# SFB-Seminar und Vollversammlung (Teilprojekt C8)

**ZEIT:**
2.12.2014, 14:00 Uhr - 18:00 Uhr

**ORT:**
FU Berlin
Konrad-Zuse-Zentrum für Informationstechnik, Hörsaal ZIB
Takustr. 7
14195 Berlin-Dahlem

**PROGRAMM:**

14:00 - 15:00

**SFB-Vollversammlung**

15:00 - 15:30 Kaffee-Pause

15:30 - 16:30 **Tobias Marxen (Leibniz Universität Hannover)**

**Ricci flow on a class of warped product manifolds**
Ricci flow is an evolution equation for Riemannian metrics, which has become famous through the solution of the Poincare conjecture by Perelman.
To get a better understanding of Ricci flow, we analyse its behaviour on certain noncompact warped product manifolds. Knowing that in our case the warped product structure is preserved under the flow, we show longtime existence of the solution and that it is of type III, i. e. we have the curvature estimate |Rm| \leq C/t for some C > 0 and all t > 0. The proof consists of applying a generalized maximum principle on noncompact manifolds to appropriately chosen geometric quantities.

16:30 - 17:00 Kaffee-Pause

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17:00 - 18:00 **Juliette Hell (Freie Universität Berlin)**

**Mixmaster map and chaos for extreme gravity**

Under certain symmetry assumptions, Einstein equations reduce to an ODE system -- the Bianchi IX model -- which can be seen as the simplest model of the big bang singularity showing BKL chaotic dynamics. By breaking some symmetries, the degeneracy of the Taub points is repealed and eigenvalues change their signs one after the other along the Kasner circle. I will present the consequences of these perturbations on the dynamics of the mixmaster map. In the subcritical case, the Taub points are replaced by stable arcs where generic heteroclinic chains end up, while chaos is contained in a nongeneric dustlike Cantor set only. From this point of view, general relativity can be seen as a bifurcation situation where generic chaos is born.

This work in progress is in collaboration with Claes Uggla (U. Karlstad, Sweden, Departement of Physics).

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