

Existence Defects of Geometric Structures

Prof. Michel Nguiffo Boyom (Alexander Grothendieck Research Institute,
University of Montpellier, France.)

Let S be a type of Geometric structure. A smooth manifold M is called a S -manifold when it is equipped with a structure of type S . A foliation the leaves of which are smoothly S -manifolds is called a foliation of type S , (the notion of S -foliation might carry another meaning.) Given a smooth manifold M , let S be a type of Geometric structure. Arises the question whether M can support a foliation of type S . That is a rather hard problem in the differential topology. The aim is to point out that for many important types of Geometry structures this existence problem is linked with sheaves of associative algebras of solutions of Hessian equations defined by Koszul connections in the tangent bundle TM . The talk is devoted to overview a few cases of geometric structures which have significant impacts on other research domains. Instances are Hessian structures in Riemannian manifolds; Hessian structures in locally flat manifolds; symplectic structure in manifolds; left invariant symplectic structure in Lie groups.