



THE AGE OF MEGA SCIENCE

Science REPORTER

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DURING the past century, science has been increasingly becoming multi-disciplinary. And over the past decade, scientific endeavours have transformed into Mega Science projects. These projects seek to look deep into profound and intriguing questions that have been bothering humans or strive to provide solutions to some of the most complex problems that the world is grappling with. So, while some projects attempt to delve into fundamental questions such as how the universe was born, how the stars and galaxies were formed or if there is life outside of earth, there are also projects attempting to demonstrate alternate and feasible sources of clean energy.

Such projects are huge in terms of outlays and infrastructure that needs to be created and so manifestly become multi-institutional and multinational in nature, bringing the world scientific community together to work in a collaborative mode. The beauty of such Mega Science projects is that they not only empower and enable a deep-dive into confounding S&T problems, and make fundamental breakthroughs in science possible, they also spin-off technologies that find applications in several other walks of life.

The Government of India has been supporting participation of the Indian scientific community in several Mega Science projects appealing to the scientific curiosity of researchers. And so, after the Independence Day special issue of *Science Reporter* focusing on “75 Years of India’s S&T Journey”, once again in the series of *Azadi ka Amrit Mahotsav* special issues that we have planned, *Science Reporter* brings to its readers another special issue, this time focusing on some of the Mega Science projects where India is an integral part. We are grateful that some of the experts at the helm of these projects acceded to our request to write about the projects.

And so, we have Dr Archana Sharma, Senior Scientist, CERN, Geneva, writing on India’s presence in various projects at CERN like ATLAS, LHC & ALICE and how India’s collaboration in the Compact Muon Solenoid programme also contributed to Peter Higgs and Francois Englert winning the Nobel Prize in 2013 for Physics.

Dr Vivek Datar, former Project Director of the India-based Neutrino Observatory (INO), along with Dr Indumathi and Dr Murthy of the Institute of Mathematical Sciences write about India’s effort in the worldwide hunt for neutrinos to understand issues of fundamental importance.

The International Thermonuclear Experimental Reactor (ITER) is slowly moving towards its goal of demonstrating the feasibility of controlled nuclear fusion as an alternate source of virtually limitless and clean energy. Dr Ujwal Baruah, Project Director of ITER-India, writes about the integral Indian participation in the project.

Dr Yashwant Gupta, Centre Director, National Centre for Radio Astrophysics, one of the participating institutes in the Square Kilometer Array (SKA) mega-project, tells us how this is an excellent opportunity for India to reap the benefits from next generation technologies and also enable Indian astronomers access to the best experimental radio astronomy facility of the future.

Dr Sibaji Raha, Former Director, Bose Institute & Raja Ramanna (DAE) Fellow, Indo-FAIR Co-ordination Centre talks about how Indian scientists and technologists have proved their mettle as expert collaborators in the international Facility for Antiproton and Ion Research (FAIR) project.

The Thirty Meter Telescope (TMT) project is looking for answers to some of the nuanced questions like, are we alone in the Universe and what would be the fate of the accelerating Universe, among others. Prof. B.E. Reddy, Programme Director, India-TMT along with Dr Ramya, Project Scientist, India-TMT Co-ordination Centre, tell us how the project will help Indian industry and science take a giant leap forward.

We do hope you enjoy reading this special issue.

Hasan Jawaid Khan

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