Emily Autumn Windes* (ewindes@u.rochester.edu), 1181 S. Plymouth Ave., Rochester, NY 14611. Killing Vector Fields on $G_2$ Manifolds. 

$G_2$ manifolds are 7-dimensional Riemannian manifolds with holonomy group $\text{Hol}(g)$ contained in the exceptional Lie group $G_2$. They are Ricci-flat and almost compact. Even though we expect to have many of them, we still don’t have an existence theorem which gives necessary and sufficient conditions under which a 7-manifold admits a $G_2$ metric. In this talk, I will report on my work related to Killing vector fields on $G_2$ manifolds as well as recent research on related problems. (Received February 19, 2018)