

# **LHC PHYSICS**

(High  $p_T$ , lectures 1 & 2)

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## Lecture 1: Introduction and the LHC accelerator

1. the Standard Model and motivation for the LHC
2. basic design choices
3. RF system and phase stability
4. dipole magnets
5. quadrupole magnets, transverse dynamic
6. machine upgrades

## Lecture 2: General purpose experiments, ATLAS and CMS

1. overview of physics channels studied by the General Purpose Experiments
2. experimental signatures for high  $PT$  physics
3. generic high  $PT$  experiment
4. comparison of ATLAS and CMS, design choices
5. detector upgrades

## Reading list:

There are a lot of resources available, ranging from basic introductions to the LHC and experiments, to full textbooks and conference presentations on latest results. In addition to the resources recommended by Miriam I would like to suggest:

- Dan Green et al., At The Leading Edge , The ATLAS and CMS LHC Experiments, World Scientific 2010.
- CERN lectures for summer students  
<https://indico.cern.ch/category/345/> , especially lectures by Verena Kain (Accelerator Physics) and Isabelle Wingerter-Seez (Detector Physics)