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Doug Dunham* (ddunham@d.umn.edu), Department of Computer Science, 320 HH, 1114 Kirby Drive, Duluth, MN 55812-3036. *Patterns on Semi-regular Triply Periodic Polyhedra*. Preliminary report.

Several artists, including M.C. Escher have created patterns on symmetric closed polyhedra. However to our knowledge no one has created patterns on triply periodic polyhedra in Euclidean 3-space. We examine some patterns on triply periodic polyhedra, especially those satisfying some regularity conditions. We show some such patterns and explain how some of them are related to triply periodic minimal surfaces (TPMS). These patterns are also related to repeating patterns of the hyperbolic plane that are based on regular tessellations $\{p,q\}$ composed of regular p -gons meeting q at each vertex. We will explain these relationships, and examine some interesting geometric facts that link the patterns on triply periodic polyhedra, the corresponding TPMS's, and patterns of the hyperbolic plane. (Received September 23, 2012)