

WELCOME LECTURE

PROF. DR. JULIA HARZ

*Charting the Physics of the Early Universe:
Novel Ideas and Advanced Methods*

Thursday, 16th of November 2023,
Alte Mensa, J.-J. Becherweg 5, JGU Campus
from 15:45: coffee and tea
16:15: Laudatio,
followed by lecture

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Dear colleagues, dear students,

The Standard Model of particle physics is able to describe the visible world around us from the largest to the smallest scales with an astonishing precision. However, the overabundance of particles over antiparticles, the existence of dark matter, the fact that neutrinos have masses, and the observed homogeneity of the Universe imply that our current theoretical understanding is not yet complete.

Guided by these puzzles, I will give a brief introduction to the current status of particle cosmology and an overview of the research pursued in my group.

I will highlight novel ideas to probe theories, connecting early universe cosmology with earth-based laboratory experiments. Furthermore, I will emphasize the necessity of methodological advances in theoretical predictions. For instance, in the context of dark matter calculations, I will showcase the importance of previously neglected non-perturbative effects and thermal corrections, which turn out to be crucial for a correct interpretation of experimental results.

I would like to invite you to my welcome lecture on the 16th of November 2023 and afterwards celebrate my start at JGU with a glass of wine and a bite to eat.



<http://www.prisma.uni-mainz.de>
<http://www.etap.physik.uni-mainz.de/>
<http://www.thep.physik.uni-mainz.de/>

Julia Harz

