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CENTER FOR THEORETICAL PHYSICS



# Sommerfeld Theory Colloquium

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## ASC-PhD-Colloquium: Inflationary Cosmology and String Theory

Cosmology of the early universe is a fascinating journey towards the origin of time. In addition, it offers a unique opportunity to investigate the fundamental laws of nature in regimes which are out of reach for particle physics experiments. I give a critical overview of the most popular paradigm, which is cosmological inflation. I review both the observational consequences of inflation and the technical and conceptual conundrums it leads to. I emphasize that inflation is an extremely UV-sensitive mechanism and hence it calls for an embedding in a UV-complete theory. I then introduce string theory and describe the path that leads towards viable phenomenological models. I review some attempts and successes in building string theory models of inflation. I describe two case studies: brane inflation in a warped throat and axion monodromy inflation. Conceptual advantages and shortcomings of these models are discussed. I conclude with some prospects for their detectability.

Wednesday, 17<sup>th</sup> December 08, 10:45 h, Room 348 / 349, Theresienstr. 37 / III