Dr. Deepak Kumar Mandal

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EMPLOYMENTS

- **Associate Professor** in the Department of Mechanical Engineering of **Indian Institute of Technology (ISM) Dhanbad** from **April 2022**.
- **Assistant Professor** in the Department of Mechanical Engineering of **Indian Institute of Technology (ISM) Dhanbad** from **August 2015 to April 2022**.

EDUCATION

Program	Institution	Duration
Postdoctoral Fellow (Mechanical Engineering)	York University, Toronto, Canada	June 2013 – June 2015
PhD (Mechanical Engineering)	Indian Institute of Technology Madras, Chennai, India	July 2006 – July 2013
Master of Engineering (Automobile Engineering)	Jadavpur University, Kolkata, West Bengal, India	July 2004 – June 2006
Bachelor of Engineering (Mechanical Engineering)	Birbhum Institute of Engineering & Technology, University of Burdwan, West Bengal, India	July 2000 – June 2004

RESEARCH INTEREST

- Shedding of drops from surfaces
- Impact of drops on various surfaces
- Evaporation and sprays
- Drop – acoustics interactions
- Flow diagnostics
- Interfacial flow

…… THERMOFLUIDS

RESEARCH EXPERIENCE

1. **Tracking the surrounding eddies and peripheral velocity distribution of a shedding drop**
2. **Airflow assisted impact of drops on surfaces with various wettabilities**
3. **Impact of various drops on surfaces**
4. **Influence of acoustics on the evaporation of various drops**
5. **Shedding of drops on surfaces with different wettabilities under ambient and icing condition** (Research completed during **Postdoctoral Fellowship**)

6. **Internal circulation inside single and multi-component drop evaporating in a closed chamber** (Research completed for the **PhD degree**)
7. **Development of Hydrogen Gas Induction System into an Existing Single Cylinder 4-stroke Diesel Engine** (Research completed for **Master of Engineering** degree)

EXTERNALLY / INTERNALLY FUNDED RESEARCH PROJECTS

- DST (SERB) funded project (SUPRA) on the area of Thermo-acoustic instability of flames …..**Ongoing**.
- DST (SERB) funded project (CRG) on the area of the impact of drops ….. **Ongoing**.
- DST (SERB) funded project (ECR) on the broad area of the impact of drops …... Completed.
- TEQIP – III project on the broad area of the evaporation of drops ….. Completed.
- IIT (ISM) funded project on the broad area of the shedding of drops….. Completed.

SUPERVISION OF RESEARCH PROJECTS

- Currently **supervising 1 institute post-doctoral fellow** (IPDF Dr. Madhu Ranjan Gunjan).
- Currently **supervising 4 PhD** (Somen Kumar Dutta, Ravi Ranjan Singh and Md. Sirajullah – *Supervisor* and Aadil Kureshee – *Co – Supervisor*) students.
- **Supervised 5 PhD** (*Lukesh Kumar Mahato – Supervisor, Ramesh Kumar Singh – Supervisor, Vikas Kumar – Supervisor, Amrit Kumar – Supervisor* and *Suraj Prasad – Co- Supervisor*) students – all ***defended*** in 2021-2022.
- Supervised more than **20 MTech** students as the Principle Supervisor / Investigator.
- Supervised **several BTech** students for their final year projects as the Principle Supervisor / Investigator.

PATENTS FILED / GRANTED

1. Adil Kureshee, Deepak Kumar Mandal, R. N. Hota, S. Narayanan. ***A system for enhancing evaporation rate of single and multi-component twin drops by acoustic streaming***. Indian Patent Application No. 202331084799, Dated 12th Dec 2023. **Applied.**
2. Nandan Kumar Jha, Vikram, Adil Kureshee, Deepak Kumar Mandal, R. N. Hota, S. Narayanan. ***Acoustic driven twin jet injector system for the control of sprays/thermoacoustic oscillations in a combustor***. Indian Patent Application No. 202331082467, Dated 04th Dec 2023. **Applied.**
3. Suraj Prasad, Deepak Kumar Mandal, S. Narayanan. ***System and method for enhancing evaporation rate of multi component drops by acoustic streaming***. Indian Patent Application No. 202231030421, Dated 27th May 2022. **Filed.**

TEACHING

- Teaching since *August 2015*.
- Taught / teaching the following subjects at IIT (ISM),
    1. Refrigeration and Air conditioning Eng.
    2. Internal Combustion Engines
    3. Engineering Mechanics
    4. Heat Engine
    5. Power Plant Engineering
    6. Mechanical Engineering 2
    7. Combustion and emission in IC engines
    8. Convection and two-phase flow

REVIEWING EXPERIENCE OF JOURNAL / CONFERENCE PAPERS

- Reviewed / currently reviewing papers for International Journals (e.g., Physics of Fluids, Chemical Engineering Science) and Conferences (e.g., Fluid Mechanics and Fluid Power).

REVIEWING EXPERIENCE OF PROJECT PROPOSALS

- Reviewed a few project proposals submitted for Core Research Grant of DST (SERB), GoI, in 2022.

LABORATORY DEVELOPMENT

- Single handedly developed Fluid surface interaction lab.
- Improved the Refrigeration and air conditioning lab.
- Currently developing a lab for conducting research on the thermo-acoustic instability of flames.

RECOGNITIONS / AWARDS

1. Delivered an ***Invited talk*** on '***A drop's evaporation under the influence of acoustics: How does the internal circulation behave?***' at 2nd International conference on fluid, thermal and energy systems (June 6-8, 2024) in NIT Calicut, Kerala, India.
2. ***Chaired a session*** in the 2nd International conference on fluid, thermal and energy systems (June 6-8, 2024) in NIT Calicut, Kerala, India.

PARTICIPATION IN INTERNATIONAL CONFERENCES HELD ABROAD

3. Participated in '***CEST 2019***', held in Banska Bystrica, *Slovakia*, to present a paper on 'Shedding of salt water drops under icing conditions' in October 2019.
4. Participated in '***Thermophysics 2018'***, held in Smolenice, *Slovakia*, to present a paper on 'The effect of the size on the oscillatory internal circulation for an evaporating methanol-water drop' in November 2018.

5. Participated in *'**DFD13** Meeting of The American Physical Society'* held in Pittsburgh, *USA*, to present a paper on 'Water drop shedding under icing conditions from surfaces with different wettabilities' in November 2013.

6. Participated in *'24th European Conference – Liquid Atomization and Spray Systems – Estoril 2011 **(iLASS – 2011)**'* held in Estoril, *Portugal*, to present a paper on 'Measurement of surface concentration of an evaporating multicomponent droplet under different ambient conditions' in September 2011.

DEPARTMENT / INSTITUTE LEVEL RESPONSIBITIES

1. Member of Department PG committee and Faculty in charge of MTech (Thermal Eng.) from Oct 2024 to Oct 2026.
2. Co-Chairman of the department stock verification committee for the year 2022-23.
3. Member of the Department UG courses committee from Oct 2020 to Oct 2022.
4. Member of the Department purchase advisory committee from May 2022 to April 2023.
5. Document verification of students for the counselling of JEE admission of 2020.
6. Faculty – in – charge of the final year BTech Mechanical Engineering students from Oct 2020 to Oct 2022.
7. Member of the time table committee from the department (2017 – 2020).
8. Member of the NBA committee of the department.
9. Member of the standing DPAC committee of the department.
10. Faculty in charge of the department regarding training and placement.
11. Lab in charge of Refrigeration and air conditioning lab.
12. Lab in charge of Fluid surface interaction lab.
13. Record keeping of departmental publications in journals.
14. Conducted (along with other 3 faculties) an industrial visit for 110 UG students in CLW, Chittaranjan, WB.

INDUSTRIAL EXPERIENCE .... AUTOMOBILE INDUSTRY

- Worked as a **Manager** (Research and Development, **Alternate Fuel Technology** Department) from **September 2011** to **May 2013** in **Mahindra and Mahindra Limited – Chennai** (India's leading **automobile** manufacturer). The responsibilities were to,
    - Study the emerging technologies for the vehicle development,
    - Use of bio-diesel in vehicles,
    - Development of new power transmission system to minimize friction loss.

SCHOLASTIC ACHIEVEMENTS

- **Fellowship** to pursue postdoctoral research in York University, Toronto, Canada, from June 2013 to June 2015.

- **Half Teaching and Research Assistantship** (HTRA) for pursuing PhD in Indian Institute of Technology – Madras (IIT Madras) from July-2006.
- **Full scholarship** to present paper at international conference in Estoril, Portugal in 2011 from IIT Madras.

SKILLS

- Matlab
- Gambit v2.2.30
- Fluent v6.2.16
- Auto CAD

OTHER SKILLS / AWARDS / TRAININGS

- **Best paper of the session and best paper of the day award** in the ***48th National Conference on Fluid Mechanics and Fluid Power (FMFP)***, held on Dec 27-29, 2021, in BITS Pilani, Pilani Campus, India for the paper titled "Impact Dynamics of a Compound Drop on a Plane Solid: Effect of the Core Drop Viscosity" by Amrit Kumar, Deepak Kumar Mandal.
- Awarded from Mahindra and Mahindra Limited (March, 2013) for **'Continuous effort to scan the technology projects and reports prepared on various topics'**.
- Trained buyer of materials / equipment related to project at York University.
- 30 Days Industrial Vocational Training in the Chittaranjan Locomotive Works, West Bengal, India.
- 18 Days Industrial Training in the Bakreshwar Thermal Power Project, West Bengal, India.
