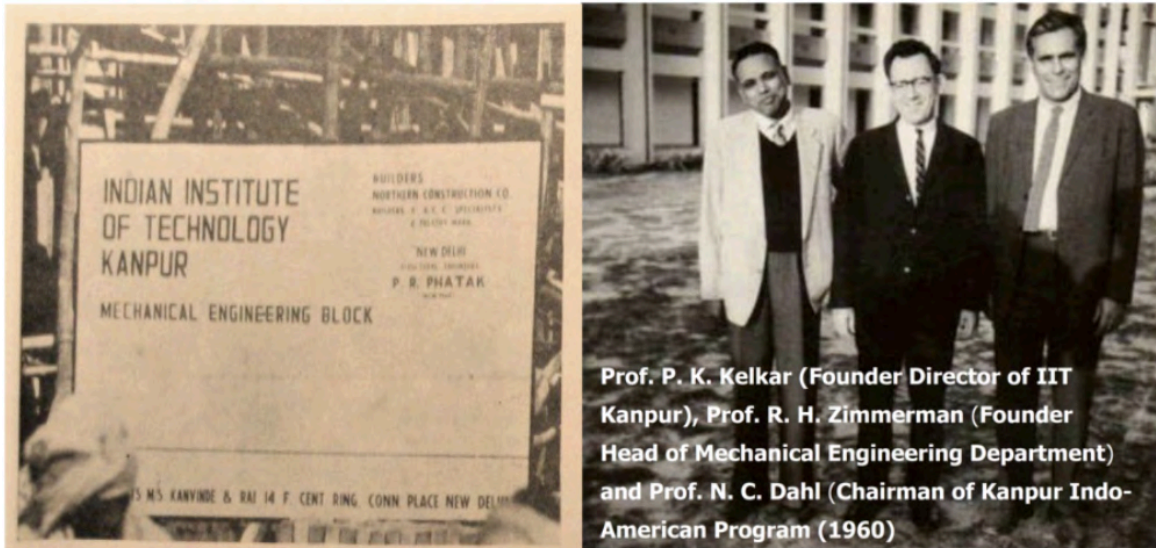


सन्धि/SANDHI

Newsletter of the Department of Mechanical Engineering, IIT Kanpur, Vol. 1, 2024

Welcome to our first Newsletter 'Sandhi'. Through Sandhi, we aim to reconnect with our alumni and colleagues, celebrate our shared history, and seek their partnership in developing our department into an internationally top-ranked center for research and education in the broad field of mechanical engineering.



IIT Kanpur had its humble beginnings in 1959 at the Harcourt Butler Technological Institute in Kanpur. The Department of Mechanical Engineering embarked on its journey in the year 1960, with 23 undergraduate students and a team of 3 faculty members. Since then, the department has grown remarkably and now has 474 undergraduates, 35 dual degree students, 254 M.Tech. students, 48 M.S. research students and 200 PhD students.

Visits

We were delighted to welcome our alumnus, Prof. Jayathi Y. Murthy (BT/ME/1979), President of Oregon State University, as the Chief Guest for the 57th Convocation on June 29, 2024. Her insights, experiences, wisdom and sage advice added great significance to the event.

[Thoughts shared by Prof. Jayathi Y. Murthy.](#)

"In June, I had the honor of serving as chief guest at the 57th convocation at IIT Kanpur, and visited my old department, Mechanical Engineering. So much was familiar, and so much was different. The campus has grown exponentially, even compared to a decade ago. Kalyanpur is no longer a sleepy hamlet surrounding the campus, but a bustling town with cars and buses and tempos driving maniacally on GT road. But in so many ways, IITK remains an oasis – an oasis of green, an oasis of excellence, an oasis of eager young minds bringing their energy, their imagination – their brilliance – to bear on the most challenging problems of our time.



And so it is with the ME department. Yes, its location in the faculty building is comfortingly familiar. But the work that ME faculty are doing today was the stuff of dreams only a few decades ago – robotics, nanotechnology, clean energy, manufacturing, bio health and so much more. They are publishing in top journals, writing books and monographs, teaching courses on the latest trends, doing all the things that top academics are supposed to do. But I also felt, among faculty and students both, a desire to do what mattered – to work on important problems that make a difference to India and the world, to go beyond publishing papers. The entrepreneurial energy on campus and in the department was palpable.

In so many ways, this aligns with what we're trying to do in the institution that I lead, Oregon State University – to turn big ideas into big solutions, to make sure that every student who comes to OSU is successful, and to be an engine for the economic development of Oregon and the country. In this sense, IITK and OSU are bound by a common vision and mission. I am excited about deepening our connections and working together to address the extraordinary challenges our world faces."

[Hear convocation speech @ time stamp 1h 15 m](#)

Student achievements

Sharun Kuhar (BT/ME/2014), a B.Tech graduate currently pursuing a PhD at the Johns Hopkins' Whiting School of Engineering, has been invited to the White House for the inaugural gathering of the QUAD Fellowship. The Quad Fellowship, established in 2021 by the governments of Australia, India, Japan, and the United States, offers financial support to exceptional master's and doctoral students pursuing STEM studies in the United States.



Sharun was awarded the QUAD fellowship for his research in gastrointestinal fluid mechanics. His project stood out because of its application of computational fluid dynamics to address problems related to stomach digestion, disorders, and surgery.

About QUAD fellowship

Research highlights

The study by Mohammad Anas, PhD student and Prof. Pranav Joshi has been published in the journal "Physical Review Letters" (Impact factor 8.1).



Fig: Flow organized into hot (red) and cold (blue) columnar structures

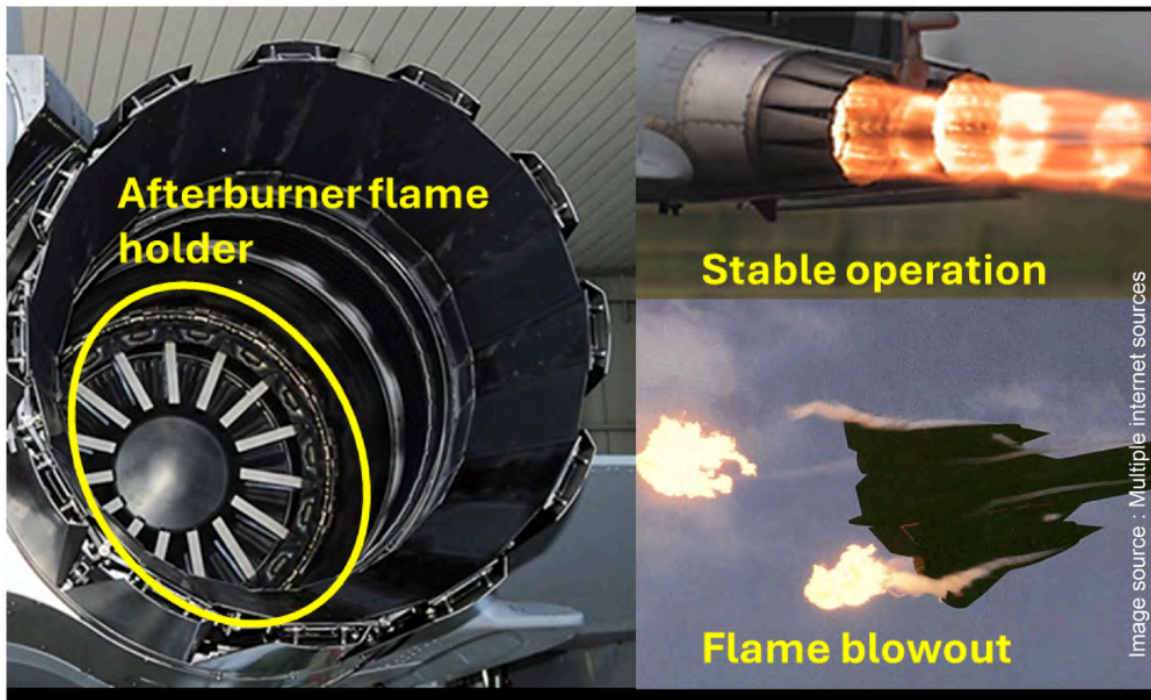
Ref: "Critical Prandtl number for Heat Transfer Enhancement in Rotating Convection", Mohammad Anas and Pranav Joshi, Physical Review Letters 132(3),034001(2024). doi:10.1103/PhysRevLett.132.034001

Buoyancy-driven convection is ubiquitous in applications and nature, from cooling electronics to geophysical and astrophysical flows. Rotation, the effects of which become prominent for large-scale flows such as those occurring on planetary and astrophysical scales, weakens the flow intensity via the Coriolis force but can enhance the heat transfer, an important property of such flows, under specific conditions. Our research sheds light on this phenomenon across various strengths of the buoyancy force, system rotation, and fluid properties and shows that, surprisingly, the heat transfer enhancement increases with an increase in the strength of the buoyancy forcing under appropriate conditions.

[Go to the article](#)

Research impact

The Aeronautics R&D Board allocates Rs 10 Crore for the project titled 'Experimental Characterization of Flame stabilization in a Jet Engine Afterburner' to be headed by Prof. Shantanu De and Prof. Alakesh Chandra Mandal.



An afterburner test rig will be designed, developed, and demonstrated for the Advanced Medium Combat Aircraft (AMCA) class fighter aircraft. The rig will be operated at the actual flying condition with Jet-A fuel. The dynamic flame response at various operating conditions and design configurations will be explored using high-speed state-of-the-art laser-based optical diagnostics techniques. The study will allow us to gain physical insights into spray and flame dynamics in such complex flow and combustion systems and generate the much-needed stability map of the jet engine afterburner. The outcome of the project, funded by the Aeronautical Research and Development Board (ARDB) will be instrumental in realizing the indigenous development of the AMCA class fighter aircraft with an afterburner.

Recent happenings



Prof. Avinash Kumar Agarwal appointed as
Director of Indian Institute of Technology
Jodhpur



Prof. Shantanu Bhattacharya appointed as
Director of CSIR-Central Scientific
Instruments Organization (CSIO) Chandigarh

Generous contribution

The Department of Mechanical Engineering expresses deep gratitude to Dr P M Jain for his invaluable contribution, aligning with the department's vision of innovation. Dr P M Jain's commitment underscores the importance of collaborative partnerships in advancing the field of mechanical engineering towards excellence and lasting impact.

In the media

Prof. Avinash Agarwal in **NDTV News** has shared insights on the effectiveness of delivering technical education in the native language.

[See interview](#)

Prof. Anindya Chatterjee penned an article in **The Indian Express**. He emphasizes the necessity of tackling fundamental issues in top-tier Indian institutes to foster realistic expectations and revitalize trust in education.

[Read article](#)

Stay connected

Write to us at me_outreach@iitk.ac.in

We would love to hear your comments, criticisms, stories and suggestions.

Please let us know if you would like to visit your alma mater
by contacting us on the email above. We look forward to hosting you.

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