



Contribution ID: 226

Type: Plenary Talk

## Astroparticle Physics with the Forward Physics Facility at the High-Luminosity LHC

*Friday 12 August 2022 11:00 (30 minutes)*

High-energy collisions at the High-Luminosity Large Hadron Collider (HL-LHC) will produce an enormous flux of particles along the beam collision axis that is not accessible by existing LHC experiments. Multiparticle production in the far-forward region is of particular interest for astroparticle physics. High-energy cosmic rays produce large particle cascades in the atmosphere, extensive air showers (EAS), which are driven by hadron-ion collisions under low momentum transfer in the non-perturbative regime of QCD. Thus, the understanding of high-energy hadronic interactions in the forward region is crucial for the interpretation of EAS data and for the estimation of backgrounds for searches of astrophysical neutrinos. The Forward Physics Facility (FPF) is a proposal to build a new underground cavern at the HL-LHC which will host a variety of far-forward experiments to detect particles outside the acceptance of the existing LHC experiments. We will present the current status of plans for the FPF and highlight the synergies with astroparticle physics. We will discuss how measurements at the FPF will improve the modeling of high-energy hadronic interactions in the atmosphere and thereby reduce the associated uncertainties of measurements in the context of multimessenger astrophysics. In addition, we will explore the connection between searches for new physics at the FPF and the understanding of the nature of Dark Matter in the Universe.

### Collaboration name

**Presenter:** SOLDIN, Dennis

**Session Classification:** Plenary session