

**iTHEMS Cosmology Forum
n°3 - (P)reheating the
primordial Universe**

Report of Contributions

Contribution ID: 1

Type: **not specified**

Keynote Talk - A Snapshot of Preheating: success, challenges and possibilities

Tuesday 4 March 2025 10:00 (1h 15m)

Presenter: Dr GIBLIN, Tom (Kenyon College)

Contribution ID: 2

Type: **not specified**

Perturbative Reheating and Thermalization

Tuesday 4 March 2025 11:15 (1 hour)

In this talk, we will discuss in detail the process of reheating that is dominated by the perturbative decay of inflaton.

Thought it appears to be merely a textbook exercise, we will see that the underlying physical processes are involved, which calls for e.g., the understanding of in-medium cascade of energetic particles.

We will also discuss how this refined understanding affects the predictions based on conventional picture.

Presenter: Dr MUKAIDA, Kyohei (KEK)

Contribution ID: 3

Type: **not specified**

The exact WKB analysis as an analytic approach to preheating

Tuesday 4 March 2025 13:15 (1 hour)

Preheating is a crucial phase in the early universe where non-perturbative particle production occurs due to the oscillating background field. While numerical methods have been widely used to study preheating dynamics, analytic approaches remain essential for gaining deeper theoretical insights and generalizing results across different models. In this talk, I will present the exact WKB analysis as a powerful analytical tool to investigate particle production during preheating.

Presenter: Dr ENOMOTO, Seishi (Yokohama National University)

Contribution ID: 4

Type: **not specified**

Panel discussion

Tuesday 4 March 2025 16:15 (45 minutes)

Presenters: Dr KITAJIMA, Naoya (Tohoku University); SAHA, Pankaj (KEK); ENOMOTO, Seishi; GIB-LIN, Tom (Kenyon College)

Contribution ID: 6

Type: **not specified**

Theory Session

Wednesday 5 March 2025 10:30 (1h 30m)

Presenter: Dr GIBLIN, Tom (Kenyon College)

Contribution ID: 7

Type: **not specified**

Practical Session

Wednesday 5 March 2025 14:00 (2 hours)

Presenter: Dr GIBLIN, Tom

Contribution ID: 9

Type: **not specified**

Reheating after Inflation: Characteristics and Constraints

Tuesday 4 March 2025 15:00 (1 hour)

Reheating, the period following inflation, marks the transition where the inflaton decays, populating the early universe with matter and radiation.

This phase remains relatively unexplored due to the absence of direct observational evidence and the complex, non-linear dynamics involved.

This talk will examine the characteristics and constraints of the reheating phase.

As reheating typically unfolds in multiple stages, I will describe the general features of the stages, drawing on some results from lattice simulations.

I will describe how the reheating phase can be linked to Cosmic Microwave Background (CMB) observables via its Gravitational Waves signature,

Finally, I will show how even subtle features in the inflationary potential at very small scales can significantly alter the dynamics of reheating and its potential observable signatures.

Presenter: Dr SAHA, Pankaj (KEK)

Contribution ID: **10**

Type: **not specified**

Poster session

Tuesday 4 March 2025 14:20 (40 minutes)

Reheating Process after Axion Inflation - Tenta Tsuji

High frequency gravitational waves from Gauss-Bonnet inflation - Kamil Mudrunka

Presenters: MUDRUNKA, Kamil (Tohoku University); TSUJI, Tenta (KEK)