

Title: Conformally Einstein and Bach flat homogeneous manifolds

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Abstract: The classification of conformally Einstein manifolds is still an intriguing open problem nowadays. Despite recent progress on product manifolds and Kähler manifolds, the general situation needs to be elucidated. Our purpose on this lecture is to determine all four-dimensional conformally Einstein homogeneous manifolds. In addition to the symmetric cases (which contain the Einstein and the locally conformally Einstein situations) there are three new homogeneous geometries containing an Einstein representative in their conformal class.