

1068-26-4

Jeremy T. Tyson* (tyson@math.uiuc.edu), 1409 West Green St., Urbana, IL 61801. *Sobolev mappings into metric spaces.*

The theory of Sobolev functions is by now classical and forms a cornerstone of the modern approach to PDE. Variational problems in differential geometry and geometric function theory motivate extension of the Sobolev theory to nonlinear targets such as Riemannian manifolds and even metric spaces. We will survey recent advances in the theory of metric space-valued Sobolev mappings. Along the way we will encounter several striking results: (a) there exist Sobolev maps from the plane into the first Heisenberg group which cannot be approximated in the Sobolev norm by Lipschitz maps, and (b) every locally compact geodesic metric space is the image of the plane by a continuous map in the Sobolev class $W^{1,2}$. I will indicate why these results are surprising and suggest some future directions for the subject. (Received January 18, 2011)