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Probing the Inflationary Field Content with Primordial Gravitational Waves and more

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Abstract:

The inflationary paradigm, already in its simplest disguises, has been spectacularly successful when it comes to agreement with observations. However, there's a lot we do not yet know about inflation:

- what is its energy scale?
- how about its particle content?
- how did inflation begin?

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New cosmological probes (at all scales, from CMB to interferometers) will soon put some of our best ideas to the test.

The answers to these questions are bound to be transformative of our understanding of cosmology and, possibly, also particle physics. A high-scale inflation, for example, would automatically be a portal to otherwise inaccessible energy scales.

In this talk I will review some recent work on the inflationary particle content and then focus on a model that includes a pseudo scalar field coupled with $SU(2)$ gauge fields. This setup can generate a chiral gravitational waves signal. I will then detail on how the parameter space of the theory supports a blue tensor spectrum and large tensor as well as mixed non-Gaussianities.

Primary author: Dr FASIELLO, Matteo

Presenter: Dr FASIELLO, Matteo

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