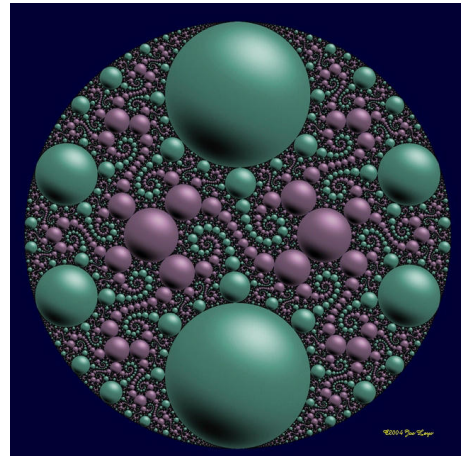


Oberseminar Geometrie
Department of Mathematics
University of Fribourg
Seminar room, Lonza dependence
Wednesday November 5, 2014, 10:20-12:00



Sonja Hohloch (EPF Lausanne):

From semi-toric systems to Hamiltonian \mathbb{S}^1 -actions and back

Roughly, a semi-toric integrable Hamiltonian system (briefly, a semi-toric system) on a compact 4-dimensional manifold consists of two commuting Hamiltonian flows one of which is periodic. Thus the flow parameters induce an $\mathbb{S}^1 \times \mathbb{R}$ -action on the manifold. Under certain assumptions on the singularities, semi-toric systems have been classified by Pelayo & by means of 5 invariants. Every semi-toric system induces a Hamiltonian \mathbb{S}^1 -action on the manifold by ‘forgetting’ the \mathbb{R} -valued flow parameter. Effective Hamiltonian \mathbb{S}^1 -actions on compact 4-manifolds have been classified by Karshon by means of so-called ‘labeled directed graphs’.

In a joint work with S. Sabatini and D. Sepe, we linked Pelayo & ’s classification of semi-toric systems to Karshon’s classification of Hamiltonian \mathbb{S}^1 -actions. More precisely, we show that only 2 of the 5 invariants are necessary to deduce the Karshon graph of the underlying \mathbb{S}^1 -action. In an ongoing work with S. Sabatini, D. Sepe and M. Symington, we study how to ‘lift’ an effective Hamiltonian \mathbb{S}^1 -action on a compact 4-manifold to a semi-toric system.

In this talk, we give an introduction to semi-toric systems and Hamiltonian \mathbb{S}^1 -actions and sketch part of our constructions.