

Publicacions més rellevants de la línia de recerca:
Varietats complexes

Referència: Loeb, J.-J., Manjarín, M. and Nicolau, M. Complex and CR-structures on compact Lie groups associated to Abelian actions. *Annals of Global Analysis and Geometry*, **32** (2007), pp. 361–378.

Abstract: It was shown by Samelson and Wang that each compact Lie group K of even dimension admits left-invariant complex structures. When K has odd dimension it admits a left-invariant CR-structure of maximal dimension. This has been proved recently by Charbonnel and Khalgui who have also given a complete algebraic description of these structures.

In this article we present an alternative and more geometric construction of this type of invariant structures on a compact Lie group K when it is semisimple. We prove that each left-invariant complex structure, or each CR-structure of maximal dimension with a transverse CR-action by \mathbb{R} , is induced by a holomorphic \mathbb{C}^l -action on a quasi-projective manifold X naturally associated to K . We then show that X admits more general Abelian actions, also inducing complex or CR-structures on K which are generically non-invariant.

Referència: Manjarín, M. Normal almost contact structures and non-Kähler compact complex manifolds. *Indiana University Mathematics Journal*, **57(1)** (2008), pp. 481–507.

Abstract: We construct some families of complex structures on compact manifolds by means of normal almost contact structures (nacs) so that each complex manifold in the family has a non-singular holomorphic flow. These families include as particular cases the Hopf and Calabi-Eckmann manifolds and the complex structures on the product of two normal almost contact manifolds constructed by Morimoto. We prove that every compact Kähler manifold admitting a non-vanishing holomorphic vector field belongs to one of these families, and is a complexification of a normal almost contact manifold. Finally, we show that if a complex manifold obtained by our constructions is Kählerian, then the Euler class of the nacs (a cohomological invariant associated to the structure) is zero. Under extra hypotheses, we give necessary and sufficient conditions for the complex manifolds so obtained to be Kählerian.