1021-35-219 **John C Loftin*** (loftin@andromeda.rutgers.edu), Department of Mathematics, Rutgers Newark, 101 Warren St., 216 Smith Hall, Newark, NJ 07102, and **Mao-Pei Tsui**. *Ancient Solutions of the Affine Normal Flow.*

The affine normal flow is a geometric flow of convex hypersurfaces in R^{n+1} which is invariant under affine volume-preserving transformations. The compact case of this flow has been well studied by Ben Andrews. We construct noncompact solutions to the affine normal flow of hypersurfaces, and show that all ancient solutions must be either ellipsoids (shrinking solitons) or paraboloids (translating solitons). We also provide a new proof of the existence of a hyperbolic affine sphere asymptotic to the boundary of a convex cone containing no lines, which is originally due to Cheng-Yau. The main techniques are local second-derivative estimates for a parabolic Monge-Ampère equation modeled on those of Ben Andrews and Gutiérrez-Huang, a decay estimate for the cubic form under the affine normal flow due to Ben Andrews, and a hypersurface barrier due to Calabi. We compare our result to the famous theorem of Jörgens, Calabi, Pogorelov, and Cheng-Yau, that any entire convex solution u to $\det u_{ij} = 1$ is a quadratic polynomial. (Received September 06, 2006)