

NDE VARTIKA NEWS LETTER OF CNDE

May-2025

Prof. Krishnan Balasubramaniam – A Trailblazer in NDE, Entrepreneurship & Innovation Leadership



The Centre for Non-Destructive Evaluation (CNDE) at IIT Madras is proud to shine the spotlight on Prof. Krishnan (Head - CNDE), a true luminary whose three-decade career has transformed the way we inspect, monitor, and protect critical infrastructure—setting new standards across the industry infrastructure. Since 2000, as a professor in the Department of Mechanical Engineering at IIT Madras, he has been seamlessly shaping future innovators. As Dean of Industrial Consultancy & Sponsored Research since 2012 and the visionary leader behind the Gopalakrishnan-Deshpande Centre for Innovation & Entrepreneurship since 2017, he skillfully bridges academia, industry, and entrepreneurship, turning research insights into impactful real-world solutions that drive meaningful change.

Trained at the University of Madras (B.E., 1984) and Drexel University (M.S., 1986; Ph.D., 1989), where his groundbreaking thesis on guided plate waves laid the foundation for long-range ultrasonic inspection. Over the last three decades, he has been at the forefront of innovation—pioneering laser-ultrasonics for in-situ viscosity and temperature measurement of molten metals, developing hybrid finite-element/genetic-algorithm methods for composite material characterization, and introducing novel guided-wave sensor arrays for continuous monitoring of critical infrastructure.

With over 200 peer-reviewed publications, an impressive H-index of 36, and more than 30 major funded projects worth over ₹50 crore, Professor Krishnan has made a huge impact in fields like aerospace, energy, water, and healthcare. His research plays a key role in ensuring the safety of everything from pipelines and pressure vessels to bridges and medical devices. A true innovator, he holds 17 patents, including the real-time laser viscosity sensor (US 5,686,661) and an automated tone-burst eddy-current thermography for weld inspection. Many of these inventions have found their way into the hands of industry partners or been developed into startups, thanks to his mentorship.

When he's not pushing the boundaries of research, Professor Balasubramaniam is busy shaping the future of professional societies and academic publishing. As Editor-in-Chief of the Journal of Non-Destructive Testing & Evaluation and Associate Editor for Ultrasonics and NDT&E International, he's driving the global conversation on NDE research. He's also Vice President of the Indian Society for Nondestructive Testing (ISNT) and a Fellow of both the Indian National Academy of Engineering (INAE) and Academia NDT International. On top of that, he plays a major role in conferences and government advisory boards, like the DST's Nano Mission and the Rural Technology Business Incubator.

His incredible contributions haven't gone unnoticed—Professor Krishnan has been honored with the Abdul P. Kalam National Technology Innovation Fellowship (2018), the DRDO Academic Excellence Award (2015), and the Roy Sharpe Prize (2012) from the British Institute for NDT etc.

A mentor at heart, he's guided over 20 Ph.D. scholars and helped launch dozens of startups such as Planys Technologies, Dhvani Research and Development Solutions etc., giving rise to the next wave of deep-tech entrepreneurs and engineers.

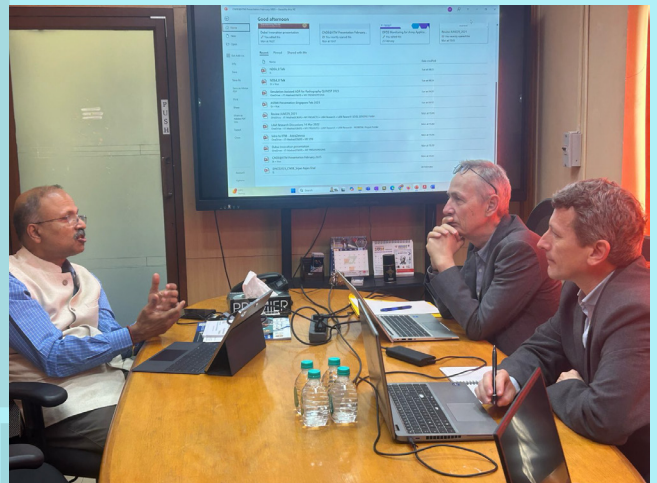
His contributions extend internationally, having been a Board Member of the Indo-German Science and Technology Centre (IGSTC) from 2012 to 2014, and serving on the NANO MISSION Committee at the Department of Science and Technology (DST) since 2015.

These days, Prof. Krishnan is venturing into exciting new areas like AI-powered structural monitoring, and edge-based smart sensor networks. By teaming up with leading universities and industry partners across the globe—from the US to Europe and Asia—he's building practical, data-driven solutions that make infrastructure smarter and safer.

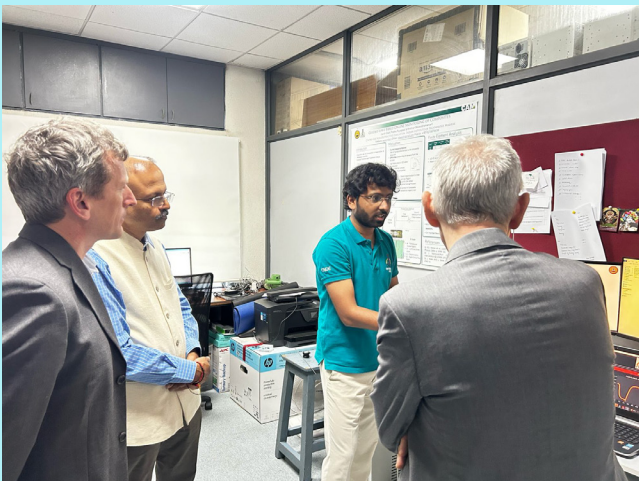
His work has been widely featured in national and international media, helping bring NDE, SHM, and digital transformation into the spotlight. For students and aspiring researchers, Prof. Krishnan's journey is a powerful reminder of how academic passion, real-world innovation, and entrepreneurial thinking can come together to make a lasting difference.

Collaborations/Lab Visits

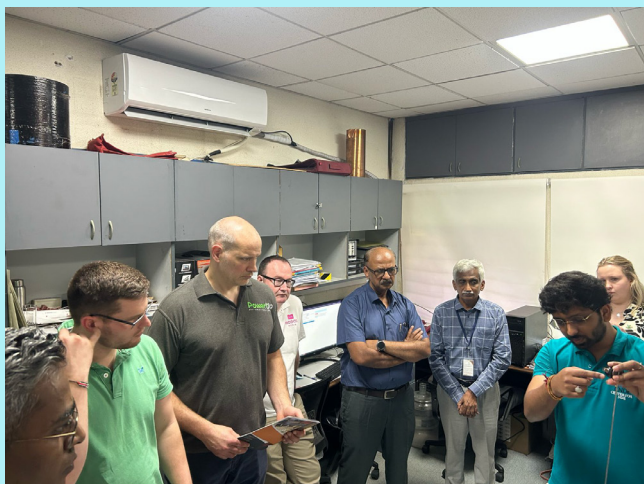
Forging Franco-Indian Synergy in NDE



On 7 March 2025, CNDE hosted delegates from the French Atomic Energy Commission (CEA), including Dr. Pierre Calmon and Dr. Vincent Bergeaud. The visit aimed to explore research synergies and collaboration opportunities between CEA and CNDE. Discussions spanned advanced NDE techniques, modeling and simulation, and potential Indo-French joint initiatives, marking a promising step towards deeper international cooperation in NDE.



Driving Innovation Across Borders



Delegates from UK Catapult visited CNDE as part of their tour of IIT Madras. The visit included an overview of CNDE's research facilities and discussions on collaborative projects in structural health monitoring and cutting-edge instrumentation. The session highlighted CNDE's growing footprint in global research networks and its commitment to technology-driven solutions in NDE.



From New York to Chennai – NDE Knows No Borders

Mr. Prashanth Kadaba from Con Edison, New York, visited CNDE to understand its research capabilities and explore avenues for future collaboration. With a focus on infrastructure inspection and advanced diagnostics, the interaction laid the groundwork for Indo-US engagements in utility-focused NDE technologies.



Decade of Impact – CNDE & Nairobi

CNDE marked over ten years of impactful collaboration with the University of Nairobi, Kenya. Through faculty exchanges, joint research, and capacity-building efforts, this partnership has played a vital role in strengthening NDE education and research in East Africa. The milestone reaffirms CNDE's commitment to global outreach and sustainable scientific development.



Celebrating Excellence in Research – IRDA 2025

Professor Prabhu Rajagopal has been awarded the Institute Research Development Award for 2025 in the Mid-Career category. The award ceremony was graced by Prof. V Kamakoti, Director of IIT Madras, and Dr. Shivkumar Kalyanaraman, Chief Guest and CEO of Anusandhan National Research Foundation (ANRF).



This recognition highlights Prof. Rajagopal's sustained contributions to NDE research, building on his earlier IRDA win in 2019 under the Early Career category.

CNDE also congratulates Professor Surendra Singh, Dr. Arvind Kumar Chandran, and Professor Sushanta Kumar Panigrahi, who received IRD Awards this year, reaffirming our culture of excellence and dedication to impactful research.

Strengthening Academia-Industry Ties – Vel Tech at CNDE

On April 28, 2025, Professors Joseph Kakkassery and Gowri Shankar from Vel Tech Rangarajan Dr. Sagunthala R&D Institute of Science and Technology, Chennai, visited CNDE.

The discussions included CNDE's research activities, emerging startups, and the scope of academic membership in the National Consortium of Nondestructive Evaluation (NCNDE).

This interaction opened doors for deeper collaborations and mutual growth.



Fostering Industry Partnerships – ANSA at CNDE

CNDE welcomed Mr. Kumaran K, Managing Director of ANSA Training and Quality Assurance Pvt Ltd.

During the visit, Mr. Manoharan Venugopal, CEO of CNDE, showcased ongoing research, startup initiatives, and NDE training programs under NCNDE.

Mr. Kumaran K toured CNDE labs, and the meeting laid the groundwork for future cooperation in NDE training and capacity building between CNDE and ANSA.



Showcasing work on DLT-AI to the Hon'ble CM – Plenome at Andhra Pradesh

Team Plenome had the honor of presenting its work on DLT-AI and data federation to Hon. Chief Minister of Andhra Pradesh, Sri Nara Chandrababu Naidu.

During the presentation, the Chief Minister expressed keen interest in Plenome's solutions aimed at universal healthcare access, precision medicine, clinical authenticity, and predictive guidance.



The meeting marked a significant step toward potential collaboration with the Government of Andhra Pradesh, and Plenome looks forward to working together to implement these solutions.

The team extends its gratitude to the IITM Incubation Cell for facilitating this invaluable opportunity.

Showcasing Optical Fiber Sensing – Folium Sensing Hosts Hon’ble CM

Folium Sensing Pvt Ltd had the honor of hosting Hon. Chief Minister of Andhra Pradesh, Shri N. Chandrababu Naidu, during his visit to IIT Madras.

An IITM-incubated startup emerging from CNDE’s decade-long research, Folium demonstrated its advanced Distributed Acoustic, Temperature, and Strain Sensing technologies for real-time, long-range monitoring.



Co-founders Sanidhya Chaturvedi and Venkatesh Varadhan presented the innovations, earning praise from the Chief Minister, who recognized the vast potential of optical fiber sensing and lauded CNDE’s pioneering research.

Pushing Boundaries in Ultrasonics – CNDE at NNetRA

CNDE, IIT Madras, a key participant in the NNetRA project funded by MeitY, has developed India’s first acoustic microscopy device with Lamb wave scanning led by Prof. Krishnan Balasubramanian, in collaboration with Center for NEMS and Nano Photonics (CNNP).

In the second phase, Prof. Prabhu Rajagopal’s team achieved world-record resolution in ultrasonics using metamaterials, resulting in multiple IP filings and commercialisation via Dhvani R&D Solutions Pvt. Ltd.

At the project’s closing roadshow in Bengaluru, researchers demonstrated breakthroughs like hyperlens-based imaging and SAM to over 800 attendees, earning appreciation from MeitY Secretary Mr. S. Krishnan, IAS.



CNDE Hosts Airbus Guests – Strengthening Industry Collaborations

On April 4, 2025, CNDE, IIT Madras, hosted Dr. Jocelyn Gaudin (Head, Airbus India Engineering), Siddharth Balachandran (Head, Airbus Innovation Center for India & South Asia), and Saurav Sinha (Manager, Materials and Processes, Airframe Engineering).

Prof. Krishnan Balasubramanian informed the Airbus team on CNDE's research initiatives and the startups incubated at CNDE. The visit also included engaging discussions with IIT Madras faculty and a tour of the IIT Madras Research Park.



Fostering Industry Partnerships – TDK Corporation at CNDE

CNDE hosted a delegation from TDK Corporation, including Dr. Jocelyn Gaudin, Siddharth Balachandran, and Saurav Sinha. During the visit, Prof. Krishnan Balasubramanian and Prof. Balaji Srinivasan provided an overview of ongoing research and breakthrough sensing technologies developed at CNDE.

The TDK team explored Folium Sensing's advancements in Distributed Acoustic, Temperature, and Strain Sensing (DAS, DTS, DSS), which are revolutionising industrial monitoring. The meeting fostered discussions for potential collaboration between TDK and CNDE in advancing optical fiber sensing applications.



Rail Labs Showcases Railway Safety Innovations to Hon'ble Minister Shri Ashwini Vaishnaw

We at the Centre for Nondestructive Evaluation (CNDE) are proud to share that our startup, Rail Labs, had the honor of presenting its innovative solutions to Shri Ashwini Vaishnaw, Hon'ble Minister of Railways. The interaction was a valuable opportunity for the Rail Labs team—including Prof. Dr. Krishnan Balasubramanian (Founder), Rajesh Rathi (Founder), Kaushik V N (MS Entrepreneurship Scholar & Co-founder), and Sumit Anand (Co-founder)—to engage with key stakeholders from Indian Railways, Southern Railways, as well as CEOs and investors.

Shri Ashwini Vaishnaw took keen interest in Rail Labs' commitment to advancing digital safety infrastructure in railways through cutting-edge, sustainable technology. We are excited to continue shaping the future of railway safety and innovation, and look forward to deeper collaboration within the railway ecosystem.



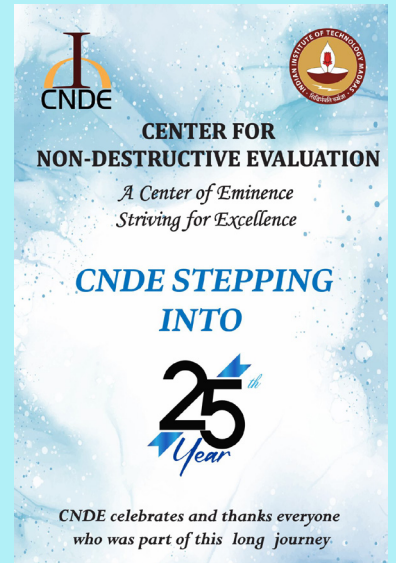
CNDE

Celebration & Events

Celebrating 25 Years of CNDE – A Milestone in Non-Destructive Evaluation

The Centre for Non-Destructive Evaluation (CNDE) is proud to enter its 25th year. Founded in 2001 by Prof. Krishnan Balasubramanian at IIT Madras, with the support of countless contributors, CNDE has grown into a global leader in NDE research.

To celebrate this milestone, CNDE will remain open throughout the year, hosting workshops, seminars, and webinars, inviting everyone to join us in marking this momentous occasion.



The End