

## MVJCE- Physics Department – Guest Lecture- Nov 2023

Department of Physics organized a “Guest Lecture” for the first-year Engineering students on 23<sup>rd</sup> November 2023. The Guest Speaker was Prof. S. Kasthuriangan, Indian Institute of Science (IISc), Bangalore. The topic of the talk was on “Cryogenics Technology: Fundamentals and Applications. The students from the entire Physics Cycle, ME stream students from the Chemistry cycle and Second year AE students have actively participated in this session. Around 600 students had taken active participation in the event.



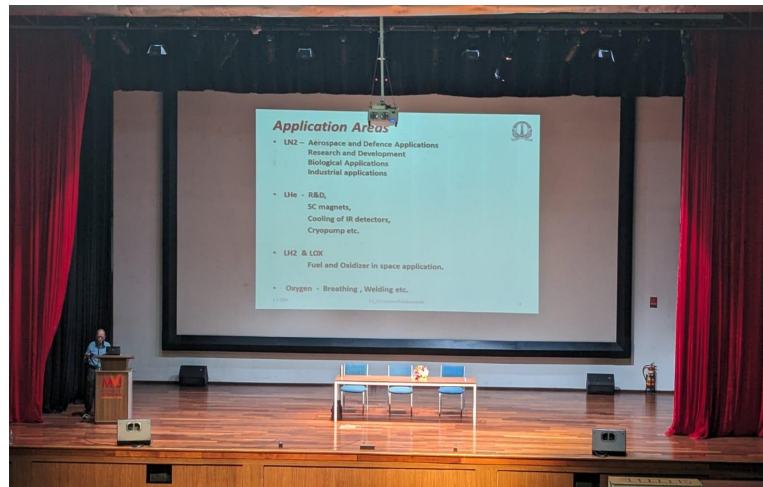
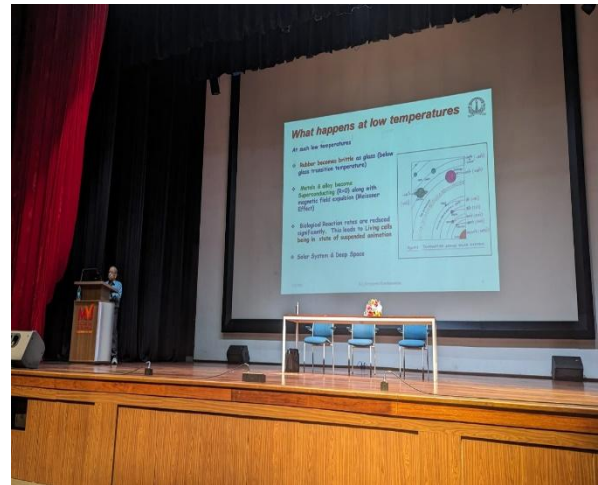
The department has made the necessary arrangement for the commencement of Guest Lecture at MVJCE Auditorium, MVJCE. A session began with a welcome address by Ms. Kavitha, Assistant Professor of Physics. She has started the session by inviting the guest of honour Prof. S. Kasthuriangan, Faculty of Physics at IISc, Bangalore. She introduces the chief guest before the students and faculty members.

Prof. S. Kasthuriangan has started his career after completing his Ph.D degree in Physics from TIFR, Mumbai in 1975. Subsequently he joined IISc, Bangalore and served as a Cryogenic Physicist at the Centre for Cryogenic Technology, Indian Institute of Science, Bangalore. He has more than 40 years of research experience in cryogenic engineering as a scientist. He has executed several R&D and consultancy projects funded by DST, CSIR, DAE, ISRO and other non-governmental agencies. He has more than 120 publications in national and international journals. Based on his contributions in the area of Cryogenics, he was awarded the “Lifetime Achievement Award” in October 2022 by the Indian Cryogenics Council at the National Symposium on Cryogenics (NSCS28), held at IIT, Kharagpur. After his superannuation in 2013, he served as an advisor on liquid helium plant operations at the Physics department, IISc as well as a cryogenic consultant to a few other institutions. He is currently involved as a teaching faculty at TKM College of Engineering, Kollam and in the Talent Development Centre of IISc second campus at Kudapura, Challukere, Karnataka.

The Speaker was honoured by Dr. Brindtha, Vice Principal of MVJCE with a Bouquet.



Prof. Kasthuriengan began his talk with a brief history of cryogenics with introduction. The speaker explained the basic concepts of cryogenics with its essential role in various areas. The talk also included a detailed explanation on various methods involved for cryogenic study and cryogenic developments.

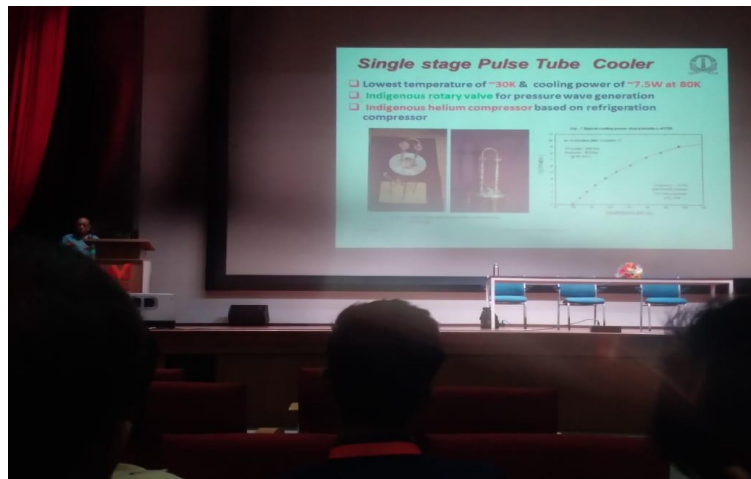


He has discussed the historical developments in cryogenics, different cryogenic fluids & properties. Besides he showed the various methods for producing low temperatures, like Induced Evaporation, JT Expansion and Adiabatic Expansion, cryogenic Plants, still lower temperatures, Storage of cryo fluids, Cryocoolers - GM, Stirling, JT & Pulse Tube. Followed by he has showed the various applications based on Cryogenics.



The lecture also discussed about the possibilities with challenges of advanced level cryogenics research in India since past few decades to till date. He gave a brief overview of the cryogenic related research work which was executed under his supervision at Centre for Cryogenic Technology, IISc Bangalore. He finally shown the few images of the experimental setup which was developed in IISc.



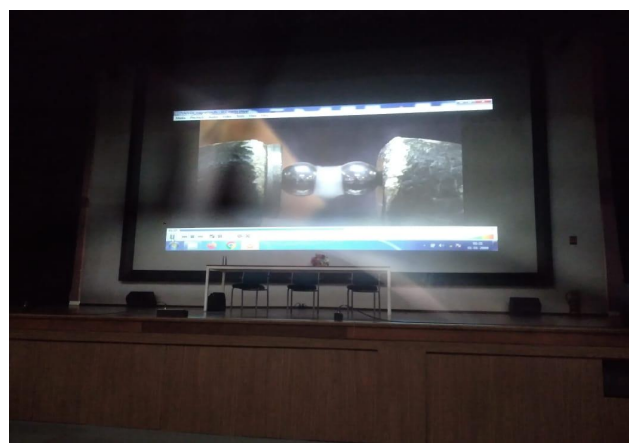
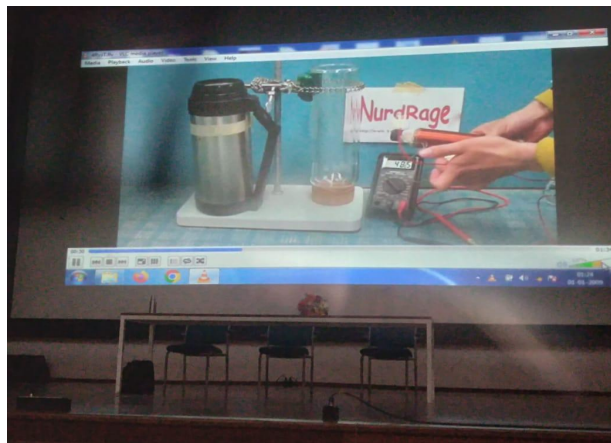


He discussed about cryogenic system configuration and its applications in real-time like domestic refrigerator, medical, food, electronics, and aerospace, military, chemical and gas industries.



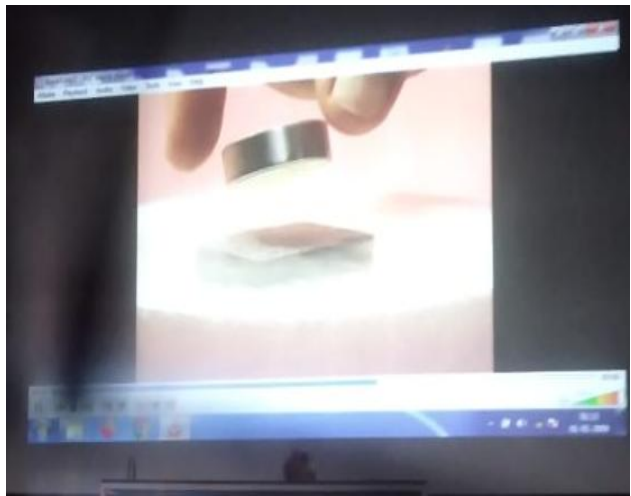
This was followed by videos of demonstration on experiments. He has presented the experimental demonstration based videos where students were impressed by watching and

understood the reality of technological involvements and developments in cryogenics. He emphasized the importance and scopes of the cryogenics.



He highlighted the importance and relevance based on cryogenics in the syllabus for engineering students especially superconductors, quantum computing, heat and thermodynamics, cryogenics, etc., Besides, he gave a brief idea about how and where this cryogenic will be used in Future.





After his lecture, 20 minutes time given to students for interaction with Chief Guest.





The students have actively participated during the interaction session and expressed their doubts and got them clarified by our Chief Guest. The lecture was concluded with a vote of thanks by Dr. Debalina.



A prime objective of the Guest lecture was to create an exposure among the first year students to explore the advanced level theoretical and experimental based knowledge with recent applications. The lecture was highly informative towards the fundamentals of cryogenics and its applications. This lecture facilitates an opportunity for the engineering students to learn about cryogenic with research aspects and prospects in engineering fields. This lecture helped the engineering students to understand the concept of cryogenics on quantum computing,



superconductors and low temperature physics with experimental aspects in current technology in research laboratory, industrial and commercial level.