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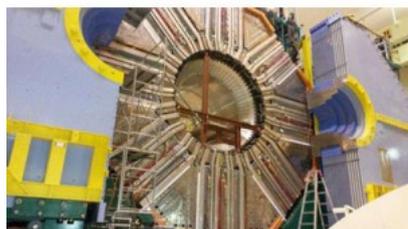


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# Indian 'hand' in search for New Physics

— By Gayatri Ramanathan | Mar 03, 2016 12:14 am



**Mumbai:** Indian scientists have contributed to the design and prototype of a key component of the new atom smasher that went live on Wednesday in the Japanese city of Tsukuba.

The atom smasher, known as the SuperKEKB at the KEK laboratory, has achieved "First Turns", a major milestone for any new particle accelerator, said a TIFR release. It is now in the test operation stage. This is the first new collider since the LHC, which is located at the CERN laboratory in Switzerland.

In contrast to the Large Hadron Collider at CERN, Switzerland, which is the world's highest energy machine, SuperKEKB is designed to have the world's highest particle beam intensity (a factor of 40 higher than the earlier KEKB machine that holds many of the current world records for accelerator performance).

Thus, SuperKEKB will soon be the leading accelerator on the "intensity frontier". The Indian team, led by Tata Institute of Fundamental Research (TIFR), Mumbai, is designing and building the silicon micro-vertex detector (SVD) of the experiment. The working prototype SVD module was also designed and assembled by scientists at TIFR.



Dr Gagan Mohanty, Associate Professor, Dept. of High Energy Physics at TIFR, Mumbai, who is leading the effort, explained that the SVD is a highly sensitive detection system that can measure sub atomic particles that "cannot be seen but whose presence we can feel". The machine, he said, can measure lengths which are "a few tenths of a micron". By comparison, the human hair is one micron.

Mohanty explained the significance of the experiment scheduled to start at SuperKEKB by next year. "When the Higgs Boson or the God particle was discovered, the standard model of particle physics was complete. However, we know that it is not the full story. That is just 5% of the story. The mystery of physics includes such things as dark matter - matter which has mass but does not emit light. These constitute about 25% of matter. This is the New Physics that this collider will help us unravel." The experiment which is being set up at SuperKEKB, called Belle II, is a search for this New Physics by indirect means, explained Mohanty.

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