



# UNIVERSITÀ DI PISA

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## FISICA AI COLLISIONATORI ADRONICI

### VINCENZO CAVASINNI

Anno accademico 2023/24  
CdS FISICA  
Codice 201BB  
CFU 9

Moduli	Settore/i	Tipo	Ore	Docente/i
FISICA AI COLLISIONATORI ADRONICI	FIS/04	LEZIONI	54	VINCENZO CAVASINNI SANDRA LEONE

#### Obiettivi di apprendimento

##### *Conoscenze*

HADRON COLLIDER PHYSICS The aim of the course is to communicate the most recent advances obtained in elementary particle physics using high energy hadron colliders (protons, antiprotons, heavy ions).

##### *Modalità di verifica delle conoscenze*

Preparation and presentation of the analysis work on data collected at the LHC, oral exam on the course contents.

##### *Prerequisiti (conoscenze iniziali)*

Basics of theoretical physics, calculation of Feynman diagrams. "Fundamental interactions" course. Characteristics of elementary particle detectors.

##### *Programma (contenuti dell'insegnamento)*

Elementary particle physics at the hadronic colliders , proton-proton and proton-antiproton. The study of the quark and gluon interactions, which are the proton constituents, have provided many fundamental discoveries in particle physics such as those of bosons W, Z, top-quark and Higgs. Using an phenomenological/experimental approach a review of results obtained at the colliders : ISR, SPS collider, Tevatron and LHC is presented together with a discussion on future perspectives.  
In the final period of the course some scientific articles reporting important results obtained at LHC will be examined and an analysis of real data collected on the Higgs physics will be done.

##### *Bibliografia e materiale didattico*

Textbooks and scientific articles suggested in class.

##### *Indicazioni per non frequentanti*

The slides presented during the course will be available on the course e-learning site.

##### *Modalità d'esame*

Preparation and presentation of the analysis work on data collected at the LHC, oral exam on the course contents.

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