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講 師: Alexei Starobinsky 氏

(Landau Institute for Theoretical Physics RAS and RESCEU)

From generic classical curvature singularity in GR and $f(R)$ gravity to inflation

I discuss how generic is the onset of inflation from generic classical curvature singularity preceding it in GR and $f(R)$, and which conditions are needed for it. For viable inflationary models in these kinds of gravity theory, the inflaton potential in the Einstein frame is not important near the singularity. Thus, its boundedness in models producing the best fit to observational data does not reduce the degree of generality of inflation. Space-time is asymptotically locally homogeneous near the singularity, despite the absence of causal connection, due to the very structure of field equations. However, an intermediate period when spatial gradients become important may well occur before the beginning of inflation. As a whole it seems that, for inflation to begin inside a patch including the observable part of the Universe, causal connection inside the whole patch is not necessary. However, it becomes obligatory for a graceful exit from inflation in order to have practically the same number of e -folds during inflation inside this patch. Also, the fact that inflation does not "solve" the singularity problem, i.e. it does not remove a curvature singularity preceding it, can be an advantage, not its weakness.

興味をお持ちの方の聴講を歓迎致します。お茶とお菓子を用意しております。