1125-05-1245 **Mark Ellingham*** (mark.ellingham@vanderbilt.edu). *A combinatorial condition for nets of triangular polyhedra.*

A very old and still-unsolved question asks whether a convex polyhedron can be cut along a subset of its edges and then unfolded into a non-self-overlapping planar shape, which is called a *net* of the polyhedron. The net can be regarded as an outerplanar graph, and such a graph must have certain properties. In particular, if the outer cycle of the net has $2n$ vertices, every vertex of the net must have degree at most $n+1$. We show that in the case of maximal outerplanar graphs this necessary condition is also sufficient in a combinatorial sense. In other words, any maximal outerplanar graph with outer cycle of length $2n$ and with every vertex of degree at most $n+1$ can have its outer cycle glued together by identifying pairs of edges so that the result is a polyhedral (3-connected and planar) graph.

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