Soliton structures in geometry

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3:15 Kemeny 300

Abstract

The concept of soliton, in its more general version, allows to find canonical or distinguished elements on a space of structures provided with an equivalence relation and an "optimal" tangent direction at each point. The use of the term "soliton" was initiated by R. Hamilton in the 80s to refer to self-similar solutions of the Ricci flow, but it is nowadays found in many other areas of differential geometry, including symplectic, hermitian and special holonomy geometries. In this talk, after considering three motivational examples (matrices, Lie algebras and plane curves), we will survey on the role played by solitons in providing canonical geometric structures on Lie groups. Special attention will be given to the applications of geometric invariant theory in homogeneous geometry obtained by many authors during the last two decades. Most of them are based on the fact that the main part of the Ricci curvature of a homogeneous space is actually the moment map for the variety of Lie algebras.

This talk should be accessible to .