

PER²APS²
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PHYSICS²SEMINARS⁴

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Cosmological and Gravitational Wave Probes of Beyond the Standard Model Physics

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Cosmology is providing new measurements that point to new physics. I will review several of them. The new measurements of the Baryon Acoustic Oscillations (BAO) by the DESI Collaboration, together with CMB and Supernovae data, and the direct local measurements of the Hubble rate H_0 by the SH0ES Collaboration, point to new physics both in the Early Universe, in the form of Dark Radiation, and in the Dark Energy sector. I will also discuss, in this context, how to measure relic particles, focusing in particular on neutrino mass measurements and on the QCD Axion. Then, I will discuss other very interesting probes of the Early Universe: primordial Gravitational Waves and primordial Black Holes, focusing on the context of primordial Domain Walls in models with broken discrete symmetry and their signatures at Pulsar Timing Arrays, which are recently showing evidence for a gravitational wave background signal.