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SM*A*S*H - Standard Model * Axion * See-saw * Hidden scalar inflation

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A minimal extension of the Standard Model (SM) is presented that provides a consistent picture of particle physics and cosmology below the Planck scale accounting for inflation, baryogenesis, dark matter, neutrino masses and solving the strong CP problem. We add to the SM three right-handed SM singlet neutrinos, a new vector-like color triplet fermion and a complex hidden scalar whose vacuum expectation value at ~ 10^11 GeV breaks lepton number and the Peccei-Quinn symmetry simultaneously. At low energies, the model reduces to the SM, augmented by see-saw-generated neutrino masses and mixing, plus the axion, which accounts for the dark matter. Five fundamental problems of particle physics and cosmology are solved at one stroke in this unified Standard Model Axion See-saw Hidden scalar inflation (SMAS*H) model.

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