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**Ioana Suvaina\*** ([ioana.suvaina@vanderbilt.edu](mailto:ioana.suvaina@vanderbilt.edu)), 1326 Stevenson Center, Department of Mathematics, Vanderbilt University, Nashville, TN 37240. *On symmetries and invariant Einstein metrics on 4-manifolds.*

The existence or non-existence of Einstein metrics on 4-manifolds is strongly related to the differential structure considered. For a large class of non-spin 4-manifolds with the canonical smooth structure, we show that there are infinitely many, non-equivalent smooth free actions of finite cyclic groups. Moreover, we show that there are no invariant Einstein metrics on these manifolds. On manifolds with small topology, we analyze the dependency of the existence of Einstein metrics on the smooth structure considered on the underlying topological space.

The main techniques used come from Seiberg-Witten theory, the geometry of complex surfaces and symplectic topology. (Received June 28, 2011)