

Leviton, P. R. A.; Rubinstein, J. H.

Deforming Riemannian metrics on the 2-sphere. (English) Zbl 0619.53025

Geometry and partial differential equations, Miniconf. Canberra/Aust. 1985, Proc. Cent. Math. Anal. Aust. Natl. Univ. 10, 123-127 (1986).

[For the entire collection see [Zbl 0583.00013](#).]

Given a compact surface with positive Gauss curvature, the authors show how to construct a principal S^1 -bundle with a metric of positive Ricci curvature such that the projection map is a Riemannian submersion. From Hamilton's Ricci flow equation

$$\partial g / \partial t = -2Ric(g),$$

they derive a nonlinear heat equation involving the metric on the surface and an auxiliary scalar function. By Hamilton's results, this equation is solvable for all time and the metric converges to the constant curvature metric. Recently, R. Hamilton has been able to show that on a compact surface with positive Gauss curvature, the Ricci flow itself exists for long time and converges to the constant curvature metric.

Reviewer: D. Yang

MSC:

53C20 Global Riemannian geometry, including pinching

58J35 Heat and other parabolic equation methods for PDEs on manifolds

Keywords:

Ricci curvature; Riemannian submersion; Hamilton's Ricci flow equation; nonlinear heat equation; constant curvature metric