Contribution ID: **40** Type: **not specified**

Gravitational Waves from a Rolling Axion Monodromy

Thursday, 28 May 2020 12:35 (25 minutes)

In string theory inspired models of axion-like fields, sub-leading non-perturbative effects, if sufficiently large, can introduce steep cliffs and gentle plateaus onto the underlying scalar potential. During inflation, the motion of a spectator axion in this potential becomes temporarily fast, leading to exponential amplification of one helicity state of gauge fields. In this model, the axion- gauge field sector interacts gravitationally with the inflaton, therefore the resulting sourced scalar and tensor fluctuations are produced only through gravitational interactions. Due to the tem- porary speeding up of σ in the cliff-like regions, the tensor and scalar correlators sourced by the gauge fields exhibit a localized bump in momentum space corresponding to the modes that exit the horizon while the roll of σ is significant. Thanks to the gravitational coupling of gauge fields with the visible sector and the localized nature of particle production, this model can generate observable gravitational wave signal at CMB scales while satisfying the current limits on scalar perturbations. The resulting gravitational wave signal breaks parity and exhibit sizeable tensor non-Gaussianity that can be probed by future CMB B-mode missions. Depending on the initial conditions on σ and model parameters, the roll of the spectator axion can also generate an ob- servably large GW signature at interferometer scales while respecting the bounds on the scalar fluctuations from primordial black hole limits.

Presenter: OZSOY, Ogan

Session Classification: session IV