

## **Evolution of Nuclear techniques into Earth System Science research and Ion irradiation-based Radiation Biology Research at IUAC**

The upcoming talk will offer a thorough exploration of critical topics surrounding nuclear energy and its implications for the future. A central focus will be the SHANTI Bill, which aims to improve safety and accountability in the nuclear sector by addressing public concerns and refining regulatory frameworks. Additionally, the discussion will cover the Civil Liability for Nuclear Damage Act, tracing its origins and key components while highlighting the legal responsibilities imposed on operators to compensate for any nuclear incidents. This examination will reveal the balance between liability and encouraging investment in the industry.

The talk will also reflect on the lessons learned from the Bhopal gas tragedy, particularly regarding supplier and operator liability, and how these insights might shape future policies to prevent similar occurrences in the nuclear sector. Another key point will be the rationale for privatization in the energy sector, weighing the benefits of increased efficiency and innovation against potential challenges and criticisms.

Furthermore, the session will assess current energy consumption patterns in developed countries and explore projections for 2047, focusing on how nuclear energy could help bridge gaps in energy supply while fostering economic growth through employment and entrepreneurship. The role of the Nuclear Power Corporation of India Limited (NPCIL) as a monopoly in the nuclear energy market will be critically examined, looking at its implications for innovation and competition.

Concerns related to the privatization of nuclear energy, such as safety and regulatory challenges, will also be discussed, along with strategies to mitigate these risks to ensure sustainable and responsible development. The necessity of strengthening the Atomic Energy Regulatory Board (AERB) will be emphasized to enhance oversight and maintain public trust through transparent operations.

The conversation will extend to the pivotal role of nuclear energy in achieving national and global Net Zero targets, particularly in relation to climate change discussions highlighted in recent conferences. Myths surrounding nuclear energy will also be addressed, providing factual information to clarify misconceptions and facilitate informed discussions about its safety and viability as a clean energy source.

Overall, this talk promises to foster meaningful dialogue on the future of nuclear energy and its essential role in sustainable development.

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