1176-52-35 **Gabe Cunningham*** (gabriel.cunningham@gmail.com) and **Daniel Pellicer**. *Finite 3-orbit polyhedra in ordinary space.*

A *skeletal polyhedron* is a graph embedded in space where certain simple cycles are designated as faces, subject to some "geometric" restrictions. The symmetry group of a skeletal polyhedron consists of the isometries that preserve the graph and the face structure. A skeletal polyhedron is k-orbit if the symmetry group has k orbits on the flags (consisting of a vertex, an edge at that vertex, and a face using that edge). The regular (1-orbit) skeletal polyhedra in $\mathbb{E}^3$ are the 48 Grünbaum-Dress polyhedra. One of the classes of 2-orbit skeletal polyhedra (the chiral ones) were classified by Egon Schulte in 2004-2005. In this talk, I will give a brief history of highly-symmetric polyhedra, and then I will discuss joint work with Daniel Pellicer where we are classifying the finite 3-orbit skeletal polyhedra. I will describe several interesting families of such polyhedra, including some that can be embedded in $\mathbb{E}^2$ – a phenomenon that does not occur for regular or 2-orbit polyhedra. (Received January 06, 2022)