

# Hypersurfaces of nearly Kähler manifolds

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A nearly Kähler manifold is an almost Hermitian manifold  $(M, g, J)$  such that  $\nabla J$  is skew-symmetric. Nearly Kähler manifolds are one of the sixteen classes of almost Hermitian manifolds classified by Gray and Hervella [2], and, according to Gray himself, one of the most interesting ones. By results of Nagy [3] six-dimensional homogeneous nearly Kähler manifolds constitute a building block in nearly Kähler geometry.

We will study hypersurfaces of the four homogeneous six-dimensional nearly Kähler manifolds, classified by Butruille [1]:  $\mathbb{S}^6$ ,  $\mathbb{S}^3 \times \mathbb{S}^3$ ,  $\mathbb{C}P^3$  and  $F(\mathbb{C}^3)$ . We will give a brief description of each space and we will talk about the results about hypersurfaces that have been found so far in the field. We will finish with a non-existence result of hypersurfaces with constant sectional curvature and an idea of how to obtain this result.

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## References

- [1] J.-B. Butruille, *Classification des variétés approximativement kähleriennes homogènes*. Ann Glob Anal Geom 27, 201-225 (2005).
- [2] A. Gray, L. M. Hervella, *The sixteen classes of almost Hermitian manifolds and their linear invariants*. Annali di Matematica pura ed applicata 123, 35-58 (1980).
- [3] P.-A. Nagy, *Nearly Kähler geometry and Riemannian foliations*. Asian Journal of Mathematics 6(3), 481-504 (2002).