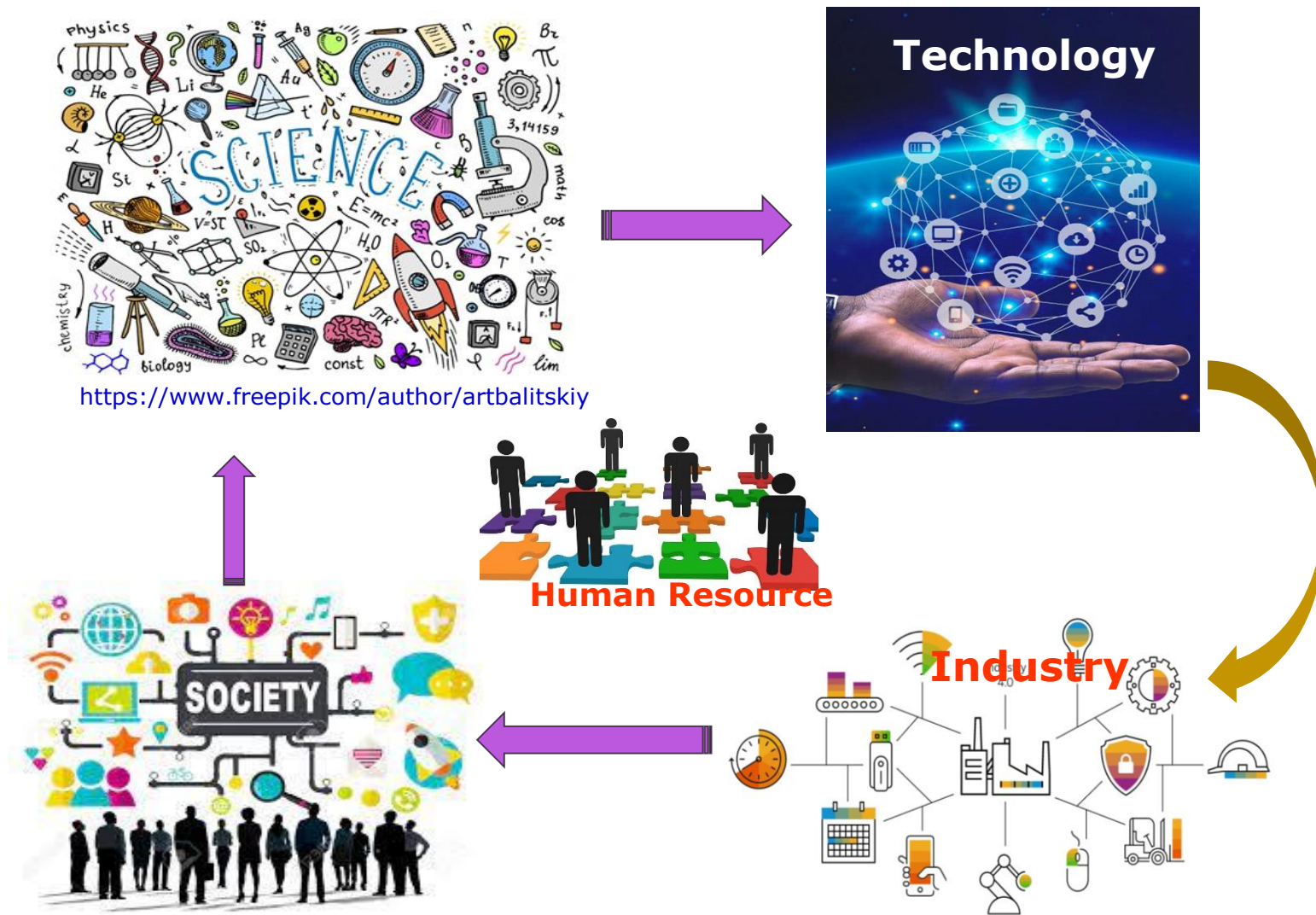


Government of India Perspective

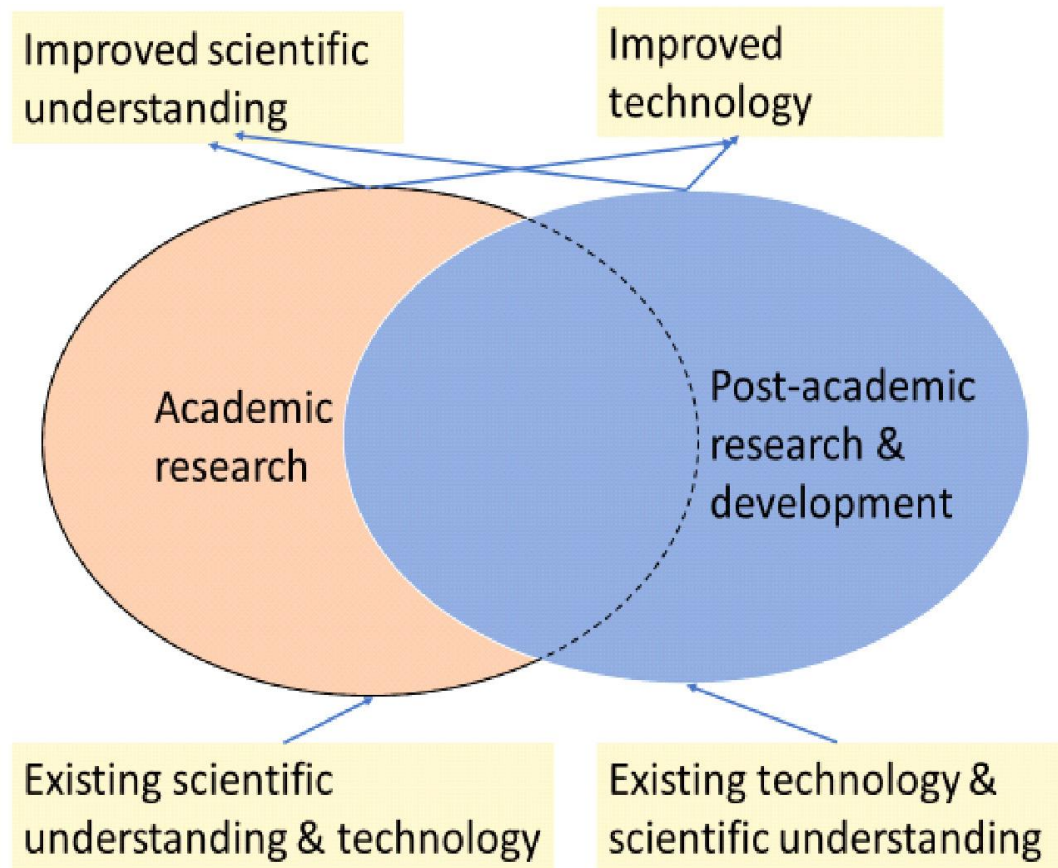
Sunil Ganju

Institutional Collaborations and Programs Division,
Nuclear Controls and Planning Wing,
Department of Atomic Energy, Mumbai (INDIA)

The complete cycle



Science and technology: Tangible vs Intangible

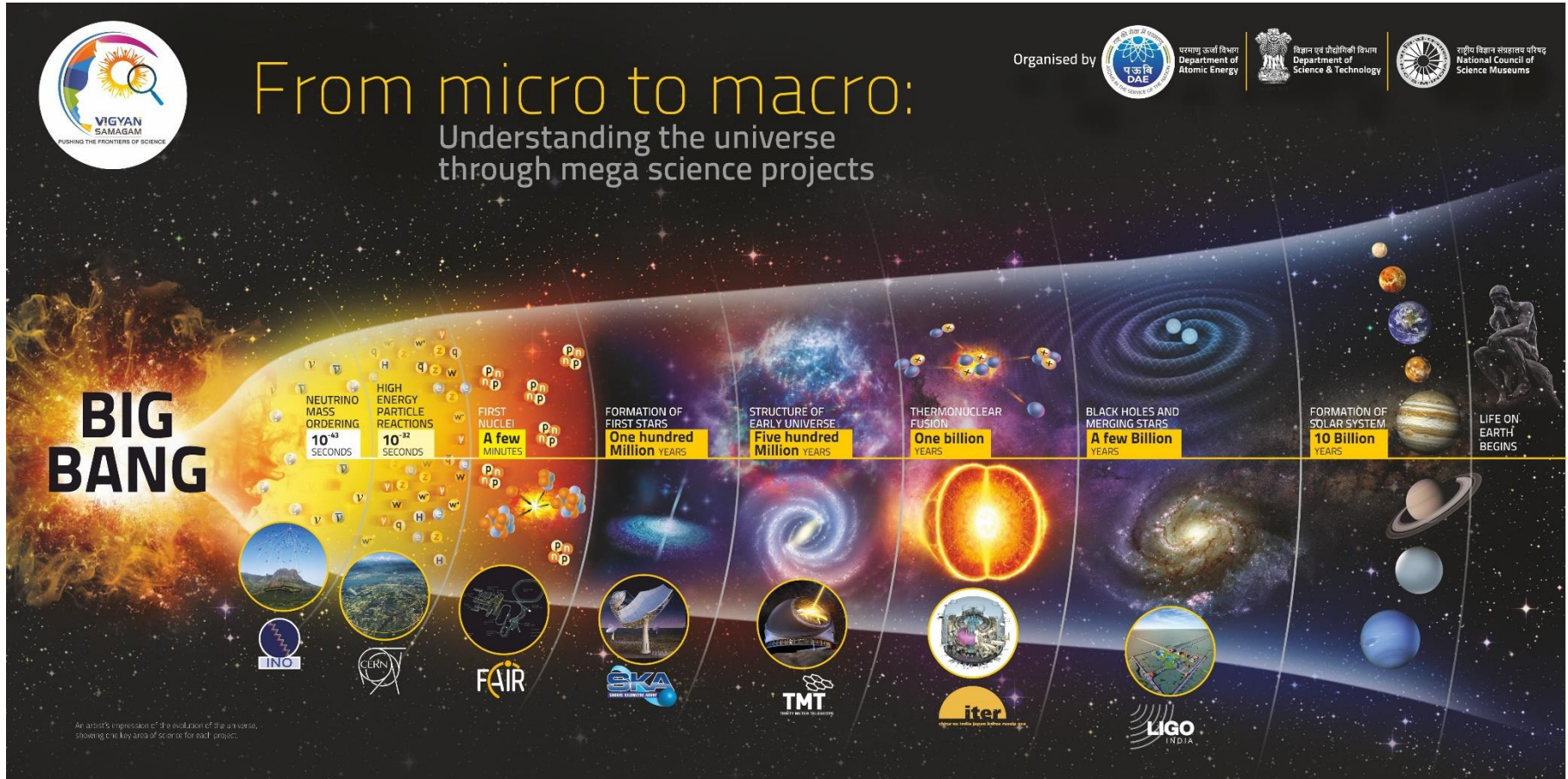


R B Grover, The Relationship between Science and Technology and Evolution in Methods of Knowledge Production, Indian Journal of History of Science, 54.1 (2019) 50-68

Applications : Physics/ Particle accelerators

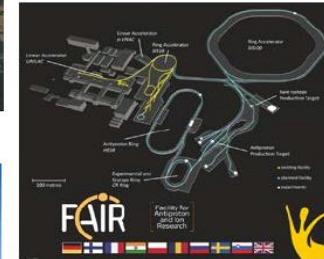
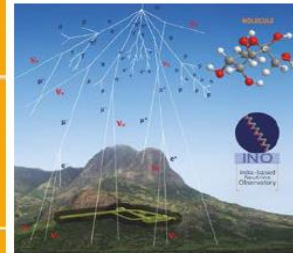
- **Health**
- **Industry**
- **Security**
- **Biology**
- **Material Science**
- **Fusion**
- **Fission**
- **Bio-fuel**
- **Incinerators**
- **Water Treatment**
- **Waste Management**

Horizons



Indian Mega Science Projects

	European Organization for Nuclear Research
	Facility for Antiproton and Ion Research
	India-based Neutrino Observatory
	International Thermonuclear Experimental Reactor
	Laser Interferometer Gravitational-wave Observatory
	Square Kilometre Array
	Thirty Meter Telescope



<http://www.vigyansamagam.in>

4

Mega Science Projects in DAE

Sr. No.	Name of the Project	Lead Agency	Sanctioned /Estimated cost (₹ in crores) and cost sharing between DAE and DST
1.	ITER	DAE	15375 (100 % DAE)
2.	CERN	DAE	500* (Annual Associate Membership fees: 50 Cr each for DAE and DST.
2a.	ALICE		500 (50%-50%)
2b.	CMS		
2c.	Grid Computing		
2d.	Accelerator (LHC)		
3.	FAIR	DST	694.8 (50%-50%)
4.	LIGO	DAE	~ 2600 (50%-50%)
5.	INO	DAE	1583.05 (50%-50%)
6.	SKA	DAE	1253.6 (50%-50%)
7.	TMT	DST	1299.8 (DST-752.5, DAE-547.3)
8.	Proton Accelerator (Fermi Lab)	DAE	1200 (100% DAE)

Evolution of Management Principles and Structures

- Cash/in-kind contributions
- Concept of Lead Agency
- Joint technical evaluation and approval (Task Force and DAE-DST Coordination Committee); joint implementation oversight (Task Force)
- Capital Cost sharing: 50:50 by DAE and DST; Rec. Cost (DAE institutions)-DAE; Rec. Cost (non-DAE institutions)-DST: Financial due-diligence and approval by the Lead Agency

The Road Travelled So Far

Great Experience To Be A Part Of Technology Development Right From Its Inception And Contribution To The World Community.

Strong base of high technologies created while participating in various Mega Science Projects.

Indian institutes have made significant contributions in terms of science, equipment, components, hardware and software and human resource for MSPs.

Positive Feedback from international collaborations in terms of human resource training, engagement in development of advanced technologies, industry partnership etc. is a valuable input for our indigenous programmes.

The Way Forward

Emphasis on deriving benefits beyond the conceptualised objectives for the MSPs.

Constructive participation in understanding the scientific background and enhancing the design and R&D capabilities within the country

The scientific and technical community needs to plan and prepare a cutting-edge road map so that India could come up as a driver for such collaborations and related R&D in future.

The research community should identify technological gaps and plan for bridging them. International collaborative projects should help in building up domestic programmes.

Our participation in the MSPs needs to mature from just being followers to being front-runners.

Focus on deriving advantages by learning design and development activities pursued by project proponents for setting up mega projects.

The Way Forward

Leveraging spin-off technologies.

A pro-active outreach programme to bring awareness about benefits from India's participation in such projects.

Emphasis on societal applications which will be a very important Tangible return for our participation in MSPs.

THANK YOU