A Webinar On

Turbulence and its modelling

Under

TEQIP-III

February, 17th and 19th, 2021

Organized by

Department of Mechanical Engineering
Indian Institute of Technology (Indian School of Mines) Dhanbad,
Dhanbad - 826 004, Jharkhand, India
https://www.iitism.ac.in

About IIT(ISM) Dhanbad

The Indian Institute of Technology (Indian School of Mines) is a fully residential and co-educational premier institute located in the mineral-rich belt of India in the city of Dhanbad, Jharkhand. It is one of the oldest technical institute of the country and was established as ISM in 1926 on the lines of the Royal School of Mines, London. What started as an institution to impart mining education, has grown into a full-fledged technical institution of international acclaim offering a host of programmes, such as B.Tech., B.E., M.Tech., M.Sc. Tech. and MBA. In addition, the Institute offers full as well as part time Ph.D. programmes besides Post-Doctoral Fellowships. The institute boasts of eighteen departments, with certain departments dedicated to the Earth Sciences and are unique in the country. Formerly known as Indian School of Mines Dhanbad, the Institute was upgraded to a full-fledged IIT on 6th September, 2016.

About the Department

The Department of Mechanical Engineering is an indispensable constituent of IIT(ISM) Dhanbad, since its inception. In recognition of the expanding activities of the Department, it was renamed as 'Department of Engineering and Mining Machinery' in 1973. With the development of substantial infrastructure and expertise, the Institute felt and recognized the necessity to start the B.Tech. course in Mechanical Engineering in 1999. Consequently, the Department was renamed in 2002, to 'Department of Mechanical Engineering and Mining Machinery Engineering'. In a few years, the B.Tech. in Mechanical Engineering acclaimed much popularity and increased its intake substantially. Thus, the Institute declared the 'Department of Mechanical Engineering' to work independently since 26 th June, 2013.

Background of the turbulent flow

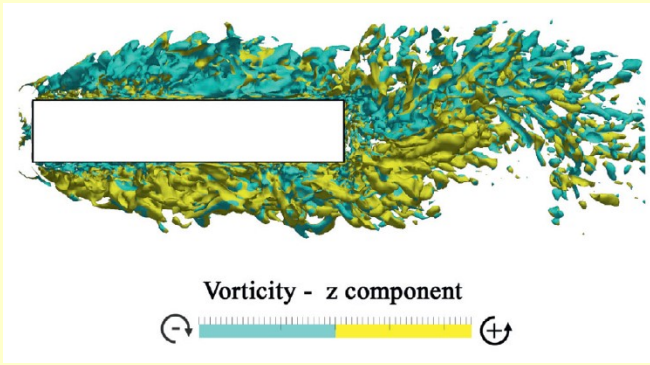

Image source:

https://site.unibo.it/cwe-lamc/en/research/bluff-aerodynamics

Virtually, all fluid dynamics problems of engineering significance belong to the realm of turbulent flow. According to Tritton (2007) turbulence is a 'state of continuous instability'. The current state of knowledge on turbulent flow owes significantly to laboratory experiments. In theoretical studies of turbulence, the objective is to develop tractable turbulent models that can accurately predict the properties of turbulent flow (Pope, 2003). The dominance of randomness in a turbulent flow leaves a very narrow room for analysis through deterministic approach and hence statistical depiction of turbulence becomes inevitable.

Topics to be covered

Lecture 1: Basics of Turbulence and Need for Tackling Turbulence

(17/2/2021, 3 – 4 PM):

Highlights:

- Characteristics of turbulent flows
- Difficulty in handling such flows
- Challenges in computing turbulent flows
- Why is it an extremely important research topic?

Lecture 2: RANS Modelling, DNS and LES of Fluid Turbulence

(19/2/2021, 3 – 4 PM):

Highlights:

- Ways of computationally studying turbulent flows
- Merits and demerits of the existing computational methods
- Recent advances in turbulent flow research.

Speaker

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About the speaker

Professor Anupam Dewan is a leading researcher of the country in turbulence modelling. He has authored the text 'Tackling turbulent flows in engineering' in 2011. Professor Dewan has published more than 150 research articles in leading international journals and conferences. Professor Dewan is the Associate Editor of the Proc. of the Inst. of Mechanical Engineers (IMechE), Part C:Journal of Mechanical Engineering Science and reviewer of several reputed journals.

Who can attend

UG, PG, Ph.D. students and faculty members from various institutes interested/working in fluid flow modelling can attend the talks.

How to apply and register

Following is the link for online registration for the talks:

https://forms.gle/cA8nPStiUAJwzdmi9

Last date of online registration is 16th February, 2021.

Registration fee

There is no registration fee for attending the talks.

Mode of the event: Google Meet

Webinar meeting links will be shared to all registered participants via email a day before each talk.

Course Coordinator

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