ANURAG PANT

akkupant@gmail.com Webpage

RESEARCH INTERESTS

- Experimental methods and measurements, Flow visualization techniques.
- Surface tension driven flows, interfacial instabilities.
- Interfacial and sub surface vorticity dynamics.

EDUCATION

Ph.D. in Fluid mechanics, Indian Institute of Technology Madras, GPA: 8.38/10.00 — June 2014- May, 2023
Advisor: Prof. A. P Baburaj.
Thesis title: *Dynamics of miscible ethanol films spreading on deep water layers.*

M.S in Applied mechanics, Indian Institute of Technology Madras, GPA: 8.38/10.00 — May, 2014

Bachelor of Technology in Mechanical engineering, DIT University, Percentage: 76/100 — May, 2010

Intermediate, St Judes' School, Dehradun (ICSE), Percentage: 83/100 — May, 2005

Matriculatiion, St Thomas' College, Dehradun (ICSE), Percentage: 74/100 — May, 2003

RESEARCH EXPERIENCE

Dissertation research — Jan 2017 - May, 2023
Flow physics laboratory, Department of Applied Mechanics, IIT Madas — Chennai, India
Worked on Vorticity dynamics in deep water layers due to miscible spreading.
- Advisor: Prof A.P Baburaj

Project — Sept 2020 - Nov, 2020
Dept. of Metallurgical & Materials Engineering, IIT Madras — Chennai, India
Worked on Photochemically Induced Dewetting of Thin Polymer Films.
- Principal Investigator: Dr Sreeram.K. Kalpathy

Dissertation research — June 2014 - Dec, 2016
Flow physics laboratory, Department of Applied Mechanics, IIT Madas — Chennai, India
Worked on Miscible, volatile film spreading on deep water layers.
- Advisor: Prof A.P Baburaj

Dissertation research (M.S) — July 2011 - June, 2014
Flow physics laboratory, Department of Applied Mechanics, IIT Madas — Chennai, India
Worked on Twisting of liquid columns and sheets.
- Advisor: Prof A.P Baburaj

PUBLICATIONS

Refereed Journal Publications

1. **Pant, Anurag, and Baburaj A. Puthenveettil.**, "Marangoni vortex rings in miscible spreading." Physical review Fluids(In press) (**Selected as an Editors' Suggestion**).
2. **Pant, Anurag, Baburaj A. Puthenveettil and Sreeram. K. Kalpathy.**, "Marangoni plumes in miscible spreading." Physics of fluids,35, 032107 (2023). (**Select as an Editors' pick.**)
3. **Dandekar, Raj, Anurag Pant, and Baburaj A. Puthenveettil.**, "Film spreading from a miscible drop on a deep liquid layer." Journal of Fluid Mechanics 829 (2017): 304-327.

4. **Pant, Anurag, and Baburaj A. Puthenveettil.**, "VORTEX RING BELOW A SPREADING ALCOHOL FILM ON WATER." Journal of Flow Visualization and Image Processing 27.2 (2020).

Manuscripts under review

1. **Anurag Pant, and Baburaj A. Puthenveettil.**, "Marangoni vorticity generation in miscible spreading." submitted to Journal of Fluid Mechanics.
2. **Anurag Pant, and Baburaj A. Puthenveettil.**, "Unveiling unique scaling behavior in miscible, volatile Marangoni spreading" submitted to Physics of Fluids.

Book Chapters

1. **Pant, Anurag, and Baburaj A. Puthenveettil.**, "Vorticity Generation Due to Surface Tension-Driven Spreading." Lecture notes in mechanical engineering. Springer, Singapore, 2021.

Conference Publications/Presentations

1. **Pant, Anurag, and Baburaj A. Puthenveettil.**, "Vorticity generation in miscible, volatile film spreading." (Poster) CompFlu, IIT Madras, Chennai, India, 2019. (**Best poster award.**)
2. **Pant, Anurag, and Baburaj A. Puthenveettil.**, "Vorticity Generation Due to Surface Tension-Driven Spreading." 16th Asian Congress of Fluid Mechanics. JNCASR, Bengaluru, India, 2019.
3. **Pant, Anurag, and Baburaj A. Puthenveettil.**, "VORTICES BELOW AN ALCOHOL FILM SPREADING ON A WATER LAYER." Proceedings of the 7th International and 45th National Conference on Fluid Mechanics and Fluid Power (FMFP), IIT Bombay, Mumbai, India, December 10-12, 2018.
4. **Pant, Anurag and Puthenveettil, Baburaj.**, "Dynamics of a surface tension driven vortex ring." Bulletin of the American Physical Society 65 (2020).
5. **Pant, Anurag and Puthenveettil, Baburaj.**, "Dynamics below an ethanol film spreading on a water layer." Bulletin of the American Physical Society 63 (2018).
6. **Pant, Anurag, and Baburaj A. Puthenveettil.**, "Bulk flow due to spreading of an alcohol drop." 12th European Fluid Mechanics Conference, Vienna, Austria, September 9-13, 2018.
7. **Pant, Anurag, and Baburaj A. Puthenveettil.**, "MIXING OF AN ALCOHOL-DROPLET WITH WATER." 11th European Fluid Mechanics Conference, Seville, Spain, September 13-16, 2016.
8. **Dandekar, Raj, Pant, Anurag and Puthenveettil, Baburaj.**, "Dynamics of surface tension driven mixing of an alcohol droplet with water." Bulletin of the American Physical Society 61.

HONORS AND FELLOWSHIPS

2023 Paper titled **Marangoni vortex rings in miscible spreading** chosen as an **Editors' Suggestion** in *Physical Review Fluids.*

2023 Poster titled **Vorticity generation in miscible, volatile film spreading** selected for **Best poster award** at *CompFlu, IIT Madras.*

2023 Paper titled **Marangoni plumes in miscible spreading** chosen as **Editors' pick** in *Physics of fluids.*

2014 Awarded **HTRA Fellowship with an upgrade to Ph.D program.**

2011 Awarded **HTRA Fellowship** for admission into M.S program at IIT Madras.

2005 Awarded **the best all round student from the passing out batch** , St Judes' school, Dehradun

WORKING EXPERIENCE

Senior research fellow, *Dept. of Metallurgical & Materials Engineering, IIT Madras* Sept–Nov 2020

- Developed a theoretical model to analyze instabilities occurring at the boundary of a thin ethanol film, that was spreading over a deep water layer. Utilized MATLAB solver capable of solving coupled differential equations.
- Validated the theoretical model by comparing its predictions with experimental observations.

TEACHING EXPERIENCE

Teaching assistant and coordinator (Fluid mechanics lab) July, 2017 - Nov, 2017; Jan, 2012 - May, 2012

- Conducted laboratory sessions for undergraduate students in the Fluid mechanics laboratory.

Teaching assistant (Instrumentation lab) July, 2015 - November, 2015

- Conducted instrumentation laboratory sessions for graduate students.
- Graded the laboratory reports.
- Mentored teams working on course projects.

Teaching assistant (Hydrodynamics) Jan, 2014 - May, 2014

- Prepared and graded course assignments.
- Monitored and conducted quizzes.

Teaching assistant (Foundations of fluid mechanics) Jan, 2013 - May, 2013

- Prepared and graded course assignments and invigilated tests.
- Conducted tutorial sessions for the class.

SERVICE

Manuscript Reviewer, Physics of Fluids Feb 2023-Present

SKILLS

Programming: MATLAB, Python, R.
Flow visualization techniques: Particle image velocimetery (PIV), Particle tracking velocimetery(PTV), High speed imaging, Laser induced fluorescence(LIF).
Tools: LaTeX, Inkscape, Mathematica, OpenFoam