SFB-Seminar

ZEIT:
10.1.2012, 16:00 Uhr - 19:00 Uhr

ORT:
Konrad-Zuse-Zentrum für Informationstechnik Berlin
Takustr. 7
14195 Berlin-Dahlem

PROGRAMM:

16:00 - 17:00   **Batu Güneysu**

Hydrogen Type Stability Problems on Manifolds
In this talk, I will explain how classical results on the stability of Hydrogen type atoms can be extended to certain abstract Riemannian 3-manifolds. This clarifies which geometric and topological properties of the Euclidean space are actually needed to formulate and prove such stability results.

17:00 - 17:30   Kaffeepause

17:30 - 18:30   **Vladimir Matveev**

How to Reconstruct a Metric by its Unparameterized Geodesics
We discuss whether it is possible to reconstruct a metric by its unparameterized geodesics, and how to do it effectively. We explain why this problem is interesting for general relativity. We show how to understand whether all curves from a sufficiently big family are unparameterized geodesics of a certain affine connection, and how to reconstruct algorithmically a generic 4-dimensional metric by its unparameterized geodesics. The algorithm works most effectively if the metric is Ricci-flat. We also prove that almost every metric does not allow nontrivial geodesic equivalence, and construct all pairs of 4-dimensional geodesically equivalent metrics of Lorenz signature. If the time allows, I will also explain how this theory helped to solve

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two problems explicitly formulated by Sophus Lie in 1882, and the semi- Riemannian two-dimensional version of the projective Lichnerowicz-Obata conjecture.

The new results of the talk are based on the papers arXiv:1010.4699, arXiv:1002.3934, arXiv:0806.3169, arXiv:0802.2344, arXiv:0705.3592 joint with Bryant, Bolsinov, Kiosak, Manno, Pucacco.