1154-53-858 **Jason Cantarella***, Boyd Graduate Studies Research Center, Athens, GA 30602, and **Tetsuo Deguchi**, **Clayton Shonkwiler** and **Erica Uehara**. *Random graph embeddings and entanglements in topological polymers.* Preliminary report.

The mechanical properties of elastic materials like rubber and collagen depend on the topology of the network of polymer strands which make up the material. This topology is that of a random embedding of an extremely complicated random graph.

In this talk, we discuss the theory of Gaussian random embeddings of graphs (much of which is classical), give a simplified and clarified picture of the existing theory, and derive new results on the expected geometry of a random embedding of a fixed graph. These results predict experimental results of Tezuka et al. for synthetic polymers of known graph type.

We then use our theorem to numerically study the expected geometry of a simple model of random graphs relevant to the "t-rex" polymer system of Honda et al. (Received September 11, 2019)