Institut für Geometrie und Topologie

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Totally geodesic submanifolds of nearly Kähler and G₂manifolds

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Abstract: An almost Hermitian manifold is said to be nearly Kähler if the covariant derivative of its almost complex structure is totally skew-symmetric.

In dimension six, these spaces are of particular interest, as the Riemannian cone of a six-dimensional strict nearly Kähler manifold (except for the sphere S⁶) has special holonomy G_2 . It was shown by Butruille that the simply connected homogeneous strict nearly Kähler manifolds of dimension six are S⁶, the flag manifold F**C**³, the complex projective space **C**P³ and the almost product S³ x S³.

In this talk, I will report on a joint work with Alberto Rodríguez Vázquez in which we classify the totally geodesic submanifolds of the (non-symmetric) homogeneous strict nearly Kähler 6-manifolds, as well as their G_2 -cones. To this end, we develop the tools to attack the problem in (naturally reductive) homogeneous spaces and Riemannian cones.



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