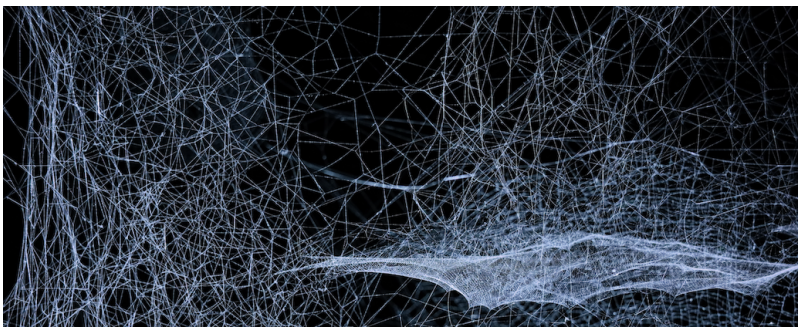
Shedding light on X17



Monday, September 6, 2021 - Wednesday, September 8, 2021

Centro Ricerche Enrico Fermi

Scientific Program

The workshop "Sheding light on X17" brings together scientists looking for the existence of a possible light dark photon.

A resonant structure has been observed at ATOMKI in the invariant mass of electron-positron pairs, produced after excitation of nuclei such as 8Be and 4He by means of proton beams. Such a resonant structure can be interpreted as the production of an hypothetical particle (X17) whose mass is around 17 MeV.

Other experiments are aiming to confirm such observation. In parallel, some theoretical effort is ongoing, to explain the anomaly. A number of experiments are currently running, looking for signals of the production of such an hypothetical particle.

Experiments on IPC

Within this track, experimental results and techniques are presented about the observation of an anomaly at 17 MeV in Internal Pair Creation (IPC), using nuclear techniques, i.e. bombarding nuclei with particle beams and observing the production of an electron-positron pair.

The most up-to-date information will be presented about the experimental evidence of the anomaly. Moreover, the status and results of other experiments in nuclear physics (in progress or in preparation) will be reported.

Theory

The observation of the X17 anomaly has triggered several theoretical groups to investigate various possibilities. Theoretical interpretations of the anomaly will be given both in SM and BSM scenarios.

In particular, we aim at comparing the recent results on g-2 on both electrons and muons, with the various model for BSM interpretations of the X17 anomaly.

Searches for X17

If the hypothesis that the X17 anomaly is due to the production of a particle is true, the latter should be detectable in dedicated experiments.

Some experiments have been done in the recent past, some other are currently running, while new experiments have been proposed to confirm or reject such an hypothesis.

In this workshop we are going to review the status of past, present and future experiments aiming at detecting a possible X17 particle.