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Sakurai Prize: Extended Higgs Sectors phenomenology and future prospects¹

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The discovery of a spin-0 state at 125 GeV with properties close to those predicted for the single Higgs boson of the Standard Model does not preclude the existence of additional Higgs bosons. In this talk, models with extended Higgs sectors are reviewed, including two-Higgs-doublet models with and without an extra singlet Higgs field and supersymmetric models. Special emphasis is given to the limit in which the couplings and properties of one of the Higgs bosons of the extended Higgs sector are very close to those predicted for the single Standard Model Higgs boson while the other Higgs bosons are relatively light, perhaps even having masses close to or below the SM-like 125 GeV state. Constraints on this type of scenario given existing data are summarized and prospects for observing these non-SM-like Higgs bosons are discussed.

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