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## Enlightening the primordial dark ages

Iarygina, O.

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## Propositions

*accompanying the dissertation “Enlightening the Primordial Dark Ages”*

1. Light fields on an axion-dilaton system may form a new type of exact multi-field inflationary attractor with single-field-like predictions.  
*Chapter 2 of this thesis*
2. Chiral gravitational waves generated by a non-Abelian gauge field sector do *not* have to produce a blue-tilted tensor power spectrum.  
*Chapter 3 of this thesis*
3. Preheating in  $\alpha$ -attractors is a genuinely multi-field phenomenon, since for highly curved manifolds it is dominated by field-space effects.  
*Chapter 4 of this thesis*
4. Asymmetry around the minimum of the potential may significantly boost as well as hinder preheating.  
*Chapter 5 of this thesis*
5. With ever increasing evidence for inflation coming from the cosmic microwave background and large-scale structure, the post-inflationary era becomes one of the major frontiers in our understanding of the early universe.  
*M. A. Amin, M. P. Hertzberg, D. I. Kaiser and J. Karouby, Int. J. Mod. Phys. D **24** (2014), 1530003.*
6. If gravitational waves produced during preheating exist, they will necessarily fall within the frequency range that is feasible for direct detection experiments – from laboratory through to solar system scales.  
*R. Easther and E. A. Lim, JCAP **04** (2006), 010.*
7. Models with non-Abelian gauge fields end inflation in a state of radiation domination. Hence, it will be interesting to ask whether new possibilities for reheating could be found that go beyond the standard story of parametric resonance.  
*P. Adshead, E. Martinec and M. Wyman, JHEP **09** (2013), 087.*
8. Multi-field inflation can enhance the primordial power spectrum with distinctive signatures, seeding primordial black holes sensitive to the details of the ultraviolet theory wherein inflation is realized, opening a new window into early Universe physics at scales far smaller than the cosmic microwave background.  
*G. A. Palma, S. Sypsas and C. Zenteno, Phys. Rev. Lett. **125** (2020) no.12, 121301.*
9. Willpower is at least as important as intelligence to stay in science.

Oksana Iarygina,  
Leiden, 03-11-2021