1051-53-191   **Rachelle DeCoste**, **Lisa DeMeyer** and **Maura Mast*** (`maura.mast@umb.edu`), Department of Mathematics, University of Massachusetts Boston, 100 Morrissey Blvd., Boston, MA 021253393. *Geodesics in Heisenberg-like Nilmanifolds.*

Two-step nilpotent Lie groups are the non-abelian Lie groups that come as close as possible to being abelian. As such, their geometry is both accessible and interesting. If such a Lie group is endowed with a left-invariant metric, then its geometry can be understood using a set of linear transformations defined on the center of the corresponding Lie algebra. We use this approach to study geodesic behavior in two-step nilpotent metric Lie groups and nilmanifolds. In particular, we focus on Heisenberg-like Lie groups. This class of Lie groups generalizes in a very natural way from the Lie groups of Heisenberg type and many questions about geodesics in Heisenberg type groups can be re-cast in this larger context. We explore some of these questions, including the question of when a compact nilmanfiold has density of closed geodesics. (Received August 25, 2009)