



University of Crete  
Department of Physics

## Physics Colloquium

Thursday, 4 April 2019 | 17:00 – 18:00, Seminar Room, 3rd floor

### Dark matter: canonical paradigms and beyond

**Dr. Kalliopi Petraki**

*Laboratoire de Physique Théorique et Hautes Énergies, Sorbonne University, Paris, France and Dutch National Institute for Subatomic Physics, Amsterdam, Netherlands*

#### ABSTRACT

*Most of the matter in our universe is in the form of some yet unknown particles, known as dark matter. Besides providing firm evidence for the existence of unknown fundamental physics, dark matter is essential in understanding how our universe evolved to be the way we observe it today. The research of the past decades led to the development of two canonical paradigms for the properties of dark matter: the collisionless cold dark matter paradigm, supported by the observed gravitational clustering, and the WIMP paradigm, which provides a well-motivated particle physics framework for collisionless cold dark matter. However, current observational and experimental results motivate looking beyond these scenarios. I will review the canonical paradigms, discuss some of the motivation to move beyond them, and describe new directions and challenges in exploring the phenomenology of dark matter with different particle physics interactions than in the canonical scenario.*