Seminar on advantages and challenges of Nuclear Energy: Is it safe? 05.06.2022

Advantages and challenges of nuclear energy: Is it safe

Prof. Hrushikesh Sahoo
Professor of Geology(Retd.) & Ex-Emeritus Fellow, Utkal University

The finite and limited occurrence of minerals makes them a unique nonrenewable resource because majority of mineral deposits are sporadic in distribution and rich deposits are rare. Moreover there is unpredictability in grade, uncertainties in extension, impersistence at depth with large variation in quality and quantity. In case of atomic minerals, the concentration of elements is very low with scattered distribution only in a few localities. The production of minerals is affected by changing needs of manufacturing industries, accumulation of stock and fluctuation in prices. Exploration and exploitation of minerals need huge capital investments. These characteristics necessitate conservation of the mineral deposits in general and atomic minerals in particular.

India produces as many as 87 minerals which include 4 fuel, 10 metallic, 47 nonmetallic, 3 atomic and 23 minor minerals including building and other materials. The conservation of minerals needs practices like a) Scientifically planned mining to ensure optimum recovery b) Minimizing environmental impacts of mining and mineral industries c) Intensifying research and development to utilize low grade ores d) Exploring new deposits and exploring continuity of old deposits e) Adopting suitable substitution techniques f) Providing proper infrastructural facilities.

Nuclear energy is generated by splitting uranium or plutonium atoms through a series of reactions in a nuclear reactor by a process called 'nuclear fission'. The energy released from splitting the atoms is used to heat water into steam. This steam then rotates a turbine, which generates electricity. It is also found that thorium is another fuel that could be used for generation of nuclear power. The advantages of the nuclear energy is that it is relatively cheap, reliable, with zero carbon and green house gases emissions, promising future energy supply and high energy density. There are also some disadvantages like release of arsenic, radon etc.; thermal pollution, use of huge amount of water, possibility of nuclear accidents, generation of radioactive wastes and non-renewable nature of the uranium, thorium and plutonium mineral resources.

India at present has uranium mineral resources of around 3,50,438 tonnes of in situ U_3O_8 (2,97,170 tonne U) in 44 deposits in Jharkhand, Andhra Pradesh, Telengana, Meghalaya, Rajasthan, Karnataka, Chhatishgarh, Uttar Pradesh, Himachal Pradesh, Uttarakhand, Maharastra etc. accounting for about 2 % of the world resources. Similarly India has huge monazite(Thorium mineral) resources of about 12.73 million tonnes in coastal beach placer sands of Odisha, Kerala, Tamil Nadu, Maharastra, Gujurat and in inland alluvium of Jharkhand, West Bengal and Tamil Nadu. Nuclear energy is going to play a dominant role in our country's development but we have to use it judiciously with appropriate conservation strategy and with proper environmental planning for safety and security of life and property.

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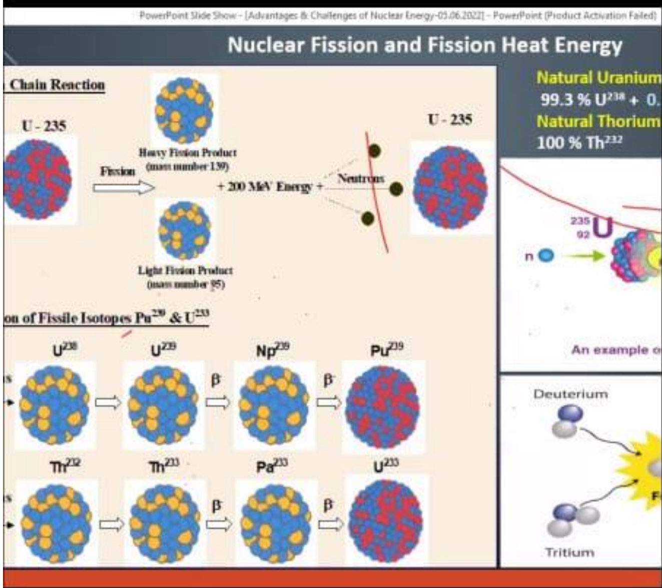

JIMUTASEN NAYAK's screen


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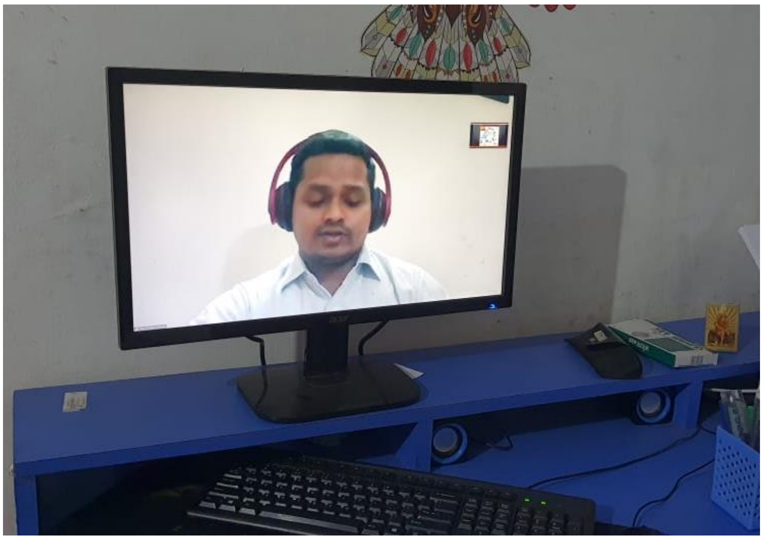
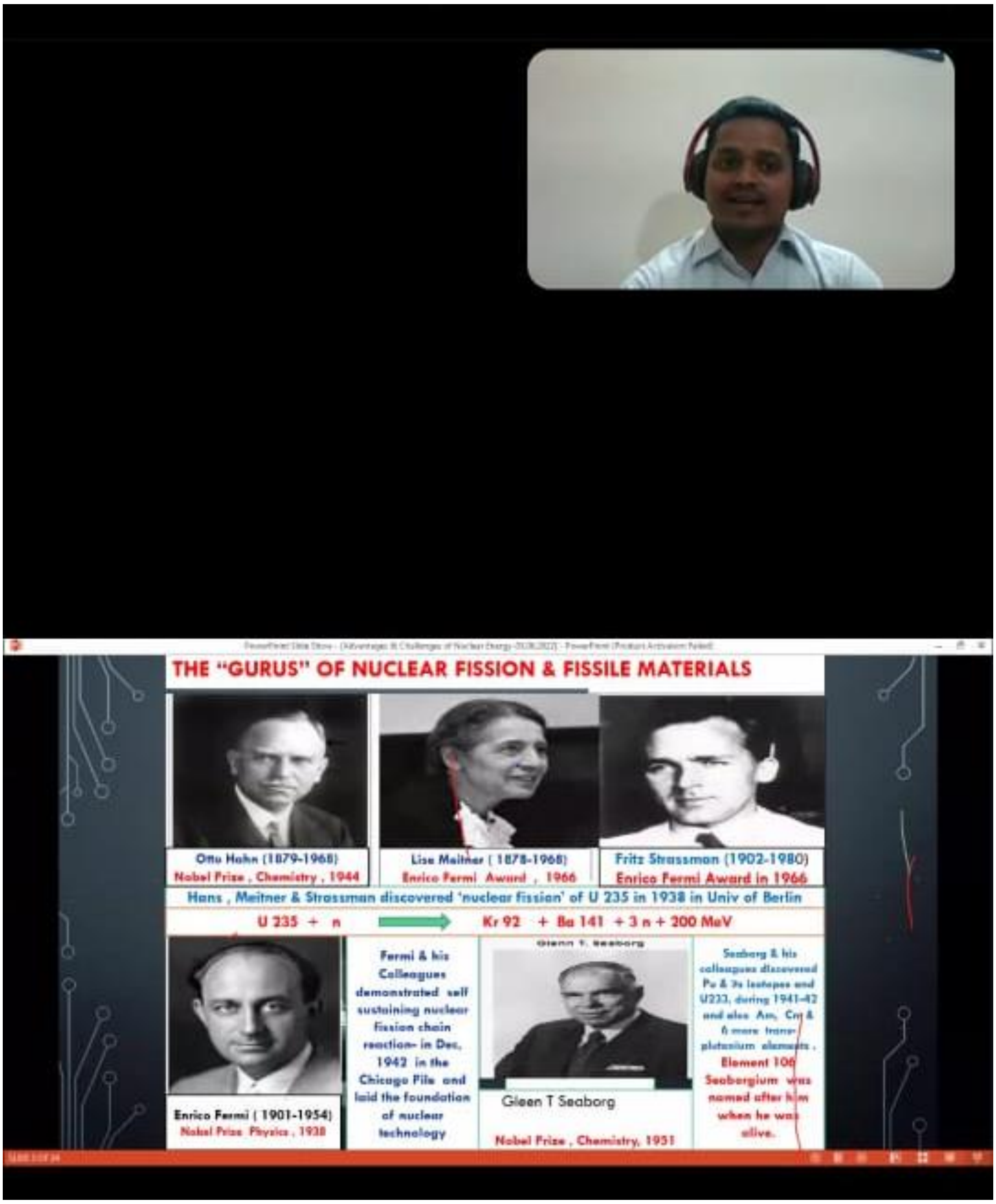
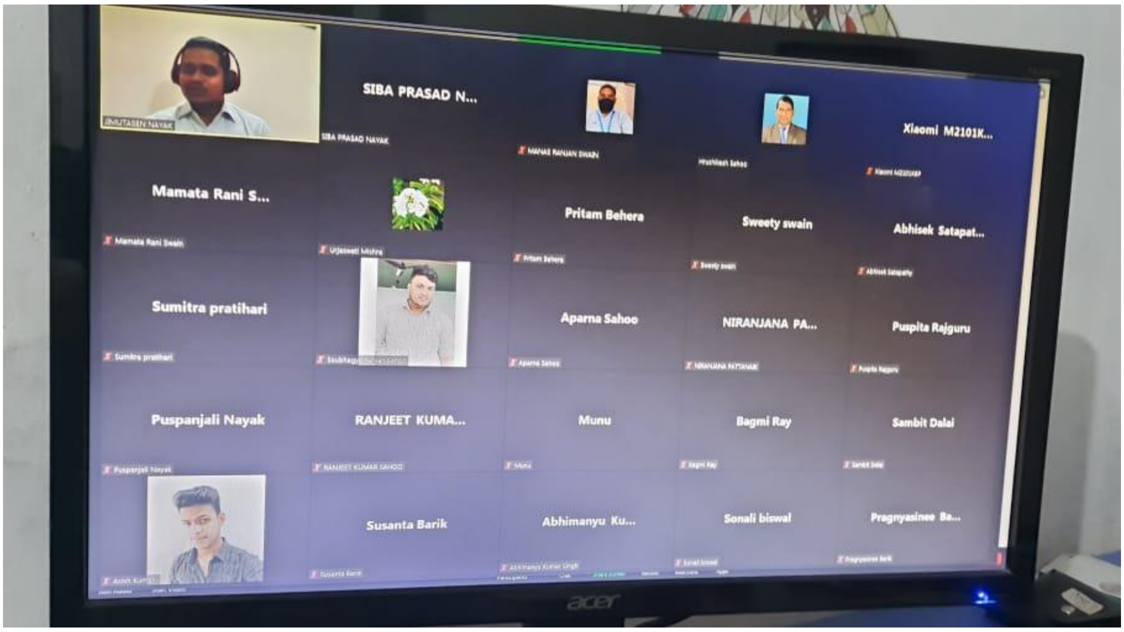
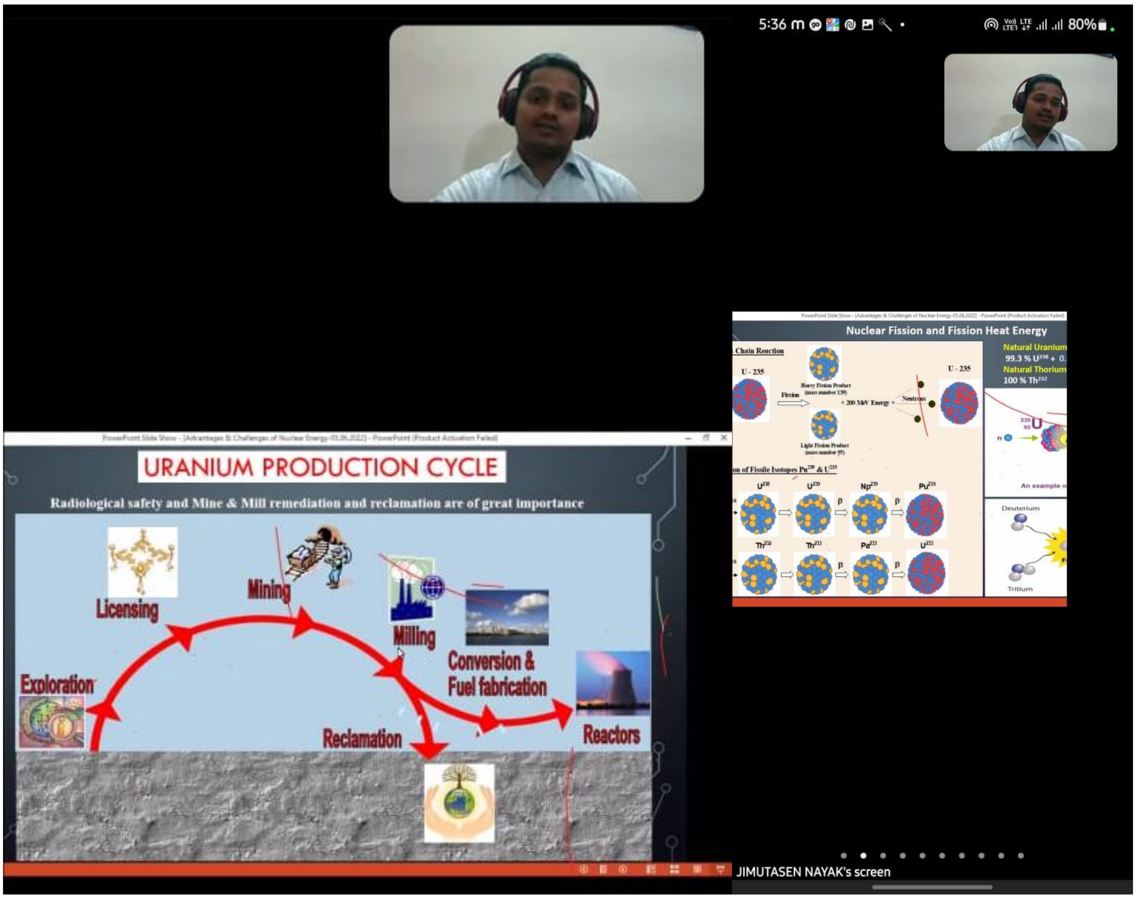
Puspita Rajguru
Galaxy On Max
MANAS RANJAN SWAIN




THE "GURUS" OF NUCLEAR FISSION & FISSILE MATERIALS
Otto Hahn (1879-1968)
Nobel Prize , Chemistry , 1944
Lise Meitner (1878-1968)
Enrico Fermi Award , 1966
Fritz Strassman (1902-1980)
Enrico Fermi Award in 1966
Hans , Meitner & Strassman discovered 'nuclear fission' of U 235 in 1938 in Univ of Berlin
U 235 + n
Kr 92 + Ba 141 + 3 n + 200 MeV
Enrico Fermi (1901-1954)
Nobel Prize Physics , 1938
Fermi & his Colleagues demonstrated self sustaining nuclear Fission chain reaction- in Dec, 1942 in the Chicago Pile and laid the foundation of nuclear technology
Gleen T Seaborg
Nobel Prize , Chemistry, 1951
Seaborg & his colleagues discovered Pu & its isotopes and U233, during 1941-42 and also Am, Cm & 6 more trans-plutonium elements . Element 106 Seaborgium was named after him when he was alive.


JIMUTASEN NAYAK
SIBA PRASAD N...
Xiaomi M2101K...
Mamata Rani S...
Pritam Behera
Sweety swain
Abhisek Satapat...
Sumitra pratihari
Aparna Sahoo
NIRANJANA PA...
Puspita Rajguru
Puspanjali Nayak
RANJEET KUMA...
Munu
Bagmi Ray
Sambit Dalai
Susanta Barik
Abhimanyu Ku...
Sonali biswal
Pragnyasinee Ba...
acer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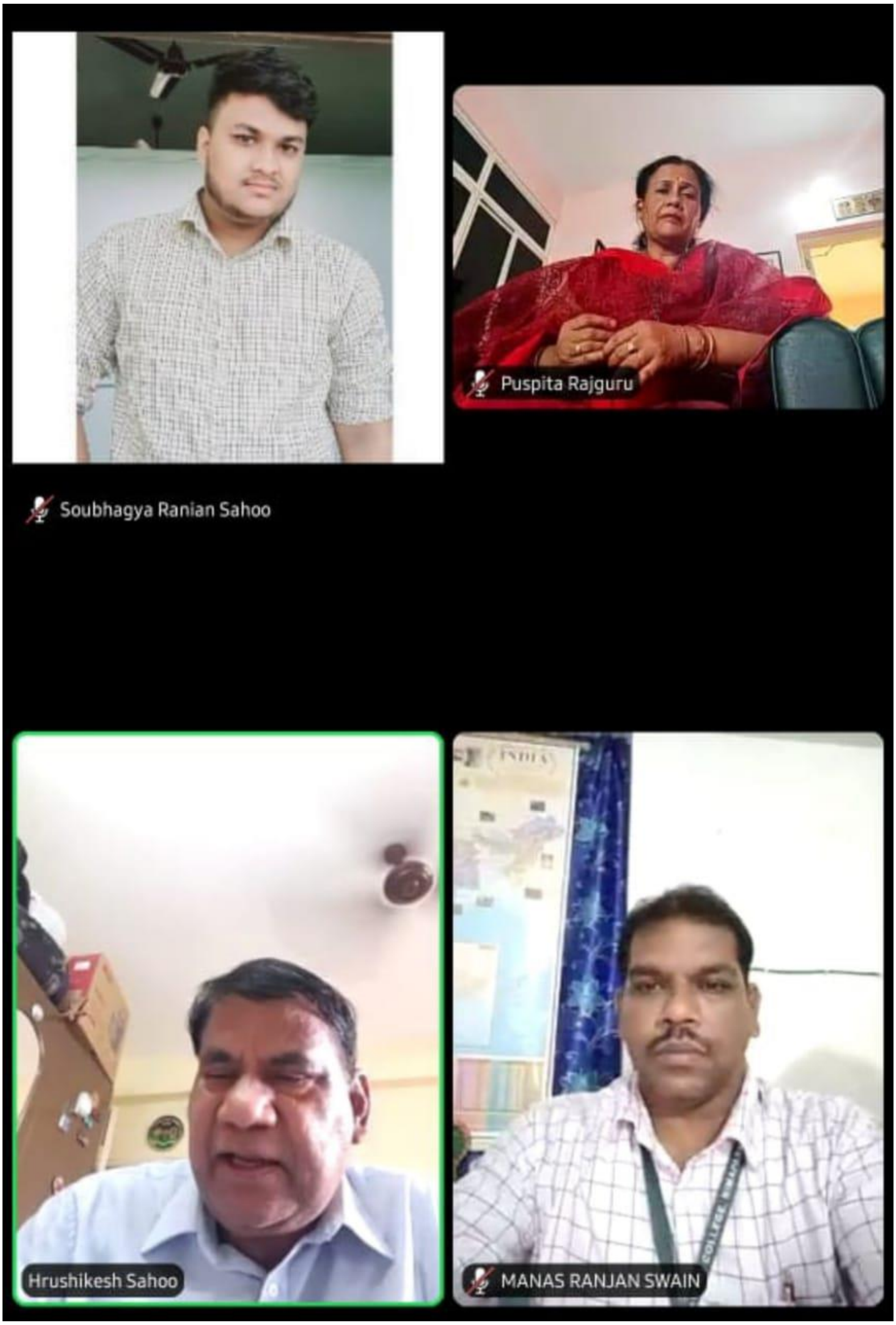
80%
URANIUM PRODUCTION CYCLE
Radiological safety and Mine & Mill remediation and reclamation are of great importance
Licensing
Mining
Milling
Exploration
Conversion &
Fuel fabrication
Reclamation
Reactors
Nuclear Fission and Fission Heat Energy
Chain Reaction
U - 235
U - 235
Natural Uranium
Natural Thorium
Deuterium
Tritium
JIMUTASEN NAYAK's screen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Soubhagya Ranian Sahoo
Hrushikesh Sahoo
MANAS RANJAN SWAIN