Abhiram Kalluri

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EDUCATION

Indian Institute of Science (IISc.)   Bengaluru, India
Master of Technology (MTech), Chemical Engineering, CGPA: 8.4/10 (Class Rank: top 5)   2024-2026

Relevant Coursework: Quantum Mechanical Modelling of Nanomaterials (DFT), Statistical Thermodynamics, Molecular Simulations, Numerical Methods, Transport Processes, Chemical Reaction Engineering, Applied Statistics, Mathematics.

National Institute of Technology (NIT)   Andhra Pradesh, India
Bachelor of Technology (BTech), Chemical Engineering, CGPA: 9.16/10 (Class Rank: 2)   2020 – 2024

Relevant Coursework: Thermodynamics, Fluid Mechanics, Transport Phenomena, Chemical Reaction Engineering, Design of Experiments, Mathematics (Applied Linear Algebra, Complex Variables, Calculus, Differential Equations and Integral Transforms)

AWARDS & ACCOMPLISHMENTS

MoE Fellowship   2024 - 2026
Fellowship for pursuing MTech. at IISc Bengaluru, awarded by the Ministry of Education, Govt. of India

Graduate Aptitude Test in Engineering (GATE)   February 2024
Secured a rank of 103 among 13937 candidates across India, in the chemical engineering discipline

Best Poster Award   January 2023
Symposium on "Ideation, Innovation, Development, and Technology Transfer of Industrially Scalable Processes" organised by Dept. of Chemical Engineering, NIT Andhra Pradesh.

Indian Academy of Sciences (IAS-INSA-NASI) Summer Research Fellowship   May – July 2022
Selected for an 8-week research fellowship program as an undergraduate student at the Engineering Mechanics Unit, JNCASR Bengaluru.
Project title: Performance Evaluation of an Internal Combustion Engine by the enrichment of Oxygen in the inlet flow by Thermodynamics and CFD

ACADEMIC & RESEARCH PROJECTS

DFT Study of CO_2 adsorption on UiO-66 MOF
Course: Quantum Mechanical Modelling of Nanomaterials
- DFT calculation to estimate the CO_2 adsorption for small cluster models (SCM) of one of the adsorption sites of a UiO-66 metal-organic framework using Quantum ESPRESSO
- Implemented the calculation using a PBE functional with Grimme-D3 Dispersion corrections.

Computation of dynamical properties in a particle system
Course: Statistical Thermodynamics
- Implemented numerical routines to compute velocity auto-correlation function (VACF) and mean squared displacement (MSD) from particle trajectories to analyze time-dependent dynamical behavior.
- Estimated diffusion coefficients by integrating VACF and using the Einstein relation from MSD data; identified ballistic and diffusive regimes through log–log slope analysis.

A simulation study of surface temperature influence on localized atmospheric flows and dispersion using shallow water equations *(UG Project)*
- Modeling and simulating the effect of surface temperature on atmospheric flows by coupling Shallow Water Equations (SWEs) with Dispersion equations.
- Implemented a finite difference scheme for the 1D problem to evaluate the model performance, and compared with the traditional CFD.
- Further evaluation is needed to ensure better prediction of vertical advection with the model.

Performance Evaluation of an Internal Combustion Engine by the enrichment of Oxygen in the inlet flow by Thermodynamics and CFD *(JNCASR Bengaluru)*
- Studied the effect on the performance of the IC engine, on the enrichment of the inlet air with Oxygen
- Carried out combustion simulation on Ansys Fluent and determined the engine parameters (Torque, Pressure at the power stroke etc.) for different Oxygen Enrichment values.
- Exhaust gas proportions (CO, NO_x, SO_x) were evaluated and compared with the current standards. Enhanced fuel economy with enrichment and reduction in exhaust CO and Hydrocarbons is observed, but higher temperatures lead to an increase in NO_x (evaluated through the Zeldovich Mechanism).

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SKILLS

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Software Tools: LAMMPS, GROMACS, Aspen Plus, Ansys Fluent, Quantum ESPRESSO, VMD
Programming: Python, Java, MATLAB, Fortran

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CERTIFICATIONS

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NPTEL MOOCs: "Aspen Plus Simulation Software - A Basic Course for Beginners"   October 2023
Top 1% in the National Level MOOCs Exam with an overall score of 95%

ICTS Summer Course: "The Fascinating World of Flows"   July 2023
Instructed by Prof. Rama Govindarajan & Prof. Samriddhi Sankar Ray, ICTS-TIFR, Bengaluru

NPTEL MOOCs: "Integral Transforms and Their Applications"   October 2022
Topper in the National Level MOOCs Exam with an overall score of 72%

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VOLUNTEERING

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Alumni Secretary   May 2025 - Present
Chemical Engineering Association, NIT Andhra Pradesh

Student Member – Departmental Board of Studies (BoS) for B.Tech. Curriculum Revision   July 2024
Dept. of Chemical Engineering, NIT Andhra Pradesh (Committee constituted by the institute senate)

Chemical Engineering Association, NIT Andhra Pradesh   August 2022 - May 2024
Editor - Department Magazine (A.Y. 2023-24)
Executive Member (A.Y. 2022-23)