# CP3-Origins/DESY/Göttingen Autumn School on Particle Physics and Cosmology

# **Report of Contributions**

/ Report of Contributions

Contribution ID: 0

Type: not specified

#### Matter and Dark Matter from heavy Majorana Neutrino Decay

Wednesday 12 October 2011 17:50 (30 minutes)

The decays of heavy Majorana neutrinos and their superpartners shortly after inflation simultaneously give rise to three crucial ingredients for the hot early universe: (1) the entropy inherent to the thermal radiation that dominates the overall energy density, (2) the matter-antimatter asymmetry and (3) dark matter. For characteristic neutrino parameters baryogenesis can be accomplished by means of nonthermal leptogenesis. At the same time the reheating temperature is controlled by the neutrino lifetime in such a way that thermal production of the gravitino, which we assume to be the lightest superparticle, automatically yields the observed amount of dark matter. This connection between the neutrino sector and supergravity results in constraints on superparticle masses in terms of neutrino masses and vice versa. In order to generate a sufficient neutrino abundance after inflation we consider, as an exampple, neutrino production in the course of tachyonic preheating associated with spontaneous B - L breaking. Our scenario is sensitive to the light neutrino masses and the supergravity mass spectrum and can hence be tested by colliders and in cosmological observations.

**Primary authors:** Dr VERTONGEN, Gilles (DESY); Mr SCHMITZ, Kai (DESY); Ms DOMCKE, Valerie (DESY); Prof. BUCHMUELLER, Wilfried (DESY)

**Presenter:** Ms DOMCKE, Valerie (DESY)

Session Classification: Student's Session

/ Report of Contributions

Technicolor and strongly coupled t ...

Contribution ID: 1

Type: not specified

## Technicolor and strongly coupled theories

*Tuesday 11 October 2011 14:30 (1 hour)* 

Primary author:Prof. SANNINO, FrancescoPresenter:Prof. SANNINO, FrancescoSession Classification:Afternoon Lectures

/ Report of Contributions

Inflation

Contribution ID: 2

Type: not specified

#### Inflation

Tuesday 11 October 2011 15:40 (1 hour)

Primary author: Dr WESTPHAL, Alexander (DESY)Presenter: Dr WESTPHAL, Alexander (DESY)Session Classification: Afternoon Lectures

/ Report of Contributions

Technicolor and strongly coupled t ...

Contribution ID: 4

Type: not specified

### Technicolor and strongly coupled theories

Wednesday 12 October 2011 09:00 (1 hour)

Primary author:Prof. SANNINO, FrancescoPresenter:Prof. SANNINO, FrancescoSession Classification:Morning Lectures

/ Report of Contributions

Inflation

Contribution ID: 5

Type: not specified

#### Inflation

Wednesday 12 October 2011 10:10 (1 hour)

Primary author: Dr WESTPHAL, Alexander (DESY)Presenter: Dr WESTPHAL, Alexander (DESY)Session Classification: Morning Lectures

/ Report of Contributions

LHC first results

Contribution ID: 6

Type: not specified

## LHC first results

Wednesday 12 October 2011 11:50 (1 hour)

Primary author: HALLER, Johannes (University Hamburg)Presenter: HALLER, Johannes (University Hamburg)Session Classification: Morning Lectures

/ Report of Contributions

Neutrino and Flavour Physics

Contribution ID: 7

Type: not specified

#### **Neutrino and Flavour Physics**

Wednesday 12 October 2011 15:40 (1 hour)

Primary author:POROD, Werner (Universität Würzburg)Presenter:KERSTEN, Joern (Universität Hamburg)Session Classification:Afternoon Lectures

/ Report of Contributions

SUSY and SUGRA

Contribution ID: 8

Type: not specified

#### **SUSY and SUGRA**

Wednesday 12 October 2011 14:30 (1 hour)

Primary author:SCRUCCA, ClaudioPresenter:SCRUCCA, ClaudioSession Classification:Afternoon Lectures

/ Report of Contributions

Neutrino and Flavour Physics

Contribution ID: 9

Type: not specified

#### **Neutrino and Flavour Physics**

Thursday 13 October 2011 10:10 (1 hour)

Primary author:POROD, Werner (Universität Würzburg)Presenter:KERSTEN, Joern (Universität Hamburg)Session Classification:Morning Lectures

/ Report of Contributions

SUSY and SUGRA

Contribution ID: 10

Type: not specified

#### **SUSY and SUGRA**

Thursday 13 October 2011 09:00 (1 hour)

Primary author:SCRUCCA, ClaudioPresenter:SCRUCCA, ClaudioSession Classification:Morning Lectures

/ Report of Contributions

QCD Phenomenology/MC

Contribution ID: 11

Type: not specified

## **QCD** Phenomenology/MC

Thursday 13 October 2011 12:00 (1 hour)

Primary author: Dr ANDERSEN, JeppePresenter: Dr ANDERSEN, JeppeSession Classification: Morning Lectures

/ Report of Contributions

Beyond the SM Models

Contribution ID: 12

Type: not specified

#### **Beyond the SM Models**

Thursday 13 October 2011 14:30 (1 hour)

Primary author:WEILER, Andreas (DESY-T)Presenter:WEILER, Andreas (DESY-T)Session Classification:Afternoon Lectures

/ Report of Contributions

Higgs and BSM Phenomenology

Contribution ID: 13

Type: not specified

### **Higgs and BSM Phenomenology**

*Thursday 13 October 2011 15:40 (1 hour)* 

Primary author: HEINEMEYER, Sven (IFCA (CSIC, Santander))Presenter: HEINEMEYER, Sven (IFCA (CSIC, Santander))Session Classification: Afternoon Lectures

/ Report of Contributions

Higgs and BSM Phenomenology

Contribution ID: 14

Type: not specified

### **Higgs and BSM Phenomenology**

Friday 14 October 2011 09:00 (1 hour)

Primary author: HEINEMEYER, Sven (IFCA (CSIC, Santander))Presenter: HEINEMEYER, Sven (IFCA (CSIC, Santander))Session Classification: Morning Lectures

QCD Phenomenology/MC

Contribution ID: 15

Type: not specified

## **QCD** Phenomenology/MC

Friday 14 October 2011 10:10 (1 hour)

Primary author: Dr ANDERSEN, JeppePresenter: Dr ANDERSEN, JeppeSession Classification: Morning Lectures

/ Report of Contributions

Beyond the SM Models

Contribution ID: 16

Type: not specified

#### **Beyond the SM Models**

Friday 14 October 2011 11:50 (1 hour)

Primary author: WEILER, Andreas (DESY-T)Presenter: WEILER, Andreas (DESY-T)Session Classification: Morning Lectures

/ Report of Contributions

String Phenomenology

Contribution ID: 17

Type: not specified

## **String Phenomenology**

Friday 14 October 2011 14:30 (1 hour)

Primary author:Prof. HEBECKER, ArthurPresenter:Prof. HEBECKER, ArthurSession Classification:Afternoon Lectures

/ Report of Contributions

Dark Matter

Contribution ID: 18

Type: not specified

#### Dark Matter

Friday 14 October 2011 15:40 (1 hour)

Primary author: Prof. ULLIO, PieroPresenter: Prof. ULLIO, PieroSession Classification: Afternoon Lectures

/ Report of Contributions

String Phenomenology

Contribution ID: 19

Type: not specified

## **String Phenomenology**

Saturday 15 October 2011 09:00 (1 hour)

Primary author:Prof. HEBECKER, ArthurPresenter:Prof. HEBECKER, ArthurSession Classification:Morning Lectures

/ Report of Contributions

Dark Matter

Contribution ID: 20

Type: not specified

#### Dark Matter

Saturday 15 October 2011 10:10 (1 hour)

Primary author: Prof. ULLIO, PieroPresenter: Prof. ULLIO, PieroSession Classification: Morning Lectures

/ Report of Contributions

DESY Visit

Contribution ID: 21

Type: not specified

#### **DESY** Visit

Saturday 15 October 2011 11:50 (1 hour)

Session Classification: Morning Lectures

/ Report of Contributions

A Dark Matter Candidate from Ine ...

Contribution ID: 22

Type: not specified

#### A Dark Matter Candidate from Inert Doublet Models

Wednesday 12 October 2011 17:30 (15 minutes)

In spite of the fact that the existence of dark matter in the Universe is established, its nature remains unknown. Our aim is to provide a model which offers a candidate for dark matter and simultaneously tries to address some potential problems like CP-violation. The model is an extension of 2HDM with an additional inert doublet along with an unbroken symmetry. The unbroken Z2 symmetry ensures that the lightest particle of this new doublet

is absolutely stable and that, it only couples very weakly to ordinary matter indirectly via the heavy gauge bosons. This very weak coupling is necessary in order not to be in conflict with laboratory data.

We present that in a significant part of the parameter space the inert charged scalar could be longlived, leaving displaced vertex in the detector. It enables one to discover the inert charged Higgs over the Standard Model background at the LHC.

**Primary authors:** Prof. PUKHOV, Alexander (Moscow State University, Russia); Prof. GRZAD-KOWSKI, Bohdan (University of Warsaw, Poland); Dr OGREID, Odd Magne (Bergen University College, Norway); Prof. OSLAND, Per (University of Bergen, Norway)

Co-author: Mr POORMOHAMMADI, Mahdi (University of Bergen)

Presenter: Mr POORMOHAMMADI, Mahdi (University of Bergen)

Session Classification: Student's Session

/ Report of Contributions

Contribution ID: 23

Type: not specified

#### A sufficient condition for de Sitter vacua in type IIB string theory

Wednesday 12 October 2011 17:10 (15 minutes)

We derive a sufficient condition for realizing meta-stable de Sitter vacua with small positive cosmological constant within type IIB string theory flux compactifications with spontaneously broken supersymmetry. There are a number of lamp post' constructions of de Sitter vacua in type IIB string theory and supergravity. We show that one of them – the method ofK\"ahler uplifting' by F-terms from an interplay between non-perturbative effects and the leading  $\alpha'$ -correction – allows for a more general parametric understanding of the existence of de Sitter vacua. The result is a condition on the values of the flux induced superpotential and the topological data of the Calabi-Yau compactification, which guarantees the existence of a meta-stable de Sitter vacuum if met. Our analysis explicitly includes the stabilization of all moduli, i.e. the K\"ahler, dilaton and complex structure moduli, by the interplay of the leading perturbative and non-perturbative effects at parametrically large volume.

Primary author: Mr RUMMEL, Markus (University of Hamburg)
Co-author: Dr WESTPHAL, Alexander (DESY)
Presenter: Mr RUMMEL, Markus (University of Hamburg)
Session Classification: Student's Session

/ Report of Contributions

How to go there

Contribution ID: 24

Type: not specified

## How to go there

Thursday 13 October 2011 19:30 (20 minutes)

**Presenter:** Prof. COVI, Laura (Institute for Theoretical Physics - Goettingen University) **Session Classification:** Dinner