SFB/TRR 21 - Colloquium

12. Januar 2015, Stuttgart

Francesco Sannino

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Rethinking Fundamental Interactions after the Higgs Discovery

Highly ambitious scientific experiments around the world are currently unveiling Nature's innermost secrets. On July 4th 2012 the Large Hadron Collider experiments at CERN announced the discovery of a new subatomic particle, the Higgs, revealing information about the basic laws of the universe. This discovery heralds a new and extremely exciting era in high-energy physics. At the same time the cosmic frontier is being explored by the Planck mission of ESA's Horizon Program. Planck will lead to unprecedented heights in the understanding of the early universe and the origin of cosmic structure. Many more state-of-the-art experiments are searching for direct or indirect traces of a mysterious form of non-luminous matter. This dark matter is five times more abundant than atoms, the bright matter. It is a fact, however, that the current description of fundamental interactions is theoretically and phenomenologically unsatisfactory. I will review the main issues about the current underlying mathematical description of fundamental interactions and then I will describe new interesting scenarios for the future generation of better theories of nature.

About Prof. Francesco Sannino:

Prof. Francesco Sannino is one of the leading contemporary theoretical physicists in high energy physics. His expertise is reaching from the Standard Model with its dark and bright extensions to string theory and cosmology. He will explain the situation of modern high energy physics after the discovery of the Higgs particle to a general audience of non experts. He is the Director of the DNRF Centre of Excellence for Particle Physics Phenomenology: CP^3-Origins at University of Southern Denmark and the Danish Research Foundation.

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