

Hyperbolic, chiral and skew domes

Dirk Huylebrouck

Abstract Some not well-known mathematical aspects of domes are discussed. The first (main) part is about Fuller domes, known to consist out of triangles meeting by five or six, when the construction is based on an icosahedron. Yet, the dome triangles can also meet by four and six, when an octahedron is the initial polyhedron, or by three and six for a tetrahedron. New is the idea, based on Fields medalist William Thurston's model for the hyperbolic plane that negatively curved surfaces can also be formed by Fuller type triangles, yet meeting by seven and six, or by eight and six, etcetera. The second topic emphasizes some domes turn left, others right, a feature which has not been noticed in architecture. The third topic provides an amusing end: one of the truncated cuboctahedron spheres of the Atomium, the Belgian landmark, is skew– like the tower of Pisa.

Keywords Hyperbolic domes, left-right domes, Atomium.