1163-05-811 **Joanna A. Ellis-Monaghan***, jellismonaghan@gmail.com, and **M. N. Ellingham**. *Balanced edge-outer embeddable graphs.* Preliminary report.

A graph is *edge-outer embeddable* if it has an orientable embedding with a special face whose boundary uses every edge at least once. While every graph has such an edge-outer embedding, finding one with a minimum size special face is NP-hard. For an Eulerian graph however, there is always an edge-outer embedding with a smallest possible face, namely one whose boundary is an Euler circuit. However, this says nothing about the number or sizes of the remaining faces. Thus, the interesting question for Eulerian graphs becomes minimizing the total number of faces, ideally by finding a *balanced* edge-outer embedding, that is, one with exactly two faces where each is bounded by an Euler circuit. We put this problem in the context of DNA self-assembly, compatible Euler circuits, and tournament embeddings, and then present some necessary and some sufficient conditions for graphs and digraphs to have balanced edge-outer embeddings. (Received September 13, 2020)