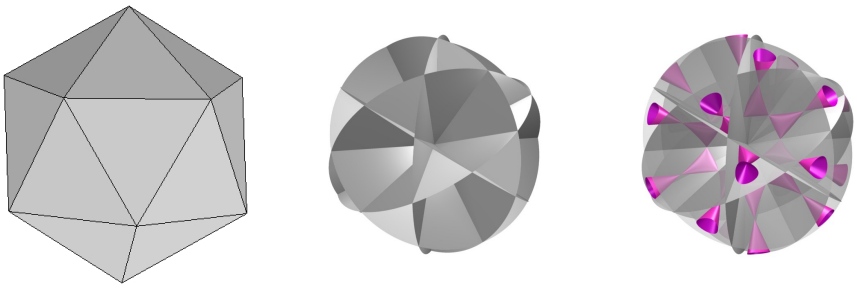
The Barth Sextic

This surface of degree 6 (sextic) was constructed by Wolf Barth in 1996.

The Barth Sextic has 65 singularities altogether. This is the maximum possible number of singularities on a sextic as shown shortly after Barth's construction by Jaffe and Ruberman — so, Barth's world record is unbeatable!

Barth's construction was a big surprise because for a long time people thought that surfaces of degree 6 can only have 64 singularities.

A striking feature of the construction is its icosahedral symmetry; the figure shows an icosahedron and its symmetry planes:



The Barth Sextic satisfies the equation $P_6 - \alpha K^2 = 0$, where P_6 denote the six symmetry planes, $K = x^2 + y^2 + z^2 - 1$ is the unit sphere and $\alpha = \frac{1}{4}(2 + \sqrt{5})$.