**LABORATORI NAZIONALI DEL GRAN SASSO**

# SEMINAR ANNOUNCEMENT


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# *ALPs in the sky: bounds and discovery opportunities*


*Very light axion-like particles (ALPs) with a two-photon vertex are predicted in many extensions of the Standard Model of particle physics. Depending on the actual value of their mass, ALPs can play an important role in cosmology, either as cold dark matter particles or as quintessential dark energy. The coupling with photons allows for ALP-photon mixing in external electromagnetic fields. This effect is exploited for direct searches of ALPs in laboratory experiments. The two-photon vertex would also induce the mixing with ALPs for photons emitted by distant astrophysical sources, and propagating in the large-scale cosmic magnetic fields. Indeed, different astrophysical puzzles would be naturally solved by conversions of cosmic photons into ALPs. Motivated by these intriguing hints, I will discuss how current and upcoming astrophysical experiments, ranging from the cosmic microwave background to the high-energy gamma-rays, could probe the elusive ALPs in a region of their parameter space not accessible by laboratory experiments.*


## APRIL 4, 2013 – 11:00 AM

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