

Curriculum Vitae

Dr. Ram Mohan Pathak

Ph.D., Indian Institute of Science, Bangalore, India

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📍 Centre for Sustainable Technologies, IISc Bangalore, India

🌐 [linkedin.com/in/ram-mohan-pathak](https://www.linkedin.com/in/ram-mohan-pathak)

🌐 <https://sites.google.com/view/ram-mohan-pathak/home?authuser=1>

Research Areas: Non-Thermal Plasma, Plasma-based gas conversion for hydrogen production, Plasma chemical kinetics modelling, Plasma assisted combustion

EDUCATION

Postdoctoral Fellow (Centre for Sustainable Technologies) **13/08/2025- Till Now**

Indian Institute of Science (IISc), Bangalore, India
Under Supervision: Prof. Lakshminarayana Rao

Ph.D. (Centre for Sustainable Technologies) **01/08/2019-12/08/2025**

Indian Institute of Science (IISc), Bangalore, India | CGPA: 7.4/10
Advisor: Prof. Lakshminarayana Rao

Doctoral Thesis: Thesis Title: “Effect of Flow Regime on Performance of Rotating Gliding Arc Reactor: Experiment and Simulation Studies”

✚ *Effect of different flow regimes, transitional and turbulent flow on the conversion and energy efficiency of hydrocarbon using a rotating gliding arc reactor. Both experimental and kinetic simulations are performed.*

M. Tech (Chemical Engineering) **2017-2019**

Indian Institute of Technology, Dhanbad, India | CGPA: 8.67/10
Advisor: Prof. Soubhik Kumar Bhaumik

Thesis Title: “Enhanced liquid-liquid solvent extraction and phase separation through secondary flow using triple helical reactor”

✚ *Development of a Novel triple helical reactor for solvent extraction.*

B. Tech (Hons.) (Chemical Engineering) **2011-2015**

Dr A P J Abdul Kalam Technical University, Uttar Pradesh, India | Percentage: 78.5%

Secondary School (Intermediate) **2009-2010**

Kendriya Vidyalaya No 2, Gorakhpur, Uttar Pradesh, India | Percentage: 79.8%

High School **2007-2008**

Kendriya Vidyalaya No 2, Gorakhpur, Uttar Pradesh, India | Percentage: 81.2%

PUBLICATIONS

Article

Ram Mohan Pathak, J. Ananthanasimhan, and Lakshminarayana Rao, Chemical Kinetics Simulation of Hydrogen Generation in Rotating Gliding Arc Plasma, *IEEE TRANSACTIONS ON PLASMA SCIENCE*, VOL. 50, NO. 8, AUGUST 2022, <https://doi.org/10.1109/TPS.2022.3188338>.

Article

Ram Mohan Pathak, Sounak Nandi and Lakshminarayana Rao, A Novel Lumped Parameter Approach Towards Understanding Rotating Gliding Arc, *IEEE TRANSACTIONS ON PLASMA SCIENCE*, 2024, <https://doi.org/10.1109/TPS.2024.3383273>.

Article

Ram Mohan Pathak, Ananthanasimhan J, Sounak Nandi, Chinmaya Ranjan Das and Lakshminarayana Rao, Investigating the Influence of Flow Regime on the Electrical Characteristics of Coaxial Cylindrical Dielectric Barrier Discharge Using Equivalent Circuit Modelling, Chemical Workbench Simulation, and Experimental Analysis, *Plasma Chemistry and Plasma Processes* 2025, 1-34, <https://doi.org/10.1007/s11090-025-10545-4>.

Article

Ram Mohan Pathak, Ananthanasimhan Jayanarasimhan, and Lakshminarayana Rao, Tar Destruction Using Non-Thermal Plasma Technology: A Critical Review, *Journal of Physics D: Applied Physics* 2025, <https://doi.org/10.1088/1361-6463/adb43c>.

Article

Ram Mohan Pathak and Lakshminarayana Rao, The Influence of Vortex Formation on the Collective Characteristics of Argon Plasma in a Rotating Gliding Arc Discharge, *Journal of Physics: Conference Series* 2778 (2024) 012011, <https://doi.org/10.1088/1742-6596/2778/1/012011>.

Article

Ram Mohan Pathak and Lakshminarayana Rao, Improving Hydrogen Production in Plasma-Assisted Bi-Reforming of Methane: Experimental Study in Rotating Gliding Arc Plasma Reactor, *Journal of Physics: Conference Series*, <https://doi.org/10.1088/1742-6596/2968/1/012005>.

Article

Ram Mohan Pathak, Chinmaya Ranjan Das and Lakshminarayana Rao, Chemical Kinetics Simulation of Toluene Dissociation with Diluted Nitrogen in a Rotating Gliding Arc Discharge: A Simulation Study, *IEEE TRANSACTIONS ON PLASMA SCIENCE*, 2025, <https://doi.org/10.1109/TPS.2025.3562030>.

Article

Ram Mohan Pathak, and Lakshminarayana Rao, Effect of enhanced rotation on electrical optical and chemical properties in rotating gliding arc for nitrogen plasma, 2025, <https://doi.org/10.1002/ppap.70021>, *Plasma Processes and Polymers*.

Article

Ananthanasimhan Jayanarasimhan, **Ram Mohan Pathak** and Lakshminarayana Rao, Tar formation in gasification systems: A holistic review of remediation approaches and removal methods, *ACS Omega* 2024, 9, 2, 2060-2079, <https://doi.org/10.1021/acsomega.3c04>.

Article

Ram Mohan Pathak, Surendra Soni, Chinmaya Ranjan, Bhoopendra Pandey and Lakshminarayana Rao, Influence of flow regime on flame dynamics and emission characteristics of inverse diffusion flames in a Rotating Gliding Arc Reactor, *Energy & Fuels*, (**To be submitted this week**)

Article

Ram Mohan Pathak, Chinmaya Ranjan Das and Lakshminarayana Rao, Quantifying the influence of flow regime on selectivity and energy efficiency of hydrogen generation through biogas reforming in Rotating Gliding Arc Reactors, *Energy Conversion and Management* (**To be submitted this week**)

Article

Ram Mohan Pathak, Surendra Soni, Chinmaya Ranjan, Bhoopendra Pandey and Lakshminarayana Rao, Effect of Biogas composition on combustion characteristics of inverse diffusion flames in a Rotating Gliding Arc Reactor (**Manuscript Under Preparation**)

CONFERENCE

International Conference on Advances in Plasma Science and Technology, ICAPST 2022 & 2023 (Coimbatore, India)

Sri Shakthi Institute of Engineering and Technology, 2022, 2023

International Conference on Advances in Condensed Matter Physics, (Hyderabad, India)

GITAM University, Hyderabad, India Plasma Chemistry Society, 2023

International Chemical Engineering Conference, (Patna, India)

Indian Institute of Technology (IIT) Patna, India, 2022

51st IEEE International Conference on Plasma Science (ICOPS) and the 4th Asia-Pacific Conference on Plasma and Terahertz Science (APCOPTS)

Beijing, China, 2024

7th International Symposium on Hydrogen Energy and Energy Technologies (HEET 2024) between 14th to 15th November 2024.

Osaka, Japan, 2024

15th Asia-Pacific Conference on Combustion (ASPACC 2025) from 18th to 22nd May 2025

NUS, Singapore 2025

26th International Symposium on Plasma Chemistry (ISPC26), from 15th to 20th June 2025

Minneapolis, USA 2025

Poster Presentation at University of Cologne, Germany, from 24th to 28th November 2025,

Cologne, Germany

AWARDS

- ✚ MHRD, Graduate Aptitude Test in Engineering (GATE) Scholarship during PhD and MTech (2017-2025).
- ✚ Got a scholarship from ISPC-26 to attend the 26th International Symposium of Plasma Chemistry at the University of Minnesota, USA.
- ✚ Received a ₹1,00,000 scholarship from the Office of Development and Alumni Affairs (ODAA), IISc Bangalore, to attend the 26th International Symposium on Plasma Chemistry at the University of Minnesota, USA.

TECHNICAL SKILLS AND INTERESTS

Experimental

High-speed Imaging, Electrical Signal Measurements, Optical Emission Spectroscopy, Gas Chromatography, Data Acquisition, Operation of Plasma Reactors and Gasifiers. Design and Fabrication of Reactor/Product, Material Characterization such as SEM and TEM. Design of plasma reactors for chemical applications, Plasma Diagnostics, Fluid Flow, Heat Transfer, Mass Transfer.

Modelling and Simulation

Chemical Kinetics modelling plasma using Chemical Workbench, MATLAB/SIMULINK, Fluent, COMSOL.

Programming

Basic level of Python Programming, Machine Learning with Python and Julia using VS code (Working on this).

Soft Skills

Taking on responsibility, Self-motivation, Persistence, Integrity, Critical Thinking, Time management, Active listening, Initiative, Ability to collaborate and active listening.

Others

Fundamental/Theoretical Calculations, Design of Experiments, Mathematical Analysis of Experimental Data, Presentation of Data, Image Processing.

RESEARCH, WORK EXPERIENCE AND PROJECT PROPOSAL

Teaching Assistant

Involved in setting up the Plasma Laboratory, Teaching: Factorial Design of Experiments. To Train the B. Tech students for course lab at IIT Dhanbad and guiding PhD., M. Tech and project assistant at IISc, Bangalore.

Project Proposal

1. Indo-German Science & Technology Centre (IGSTC-2025)

Topic : *Converting multilayered plastics to activated carbon using plasma pyrolysis.*

2. Indo-French, Collaborative Scientific Research Programme (Centre Franco-Indien pour la Promotion de la Recherche Avancée (CEFIPRA-2025))

Topic : *Enhanced Cold Plasma Reforming of Biogas : Insights from Advanced Diagnostics and Modelling.*

REFERENCES

Prof. Lakshminarayana Rao

Doctoral Thesis Advisor

Associate Professor

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Prof. Soubhik Kumar Bhaumik

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