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SPIRE OVERVIEW:

The concave dodecahedron contains eight spire like extensions that terminate in the corners of a cube. The concave dodecahedron fills the spaces between a close packing arrangement of regular pentagonal dodecahedrons.

When the concave dodecahedron is fitted with an octahedron “core” and an icosahedron is placed inside, eight of the icosahedron faces provide a base for the concave dodecahedron spires.

The concave dodecahedrons can be placed spire point to spire point and stacked like cubes to fill space. When this space filling matrix is embedded in the isotropic vector matrix, every tetrahedron is in-spired, i.e., penetrated by a concave dodecahedron spire.

When the spire penetrates the tetrahedron, cleavage results. The fragments or slices that occur are all the same shape, a skew tetrahedron, along with its mirror image form. These two forms, the slice and its mirror combine to form two regular tetrahedrons that are a mirror of one another. Color the original red and its mirror blue as a way to keep track of their positions in a grouping. The identity of these two tetrahedrons can readily be seen in the stella octangula, where the red ones form one of the interpentrated 2-frequency tetrahedrons and the blue ones form the other 2-frequency tetrahedron.

The tetrahedrons of the vector equilibrium (cube octahedron) are formed using these same modules.

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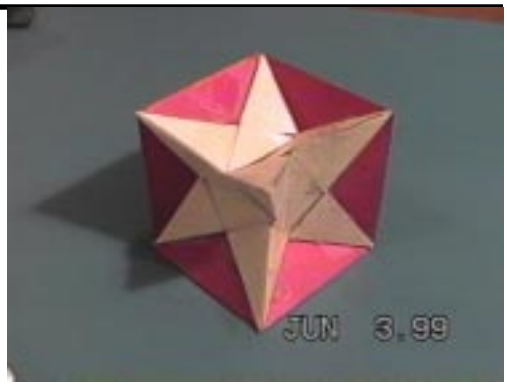
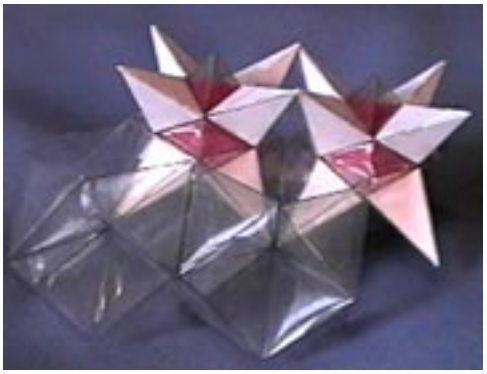


The concave dodecahedron with red “invisible” membranes illustrates the cubic relationships in the form. There are eight ***spires*** that have as their base the icosahedron.



The white spires of two concave dodecahedrons are shown emerging from red icosahedrons. The transparent forms are vector equilibriums. Each spire penetrates a tetrahedron of the vector equilibrium.

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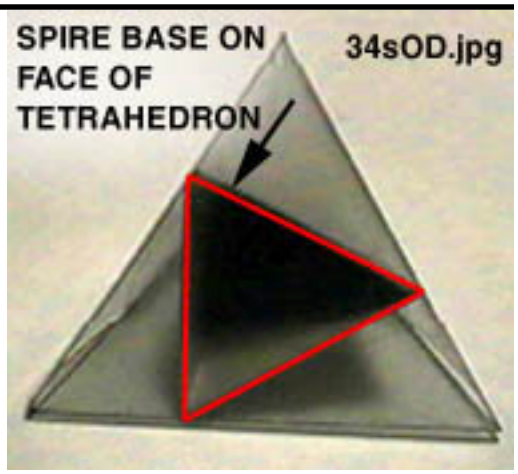
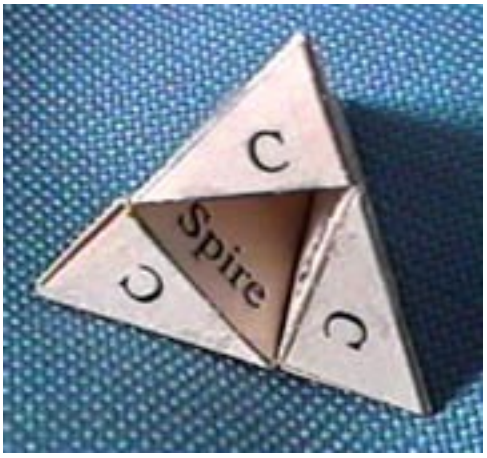
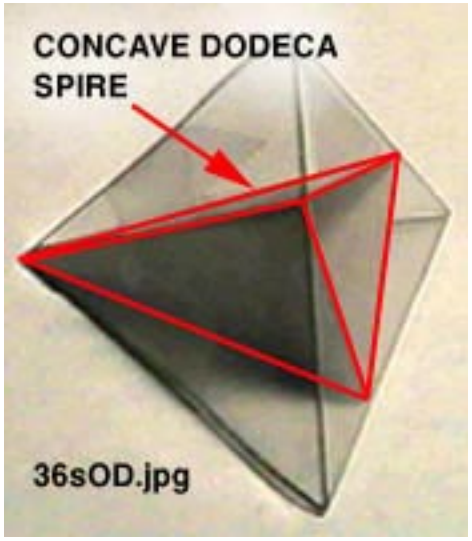
The spire base rests against the face of the tetrahedron. The red equilateral triangle connects to one of the faces of the icosahedron.





The spire fits exactly base to vertex inside the tetrahedron. The in-spired tetrahedron produce the divisions or fractures that form the ***Slice-Modules.***



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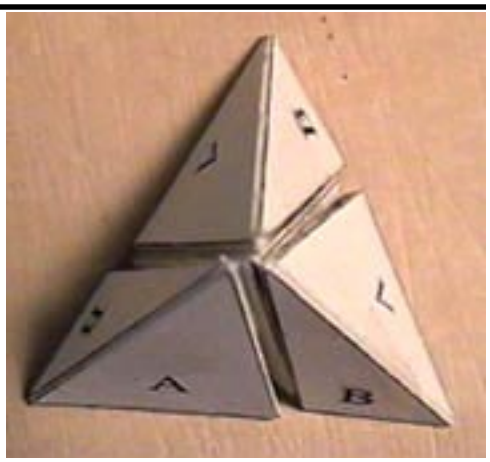
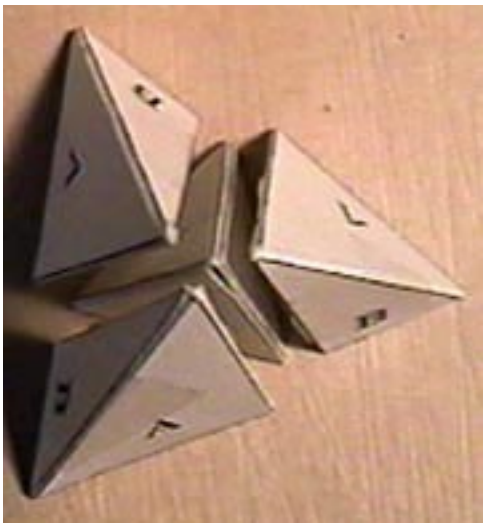
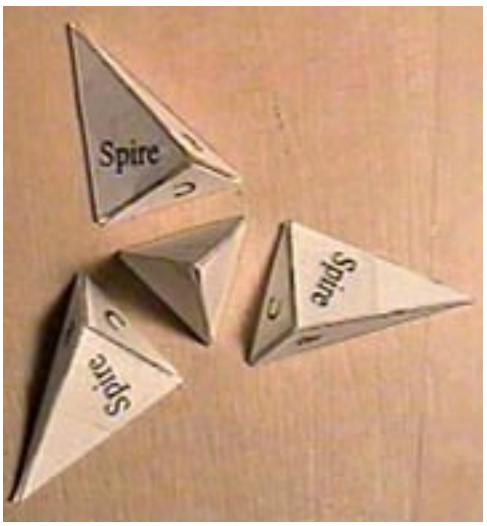
Three Slice-Modules form the outside portions of the tetrahedron. Each Slice-Module in this tetrahedron is the same.



As the Slice-Modules are pulled away from the center of the tetrahedron, the spire appears as a core.



The Slice Modules are dropped outward on their (A) faces and their bases (C) are up ended.



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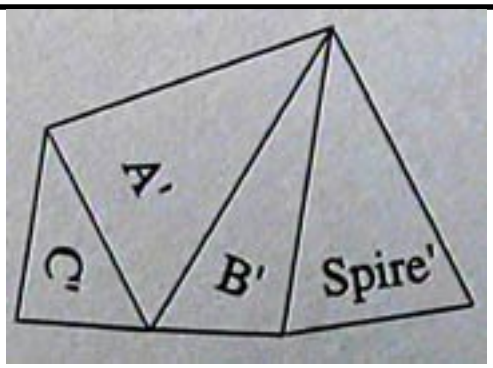
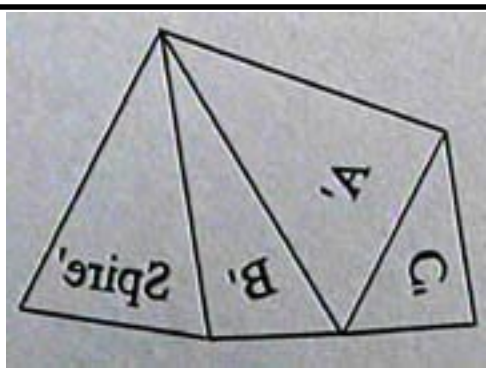
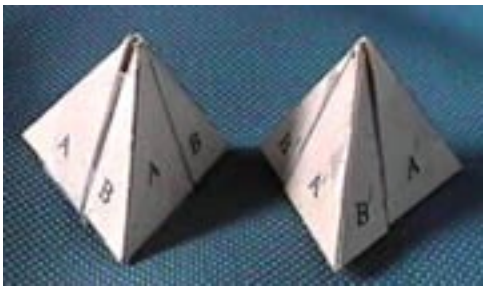


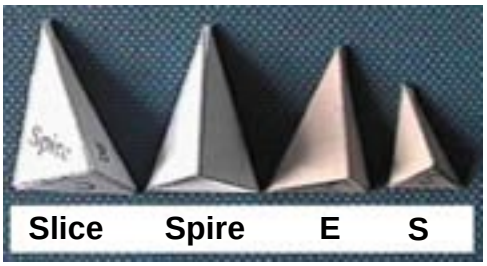


When the net for the Slice-Module is printed on transparent plastic, the sheet can be flipped over to produce a mirror image form.

To better differentiate the two mirror image tetrahedrons, one net is changed to use the letters: A, B, C, Spire and the flipped net uses the letters: A', B', C', Spire'.



Relative sizes are compared between Fuller's E-Module, S-Module and the Slice-Module and Spire-Module of this study.



Relative module sizes

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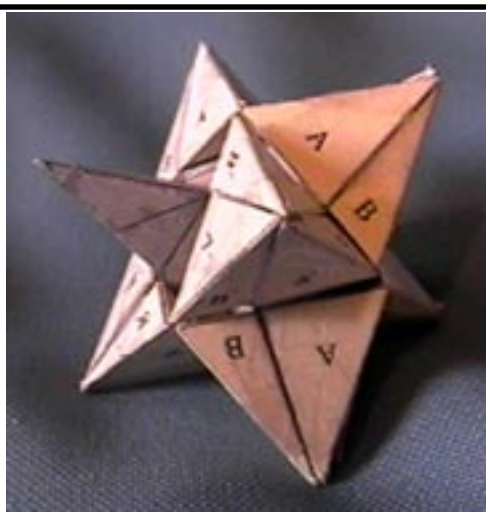
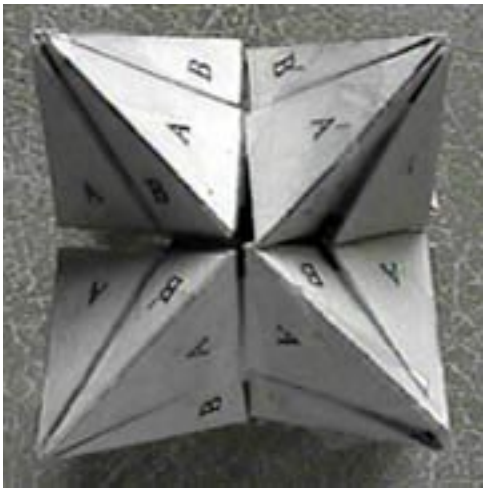
The stella octangula (duotet cube) formed with a core concave dodecahedron. When in-spired tetrahedrons are placed on each of the eight spires, the tetrahedrons are positioned by the spires into two mirror image 2-frequency tetrahedrons.



If the tetrahedron coded as A' (on the right) is instead placed on the spire holding the tetrahedron coded as A (on the left), the A' tetrahedron is turned out of position by the inserted spire from below. This is because the spire on the right side of the form is turned in a different position than the one on the left side.



The spires inserted inside the tetrahedrons position the red and blue tetrahedrons differently. As a result, the red tetrahedrons are positioned to form a 2-frequency red tetrahedron that is separate from the blue mirror image 2-frequency tetrahedron.

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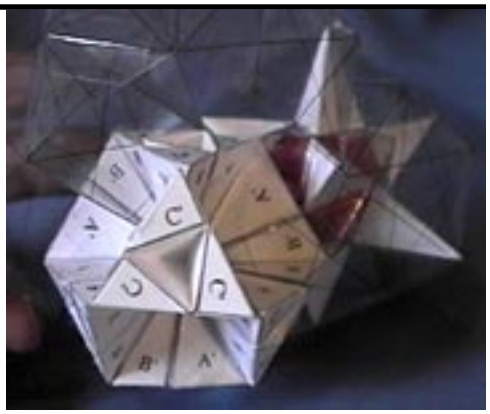

Just as the Slice-Modules form the stella octangula they also form the vector equilibrium (cube octahedron). The spire from one concave dodecahedron can be seen penetrating one of the tetrahedrons of the vector equilibrium. Each opposite tetrahedron in the vector equilibrium is the mirror of the other. That is, when proceeding from the outside base of one tetrahedron to its opposite vertice, then moving through the core nothingness, the next vertice and form met is the mirror of the tetrahedron.

Summary:

The faces of regular pentagonal dodecahedrons lie in the same planes as the sliced cleavage fractures produced in the tetrahedron. It appears that the face planes of the dodecahedron act as cleavers to slice the tetrahedron into modules.

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