

# Curriculum Vitae

## **ABHASH SHUKLA**

DOB: 12<sup>th</sup> September 1991  
Project Research Scholar,  
Thermal and Fluid Transport Laboratory (TFTL),  
**Indian Institute of Technology Patna**



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## **CAREER OBJECTIVE**

To utilize technical expertise, research experience, and management skills towards a challenging career in growth oriented and leading edge that will provide mutual benefits and where from I can utilize my capabilities to the fullest benefits of the organization and society.

## **RESEARCH INTERESTS**

My research interests center at the intersection of the water-energy nexus, focusing on sustainable and innovative technologies for environmental conservation and resource efficiency. Specifically, we focus on atmospheric water harvesting, advanced surface modification techniques to improve material performance, biomass-based gasification for clean energy, environmentally friendly refrigerants, and enhancing condensation efficiency in heat exchangers. We are particularly interested in exploring the synergy between these areas to develop scalable solutions for energy conservation, water resource management, and environmentally responsible refrigeration and cooling technologies.

## **WORK EXPERIENCES**

Sr. No.	Job organization	Job profile	Work period		Experience
			From	To	
1.	IIT Patna	Senior Research Fellow	26 April 2023	Present	1 year 5 months
2.	IIT Patna	Junior Research Fellow	4 January 2021	25 April 2023	2 years 4 months
2.	GK JCB, Raipur	Maintenance Manager	1 December 2018	30 November 2020	2 years
3.	CSIT, Durg	Asst. Professor	5 February 2018	18 November 2018	9 months
4.	Rungta group of Institutions, Durg	Asst. professor	17 July 2017	3 February 2018	7 months

## **RESEARCH PROJECTS**

Sl. No.	Project Title/Agency/Amount	Deliverables
01	Collaboration for Research Activities on Low Global Warming Potential Alternative Chemicals to Substances Controlled Under the Montreal Protocol <b>Supervisors:</b> Dr. Rishi Raj and Dr. Ajay D. Thakur <b>Funding Agency:</b> Project Management Unit, Ozone Cell, Ministry of Environment Forest and Climate Change (PMU, Ozone Cell, MoEF&CC)	<ul style="list-style-type: none"><li>➤ Design and development of custom fabricated test setup for evaluating the heat transfer characteristics and performance of novel eco-friendly refrigerants.</li><li>➤ Fabrication of superhydrophobic surfaces on metals using novel one-step single pot method, particularly for conformal geometries of heat exchanger fins.</li><li>➤ Development of energy-efficient cooling components for off-the-grid climate control unit equipped with vapor adsorption refrigeration cycle (ammonia-calcium chloride pair).</li></ul>

	<b>Period:</b> April 2023 to present (5-year project)	
02	<p>Psychrometry Driven Design and Fabrication of An All-Season Optimal Atmospheric Water Harvester</p> <p><b>Supervisors:</b> Dr. Rishi Raj and Dr. Ajay D. Thakur</p> <p><b>Funding Agency:</b> DST under Water Technology Initiative-Research, Technology and Innovation on Nexus of Water with Energy, Food, Health (EWFH)</p> <p><b>Industry Partner:</b> New leaf Dynamic Technologies Pvt. Ltd.</p> <p><b>Period:</b> December 2019 to December 2023</p>	<ul style="list-style-type: none"> <li>➤ Designed and developed a custom-made atmospheric water harvester (AWH) based on active cooling condensation with climate control unit.</li> <li>➤ Developed an all-season AWH particularly for arid (Jaisalmer, Rajasthan) and semi-arid (Jaipur, Rajasthan) climatic conditions. (Patent # 496332, granted on 9th January 2024)</li> <li>➤ The developed AWH meets the water requirement of the following zones: <ul style="list-style-type: none"> <li>○ Disaster relief camps (e.g. Kerala after the disastrous floods of 2018).</li> <li>○ Remote military establishments (e.g. North and North-east near border establishments).</li> <li>○ Remote hospitals and schools are established in water stress regions.</li> </ul> </li> <li>➤ Development of off-the-grid AWH by employing an adsorption refrigeration system powered by renewable energy sources, such as solar or biomass</li> </ul>

## **EDUCATION**

Degree	Institution	Duration	C.P.I./%
Ph.D. (Mechanical)	Indian Institute of Technology Patna	January 2021 - Present	9.35
M.Tech. (Thermal Science and Engineering)	National Institute of Technology Agartala	2015 - 2017	9.31
B.E. (Mechanical) [Pune University]	PCOE, Ahmednagar (M.H.)	2009 - 2013	69.50 %
Class XII [CBSE Board]	Sri Sankara Vidyalaya, Bhilai (C.G.)	2009	72.00 %
Class X [CBSE Board]	Sri Sankara Vidyalaya, Bhilai (C.G.)	2007	75.00 %

## **PATENTS**

1. **Shukla, A.**, Sunil, Thakur, A. D. and Raj, R., “System and Method for Extracting Atmospheric Moisture”, application filed with Indian Patent Office, Application Number 202331035489, Date – 22/05/2023. (Granted on 9th January 2024, Patent number 496332)
2. Sunil, Sinha, R., Raj, R., Thakur, A. D., **Shukla, A.**, Agrawal, A., “System and Method for Off-the-grid Climate Control”, application filed with Indian Patent Office, Application Number 202231026031, Date – 04/05/2022. (Granted on 5th March 2024, Patent number 519459)

## **PEER-REVIEWED JOURNAL ARTICLES**

1. **Shukla, A.**, Sunil, Thakur, A. D., & Raj, R. (2024). Experiment and modeling of an improvised atmospheric water harvester for arid and semi-arid conditions. *Applied Thermal Engineering*, 242, 122486. <https://doi.org/10.1016/j.applthermaleng.2024.122486>

## **PEER-REVIEWED CONFERENCE PRESENTATIONS**

1. **Shukla, A.**, Upadhyay, A., Qadeer, M., Thakur, A. D. and Raj, R., “Advancing Two-Phase Energy Systems with Ionic Liquid-Based Coating Technologies”, International Conference on Advancement in Thermal-Spray (ICOAT), July 18 – 21, 2024.
2. **Shukla, A.**, Thakur, A. D. and Raj, R., “Experiment and Modeling of a Modified Atmospheric Water Harvester for Arid and Semi-arid Conditions”, 27th National and 5th International ISHMT-ASTFE Heat and Mass Transfer Conference, December 14-17, 2023.
3. Sinha, R., Sunil, **Shukla, A.**, Thakur, A. D. and Raj, R., “Experimental Investigation of Biomass Gasification-Based Dryers for Neem Leaves”, 27th National and 5th International ISHMT-ASTFE Heat and Mass Transfer Conference, December 14-17, 2023. **(Best poster award)**
4. Sinha, R., Sunil, **Shukla, A.**, Thakur, A. D., and Raj, R., “Design, fabrication, and experimental investigations of a heat recovery system from biomass gasifier exhaust for regeneration of desiccant”, 4th International Conference on Recent Advance in Bio-Energy Research (ICRABR), October 9-12, 2023.

## **ACHEIVEMENTS**

- Best poster presentation award entitled “Atmospheric Moisture Harvesting in Arid Climates: An Innovative Approach” in Research Scholars Day 2024 held at IIT Patna.
- 1st prize in my research in three minutes award entitled “Atmospheric Water Harvesters for Dry Climates” in Research Scholars Day 2024 held at IIT Patna.
- Best poster presentation award entitled “Experimental Investigation of Biomass Gasification-Based Dryers for Neem Leaves”, 27th National and 5th International ISHMT-ASTFE Heat and Mass Transfer Conference, December 14-17, 2023.
- Best poster presentation award entitled “Novel Atmospheric Water Harvester for Arid Climatic Conditions” in Research Scholars Day 2023 held at IIT Patna.
- Teaching excellence award in CSIT, Durg for best teaching and performance.
- President of Mechanical Engineering Students Association (MESA) 2012-13 of Parikrama College of Engineering, Ahmednagar.

## **MEMBERSHIP**

- Associate member (Membership no. AM1740065) of ‘The Institution of Engineers’ (India).
- Student member (Membership no. 1650) of ‘Indian Society of Heat and Mass Transfer’.
- Student member (Membership no. 22094570217) of ‘The American Society of Mechanical Engineers’.

## **TECHNICAL SKILLS**

MATLAB, Simulink, SOLIDWORKS, AUTOCAD PRO, CREO 2.0, ANSYS 14.0

## **DECLARATION**

I hereby declare that all the data furnished above are true as per best of my knowledge.

Date: November 13, 2024

Place: Patna, India

**Abhash Shukla**