1035-N1-1305 **Robert W. Fathauer*** (`tessellations@cox.net`), 3913 E. Bronco Trail, Phoenix, AZ 85044, and **Nicholas Duchnowski** and **Hank Kaczmarski**. *Design, Fabrication, and Properties of a Fractal Crystal.* Preliminary report.

A simple iterative arrangement of cubes leads to a visually rich and complex fractal "crystal" with an overall regular-octahedron envelope and infinitely many "facets". Each facet is essentially a Sierpinski triangle, and the vertex of a cube just touches the center of each triangular hole. This fractal crystal is constructed by starting with a first generation cube and placing a half-scale cube on the center of each face. The second-generation cubes have the same orientation as the first-generation cube. Third-generation cubes again scaled by half are placed on each unoccupied face of a second-generation cube. This process is continued ad infinitum to form the fractal crystal. The growth of the crystal occurs more rapidly along normals to the faces of the starting cube, leading to an overall envelope that is the Archimedean dual of the cube. The structure has been created as a VRML object through 6 generations. A physical model approximately 20 cm across was fabricated using a zCorp color printer, with a different color assigned to each generation of cube. A preliminary estimate of the Hausdorff fractal dimension of the structure shows it to be approximately 2.4. Other examples of iteratively arranged polyhedra will be shown as well. (Received September 19, 2007)