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Light thermal relics enabled by a second Higgs

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Sub-GeV thermal relic dark matter typically requires the existence of a light mediator particle. We introduce the light two-Higgs-doublet portal, illustrated by a minimal UV-complete model for sub-GeV DM with kinematically forbidden annihilations into leptons. All new physics states in this scenario lie at or below the electroweak scale, affecting Higgs physics, the muon anomalous magnetic moment and potentially neutrino masses. Observation of radiative dark matter annihilation by future MeV gamma-ray telescopes would be key to identify the scenario.

Presenter: HERMS, Johannes (Max-Planck-Institut für Kernphysik)

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