

INSTITUTUL DE MATEMATICĂ “SIMION STOILOW” AL ACADEMIEI ROMÂNE

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Conferința lunară

Weakly complex homogeneous spaces

Andrei Moroianu

(*CNRS*)

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Abstract: A weakly complex space is a smooth real manifold whose tangent bundle is stably isomorphic to a complex bundle. For example the sphere S^n is stably parallelizable, thus weakly complex, although it is well known that its tangent bundle is underlying a complex bundle only for $n=2$ and $n=6$. It is in general a non-trivial problem to decide whether a given manifold is stably complex. As an illustration, it took several years to show that the quaternionic projective spaces $HP^n = Sp(n+1)/Sp(n)/Sp(1)$ are not weakly complex for $n>1$ (Hirzebruch 1953 for $n>3$, Milnor 1958 for $n=2$ and $n=3$, Massey 1962 for arbitrary n with a different method). In this talk we will recall the classification of compact inner symmetric spaces which are weakly complex, and extend this classification to the larger category of compact homogeneous spaces with positive Euler characteristic (Inventiones Math. 2011, Crelle 2014).