



PARTICLE DETECTORS

Enrollment year	2019/2020
Academic year	2020/2021
Regulations	DM270
Academic discipline	FIS/01 (EXPERIMENTAL PHYSICS)
Department	DEPARTMENT OF PHYSICS
Course	PHYSICAL SCIENCES
Curriculum	Fisica nucleare e subnucleare
Year of study	2°
Period	2nd semester (01/03/2021 - 11/06/2021)
ECTS	6
Lesson hours	48 lesson hours
Language	Italian
Activity type	ORAL TEST
Teacher	LIVAN MICHELE
Prerequisites	Basic concepts of electromagnetism, quantum mechanics and statistics
Learning outcomes	Understanding of the processes of interaction of radiation with matter and the physical principles of radiation detection
Course contents	After an introduction to radioactivity and radioactive sources, we pass to the study of the processes of radiation-matter interaction for charged and neutral particles. Are then described the main features of the detectors to study of the physical mechanisms of functioning of the two main classes of detectors: ionization detectors and scintillation ones. The last part of the course concerns the description of the detection systems such as particle identification and, in detail, electromagnetic and hadronic calorimetry.
Teaching methods	Front lectures using slides to show diagrams and experimental results

**Reccomended or required
readings**

W.R. Leo, Techniques for W.R. Leo, Techniques for Nuclear and Particle Physics Experiments. Springer- Verlag

K. Kleiinknecht, Detectors for particle radiation

G. Gaudio, M. Livan, R. Wigmans The art of Calorimetry. Proceedings of the International School of Physics "Enrico Fermi", Course CLXXV "radiation and Particle Detectors" (IOS Amsterdam; SIF, Bologna)

Recent review papers

Oral examination. The focus will be mainly on the physics of radiation detection and on the ability of the student to identify the more suitable instrumentation for measuring a certain physical process

Further information

