hausdorff center for mathematics

universitätbonn

Felix Klein Lectures 2011

Three roles of quantum field theory

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Dates: **May 2 – 18**

Location: **Mathematik-Zentrum, Lipschitz Lecture Hall, Endenicher Allee 60, Bonn**

Abstract:

Quantum field theory has many roles, and the lectures will be about three of them. The primary role is to provide a description of all of fundamental physics when gravity is firmly excluded. A second, at first surprising, role has emerged from string theory, which is a theory of gravitation: it turns out that a two-dimensional field theory can be regarded as a generalized manifold, and in particular can be a model for space-time. Thirdly, quite apart from physics, the concept of a field theory has taken on a new life as an organizing principle in other areas of mathematics – not only in geometry and representation theory, but even in connection with quantum computing.

The three roles can be seen together as aspects of noncommutative geometry, and that will be a central theme of the lectures. The talks will aim to show how powerful the field theory idea is by jumping between a variety of contexts, beginning from the origins of the structure in particle physics, with a little about so-called “Wick rotation”, and then moving towards more pure-mathematical applications to analysis, algebra, and the structure of manifolds.

We kindly request you to register by email (Felix-Klein-Lectures@hcm.uni-bonn.de). There is no registration fee.
There will be limited **funding for external junior participants**. If you seek financial support, please send your vitae with publication list and a short research summary to Felix-Klein-Lectures@hcm.uni-bonn.de. You may also include a short letter of recommendation by a senior scientist. **Application deadline:** April 15, 2011.

http://www.hausdorff-center.uni-bonn.de/event/2011/felix_klein_lectures/