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Barbara Shipman* (bshipman@uta.edu), Department of Mathematics, Box 19408, Arlington,
TX 76019-0408. *Toda flows on homogeneous spaces.*

This talk will explain how group actions on homogeneous spaces help in understanding the structure of iso-level sets associated with the completely integrable system known as the Toda lattice. Each version of the Toda lattice evolves on a space of matrices according to a hierarchy of iso-spectral flows in Lax form. Singularities in the flows are completed by embedding the system into a homogeneous space, where the flows generate group actions. The type of spectrum determines the group that arises from the flows, ranging from a diagonal torus when the eigenvalues are distinct to a unipotent group when all eigenvalues coincide. (Received August 23, 2009)