakar, S. K. Dash, V.M. Reddy, Experimental and Computational Investigation upon Combustion Characteristics of Liquid Fuel in a Novel Combustor with Hybrid Swirl and Recirculation Bowl, **ACS Omega (I.F. 4.132)**, 8(1), 1523-1533, **2023**
6. R. Madhumitha, S. Kumari, P.K. Ojha, S. Karmakar, Effect of particle loading on the burning characteristics of boron-laden gel fuel droplet, **International Journal of Energetic Materials and Chemical Propulsion (IF: 0.95)**, 21(6), 21–46, **2022**
7. S. K. Gupta, P. Prabhudeva, M. Kumar, P.K. Ojha, S. Karmakar, Investigation on Spray Combustion Characteristics of Boron-Loaded Slurry Fuel in a Swirl-Stabilized Combustor, **Fuel (IF: 8.035)** 323, 124316, **2022**
8. M. Kumar, C.T. Chong, S. Karmakar, Combustion Characteristics of Butanol-Jet A-1 Fuel Blends in a Swirl-Stabilized Combustor under the Influence of Preheated Swirling Air, **International Journal of Energy Research (IF: 4.672)**, 46(3), 2601-2616, **2022**
9. M. Kumar, C.T. Chong, S. Karmakar, Comparative Assessment of Combustion Characteristics of Limonene, Jet A-1 and Blends in a Swirl-Stabilized Combustor under the Influence of Pre-Heated Swirling Air, **Fuel (IF: 8.035),** 316, 123350, **2022**
10. T. Xie, C.T. Chong, S. Wang, T. Seljak, J-H. Ng, M. Tran, S. Karmakar, B. Tian, Flow Field, Flame Structure and Emissions Quantifications of Oxygenated Glycerol in a Swirl Flame Combustor, **Fuel (IF: 8.035)** 321, 124052, **2022**
11. G.R. Mong, C.T. Chong, W.W. Fongchong, J-H. Ng, H.C. Ong, V. Ashokkumar, M. Tran, S. Karmakar, B.H.H. Goh, M.M. Yasin, Progress and challenges in sustainable pyrolysis technology: Reactors, feedstocks and products, **Fuel (IF: 8.035),** 324, 124777, **2022**
12. B.H. Goha, C.T. Chong, H.C. Ong, T. Seljak, T. Katrasnik, V. Józsa, J-H. Ng., B. Tian, S. Karmakar, V. Ashokkumar, Recent advancements in catalytic conversion pathways for synthetic jet fuel produced from bioresources, **Energy Conversion and Management (IF: 11.533)** 251, 114974, **2022**
13. M. Kumar, S. Karmakar, S. Kumar, S. Basu, Experimental Investigation on Spray Characteristics of Jet A-1 and Alternative Aviation Fuels, **International Journal of Spray and Combustion Dynamics (IF: 2.088),** 13, 54-71, **2021**
14. S. A. Hashim, M. Islam, S. Kangle, S. Karmakar, A. Roy, Performance Evaluation of Boron-HTPB Based Solid Fuels Containing Activated Charcoal, **Journal of Spacecraft and Rockets (IF: 2.137)**, 58, 363-374, **2021**
15. M. Kumar, S. Karmakar, Combustion characteristics of butanol, butyl butyrate, and Jet A-1 in a swirl-stabilized combustor, **Fuel (IF: 8.035)**, 281, 118743, **2020**

16. P.K. Ojha, S. Karmakar, Combustion Characteristics of Jet A-1 Droplet Loaded with Aluminum/Magnesium Decorated Boron Particles, **International Journal of Energetic Materials and Chemical Propulsion (IF: 0.95)**, 19, 253-274, **2020**
17. P.K. Ojha, P. Prabhdeva, S. Karmakar, D. Maurya, G. Sivaramakrishna, Combustion Characteristics of JP-10 Droplet Loaded with Sub-Micron Boron Particles, **Experimental Thermal and Fluid Sciences (IF: 3.37)** 109, 109900, **2019**
18. S. A. Hashim, S. Karmakar, and A. Roy, Effects of Ti and Mg particles on Combustion Characteristics of Boron–HTPB-Based Solid Fuels for Hybrid Gas Generator in Ducted Rocket Applications, **Acta Astronautica (IF: 2.954)** 160, 125-137, **2019**
19. S.A. Hashim, P.K. Ojha, S. Karmakar, A. Roy, D. Chaira, Experimental Observation and characterization of B–HTPB-Based Solid Fuel with Addition of Iron Particles for Hybrid Gas Generator in Ducted Rocket Applications, **Propellants, Explosives, Pyrotechnics (IF: 2.134)** ,44, 896-907, **2019**
20. S. A. Hashim, S. Karmakar, and A. Roy, Combustion Characteristics of Boron-HTPB Based Solid Fuels for Hybrid Gas Generator in Ducted Rocket Applications, **Combustion and Science and Technology (IF: 2.174),** 191(11), 2082-2100, **2019**
21. P.K. Ojha and S. Karmakar, Effect of Silane Capping on the Dispersion and Combustion Characteristics of Sub-Micron Boron Particles Loaded in Jet A-1, **Energy and Fuels (IF: 4.654)**, 32, 11010-11022, **2018**
22. D.C.K. Rao and S. Karmakar, Crown formation and atomization in burning immiscible fuel droplets, **Experimental Thermal and Fluid Sciences (IF: 3.370)**, 98, 303-308, **2018**
23. P.K. Ojha and S. Karmakar, Boron for Liquid Fuel Engines-A Review on Synthesis, Dispersion Stability in Liquid Fuel, and Combustion Aspects, **Progress in Aerospace Sciences (IF: 8.934)**, 100, 18-45, **2018**
24. D.C.K. Rao, S. Karmakar and S. Basu Bubble dynamics and atomization mechanisms in burning multi-component droplets, **Physics of Fluids (IF: 3.521)**, 30, 067101: 1-17, **2018**
25. S. A. Hashim, S. Karmakar, A. Roy, and S. K. Srivastava, Regression Rates and Burning Characteristics of Boron- Loaded Paraffin-Wax Solid Fuels in Ducted Rocket Applications, **Combustion and Flame (IF: 5.767)**, 191, 287-297, **2018**
26. P.K. Ojha, R. Maji, S. Karmakar, Effect of Crystallinity on Droplet Regression and Disruptive Burning Characteristics of Nanofuel Droplets Containing Amorphous and Crystalline Boron Nanoparticles, **Combustion and Flame (IF: 5.767)**, 188, 412-427, **2018**
27. S. Meshram, M. Vanteru Reddy, and S. Karmakar, Experimental and numerical studies on high intensity meso-scale combustor for mini gas turbine applications, **Energy Conversion and Management (IF: 11.533)**, 176, 324-333, **2018**
28. D.C.K. Rao, S. Syam, S. Karmakar and R. Joarder, Experimental investigations on nucleation, bubble growth, and micro-explosion characteristics during the combustion of ethanol/Jet A-1 fuel droplets, **Experimental Thermal and Fluid Sciences (IF: 3.370)**, 89, 284-294, **2017**
29. D.C.K. Rao, S. Karmakar and S. Basu, Atomization characteristics and instabilities during the combustion of multi-component fuel droplets, **Nature-Scientific Reports (IF: 4.996)**, 7, Article no. 8925, **2017**.

30. D.C.K. Rao, S. Karmakar and S.K. Som, Puffing and micro-explosion behavior in combustion of butanol/Jet A-1 and acetone-butanol-ethanol (A-B-E)/Jet A-1 fuel droplets, **Combustion Science and Technology (IF: 2.174)**, 189(10), **2017**, 1796-1812.
31. G. Sharma, S. Ghosh and S. Karmakar, CFD Simulation of single and two-phase vortex flow –A comparison of flow field and energy separation, **Journal of Heat Transfer (IF: 1.602)**, 138, **2016**, 082003.
32. R. Sakote, N. Yadav, S. Karmakar, P. C. Joshi and A. K. Chatterjee, Regression Rate Studies of Paraffin Wax-HTPB Hybrid Fuels Using Swirl Injectors, **Propellants, Explosives, Pyrotechnics (IF: 2.134)**, 39 (6), **2014**, 859-865.
33. L. Kakumanu, N. Yadav and S. Karmakar, Combustion Study of Composite Solid Propellants Containing Metal Phthalocyanines, **International Journal of Aerospace Sciences**, 3(2), **2014**, 31-36.
34. S. Karmakar, N. Wang, S. Acharya, and K.M. Dooley, Effect of Rare-earth Oxide Catalysts on the Ignition and Combustion Characteristics of Boron Nanoparticles, **Combustion and Flame (IF: 5.767)**, 160(12), **2013**, 3004-3014
35. S. Karmakar, S. Acharya, and K.M. Dooley, Ignition and Combustion of Boron Nanoparticles in Ethanol Spray Flame, **Journal of Propulsion and Power (IF: 1.5)**, 28, **2012**, 707-718
36. S. Karmakar, J. Hanberry, K.M. Dooley, and S. Acharya, Pre- and Post-Combustion Characteristics Boron Nanoparticles in an Ethanol Spray Flame, **International Journal of Energetic Materials and Chemical Propulsion (IF: 0.95)**, 1, **2011**, 1-17
37. S. Karmakar and A. Kushari, Pressure Fluctuations in the Flow through a Low Aspect Ratio Dump Combustor with Tapered Exit, **International Journal of Fluid Mechanics Research (IF: 0.446)**, 36, **2009**, 513-523

Conference/Seminar papers (latest first)

1. R. Madhumitha, P. Prabhudeva, S. Karmakar, Effect of Magnesium on Ignition and Combustion of Boron Loaded Gelled Jet A-1 Fuel, Thirteenth International Symposium on Special Topics in Chemical Propulsion and Energetic Materials, May 30-June 02, 2023, Gjovik, Norway, paper ID# 13-ISICP-85
2. S.A. Hashim, S. Mandal, R. Divvela, A. Roy, S. Karmakar, Dispersion, Thermal, and Optical Investigation of Boron Particles Impregnated in an Energetic Polymer Fuel for Ramrocket Applications, Thirteenth International Symposium on Special Topics in Chemical Propulsion and Energetic Materials, May 30-June 02, 2023, Gjovik, Norway, paper ID# 13-ISICP-96
3. S. Mandal, S.A. Hashim, S. Karmakar, A. Roy, Experimental investigation of boron laden paraffin wax-based solid fuel for ducted rocket application, Paper ID# 3776079, AIAA SciTech., January, 2023 (virtual)
4. M. Kumar, S. Karmakar, A comparative study on the combustion characteristics investigation of Jet A-1, ABE, and blends in a Swirl Stabilized Combustor, 13th Asia-Pacific Conference on Combustion (ASPACC) – December 05-09, 2021, Abu Dhabi

5. R. Madhumitha, S. Kumari, and S. Karmakar, Droplet Regression Study on Boron Loaded Gelled Jet A-1 Fuel, International Conference on Aviation Technology-Current Scenario, AeSI 2020, March 6-7, 2020, Kolkata
6. P. Prabhudeva, R. Madhumitha, and S. Karmakar, Study on Atomization Characteristics of Jet A-1/Boron Slurry, International Conference on Aviation Technology-Current Scenario, AeSI 2020, March 6-7, 2020, Kolkata
7. S. I. Sheikh, S. V. Patayane, S. A. Hashim, S. Karmakar, and Arnab Roy, Design and Testing of Missile Launcher-Based Drone for Defense Applications, International Conference on Aviation Technology-Current Scenario, AeSI 2020, March 6-7, 2020, Kolkata
8. M. Kumar, S. Karmakar, Comparison of Atomization Characteristics of Jet A-1 and Alternative Aviation Fuels Using High Speed Imaging Technique, Paper no. GTIndia2019-2747, ASME 2019 GT India, December 5-9, 2019, IIT Madras
9. S. A. Hashim, S. Karmakar, A. Roy, S. I. Shaikh, Performance Evaluation of Boron Particles with Wax–HTPB-Based Solid Fuel for the Primary Combustor in Ducted Rocket Applications, Proceedings of 33rd National Convention of Aerospace Engineers, November 16-17, 2019, Pune, ISBN No. 978-81-942561-9-9, pp. 7-13
10. M. Kumar, P. Deva, A. Saha, V.M. Reddy and S. Karmakar, Combustion Characteristics of potential alternative aviation fuels and Jet A-1 in a swirl-stabilized combustor, National Aerospace Propulsion Conference (NAPC), December 17-19, 2018, IIT Kharagpur
11. S.A. Hashim, M. Islam, S. Karmakar and A. Roy Effects of Iron Particles on Boron-HTPB Based Solid Fuel for SFDR applications Using Rapid Screening Instrument, National Aerospace Propulsion Conference (NAPC), December 17-19, 2018, IIT Kharagpur
12. A. Kumar, R.Shah, A. Saha, S. Karmakar, A.Roy, and V.M. Reddy, Investigation of highly swirl stabilized spray combustion using low-cost computational techniques, National Aerospace Propulsion Conference (NAPC), December 17-19, 2018, IIT Kharagpur
13. S.A. Hashim, S. Karmakar and A. Roy, Screening of Nano-Aluminum Based Solid Fuels for the Hybrid Rocket Applications, Aerospace Sciences Meeting, AIAA SciTech 2018(**Top 10 Conf.**), January 8-12, 2018, Florida, USA
14. P.K. Ojha and S.Karmakar, Effect of particle loading on regression profile, igntion and flame characteristics of boron laden nanofuel droplet, Seventh International Conference on Theoretical, Applied, Computational and Experimental Mechanics (ICTACEM 2017), December 28-30, 2017, IIT Kharagpur
15. S.A. Hashim, S. Kangle, S. Karmakar and A. Roy Combustion Characteristic of Boron-HTPB Based Solid Fuels for Hybrid Rocket Applications, Seventh International Conference on Theoretical, Applied, Computational and Experimental Mechanics (ICTACEM 2017), December 28-30, 2017, IIT Kharagpur
16. P. K. Ojha, R. Maji, V. Venkatesan and S. Karmakar, Effect of Particle Size on Droplet Regression, Break-up and Combustion Characteristics of Boron-Laden Jet fuel Droplet, 11th International High Energy Material Conference and Exhibits (HEMCE-2017), November 23-25, 2017, HEMRL, Pune

17. S.A. Hashim, M. Lahariya, S. kangle, S. Karmakar and A. Roy Screening of Boron-Based Solids Fuel for the Hybrid Rocket Applications, 11th International High Energy Material Conference and Exhibits (HEMCE-2017), November 23-25, 2017, HEMRL, Pune
18. G. Jaiswal, S. Karmakar, D. Chauhan and Akhila K. S., Aggregation, Breakup and Secondary Atomisation in Nanofuel Droplet, National Aerospace Propulsion Conference (NAPC), March 15-17, 2017, IIT Kanpur
19. S. Syam, D. C. Rao, S. Karmakar, R. Joarder, Puffing and Micro-explosion Characteristics of Ethanol/Jet A-1 Mixture Droplets, AIAA SciTech 2016 (**Top 10 Conf.**), January 4-8, 2016, San Diego, USA
20. D. C. Rao, S. Syam , S. Karmakar, Droplet Combustion Characteristics of Butyl Butyrate, Limonene, and their Blends with Jet A-1, AIAA SciTech 2016 (**Top 10 Conf.**), January 4-8, 2016, San Diego, USA
21. D. C. Rao, S. Karmakar Droplet Combustion Characteristics of Butanol, Hexanol and their Blends with Jet A-1, 24th National Conference on I.C Engines and Combustion, October 30- November 1, 2015, UPES, Dehradun
22. Syam S, S. Karmakar, R. Joarder, An experimental study on droplet combustion of different fuels and biofuel blends in open atmosphere, Sixth International Conference on Theoretical, Applied, Computational and Experimental Mechanics (ICTACEM 2014), December 29-31, 2014, IIT Kharagpur, India.
23. S. Karmakar, S. Acharya, Combustion Characteristics of Ethanol Droplets Containing Boron Nanoparticles, Proceedings of the 22th National and 11th International ISHMT-ASME Heat and Mass Transfer Conference, HMTC1300831, December 28-31, 2013, IIT Kharagpur, India.
24. L. Kakumanu, N. Yadav, S. Karmkar, Catlytic Combustion of AP-HTPB based Composite Solid Rocket Propellants using Metal Phthalocyanines, Proceedings of the 22th National and 11th International ISHMT-ASME Heat and Mass Transfer Conference, HMTC1300853, December 28-31, 2013, IIT Kharagpur, India.
25. G. Sharma, S. Karmakar, S. Ghosh, CFD Analysis of Vortex Tube, Proceedings of the 22th National and 11th International ISHMT-ASME Heat and Mass Transfer Conference, December 28-31, 2013, IIT Kharagpur, India.
26. G. Sharma, S. Ghosh, S. Karmakar, CFD Analysis of a Vortex Tube Air Separator for Space Transportation, International Conference on Multiphase Flow 2013, ICMF2013-308, Jeju, Korea, May 26-31, 2013.
27. N. Wang, J. Hanberry, S. Karmakar, S. Acharya, and K.M. Dooley, Boron Composite Nanoparticles for Enhancement of Biofuel Combustion, 2012 AIChE meeting, October 28 – November 2, 2012, Pittsburgh, PA, USA
28. S. Acharya, S. Karmakar, S. Zhu, and B. Breaux, Exploring Biofuels and Hydrogen for Combustion Engines, Industrial Energy Technology Conference (IETC 2012), May 29 – June 1, 2012, New Orleans, LA, USA
29. B. Breaux, S. Karmakar, S. Zhu, and S. Acharya, Evaluation of Hydrous Ethanol Combustion in a Swirl-Stabilized Combustor, Proceedings of International Mechanical Engineering Congress and Exposition (IMECE2011), paper no. IMECE2011-63688, November 11-17, 2011, Denver, CO, USA

30. S. Karmakar, B. Breaux, and S. Acharya, Biofuels Combustion for Energy Generation, Industrial Energy Technology Conference (IETC 2011), May 17-19, 2011, New Orleans, LA, USA
31. N. Wang, J. Hanberry, S.Karmakar, S. Acharya, K.M. Dooley, Energetic Nanoparticles as Fuel Additives for Enhanced Performance in Propulsion Systems, South West Catalyst Society Spring 2011 Symposium, April 15, 2011, Houston, TX, USA
32. S. Karmakar, S. Acharya, and K.M. Dooley, Combustion of Boron Nanoparticles in Ethanol Spray Flame, Proceedings of International Mechanical Engineering Congress and Exposition (IMECE2010), paper no. IMECE2010-37450, November 12-18, 2010, Vancouver, BC, Canada
33. S. Acharya, K.M. Dooley, and S. Karmakar, J. Hanberry, Catalytic/Energetic Nanoparticles for Enhanced Combustion Performance, Proceedings of the Advanced Propulsion Meeting, Office of Naval Research (ONR), 2010 Annual Review Meeting, June 2010, Arlington, VA
34. A. De, S. Zhu, S. Karmakar, Combustion of New Fuels (Biofuels and Hydrogen), Clean Power and Energy Research Consortium (CPERC), Annual Review Meeting, August, 2009, Baton Rouge, LA
35. A. De, S. Zhu, S. Karmakar, Combustion Modeling and Measurements-Methodology and Role of Hydrogen and Fuel Additives, Clean Power and Energy Research Consortium (CPERC), Annual Review Meeting, October, 2008, New Orleans, LA
36. S. Karmakar and A. Kushari, Recirculating flow and Turbulence in a Low Aspect Ratio Dump Combustor, Proceedings of 2005 ASME Fluids Engineering Division Summer Meeting, paper no. FEDSM2005-77112, June 19-23, 2005, Houston, TX, USA

Book Chapters (latest first)

1. S.A. Hashim, S. Kangle, S. Karmakar, A. Roy, Performance Augmentation of Boron–HTPB-Based Solid Fuels by Energetic Additives for Hybrid Gas Generator in Ducted Rocket Applications, in the book Innovative Design and Development Practices in Aerospace and Automotive Engineering (I-DAD 2018), U. Chandrasekhar, L. Yang, S. Gowthaman, S. (Eds.), Lect. Notes in Mechanical Engg., Springer, 2018, 143-157
2. S. Karmakar, S.K. Som, D.C.K. Rao, Combustion of Multi-Component Fuel Droplet in the book Droplet and Sprays, S. Basu, A. Mukhopadhyay, A. Agarwal and C. Patel (Eds), Springer, 2017, 77-114
3. S.A. Hashim, M. Lahariya, S. Karmakar, A. Roy, Calculation of Theoretical Performance of Boron-Based Composite Solid Propellant for the Future Applications in the book Innovative Design and Development Practices in Aerospace and Automotive Engineering (I-DAD 2016), R.M. Bajpai, U. Chandrasekhar, A.R. Arankalle, (Eds.), Springer, 2016, 327-336

Invited Talks

1. Boron-containing Fuel for Ramjet Propulsion System-Current Challenges and Prospects, Venus Research Meet (VRM), January 07, 2023, Chennai

2. Combustion Characteristics of Alternative Aviation Fuels, Sustainable Energy and Environmental Challenges (VII SEEC), December, 2022, IIT BHU, Varanasi
3. Energetic Materials for Propulsion, Webinar at Amity University, Noida, May 08, 2020
4. Boron Nanoparticles for Energy and Propulsion Applications, International Workshop on Energy, Propulsion and Environment, March 8-11, 2017, IIT Kanpur
5. Investigation of Boron Combustion for its Application as Fuel or Fuel Additive at 10th High Energy Materials Conference and Exhibits (HEMCE2016), February 11-13, 2016, Hyderabad

SPONSORED PROJECTS

1. Production, characterization and combustion studies on sustainable aviation fuel, Role: PI at IIT Kgp (Overall project PI from IIT Bhu), Sponsor: SERB, Grant (IIT Kgp's part): Rs. 13.31 lakhs, Duration: 2023-2026 (ongoing)
2. Combustion Studies on Boron-loaded Solid Fuels for a Hybrid Gas Generator in Ducted Rocket Applications, Role: PI, Sponsor: SERB, Grant: Rs. 38.72 lakhs, Duration: 2022-2025 (ongoing)
3. Synthesis, Prilling and Coating of Ammonium Dinitramide (ADN): A Promising Oxidizer, Role: PI, Sponsor: ARMREB, DRDO (HQ), Grant: Rs. 42.562 lakhs, Duration: 2021-2024 (ongoing)
4. Investigation on Spray Combustion Characteristics of JP-10 Embedded with Boron Particles, Role: PI, Sponsor: AR&DB (Propulsion Panel), DRDO, Grant: Rs. 41.885 lakhs, Duration: 2017-2020 (completed)
5. Investigation on Spray and Combustion Characteristics of n-Butanol and Butyl Butyrate for their Application as Potential Aviation Fuels, Role: PI, Sponsor: SERB, Grant: Rs. 29.36 lakhs Duration: 2016-2019 (completed)
6. DST-FIST for Dept. of Aerospace Engineering, IIT Kharagpur, Role: Co-PI, Sponsor: DST, Grant: Rs. 295 lakhs, Duration: 2015-2020 (completed)
7. Combustion Characteristics of Single Droplets, Role: PI, Sponsor: ISIRD, SRIC, IIT Kharagpur, Grant: Rs. 28 lakhs, Duration: 2014-2017 (completed)

LABORATORY FACILITIES DEVELOPED FOR RESEARCH/TEACHING

1. Developed a static Hybrid rocket setup for studying various energetic particle loaded solid fuels
2. Developed a swirl-stabilized combustor test rig for studying slurry fuels
3. Developed a swirl-stabilized gas turbine type combustor test rig for studying alternative aviation fuels
4. Developed an opposed-flow burner for studying combustion characteristics of solid fuel for ducted rocket applications. It is now part of UG propulsion laboratory curriculum.
5. Developed an experimental facility to study combustion of single droplet consists of liquid-liquid/liquid-solid fuel blends. It is now part of UG propulsion laboratory curriculum.
6. Procured and installed an Oxygen Bomb Calorimeter for Propulsion Laboratory, Aerospace Engg. Dept. It has been included in UG propulsion laboratory curriculum.

7. Procured and installed an Educational Gas Turbine Jet Engine for Propulsion Laboratory, Aerospace Engg. Dept. It has been included in UG/PG propulsion laboratory curriculum.

ACADEMIC SERVICE ACTIVITIES

1. Laboratory-in-charge (Propulsion lab), Aerospace Engg. Dept., 2013 – 2021
2. Prof-in-charge, Departmental Mechanical Workshop, 2020-2022
3. Part of the induction faculty advisor (IFA) team for conducting UG Induction Program (IIT KGP) for first year students, 2017
4. Member, Departmental academic committee, Aerospace Engg. Dept.
5. Faculty advisor, Aerospace Engg. Dept.

ADMINISTRATIVE ACTIVITIES

1. Served as Institute Representative (IR) in conducting GATE/JAM Examinations
2. Member, Departmental purchase committee, Aerospace Engg. Dept., 2018-2022

PROFESSIONAL ACTIVITIES

1. Session Co-Chair, Thirteenth International Symposium on Special Topics in Chemical Propulsion and Energetic Materials, May 30-June 02, 2023, Gjovik, Norway
2. External examiner for ME Thesis in the Dept. of Space Engg. and Rocketry, BIT Mesra, May, 2023
3. Joint Secretary (Propulsion & Combustion), 8th International Conference on Theoretical, Applied, Computational and Experimental Mechanics (ICTACEM), December 2021, IIT Kharagpur
4. Publicity and Public Relation Secretary, 2nd National Aerospace Propulsion Conference (NAPC), December 2018, IIT Kharagpur
5. External examiner for ME Thesis in the Dept. of Space Engg. and Rocketry, BIT Mesra, May, 2018
6. Organising Secretary, 6th International Conference on Theoretical, Applied, Computational and Experimental Mechanics (ICTACEM), December 2014, IIT Kharagpur
7. Reviewer: Journal of Fluid Mechanics, Experimental Fluid and Thermal Science (Elsevier) Journal, International Journal of Heat and Mass Transfer, Physics of Fluid, Fuel, Combustion and Flame, Combustion Science and Technology, Energy, Energy & Fuels, Propusion and Power Research, Defence Science Journal, Defence Technology, Chemical Engineering Research and Design, Journal of the Institution of Engineers (India) - Series C, Journal of the Indian Institute of Science and many more
8. Reviewers of many national/international conference papers in combustion / propulsion technical tracks

HONOUR/AWARD

1. Outstanding Researcher in Aerospace Engineering by the Venus International Foundation, 2023

2. One of S Karmakar's journal papers selected as Editor's Pick (Physics of Fluids, 30, 067101 2018)
3. Early Career Research Award (ECRA), SERB, 2016
4. Member (by invitation based on academic performance) Golden Key International Honour Society, LSU Chapter, 2008
5. Graduate School Supplementary Award, Louisiana State University, 2007-2011
6. Graduate School Enhancement Award, Louisiana State University, 2007-2011
7. Merit Scholarship, West Bengal Council of Higher Secondary Education (W.B.C.H.S.E.), 1999

5. Merit Scholarship, West Bengal Board of Secondary Education (W.B.B.S.E.), 1997