Vienna Central European Seminar 2018

14th Vienna Central European Seminar
on Particle Physics and Quantum Field Theory

Global and Local Symmetries

Report of Contributions

https://indico.cern.ch/e/vces2018

Contribution ID: **1** Type: **not specified**

Public Talk

Session Classification: Contributed Talks

Contribution ID: **2** Type: **not specified**

”Black Holes, Fundamental Physics and the Information Paradox”

Friday 30 November 2018 18:00 (1h 30m)

Presenter: PERRY, Malcolm J.

Contribution ID: **3** Type: **not specified**

”Implications of Symmetries in the Scalar Sector”

Friday 30 November 2018 14:15 (45 minutes)

Presenter: REBELO, Margarida Nesbitt (Instituto Superior Tecnico (IST))

Session Classification: Plenary

Contribution ID: **4** Type: **not specified**

Dark energy, the string landscape and the swampland

Friday 30 November 2018 15:00 (45 minutes)

Presenter: WRASE, Timm Michael (Vienna University of Technology)

Session Classification: Plenary

Contribution ID: **5** Type: **not specified**

”Towards a more efficient algebraic model of particle physics”

Friday 30 November 2018 12:10 (35 minutes)

Presenter: FUREY, Cohl (Cambridge)

Session Classification: Plenary

Contribution ID: **6** Type: **not specified**

”The lepton asymmetry of the Universe“

Friday 30 November 2018 09:00 (45 minutes)

Presenter: SCHWARZ, Dominik

Session Classification: Plenary

Contribution ID: **7** Type: **not specified**

Towards a link between particle physics and quantum gravity

Friday 30 November 2018 09:45 (45 minutes)

Presenter: EICHHORN, Astrid

Session Classification: Plenary

Contribution ID: **8** Type: **not specified**

“Global and local symmetries from a black hole perspective”

Friday 30 November 2018 11:00 (35 minutes)

Presenter: URBANO, Alfredo Leonardo (CERN)

Session Classification: Plenary

Contribution ID: **9** Type: **not specified**

Dark matter shifts away from direct detection

Friday 30 November 2018 11:35 (35 minutes)

Presenter: SALVIONI, Ennio (Technische Universität Muenchen (DE))

Session Classification: Plenary

Contribution ID: **10** Type: **not specified**

Fundamental Interactions: The next generation

Saturday 1 December 2018 09:00 (45 minutes)

Presenter: SANNINO, Francesco (Syddansk Universitet (DK))

Session Classification: Plenary

Contribution ID: **11** Type: **not specified**

”What is physical? - Local vs. Global Symmetries“

Saturday 1 December 2018 09:45 (45 minutes)

Presenter: MAAS, Axel Torsten (University of Graz)

Session Classification: Plenary

Contribution ID: **12** Type: **not specified**

Soft Heisenberg hair

Saturday 1 December 2018 11:55 (45 minutes)

Presenter: GRUMILLER, Daniel (MIT)

Session Classification: Plenary

Contribution ID: **13** Type: **not specified**

Black Hole Entropy from Soft Hair

Saturday 1 December 2018 11:10 (45 minutes)

Presenter: PERRY, Malcolm

Session Classification: Plenary

Contribution ID: **14** Type: **not specified**

”QCD Topological Susceptibility at high-T via Reweighting”

Saturday 1 December 2018 14:00 (45 minutes)

Presenter: MOORE, Guy

Session Classification: Plenary

Contribution ID: **15** Type: **not specified**

”The QCD theta term and holography”

Saturday 1 December 2018 14:45 (45 minutes)

Presenter: BIGAZZI, Francesco

Session Classification: Plenary

Contribution ID: **16** Type: **not specified**

”The golden age of chirality and quantum mechanics”

Saturday 1 December 2018 16:00 (45 minutes)

Presenter: LANDSTEINER, Karl (Unknown)

Session Classification: Plenary

Contribution ID: **17** Type: **not specified**

”QCD in a magnetic background field”

Saturday 1 December 2018 16:45 (45 minutes)

Presenter: SCHAEFER, Andreas (Regensburg University)

Session Classification: Plenary

Contribution ID: **18** Type: **not specified**

An Inert Scalar In The S3 Symmetric Model

Friday 30 November 2018 17:05 (25 minutes)

We consider the S3 symmetric extension of the Standard Model in which all the irreducible representations of the permutation group are occupied by SU(2) scalar doublets,
one of which is taken as inert. We study the parameter space of the model probing points against physical constraints ranging from unitarity tests to experimental Higgs searches limits. We find that the latter constraints severely restrict the parameter space of the model, and that the relic density of the dark matter candidates lies below the Planck bound for
a large portion of the probed regions.

Presenter: ESPINOZA HERNANDEZ, Maria Catalina (IFUNAM)

Session Classification: Contributed Talks

Contribution ID: **19** Type: **not specified**

Fifth forces and discrete symmetry breaking

Friday 30 November 2018 16:40 (25 minutes)

Modifications of general relativity often involve coupling additional scalar fields to the Ricci curvature, leading to scalar-tensor theories of Brans-Dicke type. If the additional scalar fields are light, they can give rise to long-range fifth forces, which are subject to stringent constraints from local tests of gravity. In this talk, we show that fifth forces only arise for the Standard Model (SM) due to mass mixing with the Higgs field, and we emphasise the pivotal role played by discrete and continuous symmetry breaking. Quite remarkably, if one assumes that such light, non-minimally coupled scalar fields exist in nature, the non-observation of fifth forces has the potential to tell us about the structure of the SM Higgs sector and the origin of its symmetry breaking. Moreover, with these observations, we argue that certain classes of scalar-tensor theories (as studied in cosmology and astro-particle physics) are entirely equivalent to Higgs-portal theories (as studied in high-energy physics) at the level of their dimension-four operators.

Presenter: MILLINGTON, Peter (University of Nottingham)

Session Classification: Contributed Talks

Contribution ID: **20** Type: **not specified**

Gravitational waves from cosmic domain walls

Friday 30 November 2018 16:15 (25 minutes)

Domain walls are sheet-like topological defects produced when a discrete symmetry is spontaneously broken in the early universe. Although the existence of stable domain walls is disfavored by cosmological considerations, it is possible to consider unstable domain walls which disappear early enough not to lead cosmological disasters. In this talk, we discuss the possibility that a significant amount of gravitational waves is produced by annihilation of such unstable domain walls in the early universe. After reviewing cosmological evolution of domain walls, we give an estimate of the expected gravitational wave signal based on the results of numerical simulations. In addition, we briefly review a number of well-motivated particle physics models that predict the formation of unstable domain walls. The detectability of predicted signals is also discussed in prospect of planned gravitational wave observatories.

Presenter: SAIKAWA, Kenichi (Max-Planck-Institute for Physics)

Session Classification: Contributed Talks