

## Selection rules of scattering amplitudes in EFTs/Fast-rolling relaxion

*Wednesday, 11 November 2020 11:00 (1 hour)*

The talks will be given remotely:

Topic: Israeli joint seminar - Minyuan/Shoji

Time: Nov 11, 2020 11:00 AM Jerusalem

Join Zoom Meeting

<https://technion.zoom.us/j/96420929350?pwd=cVROS014dWFOcHl4OUV1SVh0MUxXQT09>

Meeting ID: 964 2092 9350

Passcode: Hep\_joint

Minyuan will talk about

Selection rules of scattering amplitudes in EFTs

Abstract:

I will discuss about the selection rules in helicity amplitudes in generic EFTs, at both tree and loop level. I will firstly review the well-known “non-interference” and “non-renormalization” theorems in the literature. Then I will present the new selection rules we obtained from angular momentum conservation, which gives new restriction of the anomalous dimension matrix of effective operators and the way how effective operators contribute to some  $2 \rightarrow N$  amplitudes at the loop level.

Yutaro will talk about

Fast-rolling relaxion

Abstract:

The negative results at the Large Hadron Collider imply that the scale of new physics is much higher than the electroweak scale, and the hierarchy between them should be explained in a natural way. The relaxion mechanism is a recently-proposed solution to the hierarchy problem and the electroweak scale is tuned dynamically by a scalar field. We point out that the tunneling phase of the original mechanism requires a huge number of e-folds of inflation and could cause fine-tuning problems in the inflation sector. We found a new mechanism within the original model, which overcomes the problem, is realized in a generic setup, and enhances the testability at colliders.

**Presenters:** MINYUAN, Jiang (Weizmann Institute of Science ); SHOJI, Yutaro (KMI, Nagoya University)