Institut für Geometrie und Topologie

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Classification of cohomogeneity-one actions on noncompact symmetric spaces

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Abstract: The first systematic approach towards classifying isometric cohomogeneity-one actions on symmetric spaces of noncompact type dates back to the work of Berndt and Brück from 2001. Later on, in a series of articles, Berndt and Tamaru reduced the classification problem to an obscure and elaborate problem in the representation theory of reductive Lie groups, known as the nilpotent construction problem. Due to the complexity of that problem, the classification efforts have been at a virtual standstill since 2013. In this talk, I will report on the joint work with Víctor Sanmartín-López, in which we fully resolve the nilpotent construction problem, thus completing the classification of cohomogeneity-one actions on symmetric spaces of noncompact type. As a byproduct, we also obtain an important structure result for transitive actions on such spaces, and we also prove that many natural types of their submanifolds can be realized by a subgroup of the solvable part of the Iwasawa decomposition (and thus are solvmanifolds).



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