

**COMPUTATIONAL FLUID DYNAMICS (CFD) WORKSHOP  
ON  
SANKHYASUTRA TARAL: THE FUTURE READY CFD TOOL**

**DEPARTMENT OF CHEMICAL ENGINEERING, IIT ROORKE**

August 11, 2023

9:30 am – 4:15 pm

Room # 101 / 202

**OVERVIEW:** Computational fluid dynamics plays a key role towards the design of products and processes not only in industry but also contributes heavily towards academic research. SankhyaSutra Taral™, a state-of-the-art CFD solver, is a high fidelity and high accuracy platform based on the Lattice Boltzmann Method (LBM). Being an inherently transient and parallelizable method of solving flow, it helps us to solve large problems where one can capture transition flow, separation flow and extend it to Multiphysics applications like aeroacoustics. SankhyaSutra Taral™ provides tremendous productivity boost to solve complex engineering problems and is designed to minimize dependence on long physical prototyping cycles. Workshop will cover the following topic.

<b>Time Slot</b>	<b>Topics</b>	<b>Speaker</b>
09:30 am – 10:00 am	Introduction to CFD (Computational Fluid Dynamics)	Athreya Ballapur
10:00 am – 11:00 am	Introduction to LBM (Lattice Boltzmann Method)	
11:00 am – 11:30 am	Break	
11:30 am – 12:45 pm	Introduction to SankhyaSutra Taral™	Athreya Ballapur
12:45 pm – 02:15 pm	Lunch Break	
02:15 pm – 04:15 pm	Hands-On Session with SankhyaSutra Taral™	Athreya Ballapur

**ABOUT THE SPEAKER:** Athreya Ballapur's area of expertise is CFD and Computational Aeroacoustics. He's a graduate of the Faculty of Aerospace Engineering at TU Delft and was a researcher at the University of Sherbrooke in Quebec before joining SankhyaSutra Labs. He's been working with LBM since 2018 on several academic and industrial research projects on unsteady aerodynamics, conjugate thermal simulations of HVACs, and aeroacoustics of rotating bodies. His current focus is on helping establish LBM as a convenient and dependable alternative to conventional CFD methods.

**ABOUT THE SANKHYASUTRA:** SankhyaSutra Taral™ is product of SankhyaSutra Labs which provides high-fidelity multiphysics and aerodynamics simulation software that leverages highly efficient computational methods, complemented by an optimally architected High Performance Cluster (HPC) to achieve reliable simulation. Our tools find applications primarily in aerospace and defence, automotive, semiconductor manufacturing, and process industries during many phases of the product lifecycle including design, operation, and maintenance. The technology also enables fundamental insights into physical phenomena including fluid dynamics, heat transfer, chemical reactions and particle dynamics. Digital twins developed using SankhyaSutra's technology are key enablers of Industry 4.0. Incubated in 2015, SankhyaSutra Labs has its R&D centre in Bangalore with target customers across the globe. The name SankhyaSutra literally translates to 'numerical algorithms' in Sanskrit. SankhyaSutra Labs is a subsidiary of Jio Platforms Limited, which is a subsidiary of Reliance Industries Ltd. More details at <https://sankhyasutralabs.com/>

**Registration link:** <https://forms.gle/dr95wBXfJ5W3LP9V9>

**Registration Fee:** Nil

**CFD Tool Download & Installation Instructions:** Please *bring your own* laptop/computing device;

Follow the instructions on the "next page" to **download and install** the SankhyaSutra Taral CFD tool before coming for the session.

*All interested are welcome to attend the workshop.*

Coordinator: Prof. R.P. Bharti (e-mail: [rpbharti@iitr.ac.in](mailto:rpbharti@iitr.ac.in))

## Steps to be done for opening gui on windows

The SankhyaSutra Taral GUI will run only on linux based OS. To run it on Windows we use Windows Subsystem Linux, version 2 (Linux VM which will run on windows).

1) The first step towards this would be to enable wsl and vm in windows features (admin permission will be required for this)

- Search for "Windows Features on or of" from the windows search utility or "Start" section
  - Enable WSL
  - Enable VM

2) Download the zip file containing ubuntu and taral product from [https://drive.google.com/file/d/1nf5PH\\_UDH2S8pZ2lwaUIRQZps7FtHOee/view?usp=sharing](https://drive.google.com/file/d/1nf5PH_UDH2S8pZ2lwaUIRQZps7FtHOee/view?usp=sharing)

- Unzip the downloaded file, to get the tar file (**taral\_gui.tar**) which will be imported to wsl. Note the path to the file **taral\_gui.tar**, which will be used in the next step

3) The following commands will take time to finish but need to be done only once

- Open Windows Powershell
- `wsl -l -v` (Check if there are existing wsl distros and which versions)
- `wsl --update` (Update the wsl version to the latest)
- `wsl --set-default-version 2` (Set default wsl version to 2)
- `wsl --import Ubuntu-22.04 <Directory where you want install the VM> <Path to the downloaded taral_gui.tar>`

4) After installing the linux distribution, to open the gui do the following

- Open Windows Powershell
- `wsl ~ -d Ubuntu-22.04 -u ssl`
- `bash start_gui.sh`
- A firefox window, with the Sankhyasutra Taral page will open, upon which you can start using the product.