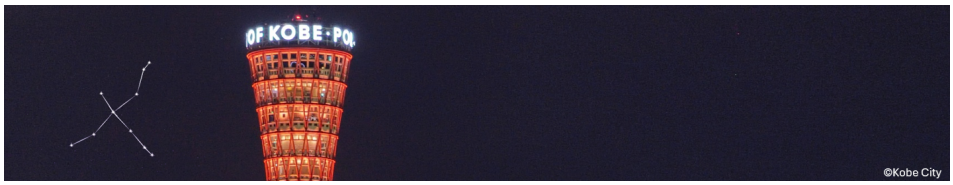

Contribution ID: **29** Type: **not specified**

Axions Bounds @GSSI

Monday, 23 February 2026 15:35 (25 minutes)

In my talk I will present the possibility to set new constraints on axion-like particles using LIME or CYGNO04. I first studied the three production channels of axions in the Sun: photon coalescence, the Primakoff process, and plasmon decay, and reconstructed the resulting axion flux at Earth. then I focus on the population of axions that remain gravitationally trapped around the Sun, which can accumulate over geological timescales and therefore provides the dominant contribution to the axion decay rate on Earth. From this, I computed the axion number density in the solar vicinity and the corresponding event rate at Earth. Applying these results to a generic ALP model, I found that, assuming a sensitivity of one event per day per cubic meter in the 1–10 keV energy range, one can set a new bound in the ALP parameter space, excluding a region that is currently constrained only by indirect arguments. Then I apply the same arguments to the Kaluza–Klein axion model, comparing our results with those obtained by the NEWS-G experiment. Finally, I will present a demonstrative data analysis performed with the CYGNO collaboration to explore the feasibility of this measurement.

Presenter: PERONI, Francesco (University of Padua, INFN)

Session Classification: Application