

A tale of two G_2

Boris Kruglikov (University of Tromsø)

Date / Time / Location: Wed. May 2, 2012, 10:00 - 11:00, JD35.

Abstract:

Exceptional Lie group G_2 is a beautiful 14-dimensional continuous group, having relations with such diverse notions as triality, 7-dimensional cross product and exceptional holonomy. It was found abstractly by Killing in 1887 (complex case) and then realized as a symmetry group by Engel and Cartan in 1894 (real split case). Later in 1910 Cartan returned to the topic and realized split G_2 as the maximal finite-dimensional symmetry algebra of a rank 2 distribution in dimension 5. In other words, Cartan classified all symmetry groups of Monge equations of the form $y' = f(x, y, z, z', z'')$. I will discuss the higher-dimensional generalization of this fact, based on the joint work with Ian Anderson. Compact real form of G_2 was realized by Cartan as the automorphism group of octonions in 1914. In the talk I will also explain how to realize this G_2 as the maximal symmetry group of a geometric object.