

Classifying families of manifolds

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Abstract

A fundamental and deep problem in mathematics is a classification of the objects of study: which objects are the same, which are different. The tools for the classification of this talk come from algebraic topology but the interest and motivation for the classifications come from differential geometry and theoretical physics. I will start with an overview over which objects we study and what we mean by "the same" and "different". In particular, I will discuss the classification of a family of seven dimensional homogeneous spaces which admit Einstein metrics. This family is of interest to physicists since it's symmetry group coincides with the relevant gauge group of theoretical physics, and to geometers since it is an example of an infinite family of manifolds admitting Einstein metrics.