

CERN Talks at Delhi University

5th September 2019

Department of Physics and Astrophysics, Delhi University

11:30 Silicon Sensor and Mechanics R&D towards the ATLAS Inner Tracker at the High Luminosity LHC by Abhishek Sharma, Doctoral Researcher, Oxford University and CERN

Venue: Committee cum Seminar Room

15:00 Low energy tests of fundamental symmetries at CERN by Michael Doser, Research physicist, CERN

Venue: D.S. Kothari Lecture Hall

Abhishek Sharma, Doctoral Researcher, Oxford University and CERN

Abhishek Sharma is a Doctoral Researcher working on the ATLAS experiment at the CERN laboratory's Large Hadron Collider (LHC) located in Geneva, Switzerland. This circular accelerator will undergo a major upgrade by 2024 towards the High Luminosity LHC, greatly enhancing its discovery potential. The experiment aims to understand the birth of the universe, its evolution and how it may end, using particle accelerators and detectors. His research includes R&D in silicon sensor technology capable of withstanding extreme radiation environments and the development of the instrumentation needed for their characterisation and operation. He is also involved in several thermal studies qualifying mechanical structures onto which these sensors will eventually be secured. Abhishek obtained his BSc in Physics from the University of Loughborough, UK, and MSc degree in the same field from University College London, UK. He is currently in the final year of his doctorate at the University of Oxford.

Title of talk

Silicon Sensor and Mechanics R&D towards the ATLAS Inner Tracker at the High Luminosity LHC

Abstract

The Large Hadron Collider (LHC) will undergo a major upgrade towards the High Luminosity LHC by 2024. As a result, all of its experiments, including ATLAS and CMS, will upgrade their detector technologies and readout systems to cope with the expected increased radiation and higher particle hit rates. This talk will present the developments made towards a novel monolithic CMOS Pixel sensor being considered for integration in the new Inner Tracker of the ATLAS experiment along with the commissioning of a thermal qualification facility for the mechanical structures expected to house the sensors, its data & power services and cooling lines.

Michael Doser, Research physicist, CERN

Michael Doser is a research physicist at CERN, the European Center for Nuclear Research in Geneva, Switzerland, who has specialized in working with antimatter, using it either as a tool (to study the strong interaction), or as an object of study itself (formation of anti-atoms, study of matter-antimatter asymmetry, measurement of the gravitational interaction between matter and antimatter). He is the spokesperson of the AEGIS experiment at CERN. In addition, he lectures on antimatter, and is editor of Physics Letters B and of the Review of Particle Properties. He is also involved in numerous outreach activities, both locally and internationally (Europe and Asia), speaking to a wide spectrum of non-specialist audiences, from school children to experts and decision makers, often also at art-related events.

Title of talk

Low energy tests of fundamental symmetries at CERN

Abstract

CERN hosts, in addition to the flagship program LHC, a wide range of experiments targeting physics at lower energies. Among these, a number of much smaller experiments at CERN's ISOLDE (isotope) and AD (antimatter) facilities, but also elsewhere at CERN, focus on investigations of fundamental

symmetries, such as the CPT symmetry, test the weak equivalence principle, or search for non-standard model physics.

In this talk I will review some of these experimental activities that range from searches for dark matter at low energy to nuclear physics to atomic physics of antiprotonic atoms, and will highlight how expertise in fields such as atomic physics, laser physics or physics of ultra-cold systems would be greatly helpful in addressing the challenges faces by these interdisciplinary and “university-scale” activities.