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The Schwinger effect in the early Universe

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The production of gauge fields during inflation has a wide range of phenomenological implications. It can affect the background dynamics of inflation, modify the spectral properties of primordial scalar and tensor perturbations, and lead to the creation of charged particles through the Schwinger effect. The latter can significantly suppress the efficiency of gauge-field production during inflation. A clear and accurate understanding of this phenomenon is therefore essential for making reliable predictions of the associated physical observables.
In this talk, we review the physics of Schwinger pair production in both flat Minkowski spacetime and an expanding Universe. We discuss several analytical and numerical approaches used to study this effect in the context of inflationary magnetogenesis and highlight a number of open questions that remain to be addressed.

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