

# COSINUS - towards the clarification of the puzzling DAMA/LIBRA signal

*Wednesday 26 March 2025 11:45 (15 minutes)*

A method for distinguishing dark matter signals from detector background is looking for an annual modulation signal caused by the seasonal variation of the Earth's velocity with respect to the sun and, thus, the dark matter halo.

The DAMA/LIBRA experiment, a pioneer using such modulation as DM signature, observes a modulated signal rate with a very high statistical significance with the period and phase matching the DM expectation.

The DAMA/LIBRA results are in strong tension with the null results of most of the other direct dark matter searches. However, as of today, a material and model-independent unambiguous cross-check is still missing to unveil this long-term puzzle.

COSINUS, one of several NaI experiments, is working towards this goal by employing sodium iodide as a low-temperature scintillating calorimeter.

The distinctive features of COSINUS, compared to the other NaI searches, are a low threshold for nuclear recoils, superior energy resolution, and particle identification on an event-by-event basis.

In this talk, I will discuss the latest results from the COSINUS prototype detector, the status of the novel cryogenic low-background facility located at the Gran Sasso underground lab, and the last steps of the commissioning towards starting the first physics data-taking campaign in 2025.

**Author:** SCHAEFFNER, Karoline Julia (Max-Planck Institute for Physics)

**Presenter:** SCHAEFFNER, Karoline Julia (Max-Planck Institute for Physics)

**Session Classification:** SESSION 11: Direct Detection: status of crystalline WIMP detectors