



SFB-Seminartag

TIME:

27 Jun 2006, 15:00 - 18:00

LOCATION:

Humboldt-Universität zu Berlin
Unter den Linden 6
Hauptgebäude, Hörsaal 3075
10099 Berlin

PROGRAM:

15:00 - 16:00 **Dr. Frederik Witt (FU Berlin)**

A supersymmetric approach to special metrics in dimension 8

Dimension 8 is extremely rich in special metrics, i.e. metrics associated with a G -structure for G a proper subgroup of $SO(8)$. In this talk, I want to describe a unified approach to $PSU(3)$ -, - (almost quaternionic Kähler) and $Spin(7)$ -structures. The latter two appear in Berger's list of Riemannian holonomy groups and are usually defined by a closed self-dual 4-form while $PSU(3)$ appeared in connection with Hitchin's variational principle and is defined by a closed and co-closed 3-form. In the case of $Spin(7)$, it is well-known that this geometry can be rephrased in terms of a unit spinor which is why this group plays a predominant rôle in supersymmetric string compactifications.

On the other hand, this invariant spinor also defines an isometry between vectors and chiral spinors.

I will explain how one can equally characterise $PSU(3)$ - and -structures by

the existence of such an isometry, giving rise to a spin $3/2$ -field (also known as Rarita-Schwinger field in supergravity). Moreover, the corresponding differential forms are closed and co-closed if and only if the corresponding spinorial invariant is harmonic with respect to the twisted Dirac operator. In the case of $Spin(7)$ this is equivalent to

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the holonomy reducing to this group.

16:30 - 17:30 **Dr. Juan Pablo Rossetti**

Isospectrality in standard geometries

After introducing the short necessary background, we will survey some results and problems concerning isospectrality of Riemannian manifolds M of constant curvature K .

We will focus on the relation between the Laplace spectrum of M and the closed geodesics in M , in the cases $K=-1$ and $K=0$; and also on the p -spectrum, i.e., the spectrum of the Laplace-Bertrami operator acting on smooth p -forms on M . Many of the examples we will see are in dimensions 2 and 3, then it is possible to draw them.

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