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Light Dark Matter with a Scalar Mediator

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Many well-motivated extensions of the standard model contain a gauge singlet scalar field which mixes with the Higgs boson. The new scalar naturally mediates the interactions between dark and visible matter. I will focus on the GeV mass window, which features exciting signatures of dark matter and the light mediator at upcoming direct detection and accelerator experiments. This mass range bears theoretical challenges since the mediator decay is affected by non-perturbative QCD processes. I will strongly reduce long-standing uncertainties in the decay rates. This will allow me to revise present and future experimental sensitivities for dark matter coupled through the Higgs portal.

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