

Corso seminariale anno accademico 2021/22

Semestre: II

TITOLO CORSO: History of 20th Century Physics/Storia della fisica del Novecento

DOCENTE: Matteo Tuveri

Corso seminariale per la laurea: Master/Magistrale

Numero CFU: 3

Programma del corso:

Introduction

- Lecture 1: From Aristotle to the Nineteenth Century: what is the history of physics?
- Lecture 2: Physics at the end of the Nineteenth Century: towards a new physics

The 20th century: Relativity

- Lecture 3: The birth of Relativity
- Lecture 4: Space and time: General Relativity

The 20th century: Quantum Mechanics

- Lecture 5: Welcome back, dear “Atom”!
- Lecture 6: The right answer to the right question: the birth of Quantum Mechanics
- Lecture 7: A new probabilistic world

Particle Physics

- Lecture 8: Atoms and particles, the world and the anti-world
- Lecture 9: Colliders

Physics and Technology

- Lecture 10: From the old to the future

Astrophysics, cosmology and contemporary challenges

- Lecture 11: Nuclear archeology and the universe
- Lecture 12: Where are we? Where are we going?

Modalità svolgimento corso:

The course will be online (**possibly frontal lectures depending on covid-19 restrictions**). Active learning strategies will be used in both synchronous and asynchronous contexts.

Class-activities will be organized in webinars, discussion and brief tests by means of “Google Classroom” platform:

- For every lecture, a registered video-lecture (and sometimes further material) will be available for the class.
- Students have one week to watch it, leave comments and raise questions
- During the week among two lectures, students will be involved in active learning activities regarding the content of the video-lectures.
- Comments and questions will be the starting point of the in-class (virtual) meeting where topics of the lectures will be discussed.

Eventuali testi di riferimento:

- E. Segrè, 2018, *Personaggi e scoperte della fisica. Da Galileo ai Quark* (Mondadori)
 R. March, 1994, *Fisica per poeti. Lo scienziato come uomo e artista: storia della fisica da Galileo ai giorni nostri* (Edizioni Dedalo)
 G. Gamow, 1966, *Trent'anni che sconvolsero la fisica. La teoria dei quanti* (Zanichelli)
 J. L. Heilbron, 2018, *The History of Physics. A very short introduction* (Oxford University Press)
 J. Maxwell, *History of Physics. The story of Newton, Feynman, Schrödinger, Heisenberg and Einstein. Discover the men who uncovered the secrets of our universe* (Amazon libri)
 M. Morganti, 2016, *Filosofia della fisica. Un'introduzione* (Carocci Editore)

Papers given as materials during the course

Modalità di svolgimento dell'esame:

Oral presentation (max 10 minutes, slides allowed) about topics to choose from the following:

- History of one contemporary physicists (from the end of 19th century until now)
- historic overview of facts that happens in contemporary physics (from the end of 19th century until now)