

# DOCTORAL COURSES

## « Modern Detectors »

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**Every Thursday from 10.15 to 12.00**

Science I, room 102 (Autumn semester)

**In Datcha (Spring semester)**

### Outline:

This course discusses particle detectors with particular attention at recent developments in detector technology. We will start with a review of interactions of particles with matter. The first family of detectors that we will study in depth are the gaseous detectors. We will continue with electromagnetic and hadron calorimetry starting from basic principles. Then we will study the different components needed to build a semiconductor particle detector, from the silicon sensor and readout electronics up to their integration into a large particle tracking detector. Next, we will study photo-detection and various photo-detectors focusing on silicon photo-detectors. We will also study different particle identification techniques including large volume Čerenkov detectors. The study of silicon detectors and photo-detectors is complemented by a hands-on laboratory. The knowledge of relativistic kinematics is mandatory, as well as some knowledge of particle detection principles.

**Format:** Starts the week of 23<sup>rd</sup> September 2019 until 20<sup>th</sup> December 2019  
and **from the week of 30<sup>th</sup> March 2020 until 29<sup>th</sup> May 2020.**