

# **Physics of the Early Universe**

## **Report of Contributions**

Contribution ID: 9

Type: **not specified**

## **Starting the Universe from strong gravity regime**

*Monday, June 13, 2022 10:20 AM (40 minutes)*

**Presenter:** RUBAKOV, Valery (Institute for Nuclear Research of RAS)

Contribution ID: **10**

Type: **not specified**

## **A de-Sitter no-hair theorem for spacetimes with isometry group forming two-dimensional orbits**

*Monday, June 13, 2022 11:00 AM (40 minutes)*

**Presenter:** SENATORE, Leonardo

Contribution ID: 11

Type: **not specified**

# Quantum gravity from the beginning to the present Universe

*Monday, June 13, 2022 3:20 PM (40 minutes)*

**Presenter:** WETTERICH, Christof

Contribution ID: 12

Type: **not specified**

## **Field redefinitions, perturbative unitarity, and Higgs inflation**

*Tuesday, June 14, 2022 10:20 AM (40 minutes)*

**Presenter:** KARANANAS, Georgios

Contribution ID: 13

Type: **not specified**

## **Higgs inflation as a door to gravity**

*Tuesday, June 14, 2022 11:00 AM (40 minutes)*

**Presenter:** RÄSÄNEN, Syksy

Contribution ID: 14

Type: **not specified**

## **Scale symmetry, the Higgs and the Nature of Gravity**

*Tuesday, June 14, 2022 11:40 AM (40 minutes)*

**Presenter:** RUBIO, Javier

Contribution ID: 15

Type: **not specified**

## **IR effects in de Sitter and in Inflation**

*Tuesday, June 14, 2022 2:00 PM (40 minutes)*

**Presenter:** GORBENKO, Victor



Contribution ID: 16

Type: **not specified**

## Bootstrapping large graviton non-Gaussianities

*Tuesday, June 14, 2022 2:40 PM (40 minutes)*

Gravitational interferometers and cosmological observations of the cosmic microwave background offer us the prospect to probe the laws of gravity in the primordial universe. To study and interpret these datasets we need to know the possible graviton non-Gaussianities. To this end, we derive the most general tree-level three-point functions (bispectra) for a massless graviton to all orders in derivatives, assuming scale invariance. Instead of working with explicit Lagrangians, we take a bootstrap approach and obtain our results using the recently derived constraints from unitarity, locality and the choice of vacuum. Since we make no assumptions about de Sitter boosts, our results capture the phenomenology of large classes of models such as the effective field theory of inflation and solid inflation. We present formulae for the infinite number of parity-even bispectra. Remarkably, for parity-odd bispectra, we show that unitarity allows for only a handful of possible shapes: three for graviton-graviton-graviton, three for scalar-graviton-graviton and one for scalar-scalar-graviton, which we bootstrap explicitly. These parity-odd non-Gaussianities can be large, for example in solid inflation, and therefore constitute a concrete and well-motivated target for future observations.

**Presenter:** PAJER, Enrico

Contribution ID: 17

Type: **not specified**

## Fundamental Physics from Galaxy Surveys

*Tuesday, June 14, 2022 3:20 PM (40 minutes)*

The distribution of galaxies on large scales is a sensitive probe of cosmological physics. In particular, the structure of this distribution depends on properties of dark matter and the dynamics of the early universe. Understanding this dependence, however, is a challenging task because the observed galaxy distribution is modulated by a variety of non-linear effects. I will present theoretical tools that have allowed for a systematic analytic description of these effects. These tools play a central role in a new program of extracting cosmological information from galaxy surveys. I will share some results of this program from my independent analysis of the public data from the Baryon acoustic Oscillation Spectroscopic Survey. These results include the measurement of the Hubble constant as well as constraints on new physics and the early Universe.

**Presenter:** IVANOV, Mikhail

Contribution ID: **18**

Type: **not specified**

## **Generation of peaks in primordial perturbation spectra due to variable number of slow-roll inflatons**

*Tuesday, June 14, 2022 4:30 PM (40 minutes)*

**Presenter:** STAROBINSKY, Alexei

Contribution ID: 19

Type: **not specified**

## **Cosmological attractors after Planck/BICEP/Keck**

*Tuesday, June 14, 2022 5:10 PM (40 minutes)*

**Presenter:** LINDE, Andrei

Contribution ID: 20

Type: **not specified**

## **From Wormholes and Baby Universes to Inflation and the Measure Problem**

*Monday, June 13, 2022 2:00 PM (40 minutes)*

**Presenter:** HEBECKER, Arthur

Contribution ID: 21

Type: **not specified**

## Gravity and Axion

*Monday, June 13, 2022 2:40 PM (40 minutes)*

**Presenter:** DVALI, Gia

Contribution ID: 23

Type: **not specified**

## **Gravitational wave production in non-local Starobinsky model**

*Monday, June 13, 2022 4:30 PM (40 minutes)*

**Presenter:** TOKAREVA, Anna

Contribution ID: 24

Type: **not specified**

## **Path integrals in some 2D and 4D quadratic gravity models**

*Monday, June 13, 2022 5:10 PM (40 minutes)*

**Presenter:** BELOKUROV, Vladimir



Contribution ID: 25

Type: **not specified**

## **Aspects of High Scale Leptogenesis with Low Energy CP Violation**

*Wednesday, June 15, 2022 10:20 AM (40 minutes)*

**Presenter:** PETCOV, Serguey

Contribution ID: 26

Type: **not specified**

## Resonant Leptogenesis

*Wednesday, June 15, 2022 11:00 AM (40 minutes)*

**Presenter:** GARBRECHT, Björn

Contribution ID: 27

Type: **not specified**

## Testable scenarios of leptogenesis

*Wednesday, June 15, 2022 11:40 AM (40 minutes)*

**Primary author:** DREWES, Marco

**Presenter:** DREWES, Marco

Contribution ID: 28

Type: **not specified**

## **2PI-approach to particle production and phase transition dynamics**

*Wednesday, June 15, 2022 2:00 PM (40 minutes)*

**Presenter:** KAINULAINEN , Kimmo

Contribution ID: 29

Type: **not specified**

# **CosmoLattice: The Art of Simulating the Early Universe**

*Wednesday, June 15, 2022 2:40 PM (40 minutes)*

**Presenter:** FIGUEROA, Daniel

Contribution ID: **30**

Type: **not specified**

## **Lattice simulations of inflation and reheating**

*Wednesday, June 15, 2022 3:20 PM (40 minutes)*

**Presenter:** LOZANOV, Kaloian

Contribution ID: 31

Type: **not specified**

## **Gravitation portals and particle production during inflationary reheating**

*Wednesday, June 15, 2022 4:30 PM (40 minutes)*

**Presenter:** OLIVE, Keith

Contribution ID: **32**

Type: **not specified**

## **Small-scale structure in vector dark matter**

*Wednesday, June 15, 2022 5:10 PM (40 minutes)*

**Presenter:** AMIN, Mustafa



Contribution ID: 33

Type: **not specified**

# **Vacuum Energy of the Universe, Large scale magnetic field and nontrivial topology in Quantum Field Theory**

*Wednesday, June 15, 2022 5:50 PM (40 minutes)*

**Presenter:** ZHITNITSKY, Ariel

Contribution ID: 34

Type: **not specified**

# Lorentzian Description of the 1st Order Phase Transition

*Thursday, June 16, 2022 10:20 AM (40 minutes)*

**Presenter:** KAMADA, Kohei

Contribution ID: 35

Type: **not specified**

## **Primordial Black Holes and Vacuum Decay**

*Thursday, June 16, 2022 11:00 AM (40 minutes)*

**Presenter:** GREGORY, Ruth

Contribution ID: 36

Type: **not specified**

## **Cosmological implications of Higgs vacuum metastability**

*Thursday, June 16, 2022 11:40 AM (40 minutes)*

**Presenter:** RAJANTIE, Arttu

Contribution ID: 37

Type: **not specified**

## **A novel technique for the description of gauge-field production during axion inflation**

*Thursday, June 16, 2022 2:00 PM (40 minutes)*

**Presenter:** SOBOL, Oleksandr

Contribution ID: **38**

Type: **not specified**

## **Electroweak model in a strong magnetic field**

*Thursday, June 16, 2022 2:40 PM (40 minutes)*

**Presenter:** CHERNODUB, Maxim

Contribution ID: 39

Type: **not specified**

# Cosmological stochastic gravitational wave backgrounds in LISA

*Thursday, June 16, 2022 3:20 PM (40 minutes)*

**Presenter:** CAPRINI, Chiara

Contribution ID: 40

Type: **not specified**

## **Probing the scale of grand unification with gravitational waves**

*Thursday, June 16, 2022 4:30 PM (40 minutes)*

**Presenter:** DOMCKE, Valerie



Contribution ID: 41

Type: **not specified**

## **Cosmic strings and black holes**

*Thursday, June 16, 2022 5:10 PM (40 minutes)*

**Presenter:** VILENKIN, Alexander

Contribution ID: 42

Type: **not specified**

## **The nature of Dark Matter: what can we learn from astrophysical data expected in the next few years**

*Friday, June 17, 2022 10:20 AM (40 minutes)*

**Presenter:** BOYARSKY, Alexey

Contribution ID: 43

Type: **not specified**

## **Dark Matter abundance via thermal decays and leptoquark mediators**

*Friday, June 17, 2022 11:00 AM (40 minutes)*

**Presenter:** STRUMIA, Alessandro

Contribution ID: 44

Type: **not specified**

## **Primordial black holes and their observational constraints**

*Friday, June 17, 2022 11:40 AM (40 minutes)*

**Presenter:** KOHRI, Kazunori

Contribution ID: 45

Type: **not specified**

## **Big Bang nucleosynthesis – new about old**

*Friday, June 17, 2022 2:00 PM (40 minutes)*

**Presenter:** RUCHAYSKIY, Oleg

Contribution ID: 46

Type: **not specified**

## **The problem of instability of gravitational baryogenesis and its possible resolution**

*Friday, June 17, 2022 2:40 PM (40 minutes)*

**Presenter:** ARBUZOVA, Elena

Contribution ID: 47

Type: **not specified**

## **Primordial black holes as dark matter from inflation**

*Friday, June 17, 2022 3:20 PM (40 minutes)*

**Presenter:** BALLESTEROS, Guillermo

Contribution ID: 48

Type: **not specified**

## **Primordial black holes in the universe and antistars in Milky Way**

*Friday, June 17, 2022 4:30 PM (40 minutes)*

**Presenter:** DOLGOV, Alexander



Contribution ID: 49

Type: **not specified**

## **Primordial black holes as dark matter**

*Friday, June 17, 2022 5:10 PM (40 minutes)*

**Presenter:** KUSENKO, Alexander

Contribution ID: 50

Type: **not specified**

## **New boundary conditions for cosmology**

*Monday, June 13, 2022 11:40 AM (40 minutes)*

**Presenter:** TUROK, Neil