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Exploring dark sectors at FASER: ForwArd Search ExpeRiment at the LHC

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New physics has traditionally been expected in the high- p_T region at high-energy collider experiments. If new particles are light and weakly-coupled, however, this focus may be completely misguided: light particles are typically highly concentrated within a few mrad of the beam line, allowing sensitive searches with small detectors, and even extremely weakly-coupled particles may be produced in large numbers there. In this talk I will discuss the recent proposal of FASER, ForwArd Search ExpeRiment at the LHC: a detector placed 400 m downstream of the ATLAS or CMS interaction point (IP) in the very forward region and operated concurrently there. Even with a small and inexpensive cylindrical detector, of volume $\sim 1 \text{ m}^3$, FASER would have a new physics discovery potential in a swath of currently unconstrained parameter-space which is comparable to, and complementary to, much larger proposed experiments. I explore this in the talk for models such as dark photons, dark higgses, axion-like particles, and heavy neutral leptons, and discuss some of the future experimental challenges involved.