

The quest for Dark Matter using LHC data

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Abstract: Astrophysical observations have provided compelling evidence for the existence of a non-luminous component of the universe: Dark Matter. However, very little is known of this elusive form of matter. If Dark Matter is a particle, it can be recreated in the high-energy proton-proton collision at the Large Hadron Collider (LHC) at CERN. The LHC experiments have a vast and diversified experimental programme, designed in collaboration with the theoretical community, which aims to discover and precisely measure dark matter. In this talk I will provide an overview of this programme, outlining both the fundamental assumptions and the experimental challenges of this effort. I will also present an outlook to the future of such scientific program in view of the ongoing Run 3 data taking period and the preparation for the High-Luminosity upgrades.

Short CV (if you need it): Priscilla Pani, born in Italy in 1986, is Group Leader of a Helmholtz Young Investigator group at the Helmholtz center Deutsches Elektronen-Synchrotron DESY since 2018. She was awarded the Hertha-Sponer Prize in 2020 for her essential contributions to the search for Dark Matter in the ATLAS Experiment at the LHC. She held various coordination roles pertaining to dark matter searches including co-chair of the LHC Dark Matter Working group at the LPCC Center (2020-2022). She was also awarded the 2023 ERC Starting Grant to implement an innovative method to search for light new particles that decay into pairs of bottom quarks.