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Tracy L. Payne* (payntrac@isu.edu), Department of Mathematics, Idaho State University, 921 S. 8th Ave., Stop 8085, Pocatello, ID 83209-8085. *Moduli spaces of nilsolitons.*

A nilpotent Lie algebra endowed with an inner product is called a nilsoliton if the corresponding left-invariant metric on the corresponding simply connected nilpotent Lie group is a soliton metric. The most symmetric nilsolitons are algebras of generalized Heisenberg type (these are horospheres in Damek-Ricci spaces). In this talk, we discuss properties of moduli spaces of nilsolitons. We survey results of Heber, Eberlein, Lauret, Nikolayevsky, Jablonski, and Will on moduli spaces. Extending earlier results of Heber, we characterize precisely which algebras of generalized Heisenberg type are isolated in the moduli space of nilsolitons, and we exhibit explicit deformations of those that are not isolated. We also present new geometric invariants that allow us to show that families of nilsolitons have mutually nonisometric elements. (Received August 26, 2011)