

Kumaran Kannaiyan, Ph.D.

Teacher  || Scientist  || Academic Advisor 



About me

Enthusiastic and empathetic individual with ample experience in an academic environment. Firm believer of 'team effort', and it is instrumental in shaping my academic journey.

- 15+ years of research experience in the field of **'thermal science'** with a focus on **'sustainability.'**
- External research grants close to **1 Million US\$** with ample experience in project management and collaboration between academia and industry.
- **Rich expertise** in developing state-of-the-art research infrastructure and strategies with multidisciplinary applications
- **7+ years of teaching experience** in the higher education system, including ABET standards.

🚩 *Combining my years of research, teaching, and project management experiences to build a strong, **purpose-driven research team** to pursue excellence in the field of sustainable energy technologies.*

Contact

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Areas of Interest

Sustainable Aviation Fuels

Nanoscale performance enhancers

Sustainable Energy Harvesting

CO₂ Utilization

Energy Storage

Hypersonics

Atomization

Acoustic Levitation

Droplet Dynamics

Combustion

Adsorption phenomenon

Education

07.2009



Doctor of Philosophy (Ph.D.)

Indian Institute of Technology (IIT) Madras

⇒ *Adviser: Prof. Babu Viswanathan*

Thesis: "Numerical Investigations of the Supersonic Combustion of Hydrogen and Kerosene."

07.2006



Master of Science (M.S.)

Indian Institute of Technology (IIT) Madras

⇒ *Mechanical Engineering*

05.2001



Bachelor of Engineering (B.E.)

Madurai Kamaraj University

⇒ *Mechanical Engineering*

⇒ **First with Distinction**

Professional Experience (Academia)

- 07.2022 – **Associate Professor**, Guangdong Technion-Israel Institute of Technology, *Shantou, China.*
- 03.2021 – **Assistant Professor**, Guangdong Technion-Israel Institute of Technology, *Shantou, China.*
- 07.2022
- 01.2018 – **Visiting Lecturer**, Texas A&M University (Qatar Campus), *Doha, Qatar.*
- 08.2020
- 01.2013 – **Assistant Research Scientist**, Texas A&M University (Qatar Campus), *Doha, Qatar.*
- 08.2020
- 11.2009 – **Postdoctoral Research Associate**, Texas A&M University (Qatar Campus), *Doha, Qatar.*
- 12.2012

Professional Experience (Industry)

- Visiting Scientist**  Stuttgart, Germany
- 10.2010 – ⇒ **German Aerospace Center, Host: Dr. Patrick Le Clercq,**
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- 11.2010 Role: investigation of combustion characteristics of alternative jet fuels. * laminar burning velocity * chemical kinetics.
- Visiting Scientist**  Indianapolis, USA
- 04.2010 – ⇒ **Rolls-Royce, Host: Dr. Mohan Razdan, Chief Engineer**
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- 06.2010 Role: Emission characteristics of alternative jet fuels at actual aircraft combustor conditions.
- Visiting Scientist**  Derby, UK
- 11.2009 – ⇒ **Rolls-Royce, Host: Dr. John Moran, Chief Engineer**
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- 01.2010 Role: High-altitude relight characteristics of alternative jet fuels at aircraft combustor conditions in RR proprietary experimental facility.

Research Collaborators:

Northeastern University, USA

Texas A&M University, USA

Tsinghua University, China

National University of Singapore, Singapore

SUSTech, China

Lodz University of Technology, Poland

National Institute of Technology Calicut, India

Indian Institute of Technology Dhanbad, India

CUSAT, India

SETU, Ireland

Rolls-Royce, UK

Shell, Qatar, USA

Teaching

Introduction to Technical Drawing

Creative Overview of Mechanical Engineering

Thermodynamics

Probability & Statistics in Mechanical Eng.

Heat and Mass Transfer

Renewable Energy Teaching Laboratory

Thermodynamics-1 Teaching Laboratory

Heat Transfer Laboratory

Research Webpage

For more details on my research & team.



Other Interests/Hobbies

- Badminton, Carrom, Swimming
- Reading Books
- Nature travel
- Exploring startups
- Investment Arena



Research Projects

- 10.2019 - **Dr. Kumaran Kannaiyan (Co-PI)**, Qatar National Research Fund, *Multiphase flow visualization of alternative refrigerant mixtures*, US\$30,000.
- 09.2021
- 04.2018 - **Dr. Kumaran Kannaiyan (Co-PI)**, Qatar Shell Research & Technology Center, *Hydrocarbon-CO₂: Environmentally-benign alternative refrigerants*, US \$ 244,998.
- 03.2019
- 01.2018 - **Dr. Kumaran Kannaiyan (Lead-PI)**, Qatar National Research Fund, *Effect of nanoparticles on alternative fuel sprays at high-pressure conditions*, US\$14,970.
- 01.2019
- 02.2015 - **Dr. Kumaran Kannaiyan (Lead-PI)**, Qatar National Research Fund, *In-depth characterization of alternative jet fuels at gas turbine combustor conditions*, US \$ 633,662.
- 06.2018



Research Team

- 03.2025 - **Dr. Vinod Kumar Singh**, Research Fellow / Lab-Manager, *CO₂ Adsorption characteristics - sustainable materials*.
- 03.2026 - **Dr. Aadil Kureshee**, Research Fellow, *Droplet evaporation dynamics of alternative jet fuels - Acoustic field*.
- 07.2025 - **JinYang Zeng**, Research Assistant, *Numerical simulations of acoustically levitated droplet dynamics*.
- 10.2024 - **Sheng Gao**, M.Sc. Candidate, *Evaporation characteristics of acoustically levitated colloidal droplet*.
- 10.2025 - **Yi Yan**, M.Sc. Candidate, *Evaporation characteristics of acoustically levitated colloidal droplet*.
- 06.2024 - **WeiChen Liao**, UG Research Assistant, *Evaporation characteristics of acoustically levitated colloidal droplet*.



Awards

- 2023 **Best Oral Presentation**, Global Conference on Decarbonization of Energy and Materials, NUS, Singapore.
- 2020 **Second Place**, UG Research Conference, Qatar.
- 2016 **Second Place**, Best Representative Image Outcome, Qatar.



Select Publications

- 2026 *Comprehensive Review on the Droplet Dynamics of an Acoustically Levitated Colloidal Droplet*, Langmuir, 42, 11543–11560.
- 2026 *Evaporation Characteristics of a Jet Fuel Component Droplet*, International Journal of Thermofluids, 34, 101651.
- 2026 *Performance of a Activated Carbon-CO₂ pair-based Adsorption Heat Pump*, The Journal of Supercritical Fluids, 237, 107066.
- 2026 *Neural Network Model for Predicting Aerodynamic Parameters of Airfoils*, Journal of Aircraft, 63, 934-949.
- 2025 *Numerical investigation of LBV of liquefied petroleum gas*, Thermal Science and Engineering Progress, 59, 103357.
- 2025 *Assessment of Carbon Capture onto Activated Carbon*, Thermal Science and Engineering Progress, 68, 104310.
- 2024 *Energy-Exergy-Economic-Environmental analysis of CO₂ utilization*, Energy Conversion and Management: X, 24, 100786.
- 2024 *Influence of fuel characteristics on the alternative jet fuel atomization at non-reacting conditions*, Fuel, 357, 129908.
- 2023 *Perspectives for the green hydrogen energy-based economy*, Energy, 284, 129358.