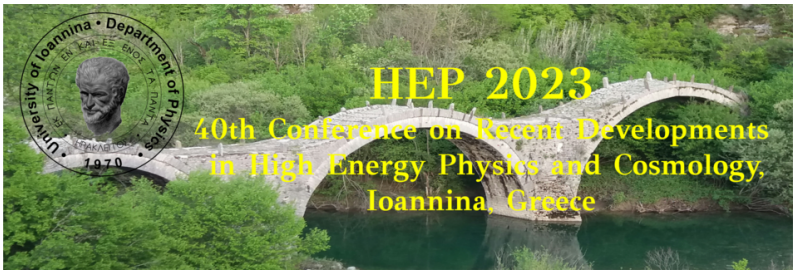

Contribution ID: **6** Type: **not specified**

A Field Theory Approach to Dark Energy and its observational consequences.

Thursday, 6 April 2023 14:30 (30 minutes)

From the perspective of Particle Physics and Field Theory, Dark Energy is a low energy phenomenon. Thus, we expect that field theory in curved space time should be sufficient to understand the physics of Dark Energy and its observational consequences. However, in the context of the Standard Model of Particle Physics obtaining fields with sufficiently low masses that can both be protected technically and be relevant for Dark Energy physics can be a challenge. Pseudo Nambu Goldstone Bosons tied to non-zero Neutrino masses provide an approach to the Dark Energy problem that appears to be very promising. Not only does such an approach solve the traditional problems that Dark Energy was invented to solve but it provides avenues to explore the connected areas of physics, cosmology and astrophysics. As some examples of this, we will discuss the gravitational collapse of dark energy field configurations to form SMBHs (Super Massive Black Holes) with masses comparable to the masses at the centers of galaxies. Further, we will discuss the gravitational waves produced by dark energy fields and show that these gravitational waves can explain the periodicity of the Ice Ages through the amplitude and frequency of the ellipticity variation of earth's orbit created by such Dark Energy Gravitational Waves. Finally, we discuss future directions and point out some of the exciting avenues that still need further exploration –these explorations will undoubtedly shape our ever expanding understanding of our Universe.

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Session Classification: Plenary