UNIVERSITÀ DI PISA

HADRON COLLIDER PHYSICS / FISICA AI COLLISIONATORI ADRONICI

VINCENZO CAVASINNI

Academic year	2023/24
Course	FISICA
Code	201BB
Credits	9

Modules	Area	Type	Hours	Teacher(s)
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 phenmomenological/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
Texbooks 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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