

Enlarging the Space of Viable Inflation Models: A Slingshot Mechanism

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The viability of a given model for inflation is determined not only by the form of the inflaton potential, but also by the initial inflaton field configuration. In many models, field configurations which are otherwise well-motivated nevertheless fail to induce inflation, or fail to produce an inflationary epoch of duration sufficient to solve the horizon and flatness problems. In this talk, I describe a mechanism which enables inflation to occur even with such initial conditions. This mechanism involves multiple scalar fields which experience a time-dependent mixing. This in turn leads to a “re-overdamping” phase as well as a parametric resonance which together “slingshot” the inflaton field from regions of parameter space that do not induce inflation to regions that do. This mechanism is flexible, dynamical, and capable of yielding an inflationary epoch of sufficiently long duration. This slingshot mechanism can therefore be utilized in a variety of settings and thereby enlarge the space of potentially viable inflation models.

Primary author: THOMAS, Brooks (Lafayette College)

Co-author: Prof. DIENES, Keith R. (University of Arizona)

Presenter: THOMAS, Brooks (Lafayette College)

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