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Primordial Black Holes from the Preheating Instability

After the end of inflation, the inflaton oscillates around a local minimum of its potential and this triggers a resonant instability for some of its fluctuation modes. In our work, we study the formation of primordial black holes at these enhanced scales. We find that in some cases, the production mechanism is so efficient that primordial black holes subsequently dominate the universe content, and reheating proceeds from their evaporation. Observational constraints on the abundance of PBHs allow us to restrict the range of allowed values for the reheating temperature and the inflationary energy scale.

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