1046-14-524 **David Eisenbud*** (de@msri.org), Dept of Math, UCB, Berkeley, CA 94720, and **Bernd Ulrich**.

Assymptotic Regularity: Are we almost at infinity yet? Preliminary report.

Suppose $I \subset S = k[x_0, \cdots, x_n]$ is a homogeneous ideal. A surprising theorem of Cutkosky-Herzog-Trung, Kodiyalam, and Trung-Wang asserts that for $t \gg 0$ the Castelnuovo-Mumford regularity of I^t is a linear function of t, say $dt + e$. The invariant d is relatively easy to identify, and in recent work Harris and I showed that, in a leading special case, the invariant e is connected with the regularities of fibers of a related morphism of varieties. That left—in every case—the question, "How large does t have to be?" I'll explain the background, and discuss a recent result from joint work with Bernd Ulrich that gives a reasonably sharp bound in the special case I treated with Harris. The work leaves open some fundamental questions about Rees algebras, and I'll discuss these as well. (Received September 06, 2008)