Knowledge Dissemination

Books: 1.**Saha A., Das D., Srivastava R., Panigrahi P., Muralidhar K. (eds) Fluid Mechanics and Fluid Power – Contemporary Research. Lecture Notes in Mechanical Engineering. Springer, New Delhi, 2017**

Publications

Journals:

1. J Mohd, A Yadav, D Das Open inverted bell and bell formation during the washing of vials.**Physics of Fluids** 34 (4), 042126
   (**It also featured in the AIP Scilight** 28 APRIL (2022) •
   https://doi.org/10.1063/10.0010427 Producing water bells with kitchen vials by Avery Thompson (A simple setup with a water jet and a vial can generate the full range of water bell shapes.)
2. J Mohd, T Murugan, D Das Transient characteristics of the trailing jet of a compressible vortex ring at Mach 1.5 (2022), **Journal of Flow Visualization and Image Processing 29** (4)
3. N Biswas, A Sharma, S Saha, D Das, Puff-like instability in laminar to turbulence supercritical transition of round jets **arXiv (2022)** preprint arXiv:2202.11771
4. N Biswas, A Sharma, S Saha, D Das, Puff-like instability in laminar to turbulence supercritical transition of round jets **Physical Review Letter Under Appeal consideration (2022)** Four Reviewers have accepted so far.
5. Sajag Poudel, lakshmana chandrala, Debopam Das, and Ashoke *also*2021 Characteristics of shock tube generated compressible vortex rings at very high shock Mach numbers " **Physics of Fluids 33**, 096105 (2021); https://doi.org/10.1063/5.0063164
   (**It Also featured in the AIP Scilight** 17 September 2021 •
   https://doi.org/10.1063/10.0006344
   Title: **Compressible vortex ring propagating faster than the speed of sound simulated for the first time** by Jodi Ackerman Frank
   Numerical model generates a supersonic vortex ring with spectacular secondary ring structures)
6. Nayak, A., & Das, D. (2021). Experimental and numerical investigation of flow instability in a transient pipe flow**. Journal of Fluid Mechanics**, 920, A39. doi:10.1017/jfm.2021.460
7. Bharadwaj, K. K., and Das, D. (May 27, 2021). "Influence of Coflow on Buoyant Plume Puffing." **ASME. J. Fluids Eng**. September 2021; 143(9): 091303. https://doi.org/10.1115/1.4050729
8. B Chandra, V Shankar, D Das (2020) Early transition, relaminarization and drag reduction in the flow of polymer solutions through microtubes **Journal of Fluid Mechanics 885** A47, doi:10.1017/jfm.2019.1040
9. Mitesh Thakor, Gaurav Kumar, Debopam Das, and Ashoke De, (2020) Investigation of asymmetrically pitching airfoil at high reduced frequency, **Physics of Fluids** 32, 053607; https://doi.org/10.1063/5.0006659
10. A Nayak, D Das (2019) A pseudospectral approach applicable for time integration of linearized N-S operator that removes pole singularity and physically spurious eigenmodes, **International Journal for Numerical Methods in Fluids** 91 (10), 473-486
11. Bharadwaj, K., & Das, D. (2019). Puffing in planar buoyant plumes: BiGlobal instability analysis and experiments. **Journal of Fluid Mechanics**, 863, 817-849. doi:10.1017/jfm.2018.1022

12. B Chandra, V Shankar, D Das, (2019) Onset of transition in the flow of polymer solutions through deformable tubes **Physics of Fluids** 31 (11), 114103

13. B Chandra, R Mangal, D Das, V Shankar, (2019) Instability driven by shear thinning and elasticity in the flow of concentrated polymer solutions through microtubes **Physical Review Fluids** 4 (8), 083301

14. Chandra, B., Shankar, V., & Das, D. (2018). Onset of transition in the flow of polymer solutions through microtubes. **Journal of Fluid Mechanics,** 844, 1052-1083. doi:10.1017/jfm.2018.234

15. T Murugan, CL Dora, S De, D Das, (2018) 'A comparative three-dimensional study of impulsive flow emanating from a shock tube for shock Mach number 1.6' **Journal of Visualization**, Vol 21(6), pp 921-934

16. Dibakar Mahalanabish, Debopam Das, Jonathan Neudorfer, 2018 'Physical Real-time Model of Diesel Particulate Filter using Second-order Perturbation Method'**, Journal of Automobile Engineering and Applications** ISSN: 2455-3360 (Online) Volume 5, Issue 3 pp-29-34

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18. Avinash Nayak and Debopam Das, (2017) "Transient growth of optimal perturbation in a decaying channel flow", **Physics of Fluids 29**, 064104 https://doi.org/10.1063/1.4985000.

19. Debopam Das, Mohit Bansal & Akash Manghnani, 2017, Generation and characteristics of vortex rings free of piston vortex and stopping vortex effects, **Journal of Fluid Mechanics** Vol **811** pp 138–167

20. Debopam Das, Mohit Bansal & Akash Manghnani, 2017 **Front Cover Page** on Vortex ring**, Journal of Fluid Mechanics. 811 (First Front Cover Page in JFM from IIT Kanpur)**

21. Das, D., Manghnani, A., Bansal, M., & Sohoni, P. (2016). Axial interaction of a vortex ring with a cylinder. **Journal of Fluid Mechanics**, 809, 1-30. doi:10.1017/jfm.2016.626

22. Abhishek Kundu, Sudipta De, Murugan Thangadurai, C. L. Dora, Debopam Das, 2016, Numerical visualization of shock tube-generated vortex–wall interaction using a fifth-order upwind scheme, **Journal of Visualization**, Online, DOI 10.1007/s12650-016-0362

23. S. Pradeep Kumar, Ashoke De, Debopam Das 2015 Investigation of flow field of clap and fling motion using immersed boundary coupled lattice Boltzmann method, **Journal of Fluids and Structures** Vol **57,** Pages 247–263

24. Bharadwaj K. K., Das Debopam, Sharma P, 2015 Near field characteristics of Buoyant Helium Plume **Sadhana,** Springer Vol **40** pp757-768

25. Dora, C. L., Murugan, T., De, S., and Das, D, 2014 Mechanism of Counter Rotating Vortex Rings formation ahead of a compressible vortex ring, ***Journal of Fluid Mechanics*. (2014),** Vol**. 753,** pp. 29_48

Conferences:

1. Pradnya Vasant Kadam, and Debopam Das, Manta-ray: Stealth Unmanned Underwater Vehicle, ICIUS-2022-P220023, ICIUS 2022 Tokushima, Japan
2. Shivam Shirbhate, Debopam Das, Analysis of Rotary Air Engine, ICIUS-2022-P220055, ICIUS 2022 Tokushima, Japan

3. Kuchumanchi Bharawdaj, Debopam Das, Understanding the Near Field Entrainment Characteristics of a Buoyant Plume using Stereo PIV Measurement, ICTAM 2020 Milano Italy, Invited paper.
4. Sanjay Pradeep, Anamika Mondal, Debopam Das, Interaction of a Compressible Vortex Ring with a Plate-Cone Surface, ICTAM 2020 Milano Italy
5. Joydeep Bhowmik, Debopam Das and Sonu Pal, Characterization of a delta tail for an ornithopter: Effect of tail size and rotation, ICIUS 2019, Beijing China.
6. On evolution and propagation of a compressible vortex ring, 2019 Asian Workshop on Theoretical and Applied Mechanics
7. Avinash Nayak and Debopam Das, 'Experimental Investigation of Flow Instability in a Transient Pipe Poiseuille Flow' 2018, FMFP2018–PAPER NO. 249, Proceedings of the 7th International and 45th National Conference on Fluid Mechanics and Fluid Power (FMFP), December 10-12, 2018, IIT Bombay, Mumbai, India
8. Dibakar Mahalanabish and Debopam Das, "Intermittent Kalman Flter: Improvements and usage in Model-Based Calibration (MBC)" January 2019 Conference: SIAT 2019, ARAI Pune
9. Sajag Poudel, Himanshu Mishra Ashoke De and Debopam Das, 'Numerical Investigation of Compressible Vortex Ring during Axial Interaction with Cylinder' 2018, FMFP2018–PAPER NO. 222, Proceedings of the 7th International and 45th National Conference on Fluid Mechanics and Fluid Power (FMFP), December 10-12, 2018, IIT Bombay, Mumbai, India
10. Krishna, R., Gupta, S., Abhishek and Das, D., "Experimental Investigation of Aerodynamic Performance of a Novel Octorotor Convertiplane UAV in Hover, Transition and Forward Flight," Proceedings of 74th AHS International Annual Forum, May 14-17, 2018, Phoenix, Arizona, USA.
11. Aggarwal, D., Ramanujam R., Abhishek and Das, D., "Aerodynamic Characterization of a Novel Dissimilar Coaxial Rotor Concept," Proceedings of 74th AHS International Annual Forum, May 14-17, 2018, Phoenix, Arizona, USA.
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13. N. Biswas, A. Mukherjee, K. K. Bharadwaj, S. Saha, D. Das, "An Experimental study on instabilities in Low Reynolds number axisymmetric jets", EFMC 2018, TU Vienna
14. Debopam Das Sajag Poudel, Bhaskar Koley, Chandrala Lakshmana Dora, Ashoke De Numerical investigation of compressible vortex ring, ICCMSO-2018 Bangkok Thailand, 22-24th June 2018.
15. Krishna, R., Gupta, S., Abhishek and Das, D., (2018) "Experimental Investigation of Aerodynamic Performance of a Novel Octorotor Convertiplane UAV in Hover, Transition and Forward Flight," accepted for publication and presentation at the 74th AHS International Annual Forum, Phoenix, AZ, USA. (Accepted)
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17. Abhishek, Krishna, R., Sinha, S., Bhowmik, J., and Das, D., "Design, Development and Flight Testing of a Novel Quadrotor Convertiplane Unmanned Air Vehicle", Proceedings of 73rd American Helicopter Society Annual Forum, Fort Worth, Texas, USA, May 9-11, 2017.
18. Kuchimanchi K Bharadwaj, Debopam Das, Pavan K Sharma, (2017) "Phase resolved PLIF measurements in puffing plumes", 11th Asia-Pacific Conference on Combustion, The University of Sydney, NSW Australia, 10th-14thDecember 2017.

19. Anshul Khandelwal, Kamal Poddar, Das D. (2017) Investigations into Asymmetric Oscillations of a Symmetric Airfoil. In: Saha A., Das D., Srivastava R., Panigrahi P., Muralidhar K. (eds) Fluid Mechanics and Fluid Power – Contemporary Research. Lecture Notes in Mechanical Engineering. Springer, New Delhi
20. CL Dora, A De, D Das 2017, Numerical simulations of 3D compressible vortex ring, AIP Conference Proceedings, Volume 1863 Issue 1 Pages 030027
21. Kuchimanchi K Bharadwaj and Debopam Das; Phase locked 2-D and stereo PIV measurements in puffing rectangular buoyant plumes, The 12th International Symposium on Particle Image Velocimetry, June 18-22, 2017, Busan, Korea.

Development

Technology Products/Patents:

Patents:

1. *Biomimicry scout camera system: 'Bruit', Patent applied 2022 Dharambir Poddar, Debopam Das*

2. "Spin Independent Fin Deployment Mechanism For Projectile" RAWAT, Deepak Singh, YADAV, Avinash Kumar, DAS, Debopam Application No.202111046373 A, 29/10/2021

3. "Ornithopter", Patent number 59/DEL/2015 J Bhowmik, and D Das

4. A foldable wing design of an improved flapping wing aerial vehicle", (filed November 08, 2016) . Application number 201611038098, J Bhowmik, G Seth and D Das

5. A system for particle generator in PIV applications (Patented) Application No.4I30/DEL/20I5 A (published in the Official Journal No. 25/2017 of the Patent Office dated 23-06-2017.)

6. ' Novel Quadrotor Convertiplane Unmanned Air Vehicle', Patent applied ,Feb. 2017, Abhishek, Krishna, R., Sinha, S., Bhowmik, J. and Das

Products Dveloped:

1. Developed a Tomographic Background Oriented Schlieren (BOS) System for 3D density measurement for BARC

2. *Design and fabrication of Flying Ornithopters*

3. Development of a LED based low cost Particle Image Velocimetry (PIV) System for BARC.

4. Developed a Planar Laser Induced Fluorescence (PLIF) system for species concentration measurements.

Details of the above prototypes/instruments are given below.

- ***Biomimicry scout camera system: 'Bruit'***