1143-60-540 **Nicholas Cook*** (nickcook@math.ucla.edu). *Large deviations for subgraph counts in sparse Erdős–Rényi graphs.*

Let A be the adjacency matrix of an Erdős–Rényi graph G on N vertices with expected edge density p. That is, A is a random $N \times N$ symmetric matrix with zeros on the diagonal and iid Bernoulli(p) entries above the diagonal. We focus on the sparse regime where $p \sim N^{-c}$ for a fixed constant $c \in (0,1)$ as $N \to \infty$. We determine the asymptotic rate function for deviations of the kth moment of A above a fixed multiple of its expectation, for each $k \geq 3$, assuming $c < 1/2$ when $k \geq 4$ and $c < 1/3$ when $k = 3$. The case $k = 3$ gives the sharp upper tail for triangle counts in G, extending a previous result of Eldan holding for $c < 1/18$. We also obtain results for large deviations of general subgraph counts in G (for narrower ranges of c), as well as for a general class of spectral statistics of A that includes the Perron–Frobenius eigenvalue. (Received August 21, 2018)