1040-05-169 **Miklos Ajtai**, **Janos Komlos**, **Miklos Simonovits** and **Endre Szemeredi*** (szemered@cs.rutgers.edu), Rutgers University, Comp. Sci, 110 Frelinghuysen Road, Piscataway, NJ 08854-8019. *Asymptotic solution of the Erdős-T. Sós conjecture.* Preliminary report.

This is the first part of two lectures on the proof of the

Erdős-T. Sós conjecture. *If T_k is a fixed tree of k vertices, then every graph G_n of n vertices and*

$$e(G_n) > \frac{1}{2}(k-2)n$$

edges contains T_k.

The second part is given by Miklós Simonovits.

Our main result is that if k is sufficiently large, then this conjecture holds.

In this (first) part we shall sketch a proof of a weakening of the Erdős-T. Sós conjecture, according to which for every $\eta > 0$ there exists an integer $n_0(\eta)$ such that if $n, k > n_0(\eta)$ and a graph G_n on n vertices contains no T_k then

$$e(G_n) \leq \frac{1}{2}(k-2)n + \eta n.$$

The proof uses the regularity lemma. One of the main technical difficulties is that we have to use the regularity lemma even if $n \gg k$. Then G_n is a sparse graph.

In the next part, using stability arguments and some elementary methods, we shall sketch the proof of the sharp version ($\eta = 0$) as well, for $k > k_0$. (Received February 07, 2008)