Dodecafoam

Dodecafoam is generated using a "substitution rule." Such rules can be used to generate a rich variety of non-periodic, yet highly structured geometric structures, and are closely related to a rich variety of topics, such as models of growth and form, aperiodic tilings, and the theory of computation. Though vast families of substitution rules are known, there is no general theory, and quite possibly can never be one.

For each of the cells we obtained by faceting the original dodecahedron, we specify a substitution rule that describes how the cell may be replaced with smaller cells. For example, a "hat" may be replaced with six smaller hats, five wedges and a dodecahedron. Iterating these rules, and showing only the dodecahedral cells, we obtain dodecafoam.