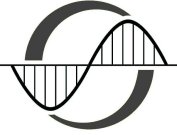




UNIVERSITÀ
degli STUDI
di CATANIA



DIPARTIMENTO DI FISICA E ASTRONOMIA
“ETTORE MAJORANA”

DOTTORATO DI RICERCA IN FISICA
CICLO XXXIX A.A. 2023/2024

TITLE

Experimental Searches for Dark Matter

2 CFU

Teaching staff

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Program of the course:

- Observational evidence for Dark Matter (DM)
- Thermal production
- Properties of the expected DM signals in Direct Detection experiments
- Background sources and possible strategies for its reduction
- Experimental techniques: detection of light, charge, and heat
- Dual-phase liquid noble gas detectors, cryogenic Ge, bolometers, TES, SQUIDS, CCD, CaWO₄ crystals and others.
- Introduction to statistical methods for data analysis
- DM searches at accelerators
- Introduction to the Dark Photon and Light Dark Matter
- Experimental techniques for the Dark Photon “visible decay” search

- Search for invisible decays: missing mass, missing energy, and missing momentum experiments
 - Beam-dump experiments
-

Bibliography:

Scientific papers and slides provided by the teacher.

G. Bertone, Particle Dark Matter: Observations, Models and Searches Cambridge University Press 2010

US Cosmic Visions: New Ideas in Dark Matter 2017,
arXiv:1707.04591