

# The Isotropic Vector Matrix

## Nature's Coordinate System

The tetrahedron combines with the octahedron to fill space, providing a lattice known to crystallographers as the face-centered cubic ([fcc](#)), and to Fuller as the isotropic vector matrix (IVM). Fuller emphasizes the IVM over the more familiar *xyz* apparatus, arguing that our fixation on cubes and right angles goes against the grain of nature, and begets a lot of unnecessary awkwardness in our curriculum.

This isotropic vector matrix is a lattice of rods connecting the centers of spheres of equal radius. Every sphere is a nucleus surrounded by 12 others in a cuboctahedral conformation (not the only option). The rods, or stress vectors, define tetrahedral and octahedral voids, of volume one and four respectively.

The IVM is also known as the [octet truss](#) and is quite widely used in architecture and engineering. As a uniform dispersion of points in space, the IVM models an ideal gas, freeze-framed to define average molecular positions as per Avogadro's Law.

