

Jet Flows: Subsonic, Supersonic and Synthetic with Applications

Overview

Jet flows are the predominant feature in many engineering devices and systems. They can be used in mixing, cooling, propulsion, spraying and numerous other applications. The jet spread rate and decay of the potential core are two important parameters for mixing. Also, the region where maximum interaction between ambient fluid and jet fluid occurs decides the evolution of the jet in the downstream direction. Understanding the functioning of these devices and systems as well as the development of new applications require a good understanding of the different types of jets and their fundamental behavior.

Jet flows can broadly be classified as free and confined. The rate of evolution of the mean flow and fluctuations are quite different for these two types of jet. Jets generated by imparting a net change of momentum to a fluid with zero net mass flux are known as synthetic jets. This type of jet is especially useful where there is a space constraint as in electronics cooling applications. There are various factors which influence the entrainment and jet spreading such as inlet velocity, nozzle geometry, fluid temperature etc. Due to the instability of the shear layer, vortices are generated as the jet moves in the axial direction. The strength and size of these vortices influence the entrainment process. Understanding the fundamental fluid mechanic aspects of a jet is very important to be able to efficiently apply jet flows in various practical engineering application.

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| Course duration | 3th December 2018 to 7th December 2018 | | | | | | | | | | | | | |
| | Number of participants for the course will be limited to fifty. | | | | | | | | | | | | | |
| You Should Attend If... | <ul style="list-style-type: none"> ▪ you are an applied mechanical engineer or researcher interested in turbulent jet flow in either a wall bounded or free boundary domain. ▪ you are a mechanical/chemical/civil engineer or research scientist interested in applying jets for your theoretical or experimental studies on turbulence. ▪ you are an atmospheric scientist, physicist or space scientist interested in supersonic jets and their impact on substrates, you are involved in oceanography or are a geophysicist interested in studying the stability of the flow in a wall bounded or free boundary domain in your profession. ▪ you are a student or faculty member from an academic institution and are interested in learning more about jet flows and contributing to turbulent flow research. | | | | | | | | | | | | | |
| Fees | <p>The participation fees for taking the course are as follows:</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td>Participants from abroad :</td> <td style="text-align: right;">US \$ 500</td> </tr> <tr> <td>Industry/ Research Organizations within India: `</td> <td style="text-align: right;">Rs. 15000</td> </tr> <tr> <td>Faculty/Staff from Academic Institutions within India:</td> <td style="text-align: right;">Rs. 5000</td> </tr> <tr> <td colspan="2">Students from India:</td> </tr> <tr> <td>Ph.D./Post-doctoral</td> <td style="text-align: right;">Rs. 2000/3000</td> </tr> <tr> <td>M.Tech./M.Sc.</td> <td style="text-align: right;">Rs. 1000</td> </tr> </table> <p>The above fee includes all instructional materials, computer use for tutorials and assignments, laboratory equipment usage charges, 24 hr free internet facility. Boarding, lodging and meal charges are not included in the fees. The participants will be provided with accommodation on a payment basis.</p> | | Participants from abroad : | US \$ 500 | Industry/ Research Organizations within India: ` | Rs. 15000 | Faculty/Staff from Academic Institutions within India: | Rs. 5000 | Students from India: | | Ph.D./Post-doctoral | Rs. 2000/3000 | M.Tech./M.Sc. | Rs. 1000 |
| Participants from abroad : | US \$ 500 | | | | | | | | | | | | | |
| Industry/ Research Organizations within India: ` | Rs. 15000 | | | | | | | | | | | | | |
| Faculty/Staff from Academic Institutions within India: | Rs. 5000 | | | | | | | | | | | | | |
| Students from India: | | | | | | | | | | | | | | |
| Ph.D./Post-doctoral | Rs. 2000/3000 | | | | | | | | | | | | | |
| M.Tech./M.Sc. | Rs. 1000 | | | | | | | | | | | | | |

The Faculty



Prof. Gary W. Rankin is a Professor in the Department of Mechanical, Automotive and Materials Engineering, University of Windsor, in Canada. His research interests include Computational Fluid Dynamics, Flow Visualization, Heat Transfer, Hot-wire Anemometry, Laser Doppler Anemometry, Mathematical Modeling, Optical Measurement Methods, Synthetic Jet Ejectors, Thermo-fluid Measurements and Unsteady Jets. His current active areas of interest are supersonic fluidic oscillators, vortex rings and synthetic jet ejectors.



Dr. Sushanta is an Associate Professor of Indian Institute of Technology, Roorkee. His research interest includes: Experimental Fluid Mechanics; Experimental Heat Transfer; Optical Measurement Techniques, Active and Passive Control of Flow Field, Wake Dynamics, Turbulence and fluid mechanics in bio mimics and micro fluidics.

Course Co-ordinator

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https://www.iitr.ac.in/departments/ME/pages/GIAN_course_on_Jet_flows:_subsonic_supersonic_and_synthetic_with_applications_.html

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