# Cube of eight carbon atoms

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http://homepage.mac.com/whitby/

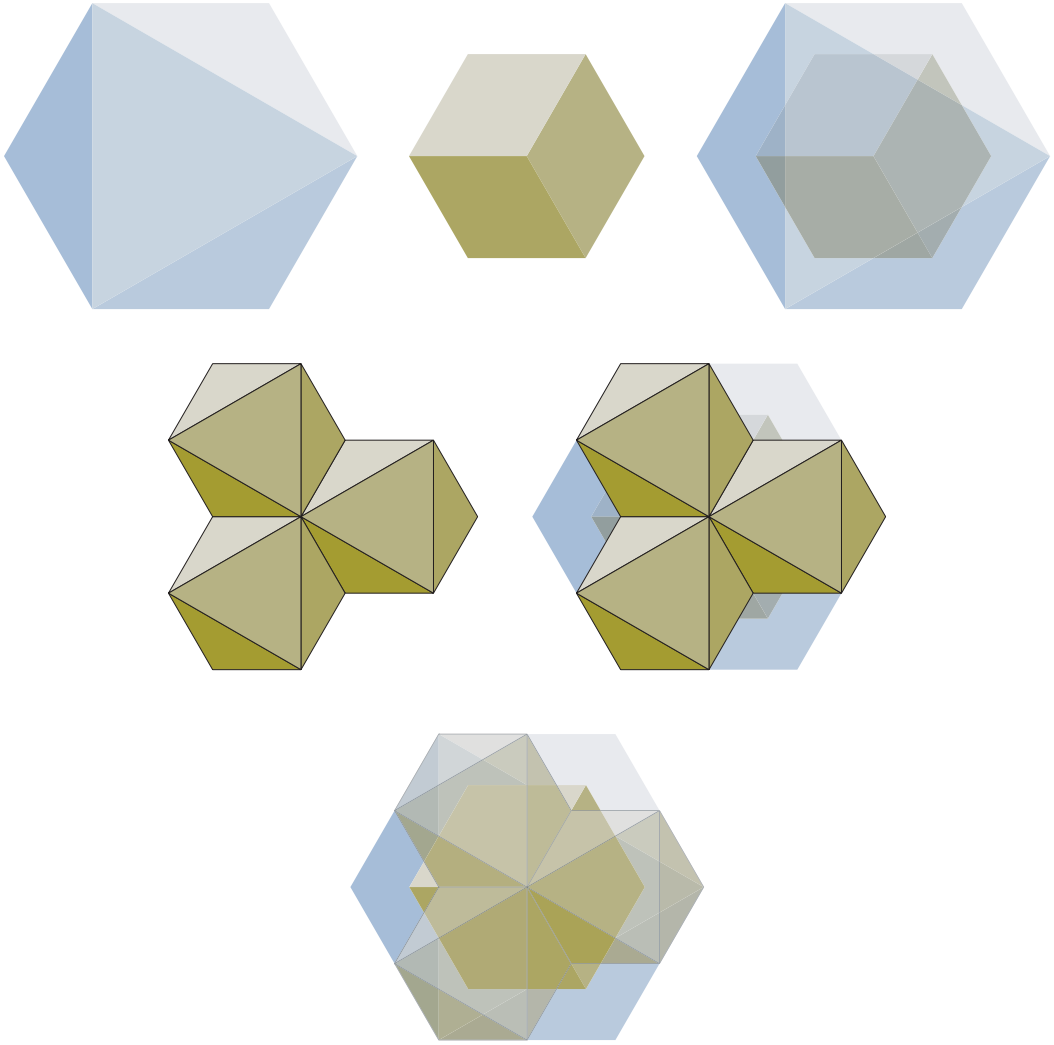
http://web.me.com/whitby/Octahedron/Welcome.html

## References

Octahedron1stEd.pdf
QuasicryOcta.pdf

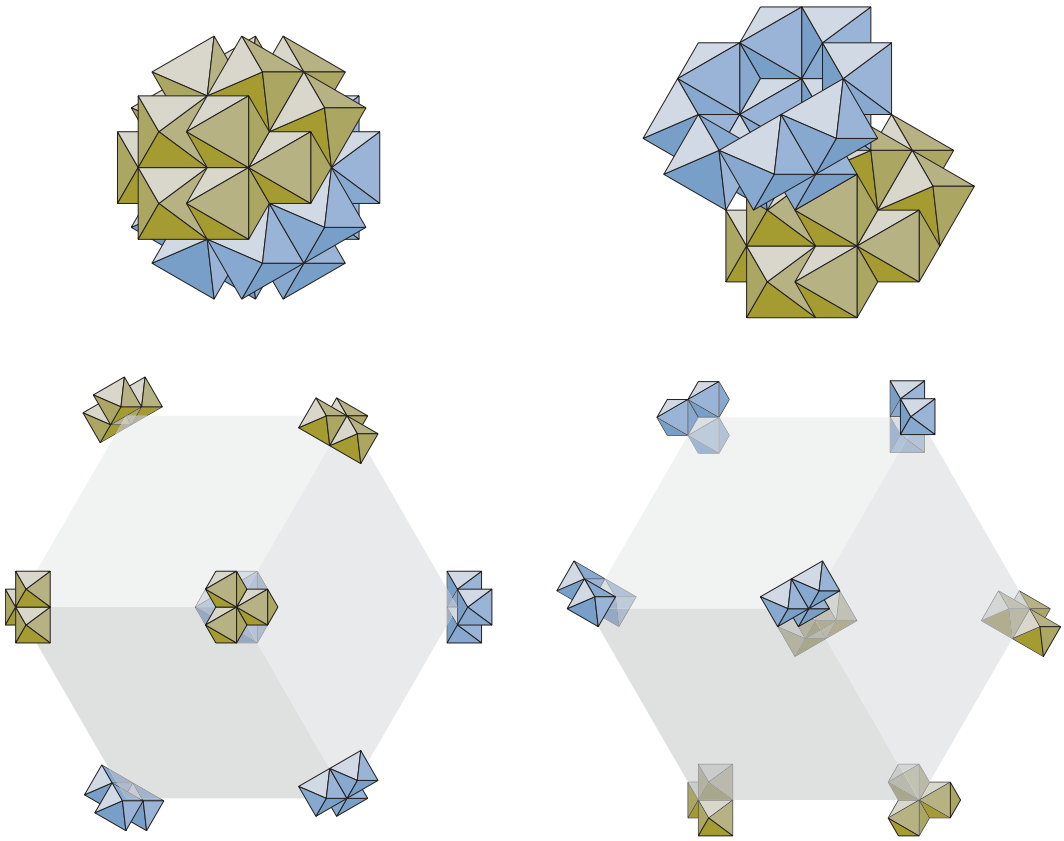
## Introduction

The assembly of eight C-atoms as facial panels of a regular octahedral volume had the unintended consequence of producing a cube in which each of the C-atoms is at a cube vertex. This results from the duality of the cube and the octahedron. A second cube of eight C-atoms can be produced in which the C-atoms are capable of cleft joins with N-atoms.



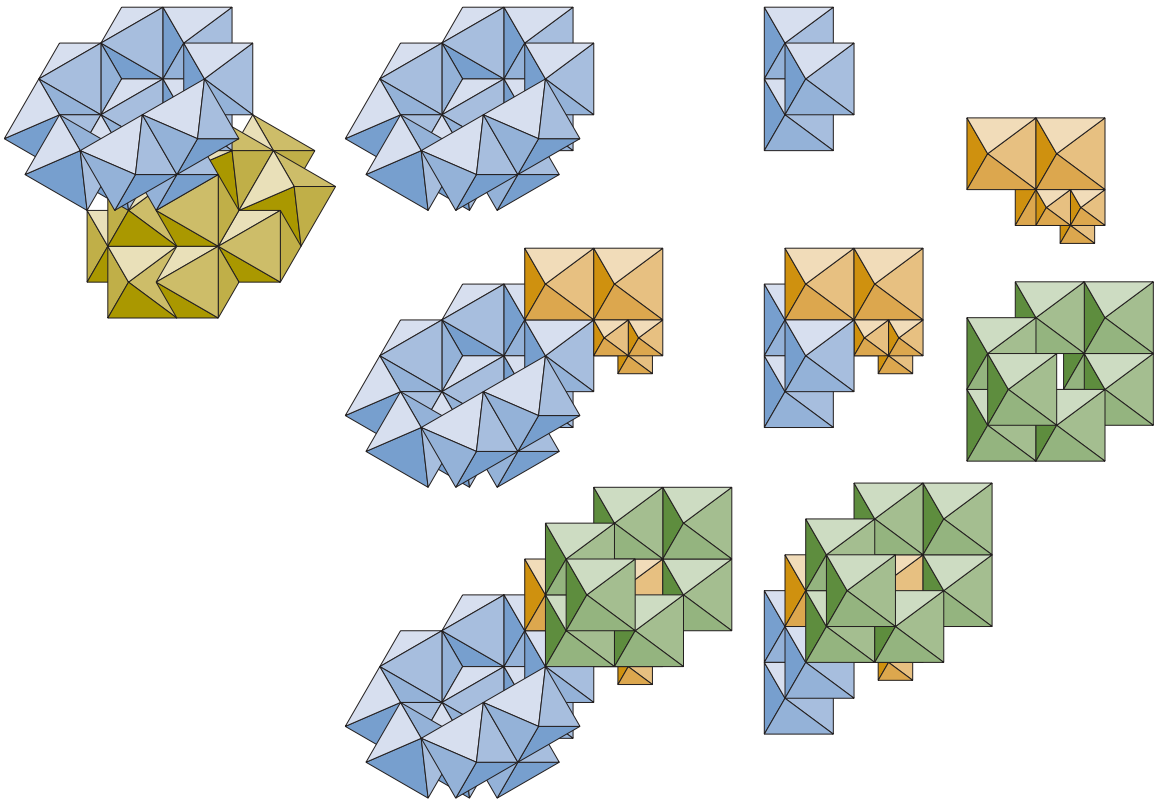
**How carbon atoms joining as the facial panels of an octahedron are found at the vertexes of a cube.**

The octahedral volume depicted at the upper left of the figure is the volume which will be defined by eight C-atoms acting as facial panels. The yellow cube to its right is sized so that its vertexes just contact the facial centroids of octahedron. At the top right, the centroids of cube and octahedron are congruent. A carbon atom is shown at the left of the middle row. The carbon atom is in place on the octahedral volume at the right. At the bottom, the carbon atom has been rendered transparent so that the congruence of its symmetry axis with the vertexial diameter of the cube can be seen.



**Two cubes formed of eight carbon atoms**

Each of the eight carbon atom assemblies at the top of the figure are cubes. The relationship between the atoms and the cubes they define are shown at the bottom of the figure. The C-atoms of the assembly on the left enclose a regular octahedral volume. The assembly on the right is composed of the same two subassemblies as the one on the left, but they are transposed. The C-atoms of the assembly on the right can make cleft joins with other atoms; the C-atoms of the assembly on the left cannot.



**Cleft joining of N-atom to C-atom of eight C-atom cube.**

The figure shows how an N-atom join with a C-atom of the cube. An $O_2$-group is then joined to the N-atom. $NO_2$-groups can join to each of the other C-atoms of the cube in the same way. The eight C-atom cube is shown at the top left. To its right, the blue portion is shown by itself. To its right, the C-atom which is to be joined is shown by itself. The orange group at the top right is an N-atom. In the second row, the N-atom is shown joined to the blue assembly and the lone C-atom. The green assembly is an $O_2$-group. In the bottom row, the $O_2$-group has been joined to the N-atoms of the two assemblies.