



Indian Institute of Technology Kanpur



# INSTITUTE LECTURE SERIES

March 05, 2024 (Tuesday) | 5 pm | L - 17

**Talk Title: Innovations in jet noise reduction technology**

**Speaker: Dr. Vinod Mengle**

## About the Speaker



Dr. Vinod G. Mengle is a well-known engineer, scientist and inventor in the area of aeroacoustics, mainly known for his novel R&D work in aircraft engine jet noise reduction. His thrust-efficient concept of “Azimuthally Varying Chevrons” (the variable serrations on engine nozzle lips) to reduce jet noise can be found on Boeing’s newer planes, 747-8 and 737MAX. He was the Subject Matter Expert in Engine Noise Control and the Chief Chevron Design Architect at Boeing. Dr. Mengle was also the Principal Investigator of aeroacoustics at Rolls-Royce and GE. His other expertise is in the area of unsteady aerodynamics of turbomachinery, and has pioneered several new theoretical concepts. At GE, he was also the lead member of tiger teams to resolve nozzle and turbomachinery flutter problems. Prior to joining industry in 1989, he was a professor of Aerospace Engineering in UCLA, and has worked at NASA. Presently, he is the Founder and CEO of Aero Insights, LLC, consulting on R&D and conceptual work, based on first principles, mainly for startups in eVTOLs and supersonic planes.

Vinod graduated from IIT, Kanpur, in 1977, and earned his M.S. and Ph.D. from Cornell University, NY, under a John McMullen Graduate Fellowship. He holds 20 patents and is a Fellow of NASA, American Institute of Aeronautics & Astronautics, and Boeing.

## Abstract of the Talk

Jet aircraft noise during take-off and landing is one of the important elements of commercial aviation which may likely impose fundamental limitations on future air transportation growth. Hence, its reduction became one of the Three Pillars of Success in NASA's 1995 environmental charter to reduce it by a factor of four in the following 25 years.

The speaker will focus on innovative jet noise reduction concepts and technology that primarily he invented and led in his 35+ years of career at Boeing, Rolls-Royce, and GE in the US. He has 20 patents on these jet noise reduction devices and some of his patented inventions and designs, e.g., azimuthally varying chevrons (which are unique serrations that are prominently visible on the engine nozzle and nacelle aft lips) have been implemented on the engines of newer Boeing planes, like, 747-8 and 737MAX.

Jet noise reduction is as much of a science as it is art where computational tools fall short in accuracy, and experimental data becomes the gold standard. Dr. Mengle will present the innovative concepts he invented to solve all the above problems by focusing on first principles and small-scale experimental testing, with final implementation into full-scale production after engine or flight testing.

All are cordially invited to attend

**Office of Dean Research & Development**