1035-58-1852 **Melanie Anne Pivarski*** (pivarski@math.tamu.edu), Department of Mathematics, Texas A&M University, College Station, TX 77843-3368. *Small Time Heat Kernel Behavior for Riemannian Polytopal Complexes.* Preliminary report.

We consider the behavior of the heat kernel, which is the fundamental solution to the heat equation, on Riemannian polytopal complexes, which are polytopal complexes with a Riemannian metric on each polytope. Under some geometric assumptions, we show a Poincaré inequality on balls of radius less than R which has a constant independent of the center of the ball. This yields uniform bounds for the heat kernel for times near zero, a local Harnack inequality, and stochastic completeness for the complex. (Received September 20, 2007)