Contribution ID: **135**   Type: **20 minutes talk**

Light inflaton model in a metastable Universe

Friday, 17 December 2021 14:00 (30 minutes)

We minimally extend the Standard Model (SM) with a Z_2 symmetric potential containing a single scalar field, serving as our inflaton with a quartic self-coupling. In the model we have symmetry breaking in both sectors, and with the addition of an inflaton-Higgs portal, the Universe is able to efficiently reheat via 2-2 inflaton-Higgs scattering. Assuming that the Universe with a positive cosmological constant should be metastable, only one particular symmetry breaking pattern in the vacuum is possible, without the need to finely-tune the Higgs quartic self-coupling. Inflatons with masses in the range $O(10^{-3}) \leq m_\chi \leq m_h$ and mixing angles that span $\theta_m^2 = O(10^{-11} - 10^{-2})$ evade all current cosmological, experimental and stability constraints required for a metastable electroweak (EW) vacuum. Upgraded particle physics experiments may be able to probe the parameter space with $\theta_m^2 \geq O(10^{-4})$, where we would observe trilinear Higgs couplings suppressed by up to 2% compared to the SM value. However to access the parameter space of very weakly-coupled inflaton, we rely on the proposals to build experiments that target the hidden sector.

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Beyond the Standard Model

Will you be pre-recording your talk?

No

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Yes

Are you happy for your talk to be recorded?

Yes

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Session Classification: Full-length talks