

## Séminaire LAL

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**Mardi 25 septembre 2018 à 11h00**

### ***The ATLAS High-Granularity Timing Detector***

The large increase of pileup interactions is one of the main experimental challenges for the HL-LHC physics program. A new powerful way to mitigate the effects of pileup is to use high-precision timing information to distinguish between collisions occurring very close in space but well-separated in time. In the past years, the development of ultra-fast silicon detectors such as low-gain avalanche diodes (LGADs) has enabled this possibility, and the LHC experiments ATLAS and CMS are in the process of designing new additions that will provide them with the capability of measuring the time of arrival of particles with high precision. This seminar will focus on the High-Granularity Timing Detector (HGTD), which is part of the ATLAS Phase-II upgrade program for the HL-LHC. The detector will consist of two thin cylinders, one on each side of the collision point, covering the pseudorapidity region between 2.4 and 4.0. The targeted time resolution per minimum-ionising particle, of 30ps, will allow to significantly improve the performance in the forward region. The talk will cover some of the technical aspects in the design of this new detector, particularly the challenges faced due to the spatial constraints and the harsh radiation environment. It will also intend to showcase the various ways in which the timing information can be used to improve the performance of object reconstruction, and therefore that of those analyses in which the activity in the forward region is relevant.

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