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UNIFORM POLYHEDRALS AND THEIR RELATIVES

Abstract

Half a century ago H.S.M. Coxeter, M.S. Longuet-Higgins and J.C.P. Miller published the very influential paper on "Uniform Polyhedra". These are finite polyhedra with regular polygons as faces and vertices in a single orbit under symmetries. *Uniform polyhedrals* are defined by the same conditions, but with *finite* replaced by *locally finite,* and the additional requirement that there be no coinciding elements (vertices, edges or faces). Coplanar faces, collinear edges, and partial overlaps are allowed for uniform polyhedrals, as they are for uniform polyhedra. It is somewhat surprising that no systematic study of infinite uniform polyhedrals has been undertaken so far. There are three distinct classes of such polyhedrals – rods, slabs, and sponges. The beginnings of their investigation form the core of the talk, supplemented by reports of the applications of such polyhedrals and their relatives in architecture, biology, engineering and other fields.