

Seminar: “Geometry&Physics@DFT”

Location : Seminar room, DFT (IFIN-HH)
([Seminar Homepage](#)) ([Indico Page](#))

Date: Friday, October 9, 2015, 11:00 a.m.

Title: Bubbling solutions of M-theory, polar G-manifolds and symmetric Riemann surfaces

Speaker: Dr. Calin Lazaroiu
(IBS, Center for Geometry and Physics)

Abstract: I show that the complete Riemannian eight-manifolds describing the internal part M of so-called ‘bubbling solutions’ of eleven-dimensional supergravity are Riemannian polar G -manifolds of cohomogeneity two for the compact Lie group $G = \mathrm{SO}(4) \times \mathrm{SO}(4)$ and characterize them up to equivariant isometry using the reconstruction theorem of Grove and Ziller. I also give a surgery description of the differential topology of M . The geometry of such manifolds is controlled by a compact hyperelliptic Riemann surface $\hat{\Sigma}$ which admits a Klein four-group $\hat{W} \simeq \mathbb{Z}_2 \times \mathbb{Z}_2$ of dyanalitic symmetries, together with a certain group graph associated with the stabilizer stratification of $\hat{\Sigma}$. The complete Riemannian metric on M is determined by a certain equivariant metric on $\hat{\Sigma}$ which is compatible with its complex structure. I also discuss the Klein surfaces arising from Σ by taking quotients and the corresponding uniformization problem. Finally, I outline a program for classifying all supersymmetric flux solutions of eleven-dimensional supergravity whose internal part is an eight-dimensional polar G -manifold of cohomogeneity two and mention a few mathematical problems which need to be resolved in order to complete that program.