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## Long-lived particles at FCC

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Long-lived particles have significant enough lifetimes as to, when produced in collisions, leave distinct signatures in the detectors. Driven by increasingly higher energies, trigger and reconstruction algorithms at particle colliders are optimized for increasingly heavier particles, which in turn, tend to be short-lived.

This makes searches for long-lived particles difficult, usually requiring dedicated methods and sometimes also hardware to spot them. However, taking upon the challenge brings enormous potential, since new, long-lived particles feature in a variety of promising new physics models that could answer most of the open questions of the standard model, such as: neutrino masses, Dark Matter, or the matter-antimatter imbalance in the Universe.

Crucial physics cases connected to long-lived particles will be accessible at the FCC. The complementarity of the three different stages of the FCC provides unique potential to discover and pin down these particles, and maybe solve long-standing problems of the SM.

This talk will describe the current landscape and possible areas to contribute to in the next few years. Three interesting examples are highlighted: Heavy Neutral Leptons, Hidden Sectors connected to Dark Matter, and exotic Higgs boson decays. The exploration of long-lived particles at the FCC-ee motivates an out-of-the-box experimental optimizations that will also be discussed.

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