

General Mathematics Seminar
of the
University of Luxembourg
in cooperation with the
Luxembourg Mathematical Society

March, 2014

Tuesday, March 4, 2014 at 17.00

Campus Kirchberg, Room B02

Prof. Simone Gutt
(Université Libre de Bruxelles)

Symplectic Space forms and their submanifolds

Abstract: A symplectic symmetric space whose canonical connection is of Ricci-type can be considered as a symplectic analogue of a space form in Riemannian geometry. In this symplectic context, one can write the equivalent of the fundamental theorems of submanifold theory in Riemannian space forms; the Gauss-Codazzi and Ricci equations suffice to determine a “good” symplectic submanifold of this symmetric space. Totally geodesic good submanifolds of simply connected symplectic space forms can be described; there is a natural homogeneous space structure on subsets of the set of those totally geodesic submanifolds. This could lead to new frameworks for Radon-type transforms.

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March, 2014

Tuesday, March 18, 2014 at 17.00

Campus Kirchberg, Room B02

Prof. Roman Fedorov
(Max Plank Institute, Bonn)

A conjecture of Grothendieck and Serre and affine Grassmannians

Abstract: The conjecture of Grothendieck and Serre on principal bundles states that a principal bundle for a reductive group scheme over an integral regular scheme is Zariski locally trivial, if it is trivial generically. I will discuss the recent proof of the conjecture for schemes over infinite fields by Ivan Panin and myself.

It turns out that the conjecture is reduced to a statement about families of principal bundles on smooth affine rational curves—these families will be the main characters of the talk. I'll present some results for such families, which are obtained using the technique of affine Grassmannians.

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March, 2014

Tuesday, March 25, 2014 at 17.00

Campus Kirchberg, Room B02

Prof. Glenn Barnich
(Université Libre de Bruxelles)

Three dimensional gravity, holography and Virasoro coadjoint orbits

Abstract: The symmetry group of three dimensional asymptotically anti-de Sitter spacetimes is shown to be the conformal group in two dimensions. In the asymptotically flat case, it is the BMS group in three dimensions, which is the semi-direct product of the diffeomorphism group on the circle with its adjoint representation embedded as an abelian normal subgroup. We further show that the reduced phase space of these three dimensional gravity theories is completely described by the coadjoint representation of their symmetry groups. As a consequence, a series of natural questions in 3d gravity can be phrased and answered in terms of the well-known classification of Virasoro coadjoints orbits and their properties.