WORKSHOP ON THE NATURE OF DARK MATTER

November 2-4, 2022

at Principia Institute, São Paulo, Brazil

CONFIRMED SPEAKERS

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The existence of dark matter has been established beyond any reasonable doubt by several observations at vastly different length scales. These include rotation curves of galaxies, weak and strong gravitational lensing, fluctuations in the cosmic microwave background, baryonic acoustic oscillations, and formation of structure in the universe. All we know about dark matter comes from its gravitational effects, and these observations tell us nothing about its microscopic nature and composition. Understanding the origin of dark matter is at the forefront of the observed phenomena that we cannot explain.

Although we do not know the particle nature of dark matter, we have collected enough data to definitively exclude a broad range of possibilities. First of all, we precisely know that dark matter currently constitutes 27% of the universe's energy budget. Furthermore, it is mostly cold and massive, it is non-baryonic with suppressed (or vanishing) couplings to the strong and electroweak gauge groups, and it does not interact appreciably with itself. Collectively, these observational facts exclude the possibility that known particles could account for these data. Thus, unveiling its identity and non-gravitational properties is one of the most important questions in fundamental physics today.

This workshop will cover interdisciplinary aspects of the experimental searches for dark matter and it will outline the viable models. We will devote special attention to those that involve non-standard production mechanisms as they allow dark matter particles to be very light. Such light candidates require new detection strategies and have implications in cosmology and structure formation that we aim to address in the workshop. We expect that the workshop will establish an effective strategy for the exploration and identification of the dark matter particle representing an important step in the hunt for this unknown and elusive degree of freedom.

There is no registration fee.

Registration deadline:
September 11, 2022

Online registration and more information:
https://www.ictp-saifr.org/dm2022/