

**Seminar:** “Geometry&Physics”

**Location :** IMAR, Hall 412  
([Seminar Homepage](#)) ([Indico Page](#))

**Date:** Friday, November 27, 2015, 10:00 AM

**Title: Compact lcK manifolds with reduced holonomy**

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**Abstract:** A locally conformally Kähler (lcK) manifold is a complex manifold  $(M, J)$  together with a  $J$ -compatible Riemannian metric  $g$  which has the property that around every point of  $M$  there exists a locally-defined Kähler metric belonging to the conformal class of  $g$ . The differentials of conformal change functions give a globally-defined closed form on  $M$  known as the Lee form. If the Lee form is exact, then the triple  $(M, J, g)$  is called globally conformally Kähler (gcK). We study the problem of classifying compact lcK manifolds  $(M, J, g)$  having the property that the holonomy of  $g$  is a proper subgroup of  $SO(n)$ . Through the Berger-Simons holonomy theorem, it suffices to consider lcK manifolds which have reducible holonomy, which have irreducible holonomy from Berger’s list or which are locally symmetric. When the holonomy is reducible, we show that  $(M, J, g)$  must be either gcK (given by an explicit construction) or must have parallel Lee form (i.e., it is Vaisman). For the remaining two cases, I present the partial results obtained together with Farid Madani and Mihaela Pilca.