1154-53-234 **Robert L. Bryant*** (bryant@math.duke.edu), Duke Mathematics Department, PO Box 90320, Durham, NC 27708-0320. *On solitons for the closed* G_2*-Laplacian flow.* Preliminary report.

For G_2-structures on 7-manifolds, there is a natural analog of the Ricci-flow studied in Riemannian geometry, namely, one considers a 1-parameter family $\sigma = \sigma(t)$ of G_2-structures on a given 7-manifold that satisfies the equation

$$\frac{\mathrm{d}\sigma}{\mathrm{d}t} = \Delta_\sigma \sigma$$

with a specified initial G_2-structure $\sigma(0) = \sigma_0$.

When the 1-parameter family σ moves by diffeomorphism and scaling, we say that σ is a *soliton* for the G_2-Laplacian flow. The most interesting case is when the initial G_2-structure is *closed*.

In this talk, I will describe some of what is known about the existence and local generality of solitons for this flow, concluding with a discussion of the still-unsolved problem of the generality of the *gradient* solitons, which are of great interest in the theory of G_2-structures. (Received August 26, 2019)