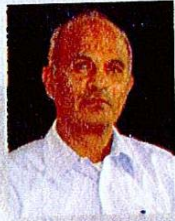


PURE SCIENCE IN REAL WORLD



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The Physics & Astrophysics was identified as an area of cooperation between India and Russia under Integrated Long Term Program (ILTP) of cooperation in Science & Technology when the ILTP was signed at the highest level in 1987. This was done because basic research in science was for the growth and development of technology and hence for the benefit of society and the human being.

Somebody could say that it's pure science. We certainly increase our knowledge base through our interaction, and try to see how it is going to help humanity. This is a general statement but let me give you a specific example which will answer your question. Today, everyone uses LCD cameras, TVs and so on, but these concepts originated from astronomical research. The reason is that in space research and astronomy we always try to create cutting edge technology. In the process, we explore what other applications these things can have. We are pushing technological development and then apply it. So, there are three or four examples where astro-physics research created better working conditions. But you can not do everything at once. There is always a time gap: first, pure science develops something and then applied science follows. So, we are part of pure science. Russia's modeling capabilities are very good. We have good computation and observational facilities. So, we are just trying to put them together, and quite successfully.

In the area of Physics & Astrophysics, 21 research projects have been undertaken during the last 20 years. The Projects cover a wide range of areas from Gamma Ray to Radio astronomy on the observational side to high energy physics and Cosmology on the theoretical side.

For example, preliminary design, engineering and proto model of sub system to cover energy range 150 KeV - 1 MeV gamma rays were made by TIFR. The X-ray/gamma ray detector systems, 34 parabolic mirrors, each of 60 cm diameter, were fabricated and tested under the ILTP projects. Both India and Russia benefited from these activities as photo multiplier detectors and mirrors are presently being used in Mount Abu (TACTIC) and Novosibirsk (Shalon). In Radio astronomy projects, a 326 MHz front end has been constructed for the radio telescope radio-astron and important radio observations have also been obtained jointly.

This has further widened cooperation as the projects in the areas of ground based optical and space based astronomy. Advantage of geographical location of India is being used in the present era of multi-wavelength multi-site observational astronomy. Such observations are not possible to have from any other place. Because of this and existence of good astronomical sites, Indian optical telescopes equipped with modern CCD detectors make unique contribution to many astronomical research, particularly involving time critical phenomena. So, under one of the ongoing ILTP projects design, development and testing of the both primary and secondary mirrors of the 3.6 metre Indian optical telescope as well as their aluminizing are planned. In fact, we already have one proposal, and they also want to make some equipment, but funding is a problem. In other ongoing projects, complementary observational and modeling capabilities of the scientists are being used. It means that the both Russia and India could derive significant benefit from the ILTP cooperation.