1171-05-102 **Chris Cox*** (cocox@iastate.edu) and **Ryan Martin**. *The maximum number of cycles in a planar graph.*

For a fixed graph H, let $\mathbf{N}_{\mathcal{P}}(n, H)$ denote the maximum number of copies of H in an n-vertex planar graph. In this talk, we will focus on the case when H is an even cycle, where it is conjectured that $\mathbf{N}_{\mathcal{P}}(n, C_{2m}) \sim (n/m)^m$ for all $m \geq 3$. We verify this conjecture for $m \in \{3, 4, 5, 6\}$ and show that $\mathbf{N}_{\mathcal{P}}(n, C_{2m}) \lesssim n^m/m!$ for $m \geq 7$. This is accomplished by establishing a connection between this problem and the following question, which is interesting in its own right: which probability mass μ on the edges of some clique maximizes the probability that m independent samples from μ form an m-cycle? (Received August 09, 2021)