

Appunti di Fisica '22

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su Microsoft Teams "Seminari di Appunti di Fisica"

A modern overview of the nuclear fundamental research

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Thanks to the nuclear physics theories and techniques we achieved a remarkable success in the understanding of the properties of nuclei and of the structures responsible for these properties. Nowadays the research in nuclear physics continues to reveal new phenomena, new elements, gives new contributions to astrophysics and provides technological advances for the benefit of the society. In this informative seminar we will present selected interesting topics in nuclear physics and nuclear astrophysics connected mostly with the NPI activities (Nuclear Physics Institute of the Czech Academy of Science). The presented topics will be:

- The indirect techniques whose purpose is to study nuclear reactions of astrophysical importance for the understanding of the stellar and Big Bang nucleosynthesis processes. This work is done in collaboration with INFN LNS (Istituto Nazionale di Fisica Nucleare - Laboratori Nazionali del Sud), in Catania.
- We will explore the cluster structure of the ^{12}Be . The measurements will be performed by using the radioactive beam facility and the new detection system ACTAR TPC (ACTIVE TARGET Time Projection Chamber), placed in GANIL (Grand Accélérateur National d'Ions Lourds), thanks to the SPIRAL2/CZ project.
- We will talk about the first experiment performed in the charged particle activation facility, developed by the NPI for the GANIL NFS (Neutrons For Science), concerning the metallic target activation.
- We will briefly present the New JEDI project (Judicious Experiments for Dark sectors Investigations), within SPIRAL2-CZ project. The goal is the measurement of the unconfirmed boson X17, that may be the force carrier for the so called "fifth force", connected with the dark matter.