Seminar

Institute for Plasma Research

Title : Cryogenic Processes for Sustainable Power Generation and Energy Storage Systems

Speaker: Dr. Rohan Dutta
Indian Institute of Technology Kharagpur

Date : 18th August 2020 (Tuesday)

Time : 03:30 PM

Venue : Online - Join the talk:
https://meet.ipr.res.in/Dr.RohanDutta_PDFTalk

Abstract :

The challenge of the generation of clean, sustainable, and enough power for our society with growing demand and its unusual characteristic leads the direction of research in the field of power plants towards harnessing the potential of energy sources other than traditional means such as fossil fuel and nuclear fission, etc. Besides several renewable sources, nuclear fusion has been found to be one major source of energy. On the other hand, global warming due to anthropogenic emission of greenhouse gases presents a new challenge to us in the form of rapid climate change and that needs to be met quickly. One of the ways to meet the requirements to reduce the rate of change in the earth's climate is to reduce greenhouse gases such as CO_2 etc. Large point sources such as thermal power plants, cement industries, etc. are the highest emitter of these gases. Therefore, the reduction of such emissions from those plants has been identified as the option to fulfill the goal as also is the suggestion of the Intercontinental Panel on Climate Change (IPCC), an international body for assessing the science related to climate change.

My presentation will explore these challenges and how cryogenics have found its own application there. My works on large-scale helium liquefiers/refrigerators for cooling superconducting magnets for fusion devices, post-combustion CO_2 capture plants for fossil fuel based power plants and novel cryogenic energy storage system have contributed towards understanding the performances of such plants when operated and provided suitable suggestions to modify them for stable operation and ease of control. I will also briefly discuss the significance and outcomes of these works in my presentation.