

# 3rd International Conference on New Frontiers in Physics



**Monday 28 July 2014 - Wednesday 6 August 2014**

## Scientific Programme

The conference series "New Frontiers in Physics" aims to promote interdisciplinarity and cross-fertilization of ideas between different disciplines addressing fundamental physics. While different fields each face a distinct set of field-specific challenges in the coming decade, a significant set of commonalities has emerged in the technical nature of some of these challenges, or are underlying the fundamental concepts involved. A Grand Unified Theory should in principle reveal this underlying relationship.

For instance, techniques from string theory have become relevant in recent years for improving perturbative techniques in high energy physics or identifying material properties of non-abelian plasmas that share essential features with the systems studied in heavy ion collisions. Fluctuation analyses of the cosmic microwave background involve techniques and concepts that are becoming increasingly relevant for the study of the quickly expanding little bangs in heavy ion collisions. Cosmological models are developed in close interplay with searches for new physics at the LHC. There is a multitude of examples illustrating that crosstalk between neighboring fields is relevant or even crucial for progress in either field.

The conference series "New Frontiers in Physics" aims at identifying interdisciplinary topics on which crosstalk between different disciplines of fundamental physics can contribute to further progress. The conference series aims at bringing together key scientists of different fields to discuss the state of the art and the nature of open questions in a language suitable for a physics educated interdisciplinary audience, and to discuss avenues for further progress.

**The agenda of the 2013 conference can be found** here.

**The agenda of the 2012 conference can be found** here.

**Main topics of the Conference**

**A High Energy Particle Physics:**

Searches for new particles and new phenomena (Higgs boson, SUSY, top quarks, extra dimensions, flavour physics, precision electroweak measurements and other), hadron physics, neutrino physics.

**B Heavy Ion Collisions and Critical Phenomena :**

The properties of QCD matter at extreme conditions and the QCD phase diagram. Branching out to neighbouring disciplines: Superconductivity, Neutron Stars, Quark Stars, Exotics.

**<font color="#83271E">C Quantum Physics and Quantum Entanglement :</font>**

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Quantum Optics, foundations of Quantum Mechanics, Quantum information, Quantum Entanglement and the Universe: Black Holes and Cosmology, Quantum Non-Locality.</div>

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**<font color="#83271E">D Cosmology, Astrophysics, Gravity, Mathematical Physics : </font></div>**

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Cosmic Microwave Background, Dark Energy, Modified Gravity, Dark Matter, Astroparticle Physics, Quantum Gravity, String Theory, Non Commutative Geometry, Holography.</div>

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While the main body of the conference builds mostly on the above mentioned topics, presentations on yet different disciplines are invited, and vary every year. Such topics include nuclear structure, atomic physics, plasma physics, physics applications (biophysics, medical science), biology, mathematics, computing science and other.</div>