Saha Institute of Nuclear Physics (SINP), Kolkata and Deutsches Elektronen-Synchrotron (DESY), Hamburg signs an agreement to promote India - Germany cooperation in Synchrotron research

In presence of the Chancellor of Germany, Dr. Angela Merkel and Hon'ble Prime Minister of India, Dr. Manmohan Singh, the Directors of Saha Institute of Nuclear Physics (SINP), India and Deutsches Elektronen-Synchrotron (DESY), Germany, Professor Milan K. Sanyal and Professor Helmut Dosch, respectively, signed one of the four major Cooperation Agreements in Delhi on 31st May, 2011. This Agreement will enable Indian scientists to access world's best high-energy synchrotron light source PETRA-III and free electron laser source FLASH at DESY. DESY's light sources PETRA III and FLASH offer unique research opportunities and a great potential for innovative experiments. SINP is planning to build an Indian synchrotron facility of the third generation for high-energy photons; thus, the country has keen interest in training young scientists at the DESY experimental facilities. Prof. Dosch said, "DESY very strongly welcomes the plans of the Indian research community to enhance its activities in the construction and use of large scale x-ray facilities. By this India will attract brilliant young scientists from many scientific disciplines and will become a leading nation in the development of nanoscience and nanotechnology. The new cooperation between DESY and India

in the use of the high energy Synchrotron radiation source PETRA III is an important milestone in this endeavor and will benefit both nations". Prof. Sanyal stated, "One of the greatest challenges in fundamental and applied science is the creation and exploration of new materials with unexpected behaviour that results from novel structures on the nanoscale. This so-called emergent behaviour arises from three basic qualities that are typical of nanoscale systems: geometrical confinement, physical proximity and self-organization. Substantial work has been done in India towards the development of a variety of nano-structured materials, but lack of in-situ non-destructive characterization facilities have hindered the development of understanding of structure-property relationship of these materials. Access to the world's best synchrotron source PETRA-III that can provide high brilliance, nano-sized X-ray beam with energy tunable from fraction of a keV to several tens of keV, and with tunable polarization, will enable the Indian science community to be at the fore-front of basic and applied materials research."

Synchrotron light source provides intense light ranging from Infra-red to X-rays which may be used to investigate materials for basic research and industrial application in various subjects ranging from medical applications to nano-technology. SINP will be the nodal Institute for developing participation of Indian scientists in this major India-German collaboration project, funded by the Department of Science and Technology, India. This initiative was started in 2009 by Professor C.N.R. Rao, the scientific advisor of the Indian Prime Minister. India will contribute 14 million Euros for the construction and operation of a beamline in one of the PETRA III extensions and in return will get access to 1.3 beamline-year time across the entire facility. A hair-thin, brilliant X-ray beam such as the one produced by PETRA III gives researchers vital advantages. For certain applications, materials researchers need highly energetic photons with high penetration power – for example, to test welding seams or to check production parts for signs of fatigue. The PETRA III storage ring generates especially high-energy radiation at up to 100 keV with high brilliance – a decisive advantage for many experiments. For example, even minuscule material samples can be studied and the arrangement of their atoms precisely determined – or molecular biologists can explore the atomic structure of tiny protein crystals. The demand for such information is enormous. This cooperation agreement will also allow collaborations of scientists from SINP and DESY in other research areas of mutual interest, such as High Energy Physics, Nuclear Physics, Condensed Matter Physics and Bioscience.