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**Arlo Caine\*** ([arlo.caine@nd.edu](mailto:arlo.caine@nd.edu)). *Toric Poisson Structures.*

A real algebraic Poisson structure on smooth complex toric varieties is constructed. In the natural holomorphic coordinates, the Poisson structure is homogeneous quadratic and generalizes quadratic Poisson structures of elliptic type in the plane. The geometry of the symplectic foliation is characterized and it is shown that the action of the complex torus is Poisson, but no subgroup acts in a globally Hamiltonian way. However, each symplectic leaf is a completely integrable system as sub-tori of the compact torus act in a Hamiltonian fashion on each leaf. The modular class is always non-trivial and, using work of Nakanishi on plane quadratic Poisson structures, the Poisson cohomology of the simplest toric variety can be computed. A local calculation shows a connection between the zero locus of the modular vector field relative to a Delzant symplectic form on complex projective space and the centroids of the faces of the Delzant moment simplex. (Received August 28, 2009)