1070-53-223          **Mihai Bailesteanu\*** (`mb452@cornell.edu`), 301 Maple Ave, Apt D3, Ithaca, NY 14850. *Heat equation under the Ricci flow - old and new.*

We will discuss various Li-Yau type gradient estimates of the solution of the heat equation on a manifold evolving under Ricci flow. We consider both the case where the manifold is a complete manifold without boundary and the case where M is a closed manifold. Harnack inequalities follow there-from. We will also present some lower bounds for the heat kernel, involving Sobolev imbedding constants. (Received February 12, 2011)