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The 3D Visualization of E_8 using an H_4 Folding Matrix

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This paper will present various techniques for visualizing a split real even E_8 representation in 2 and 3 dimensions using an E_8 to H_4 folding matrix. This matrix is shown to be useful in providing direct relationships between E_8 and the lower dimensional Dynkin and Coxeter-Dynkin geometries contained within it, geometries that are visualized in the form of real and virtual 3 dimensional objects. A direct linkage between E_8, the folding matrix, fundamental physics particles in an extended Standard Model GraviGUT, quaternions, and octonions is introduced, and its importance is investigated and described.

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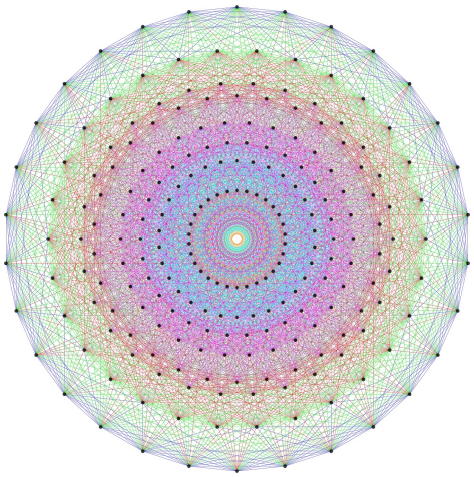

FIG. 1: E_8 Petrie projection

I. INTRODUCTION

Fig. 1 is the Petrie projection of the largest of the exceptional simple Lie algebras, groups and lattices called E_8. It has 240 vertices and 6720 edges of 8 dimensional (8D) length $\sqrt{2}$. Interestingly, in addition to containing the 8D structures of D_8 (aka. the rectified 8-orthoplex) and BC_8 (aka. the 8 demicube or alternated octeract), E_8 has been shown to fold to the 4D Polychora of H_4 (aka. the 120 vertex 600-cell) and a scaled copy $H_4\Phi$[10][20], where $\Phi = \frac{1}{2}\left(1+\sqrt{5}\right) = 1.618...$ is the big Golden Ratio and $\varphi = \frac{1}{2}\left(\sqrt{5}-1\right) = 1/\Phi = \Phi - 1 = 0.618...$ is the small Golden Ratio. Fig. 2 shows the folding orientation of E_8 and D_6 Dynkin diagrams above the H_4 and H_3 Coxeter-Dynkin diagrams (respectively).

The 600-cell is constructed from the combination of the 96 vertices of the snub 24-cell and the 24 vertices of the 24-cell shown in Fig. 3. The 24-cell is self-dual and contained within both F_4 and the triality symmetry of the D_4 Dynkin diagram. It is interesting to note that it is constructed from the 16 vertices of the BC_4 tesseract (or 8-cell or 4-cube) and the 8 vertices of it's dual, the 4-orthoplex (or 16-cell). All of these polychora can be found within E_8 with the excluded 8-orthoplex. The snub 24-cell is constructed from even permutations of $\{\Phi, 1, \varphi, 0\}$. Also shown in Fig. 3 is the dual of the 600-cell, namely the 120-cell with 600 vertices and a trirectified H_4 Coxeter-Dynkin diagram (i.e. the filled node is moved to the other end).

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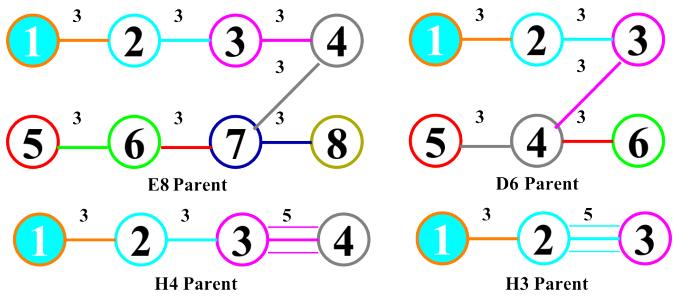


FIG. 2: E_8 and D_6 Dynkin diagrams in folding orientation with their associated Coxeter-Dynkin diagrams H_4 and H_3

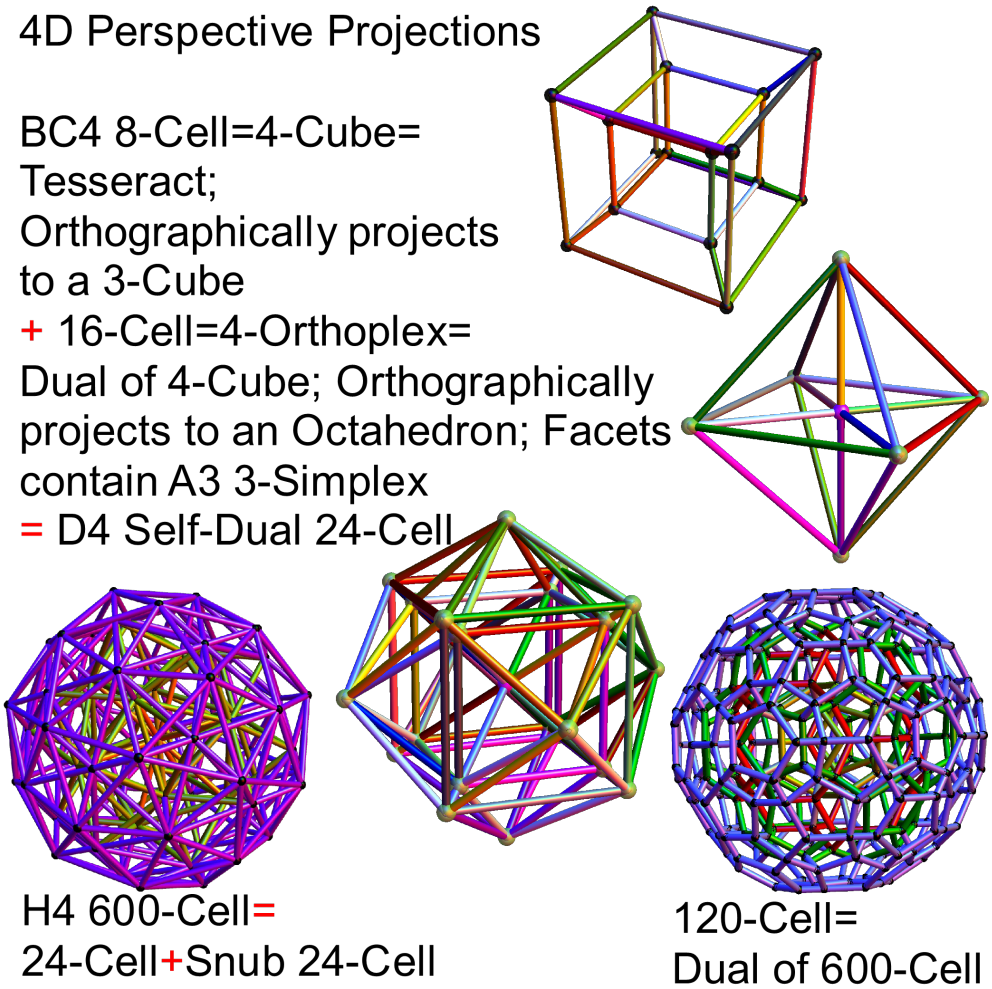


FIG. 3: 4D Polychora

$$\mathrm{H4}_{\mathrm{fold}} = \begin{pmatrix} \Phi & 0 & 0 & 0 & \varphi^2 & 0 & 0 & 0 \\ 0 & \varphi & 1 & 0 & 0 & -\varphi & 1 & 0 \\ 0 & 1 & 0 & \varphi & 0 & 1 & 0 & -\varphi \\ 0 & 0 & \varphi & 1 & 0 & 0 & -\varphi & 1 \\ \varphi^2 & 0 & 0 & 0 & \Phi & 0 & 0 & 0 \\ 0 & -\varphi & 1 & 0 & 0 & \varphi & 1 & 0 \\ 0 & 1 & 0 & -\varphi & 0 & 1 & 0 & \varphi \\ 0 & 0 & -\varphi & 1 & 0 & 0 & \varphi & 1 \end{pmatrix} \tag{1}$$

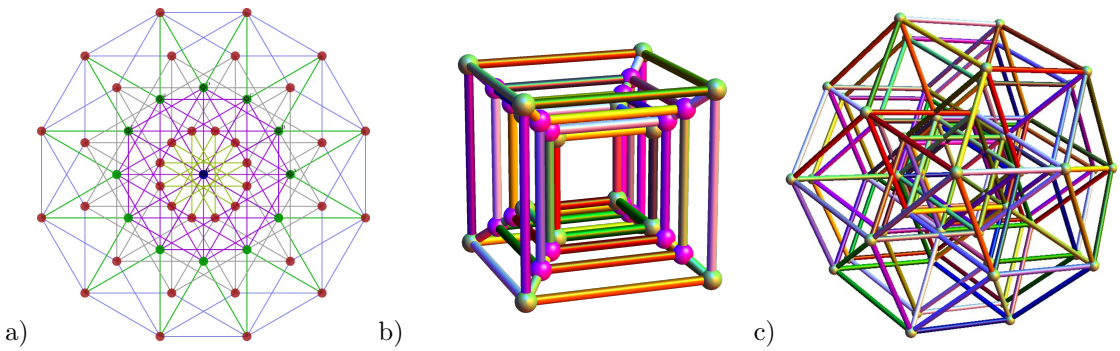


FIG. 4: The 6-cube a) Petrie projection b) 3D perspective c) rhombic triacontahedron

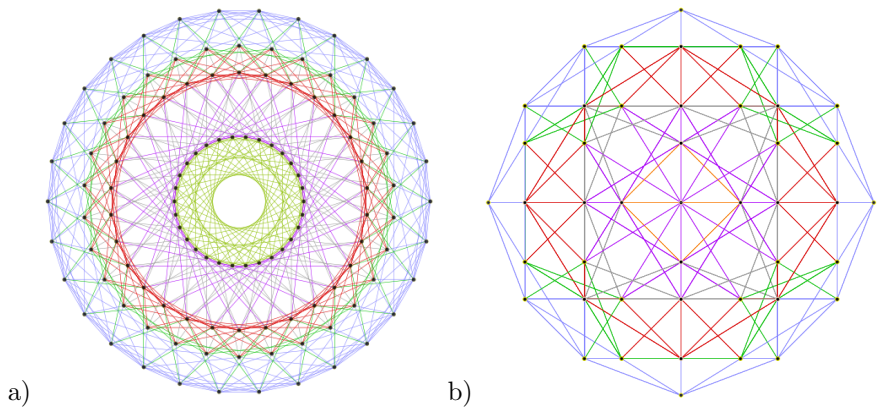


FIG. 5: H_4 600-cell 2D projections: a) Van Oss (or Petrie), b) orthonormal

The specific matrix for performing this folding of E_8 group vertices was shown[16] several years ago to be that of (1). Notice that $\mathrm{H4_{fold}} = \mathrm{H4_{fold}}^T$ such that it is symmetric with a quaternion-octonion Cayley-Dickson like structure. Only the first 4 rows are needed for folding E_8 to H_4, but the 8×8 square matrix is useful in the rotation of 8D vectors by taking its inverse.

E_8 also contains the 6D structures of the 6-cube or hexeract as shown in Fig. 4. It has been shown that using rows 2 through 4 of $\mathrm{H4_{fold}}$ projects the 6-cube[1] down to the 3D Rhombic Triacontahedron[3]. This particular object is interesting in that it contains the Platonic solids including the icosahedron and dodecahedron, and has been used to describe the Φ related geometry leading to quasicrystals[2].

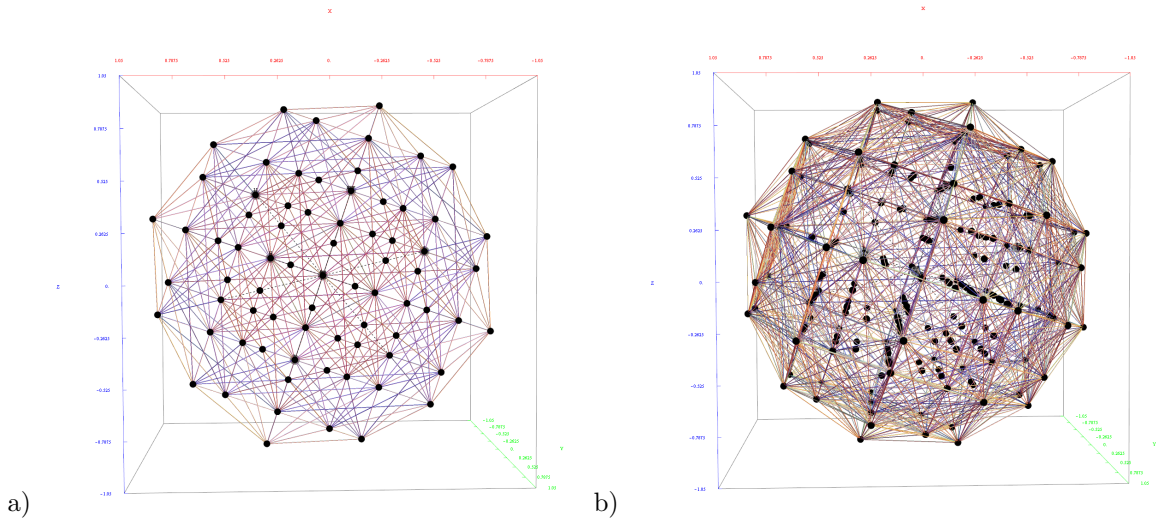
II. $\mathrm{H4_{fold}}$ MATRIX ANALYIS

$$\begin{array}{lcccccccc} \mathrm{x}=\{ & 0 & 0 & 0 & 0 & -\Phi 2\mathrm{Sin}\frac{2\pi}{60} & 0 & 1 & 0 & \} \\ \mathrm{y}=\{ & 0 & 0 & 0 & 0 & 0 & \Phi 2\mathrm{Sin}\frac{2\pi}{30} & 0 & 2\mathrm{Sin}\frac{2\pi}{15} & \} \\ \mathrm{z}=\{ & 0 & 0 & 0 & 0 & 1 & 0 & \Phi 2\mathrm{Sin}\frac{2\pi}{60} & 0 & \} \end{array} \tag{2}$$

$$\begin{array}{lcccccccc} \mathrm{X}=\{ & 0.0522642 & 1/4 & 0 & -0.404508 & -0.221395 & 1/4 & 0 & 0.404508 & \} \\ \mathrm{Y}=\{ & 0 & -0.27216 & -0.160853 & 0.203368 & 1/4 & 0.27216 & 0.497261 & 0.203368 & \} \\ \mathrm{Z}=\{ & -0.154508 & 0.0845653 & 0 & -0.13683 & 0.654508 & 0.0845653 & 0 & 0.13683 & \} \end{array} \tag{3}$$

Projection of E_8 to 2D (or 3D) requires 2 (or 3) basis vectors $\{X, Y, Z\}$. We start with those in (2), which are simply the two 2D Petrie projection basis vectors of the 600-cell (aka. the Van Oss projection) as shown in Fig. 5 a), with a 3rd z basis vector added for the 3D projection. Notice the 8D basis vectors with zero in the first 4 columns (or dimensions).

$$\text{Space-Time metric signature ST} = \{t, x, y, z\} = \{-1, 1, 1, 1\} \tag{4}$$



a) b)

FIG. 6: E_8 projection showing H_4 and $H_4\Phi$ orthonormal face orientation in 2D and 3D perspective. Only 1220 of 6720 edges are shown in order to prevent occlusion of vertices in 3D.

$$\text{Eigenvalues:} \quad \begin{array}{ll} \text{H4}_{\text{fold}} & \text{eVal} = 2\{ST, \varphi ST\} \\ \text{H4}_{\text{fold}}^{-1} & \text{eValInv} = \{ST, \Phi ST\}/2 \end{array} \tag{5}$$

$$\text{Eigenvectors of H4}_{\text{fold}} \ \text{eVec} = \begin{pmatrix} 0 & -1 & 1 & 0 & 0 & -1 & 1 & 0 \\ 0 & 0 & 0 & 1 & 0 & 0 & 0 & 1 \\ 0 & 1 & 1 & 0 & 0 & 1 & 1 & 0 \\ 1 & 0 & 0 & 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & -1 & 0 & 0 & -1 & 1 \\ 0 & 0 & -1 & -1 & 0 & 0 & 1 & 1 \\ 0 & -1 & 0 & 0 & 0 & 1 & 0 & 0 \\ -1 & 0 & 0 & 0 & 1 & 0 & 0 & 0 \end{pmatrix} \tag{6}$$

The E_8 projection basis (3) is obtained by $\{X, Y, Z\} = \text{H4}_{\text{fold}}^{-1}.\{x, y, z\}$. On one face (or 2 of 6 cubic faces, which are the same), they project E_8 to its 2D Petrie projection shown in Fig. 1. On another face of this particular 3D projection is what would be found on all 6 faces of an orthonormal projection to 3D of the H_4 600-cell combined with a scaled $H_4\Phi$, shown in 2D on Fig. 5 b) and in 3D in Fig. 6. It is also interesting to note the $\{X, Y, Z\}$ quaternion-octonion Φ related scaling between dimensions $\{1, 5\}$ and $\{3, 7\}$, and the $\pm$ sign pairing of $\{2, 6\}$ and $\{4, 8\}$.

In addition, the {eigenvalue, eigenvector} systemics of H4_{fold} and $\text{H4}_{\text{fold}}^{-1}$ relate to the general relativistic (GR) space-time metric signature in 4 as quaternion parts of the octonion vectors in 5. The eigenvector matrix is shown in 6, where $\text{H4}_{\text{fold}} = \text{eVec}^T.\text{Diag}(\text{eVal}).(\text{eVec}^T)^{-1}$. The eigenvectors of $\text{H4}_{\text{fold}}^{-1}$ are the same as those in eVec.

This pattern of eigenvalues and eigenvectors strongly suggests that E_8 (and H_4) passes through a "geometric identity" as it folds (or unfolds), respectively. This makes establishing a unit determinant of these matrices interesting. The $\text{Det}(\text{H4}_{\text{fold}}) = (4\varphi)^3(\Phi^2 - \varphi^4) = 37.3499...$, such that $\text{Adj}(\text{H4}_{\text{fold}}) = \text{Det}(\text{H4}_{\text{fold}}) * \text{H4}_{\text{fold}}^{-1}$. Establishing the $\text{Det}(\text{H4}_{\text{fold}}) = 1.00$ by dividing by 37.3499 is easily done. Yet, $\text{Det}(\text{H4}_{\text{fold}}/((4\varphi)^3(\Phi^2 - \varphi^4)) \approx 0$, suggesting the rows and columns of the matrices not independant.

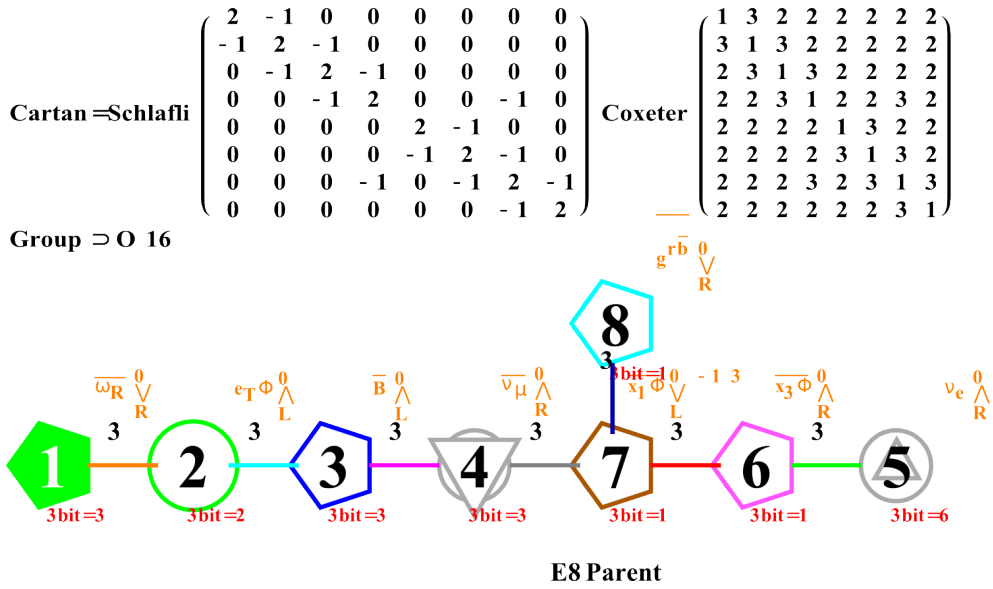


FIG. 7: E_8 Dynkin diagram with Cartan, Schlafli, and Coxeter matrices

$$\mathrm{E8}_{\mathrm{srm}} = \begin{pmatrix} 1 & -1 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 1 & -1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & -1 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & -1 & 0 & 0 & 0 \\ -\frac{1}{2} & -\frac{1}{2} & -\frac{1}{2} & -\frac{1}{2} & -\frac{1}{2} & -\frac{1}{2} & -\frac{1}{2} & -\frac{1}{2} \\ 0 & 0 & 0 & 0 & 0 & 1 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 & -1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 1 & -1 & 0 \end{pmatrix} \tag{7}$$

There are several choices for the form of E_8, whether it be complex or split real (even or odd). For the purposes of this work, the form selected is split real even (SRE). While the basic topology of the E_8 Dynkin diagram is unique, it has 8!=40320 permutations of node ordering. The node order used here is given in Fig. 7. The 240 specific E_8 group vertex values are determined from the simple roots matrix $\mathrm{E8}_{\mathrm{srm}}$ shown in (7). The resulting Cartan matrix and generated algebraic roots are directly dependent on these as inputs.

$$\mathrm{E8}_{\mathrm{Cartan}} = \mathrm{E8}_{\mathrm{srm}}.\mathrm{E8}_{\mathrm{srm}}^{T} \tag{8}$$

$$\mathrm{E8}_{\mathrm{SREvertex}} = \mathrm{E8}_{\mathrm{srm}}^{T}.\mathrm{E8}_{\mathrm{root}} \tag{9}$$

The Dynkin diagram was constructed as user input with the Mathematica "VisibLie" notebook. Fig. 7 was generated and exported from the referenced tool, as are all of the figures in this paper. It has the same node ordering as the E_8 Dynkin used in Fig. 2, but is now shown with the assigned physics particles with SRE $E_8\#\{206, 194, 184, 176, 1, 169, 170, 166\}$ that make up the simple roots matrix row entries of (7). The Cartan matrix can be generated directly by the structure of the Dynkin diagram or from its relationship to the simple roots matrix (8). The positive E_8 algebra roots are generated by the Mathematica "SuperLie" package and listed with its Hasse diagram in Appendix A. The 120 positive and 120 negative algebra roots are then used to generate the SRE E_8 vertices using (9).

E_8 GraviGUT Extended Standard Model Construction

Lisi has proposed an extended Standard Model (SM) GraviGUT based on an E_8 Lie Algebra with a fundamental physics particle associated with each of its 240 roots[11]. While the particle assignments

were modified from his original model to his current model[12], the model used here is closer to the original. It is modified slightly in order to create a complete 8-bit quantum pattern consistent with Figures 9 and 10. The complete E_8 vertex to particle and octonion assignments are listed for reference in Appendix B. The construction of this model is based on the $256 = 2^8$ binary pattern from the 9th row of the Pascal triangle {1, 8, 28, 56, 70, 56, 28, 8, 1} and its associated Cl_8 Clifford Algebra, shown in Fig. 8.

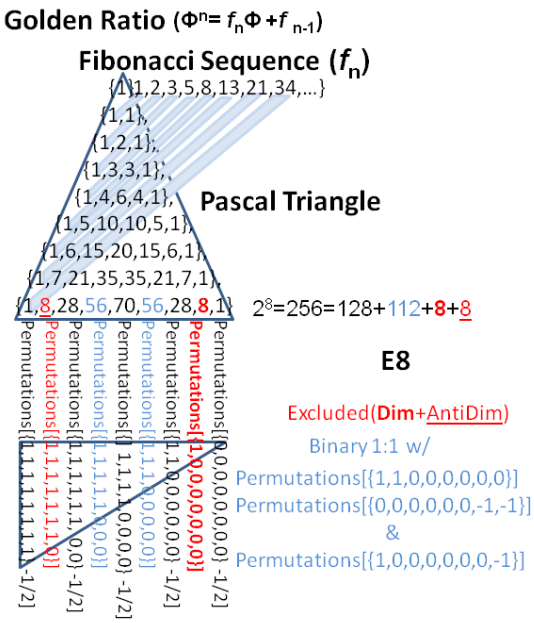


FIG. 8: SRE E_8 construction from Pascal Triangle, Cl_8 Clifford Algebra and binary permutations

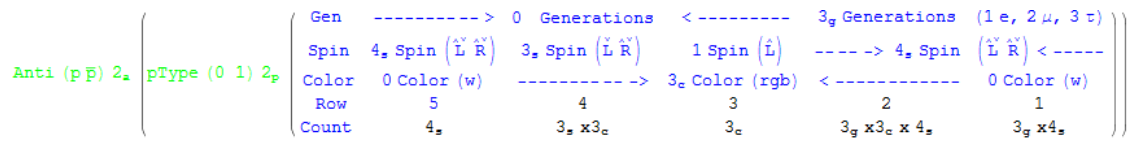


FIG. 9: Particle flavor counts given quantum number assignments

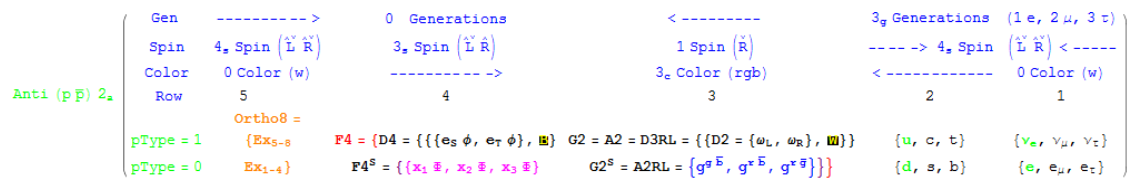


FIG. 10: Particle flavors in row / column groups with boson {group} coloring based on Lie group assignments (F_4 , F_4^*, D_4&G_2, G_2^*)

In this model, the 16 particles associated with columns 2 and 8 of the 9th row of the Pascal triangle {8, 8} are excluded as dimensional generators from the permutations of $\{\pm1, 0, 0, 0, 0, 0, 0, 0\}$. These excluded particles are associated with the 8-orthoplex (dual of the 8-cube with 256 vertices). While the positive generators are added to the "dimension count" of E_8, they are not included as vertices per se, but they do show up in the projections as the axis of the basis vectors. This leaves E_8 with its 120 positive roots and 120 negative roots in the other 7 columns of the Pascal triangle.

The SRE E_8 roots are defined by combining the 112={56, 56} integer roots of Lie group D_8=SO(16) with 128={1, 28, 70, 28, 1} half integer roots of Lie group BC_8=Sp(16). Specifically, D_8 contains all permutations of $\{\pm1, \pm1, 0, 0, 0, 0, 0, 0\}$ and BC_8 contains all permutations of $\{\pm1, \pm1, \pm1, \pm1, \pm1, \pm1, \pm1, \pm1\}/2$ with an even number of plus signs (an 8 demicube or even 7-cube).

There are 48 assigned D_8 integer bosons and only 128 C_8 half-integer vertices available. Yet, with $192 = 64 * 3$ generation fermions in SM, the meaning or validity of assigning a generation of fermions to the remaining 64 D_8 integer vertices has been hotly debated[7]. In this model, the remaining 64 integer vertices are assigned to the 2nd generation fermions. For a complete reference of particle assignments, see Appendix B.

The specific particle assignments are determined by the configuration of the particle {spin, color, generation, flavor and type} and the patterns within E_8. The particle type $\{e, \nu_e\}$ or $\{u, d\}$ and spin $\{\overset{\vee}{L}, \hat{R}, \hat{L}, \overset{\vee}{R}\}$ are assigned or encoded in the positions or dimensions $\{1,\ 2,\ 3,\ 4\}$ of each E_8 vertex. The generations are encoded in position $\{5\}$, and color in positions $\{6,\ 7,\ 8\}$. The antiparticle operation is simply the negation of the E_8 vertex (or in the binary representation "inverted" $0 \Leftrightarrow 1$ as shown in Fig. 8). It should be noted that although the positive roots of the algebra are not all assigned as "particles", the negation of the root does represent the "anti" particle operation on the assigned particle. The charge calculation for the particles is obtained by $Q = \mathrm{E8}_{\mathrm{SREvertex}}.\{0, 0, 0, -3, 0, 1, 1, 1\}/3$. This provides accurate results for the generation 0 bosons and 1st and 3rd generation fermions. It shows interesting deviations for some of the 2nd generation fermions that have been assigned to the D_8 integer vertices.

It is also helpful to note that the entire binary and SRE vertex list (as constructed in Fig. 8 and listed in Appendix B) is lexicographically ordered from negative to positive with a left-right and bottom-top mirroring about the middle, between the 128th and 129th of 256 vertices, which are the $\hat{R}$ tau neutrinos ν_τ and $\overline{\nu_\tau}$. Also of interest are the first and last vertex particles which are rows $\{1,\ 9\}$ of the Pascal Triangle with all 0 or all 1/2 entries. These are the $\hat{R}$ electron neutrinos ν_e and $\overline{\nu_e}$. This integrated model aligns well with the idea that it is associated with (T)ime reversal in the Charge-Parity-Time (CPT) conservation laws and points to the special consideration needed for the right handed neutrinos in the SM.

III. THE QUANTUM BIT-WISE PARTICLE ASSIGNMENTS

The 1:1 bit-wise correspondence of a particle's quantum number assignments is a big-endian (left most significant) zero-based 8 dimensional vector {7-0}. The assignments are {1 antiparticle bit=$\{\boldsymbol{a}\}(p/\bar{p})$, 1 $\mathrm{p_{type}}$ bit=$\{\boldsymbol{p}\}(e/\nu$ leptons or u/d quark), 2 color bits=$\{c1, c0\}$(w=0 or none/r/g/b), 2 spin bits=$\{s1, s0\}(\overset{\vee}{L}, \hat{R}, \hat{L}, \overset{\vee}{R})$, and 2 generation bits=$\{g1, \boldsymbol{g0}\}$(0=bosons/$e/\mu/\tau$)} or simply $\{\boldsymbol{a}, \boldsymbol{p}, s1, s0, c1, c0, g1, \boldsymbol{g0}\}$. The **bold** type face indicates quantum assignments which are not only allocated to an SRE E_8 vertex dimension as described above, but are exhibited in the inherent structural symmetry of the E_8 algebra, group or lattice. These **bold** bits are used to define the 3 bit structure of (10) associated with the E_8 Dynkin diagram in Fig. 7.

$$E_8\ \mathrm{Dynkin}_{3\ \mathrm{bit}} = \begin{pmatrix} \textbf{3bit =} & & 0 & 1 \\ 4 = 2^2 & \textbf{g0} & \text{Boson} & \text{Fermion} \\ & & \text{Gen 0-2} & \text{Gen 1-3} \\ 2 = 2^1 & \boldsymbol{p} & e/d & \nu/u \\ 1 = 2^0 & \boldsymbol{a} & p & \bar{p} \end{pmatrix} \tag{10}$$

$$\mathrm{Physics}_{\mathrm{rot}} = \begin{pmatrix} 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{1}{\sqrt{2}} & -\frac{1}{\sqrt{2}} & 0 & 0 & 0 & 0 \\ 0 & 0 & \frac{1}{\sqrt{2}} & \frac{1}{\sqrt{2}} & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & \frac{1}{\sqrt{3}} & \frac{1}{\sqrt{3}} & \frac{1}{\sqrt{3}} \\ 0 & 0 & 0 & 0 & 0 & -\frac{1}{\sqrt{2}} & \frac{1}{\sqrt{2}} & 0 \\ 0 & 0 & 0 & 0 & 0 & -\frac{1}{\sqrt{6}} & -\frac{1}{\sqrt{6}} & \sqrt{\frac{2}{3}} \end{pmatrix} \tag{11}$$

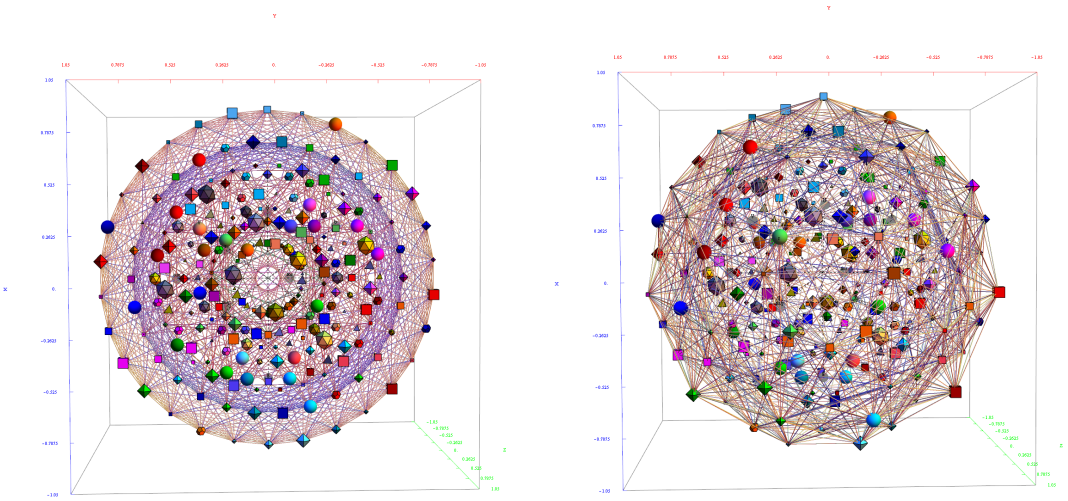


FIG. 11: E_8 showing the Petrie projection face orientation in 2D and 3D persepective with vertices as physics particle assignments. Vertex shape, size, color/shade are assigned based on extended Standard Model particle assignments. Only 1220 of 6720 edges are shown in order to prevent occlusion of vertices in 3D perspective.

$$\text{Fermionic Triality}_{\text{rot}} = \frac{1}{2}\begin{pmatrix} -1 & 1 & 1 & -1 & 0 & 0 & 0 & 0 \\ -1 & 1 & -1 & 1 & 0 & 0 & 0 & 0 \\ -1 & -1 & 1 & 1 & 0 & 0 & 0 & 0 \\ 1 & 1 & 1 & 1 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & -1 & -1 & -1 & -1 \\ 0 & 0 & 0 & 0 & 1 & 1 & -1 & -1 \\ 0 & 0 & 0 & 0 & 1 & -1 & 1 & -1 \\ 0 & 0 & 0 & 0 & 1 & -1 & -1 & 1 \end{pmatrix} \tag{12}$$

$$\text{Bosonic Triality}_{\text{rot}} = \frac{1}{3}\begin{pmatrix} 3 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & -3 & 0 & 0 & 0 & 0 \\ 0 & 3 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & -3 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & -2 & -1 & 2 \\ 0 & 0 & 0 & 0 & 0 & 2 & -1 & -1 \\ 0 & 0 & 0 & 0 & 0 & -1 & 2 & -1 \end{pmatrix} \tag{13}$$

As already described for the E_8 vertices, the $\{\boldsymbol{a}\}$ bit splits the 128 particles from 128 anti-particles. The $\{\boldsymbol{g0}\}$ bit splits the generation 0 boson family of 128(=112 integer roots of D_8+16 excluded integer roots of the 8-orthoplex) from the 128 half integer root (and half integer spin) of C_8 fermions. The $\{\boldsymbol{p}\}$ bit splits all particle families into two types, referenced in the leptons as electron and neutrino types, while the quarks are designated by up and down types. It splits the integer bosons into 2 types as well, which is a key feature of this model over the original Lisi model.

These differences are most easily seen in the 8×8 rotation matrix used for transforming SRE coordinates to physics coordinates (11) and those matrices used in identifyingfermionic (12) and bosonic (13) triality transformations. Just as the E_8 to H_4 folding matrix has symmetric quaternion quadrants in the octonion matrix, the phyics and triality rotation matrices are divided by an upper left quadrant affecting the SRE $\{$1-4$\}$ spin positions and a lower right quadrant affecting the SRE $\{$5-8$\}$ generation-color positions. As a matter of fact, the physics rotation clearly operates on the SRE E_8 vertices by pairing them into 4 sets, specifically p_{type} $\{$1,2$\}$, spin $\{$3,4$\}$, generation $\{$5,6$\}$ and color $\{$7,8$\}$. This physics rotation is more dramatically shown in the next section on triality.

Visualizing this E_8 based physics model by projection to 2D and 3D with vertex shape, size and color assigned based on the described patterns is now possible. Using the direct relationship to lower dimensional geometry symmetries provided by the folding matrix provides the flexibility to select the

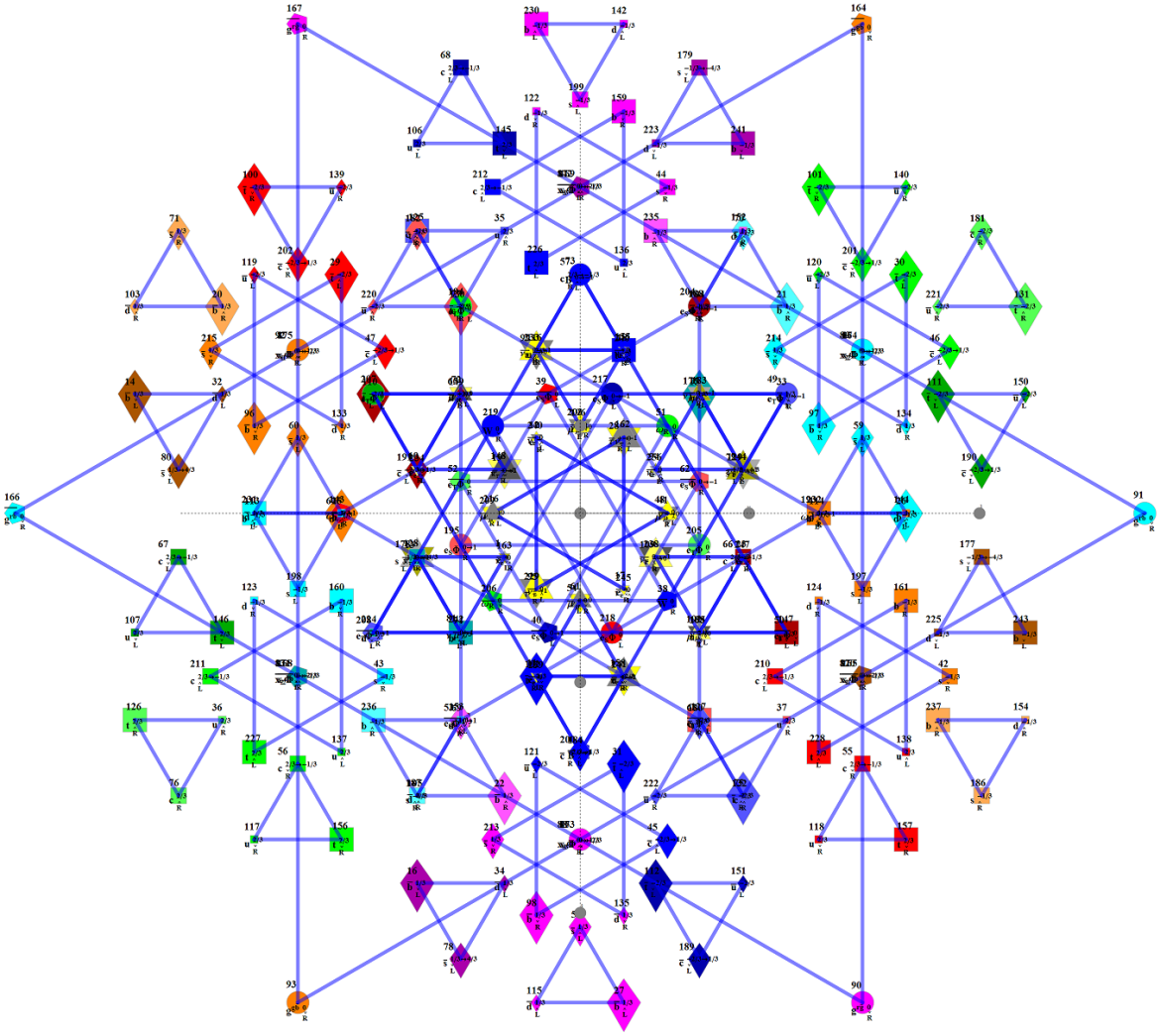


FIG. 12: E_8 with vertices rotated to physics coordinates and projected from 8D→2D, with 86=22 bosonic+64 fermionic triality generated ***equilateral*** trianges. Vertex shape, size, color/shade are assigned based on extended Standard Model particle assignments

contents of the visualization based on the quantum physics parameters of the model and not just the math of the geometry. A few examples are shown in Fig. 11.

Triality Relationships

The Lisi model also demonstrates a consistency with the bosons and fermions that is related to the triality relationships within E_8. This is shown in Fig. 12 with blue triality lines linking the 3 generations of each fermion using (12). Applying the triality rotation matrix as a dot product against an SRE vector gives the 2nd generation fermion particle. Applying it again gives the 3rd generation. Applying it a 3rd time returns to the 1st generation fermion. The bosons are also involved in triality relationships as well using (13), rotating through red, green, and blue particle color assignments.

It is interesting to note that the quarks $\{\mathrm{r/g/b},\ \mathrm{p}/\bar{p}\}$ are all located on 6 corresponding dual concentric circles around the center. The leptons are hexagonal "Star of David" patterns in the center, while the bosons are in single or dual hexagonal rings radiating from the center.

$$\text{Triality}_{\text{basis}} \begin{array}{l} H = \{\ 2-\frac{4}{\sqrt{3}} \quad 0 \quad 0 \quad \sqrt{2}-\sqrt{\frac{2}{3}}\ 0\ 0\ ,\sqrt{2} \quad 0\ \} \\ V = \{\ 0 \quad \frac{4}{\sqrt{3}}-2\ \sqrt{\frac{2}{3}}-\sqrt{2} \quad 0 \quad 0\ 0 \quad 0 \quad -\sqrt{2}\ \} \end{array} \tag{14}$$

The axis shown in Fig. 12 are rotated to physics coordinates using (11), which puts the basis vectors (14) on the projected (H)orizontal and (V)ertical axis. It seems to clarify dimensional identities as well. For example, when the $\{1, 2, 3\}$ dimensions are moved (i.e. using axis locators in the tool), all vertices change positions except the p_{type}=0 bosons {g gluons, $x_n\Phi$}. Moving dimension $\{4\}$ preserves these as well as the $\hat{L}$ and $\check{R}$ quark positions. Moving the dimensions $\{5, 6\}$ preserves these, except now the row 4 p_{type}=0 bosons $\{x_n\Phi\}$ emerge from the 6 triple overlap points at center of the quark's concentric rings (the intersection of the gluons triality lines). And finally, the $\{7, 8\}$ dimensions in physics can be identified with quark color, as $\{7\}$ preserves the blue quark positions, while $\{8\}$ moves the dual concentric rings of quarks while preserving their relative positions within the rings. It is interesting to note that the dimensions {6, 7, 8} are appropriately labeled {r, g, b} in SRE coordinates, since in this projection the SRE math coordinates are located at the afforementioned 6 triple overlap points at center of the quark's $\{\bar{r}, g, \bar{g}, b, \bar{b}\}$ concentric rings (the intersection of the gluons triality lines).

IV. E_8 TO H_4 FOLDING'S APPLICATION TO THEORETICAL PHYSICS

H4_{fold} provides a new and more direct relationship between E_8 and its lower dimensional geometric objects such as H_4. This has allowed for improvements to E_8 related physics models, such as those of Lisi[11]. This theoretical model is shown to provide E8_{srm} assigned particles as fundamental building blocks for generating the rest of the 240 E_8 vertex mapped particles[14].

Those specific particle assignments now also include their association to 8 bitwise quantum numbers, which are; the anti-particle bit, the particle type bit $\{e, \nu_e\}$ or $\{u, d\}$, 2 spin bits $\{\check{L}, \hat{R}, \hat{L}, \check{R}\}$, 2 color bits $\{w = 0, r, g, b\}$, and 2 generation bits $\{0, 1, 2, 3\}$. This capability of mapping specific particles to E_8 has allowed the verification of related results[9].

This has also allowed for improved charge calculations in Lisi's extended GraviGUT integrated Standard Model (SM)[12]. This was done through the analysis of variations associated with a particular association of generation 0 bosons and generation 1-3 fermions with H_4 and $H_4\Phi$[19].

E_8 has also been shown to be related to an 8 dimensional Charge-Parity-Time (CPT) construct for a Theory of Everything (ToE)[13]. This now includes particle mass predictions such as a Higgs mass of 124.443...GeV[15], which is within the current error bars of the LHC CMS experiment results for a discovered Higgs particle mass of 124.70 ± 0.31 (stat) ± 0.15 (syst) GeV[6]. More particle mass predictions based on the model have been found to be within standard experimental error. Other mass predictions are suggested by the features of this integrated geometry based physics model and are an active part of the author's research on the topic.

V. OCTONIONS AND E_8 WITH H_4 FOLDING

In addition to mapping extended SM particle quantum bits between H_4 and the SRE E_8 vertices and algebra roots, they have been mapped[17] to the 480 unique permutations of octonions[5] and the 3840 split octonions[18] through a common pattern associated with the quantum bits. This octonionic mapping provides valuable insight into related theoretical physics models.

$$\begin{array}{c} \text{Fano plane triads} \\ \{\{1,2,4\},\{1,3,7\},\{1,5,6\},\{2,3,5\},\{2,6,7\},\{3,4,6\},\{4,5,7\}\} \\ \\ \text{Flattened triads} \\ \{1,\mathbf{4},\mathbf{2},3,7,5,6\} \\ \\ \text{Mask bits} \\ \{0,0,0,0,0,0,0\} \end{array} \tag{15}$$

The double cover of the 240 vertices requires the addition of a 9th "flip" bit that operates on the

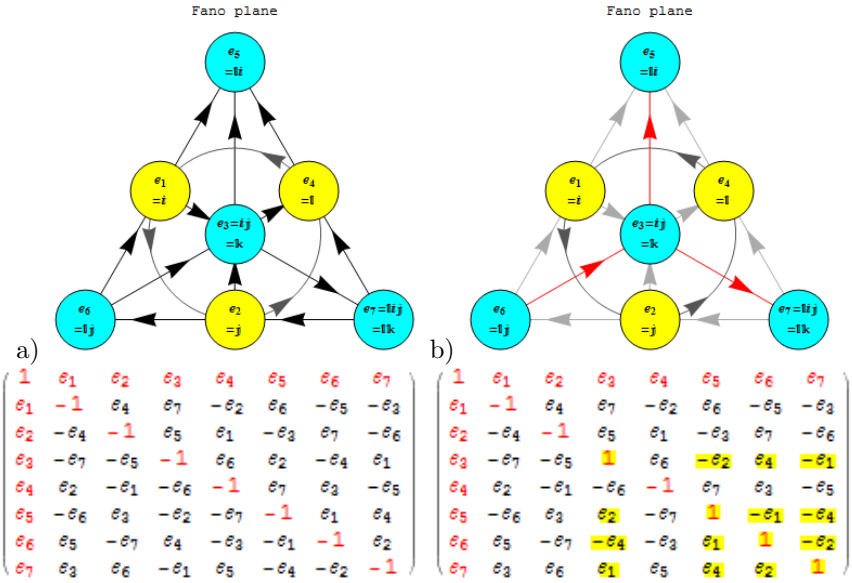


FIG. 13: Octonion representations: a) Fano plane, b) 1st triad split Fano plane

Fano plane representation by reversing two of the midpoint nodes in the Fano plane triads (i.e. those with circular directed edges in Fig. 13). These node numbers are always indicated by the 2nd and 3rd columns of the flattened triads as shown in (15). They are bolded when reversed (or "flipped"), which shows this particular octonion has the flip bit set. The flattened triad is simply created by taking in sequence the numbers from the first triad along with the last two numbers in the 2nd and 3rd triads. It operates to define the node numbers for each canonical position of the Fano plane mnemonic.

As it was for the permutation of node numbers in Dynkin diagrams, there are many permutations of node number and arrow direction in the octonion Fano plane which are equivalent. What is important is the representation of the triads given in (15). This particular set of triads is equivalent to that used in Baez' work on octonions[4].

$$
\text{fpi} = \begin{array}{ll}
1 & \{\{1,2,3\},\{1,4,5\},\{1,6,7\},\{2,4,6\},\{2,5,7\},\{3,4,7\},\{3,5,6\}\} \\
2 & \{\{1,2,3\},\{1,4,5\},\{1,6,7\},\{2,4,7\},\{2,5,6\},\{3,4,6\},\{3,5,7\}\} \\
3 & \{\{1,2,3\},\{1,4,6\},\{1,5,7\},\{2,4,5\},\{2,6,7\},\{3,4,7\},\{3,5,6\}\} \\
4 & \{\{1,2,3\},\{1,4,6\},\{1,5,7\},\{2,4,7\},\{2,5,6\},\{3,4,5\},\{3,6,7\}\} \\
5 & \{\{1,2,3\},\{1,4,7\},\{1,5,6\},\{2,4,5\},\{2,6,7\},\{3,4,6\},\{3,5,7\}\} \\
6 & \{\{1,2,3\},\{1,4,7\},\{1,5,6\},\{2,4,6\},\{2,5,7\},\{3,4,5\},\{3,6,7\}\} \\
7 & \{\{1,2,4\},\{1,3,5\},\{1,6,7\},\{2,3,6\},\{2,5,7\},\{3,4,7\},\{4,5,6\}\} \\
8 & \{\{1,2,4\},\{1,3,5\},\{1,6,7\},\{2,3,7\},\{2,5,6\},\{3,4,6\},\{4,5,7\}\} \\
9 & \{\{1,2,4\},\{1,3,6\},\{1,5,7\},\{2,3,5\},\{2,6,7\},\{3,4,7\},\{4,5,6\}\} \\
10 & \{\{1,2,4\},\{1,3,6\},\{1,5,7\},\{2,3,7\},\{2,5,6\},\{3,4,5\},\{4,6,7\}\} \\
11 & \{\{1,2,4\},\{1,3,7\},\{1,5,6\},\{2,3,5\},\{2,6,7\},\{3,4,6\},\{4,5,7\}\} \\
12 & \{\{1,2,4\},\{1,3,7\},\{1,5,6\},\{2,3,6\},\{2,5,7\},\{3,4,5\},\{4,6,7\}\} \\
13 & \{\{1,2,5\},\{1,3,4\},\{1,6,7\},\{2,3,6\},\{2,4,7\},\{3,5,7\},\{4,5,6\}\} \\
14 & \{\{1,2,5\},\{1,3,4\},\{1,6,7\},\{2,3,7\},\{2,4,6\},\{3,5,6\},\{4,5,7\}\} \\
15 & \{\{1,2,5\},\{1,3,6\},\{1,4,7\},\{2,3,4\},\{2,6,7\},\{3,5,7\},\{4,5,6\}\} \\
16 & \{\{1,2,5\},\{1,3,6\},\{1,4,7\},\{2,3,7\},\{2,4,6\},\{3,4,5\},\{5,6,7\}\} \\
17 & \{\{1,2,5\},\{1,3,7\},\{1,4,6\},\{2,3,4\},\{2,6,7\},\{3,5,6\},\{4,5,7\}\} \\
18 & \{\{1,2,5\},\{1,3,7\},\{1,4,6\},\{2,3,6\},\{2,4,7\},\{3,4,5\},\{5,6,7\}\} \\
19 & \{\{1,2,6\},\{1,3,4\},\{1,5,7\},\{2,3,5\},\{2,4,7\},\{3,6,7\},\{4,5,6\}\} \\
20 & \{\{1,2,6\},\{1,3,4\},\{1,5,7\},\{2,3,7\},\{2,4,5\},\{3,5,6\},\{4,6,7\}\} \\
21 & \{\{1,2,6\},\{1,3,5\},\{1,4,7\},\{2,3,4\},\{2,5,7\},\{3,6,7\},\{4,5,6\}\} \\
22 & \{\{1,2,6\},\{1,3,5\},\{1,4,7\},\{2,3,7\},\{2,4,5\},\{3,4,6\},\{5,6,7\}\} \\
23 & \{\{1,2,6\},\{1,3,7\},\{1,4,5\},\{2,3,4\},\{2,5,7\},\{3,5,6\},\{4,6,7\}\} \\
24 & \{\{1,2,6\},\{1,3,7\},\{1,4,5\},\{2,3,5\},\{2,4,7\},\{3,4,6\},\{5,6,7\}\} \\
25 & \{\{1,2,7\},\{1,3,4\},\{1,5,6\},\{2,3,5\},\{2,4,6\},\{3,6,7\},\{4,5,7\}\} \\
26 & \{\{1,2,7\},\{1,3,4\},\{1,5,6\},\{2,3,6\},\{2,4,5\},\{3,5,7\},\{4,6,7\}\} \\
27 & \{\{1,2,7\},\{1,3,5\},\{1,4,6\},\{2,3,4\},\{2,5,6\},\{3,6,7\},\{4,5,7\}\} \\
28 & \{\{1,2,7\},\{1,3,5\},\{1,4,6\},\{2,3,6\},\{2,4,5\},\{3,4,7\},\{5,6,7\}\} \\
29 & \{\{1,2,7\},\{1,3,6\},\{1,4,5\},\{2,3,4\},\{2,5,6\},\{3,5,7\},\{4,6,7\}\} \\
30 & \{\{1,2,7\},\{1,3,6\},\{1,4,5\},\{2,3,5\},\{2,4,6\},\{3,4,7\},\{5,6,7\}\}
\end{array} \tag{16}
$$

$$
\text{sm} = \begin{array}{ll}
1 & \{00,07,19,1\text{E},2\text{A},2\text{D},33,34\} \\
2 & \{01,06,18,1\text{F},2\text{B},2\text{C},32,35\} \\
3 & \{02,05,1\text{B},1\text{C},28,2\text{F},31,36\} \\
4 & \{03,04,1\text{A},1\text{D},29,2\text{E},30,37\} \\
5 & \{08,0\text{F},11,16,22,25,3\text{B},3\text{C}\} \\
6 & \{09,0\text{E},10,17,23,24,3\text{A},3\text{D}\} \\
7 & \{0\text{A},0\text{D},13,14,20,27,39,3\text{E}\} \\
8 & \{0\text{B},0\text{C},12,15,21,26,38,3\text{F}\}
\end{array} \tag{17}
$$

$$
\text{sm2fpi} = \{5,8,4,3,7,6,3,2,6,5,1,4,6,7,3,3,8,6,3,1,6,6,2,3,5,8,4,3,7,6\} \tag{18}
$$

There are 30 canonical sets of 7 triads indexed with a Fano plane index (fpi) in (16). As in E_8 with 16 of the $2^8 = 256$ binary representations excluded from the group, there are 32 excluded octonions from the $2^9 = 512$. As in E_8, excluded particles are associated with the color=0, generation=0 (bosons) which are the positive (and negative) generators commonly associated with the 8-orthoplex with 16 permutations of $\{\pm 1, 0, 0, 0, 0, 0, 0, 0\}$.

In order to make a valid octonion, each fpi gets one of 8 possible 7-bit sign masks (sm) applied (17). Since each sm can be "inverted" ($0 \Leftrightarrow 1$ as we do with the anti-particle quantum bit), this gives $16 * 30 = 480$ octonion permutations.

The sign mask operates on the triads by reversing the 2nd and 3rd numbers from canonical (numerical) order when the mask bit is set on that triad's position. Each sign mask operation acting on the 30 fpi's can be permuted in consistent ways to produce the many isomorphic sets of 480 octonions. Since they are bit-wise operations, the sign masks use hexadecimal notation with the first bit always 0. It is interesting to note that there are only 2 octonions that use a sign mask of 00H. The one shown and another discovered by Dixon[8].

The 8 sets of 8 sm are assigned to the 30 fpi given in (18), so if fpi=1, the 5th sm group is selected. Since the octonion in Fig. 13 has fpi=11 and the 11th sm2fpi=1, this means sm bits will index to the 1st sm group in (17).

$$\begin{array}{lll} \text{Assigned Particle and} & \text{Quantum bits} & \{apccssgg\} \\ \text{SRE } E_8\#177 = \underset{\text{r}}{\text{s}}^{-1/3}\underset{\text{L}}{\vee} & & \{00010010\} \end{array} \tag{19}$$

In this integrated system of E_8, particles, and octonions, the 4 bits that make up the 16 possible sign masks are associated with the 4 quantum particle bits {anti, p_{type}, and 2 spin bits}. Looking deeper at the space-(P)arity orientation pattern, where pitch and roll rotations are associated with the up/down and left/right spin bits, a conjecture is made that the p_{type} bit can be thought of as a 3rd spin bit, giving a 3rd spin type which we might call "in/out" or yaw rotation. Since according to (19) the octonion in Fig. 13 has p_{type}=0, and spin=00 or $\overset{\vee}{L}$, this means sm=1, so it gets the 1st sign mask of the 1st sm group, giving sm=00H.

The assignment of the 30 fpi's is based on the 4 color and generation bits that are not both 0 (or excluded) giving $2^4 - 1 = 15$. It is not simply a naive index created by simply adding the flip bit to the index. The extra logic needed to index 2*15 is based on a pattern discovered that relates how the anti and flip bits operate across the generation and color bits. Specifically, this pattern differentiates the 128 1/2 integer E_8 vertices associated with the BC_8 group (2 generations of fermions) from the integer 112 vertices in the D_8 group (bosons plus an anomalous generation=2 set of fermions).

VI. CONCLUSION

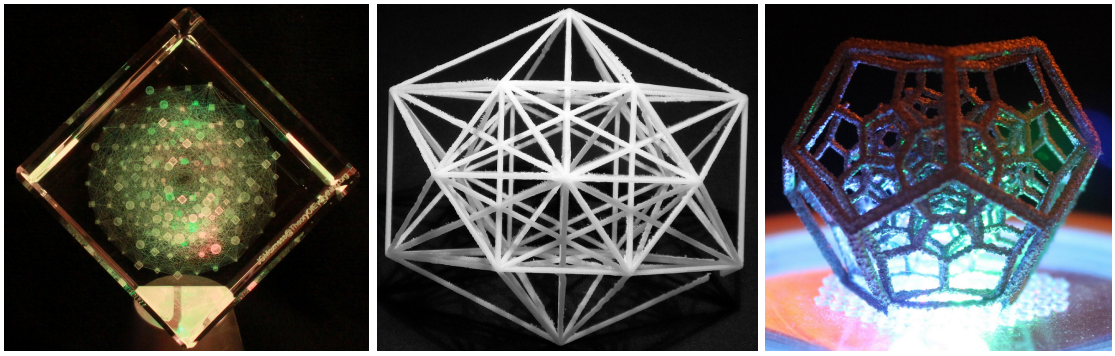


FIG. 14: The E_8 to H_4 3D projection model used to laser etch optical crystal

In terms of mathematical symmetry representing the beauty of Nature, E_8 is one of the most beautiful. It contains a wealth of symmetries, including those of 2D projections, 3D polyhedrons, 4D polychora, and those up to 8D. An SRE E_8 to H_4 folding matrix was determined and used to fold E_8 to the 120 4D vertices of the H_4 600-cell and 120 vertices of $H_4\Phi$. A direct relationship between the simple roots matrix and theoretical physics models was introduced. In addition to the mapping for particles, a direct relationship to the 480 unique octonion permutations was also shown.

The traditional 2D Petrie projections of high dimensional geometry were extended by adding a carefully chosen third basis vector and generating 3D objects in either orthogonal or perspective views. The folding matrix was shown to generate these basis vectors used in projecting the E_8 vertices. These projected 3D objects can be realized as 3D models, which allow for their realization as animated rotations, models laser etched in optical crystal, and in some cases 3D printed in plastic or even metal as in Fig. 14.

In addition, these new mathematical relationships and visual representations have been used to verify and improve grand unified theories which rely on these structures.

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VII. APPENDIX A

Dimension=248 Rank=8 DetCM=1 # of Positive Roots=120 Coxeter #=30

CartanMatrix

2	−1	0	0	0	0	0	0
−1	2	−1	0	0	0	0	0
0	−1	2	−1	0	0	0	0
0	0	−1	2	0	0	−1	0
0	0	0	0	2	−1	0	0
0	0	0	0	−1	2	−1	0
0	0	0	−1	0	−1	2	−1
0	0	0	0	0	0	−1	2

Root #	Weights								Positive Root Vectors								Heights
1	2	−1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
2	−1	2	−1	0	0	0	0	0	0	1	0	0	0	0	0	0	1
3	0	−1	2	−1	0	0	0	0	0	0	1	0	0	0	0	0	1
4	0	0	−1	2	0	0	−1	0	0	0	0	1	0	0	0	0	1
5	0	0	0	0	2	−1	0	0	0	0	0	0	1	0	0	0	1
6	0	0	0	0	−1	2	−1	0	0	0	0	0	0	1	0	0	1
7	0	0	0	−1	0	−1	2	−1	0	0	0	0	0	0	1	0	1
8	0	0	0	0	0	0	−1	2	0	0	0	0	0	0	0	1	1
9	1	1	−1	0	0	0	0	0	1	1	0	0	0	0	0	0	2
10	−1	1	1	−1	0	0	0	0	0	1	1	0	0	0	0	0	2
11	0	−1	1	1	0	0	−1	0	0	0	1	1	0	0	0	0	2
12	0	0	−1	1	0	−1	1	−1	0	0	0	1	0	0	1	0	2
13	0	0	0	0	1	1	−1	0	0	0	0	0	1	1	0	0	2
14	0	0	0	−1	−1	1	1	−1	0	0	0	0	0	1	1	0	2
15	0	0	0	−1	0	−1	1	1	0	0	0	0	0	0	1	1	2
16	1	0	1	−1	0	0	0	0	1	1	1	0	0	0	0	0	3
17	−1	1	0	1	0	0	−1	0	0	1	1	1	0	0	0	0	3
18	0	0	−1	1	−1	1	0	−1	0	0	0	1	0	1	1	0	3
19	0	−1	1	0	0	−1	1	−1	0	0	1	1	0	0	1	0	3
20	0	0	0	−1	1	0	1	−1	0	0	0	0	1	1	1	0	3
21	0	0	−1	1	0	−1	0	1	0	0	0	1	0	0	1	1	3
22	0	0	0	−1	−1	1	0	1	0	0	0	0	0	1	1	1	3
23	0	0	−1	1	−1	1	−1	1	0	0	0	1	0	1	1	1	4
24	1	0	0	1	0	0	−1	0	1	1	1	1	0	0	0	0	4
25	−1	1	0	0	0	−1	1	−1	0	1	1	1	0	0	1	0	4
26	0	−1	1	0	−1	1	0	−1	0	0	1	1	0	1	1	0	4
27	0	−1	1	0	0	−1	0	1	0	0	1	1	0	0	1	1	4
28	0	0	−1	1	1	0	0	−1	0	0	0	1	1	1	1	0	4
29	0	0	0	−1	1	0	0	1	0	0	0	0	1	1	1	1	4
30	0	−1	1	0	−1	1	−1	1	0	0	1	1	0	1	1	1	5
31	1	0	0	0	0	−1	1	−1	1	1	1	1	0	0	1	0	5
32	0	−1	1	0	1	0	0	−1	0	0	1	1	1	1	1	0	5
33	0	0	−1	1	1	0	−1	1	0	0	0	1	1	1	1	1	5
34	−1	1	0	0	−1	1	0	−1	0	1	1	1	0	1	1	0	5
35	−1	1	0	0	0	−1	0	1	0	1	1	1	0	0	1	1	5
36	0	0	−1	0	−1	0	1	0	0	0	0	1	0	1	2	1	5
37	0	−1	1	0	1	0	−1	1	0	0	1	1	1	1	1	1	6
38	1	0	0	0	−1	1	0	−1	1	1	1	1	0	1	1	0	6
39	1	0	0	0	0	−1	0	1	1	1	1	1	0	0	1	1	6
40	−1	1	0	0	1	0	0	−1	0	1	1	1	1	1	1	0	6
41	−1	1	0	0	−1	1	−1	1	0	1	1	1	0	1	1	1	6
42	0	−1	1	−1	−1	0	1	0	0	0	1	1	0	1	2	1	6
43	0	0	−1	0	1	−1	1	0	0	0	0	1	1	1	2	1	6
44	−1	1	0	0	1	0	−1	1	0	1	1	1	1	1	1	1	7
45	1	0	0	0	1	0	0	−1	1	1	1	1	1	1	1	0	7
46	0	−1	1	−1	1	−1	1	0	0	0	1	1	1	1	2	1	7
47	0	−1	0	1	−1	0	0	0	0	0	1	2	0	1	2	1	7
48	1	0	0	0	−1	1	−1	1	1	1	1	1	0	1	1	1	7
49	−1	1	0	−1	−1	0	1	0	0	1	1	1	0	1	2	1	7
50	0	0	−1	0	0	1	0	0	0	0	0	1	1	2	2	1	7
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53	1	0	0	0	1	0	−1	1	1	1	1	1	1	1	1	1	8
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56	0	−1	0	1	1	−1	0	0	0	0	1	2	1	1	2	1	8
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118	0	−1	1	0	0	0	0	0	1	2	4	5	2	4	6	3	27
119	−1	1	0	0	0	0	0	0	1	3	4	5	2	4	6	3	28
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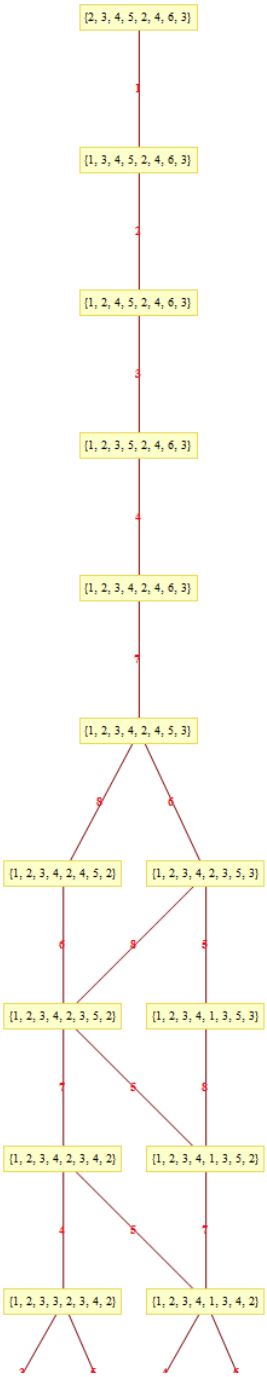
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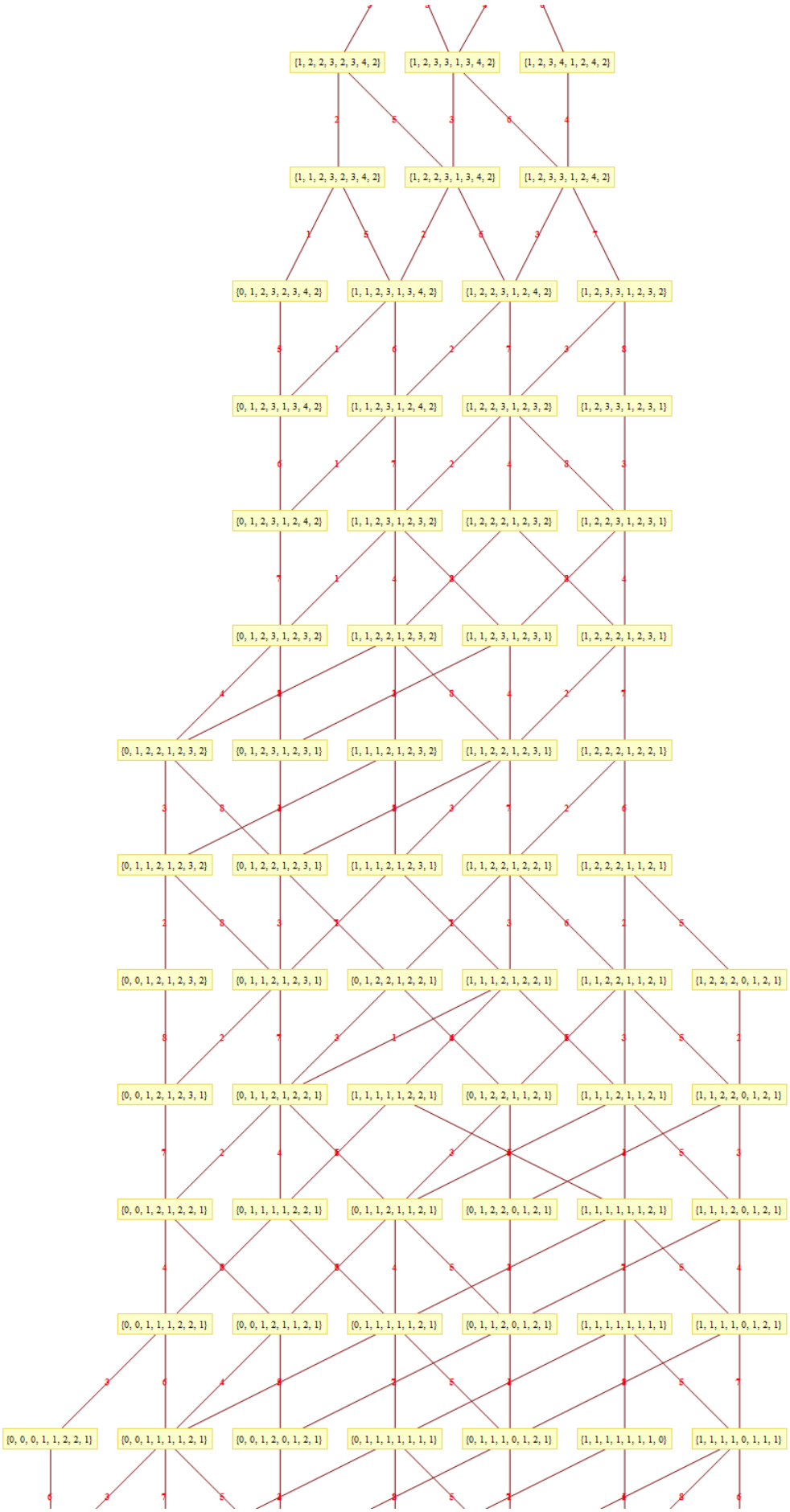
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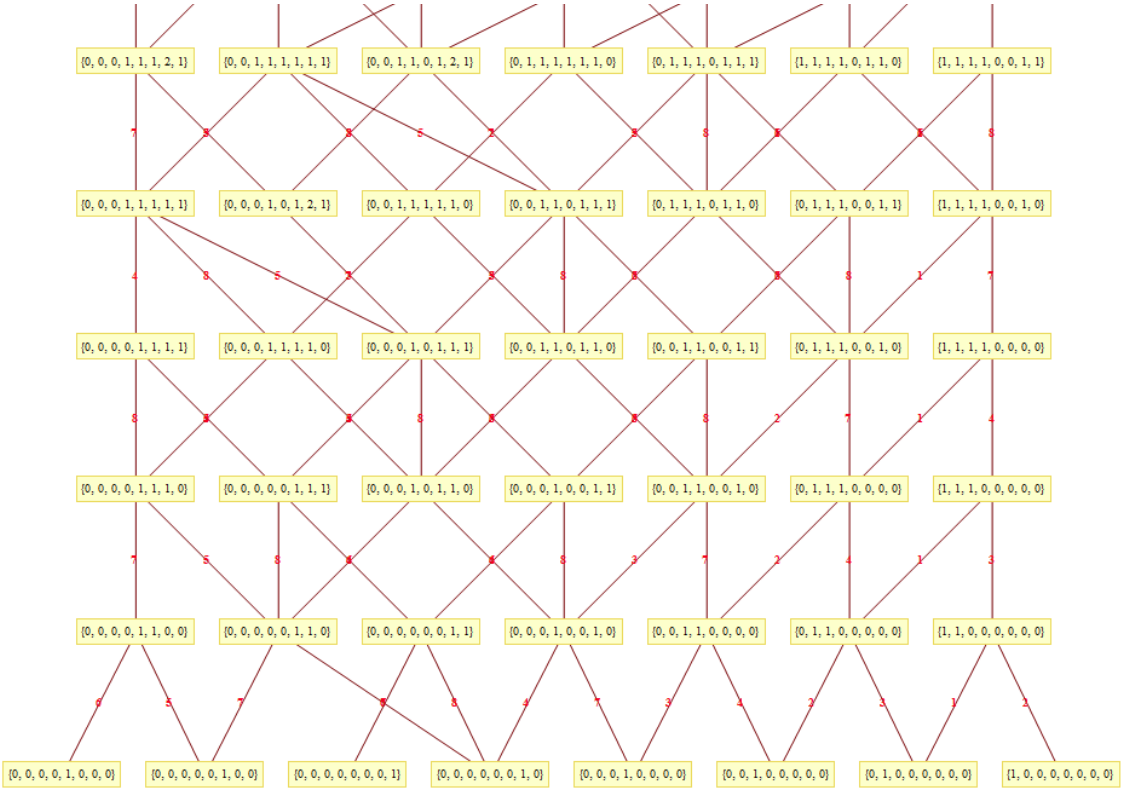
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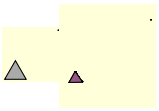
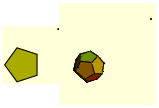
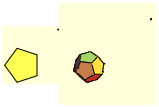
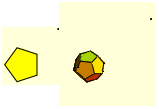
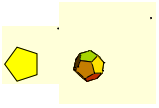
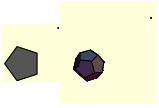
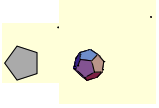
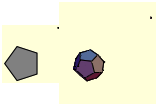
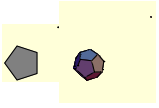
VIII. APPENDIX B

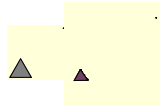
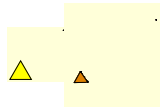
pascalRow@1

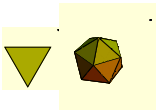
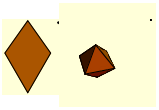
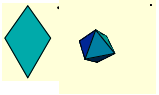
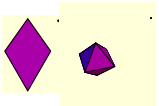
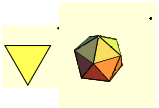
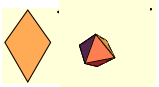
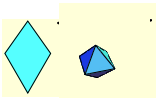
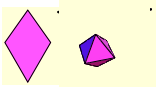
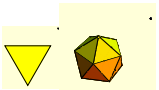
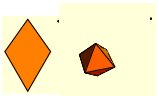
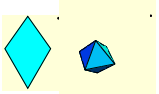
Seq #	Symbol	2D/3D Shape	Groups	Particle Quantum Bits	Binary / E8 / Physics Coordinates	Algebra Root Weight / Height / Rt#=Atomic Element Number -->	Ele #	Octonions
1	$\overset{0}{\overset{\wedge}{\overset{v_e}{w_1}}}$ R		{BC8, E7, E6, 6Cube, E5, E4, C4, H4, 24cell, 8Cell, altSnub24, snub24E8, 24cellH4, 3Cube, B2=C2, Hamming, Idempot}	$0apggsscc$ 001010100_2	Bn{ 0 0 0 0 0 0 0 0 } E8{ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ } Ph{ $-\frac{1}{2}$ $-\frac{1}{2}$ 0 $-\frac{1}{\sqrt{2}}$ $-\frac{1}{2}$ $-\frac{\sqrt{3}}{2}$ 0 0 }	Rt{ 0 0 0 0 1 0 0 0 } Wt{ 0 0 0 0 2 −1 0 0 } Ht 1	Be 4	**Flipped** Triad fpi=7 BC_8 R fp_sm=3→1BH {1, 4, 2}, {1, 5, 3}, {1, 6, 7}, {2, 6, 3}, {2, 7, 5}, {3, 4, 7}, {4, 5, 6} flat triad/mask bits {1, 2, 4, 5, 3, 6, 7} {1, 1, 0, 1, 1, 0, 0} **Not Flipped** Triad fpi=4 BC_8 R fp_sm=3→1BH {1, 3, 2}, {1, 6, 4}, {1, 5, 7}, {2, 7, 4}, {2, 6, 5}, {3, 4, 5}, {3, 6, 7} flat triad/mask bits {1, 3, 2, 6, 4, 5, 7} {1, 1, 0, 1, 1, 0, 0}

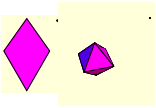
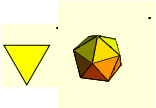
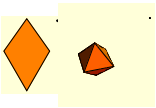
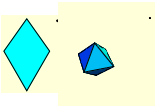
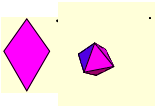
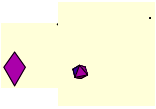
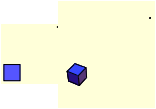
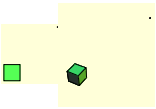
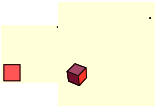
pascalRow@2

Seq #	Symbol	2D/3D Shape	Groups	Particle Quantum Bits	Binary / E8 / Physics Coordinates	Algebra Root Weight / Height / Rt#=Atomic Element Number -->	Ele #	Octonions
2	$\overline{\overset{0}{\overset{\vee}{\overset{Ex_1}{\text{"}\,\text{"}}}}}$ L		{8Ortho}	$0apggsscc$ 010000000_2	Bn{ 1 0 0 0 0 0 0 0 } E8{ 0 0 0 0 0 0 0 −1 } Ph{ 0 0 0 0 0 $-\frac{1}{\sqrt{3}}$ 0 $-\sqrt{\frac{2}{3}}$ }	Rt{ 1 2 3 4 2 $\frac{7}{2}$ 5 $\frac{5}{2}$ } Wt{ 0 0 0 0 $\frac{1}{2}$ 0 0 0 } Ht 23	$\overline{\text{Exc}}$ 1	**Flipped** Invalid octonion Fano plane not defined! Invalid octonion Fano plane not defined! **Not Flipped** Invalid octonion Fano plane not defined! Invalid octonion Fano plane not defined!
3	$\overline{\overset{0}{\overset{\wedge}{\overset{Ex_1}{\text{"}\,\text{"}}}}}$ R		{8Ortho}	$0apggsscc$ 010000100_2	Bn{ 0 1 0 0 0 0 0 0 } E8{ 0 0 0 0 0 0 −1 0 } Ph{ 0 0 0 0 0 $-\frac{1}{\sqrt{3}}$ $-\frac{1}{\sqrt{2}}$ $\frac{1}{\sqrt{6}}$ }	Rt{ 0 0 0 0 0 $-\frac{1}{2}$ 0 $\frac{1}{2}$ } Wt{ 0 0 0 0 $\frac{1}{2}$ −1 0 1 } Ht 0	$\overline{\text{Exc}}$ 1	**Flipped** Invalid octonion Fano plane not defined! Invalid octonion Fano plane not defined! **Not Flipped** Invalid octonion Fano plane not defined! Invalid octonion Fano plane not defined!
4	$\overline{\overset{0}{\overset{\wedge}{\overset{Ex_1}{\text{"}\,\text{"}}}}}$ L		{8Ortho}	$0apggsscc$ 010001000_2	Bn{ 0 0 1 0 0 0 0 0 } E8{ 0 0 0 0 0 −1 0 0 } Ph{ 0 0 0 0 0 $-\frac{1}{\sqrt{3}}$ $\frac{1}{\sqrt{2}}$ $\frac{1}{\sqrt{6}}$ }	Rt{ 0 0 0 0 0 $-\frac{1}{2}$ 0 $-\frac{1}{2}$ } Wt{ 0 0 0 0 $\frac{1}{2}$ −1 1 −1 } Ht 1	$\overline{\text{Exc}}$ 1	**Flipped** Invalid octonion Fano plane not defined! Invalid octonion Fano plane not defined! **Not Flipped** Invalid octonion Fano plane not defined! Invalid octonion Fano plane not defined!
5	$\overline{\overset{0}{\overset{\vee}{\overset{Ex_1}{\text{"}\,\text{"}}}}}$ R		{8Ortho}	$0apggsscc$ 010001100_2	Bn{ 0 0 0 1 0 0 0 0 } E8{ 0 0 0 0 −1 0 0 0 } Ph{ 0 0 0 0 −1 0 0 0 }	Rt{ 0 0 0 0 0 $-\frac{1}{2}$ −1 $-\frac{1}{2}$ } Wt{ 0 0 0 1 $\frac{1}{2}$ 0 −1 0 } Ht 2	$\overline{\text{Exc}}$ 1	**Flipped** Invalid octonion Fano plane not defined! Invalid octonion Fano plane not defined! **Not Flipped** Invalid octonion Fano plane not defined! Invalid octonion Fano plane not defined!
6	$\overline{\overset{0}{\overset{\vee}{\overset{Ex_2}{\text{"}\,\text{"}}}}}$ L		{8Ortho, 24cell, 16Cell}	$0apggsscc$ 011000000_2	Bn{ 0 0 0 0 1 0 0 0 } E8{ 0 0 0 −1 0 0 0 0 } Ph{ 0 0 $\frac{1}{\sqrt{2}}$ $-\frac{1}{\sqrt{2}}$ 0 0 0 0 }	Rt{ 0 0 0 −1 0 $-\frac{1}{2}$ −1 $-\frac{1}{2}$ } Wt{ 0 0 1 −1 $\frac{1}{2}$ 0 0 0 } Ht 3	$\overline{\text{Exc}}$ 1	**Flipped** Invalid octonion Fano plane not defined! Invalid octonion Fano plane not defined! **Not Flipped** Invalid octonion Fano plane not defined! Invalid octonion Fano plane not defined!
7	$\overline{\overset{0}{\overset{\wedge}{\overset{Ex_2}{\text{"}\,\text{"}}}}}$ R		{8Ortho, 24cell, 16Cell}	$0apggsscc$ 011000100_2	Bn{ 0 0 0 0 0 1 0 0 } E8{ 0 0 −1 0 0 0 0 0 } Ph{ 0 0 $-\frac{1}{\sqrt{2}}$ $-\frac{1}{\sqrt{2}}$ 0 0 0 0 }	Rt{ 0 0 −1 −1 0 $-\frac{1}{2}$ −1 $-\frac{1}{2}$ } Wt{ 0 1 −1 0 $\frac{1}{2}$ 0 0 0 } Ht 4	$\overline{\text{Exc}}$ 1	**Flipped** Invalid octonion Fano plane not defined! Invalid octonion Fano plane not defined! **Not Flipped** Invalid octonion Fano plane not defined! Invalid octonion Fano plane not defined!
8	$\overline{\overset{0}{\overset{\wedge}{\overset{Ex_2}{\text{"}\,\text{"}}}}}$ L		{8Ortho, 24cell, 16Cell}	$0apggsscc$ 011001000_2	Bn{ 0 0 0 0 0 0 1 0 } E8{ 0 −1 0 0 0 0 0 0 } Ph{ 0 −1 0 0 0 0 0 0 }	Rt{ 0 −1 −1 −1 0 $-\frac{1}{2}$ −1 $-\frac{1}{2}$ } Wt{ 1 −1 0 0 $\frac{1}{2}$ 0 0 0 } Ht 5	$\overline{\text{Exc}}$ 1	**Flipped** Invalid octonion Fano plane not defined! Invalid octonion Fano plane not defined! **Not Flipped** Invalid octonion Fano plane not defined! Invalid octonion Fano plane not defined!
9	$\overline{\overset{0}{\overset{\vee}{\overset{Ex_2}{\text{"}\,\text{"}}}}}$ R		{8Ortho, 24cell, 16Cell}	$0apggsscc$ 011001100_2	Bn{ 0 0 0 0 0 0 0 1 } E8{ −1 0 0 0 0 0 0 0 } Ph{ −1 0 0 0 0 0 0 0 }	Rt{ −1 −1 −1 −1 0 $-\frac{1}{2}$ −1 $-\frac{1}{2}$ } Wt{ −1 0 0 0 $\frac{1}{2}$ 0 0 0 } Ht 6	$\overline{\text{Exc}}$ 1	**Flipped** Invalid octonion Fano plane not defined! Invalid octonion Fano plane not defined! **Not Flipped** Invalid octonion Fano plane not defined! Invalid octonion Fano plane not defined!

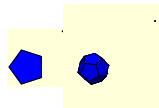
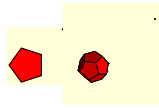
pascalRow@3

Seq #	Symbol	2D/3D Shape	Groups	Particle Quantum Bits	Binary / E8 / Physics Coordinates	Algebra Root Weight / Height / Rt#=Atomic Element Number -->	Ele #	Octonions
10	$\overset{0}{\overset{\vee}{\overset{v_e}{w_d}}}$ L		{BC8, E7, E6, 6Cube, E5, E4, C4, H4, 24cell, 8Cell, altSnub24, snub24E8, snub24H4, 3Cube, B2=C2}	$0apggsscc$ 001010000_2	Bn{ 1 1 0 0 0 0 0 0 } E8{ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ } Ph{ $\frac{1}{2}$ $\frac{1}{2}$ 0 $-\frac{1}{\sqrt{2}}$ $-\frac{1}{2}$ $-\frac{\sqrt{3}}{2}$ 0 0 }	Rt{ 1 2 2 2 1 1 2 1 } Wt{ 0 1 0 0 1 −1 0 0 } Ht 12	Au 79	**Flipped** Triad fpi=7 BC_8 R fp_sm=3→05H {1, 4, 2}, {1, 3, 5}, {1, 7, 6}, {2, 3, 6}, {2, 5, 7}, {3, 4, 7}, {4, 5, 6} flat triad/mask bits {1, 2, 4, 3, 5, 7, 6} {1, 0, 1, 0, 0, 0, 0} **Not Flipped** Triad fpi=4 BC_8 R fp_sm=3→05H {1, 3, 2}, {1, 4, 6}, {1, 7, 5}, {2, 4, 7}, {2, 5, 6}, {3, 4, 5}, {3, 6,
11	$\overset{0}{\overset{\vee}{\overset{v_e}{w_m}}}$ R		{BC8, E7, E6, 6Cube, E5, E4, C4, H4, 24cell, 8Cell, altSnub24, snub24E8, snub24H4, 3Cube, B2=C2}	$0apggsscc$ 001011100_2	Bn{ 1 0 1 0 0 0 0 0 } E8{ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ } Ph{ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{\sqrt{2}}$ 0 $-\frac{1}{2}$ $-\frac{\sqrt{3}}{2}$ 0 0 }	Rt{ 1 1 2 2 1 1 2 1 } Wt{ 1 −1 1 0 1 −1 0 0 } Ht 11	Ta 73	**Flipped** Triad fpi=7 BC_8 R fp_sm=3→36H {1, 2, 4}, {1, 5, 3}, {1, 7, 6}, {2, 3, 6}, {2, 7, 5}, {3, 7, 4}, {4, 5, 6} flat triad/mask bits {1, 4, 2, 5, 3, 7, 6} {0, 1, 1, 0, 1, 1, 0} **Not Flipped** Triad fpi=4 BC_8 R fp_sm=3→36H {1, 2, 3}, {1, 6, 4}, {1, 7, 5}, {2, 4, 7}, {2, 6, 5}, {3, 5, 4}, {3, 6,
12	$\overset{e}{\overset{\vee}{\overset{\bar{}}{y_m}}}$ R		{BC8, E7, E6, 6Cube, E5, C4, H4, 24cell, 8Cell, altSnub24, snub24E8, snub24H4, 3Cube}	$0apggsscc$ 000011100_2	Bn{ 1 0 0 1 0 0 0 0 } E8{ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ } Ph{ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{\sqrt{2}}$ 0 $-\frac{1}{2}$ $-\frac{\sqrt{3}}{2}$ 0 0 }	Rt{ 1 1 1 2 1 1 2 1 } Wt{ 1 0 −1 1 1 −1 0 0 } Ht 10	Ho 67	**Flipped** Triad fpi=4 BC_8 L fp_sm=3→31H {1, 3, 2}, {1, 4, 6}, {1, 5, 7}, {2, 4, 7}, {2, 6, 5}, {3, 5, 4}, {3, 6, 7} flat triad/mask bits {1, 2, 3, 4, 6, 5, 7} {1, 0, 0, 0, 1, 1, 0} **Not Flipped** Triad fpi=7 BC_8 L fp_sm=3→31H {1, 4, 2}, {1, 3, 5}, {1, 6, 7}, {2, 3, 6}, {2, 7, 5}, {3, 7, 4}, {4, 5,

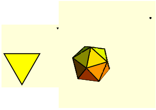
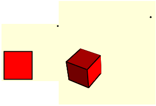
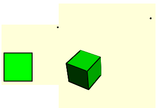
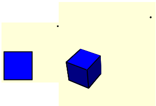
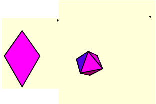
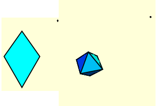
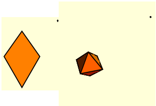
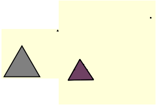
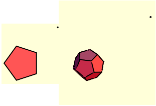
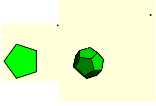
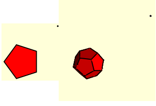
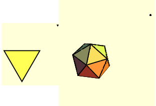
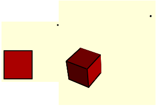
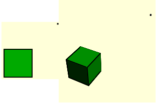
13	$\overline{\tau}\,{}^{+}_{\vee}\,{}^{y}_{d}\,L$		{BC8, E7, E6, 6Cube, C4, H4, 24cell, 8Cell, altSnub24, snub24E8, 24cellH4}	$0apggsscc$ 010110000_2	Bn{	1	0	0	0	1	0	0	0	}	Rt{	1	1	1	1	1	1	2	1	}	Pm 61	Flipped Triad fpi=23 BC_8 $\overline{E}$ fp_sm=2→7EH {1, 2, 6}, {1, 7, 3}, {1, 5, 4}, {2, 4, 3}, {2, 7, 5}, {3, 6, 5}, {4, 7, 6} flat triad/mask bits {1, 6, 2, 7, 3, 5, 4} {0, 1, 1, 1, 1, 1, 1}	Not Flipped Triad fpi=24 BC_8 $\overline{E}$ fp_sm=3→7DH {1, 6, 2}, {1, 3, 7}, {1, 5, 4}, {2, 5, 3}, {2, 7, 4}, {3, 6, 4}, {5, 7, flat triad/mask bits {1, 6, 2, 3, 7, 5, 4} {1, 0, 1, 1, 1, 1, 1}
					E8{	$\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	}	Wt{	1	0	0	−1	1	−1	1	0	}										
					Ph{	$\frac{1}{2}$	$-\frac{1}{2}$	0	$-\frac{1}{\sqrt{2}}$	$\frac{1}{2}$	$-\frac{\sqrt{3}}{2}$	0	0	}	Ht	9																
14	$\overline{b}\,{}^{1/3}_{\vee}\,{}^{o}_{d}\,L$		{BC8, E7, 6Cube, C4, H4Φ, dualSnub24, 24cellE8Φ, snub24H4Φ}	$0apggsscc$ 010110001_2	Bn{	1	0	0	0	0	1	0	0	}	Rt{	1	1	1	1	1	1	1	1	}	Ba 56	Flipped Triad fpi=26 BC_8 $\overline{E}$ fp_sm=8→74H {1, 2, 7}, {1, 3, 4}, {1, 6, 5}, {2, 3, 6}, {2, 5, 4}, {3, 7, 5}, {4, 7, 6} flat triad/mask bits {1, 7, 2, 3, 4, 6, 5} {0, 0, 1, 0, 1, 1, 1}	Not Flipped Triad fpi=25 BC_8 $\overline{E}$ fp_sm=5→77H {1, 7, 2}, {1, 4, 3}, {1, 6, 5}, {2, 3, 5}, {2, 6, 4}, {3, 7, 6}, {4, 7, flat triad/mask bits {1, 7, 2, 4, 3, 6, 5} {1, 1, 1, 0, 1, 1, 1}
					E8{	$\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	}	Wt{	1	0	0	0	1	0	−1	1	}										
					Ph{	$\frac{1}{2}$	$-\frac{1}{2}$	0	$-\frac{1}{\sqrt{2}}$	$-\frac{1}{2}$	$-\frac{1}{2\sqrt{3}}$	$-\frac{1}{\sqrt{2}}$	$-\frac{1}{\sqrt{6}}$	}	Ht	8																
15	$\overline{b}\,{}^{1/3}_{\vee}\,{}^{c}_{d}\,L$		{BC8, 6Cube, H4Φ, dualSnub24, 24cellE8Φ, snub24H4Φ}	$0apggsscc$ 010110010_2	Bn{	1	0	0	0	0	0	1	0	}	Rt{	1	1	1	1	1	1	1	0	}	Sn 50	Flipped Triad fpi=29 BC_8 $\overline{E}$ fp_sm=7→75H {1, 7, 2}, {1, 3, 6}, {1, 5, 4}, {2, 3, 4}, {2, 6, 5}, {3, 7, 5}, {4, 7, 6} flat triad/mask bits {1, 2, 7, 3, 6, 5, 4} {1, 0, 1, 0, 1, 1, 1}	Not Flipped Triad fpi=27 BC_8 $\overline{E}$ fp_sm=4→7CH {1, 2, 7}, {1, 3, 5}, {1, 6, 4}, {2, 4, 3}, {2, 6, 5}, {3, 7, 6}, {4, 7, flat triad/mask bits {1, 2, 7, 3, 5, 6, 4} {0, 0, 1, 1, 1, 1, 1}
					E8{	$\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	}	Wt{	1	0	0	0	1	0	0	−1	}										
					Ph{	$\frac{1}{2}$	$-\frac{1}{2}$	0	$-\frac{1}{\sqrt{2}}$	$-\frac{1}{2}$	$-\frac{1}{2\sqrt{3}}$	$\frac{1}{\sqrt{2}}$	$-\frac{1}{\sqrt{6}}$	}	Ht	7																
16	$\overline{b}\,{}^{1/3}_{\vee}\,{}^{m}_{d}\,L$		{BC8, H4Φ, dualSnub24, 24cellE8Φ, snub24H4Φ}	$0apggsscc$ 010110011_2	Bn{	1	0	0	0	0	0	0	1	}	Rt{	0	−1	−2	−3	−1	−3	−4	−2	}	Np 93	Flipped Triad fpi=28 BC_8 $\overline{E}$ fp_sm=3→7DH {1, 7, 2}, {1, 3, 5}, {1, 6, 4}, {2, 6, 3}, {2, 5, 4}, {3, 7, 4}, {5, 7, 6} flat triad/mask bits {1, 7, 2, 3, 5, 6, 4} {1, 0, 1, 1, 1, 1, 1}	Not Flipped Triad fpi=30 BC_8 $\overline{E}$ fp_sm=6→76H {1, 2, 7}, {1, 6, 3}, {1, 5, 4}, {2, 3, 5}, {2, 6, 4}, {3, 7, 4}, {5, 7, flat triad/mask bits {1, 2, 7, 6, 3, 5, 4} {0, 1, 1, 0, 1, 1, 1}
					E8{	$\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	}	Wt{	1	0	0	0	1	−1	0	0	}										
					Ph{	$\frac{1}{2}$	$-\frac{1}{2}$	0	$-\frac{1}{\sqrt{2}}$	$-\frac{1}{2}$	$-\frac{1}{2\sqrt{3}}$	0	$\sqrt{\frac{2}{3}}$	}	Ht	16																
17	${}^{\tau c}_{m}\,{}^{0}_{\wedge}\,L$		{BC8, E7, E6, 6Cube, E5, E4, C4, H4, 24cell, 8Cell, altSnub24, cellE8, snub24H4, 3Cube, B2=C2}	$0apggsscc$ 001011000_2	Bn{	0	1	1	0	0	0	0	0	}	Rt{	0	1	2	2	1	1	2	1	}	Tb 65	Flipped Triad fpi=7 BC_8 $\overline{E}$ fp_sm=3→28H {1, 2, 4}, {1, 3, 5}, {1, 6, 7}, {2, 6, 3}, {2, 5, 7}, {3, 7, 4}, {4, 5, 6} flat triad/mask bits {1, 4, 2, 3, 5, 6, 7} {0, 0, 0, 1, 0, 1, 0}	Not Flipped Triad fpi=4 BC_8 $\overline{E}$ fp_sm=3→28H {1, 2, 3}, {1, 4, 6}, {1, 5, 7}, {2, 4, 7}, {2, 5, 6}, {3, 5, 4}, {3, 6, flat triad/mask bits {1, 2, 3, 4, 6, 5, 7} {0, 0, 0, 1, 0, 1, 0}
					E8{	$-\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{\sqrt{3}}{2}$	0	0	}	Wt{	−1	0	1	0	1	−1	0	0	}										
					Ph{	$-\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{\sqrt{2}}$	0	$-\frac{1}{2}$	0	0	0	}	Ht	10																
18	${}^{e}_{3m}\,{}^{-}_{\wedge}\,L$		{BC8, E7, E6, 6Cube, E5, C4, H4, 24cell, 8Cell, altSnub24, snub24E8, snub24H4, 3Cube}	$0apggsscc$ 000011000_2	Bn{	0	1	0	1	0	0	0	0	}	Rt{	0	1	1	2	1	1	2	1	}	Pr 59	Flipped Triad fpi=4 BC_8 $\overline{E}$ fp_sm=3→2FH {1, 3, 2}, {1, 6, 4}, {1, 7, 5}, {2, 7, 4}, {2, 5, 6}, {3, 5, 4}, {3, 6, 7} flat triad/mask bits {1, 2, 3, 6, 4, 7, 5} {1, 1, 1, 1, 0, 1, 0}	Not Flipped Triad fpi=7 BC_8 $\overline{E}$ fp_sm=3→2FH {1, 4, 2}, {1, 5, 3}, {1, 7, 6}, {2, 6, 3}, {2, 5, 7}, {3, 7, 4}, {4, 5, flat triad/mask bits {1, 4, 2, 5, 3, 7, 6} {1, 1, 1, 1, 0, 1, 0}
					E8{	$-\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{\sqrt{3}}{2}$	0	0	}	Wt{	−1	1	−1	1	1	−1	0	0	}										
					Ph{	$-\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{\sqrt{2}}$	0	$-\frac{1}{2}$	0	0	0	}	Ht	9																
19	$\overline{\tau}\,{}^{+}_{\tau}\,{}^{y}_{3}\,{}^{\wedge}_{1}\,R$		{BC8, E7, E6, 6Cube, C4, H4, 24cell, 8Cell, altSnub24, snub24E8, snub24H4}	$0apggsscc$ 010110100_2	Bn{	0	1	0	0	1	0	0	0	}	Rt{	0	1	1	1	1	1	2	1	}	I 53	Flipped Triad fpi=23 BC_8 $\overline{E}$ fp_sm=2→60H {1, 2, 6}, {1, 3, 7}, {1, 4, 5}, {2, 3, 4}, {2, 5, 7}, {3, 6, 5}, {4, 7, 6} flat triad/mask bits {1, 6, 2, 3, 7, 4, 5} {0, 0, 0, 0, 0, 1, 1}	Not Flipped Triad fpi=24 BC_8 $\overline{E}$ fp_sm=3→63H {1, 6, 2}, {1, 7, 3}, {1, 4, 5}, {2, 3, 5}, {2, 4, 7}, {3, 6, 4}, {5, 7, flat triad/mask bits {1, 6, 2, 7, 3, 4, 5} {1, 1, 0, 0, 0, 1, 1}
					E8{	$-\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$-\frac{\sqrt{3}}{2}$	0	0	}	Wt{	−1	1	0	−1	1	−1	1	0	}										
					Ph{	$-\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{\sqrt{2}}$	0	$\frac{1}{2}$	0	0	0	}	Ht	8																
20	$\overline{b}\,{}^{1/3}_{\wedge}\,{}^{o}_{1}\,R$		{BC8, E7, 6Cube, C4, H4, snub24, altSnub24, snub24E8, 24cellH4}	$0apggsscc$ 010110101_2	Bn{	0	1	0	0	0	1	0	0	}	Rt{	0	1	1	1	1	1	1	1	}	Cd 48	Flipped Triad fpi=26 BC_8 $\overline{E}$ fp_sm=8→6AH {1, 2, 7}, {1, 4, 3}, {1, 5, 6}, {2, 6, 3}, {2, 4, 5}, {3, 7, 5}, {4, 7, 6} flat triad/mask bits {1, 7, 2, 4, 3, 5, 6} {0, 1, 0, 1, 0, 1, 1}	Not Flipped Triad fpi=25 BC_8 $\overline{E}$ fp_sm=5→69H {1, 7, 2}, {1, 3, 4}, {1, 5, 6}, {2, 5, 3}, {2, 4, 6}, {3, 7, 6}, {4, 7, flat triad/mask bits {1, 7, 2, 3, 4, 5, 6} {1, 0, 0, 1, 0, 1, 1}
					E8{	$-\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	}	Wt{	−1	1	0	0	1	0	−1	1	}										
					Ph{	$-\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{\sqrt{2}}$	0	$-\frac{1}{2}$	$-\frac{1}{2\sqrt{3}}$	$-\frac{1}{\sqrt{2}}$	$-\frac{1}{\sqrt{6}}$	}	Ht	7																
21	$\overline{b}\,{}^{1/3}_{\wedge}\,{}^{c}_{1}\,R$		{BC8, 6Cube, H4Φ, dualSnub24, snub24H4Φ}	$0apggsscc$ 010110110_2	Bn{	0	1	0	0	0	0	1	0	}	Rt{	0	1	1	1	1	1	1	0	}	Nb 41	Flipped Triad fpi=29 BC_8 $\overline{E}$ fp_sm=7→6BH {1, 7, 2}, {1, 6, 3}, {1, 4, 5}, {2, 4, 3}, {2, 5, 6}, {3, 7, 5}, {4, 7, 6} flat triad/mask bits {1, 2, 7, 6, 3, 4, 5} {1, 1, 0, 1, 0, 1, 1}	Not Flipped Triad fpi=27 BC_8 $\overline{E}$ fp_sm=4→62H {1, 2, 7}, {1, 5, 3}, {1, 4, 6}, {2, 3, 4}, {2, 5, 6}, {3, 7, 6}, {4, 7, flat triad/mask bits {1, 2, 7, 5, 3, 4, 6} {0, 1, 0, 0, 0, 1, 1}
					E8{	$-\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	}	Wt{	−1	1	0	0	1	0	0	−1	}										
					Ph{	$-\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{\sqrt{2}}$	0	$-\frac{1}{2}$	$-\frac{1}{2\sqrt{3}}$	$\frac{1}{\sqrt{2}}$	$-\frac{1}{\sqrt{6}}$	}	Ht	6																
22	$\overline{b}\,{}^{1/3}_{\wedge}\,{}^{m}_{1}\,R$		{BC8, H4, snub24, altSnub24, cellE8, snub24H4}	$0apggsscc$ 010110111_2	Bn{	0	1	0	0	0	0	0	1	}	Rt{	−1	−1	−2	−3	−1	−3	−4	−2	}	Cf 98	Flipped Triad fpi=28 BC_8 $\overline{E}$ fp_sm=3→63H {1, 7, 2}, {1, 5, 3}, {1, 4, 6}, {2, 3, 6}, {2, 4, 5}, {3, 7, 4}, {5, 7, 6} flat triad/mask bits {1, 7, 2, 5, 3, 4, 6} {1, 1, 0, 0, 0, 1, 1}	Not Flipped Triad fpi=30 BC_8 $\overline{E}$ fp_sm=6→68H {1, 2, 7}, {1, 3, 6}, {1, 4, 5}, {2, 5, 3}, {2, 4, 6}, {3, 7, 4}, {5, 7, flat triad/mask bits {1, 2, 7, 3, 6, 4, 5} {0, 0, 0, 1, 0, 1, 1}
					E8{	$-\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	}	Wt{	−1	1	0	0	1	−1	0	0	}										
					Ph{	$-\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{\sqrt{2}}$	0	$-\frac{1}{2}$	$-\frac{1}{2\sqrt{3}}$	0	$\sqrt{\frac{2}{3}}$	}	Ht	17																
23	${}^{e}_{3}\,{}^{-}_{\wedge}\,{}^{}_{1}\,R$		{BC8, E7, E6, 6Cube, E5, C4, H4, 24cell, 8Cell, altSnub24, snub24E8, snub24H4, 3Cube}	$0apggsscc$ 000010100_2	Bn{	0	0	1	1	0	0	0	0	}	Rt{	0	0	1	2	1	1	2	1	}	Te 52	Flipped Triad fpi=4 BC_8 $\overline{E}$ fp_sm=3→1CH {1, 2, 3}, {1, 4, 6}, {1, 7, 5}, {2, 7, 4}, {2, 6, 5}, {3, 4, 5}, {3, 6, 7} flat triad/mask bits {1, 3, 2, 4, 6, 7, 5} {0, 0, 1, 1, 1, 0, 0}	Not Flipped Triad fpi=7 BC_8 $\overline{E}$ fp_sm=3→1CH {1, 2, 4}, {1, 3, 5}, {1, 7, 6}, {2, 7, 5}, {3, 4, 7}, {4, 5, flat triad/mask bits {1, 2, 4, 3, 5, 7, 6} {0, 0, 1, 1, 1, 0, 0}
					E8{	$-\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{\sqrt{3}}{2}$	0	0	}	Wt{	0	−1	0	1	1	−1	0	0	}										
					Ph{	$-\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{\sqrt{2}}$	0	$-\frac{1}{2}$	0	0	0	}	Ht	8																
24	$\overline{\tau}\,{}^{+}_{3}\,{}^{y}_{m}\,{}^{\wedge}_{L}$		{BC8, E7, E6, 6Cube, C4, H4, 24cell, 8Cell, altSnub24, snub24E8, snub24H4}	$0apggsscc$ 010111000_2	Bn{	0	0	1	0	1	0	0	0	}	Rt{	0	0	1	1	1	1	2	1	}	Rb 45	Flipped Triad fpi=23 BC_8 $\overline{E}$ fp_sm=2→53H {1, 6, 2}, {1, 7, 3}, {1, 4, 5}, {2, 3, 4}, {2, 7, 5}, {3, 5, 6}, {4, 7, 6} flat triad/mask bits {1, 2, 6, 7, 3, 4, 5} {1, 1, 0, 0, 1, 0, 1}	Not Flipped Triad fpi=24 BC_8 $\overline{E}$ fp_sm=3→50H {1, 6, 2}, {1, 3, 7}, {1, 4, 5}, {2, 5, 3}, {2, 7, 4}, {3, 4, 6}, {5, 7, flat triad/mask bits {1, 2, 6, 3, 7, 4, 5} {0, 0, 0, 0, 1, 0, 1}
					E8{	$-\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$-\frac{\sqrt{3}}{2}$	0	0	}	Wt{	0	−1	1	−1	1	−1	1	0	}										
					Ph{	$-\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{\sqrt{2}}$	0	$\frac{1}{2}$	0	0	0	}	Ht	7																
25	$\overline{b}\,{}^{1/3}_{\wedge}\,{}^{o}_{m}\,{}^{}_{L}$		{BC8, E7, 6Cube, C4, H4, snub24, altSnub24, snub24E8, snub24H4}	$0apggsscc$ 010111001_2	Bn{	0	0	1	0	0	1	0	0	}	Rt{	0	0	1	1	1	1	1	1	}	Y 39	Flipped Triad fpi=26 BC_8 $\overline{E}$ fp_sm=8→59H {1, 7, 2}, {1, 3, 4}, {1, 5, 6}, {2, 6, 3}, {2, 5, 4}, {3, 5, 7}, {4, 7, 6} flat triad/mask bits {1, 2, 7, 3, 4, 5, 6} {1, 0, 0, 1, 1, 0, 1}	Not Flipped Triad fpi=25 BC_8 $\overline{E}$ fp_sm=5→5AH {1, 2, 7}, {1, 4, 3}, {1, 5, 6}, {2, 5, 3}, {2, 6, 4}, {3, 6, 7}, {4, 7, flat triad/mask bits {1, 2, 7, 4, 3, 5, 6} {0, 1, 0, 1, 1, 0, 1}
					E8{	$-\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	}	Wt{	0	−1	1	0	1	0	−1	1	}										
					Ph{	$-\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{\sqrt{2}}$	0	$-\frac{1}{2}$	$-\frac{1}{2\sqrt{3}}$	$-\frac{1}{\sqrt{2}}$	$-\frac{1}{\sqrt{6}}$	}	Ht	6																
26	$\overline{b}\,{}^{1/3}_{\wedge}\,{}^{c}_{m}\,{}^{}_{L}$		{BC8, 6Cube, H4, snub24, altSnub24, snub24E8, 24cellH4}	$0apggsscc$ 010111010_2	Bn{	0	0	1	0	0	0	1	0	}	Rt{	0	0	1	1	1	1	1	0	}	As 33	Flipped Triad fpi=29 BC_8 $\overline{E}$ fp_sm=7→58H {1, 2, 7}, {1, 3, 6}, {1, 4, 5}, {2, 4, 3}, {2, 6, 5}, {3, 5, 7}, {4, 7, 6} flat triad/mask bits {1, 7, 2, 3, 6, 4, 5} {0, 0, 0, 1, 1, 0, 1}	Not Flipped Triad fpi=27 BC_8 $\overline{E}$ fp_sm=4→51H {1, 2, 7}, {1, 3, 5}, {1, 4, 6}, {2, 3, 4}, {2, 6, 5}, {3, 6, 7}, {4, 7, flat triad/mask bits {1, 7, 2, 3, 5, 4, 6} {1, 0, 0, 0, 1, 0, 1}
					E8{	$-\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	}	Wt{	0	−1	1	0	1	0	0	−1	}										
					Ph{	$-\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{\sqrt{2}}$	0	$-\frac{1}{2}$	$-\frac{1}{2\sqrt{3}}$	$\frac{1}{\sqrt{2}}$	$-\frac{1}{\sqrt{6}}$	}	Ht	5																

Seq #	Symbol	2D/3D Shape	Groups	Particle Quantum Bits	Binary / E8 / Physics Coordinates	Algebra Root Weight / Height / RtH=Atomic Element Number -->	Ele #	Octonions
27	$\overline{{}^{b}_{m}{}_{m}}^{1/3\,\wedge}_{L}$		{BC8, H4Φ, dualSnub24, snub24H4Φ}	0apggssec 010111011_2	Bn{ 0 0 1 0 0 0 0 1 } E8{ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ } Ph{ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{\sqrt{2}}$ 0 $-\frac{1}{2}$ $-\frac{1}{2\sqrt{3}}$ 0 $\sqrt{\frac{2}{3}}$ }	Rt{ −1 −2 −2 −3 −1 −3 −4 −2 } Wt{ 0 −1 1 0 1 −1 0 0 } Ht 18	$\overline{\text{No}}$ 102	Flipped Triad fpi=28 BC_8 L fp_sm=3→50H {1, 2, 7}, {1, 3, 5}, {1, 4, 6}, {2, 3, 6}, {2, 5, 4}, {3, 4, 7}, {5, 7, 6} flat triad/mask bits {1, 2, 7, 3, 5, 4, 6} {0, 0, 0, 0, 1, 0, 1} Not Flipped Triad fpi=30 BC_8 L fp_sm=6→5BH {1, 7, 2}, {1, 6, 3}, {1, 4, 5}, {2, 5, 3}, {2, 6, 4}, {3, 4, 7}, {5, 7, flat triad/mask bits {1, 7, 2, 6, 3, 4, 5} {1, 1, 0, 1, 1, 0, 1}
28	$\overline{{}^{\tau}_{y}{}_{m}}^{+\,\vee}_{R}$		{BC8, E7, E6, 6Cube, C4, H4, 24cell, 8Cell, altSnub24, snub24E8, snub24H4}	0apggssec 010111100_2	Bn{ 0 0 0 1 1 0 0 0 } E8{ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ } Ph{ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{\sqrt{2}}$ 0 $\frac{1}{2}$ $-\frac{\sqrt{3}}{2}$ 0 0 }	Rt{ 0 0 0 1 1 1 2 1 } Wt{ 0 0 −1 0 1 −1 1 0 } Ht 6	$\overline{\text{Rb}}$ 37	Flipped Triad fpi=23 BC_8 L fp_sm=2→4DH {1, 6, 2}, {1, 3, 7}, {1, 5, 4}, {2, 4, 3}, {2, 5, 7}, {3, 5, 6}, {4, 7, 6} flat triad/mask bits {1, 2, 6, 3, 7, 5, 4} {1, 0, 1, 1, 0, 0, 1} Not Flipped Triad fpi=24 BC_8 L fp_sm=3→4EH {1, 2, 6}, {1, 7, 3}, {1, 5, 4}, {2, 5, 3}, {2, 4, 7}, {3, 4, 6}, {5, 7, flat triad/mask bits {1, 2, 6, 7, 3, 5, 4} {0, 1, 1, 1, 0, 0, 1}
29	$\overline{{}^{b}_{o}{}_{m}}^{1/3\,\vee}_{R}$		{BC8, E7, 6Cube, C4, H4Φ, dualSnub24, snub24H4Φ}	0apggssec 010111101_2	Bn{ 0 0 0 1 0 1 0 0 } E8{ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ } Ph{ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{\sqrt{2}}$ 0 $-\frac{1}{2}$ $-\frac{1}{2\sqrt{3}}$ $-\frac{1}{\sqrt{2}}$ $-\frac{1}{\sqrt{6}}$ }	Rt{ 0 0 0 1 1 1 1 1 } Wt{ 0 0 −1 1 1 0 −1 1 } Ht 5	Ga 31	Flipped Triad fpi=26 BC_8 L fp_sm=8→47H {1, 7, 2}, {1, 4, 3}, {1, 6, 5}, {2, 3, 6}, {2, 4, 5}, {3, 5, 7}, {4, 7, 6} flat triad/mask bits {1, 2, 7, 4, 3, 6, 5} {1, 1, 1, 0, 0, 0, 1} Not Flipped Triad fpi=25 BC_8 L fp_sm=5→44H {1, 2, 7}, {1, 3, 4}, {1, 6, 5}, {2, 3, 5}, {2, 4, 6}, {3, 6, 7}, {4, 7, flat triad/mask bits {1, 2, 7, 3, 4, 6, 5} {0, 0, 1, 0, 0, 0, 1}
30	$\overline{{}^{b}_{c}{}_{m}}^{1/3\,\vee}_{R}$		{BC8, 6Cube, H4, snub24, altSnub24, snub24E8, snub24H4}	0apggssec 010111110_2	Bn{ 0 0 0 1 0 0 1 0 } E8{ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ } Ph{ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{\sqrt{2}}$ 0 $-\frac{1}{2}$ $-\frac{1}{2\sqrt{3}}$ $\frac{1}{\sqrt{2}}$ $-\frac{1}{\sqrt{6}}$ }	Rt{ 0 0 0 1 1 1 1 0 } Wt{ 0 0 −1 1 1 0 0 −1 } Ht 4	Mn 25	Flipped Triad fpi=29 BC_8 L fp_sm=7→46H {1, 2, 7}, {1, 6, 3}, {1, 5, 4}, {2, 3, 4}, {2, 5, 6}, {3, 5, 7}, {4, 7, 6} flat triad/mask bits {1, 7, 2, 6, 3, 5, 4} {0, 1, 1, 0, 0, 0, 1} Not Flipped Triad fpi=27 BC_8 L fp_sm=4→4FH {1, 7, 2}, {1, 5, 3}, {1, 6, 4}, {2, 4, 3}, {2, 5, 6}, {3, 6, 7}, {4, 7, flat triad/mask bits {1, 7, 2, 5, 3, 6, 4} {1, 1, 1, 1, 0, 0, 1}
31	$\overline{{}^{b}_{m}{}_{m}}^{1/3\,\vee}_{R}$		{BC8, H4, snub24, altSnub24, cellE8, 24cellH4}	0apggssec 010111111_2	Bn{ 0 0 0 1 0 0 0 1 } E8{ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ } Ph{ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{\sqrt{2}}$ 0 $-\frac{1}{2}$ $-\frac{1}{2\sqrt{3}}$ 0 $\sqrt{\frac{2}{3}}$ }	Rt{ −1 −2 −3 −3 −1 −3 −4 −2 } Wt{ 0 0 −1 1 1 −1 0 0 } Ht 19	$\overline{\text{Db}}$ 105	Flipped Triad fpi=28 BC_8 L fp_sm=3→4EH {1, 2, 7}, {1, 5, 3}, {1, 6, 4}, {2, 6, 3}, {2, 4, 5}, {3, 4, 7}, {5, 7, 6} flat triad/mask bits {1, 2, 7, 5, 3, 6, 4} {0, 1, 1, 1, 0, 0, 1} Not Flipped Triad fpi=30 BC_8 L fp_sm=6→45H {1, 7, 2}, {1, 3, 6}, {1, 5, 4}, {2, 3, 5}, {2, 4, 6}, {3, 4, 7}, {5, 7, flat triad/mask bits {1, 7, 2, 3, 6, 5, 4} {1, 0, 1, 0, 0, 0, 1}
32	$\overline{{}^{d}_{d}{}_{d}}^{1/3\,\vee}_{L}$		{BC8, E7, 6Cube, C4, H4Φ, dualSnub24, 24cellE8Φ, snub24H4Φ}	0apggssec 010010001_2	Bn{ 0 0 0 0 1 1 0 0 } E8{ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ } Ph{ $-\frac{1}{2}$ $-\frac{1}{2}$ 0 $-\frac{1}{\sqrt{2}}$ $\frac{1}{2}$ $-\frac{1}{2\sqrt{3}}$ $-\frac{1}{\sqrt{2}}$ $-\frac{1}{\sqrt{6}}$ }	Rt{ 0 0 0 0 1 1 1 1 } Wt{ 0 0 0 −1 1 0 0 1 } Ht 4	V 23	Flipped Triad fpi=10 BC_8 L fp_sm=5→77H {1, 4, 2}, {1, 6, 3}, {1, 7, 5}, {2, 3, 7}, {2, 6, 5}, {3, 5, 4}, {4, 7, 6} flat triad/mask bits {1, 2, 4, 6, 3, 7, 5} {1, 1, 1, 0, 1, 1, 1} Not Flipped Triad fpi=8 BC_8 L fp_sm=2→7EH {1, 2, 4}, {1, 5, 3}, {1, 7, 6}, {2, 3, 7}, {2, 6, 5}, {3, 6, 4}, {4, 7, flat triad/mask bits {1, 2, 4, 5, 3, 7, 6} {0, 1, 1, 1, 1, 1, 1}
33	$\overline{{}^{d}_{c}{}_{d}}^{1/3\,\vee}_{L}$		{BC8, 6Cube, H4Φ, dualSnub24, 24cellE8Φ, snub24H4Φ}	0apggssec 010010010_2	Bn{ 0 0 0 0 1 0 1 0 } E8{ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ } Ph{ $-\frac{1}{2}$ $-\frac{1}{2}$ 0 $-\frac{1}{\sqrt{2}}$ $\frac{1}{2}$ $-\frac{1}{2\sqrt{3}}$ $\frac{1}{\sqrt{2}}$ $-\frac{1}{\sqrt{6}}$ }	Rt{ 0 0 0 0 1 1 1 0 } Wt{ 0 0 0 −1 1 0 1 −1 } Ht 3	Cl 17	Flipped Triad fpi=12 BC_8 L fp_sm=4→7CH {1, 2, 4}, {1, 3, 7}, {1, 6, 5}, {2, 6, 3}, {2, 7, 5}, {3, 5, 4}, {4, 7, 6} flat triad/mask bits {1, 4, 2, 3, 7, 6, 5} {0, 0, 1, 1, 1, 1, 1} Not Flipped Triad fpi=11 BC_8 L fp_sm=1→7FH {1, 4, 2}, {1, 7, 3}, {1, 6, 5}, {2, 5, 3}, {2, 7, 6}, {3, 6, 4}, {4, 7, flat triad/mask bits {1, 4, 2, 3, 7, 6, 5} {1, 1, 1, 1, 1, 1, 1}
34	$\overline{{}^{d}_{m}{}_{d}}^{1/3\,\vee}_{L}$		{BC8, H4Φ, dualSnub24, 24cellE8Φ, snub24H4Φ}	0apggssec 010010011_2	Bn{ 0 0 0 0 1 0 0 1 } E8{ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ } Ph{ $-\frac{1}{2}$ $-\frac{1}{2}$ 0 $-\frac{1}{\sqrt{2}}$ $\frac{1}{2}$ $-\frac{1}{2\sqrt{3}}$ 0 $\sqrt{\frac{2}{3}}$ }	Rt{ −1 −2 −3 −4 −1 −3 −4 −2 } Wt{ 0 0 0 −1 1 −1 1 0 } Ht 20	$\overline{\text{Hs}}$ 108	Flipped Triad fpi=13 BC_8 L fp_sm=6→76H {1, 2, 5}, {1, 4, 3}, {1, 7, 6}, {2, 3, 6}, {2, 7, 4}, {3, 7, 5}, {4, 6, 5} flat triad/mask bits {1, 5, 2, 4, 3, 7, 6} {0, 1, 1, 0, 1, 1, 1} Not Flipped Triad fpi=14 BC_8 L fp_sm=7→75H {1, 5, 2}, {1, 3, 4}, {1, 7, 6}, {2, 3, 7}, {2, 6, 4}, {3, 6, 5}, {4, 7, flat triad/mask bits {1, 5, 2, 3, 4, 7, 6} {1, 1, 0, 1, 1, 1, 1}
35	${}^{u}_{b}{}_{l}^{2/3\,\wedge}_{R}$		{BC8, 6Cube, H4Φ, dualSnub24, 24cellE8Φ, snub24H4Φ}	0apggssec 001010111_2	Bn{ 0 0 0 0 0 1 1 0 } E8{ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ } Ph{ $-\frac{1}{2}$ $-\frac{1}{2}$ 0 $-\frac{1}{\sqrt{2}}$ $-\frac{1}{2}$ $\frac{1}{2\sqrt{3}}$ 0 $-\sqrt{\frac{2}{3}}$ }	Rt{ 0 0 0 0 1 1 0 0 } Wt{ 0 0 0 0 1 1 −1 0 } Ht 2	Na 11	Flipped Triad fpi=13 BC_8 R fp_sm=6→10H {1, 2, 5}, {1, 3, 4}, {1, 6, 7}, {2, 3, 6}, {2, 7, 4}, {3, 5, 7}, {4, 5, 6} flat triad/mask bits {1, 5, 2, 3, 4, 6, 7} {0, 0, 0, 0, 1, 0, 0} Not Flipped Triad fpi=14 BC_8 R fp_sm=7→13H {1, 5, 2}, {1, 4, 3}, {1, 6, 7}, {2, 3, 7}, {2, 6, 4}, {3, 5, 6}, {4, 5, flat triad/mask bits {1, 5, 2, 4, 3, 6, 7} {1, 1, 0, 0, 1, 0, 0}
36	${}^{u}_{g}{}_{l}^{2/3\,\wedge}_{R}$		{BC8, H4Φ, dualSnub24, 24cellE8Φ, snub24H4Φ}	0apggssec 001010110_2	Bn{ 0 0 0 0 0 1 0 1 } E8{ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ } Ph{ $-\frac{1}{2}$ $-\frac{1}{2}$ 0 $-\frac{1}{\sqrt{2}}$ $-\frac{1}{2}$ $\frac{1}{2\sqrt{3}}$ $-\frac{1}{\sqrt{2}}$ $\frac{1}{\sqrt{6}}$ }	Rt{ −1 −2 −3 −4 −1 −3 −5 −2 } Wt{ 0 0 0 0 0 1 0 −1 } Ht 21	$\overline{\text{Mt}}$ 109	Flipped Triad fpi=12 BC_8 R fp_sm=4→1AH {1, 2, 4}, {1, 7, 3}, {1, 5, 6}, {2, 6, 3}, {2, 7, 5}, {3, 4, 5}, {4, 6, 7} flat triad/mask bits {1, 4, 2, 7, 3, 5, 6} {0, 1, 0, 1, 1, 0, 0} Not Flipped Triad fpi=11 BC_8 R fp_sm=1→19H {1, 4, 2}, {1, 3, 7}, {1, 5, 6}, {2, 5, 3}, {2, 7, 6}, {3, 4, 6}, {4, 5, flat triad/mask bits {1, 4, 2, 3, 7, 5, 6} {1, 0, 0, 1, 1, 0, 0}
37	${}^{u}_{r}{}_{l}^{2/3\,\wedge}_{R}$		{BC8, E7, H4Φ, dualSnub24, 24cellE8Φ, snub24H4Φ}	0apggssec 001010101_2	Bn{ 0 0 0 0 0 0 1 1 } E8{ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ } Ph{ $-\frac{1}{2}$ $-\frac{1}{2}$ 0 $-\frac{1}{\sqrt{2}}$ $-\frac{1}{2}$ $\frac{1}{2\sqrt{3}}$ $\frac{1}{\sqrt{2}}$ $\frac{1}{\sqrt{6}}$ }	Rt{ −1 −2 −3 −4 −1 −3 −5 −3 } Wt{ 0 0 0 0 1 0 0 −1 } Ht 22	$\overline{\text{Rg}}$ 111	Flipped Triad fpi=10 BC_8 R fp_sm=5→11H {1, 4, 2}, {1, 3, 6}, {1, 5, 7}, {2, 3, 7}, {2, 6, 5}, {3, 4, 5}, {4, 6, 7} flat triad/mask bits {1, 2, 4, 3, 6, 5, 7} {1, 0, 0, 0, 1, 0, 0} Not Flipped Triad fpi=8 BC_8 R fp_sm=2→18H {1, 2, 4}, {1, 3, 5}, {1, 6, 7}, {2, 3, 7}, {2, 6, 5}, {3, 4, 6}, {4, 5, flat triad/mask bits {1, 2, 4, 3, 5, 6, 7} {0, 0, 0, 1, 1, 0, 0}

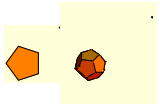
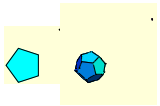
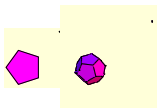
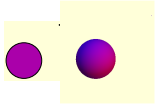
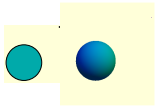
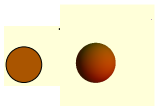
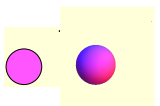
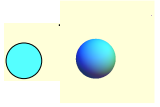
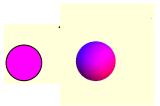
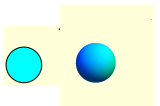
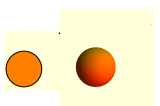
pascalRow@4

Seq #	Symbol	2D/3D Shape	Groups	Particle Quantum Bits	Binary / E8 / Physics Coordinates	Algebra Root Weight / Height / RtH=Atomic Element Number -->	Ele #	Octonions
38	$\overline{{}^{W}_{b}{}_{m}}^{0\,\vee}_{R}$		{D8, E7, D7, E6, D6, E5, D5, E4, D4, F4s, H4Φ, snub24H4Φ, D3, D3, D2}	0apggssec 011001111_2	Bn{ 1 1 1 0 0 0 0 0 } E8{ −1 −1 0 0 0 0 0 0 } Ph{ −1 −1 0 0 0 0 0 0 }	Rt{ −1 −2 −2 −2 0 −1 −2 −1 } Wt{ 0 −1 0 0 1 0 0 0 } Ht 11	$\overline{\text{W}}$ 74	Flipped Triad fpi=6 D_8 R fp_sm=6→42H {1, 2, 3}, {1, 7, 4}, {1, 5, 6}, {2, 4, 6}, {2, 5, 7}, {3, 4, 5}, {3, 7, 6} flat triad/mask bits {1, 3, 2, 7, 4, 5, 6} {0, 1, 0, 0, 0, 0, 1} Not Flipped Triad fpi=9 D_8 R fp_sm=6→42H {1, 2, 4}, {1, 6, 3}, {1, 5, 7}, {2, 5, 3}, {2, 6, 7}, {3, 4, 7}, {4, 6 flat triad/mask bits {1, 2, 4, 6, 3, 5, 7} {0, 1, 0, 0, 0, 0, 1}
39	$\overline{{}^{c_S\phi}_{r_m}}^{0\,\wedge}_{L}$		{D8, E7, D7, E6, D6, E5, D5, E4, D4, F4s, H4Φ, snub24H4Φ, D3, D3}	0apggssec 011001001_2	Bn{ 1 1 0 1 0 0 0 0 } E8{ −1 0 −1 0 0 0 0 0 } Ph{ −1 0 $-\frac{1}{\sqrt{2}}$ $-\frac{1}{\sqrt{2}}$ 0 0 0 0 }	Rt{ −1 −1 −2 −2 0 −1 −2 −1 } Wt{ −1 1 −1 0 1 0 0 0 } Ht 10	$\overline{\text{Er}}$ 68	Flipped Triad fpi=1 D_8 R fp_sm=5→5DH {1, 3, 2}, {1, 4, 5}, {1, 7, 6}, {2, 6, 4}, {2, 7, 5}, {3, 4, 7}, {3, 6, 5} flat triad/mask bits {1, 2, 3, 4, 5, 7, 6} {1, 0, 1, 1, 1, 0, 1} Not Flipped Triad fpi=2 D_8 R fp_sm=8→5EH {1, 2, 3}, {1, 5, 4}, {1, 7, 6}, {2, 7, 4}, {2, 6, 5}, {3, 4, 6}, {3, 7 flat triad/mask bits {1, 2, 3, 5, 4, 7, 6} {0, 1, 1, 1, 1, 0, 1}

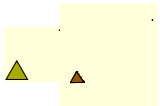
40	$\overline{{}^{c}_{S}\phi}{}^{0}_{\vee}$ ${}^{}_{b_d}{}^{}_{L}$			{D8, E7, D7, E6, D6, E5, D5, D4, F4s, H4Φ, snub24H4Φ}	0_{apggsscc} 011000011_2	Bn{ E8{ Ph{	1 1 0 0 1 0 0 0 } −1 0 0 0 0 0 0 0 } −1 0 $\frac{1}{\sqrt{2}}$ $-\frac{1}{\sqrt{2}}$ 0 0 0 0 }	Rt{ Wt{ Ht	−1 −1 −1 −2 0 −1 −2 −1 } −1 0 1 −1 1 0 0 0 } 9	Sm 62	Flipped Triad fpi=6 D_8 R fp_sm=6→71H {1, 3, 2}, {1, 4, 7}, {1, 5, 6}, {2, 4, 6}, {2, 7, 5}, {3, 5, 4}, {3, 7, 6} flat triad/mask bits {1, 2, 3, 4, 7, 5, 6} {1, 0, 0, 0, 1, 1, 1}	Not Flipped Triad fpi=9 D_8 R fp_sm=6→71H {1, 4, 2}, {1, 3, 6}, {1, 5, 7}, {2, 3, 5}, {2, 7, 6}, {3, 7, 4}, {4, 6 flat triad/mask bits {1, 4, 2, 3, 6, 5, 7} {1, 0, 0, 0, 1, 1, 1}
41	$\overline{{}^{}_{Y}\mu}{}^{0}_{\wedge}$ ${}^{}_{w_m}{}^{}_{L}$			{D8, E7, D7, E6, D6, D5, H4, snub24, altSnub24, snub24E8, 24cellH4, 16cellH4}	0_{apggsscc} 011101000_2	Bn{ E8{ Ph{	1 1 0 0 0 1 0 0 } −1 0 0 0 −1 0 0 0 } −1 0 0 0 −1 0 0 0 }	Rt{ Wt{ Ht	−1 −1 −1 −1 0 −1 −2 −1 } −1 0 0 1 1 0 −1 0 } 8	Cs 55	Flipped Triad fpi=16 D_8 R fp_sm=3→57H {1, 5, 2}, {1, 6, 3}, {1, 7, 4}, {2, 3, 7}, {2, 6, 4}, {3, 4, 5}, {5, 7, 6} flat triad/mask bits {1, 2, 5, 6, 3, 7, 4} {1, 1, 1, 0, 1, 0, 1}	Not Flipped Triad fpi=15 D_8 R fp_sm=3→57H {1, 5, 2}, {1, 6, 3}, {1, 7, 4}, {2, 3, 4}, {2, 7, 6}, {3, 5, 7}, {4, 6 flat triad/mask bits {1, 5, 2, 6, 3, 7, 4} {1, 1, 1, 0, 1, 0, 1}
42	${}^{s}_{o_m}{}^{-1/3}_{\vee}$ R			{D8, E7, D7, D6, H4Φ, dualSnub24, 24cellE8Φ, 16cellE8Φ, snub24H4Φ}	0_{apggsscc} 000101101_2	Bn{ E8{ Ph{	1 1 0 0 0 0 1 0 } −1 0 0 0 0 −1 0 0 } −1 0 0 0 0 $-\frac{1}{\sqrt{3}}$ $\frac{1}{\sqrt{2}}$ $\frac{1}{\sqrt{6}}$ }	Rt{ Wt{ Ht	−1 −1 −1 −1 0 −1 −1 −1 } −1 0 0 0 1 −1 1 −1 } 7	In 49	Flipped Triad fpi=17 D_8 L fp_sm=8→38H {1, 2, 5}, {1, 3, 7}, {1, 4, 6}, {2, 4, 3}, {2, 7, 6}, {3, 6, 5}, {4, 5, 7} flat triad/mask bits {1, 5, 2, 3, 7, 4, 6} {0, 0, 0, 1, 1, 1, 0}	Not Flipped Triad fpi=19 D_8 L fp_sm=3→31H {1, 6, 2}, {1, 3, 4}, {1, 5, 7}, {2, 3, 5}, {2, 7, 4}, {3, 7, 6}, {4, 5 flat triad/mask bits {1, 6, 2, 3, 4, 5, 7} {1, 0, 0, 0, 1, 1, 0}
43	${}^{s}_{c_m}{}^{-1/3}_{\vee}$ R			{D8, D7, H4Φ, dualSnub24, 24cellE8Φ, 16cellE8Φ, snub24H4Φ}	0_{apggsscc} 000101110_2	Bn{ E8{ Ph{	1 1 0 0 0 0 0 1 } −1 0 0 0 0 0 −1 0 } −1 0 0 0 0 $-\frac{1}{\sqrt{3}}$ $-\frac{1}{\sqrt{2}}$ $\frac{1}{\sqrt{6}}$ }	Rt{ Wt{ Ht	−1 −1 −1 −1 0 −1 −1 0 } −1 0 0 0 1 −1 0 1 } 6	Tc 43	Flipped Triad fpi=18 D_8 L fp_sm=6→3AH {1, 2, 5}, {1, 7, 3}, {1, 4, 6}, {2, 6, 3}, {2, 7, 4}, {3, 5, 4}, {5, 6, 7} flat triad/mask bits {1, 5, 2, 7, 3, 4, 6} {0, 1, 0, 1, 1, 1, 0}	Not Flipped Triad fpi=20 D_8 L fp_sm=1→33H {1, 6, 2}, {1, 4, 3}, {1, 5, 7}, {2, 3, 7}, {2, 5, 4}, {3, 6, 5}, {4, 6 flat triad/mask bits {1, 6, 2, 4, 3, 5, 7} {1, 1, 0, 0, 1, 1, 0}
44	${}^{s}_{m_m}{}^{-1/3}_{\vee}$ R			{D8, H4Φ, dualSnub24, 24cellE8Φ, 16cellE8Φ, snub24H4Φ}	0_{apggsscc} 000101111_2	Bn{ E8{ Ph{	1 0 1 1 0 0 0 0 } −1 0 0 0 0 0 0 −1 } −1 0 0 0 0 $-\frac{1}{\sqrt{3}}$ 0 $-\sqrt{\frac{2}{3}}$ }	Rt{ Wt{ Ht	0 1 2 3 2 3 4 2 } −1 0 0 0 1 0 0 0 } 17	Bk 97	Flipped Triad fpi=22 D_8 L fp_sm=6→3AH {1, 2, 6}, {1, 5, 3}, {1, 4, 7}, {2, 7, 3}, {2, 5, 4}, {3, 6, 4}, {5, 6, 7} flat triad/mask bits {1, 6, 2, 5, 3, 4, 7} {0, 1, 0, 1, 1, 1, 0}	Not Flipped Triad fpi=21 D_8 L fp_sm=6→3AH {1, 2, 6}, {1, 5, 3}, {1, 4, 7}, {2, 4, 3}, {2, 7, 6}, {3, 5, 4}, {5, 6, 7} flat triad/mask bits {1, 2, 6, 5, 3, 4, 7} {0, 1, 0, 1, 1, 1, 0}
45	$\overline{{}^{c}_{b_m}}{}^{-2/3}_{\wedge}$ L			{D8, H4Φ, dualSnub24, snub24H4Φ}	0_{apggsscc} 011101011_2	Bn{ E8{ Ph{	1 0 1 0 1 0 0 0 } −1 0 0 0 0 0 0 1 } −1 0 0 0 0 $\frac{1}{\sqrt{3}}$ 0 $\sqrt{\frac{2}{3}}$ }	Rt{ Wt{ Ht	−2 −3 −4 −5 −2 −4 −6 −3 } −1 0 0 0 0 0 0 0 } 29	Ubn 120	Flipped Triad fpi=22 D_8 R fp_sm=6→5CH {1, 2, 6}, {1, 3, 5}, {1, 7, 4}, {2, 7, 3}, {2, 5, 4}, {3, 4, 6}, {5, 7, 6} flat triad/mask bits {1, 6, 2, 3, 5, 7, 4} {0, 0, 1, 1, 1, 0, 1}	Not Flipped Triad fpi=21 D_8 R fp_sm=6→5CH {1, 2, 6}, {1, 3, 5}, {1, 7, 4}, {2, 4, 3}, {2, 7, 6}, {3, 5, 4}, {5, 7, 6} flat triad/mask bits {1, 2, 6, 3, 5, 7, 4} {0, 0, 1, 1, 1, 0, 1}
46	$\overline{{}^{c}_{g_m}}{}^{-2/3}_{\wedge}$ L			{D8, D7, H4Φ, dualSnub24, snub24H4Φ}	0_{apggsscc} 011101010_2	Bn{ E8{ Ph{	1 0 1 0 0 1 0 0 } −1 0 0 0 0 0 1 0 } −1 0 0 0 0 $\frac{1}{\sqrt{3}}$ $\frac{1}{\sqrt{2}}$ $-\frac{1}{\sqrt{6}}$ }	Rt{ Wt{ Ht	−1 −1 −1 −1 0 0 −1 −1 } −1 0 0 0 0 1 0 −1 } 6	Mo 42	Flipped Triad fpi=18 D_8 R fp_sm=6→5CH {1, 2, 5}, {1, 3, 7}, {1, 6, 4}, {2, 6, 3}, {2, 7, 4}, {3, 4, 5}, {5, 7, 6} flat triad/mask bits {1, 5, 2, 3, 7, 6, 4} {0, 0, 1, 1, 1, 0, 1}	Not Flipped Triad fpi=20 D_8 R fp_sm=1→55H {1, 6, 2}, {1, 3, 4}, {1, 7, 5}, {2, 3, 7}, {2, 5, 4}, {3, 5, 6}, {4, 7 flat triad/mask bits {1, 6, 2, 3, 4, 7, 5} {1, 0, 1, 0, 1, 0, 1}
47	$\overline{{}^{c}_{r_m}}{}^{-2/3}_{\wedge}$ L			{D8, E7, D7, D6, H4Φ, dualSnub24, snub24H4Φ}	0_{apggsscc} 011101001_2	Bn{ E8{ Ph{	1 0 1 0 0 0 1 0 } −1 0 0 0 0 1 0 0 } −1 0 0 0 0 $\frac{1}{\sqrt{3}}$ $-\frac{1}{\sqrt{2}}$ $-\frac{1}{\sqrt{6}}$ }	Rt{ Wt{ Ht	−1 −1 −1 −1 0 0 −1 0 } −1 0 0 0 0 1 −1 1 } 5	Kr 36	Flipped Triad fpi=17 D_8 R fp_sm=8→5EH {1, 2, 5}, {1, 7, 3}, {1, 6, 4}, {2, 4, 3}, {2, 7, 6}, {3, 5, 6}, {4, 7, 5} flat triad/mask bits {1, 5, 2, 7, 3, 6, 4} {0, 1, 1, 1, 1, 0, 1}	Not Flipped Triad fpi=19 D_8 R fp_sm=3→57H {1, 6, 2}, {1, 4, 3}, {1, 7, 5}, {2, 3, 5}, {2, 7, 4}, {3, 6, 7}, {4, 6 flat triad/mask bits {1, 6, 2, 4, 3, 7, 5} {1, 1, 0, 0, 1, 0, 1}
48	${}^{\mu}_{y_m}{}^{-}_{\vee}$ R			{D8, E7, D7, E6, D6, D5, H4Φ, dualSnub24, 24cellH4Φ, 16cellH4Φ}	0_{apggsscc} 000101100_2	Bn{ E8{ Ph{	1 0 1 0 0 0 0 1 } −1 0 0 0 1 0 0 0 } −1 0 0 0 1 0 0 0 }	Rt{ Wt{ Ht	−1 −1 −1 −1 0 0 0 0 } −1 0 0 −1 0 0 1 0 } 4	Cu 29	Flipped Triad fpi=16 D_8 L fp_sm=3→31H {1, 5, 2}, {1, 3, 6}, {1, 4, 7}, {2, 3, 7}, {2, 6, 4}, {3, 5, 4}, {5, 6, 7} flat triad/mask bits {1, 2, 5, 3, 6, 4, 7} {1, 0, 0, 0, 1, 1, 0}	Not Flipped Triad fpi=15 D_8 L fp_sm=3→31H {1, 5, 2}, {1, 3, 6}, {1, 4, 7}, {2, 3, 4}, {2, 7, 6}, {3, 5, 7}, {4, 5 flat triad/mask bits {1, 5, 2, 3, 6, 4, 7} {1, 0, 0, 0, 1, 1, 0}
49	${}^{c_I}_{b_l}{}^{\phi}_{\wedge}{}^{0}$ R			{D8, E7, D7, E6, D6, E5, D5, D4, F4s, H4Φ, snub24H4Φ}	0_{apggsscc} 001000111_2	Bn{ E8{ Ph{	1 0 0 1 1 0 0 0 } −1 0 0 1 0 0 0 0 } −1 0 $-\frac{1}{\sqrt{2}}$ $\frac{1}{\sqrt{2}}$ 0 0 0 0 }	Rt{ Wt{ Ht	−1 −1 −1 0 0 0 0 0 } −1 0 −1 1 0 0 0 0 } 3	Ti 22	Flipped Triad fpi=9 D_8 R fp_sm=6→10H {1, 2, 4}, {1, 3, 6}, {1, 5, 7}, {2, 3, 5}, {2, 7, 6}, {3, 4, 7}, {4, 5 flat triad/mask bits {1, 4, 2, 3, 6, 5, 7} {0, 0, 0, 0, 1, 0, 0}	Not Flipped Triad fpi=6 D_8 R fp_sm=6→10H {1, 2, 3}, {1, 4, 7}, {1, 5, 6}, {2, 4, 6}, {2, 7, 5}, {3, 4, 5}, {3, 6 flat triad/mask bits {1, 2, 3, 4, 7, 5, 6} {0, 0, 0, 0, 1, 0, 0}
50	$\overline{{}^{c_I}_{g_d}\phi}{}^{0}_{\vee}$ L			{D8, E7, D7, E6, D6, E5, D5, E4, D4, F4s, H4Φ, snub24H4Φ, D3, D3}	0_{apggsscc} 011000010_2	Bn{ E8{ Ph{	1 0 0 1 0 1 0 0 } −1 0 1 0 0 0 0 0 } −1 0 $\frac{1}{\sqrt{2}}$ $\frac{1}{\sqrt{2}}$ 0 0 0 0 }	Rt{ Wt{ Ht	−1 −1 0 0 0 0 0 0 } −1 −1 1 0 0 0 0 0 } 2	P 15	Flipped Triad fpi=3 D_8 R fp_sm=4→7BH {1, 3, 2}, {1, 6, 4}, {1, 5, 7}, {2, 5, 4}, {2, 7, 6}, {3, 7, 4}, {3, 6, 5} flat triad/mask bits {1, 2, 3, 6, 4, 5, 7} {1, 1, 0, 1, 1, 1, 1}	Not Flipped Triad fpi=5 D_8 R fp_sm=7→72H {1, 2, 3}, {1, 7, 4}, {1, 5, 6}, {2, 4, 5}, {2, 7, 6}, {3, 6, 4}, {3, 7 flat triad/mask bits {1, 2, 3, 7, 4, 5, 6} {0, 1, 0, 0, 1, 1, 1}
51	${}^{\omega}_{R}{}^{0}_{\vee}$ R			{D8, E7, D7, E6, D6, E5, D5, E4, D4, F4s, H4Φ, snub24H4Φ, D3, D3, D2}	0_{apggsscc} 001001110_2	Bn{ E8{ Ph{	1 0 0 1 0 0 1 0 } −1 1 0 0 0 0 0 0 } −1 1 0 0 0 0 0 0 }	Rt{ Wt{ Ht	−1 0 0 0 0 0 0 0 } −2 1 0 0 0 0 0 0 } 1	O 8	Flipped Triad fpi=5 D_8 R fp_sm=7→3EH {1, 2, 3}, {1, 7, 4}, {1, 6, 5}, {2, 5, 4}, {2, 7, 6}, {3, 6, 4}, {3, 5, 7} flat triad/mask bits {1, 3, 2, 7, 4, 6, 5} {0, 1, 1, 1, 1, 1, 0}	Not Flipped Triad fpi=3 D_8 R fp_sm=4→37H {1, 3, 2}, {1, 6, 4}, {1, 7, 5}, {2, 5, 4}, {2, 7, 6}, {3, 6, 4}, {3, 5 flat triad/mask bits {1, 3, 2, 6, 4, 7, 5} {1, 1, 1, 0, 1, 1, 0}
52	$\overline{{}^{c_I}_{g_l}\phi}{}^{0}_{\wedge}$ R			{D8, E7, D7, E6, D6, E5, D5, E4, D4, F4s, H4Φ, snub24H4Φ, D3, D3}	0_{apggsscc} 011000110_2	Bn{ E8{ Ph{	1 0 0 1 0 0 0 1 } 0 −1 −1 0 0 0 0 0 } 0 −1 $-\frac{1}{\sqrt{2}}$ $-\frac{1}{\sqrt{2}}$ 0 0 0 0 }	Rt{ Wt{ Ht	0 −1 −2 −2 0 −1 −2 −1 } 1 0 −1 0 1 0 0 0 } 9	Nd 60	Flipped Triad fpi=3 D_8 R fp_sm=4→65H {1, 3, 2}, {1, 4, 6}, {1, 7, 5}, {2, 4, 5}, {2, 6, 7}, {3, 7, 4}, {3, 6, 5} flat triad/mask bits {1, 2, 3, 4, 6, 7, 5} {1, 0, 1, 0, 0, 1, 1}	Not Flipped Triad fpi=5 D_8 R fp_sm=7→6CH {1, 3, 2}, {1, 4, 7}, {1, 6, 5}, {2, 4, 5}, {2, 6, 7}, {3, 7, 4}, {3, 6, 4}, {3, 7 flat triad/mask bits {1, 2, 3, 4, 7, 6, 5} {0, 0, 1, 1, 0, 1, 1}
53	$\overline{{}^{c_S}_{r_d}\phi}{}^{0}_{\vee}$ L			{D8, E7, D7, E6, D6, E5, D5, D4, F4s, H4Φ, snub24H4Φ}	0_{apggsscc} 011000001_2	Bn{ E8{ Ph{	1 0 0 0 1 1 0 0 } 0 −1 0 −1 0 0 0 0 } 0 −1 $\frac{1}{\sqrt{2}}$ $-\frac{1}{\sqrt{2}}$ 0 0 0 0 }	Rt{ Wt{ Ht	0 −1 −1 −2 0 −1 −2 −1 } 1 −1 1 −1 1 0 0 0 } 8	Xe 54	Flipped Triad fpi=1 D_8 R fp_sm=5→70H {1, 2, 3}, {1, 4, 5}, {1, 6, 7}, {2, 4, 6}, {2, 7, 5}, {3, 7, 4}, {3, 6, 5} flat triad/mask bits {1, 3, 2, 4, 5, 6, 7} {0, 0, 0, 0, 1, 1, 1}	Not Flipped Triad fpi=2 D_8 R fp_sm=8→73H {1, 3, 2}, {1, 5, 4}, {1, 6, 7}, {2, 4, 7}, {2, 6, 5}, {3, 6, 4}, {3, 7 flat triad/mask bits {1, 3, 2, 5, 4, 6, 7} {1, 1, 0, 0, 1, 1, 1}

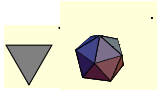
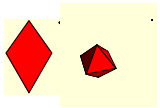
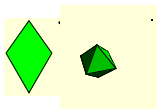
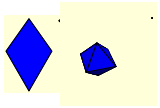
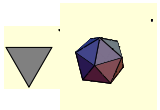
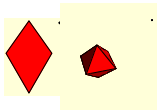
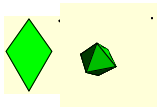
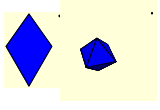
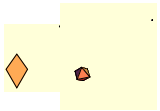
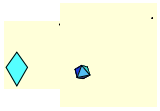
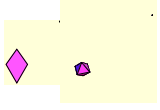
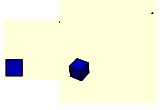
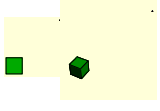
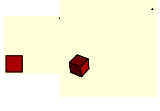
54	$\overset{\overline{\mu}}{y_m}\ \overset{+}{\hat{L}}$		{D8, E7, D7, E6, D6, D5, H4, snub24, altSnub24, snub24E8, snub24H4}	0apggsscc 010101000_2	Bn{ 1 0 0 0 1 0 1 0 } E8{ 0 −1 0 0 −1 0 0 0 } Ph{ 0 −1 0 0 −1 0 0 0 }	Rt{ 0 −1 −1 −1 0 −1 −2 −1 } Wt{ 1 −1 0 1 1 0 −1 0 } Ht 7	$\overline{\text{Ag}}$ 47	Flipped Triad fpi=15 D_8 L fp_sm=3→50H {1, 2, 5}, {1, 3, 6}, {1, 4, 7}, {2, 3, 4}, {2, 7, 6}, {3, 5, 7}, {4, 6, 5 flat triad/mask bits {1, 5, 2, 3, 6, 4, 7} {0, 0, 0, 0, 1, 0, 1}	Not Flipped Triad fpi=16 D_8 L fp_sm=3→50H {1, 2, 5}, {1, 3, 6}, {1, 4, 7}, {2, 3, 7}, {2, 6, 4}, {3, 4, 5}, {5, 7 flat triad/mask bits {1, 2, 5, 3, 6, 4, 7} {0, 0, 0, 0, 1, 0, 1}
55	$\overset{c}{r_m}\ \overset{2/3}{\check{R}}$		{D8, E7, D7, D6, H4, snub24, altSnub24, snub24E8, 24cellH4, 16cellH4}	0apggsscc 001101101_2	Bn{ 1 0 0 0 1 0 0 1 } E8{ 0 −1 0 0 0 −1 0 0 } Ph{ 0 −1 0 0 0 $-\frac{1}{\sqrt{3}}$ $\frac{1}{\sqrt{2}}$ $\frac{1}{\sqrt{6}}$ }	Rt{ 0 −1 −1 −1 0 −1 −1 −1 } Wt{ 1 −1 0 0 1 −1 1 −1 } Ht 6	$\overline{\text{Zr}}$ 40	Flipped Triad fpi=19 D_8 R fp_sm=3→36H {1, 2, 6}, {1, 4, 3}, {1, 7, 5}, {2, 3, 5}, {2, 7, 4}, {3, 7, 6}, {4, 5, 6 flat triad/mask bits {1, 6, 2, 4, 3, 7, 5} {0, 1, 1, 0, 1, 1, 0}	Not Flipped Triad fpi=17 D_8 R fp_sm=8→3FH {1, 5, 2}, {1, 7, 3}, {1, 6, 4}, {2, 4, 3}, {2, 7, 6}, {3, 6, 5}, {4, 5 flat triad/mask bits {1, 5, 2, 7, 3, 6, 4} {1, 1, 1, 1, 1, 1, 0}
56	$\overset{c}{g_m}\ \overset{2/3}{\check{R}}$		{D8, D7, H4Φ, dualSnub24, snub24H4Φ}	0apggsscc 001101110_2	Bn{ 1 0 0 0 0 1 1 0 } E8{ 0 −1 0 0 0 0 −1 0 } Ph{ 0 −1 0 0 0 $-\frac{1}{\sqrt{3}}$ $-\frac{1}{\sqrt{2}}$ $\frac{1}{\sqrt{6}}$ }	Rt{ 0 −1 −1 −1 0 −1 −1 0 } Wt{ 1 −1 0 0 1 −1 0 1 } Ht 5	$\overline{\text{Br}}$ 35	Flipped Triad fpi=20 D_8 R fp_sm=1→34H {1, 2, 6}, {1, 3, 4}, {1, 7, 5}, {2, 3, 7}, {2, 5, 4}, {3, 6, 5}, {4, 6, 7 flat triad/mask bits {1, 6, 2, 3, 4, 7, 5} {0, 0, 1, 0, 1, 1, 0}	Not Flipped Triad fpi=18 D_8 R fp_sm=6→3DH {1, 5, 2}, {1, 3, 7}, {1, 6, 4}, {2, 6, 3}, {2, 7, 4}, {3, 5, 4}, {5, 6 flat triad/mask bits {1, 5, 2, 3, 7, 6, 4} {1, 0, 1, 1, 1, 1, 0}
57	$\overset{c}{b_m}\ \overset{2/3}{\check{R}}$		{D8, H4, snub24, altSnub24, 16cellE8, snub24H4}	0apggsscc 001101111_2	Bn{ 1 0 0 0 0 1 0 1 } E8{ 0 −1 0 0 0 0 0 −1 } Ph{ 0 −1 0 0 0 $-\frac{1}{\sqrt{3}}$ 0 $-\sqrt{\frac{2}{3}}$ }	Rt{ 1 1 2 3 2 3 4 2 } Wt{ 1 −1 0 0 1 0 0 0 } Ht 18	Md 101	Flipped Triad fpi=21 D_8 R fp_sm=6→3DH {1, 6, 2}, {1, 3, 5}, {1, 7, 4}, {2, 4, 3}, {2, 7, 5}, {3, 7, 6}, {4, 5, 6 flat triad/mask bits {1, 2, 6, 3, 5, 7, 4} {1, 0, 1, 1, 1, 1, 0}	Not Flipped Triad fpi=22 D_8 R fp_sm=6→3DH {1, 6, 2}, {1, 3, 5}, {1, 7, 4}, {2, 7, 3}, {2, 5, 4}, {3, 6, 4}, {5, 6 flat triad/mask bits {1, 6, 2, 3, 5, 7, 4} {1, 0, 1, 1, 1, 1, 0}
58	$\overset{\overline{s}}{m_m}\ \overset{1/3}{\hat{L}}$		{D8, H4Φ, dualSnub24, 24cellE8Φ, 16cellE8Φ, snub24H4Φ}	0apggsscc 010101011_2	Bn{ 1 0 0 0 0 0 1 1 } E8{ 0 −1 0 0 0 0 0 1 } Ph{ 0 −1 0 0 0 $\frac{1}{\sqrt{3}}$ 0 $\sqrt{\frac{2}{3}}$ }	Rt{ −1 −3 −4 −5 −2 −4 −6 −3 } Wt{ 1 −1 0 0 0 0 0 0 } Ht 28	$\overline{\text{Uue}}$ 119	Flipped Triad fpi=21 D_8 L fp_sm=6→5BH {1, 6, 2}, {1, 5, 3}, {1, 4, 7}, {2, 4, 3}, {2, 7, 5}, {3, 6, 7}, {4, 6, 5 flat triad/mask bits {1, 2, 6, 5, 3, 4, 7} {1, 1, 0, 1, 1, 0, 1}	Not Flipped Triad fpi=22 D_8 L fp_sm=6→5BH {1, 6, 2}, {1, 5, 3}, {1, 4, 7}, {2, 7, 3}, {2, 5, 4}, {3, 4, 6}, {5, 7 flat triad/mask bits {1, 6, 2, 5, 3, 4, 7} {1, 1, 0, 1, 1, 0, 1}
59	$\overset{\overline{s}}{c_m}\ \overset{1/3}{\hat{L}}$		{D8, D7, H4, snub24, altSnub24, snub24E8, snub24H4}	0apggsscc 010101010_2	Bn{ 0 1 1 1 0 0 0 0 } E8{ 0 −1 0 0 0 0 1 0 } Ph{ 0 −1 0 0 0 $\frac{1}{\sqrt{3}}$ $\frac{1}{\sqrt{2}}$ $-\frac{1}{\sqrt{6}}$ }	Rt{ 0 −1 −1 −1 0 0 −1 −1 } Wt{ 1 −1 0 0 0 1 0 −1 } Ht 5	$\overline{\text{Se}}$ 34	Flipped Triad fpi=20 D_8 L fp_sm=1→52H {1, 2, 6}, {1, 4, 3}, {1, 5, 7}, {2, 3, 7}, {2, 5, 4}, {3, 5, 6}, {4, 7, 6 flat triad/mask bits {1, 6, 2, 4, 3, 5, 7} {0, 1, 0, 0, 1, 0, 1}	Not Flipped Triad fpi=18 D_8 L fp_sm=6→5BH {1, 5, 2}, {1, 7, 3}, {1, 4, 6}, {2, 6, 3}, {2, 7, 4}, {3, 4, 5}, {5, 7 flat triad/mask bits {1, 5, 2, 7, 3, 4, 6} {1, 1, 0, 1, 1, 0, 1}
60	$\overset{\overline{s}}{o_m}\ \overset{1/3}{\hat{L}}$		{D8, E7, D7, D6, H4Φ, dualSnub24, 24cellE8Φ, 16cellE8Φ, 24cellH4Φ, 16cellH4Φ}	0apggsscc 010101001_2	Bn{ 0 1 1 0 1 0 0 0 } E8{ 0 −1 0 0 0 1 0 0 } Ph{ 0 −1 0 0 0 $\frac{1}{\sqrt{3}}$ $-\frac{1}{\sqrt{2}}$ $-\frac{1}{\sqrt{6}}$ }	Rt{ 0 −1 −1 −1 0 0 −1 0 } Wt{ 1 −1 0 0 0 1 −1 1 } Ht 4	$\overline{\text{Ni}}$ 28	Flipped Triad fpi=19 D_8 L fp_sm=3→50H {1, 2, 6}, {1, 3, 4}, {1, 5, 7}, {2, 3, 5}, {2, 7, 4}, {3, 6, 7}, {4, 6, 5 flat triad/mask bits {1, 6, 2, 3, 4, 5, 7} {0, 0, 0, 0, 1, 0, 1}	Not Flipped Triad fpi=17 D_8 L fp_sm=8→59H {1, 5, 2}, {1, 3, 7}, {1, 4, 6}, {2, 4, 3}, {2, 7, 6}, {3, 5, 6}, {4, 7 flat triad/mask bits {1, 5, 2, 3, 7, 4, 6} {1, 0, 0, 1, 1, 0, 1}
61	$\overset{\nu_\mu}{w_m}\ \overset{0}{\check{R}}$		{D8, E7, D7, E6, D6, D5, H4, snub24, altSnub24, snub24E8, snub24H4}	0apggsscc 001101100_2	Bn{ 0 1 1 0 0 1 0 0 } E8{ 0 −1 0 0 1 0 0 0 } Ph{ 0 −1 0 0 1 0 0 0 }	Rt{ 0 −1 −1 −1 0 0 0 0 } Wt{ 1 −1 0 −1 0 0 1 0 } Ht 3	$\overline{\text{Sc}}$ 21	Flipped Triad fpi=15 D_8 R fp_sm=3→36H {1, 2, 5}, {1, 6, 3}, {1, 7, 4}, {2, 3, 4}, {2, 7, 6}, {3, 7, 5}, {4, 5, 6 flat triad/mask bits {1, 5, 2, 6, 3, 7, 4} {0, 1, 1, 0, 1, 1, 0}	Not Flipped Triad fpi=16 D_8 R fp_sm=3→36H {1, 2, 5}, {1, 6, 3}, {1, 7, 4}, {2, 3, 7}, {2, 6, 4}, {3, 5, 4}, {5, 6 flat triad/mask bits {1, 2, 5, 6, 3, 7, 4} {0, 1, 1, 0, 1, 1, 0}
62	$\overset{\overline{e_S\phi}}{r_l}\ \overset{0}{\hat{R}}$		{D8, E7, D7, E6, D6, E5, D5, D4, F4s, H4, snub24, altSnub24, snub24E8, snub24H4}	0apggsscc 011000101_2	Bn{ 0 1 1 0 0 0 1 0 } E8{ 0 −1 0 1 0 0 0 0 } Ph{ 0 −1 $-\frac{1}{\sqrt{2}}$ $\frac{1}{\sqrt{2}}$ 0 0 0 0 }	Rt{ 0 −1 −1 0 0 0 0 0 } Wt{ 1 −1 −1 1 0 0 0 0 } Ht 2	$\overline{\text{Si}}$ 14	Flipped Triad fpi=1 D_8 R fp_sm=5→6EH {1, 2, 3}, {1, 5, 4}, {1, 7, 6}, {2, 6, 4}, {2, 5, 7}, {3, 7, 4}, {3, 6, 5 flat triad/mask bits {1, 3, 2, 5, 4, 7, 6} {0, 1, 1, 1, 0, 1, 1}	Not Flipped Triad fpi=2 D_8 R fp_sm=8→6DH {1, 3, 2}, {1, 4, 5}, {1, 7, 6}, {2, 7, 4}, {2, 5, 6}, {3, 6, 4}, {3, 7 flat triad/mask bits {1, 3, 2, 4, 5, 7, 6} {1, 0, 1, 1, 0, 1, 1}
63	$\overset{\overline{e_T\phi}}{g_m}\ \overset{0}{\hat{L}}$		{D8, E7, D7, E6, D6, E5, D5, E4, D4, F4s, H4, snub24, altSnub24, snub24E8, snub24H4, D3, D3}	0apggsscc 011001010_2	Bn{ 0 1 1 0 0 0 0 1 } E8{ 0 −1 1 0 0 0 0 0 } Ph{ 0 −1 $\frac{1}{\sqrt{2}}$ $\frac{1}{\sqrt{2}}$ 0 0 0 0 }	Rt{ 0 −1 0 0 0 0 0 0 } Wt{ 1 −2 1 0 0 0 0 0 } Ht 1	$\overline{\text{N}}$ 7	Flipped Triad fpi=3 D_8 R fp_sm=4→56H {1, 2, 3}, {1, 6, 4}, {1, 7, 5}, {2, 4, 5}, {2, 7, 6}, {3, 4, 7}, {3, 6, 5 flat triad/mask bits {1, 3, 2, 6, 4, 7, 5} {0, 1, 1, 0, 1, 0, 1}	Not Flipped Triad fpi=5 D_8 R fp_sm=7→5FH {1, 3, 2}, {1, 7, 4}, {1, 6, 5}, {2, 5, 4}, {2, 7, 6}, {3, 4, 6}, {3, 7 flat triad/mask bits {1, 3, 2, 7, 4, 6, 5} {1, 1, 1, 1, 1, 0, 1}
64	$\overset{\overline{\omega_L}}{r_m}\ \overset{0}{\check{R}}$		{D8, E7, D7, E6, D6, E5, D5, D4, F4s, H4Φ, snub24H4Φ}	0apggsscc 011001101_2	Bn{ 0 1 0 1 1 0 0 0 } E8{ 0 0 −1 −1 0 0 0 0 } Ph{ 0 0 0 $-\sqrt{2}$ 0 0 0 0 }	Rt{ 0 0 −1 −2 0 −1 −2 −1 } Wt{ 0 1 0 −1 1 0 0 0 } Ht 7	$\overline{\text{Pd}}$ 46	Flipped Triad fpi=1 D_8 R fp_sm=5→43H {1, 3, 2}, {1, 5, 4}, {1, 6, 7}, {2, 4, 6}, {2, 5, 7}, {3, 4, 7}, {3, 6, 5 flat triad/mask bits {1, 2, 3, 5, 4, 6, 7} {1, 1, 0, 0, 0, 0, 1}	Not Flipped Triad fpi=2 D_8 R fp_sm=8→40H {1, 2, 3}, {1, 4, 5}, {1, 6, 7}, {2, 4, 7}, {2, 5, 6}, {3, 4, 6}, {3, 7 flat triad/mask bits {1, 2, 3, 4, 5, 6, 7} {0, 0, 0, 0, 0, 0, 1}
65	$\overset{\overline{\mu}}{y_l}\ \overset{+}{\hat{R}}$		{D8, E7, D7, E6, D6, D5, H4, snub24, altSnub24, snub24E8, snub24H4}	0apggsscc 010100100_2	Bn{ 0 1 0 1 0 1 0 0 } E8{ 0 0 −1 0 −1 0 0 0 } Ph{ 0 0 $-\frac{1}{\sqrt{2}}$ $-\frac{1}{\sqrt{2}}$ −1 0 0 0 }	Rt{ 0 0 −1 −1 0 −1 −2 −1 } Wt{ 0 1 −1 1 1 0 −1 0 } Ht 6	$\overline{\text{Sr}}$ 38	Flipped Triad fpi=15 D_8 L fp_sm=3→63H {1, 5, 2}, {1, 6, 3}, {1, 4, 7}, {2, 3, 4}, {2, 6, 7}, {3, 7, 5}, {4, 6, 5 flat triad/mask bits {1, 2, 5, 6, 3, 4, 7} {1, 1, 0, 0, 0, 1, 1}	Not Flipped Triad fpi=16 D_8 L fp_sm=3→63H {1, 5, 2}, {1, 6, 3}, {1, 4, 7}, {2, 3, 7}, {2, 4, 6}, {3, 5, 4}, {5, 7 flat triad/mask bits {1, 5, 2, 6, 3, 4, 7} {1, 1, 0, 0, 0, 1, 1}
66	$\overset{c}{r_d}\ \overset{2/3}{\check{L}}$		{D8, E7, D7, D6, H4, snub24, altSnub24, snub24E8, snub24H4}	0apggsscc 001100001_2	Bn{ 0 1 0 1 0 0 1 0 } E8{ 0 0 −1 0 0 −1 0 0 } Ph{ 0 0 $-\frac{1}{\sqrt{2}}$ $-\frac{1}{\sqrt{2}}$ 0 $-\frac{1}{\sqrt{3}}$ $\frac{1}{\sqrt{2}}$ $\frac{1}{\sqrt{6}}$ }	Rt{ 0 0 −1 −1 0 −1 −1 −1 } Wt{ 0 1 −1 0 1 −1 1 −1 } Ht 5	$\overline{\text{Ge}}$ 32	Flipped Triad fpi=19 D_8 R fp_sm=3→05H {1, 6, 2}, {1, 3, 4}, {1, 7, 5}, {2, 3, 5}, {2, 4, 7}, {3, 6, 7}, {4, 5, 6 flat triad/mask bits {1, 2, 6, 3, 4, 7, 5} {1, 0, 1, 0, 0, 0, 0}	Not Flipped Triad fpi=17 D_8 R fp_sm=8→0CH {1, 2, 5}, {1, 3, 7}, {1, 6, 4}, {2, 4, 3}, {2, 6, 7}, {3, 5, 6}, {4, 5 flat triad/mask bits {1, 2, 5, 3, 7, 6, 4} {0, 0, 1, 1, 0, 0, 0}
67	$\overset{c}{g_d}\ \overset{2/3}{\check{L}}$		{D8, D7, H4, snub24, altSnub24, snub24E8, 24cellH4, 16cellH4}	0apggsscc 001100010_2	Bn{ 0 1 0 1 0 0 0 1 } E8{ 0 0 −1 0 0 0 −1 0 } Ph{ 0 0 $-\frac{1}{\sqrt{2}}$ $-\frac{1}{\sqrt{2}}$ 0 $-\frac{1}{\sqrt{3}}$ $-\frac{1}{\sqrt{2}}$ $\frac{1}{\sqrt{6}}$ }	Rt{ 0 0 −1 −1 0 −1 −1 0 } Wt{ 0 1 −1 0 1 −1 0 1 } Ht 4	$\overline{\text{Co}}$ 27	Flipped Triad fpi=20 D_8 R fp_sm=1→07H {1, 6, 2}, {1, 4, 3}, {1, 7, 5}, {2, 3, 7}, {2, 4, 5}, {3, 5, 6}, {4, 6, 7 flat triad/mask bits {1, 2, 6, 4, 3, 7, 5} {1, 1, 1, 0, 0, 0, 0}	Not Flipped Triad fpi=18 D_8 R fp_sm=6→0EH {1, 2, 5}, {1, 7, 3}, {1, 6, 4}, {2, 6, 3}, {2, 4, 7}, {3, 4, 5}, {5, 6 flat triad/mask bits {1, 2, 5, 7, 3, 6, 4} {0, 1, 1, 1, 0, 0, 0}

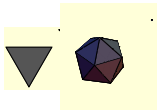
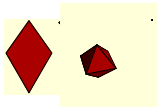
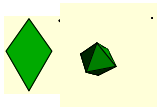
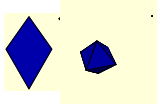
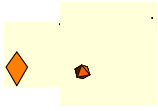
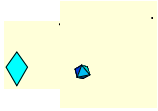
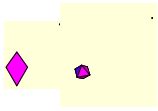
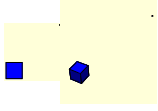
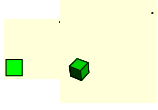
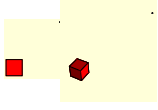
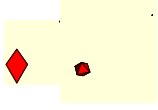
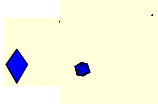
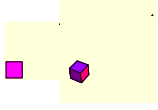
68	$^{c}_{b}{}^{2/3}_{d}{}^{\vee}_{L}$			{D8, H4Φ, dualSnub24, snub24H4Φ}	0apggssec 001100011_2	Bn{	0	1	0	0	1	1	0	0	}	Rt{	1	2	2	3	2	3	4	2	}	Rf 104	Flipped Triad fpi=21 D_8 R fp_sm=6→0EH	Not Flipped Triad fpi=22 D_8 R fp_sm=6→0EH
						E8{	0	0	−1	0	0	0	0	−1	}	Wt{	0	1	−1	0	1	0	0	0	}		{1, 2, 6}, {1, 5, 3}, {1, 7, 4},	{1, 2, 6}, {1, 5, 3}, {1, 7, 4},
						Ph{	0	0	$-\frac{1}{\sqrt{2}}$	$-\frac{1}{\sqrt{2}}$	0	$-\frac{1}{\sqrt{3}}$	0	$-\sqrt{\frac{2}{3}}$	}	Ht	19										{2, 4, 3}, {2, 5, 7}, {3, 6, 7}, {4, 5, 6}	{2, 4, 3}, {2, 5, 7}, {3, 6, 7}, {4, 5, 6}
																											flat triad/mask bits	flat triad/mask bits
																											{1, 6, 2, 5, 3, 7, 4}	{1, 2, 6, 5, 3, 7, 4}
																											{0, 1, 1, 1, 0, 0, 0}	{0, 1, 1, 1, 0, 0, 0}
69	$\overline{{}^{s}_{m}}{}^{1/3}_{l}{}^{\wedge}_{R}$			{D8, H4, snub24, altSnub24, snub24E8, snub24H4}	0apggssec 010100111_2	Bn{	0	1	0	0	1	0	1	0	}	Rt{	−1	−2	−4	−5	−2	−4	−6	−3	}	$\overline{\text{Uuo}}$ 118	Flipped Triad fpi=21 D_8 L fp_sm=6→68H	Not Flipped Triad fpi=22 D_8 L fp_sm=6→68H
						E8{	0	0	−1	0	0	0	0	1	}	Wt{	0	1	−1	0	0	0	0	0	}		{1, 2, 6}, {1, 3, 5}, {1, 4, 7},	{1, 2, 6}, {1, 3, 5}, {1, 4, 7},
						Ph{	0	0	$-\frac{1}{\sqrt{2}}$	$-\frac{1}{\sqrt{2}}$	0	$\frac{1}{\sqrt{3}}$	0	$\sqrt{\frac{2}{3}}$	}	Ht	27										{2, 4, 3}, {2, 5, 7}, {3, 7, 6}, {4, 6, 5}	{2, 4, 3}, {2, 5, 7}, {3, 7, 6}, {4, 6, 5}
																											flat triad/mask bits	flat triad/mask bits
																											{1, 6, 2, 3, 5, 4, 7}	{1, 2, 6, 3, 5, 4, 7}
																											{0, 0, 0, 1, 0, 1, 1}	{0, 0, 0, 1, 0, 1, 1}
70	$\overline{{}^{s}_{c}}{}^{1/3}_{l}{}^{\wedge}_{R}$			{D8, D7, H4Φ, dualSnub24, 24cellH4Φ, 16cellH4Φ}	0apggssec 010100110_2	Bn{	0	1	0	0	1	0	0	1	}	Rt{	0	0	−1	−1	0	0	−1	−1	}	$\overline{\text{Fc}}$ 26	Flipped Triad fpi=20 D_8 L fp_sm=1→61H	Not Flipped Triad fpi=18 D_8 L fp_sm=6→68H
						E8{	0	0	−1	0	0	0	1	0	}	Wt{	0	1	−1	0	0	1	0	−1	}		{1, 6, 2}, {1, 3, 4}, {1, 5, 7},	{1, 2, 5}, {1, 3, 7}, {1, 4, 6},
						Ph{	0	0	$-\frac{1}{\sqrt{2}}$	$-\frac{1}{\sqrt{2}}$	0	$\frac{1}{\sqrt{3}}$	$\frac{1}{\sqrt{2}}$	$-\frac{1}{\sqrt{6}}$	}	Ht	4										{2, 3, 7}, {2, 4, 5}, {3, 6, 5}, {4, 7, 6}	{2, 6, 3}, {2, 4, 7}, {3, 5, 4}, {5, 7
																											flat triad/mask bits	flat triad/mask bits
																											{1, 2, 6, 3, 4, 5, 7}	{1, 2, 5, 3, 7, 4, 6}
																											{1, 0, 0, 0, 0, 1, 1}	{0, 0, 0, 1, 0, 1, 1}
71	$\overline{{}^{s}_{n}}{}^{1/3}_{l}{}^{\wedge}_{R}$			{D8, E7, D7, D6, H4Φ, dualSnub24, snub24H4Φ}	0apggssec 010100101_2	Bn{	0	1	0	0	0	1	1	0	}	Rt{	0	0	−1	−1	0	0	−1	0	}	$\overline{\text{Ca}}$ 20	Flipped Triad fpi=19 D_8 L fp_sm=3→63H	Not Flipped Triad fpi=17 D_8 L fp_sm=8→6AH
						E8{	0	0	−1	0	0	1	0	0	}	Wt{	0	1	−1	0	0	1	−1	1	}		{1, 6, 2}, {1, 4, 3}, {1, 5, 7},	{1, 2, 5}, {1, 7, 3}, {1, 4, 6},
						Ph{	0	0	$-\frac{1}{\sqrt{2}}$	$-\frac{1}{\sqrt{2}}$	0	$\frac{1}{\sqrt{3}}$	$-\frac{1}{\sqrt{2}}$	$-\frac{1}{\sqrt{6}}$	}	Ht	3										{2, 3, 5}, {2, 4, 7}, {3, 7, 6}, {4, 6, 5}	{2, 4, 3}, {2, 6, 7}, {3, 6, 5}, {4, 7
																											flat triad/mask bits	flat triad/mask bits
																											{1, 2, 6, 4, 3, 5, 7}	{1, 2, 5, 7, 3, 4, 6}
																											{1, 1, 0, 0, 0, 1, 1}	{0, 1, 0, 1, 0, 1, 1}
72	$^{\gamma}_{w}{}^{\mu}_{d}{}^{0}_{L}{}^{\vee}$			{D8, E7, D7, E6, D6, D5, H4, snub24, altSnub24, snub24E8, snub24H4}	0apggssec 001100000_2	Bn{	0	1	0	0	0	1	0	1	}	Rt{	0	0	−1	−1	0	0	0	0	}	$\overline{\text{Al}}$ 13	Flipped Triad fpi=15 D_8 R fp_sm=3→05H	Not Flipped Triad fpi=16 D_8 R fp_sm=3→05H
						E8{	0	0	−1	0	1	0	0	0	}	Wt{	0	1	−1	−1	0	0	1	0	}		{1, 5, 2}, {1, 3, 6}, {1, 7, 4},	{1, 5, 2}, {1, 3, 6}, {1, 7, 4},
						Ph{	0	0	$-\frac{1}{\sqrt{2}}$	$-\frac{1}{\sqrt{2}}$	1	0	0	0	}	Ht	2										{2, 3, 4}, {2, 6, 7}, {3, 5, 7}, {4, 5, 6}	{2, 3, 4}, {2, 6, 7}, {3, 5, 7}, {4, 5, 6}
																											flat triad/mask bits	flat triad/mask bits
																											{1, 2, 5, 3, 6, 7, 4}	{1, 5, 2, 3, 6, 7, 4}
																											{1, 0, 1, 0, 0, 0, 0}	{1, 0, 1, 0, 0, 0, 0}
73	$^{B}_{b}{}^{0}_{m}{}^{\wedge}_{L}$			{D8, E7, D7, E6, D6, E5, D5, D4, F4s, H4, snub24, altSnub24, snub24E8, snub24H4}	0apggssec 001001011_2	Bn{	0	1	0	0	0	0	1	1	}	Rt{	0	0	−1	0	0	0	0	0	}	$\overline{\text{C}}$ 6	Flipped Triad fpi=9 D_8 R fp_sm=6→23H	Not Flipped Triad fpi=6 D_8 R fp_sm=6→23H
						E8{	0	0	−1	1	0	0	0	0	}	Wt{	0	1	−2	1	0	0	0	0	}		{1, 4, 2}, {1, 6, 3}, {1, 5, 7},	{1, 3, 2}, {1, 7, 4}, {1, 5, 6},
						Ph{	0	0	$-\sqrt{2}$	0	0	0	0	0	}	Ht	1										{2, 3, 5}, {2, 6, 7}, {3, 7, 4}, {4, 5, 6}	{2, 4, 6}, {2, 5, 7}, {3, 5, 4}, {3, 6
																											flat triad/mask bits	flat triad/mask bits
																											{1, 2, 4, 6, 3, 5, 7}	{1, 3, 2, 7, 4, 5, 6}
																											{1, 1, 0, 0, 0, 1, 0}	{1, 1, 0, 0, 0, 1, 0}
74	$\overline{{}^{\mu}_{y}}{}^{+}_{d}{}^{\vee}_{L}$			{D8, E7, D7, E6, D6, D5, H4, snub24, altSnub24, 16cellE8, snub24H4}	0apggssec 010100000_2	Bn{	0	0	1	1	1	0	0	0	}	Rt{	0	0	0	−1	0	−1	−2	−1	}	$\overline{\text{Zn}}$ 30	Flipped Triad fpi=15 D_8 L fp_sm=3→7DH	Not Flipped Triad fpi=16 D_8 L fp_sm=3→7DH
						E8{	0	0	0	−1	−1	0	0	0	}	Wt{	0	0	1	0	1	0	−1	0	}		{1, 5, 2}, {1, 3, 6}, {1, 7, 4},	{1, 5, 2}, {1, 3, 6}, {1, 7, 4},
						Ph{	0	0	$\frac{1}{\sqrt{2}}$	$-\frac{1}{\sqrt{2}}$	−1	0	0	0	}	Ht	5										{2, 4, 3}, {2, 7, 6}, {3, 7, 5}, {4, 6, 5}	{2, 4, 3}, {2, 7, 6}, {3, 7, 5}, {4, 6, 5}
																											flat triad/mask bits	flat triad/mask bits
																											{1, 2, 5, 3, 6, 7, 4}	{1, 5, 2, 3, 6, 7, 4}
																											{1, 0, 1, 1, 1, 1, 1}	{1, 0, 1, 1, 1, 1, 1}
75	$^{c}_{r}{}^{2/3}_{l}{}^{\wedge}_{R}$			{D8, E7, D7, D6, H4Φ, dualSnub24, snub24H4Φ}	0apggssec 001100101_2	Bn{	0	0	1	1	0	1	0	0	}	Rt{	0	0	0	−1	0	−1	−1	−1	}	$\overline{\text{Cr}}$ 24	Flipped Triad fpi=19 D_8 R fp_sm=3→1BH	Not Flipped Triad fpi=17 D_8 R fp_sm=8→12H
						E8{	0	0	0	−1	0	−1	0	0	}	Wt{	0	0	1	−1	1	−1	1	−1	}		{1, 6, 2}, {1, 4, 3}, {1, 5, 7},	{1, 2, 5}, {1, 7, 3}, {1, 4, 6},
						Ph{	0	0	$\frac{1}{\sqrt{2}}$	$-\frac{1}{\sqrt{2}}$	0	$-\frac{1}{\sqrt{3}}$	$\frac{1}{\sqrt{2}}$	$\frac{1}{\sqrt{6}}$	}	Ht	4										{2, 5, 3}, {2, 7, 4}, {3, 6, 7}, {4, 5, 6}	{2, 5, 3}, {2, 7, 4}, {3, 6, 7}, {4, 5, 6}
																											flat triad/mask bits	flat triad/mask bits
																											{1, 2, 6, 4, 3, 5, 7}	{1, 2, 5, 7, 3, 4, 6}
																											{1, 1, 0, 1, 1, 0, 0}	{0, 1, 0, 0, 1, 0, 0}
76	$^{c}_{g}{}^{2/3}_{l}{}^{\wedge}_{R}$			{D8, D7, H4, snub24, altSnub24, 16cellE8, snub24H4}	0apggssec 001100110_2	Bn{	0	0	1	1	0	0	1	0	}	Rt{	0	0	0	−1	0	−1	−1	0	}	$\overline{\text{Kr}}$ 19	Flipped Triad fpi=20 D_8 R fp_sm=1→19H	Not Flipped Triad fpi=18 D_8 R fp_sm=6→10H
						E8{	0	0	0	−1	0	0	−1	0	}	Wt{	0	0	1	−1	1	−1	0	1	}		{1, 6, 2}, {1, 3, 4}, {1, 5, 7},	{1, 2, 5}, {1, 3, 7}, {1, 4, 6},
						Ph{	0	0	$\frac{1}{\sqrt{2}}$	$-\frac{1}{\sqrt{2}}$	0	$-\frac{1}{\sqrt{3}}$	$-\frac{1}{\sqrt{2}}$	$\frac{1}{\sqrt{6}}$	}	Ht	3										{2, 7, 3}, {2, 5, 4}, {3, 5, 6}, {4, 6, 7}	{2, 7, 6}, {2, 6, 3}, {3, 4, 5}, {5, 6
																											flat triad/mask bits	flat triad/mask bits
																											{1, 2, 6, 3, 4, 5, 7}	{1, 2, 5, 3, 7, 4, 6}
																											{1, 0, 0, 1, 1, 0, 0}	{0, 0, 0, 1, 0, 0, 0}
77	$^{c}_{h}{}^{2/3}_{l}{}^{\wedge}_{R}$			{D8, H4, snub24, altSnub24, 16cellE8, 24cellH4, 16cellH4}	0apggssec 001100111_2	Bn{	0	0	1	1	0	0	0	1	}	Rt{	1	2	3	3	2	3	4	2	}	$\overline{\text{Bh}}$ 107	Flipped Triad fpi=21 D_8 R fp_sm=6→10H	Not Flipped Triad fpi=22 D_8 R fp_sm=6→10H
						E8{	0	0	0	−1	0	0	0	−1	}	Wt{	0	0	1	−1	1	0	0	0	}		{1, 2, 6}, {1, 3, 5}, {1, 4, 7},	{1, 2, 6}, {1, 3, 5}, {1, 4, 7},
						Ph{	0	0	$\frac{1}{\sqrt{2}}$	$-\frac{1}{\sqrt{2}}$	0	$-\frac{1}{\sqrt{3}}$	0	$-\sqrt{\frac{2}{3}}$	}	Ht	20										{2, 3, 4}, {2, 7, 5}, {3, 6, 7}, {4, 5, 6}	{2, 3, 4}, {2, 7, 5}, {3, 6, 7}, {4, 5, 6}
																											flat triad/mask bits	flat triad/mask bits
																											{1, 6, 2, 3, 5, 4, 7}	{1, 2, 6, 3, 5, 4, 7}
																											{0, 0, 0, 0, 1, 0, 0}	{0, 0, 0, 0, 1, 0, 0}
78	$\overline{{}^{s}_{m}}{}^{1/3}_{d}{}^{\vee}_{L}$			{D8, H4Φ, dualSnub24, 24cellH4Φ, 16cellH4Φ}	0apggssec 010100011_2	Bn{	0	0	1	0	1	1	0	0	}	Rt{	−1	−2	−3	−5	−2	−4	−6	−3	}	$\overline{\text{Uus}}$ 117	Flipped Triad fpi=21 D_8 L fp_sm=6→76H	Not Flipped Triad fpi=22 D_8 L fp_sm=6→76H
						E8{	0	0	0	−1	0	0	0	1	}	Wt{	0	0	1	−1	0	0	0	0	}		{1, 2, 6}, {1, 5, 3}, {1, 7, 4},	{1, 2, 6}, {1, 5, 3}, {1, 7, 4},
						Ph{	0	0	$\frac{1}{\sqrt{2}}$	$-\frac{1}{\sqrt{2}}$	0	$\frac{1}{\sqrt{3}}$	0	$\sqrt{\frac{2}{3}}$	}	Ht	26										{2, 3, 4}, {2, 7, 5}, {3, 7, 6}, {4, 6, 5}	{2, 3, 4}, {2, 7, 5}, {3, 7, 6}, {4, 6, 5}
																											flat triad/mask bits	flat triad/mask bits
																											{1, 6, 2, 5, 3, 7, 4}	{1, 2, 6, 5, 3, 7, 4}
																											{0, 1, 1, 0, 1, 1, 1}	{0, 1, 1, 0, 1, 1, 1}
79	$\overline{{}^{s}_{c}}{}^{1/3}_{d}{}^{\vee}_{L}$			{D8, D7, H4Φ, dualSnub24, snub24H4Φ}	0apggssec 010100010_2	Bn{	0	0	1	0	1	0	1	0	}	Rt{	0	0	0	−1	0	0	−1	−1	}	$\overline{\text{Ar}}$ 18	Flipped Triad fpi=20 D_8 L fp_sm=1→7FH	Not Flipped Triad fpi=18 D_8 L fp_sm=6→76H
						E8{	0	0	0	−1	0	0	1	0	}	Wt{	0	0	1	−1	0	1	0	−1	}		{1, 6, 2}, {1, 4, 3}, {1, 7, 5},	{1, 2, 5}, {1, 7, 3}, {1, 6, 4},
						Ph{	0	0	$\frac{1}{\sqrt{2}}$	$-\frac{1}{\sqrt{2}}$	0	$\frac{1}{\sqrt{3}}$	$\frac{1}{\sqrt{2}}$	$-\frac{1}{\sqrt{6}}$	}	Ht	3										{2, 7, 3}, {2, 5, 4}, {3, 6, 5}, {4, 7, 6}	{2, 5, 4}, {3, 6, 7}, {2, 7, 4}, {3, 5, 6}
																											flat triad/mask bits	flat triad/mask bits
																											{1, 2, 6, 4, 3, 7, 5}	{1, 2, 5, 7, 3, 6, 4}
																											{1, 1, 1, 1, 1, 1, 1}	{0, 1, 1, 0, 1, 1, 1}
80	$\overline{{}^{s}_{o}}{}^{1/3}_{d}{}^{\vee}_{L}$			{D8, E7, D7, D6, H4, snub24, altSnub24, snub24E8, snub24H4}	0apggssec 010100001_2	Bn{	0	0	1	0	1	0	0	1	}	Rt{	0	0	0	−1	0	0	−1	0	}	$\overline{\text{Mg}}$ 12	Flipped Triad fpi=19 D_8 L fp_sm=3→7DH	Not Flipped Triad fpi=17 D_8 L fp_sm=8→74H
						E8{	0	0	0	−1	0	1	0	0	}	Wt{	0	0	1	−1	0	1	−1	1	}		{1, 6, 2}, {1, 3, 4}, {1, 7, 5},	{1, 2, 5}, {1, 3, 7}, {1, 6, 4},
						Ph{	0	0	$\frac{1}{\sqrt{2}}$	$-\frac{1}{\sqrt{2}}$	0	$\frac{1}{\sqrt{3}}$	$-\frac{1}{\sqrt{2}}$	$-\frac{1}{\sqrt{6}}$	}	Ht	2										{2, 5, 3}, {2, 7, 4}, {3, 7, 6}, {4, 6, 5}	{2, 6, 3}, {2, 4, 7}, {3, 5, 4}, {5, 7
																											flat triad/mask bits	flat triad/mask bits
																											{1, 2, 6, 3, 4, 7, 5}	{1, 2, 5, 3, 7, 6, 4}
																											{1, 0, 1, 1, 1, 1, 1}	{0, 0, 1, 1, 0, 1, 1}
81	$^{\gamma}_{w}{}^{\mu}_{l}{}^{0}_{R}{}^{\wedge}$			{D8, E7, D7, E6, D6, D5, H4, snub24, altSnub24, snub24E8, snub24H4}	0apggssec 001100100_2	Bn{	0	0	1	0	0	1	1	0	}	Rt{	0	0	0	−1	0	0	0	0	}	$\overline{\text{B}}$ 5	Flipped Triad fpi=15 D_8 R fp_sm=3→1BH	Not Flipped Triad fpi=16 D_8 R fp_sm=3→1BH
						E8{	0	0	0	−1	1	0	0	0	}	Wt{	0	0	1	−2	0	0	1	0	}		{1, 5, 2}, {1, 6, 3}, {1, 4, 7},	{1, 5, 2}, {1, 6, 3}, {1, 4, 7},
						Ph{	0	0	$\frac{1}{\sqrt{2}}$	$-\frac{1}{\sqrt{2}}$	1	0	0	0	}	Ht	1										{2, 4, 3}, {2, 7, 6}, {3, 5, 7}, {4, 5, 6}	{2, 4, 3}, {2, 7, 6}, {3, 5, 7}, {4, 5, 6}
																											flat triad/mask bits	flat triad/mask bits
																											{1, 2, 5, 6, 3, 4, 7}	{1, 5, 2, 6, 3, 4, 7}
																											{1, 1, 0, 1, 1, 0, 0}	{1, 1, 0, 1, 1, 0, 0}

Seq #	Symbol	2D/3D Shape	Groups	Particle Quantum Bits	Binary / E8 / Physics Coordinates	Algebra Root Weight / Height / Rt#=Atomic Element Number -->	Ele #	Octonions Flipped	Octonions Not Flipped
82	$\overline{\Phi x_1}^{0}_{o_m}{}^{\wedge}_{L}$		{D8, E7, D7, D6, D4, F4, H4, snub24, snub24E8, snub24H4}	0apggssec 010001001_2	Bn{ 0 0 1 0 0 1 0 1 } E8{ 0 0 0 0 −1 −1 0 0 } Ph{ 0 0 0 0 −1 $-\frac{1}{\sqrt{3}}$ $\frac{1}{\sqrt{2}}$ $\frac{1}{\sqrt{6}}$ }	Rt{ 0 0 0 0 0 −1 −1 −1 } Wt{ 0 0 0 1 1 −1 0 −1 } Ht 3	S 16	Triad fpi=2 D_8 $\overline{L}$ fp_sm=8→59H {1, 3, 2}, {1, 4, 5}, {1, 6, 7}, {2, 7, 4}, {2, 6, 5}, {3, 4, 6}, {3, 7, 5} flat triad/mask bits {1, 2, 3, 4, 5, 6, 7} {1, 0, 0, 1, 1, 0, 1}	Triad fpi=1 D_8 $\overline{L}$ fp_sm=5→5AH {1, 2, 3}, {1, 5, 4}, {1, 6, 7}, {2, 6, 4}, {2, 7, 5}, {3, 4, 7}, {3, 6 flat triad/mask bits {1, 2, 3, 5, 4, 6, 7} {0, 1, 0, 1, 1, 0, 1}
83	$\overline{\Phi x_2}^{0}_{c_m}{}^{\wedge}_{L}$		{D8, D7, D4, F4, H4, snub24, snub24E8, snub24H4}	0apggssec 010001010_2	Bn{ 0 0 1 0 0 0 1 1 } E8{ 0 0 0 0 −1 0 −1 0 } Ph{ 0 0 0 0 −1 $-\frac{1}{\sqrt{3}}$ $-\frac{1}{\sqrt{2}}$ $\frac{1}{\sqrt{6}}$ }	Rt{ 0 0 0 0 0 −1 −1 0 } Wt{ 0 0 0 1 1 −1 −1 1 } Ht 2	Ne 10	Triad fpi=5 D_8 $\overline{L}$ fp_sm=7→58H {1, 2, 3}, {1, 4, 7}, {1, 5, 6}, {2, 5, 4}, {2, 7, 6}, {3, 4, 6}, {3, 7, 5} flat triad/mask bits {1, 3, 2, 4, 7, 5, 6} {0, 0, 0, 1, 1, 0, 1}	Triad fpi=3 D_8 $\overline{L}$ fp_sm=4→51H {1, 3, 2}, {1, 4, 6}, {1, 5, 7}, {2, 5, 4}, {2, 7, 6}, {3, 4, 7}, {3, 6 flat triad/mask bits {1, 3, 2, 4, 6, 5, 7} {1, 0, 0, 0, 1, 0, 1}
84	$\overline{\Phi x_3}^{0}_{m_m}{}^{\wedge}_{L}$		{D8, D4, F4, H4, snub24, snub24E8, snub24H4}	0apggssec 010001011_2	Bn{ 0 0 0 1 1 1 0 0 } E8{ 0 0 0 0 −1 0 0 −1 } Ph{ 0 0 0 0 −1 $-\frac{1}{\sqrt{3}}$ 0 $-\sqrt{\frac{2}{3}}$ }	Rt{ 1 2 3 4 2 3 4 2 } Wt{ 0 0 0 1 1 0 −1 0 } Ht 21	Ds 110	Triad fpi=9 D_8 $\overline{L}$ fp_sm=6→5BH {1, 4, 2}, {1, 6, 3}, {1, 5, 7}, {2, 5, 3}, {2, 7, 6}, {3, 4, 7}, {4, 6, 5} flat triad/mask bits {1, 2, 4, 6, 3, 5, 7} {1, 1, 0, 1, 1, 0, 1}	Triad fpi=6 D_8 $\overline{L}$ fp_sm=6→5BH {1, 3, 2}, {1, 7, 4}, {1, 5, 6}, {2, 6, 4}, {2, 7, 5}, {3, 4, 5}, {3, 7 flat triad/mask bits {1, 3, 2, 7, 4, 5, 6} {1, 1, 0, 1, 1, 0, 1}
85	$\Phi x_3{}^{0}_{m_d}{}^{\vee}_{L}$		{D8, D4, F4, H4, snub24, snub24E8, snub24H4}	0apggssec 000000011_2	Bn{ 0 0 0 1 1 0 1 0 } E8{ 0 0 0 0 −1 0 0 1 } Ph{ 0 0 0 0 −1 $\frac{1}{\sqrt{3}}$ 0 $\sqrt{\frac{2}{3}}$ }	Rt{ −1 −2 −3 −4 −2 −4 −6 −3 } Wt{ 0 0 0 1 0 0 −1 0 } Ht 25	Lv 116	Triad fpi=6 D_8 $\overline{L}$ fp_sm=6→09H {1, 3, 2}, {1, 4, 7}, {1, 5, 6}, {2, 6, 4}, {2, 5, 7}, {3, 4, 5}, {3, 6, 7} flat triad/mask bits {1, 2, 3, 4, 7, 5, 6} {1, 0, 0, 1, 0, 0, 0}	Triad fpi=9 D_8 $\overline{L}$ fp_sm=6→09H {1, 4, 2}, {1, 3, 6}, {1, 5, 7}, {2, 5, 3}, {2, 6, 7}, {3, 4, 7}, {4, 5 flat triad/mask bits {1, 4, 2, 3, 6, 5, 7} {1, 0, 0, 1, 0, 0, 0}
86	$\Phi x_2{}^{0}_{c_d}{}^{\vee}_{L}$		{D8, D7, D4, F4, H4, snub24, snub24E8, snub24H4}	0apggssec 000000010_2	Bn{ 0 0 0 1 1 0 0 1 } E8{ 0 0 0 0 −1 0 1 0 } Ph{ 0 0 0 0 −1 $\frac{1}{\sqrt{3}}$ $\frac{1}{\sqrt{2}}$ $-\frac{1}{\sqrt{6}}$ }	Rt{ 0 0 0 0 0 0 −1 −1 } Wt{ 0 0 0 1 0 1 −1 −1 } Ht 2	F 9	Triad fpi=3 D_8 $\overline{L}$ fp_sm=4→03H {1, 3, 2}, {1, 6, 4}, {1, 5, 7}, {2, 4, 5}, {2, 6, 7}, {3, 4, 7}, {3, 5, 6} flat triad/mask bits {1, 2, 3, 6, 4, 5, 7} {1, 1, 0, 0, 0, 0, 0}	Triad fpi=5 D_8 $\overline{L}$ fp_sm=7→0AH {1, 2, 3}, {1, 7, 4}, {1, 5, 6}, {2, 4, 5}, {2, 6, 7}, {3, 4, 6}, {3, 5 flat triad/mask bits {1, 2, 3, 7, 4, 5, 6} {0, 1, 0, 1, 0, 0, 0}
87	$\Phi x_1{}^{0}_{o_d}{}^{\vee}_{L}$		{D8, E7, D7, D6, D4, F4, H4, snub24, snub24E8, snub24H4}	0apggssec 000000001_2	Bn{ 0 0 0 1 0 1 1 0 } E8{ 0 0 0 0 −1 1 0 0 } Ph{ 0 0 0 0 −1 $\frac{1}{\sqrt{3}}$ $-\frac{1}{\sqrt{2}}$ $-\frac{1}{\sqrt{6}}$ }	Rt{ 0 0 0 0 0 0 −1 0 } Wt{ 0 0 0 1 0 1 −2 1 } Ht 1	He 2	Triad fpi=1 D_8 $\overline{L}$ fp_sm=5→08H {1, 2, 3}, {1, 4, 5}, {1, 6, 7}, {2, 6, 4}, {2, 5, 7}, {3, 4, 7}, {3, 5, 6} flat triad/mask bits {1, 3, 2, 4, 5, 6, 7} {0, 0, 0, 1, 0, 0, 0}	Triad fpi=2 D_8 $\overline{L}$ fp_sm=8→0BH {1, 3, 2}, {1, 5, 4}, {1, 6, 7}, {2, 7, 4}, {2, 5, 6}, {3, 4, 6}, {3, 5 flat triad/mask bits {1, 3, 2, 5, 4, 6, 7} {1, 1, 0, 1, 0, 0, 0}
88	$\Phi x_3{}^{0}_{m_l}{}^{\wedge}_{R}$		{D8, D7, D4, F4, H4, snub24, snub24E8, snub24H4}	0apggssec 000000111_2	Bn{ 0 0 0 1 0 1 0 1 } E8{ 0 0 0 0 0 −1 −1 0 } Ph{ 0 0 0 0 0 $-\frac{2}{\sqrt{3}}$ 0 $\sqrt{\frac{2}{3}}$ }	Rt{ 0 0 0 0 0 −1 0 0 } Wt{ 0 0 0 0 1 −2 1 0 } Ht 1	Li 3	Triad fpi=6 D_8 $\overline{L}$ fp_sm=6→17H {1, 3, 2}, {1, 7, 4}, {1, 6, 5}, {2, 4, 6}, {2, 7, 5}, {3, 4, 5}, {3, 6, 7} flat triad/mask bits {1, 2, 3, 7, 4, 6, 5} {1, 1, 1, 0, 1, 0, 0}	Triad fpi=9 D_8 $\overline{L}$ fp_sm=6→17H {1, 4, 2}, {1, 6, 3}, {1, 7, 5}, {2, 5, 3}, {2, 7, 6}, {3, 4, 7}, {4, 5 flat triad/mask bits {1, 4, 2, 6, 3, 7, 5} {1, 1, 1, 0, 1, 0, 0}
89	$\Phi x_2{}^{0}_{c_l}{}^{\wedge}_{R}$		{D8, D4, F4, H4, snub24, snub24E8, snub24H4}	0apggssec 000000110_2	Bn{ 0 0 0 1 0 0 1 1 } E8{ 0 0 0 0 0 −1 0 −1 } Ph{ 0 0 0 0 0 $-\frac{2}{\sqrt{3}}$ $\frac{1}{\sqrt{2}}$ $-\frac{1}{\sqrt{6}}$ }	Rt{ 1 2 3 4 2 3 5 2 } Wt{ 0 0 0 0 1 −1 1 −1 } Ht 22	Cn 112	Triad fpi=3 D_8 $\overline{L}$ fp_sm=4→1DH {1, 3, 2}, {1, 4, 6}, {1, 7, 5}, {2, 5, 4}, {2, 7, 6}, {3, 4, 7}, {3, 5, 6} flat triad/mask bits {1, 2, 3, 4, 6, 7, 5} {1, 0, 1, 1, 1, 0, 0}	Triad fpi=5 D_8 $\overline{L}$ fp_sm=7→14H {1, 2, 3}, {1, 4, 7}, {1, 5, 6}, {2, 4, 5}, {2, 6, 7}, {3, 4, 6}, {3, 5 flat triad/mask bits {1, 2, 3, 4, 7, 6, 5} {0, 1, 0, 1, 0, 1, 0}
90	$\overline{g^{rg}}_{m_m}{}^{0}_{R}{}^{\vee}$		{D8, D4, F4, H4Φ, dualSnub24, snub24H4Φ, G2s}	0apggssec 000001111_2	Bn{ 0 0 0 0 1 1 1 0 } E8{ 0 0 0 0 0 −1 0 1 } Ph{ 0 0 0 0 0 0 $\frac{1}{\sqrt{2}}$ $\sqrt{\frac{3}{2}}$ }	Rt{ −1 −2 −3 −4 −2 −4 −5 −3 } Wt{ 0 0 0 0 0 −1 1 −1 } Ht 24	Uup 115	Triad fpi=6 D_8 $\overline{L}$ fp_sm=6→3AH {1, 2, 3}, {1, 7, 4}, {1, 5, 6}, {2, 6, 4}, {2, 7, 5}, {3, 5, 4}, {3, 6, 7} flat triad/mask bits {1, 3, 2, 7, 4, 5, 6} {0, 1, 0, 1, 1, 1, 0}	Triad fpi=9 D_8 $\overline{L}$ fp_sm=6→3AH {1, 2, 4}, {1, 6, 3}, {1, 5, 7}, {2, 5, 3}, {2, 7, 6}, {3, 4, 7}, {4, 5 flat triad/mask bits {1, 2, 4, 6, 3, 5, 7} {0, 1, 0, 1, 1, 1, 0}
91	$\overline{g^{rb}}_{c_m}{}^{0}_{R}{}^{\vee}$		{D8, D7, D4, F4, H4Φ, dualSnub24, snub24H4Φ, G2s}	0apggssec 000001110_2	Bn{ 0 0 0 0 1 1 0 1 } E8{ 0 0 0 0 0 −1 1 0 } Ph{ 0 0 0 0 0 0 $\sqrt{2}$ 0 }	Rt{ 0 0 0 0 0 0 0 −1 } Wt{ 0 0 0 0 0 0 1 −2 } Ht 1	Hi 1	Triad fpi=3 D_8 $\overline{L}$ fp_sm=4→30H {1, 2, 3}, {1, 4, 6}, {1, 5, 7}, {2, 4, 5}, {2, 7, 6}, {3, 7, 4}, {3, 5, 6} flat triad/mask bits {1, 3, 2, 4, 6, 5, 7} {0, 0, 0, 0, 1, 1, 0}	Triad fpi=5 D_8 $\overline{L}$ fp_sm=7→39H {1, 3, 2}, {1, 4, 7}, {1, 5, 6}, {2, 4, 5}, {2, 6, 7}, {3, 4, 6}, {3, 5 flat triad/mask bits {1, 3, 2, 4, 7, 5, 6} {1, 0, 0, 1, 1, 1, 0}
92	$\Phi x_1{}^{0}_{o_l}{}^{\wedge}_{R}$		{D8, E7, D4, F4, H4, snub24, snub24E8, snub24H4}	0apggssec 000000101_2	Bn{ 0 0 0 0 0 1 0 1 } E8{ 0 0 0 0 0 0 −1 −1 } Ph{ 0 0 0 0 0 $-\frac{2}{\sqrt{3}}$ $-\frac{1}{\sqrt{2}}$ $-\frac{1}{\sqrt{6}}$ }	Rt{ 1 2 3 4 2 3 5 3 } Wt{ 0 0 0 0 1 −1 0 1 } Ht 23	Unt 113	Triad fpi=1 D_8 $\overline{L}$ fp_sm=5→16H {1, 2, 3}, {1, 5, 4}, {1, 7, 6}, {2, 4, 6}, {2, 7, 5}, {3, 4, 7}, {3, 5, 6} flat triad/mask bits {1, 3, 2, 5, 4, 7, 6} {0, 1, 1, 0, 1, 0, 0}	Triad fpi=2 D_8 $\overline{L}$ fp_sm=8→15H {1, 3, 2}, {1, 4, 5}, {1, 7, 6}, {2, 6, 5}, {3, 4, 6}, {3, 5 flat triad/mask bits {1, 3, 2, 4, 5, 7, 6} {1, 0, 1, 0, 1, 0, 0}
93	$\overline{g^{gb}}_{o_m}{}^{0}_{R}{}^{\vee}$		{D8, D4, F4, H4Φ, dualSnub24, snub24H4Φ, G2s}	0apggssec 000001101_2	Bn{ 0 0 0 0 0 1 1 1 } E8{ 0 0 0 0 0 0 −1 1 } Ph{ 0 0 0 0 0 0 $-\frac{1}{\sqrt{2}}$ $\sqrt{\frac{3}{2}}$ }	Rt{ −1 −2 −3 −4 −2 −4 −5 −2 } Wt{ 0 0 0 0 0 −1 0 1 } Ht 23	Fl 114	Triad fpi=1 D_8 $\overline{L}$ fp_sm=5→3BH {1, 3, 2}, {1, 5, 4}, {1, 6, 7}, {2, 6, 4}, {2, 7, 5}, {3, 7, 4}, {3, 5, 6} flat triad/mask bits {1, 2, 3, 5, 4, 6, 7} {1, 1, 0, 1, 1, 1, 0}	Triad fpi=2 D_8 $\overline{L}$ fp_sm=8→38H {1, 2, 3}, {1, 4, 5}, {1, 6, 7}, {2, 6, 4}, {2, 7, 5}, {3, 7, 4}, {3, 5 flat triad/mask bits {1, 2, 3, 4, 5, 6, 7} {0, 0, 0, 1, 1, 1, 0}

pascalRow@5

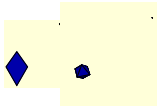
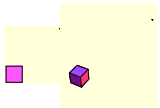
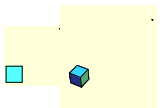
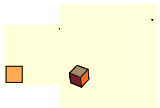
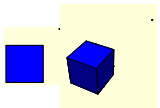
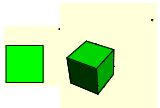
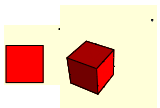
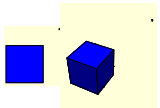
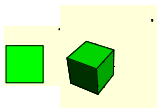
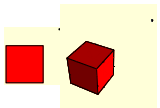
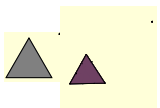
Seq #	Symbol	2D/3D Shape	Groups	Particle Quantum Bits	Binary / E8 / Physics Coordinates	Algebra Root Weight / Height / Rt#=Atomic Element Number -->	Ele #	Octonions Flipped	Octonions Not Flipped
94	$\overline{c}_{{}^{\vee}d}{}^{\vee}_{L}$		{BC8, E7, E6, 6Cube, E5, C4, H4Φ, 24cell, 8Cell, dualSnub24, 24cellE8Φ, 24cellH4Φ, 3Cube, Hamming}	0apggssec 000010000_2	Bn{ 1 1 1 1 0 0 0 0 } E8{ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ } Ph{ $\frac{1}{2}$ $\frac{1}{2}$ 0 $\frac{1}{\sqrt{2}}$ $-\frac{1}{2}$ $-\frac{\sqrt{3}}{2}$ 0 0 }	Rt{ 1 2 3 4 1 2 4 2 } Wt{ 0 0 0 1 0 −1 0 0 } Ht 19	Sg 106	Triad fpi=4 BC_8 $\overline{L}$ fp_sm=3→02H {1, 2, 3}, {1, 6, 4}, {1, 5, 7}, {2, 4, 7}, {2, 5, 6}, {3, 4, 5}, {3, 6, 7} flat triad/mask bits {1, 3, 2, 6, 4, 5, 7} {0, 1, 0, 0, 0, 0, 0}	Triad fpi=7 BC_8 $\overline{L}$ fp_sm=3→02H {1, 2, 4}, {1, 5, 3}, {1, 6, 7}, {2, 5, 3}, {2, 6, 7}, {3, 4, 7}, {4, 5, flat triad/mask bits {1, 2, 4, 5, 3, 6, 7} {0, 1, 0, 0, 0, 0, 0}

95	$\overline{\overset{0}{v_T}}\ \overset{\wedge}{w_m}\ \hat{L}$		{BC8, E7, E6, 6Cube, C4, H4, 24cell, 8Cell, altSnub24, cellE8, snub24H4}	$0apggsscc$ 0111110001_2	Bn{ 1/2, 1/2, 1/2, 0, 1/2, 0, 0, 0 } E8{ 1/2, 1/2, 1/2, −1/2, 1/2, −1/2, −1/2, −1/2 } Ph{ 1/2, 1/2, 1/√2, 0, 1/2, −√3/2, 0, 0 }	Rt{ 1, 2, 3, 3, 1, 2, 4, 2 } Wt{ 0, 0, 1, −1, 0, −1, 1, 0 } Ht 18	Lr 103	Flipped Triad fpi=24 BC_8 R fp_sm=3→57H {1, 6, 2}, {1, 7, 3}, {1, 5, 4}, {2, 3, 5}, {2, 7, 4}, {3, 4, 6}, {5, 7, 6} flat triad/mask bits {1, 2, 6, 7, 3, 5, 4} {1, 1, 1, 0, 1, 0, 1}	Not Flipped Triad fpi=23 BC_8 R fp_sm=2→54H {1, 2, 6}, {1, 3, 7}, {1, 5, 4}, {2, 3, 4}, {2, 7, 5}, {3, 5, 6}, {4, 7, flat triad/mask bits {1, 2, 6, 3, 7, 5, 4} {0, 0, 1, 0, 1, 0, 1}
96	$\overline{\overset{-2/3}{r_m}}\ \hat{L}$		{BC8, E7, 6Cube, C4, H4, snub24, altSnub24, cellE8, snub24H4}	$0apggsscc$ 0111110011_2	Bn{ 1/2, 1/2, 1/2, −1/2, −1/2, 1/2, −1/2, −1/2 } E8{ 1/2, 1/2, 1/2, −1/2, −1/2, 1/2, −1/2, −1/2 } Ph{ 1/2, 1/2, 1/√2, 0, −1/2, −1/(2√3), −1/√2, −1/√6 }	Rt{ 1, 2, 3, 3, 1, 2, 3, 2 } Wt{ 0, 0, 1, 0, 0, 0, −1, 1 } Ht 17	Fm 100	Flipped Triad fpi=25 BC_8 R fp_sm=5→5DH {1, 7, 2}, {1, 3, 4}, {1, 6, 5}, {2, 5, 3}, {2, 6, 4}, {3, 6, 7}, {4, 7, 5} flat triad/mask bits {1, 2, 7, 3, 4, 6, 5} {1, 0, 1, 1, 1, 0, 1}	Not Flipped Triad fpi=26 BC_8 R fp_sm=8→5EH {1, 2, 7}, {1, 4, 3}, {1, 6, 5}, {2, 6, 3}, {2, 5, 4}, {3, 5, 7}, {4, 7, flat triad/mask bits {1, 2, 7, 4, 3, 6, 5} {0, 1, 1, 1, 1, 0, 1}
97	$\overline{\overset{t}{g_m}}\ \overset{-2/3}{\wedge}\ \hat{L}$		{BC8, 6Cube, H4Φ, dualSnub24, snub24H4Φ, Idempot}	$0apggsscc$ 0111110010_2	Bn{ 1/2, 1/2, 1/2, −1/2, −1/2, 1/(2√3), 1/√2, −1/√6 } E8{ 1/2, 1/2, 1/2, −1/2, −1/2, 1/(2√3), 1/√2, −1/√6 } Ph{ 1/2, 1/2, 1/√2, 0, −1/2, −1/(2√3), 1/√2, −1/√6 }	Rt{ 1, 2, 3, 3, 1, 2, 3, 1 } Wt{ 0, 0, 1, 0, 0, 0, 0, −1 } Ht 16	Cm 96	Flipped Triad fpi=27 BC_8 R fp_sm=4→56H {1, 2, 7}, {1, 5, 3}, {1, 6, 4}, {2, 3, 4}, {2, 6, 5}, {3, 6, 7}, {4, 7, 5} flat triad/mask bits {1, 7, 2, 5, 3, 6, 4} {0, 1, 1, 0, 1, 0, 1}	Not Flipped Triad fpi=29 BC_8 R fp_sm=7→5FH {1, 7, 2}, {1, 6, 3}, {1, 5, 4}, {2, 4, 3}, {2, 6, 5}, {3, 7, 4}, {4, 7, flat triad/mask bits {1, 7, 2, 6, 3, 5, 4} {1, 1, 1, 1, 1, 0, 1}
98	$\overline{\overset{t}{h_m}}\ \overset{-2/3}{\wedge}\ \hat{L}$		{BC8, H4Φ, dualSnub24, 24cellH4Φ}	$0apggsscc$ 0111110011_2	Bn{ 1/2, 1/2, 1/2, −1/2, −1/2, 1/(2√3), 0, √(2/3) } E8{ 1/2, 1/2, 1/2, −1/2, −1/2, 1/(2√3), 0, √(2/3) } Ph{ 1/2, 1/2, 1/√2, 0, −1/2, −1/(2√3), 0, √(2/3) }	Rt{ 0, 0, 0, −1, −1, −2, −2, −1 } Wt{ 0, 0, 1, 0, 0, −1, 0, 0 } Ht 7	Ru 44	Flipped Triad fpi=30 BC_8 R fp_sm=6→5CH {1, 2, 7}, {1, 3, 6}, {1, 5, 4}, {2, 5, 3}, {2, 6, 4}, {3, 4, 7}, {5, 7, 6} flat triad/mask bits {1, 7, 2, 3, 6, 5, 4} {0, 0, 1, 1, 1, 0, 1}	Not Flipped Triad fpi=28 BC_8 R fp_sm=3→57H {1, 7, 2}, {1, 5, 3}, {1, 6, 4}, {2, 5, 4}, {3, 4, 7}, {5, 7, flat triad/mask bits {1, 2, 7, 5, 3, 6, 4} {1, 1, 1, 1, 0, 1, 1}
99	$\overline{\overset{0}{v_T}}\ \overset{\vee}{w_m}\ \overset{\vee}{R}$		{BC8, E7, E6, 6Cube, C4, H4, 24cell, 8Cell, altSnub24, snub24E8, snub24H4, Idempot}	$0apggsscc$ 0111111100_2	Bn{ 1/2, 1/2, −1/√2, 0, 1/2, √3/2, 0, 0 } E8{ 1/2, 1/2, −1/2, 1/2, 1/2, −1/2, −1/2, −1/2 } Ph{ 1/2, 1/2, −1/√2, 0, 1/2, −√3/2, 0, 0 }	Rt{ 1, 2, 2, 3, 1, 2, 4, 2 } Wt{ 0, 1, −1, 0, 0, −1, 1, 0 } Ht 17	Ex 99	Flipped Triad fpi=24 BC_8 R fp_sm=3→49H {1, 6, 2}, {1, 3, 7}, {1, 4, 5}, {2, 5, 3}, {2, 4, 7}, {3, 4, 6}, {5, 7, 6} flat triad/mask bits {1, 2, 6, 3, 7, 4, 5} {1, 0, 0, 1, 0, 0, 1}	Not Flipped Triad fpi=23 BC_8 R fp_sm=2→4AH {1, 2, 6}, {1, 7, 3}, {1, 4, 5}, {2, 4, 3}, {2, 5, 7}, {3, 5, 6}, {4, 7, flat triad/mask bits {1, 2, 6, 7, 3, 4, 5} {0, 1, 0, 1, 0, 0, 1}
100	$\overline{\overset{t}{r_m}}\ \overset{-2/3}{\vee}\ \overset{\vee}{R}$		{BC8, E7, 6Cube, C4, H4Φ, dualSnub24, snub24H4Φ}	$0apggsscc$ 0111111101_2	Bn{ 1/2, 1/2, −1/√2, 0, −1/2, −1/(2√3), −1/√2, −1/√6 } E8{ 1/2, 1/2, −1/2, 1/2, −1/2, −1/(2√3), −1/√2, −1/√6 } Ph{ 1/2, 1/2, −1/√2, 0, −1/2, −1/(2√3), −1/√2, −1/√6 }	Rt{ 1, 2, 2, 3, 1, 2, 3, 2 } Wt{ 0, 1, −1, 1, 0, 0, −1, 1 } Ht 16	Am 95	Flipped Triad fpi=25 BC_8 R fp_sm=5→43H {1, 7, 2}, {1, 4, 3}, {1, 5, 6}, {2, 3, 5}, {2, 4, 6}, {3, 6, 7}, {4, 7, 5} flat triad/mask bits {1, 2, 7, 4, 3, 5, 6} {1, 1, 0, 0, 0, 0, 1}	Not Flipped Triad fpi=26 BC_8 R fp_sm=8→40H {1, 2, 7}, {1, 3, 4}, {1, 5, 6}, {2, 3, 6}, {2, 4, 5}, {3, 5, 7}, {4, 7, flat triad/mask bits {1, 2, 7, 3, 4, 5, 6} {0, 0, 0, 0, 0, 0, 1}
101	$\overline{\overset{t}{g_m}}\ \overset{-2/3}{\vee}\ \overset{\vee}{R}$		{BC8, 6Cube, H4Φ, dualSnub24, 24cellH4Φ}	$0apggsscc$ 0111111110_2	Bn{ 1/2, 1/2, −1/√2, 0, −1/2, −1/(2√3), 1/√2, −1/√6 } E8{ 1/2, 1/2, −1/2, 1/2, −1/2, −1/(2√3), 1/√2, −1/√6 } Ph{ 1/2, 1/2, −1/√2, 0, −1/2, −1/(2√3), 1/√2, −1/√6 }	Rt{ 1, 2, 2, 3, 1, 2, 3, 1 } Wt{ 0, 1, −1, 1, 0, 0, 0, −1 } Ht 15	U 92	Flipped Triad fpi=27 BC_8 R fp_sm=4→48H {1, 7, 2}, {1, 3, 5}, {1, 4, 6}, {2, 4, 3}, {2, 5, 6}, {3, 6, 7}, {4, 7, 5} flat triad/mask bits {1, 7, 2, 3, 5, 4, 6} {0, 0, 0, 1, 0, 0, 1}	Not Flipped Triad fpi=29 BC_8 R fp_sm=7→41H {1, 7, 2}, {1, 3, 6}, {1, 4, 5}, {2, 4, 3}, {2, 5, 6}, {3, 5, 7}, {4, 7, flat triad/mask bits {1, 7, 2, 3, 5, 4, 6} {1, 0, 0, 0, 0, 0, 1}
102	$\overline{\overset{t}{h_m}}\ \overset{-2/3}{\vee}\ \overset{\vee}{R}$		{BC8, H4, snub24, altSnub24, cellE8, snub24H4}	$0apggsscc$ 0111111111_2	Bn{ 1/2, 1/2, −1/√2, 0, −1/2, −1/(2√3), 0, √(2/3) } E8{ 1/2, 1/2, −1/2, 1/2, −1/2, −1/(2√3), 1/2, 1/2 } Ph{ 1/2, 1/2, −1/√2, 0, −1/2, −1/(2√3), 0, √(2/3) }	Rt{ 0, 0, −1, −1, −1, −2, −2, −1 } Wt{ 0, 1, −1, 1, 0, −1, 0, 0 } Ht 8	Sb 51	Flipped Triad fpi=30 BC_8 R fp_sm=6→42H {1, 2, 7}, {1, 6, 3}, {1, 4, 5}, {2, 3, 5}, {2, 4, 6}, {3, 4, 7}, {5, 7, 6} flat triad/mask bits {1, 7, 2, 6, 3, 4, 5} {0, 1, 0, 0, 0, 0, 1}	Not Flipped Triad fpi=28 BC_8 R fp_sm=3→49H {1, 7, 2}, {1, 3, 5}, {1, 4, 6}, {2, 4, 3}, {2, 5, 7}, {3, 4, 7}, {5, 7, flat triad/mask bits {1, 2, 7, 3, 5, 4, 6} {1, 0, 0, 1, 0, 0, 1}
103	$\overline{\overset{d}{a_l}}\ \overset{1/3}{\wedge}\ \hat{R}$		{BC8, E7, 6Cube, C4, H4, snub24, altSnub24, snub24E8, 24cellH4, Hamming}	$0apggsscc$ 0100101010_2	Bn{ 1/2, 1/2, 1/2, −1/√2, 1/2, 1/(2√3), −1/√2, −1/√6 } E8{ 1/2, 1/2, −1/2, 1/2, 1/2, −1/(2√3), −1/√2, −1/√6 } Ph{ 1/2, 1/2, 0, −1/√2, 1/2, −1/(2√3), −1/√2, −1/√6 }	Rt{ 1, 2, 2, 2, 1, 2, 3, 2 } Wt{ 0, 1, 0, −1, 0, 0, 0, 1 } Ht 15	Pa 91	Flipped Triad fpi=10 BC_8 L fp_sm=5→69H {1, 4, 2}, {1, 3, 6}, {1, 5, 7}, {2, 7, 3}, {2, 5, 6}, {3, 5, 4}, {4, 7, 6} flat triad/mask bits {1, 2, 4, 3, 6, 5, 7} {1, 0, 0, 1, 0, 1, 1}	Not Flipped Triad fpi=8 BC_8 L fp_sm=2→60H {1, 2, 4}, {1, 3, 5}, {1, 6, 7}, {2, 5, 6}, {3, 6, 4}, {4, 7, flat triad/mask bits {1, 2, 4, 3, 5, 6, 7} {0, 0, 0, 0, 0, 1, 1}
104	$\overline{\overset{d}{c_l}}\ \overset{1/3}{\wedge}\ \hat{R}$		{BC8, 6Cube, H4Φ, dualSnub24, snub24H4Φ}	$0apggsscc$ 0100101100_2	Bn{ 1/2, 1/2, −1/√2, −1/√2, 1/2, −1/(2√3), 1/√2, −1/√6 } E8{ 1/2, 1/2, −1/2, 1/2, 1/2, −1/(2√3), 1/√2, −1/√6 } Ph{ 1/2, 1/2, 0, −1/√2, 1/2, −1/(2√3), 1/√2, −1/√6 }	Rt{ 1, 2, 2, 2, 1, 2, 3, 1 } Wt{ 0, 1, 0, −1, 0, 0, 1, −1 } Ht 14	Ra 88	Flipped Triad fpi=12 BC_8 L fp_sm=4→62H {1, 2, 4}, {1, 7, 3}, {1, 5, 6}, {2, 3, 6}, {2, 5, 7}, {3, 5, 4}, {4, 7, 6} flat triad/mask bits {1, 4, 2, 7, 3, 5, 6} {0, 1, 0, 0, 0, 1, 1}	Not Flipped Triad fpi=11 BC_8 L fp_sm=1→61H {1, 4, 2}, {1, 3, 7}, {1, 5, 6}, {2, 3, 7}, {2, 5, 6}, {3, 6, 4}, {4, 7, flat triad/mask bits {1, 4, 2, 3, 7, 5, 6} {1, 0, 0, 0, 0, 1, 1}
105	$\overline{\overset{d}{m_l}}\ \overset{1/3}{\wedge}\ \hat{R}$		{BC8, H4, snub24, altSnub24, cellE8, snub24H4}	$0apggsscc$ 0100101111_2	Bn{ 1/2, 1/2, −1/√2, −1/√2, 1/2, −1/(2√3), 0, √(2/3) } E8{ 1/2, 1/2, −1/2, 1/2, 1/2, −1/(2√3), 1/2, 1/2 } Ph{ 1/2, 1/2, 0, −1/√2, 1/2, −1/(2√3), 0, √(2/3) }	Rt{ 0, 0, −1, −2, −1, −2, −2, −1 } Wt{ 0, 1, 0, −1, 0, −1, 1, 0 } Ht 9	La 57	Flipped Triad fpi=13 BC_8 L fp_sm=6→68H {1, 2, 5}, {1, 3, 4}, {1, 6, 7}, {2, 6, 3}, {2, 4, 7}, {3, 7, 5}, {4, 6, 5} flat triad/mask bits {1, 5, 2, 3, 4, 6, 7} {0, 0, 0, 1, 0, 1, 1}	Not Flipped Triad fpi=14 BC_8 L fp_sm=7→6BH {1, 5, 2}, {1, 4, 3}, {1, 6, 7}, {2, 6, 3}, {2, 4, 7}, {3, 7, 4}, {4, 6, 5} flat triad/mask bits {1, 5, 2, 4, 3, 6, 7} {1, 1, 0, 1, 0, 1, 1}
106	$\overset{u}{b_d}\ \overset{2/3}{\vee}\ \overset{\vee}{L}$		{BC8, 6Cube, H4Φ, dualSnub24, snub24H4Φ}	$0apggsscc$ 0010100111_2	Bn{ 1/2, 1/2, −1/√2, −1/√2, −1/2, 1/(2√3), 1/2, −√(2/3) } E8{ 1/2, 1/2, −1/2, 1/2, −1/2, 1/(2√3), 1/2, −1/2 } Ph{ 1/2, 1/2, 0, −1/√2, −1/2, 1/(2√3), 0, −√(2/3) }	Rt{ 1, 2, 2, 2, 1, 2, 2, 1 } Wt{ 0, 1, 0, 0, 0, 1, −1, 0 } Ht 13	Po 84	Flipped Triad fpi=13 BC_8 R fp_sm=6→0EH {1, 2, 5}, {1, 4, 3}, {1, 7, 6}, {2, 6, 3}, {2, 4, 7}, {3, 5, 7}, {4, 5, 6} flat triad/mask bits {1, 5, 2, 4, 3, 7, 6} {0, 1, 1, 0, 0, 0}	Not Flipped Triad fpi=14 BC_8 R fp_sm=7→0DH {1, 5, 2}, {1, 3, 4}, {1, 7, 6}, {2, 6, 3}, {2, 4, 7}, {3, 5, 7}, {4, 5, flat triad/mask bits {1, 5, 2, 3, 4, 7, 6} {1, 0, 1, 0, 0, 0}
107	$\overset{u}{g_d}\ \overset{2/3}{\vee}\ \overset{\vee}{L}$		{BC8, H4, snub24, altSnub24, snub24E8, snub24H4, Idempot}	$0apggsscc$ 0010100010_2	Bn{ 1/2, 1/2, −1/√2, −1/√2, −1/2, 1/(2√3), −1/√2, 1/√6 } E8{ 1/2, 1/2, −1/2, 1/2, −1/2, 1/(2√3), −1/√2, 1/√6 } Ph{ 1/2, 1/2, 0, −1/√2, −1/2, 1/(2√3), −1/√2, 1/√6 }	Rt{ 0, 0, −1, −2, −1, −2, −3, −1 } Wt{ 0, 1, 0, 0, 0, 0, −1, 1 } Ht 10	Eu 63	Flipped Triad fpi=12 BC_8 R fp_sm=4→04H {1, 2, 4}, {1, 3, 7}, {1, 6, 5}, {2, 3, 6}, {2, 5, 7}, {3, 4, 5}, {4, 6, 7} flat triad/mask bits {1, 4, 2, 3, 7, 6, 5} {0, 0, 1, 0, 0, 0, 0}	Not Flipped Triad fpi=11 BC_8 R fp_sm=1→07H {1, 4, 2}, {1, 7, 3}, {1, 6, 5}, {2, 3, 5}, {2, 6, 7}, {3, 4, 6}, {4, 5, flat triad/mask bits {1, 4, 2, 7, 3, 6, 5} {1, 1, 1, 0, 0, 0, 0}
108	$\overset{u}{r_d}\ \overset{2/3}{\vee}\ \overset{\vee}{L}$		{BC8, E7, H4Φ, dualSnub24, 24cellH4Φ, Hamming}	$0apggsscc$ 0010100001_2	Bn{ 1/2, 1/2, −1/√2, −1/√2, −1/2, 1/(2√3), 1/√2, 1/√6 } E8{ 1/2, 1/2, −1/2, 1/2, −1/2, 1/(2√3), 1/√2, 1/√6 } Ph{ 1/2, 1/2, 0, −1/√2, −1/2, 1/(2√3), 1/√2, 1/√6 }	Rt{ 0, 0, −1, −2, −1, −2, −3, −2 } Wt{ 0, 1, 0, 0, 0, 0, 0, −1 } Ht 11	Tm 69	Flipped Triad fpi=10 BC_8 R fp_sm=5→0FH {1, 4, 2}, {1, 6, 3}, {1, 7, 5}, {2, 7, 3}, {2, 5, 6}, {3, 4, 5}, {4, 6, 7} flat triad/mask bits {1, 2, 4, 6, 3, 7, 5} {1, 1, 1, 0, 0, 0, 0}	Not Flipped Triad fpi=8 BC_8 R fp_sm=2→06H {1, 2, 4}, {1, 5, 3}, {1, 7, 6}, {2, 7, 3}, {2, 5, 6}, {3, 4, 6}, {4, 5, flat triad/mask bits {1, 2, 4, 5, 3, 7, 6} {0, 1, 1, 0, 0, 0, 0}

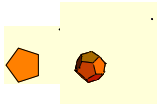
109	$\overline{r_r}^{\,0}_{w_d}\,\vee\,L$		{BC8, E7, E6, 6Cube, C4, H4, 24cell, 8Cell, altSnub24, snub24E8, snub24H4}	$0apggsscc$ 011110000_2	Bn{ 1, 0, 1, 1, 1, 0, 0, 0 } E8{ 1/2, −1/2, 1/2, 1/2, 1/2, −1/2, −1/2, −1/2 } Ph{ 1/2, −1/2, 0, 1/√2, 1/2, −√3/2, 0, 0 }	Rt{ 1, 1, 2, 3, 1, 2, 4, 2 } Wt{ 1, −1, 0, 0, 0, −1, 1, 0 } Ht 16	Pu 94	Flipped Triad fpi=24 BC_8 R fp_sm=3→7AH {1, 2, 6}, {1, 7, 3}, {1, 4, 5}, {2, 5, 3}, {2, 7, 4}, {3, 6, 4}, {5, 7, 6} flat triad/mask bits {1, 6, 2, 7, 3, 4, 5} {0, 1, 0, 1, 1, 1, 1}	Not Flipped Triad fpi=23 BC_8 R fp_sm=2→79H {1, 6, 2}, {1, 3, 7}, {1, 4, 5}, {2, 4, 3}, {2, 7, 5}, {3, 6, 5}, {4, 7, flat triad/mask bits {1, 6, 2, 3, 7, 4, 5} {1, 0, 0, 1, 1, 1, 1}
110	$\overline{t_r}^{\,-2/3}_{d}\,\vee\,L$		{BC8, E7, 6Cube, C4, H4Φ, dualSnub24, 24cellH4Φ}	$0apggsscc$ 011110001_2	Bn{ 1, 0, 1, 1, 0, 1, 0, 0 } E8{ 1/2, −1/2, 1/2, 1/2, −1/2, 1/2, −1/2, −1/2 } Ph{ 1/2, −1/2, 0, 1/√2, −1/2, −1/(2√3), −1/√2, −1/√6 }	Rt{ 1, 1, 2, 3, 1, 2, 3, 2 } Wt{ 1, −1, 0, 1, 0, 0, −1, 1 } Ht 15	Th 90	Flipped Triad fpi=25 BC_8 R fp_sm=5→70H {1, 2, 7}, {1, 3, 4}, {1, 5, 6}, {2, 3, 5}, {2, 6, 4}, {3, 7, 6}, {4, 7, 5} flat triad/mask bits {1, 7, 2, 3, 4, 5, 6} {0, 0, 0, 0, 1, 1, 1}	Not Flipped Triad fpi=26 BC_8 R fp_sm=8→73H {1, 7, 2}, {1, 4, 3}, {1, 5, 6}, {2, 5, 4}, {2, 6, 3}, {3, 7, 5}, {4, 7, flat triad/mask bits {1, 7, 2, 3, 4, 5, 6} {1, 1, 0, 0, 1, 1, 1}
111	$\overline{t_g}^{\,-2/3}_{d}\,\vee\,L$		{BC8, 6Cube, H4, snub24, altSnub24, snub24E8, snub24H4}	$0apggsscc$ 011110010_2	Bn{ 1, 0, 1, 1, 0, 0, 1, 0 } E8{ 1/2, −1/2, 1/2, 1/2, −1/2, 1/(2√3), 1/√2, −1/√6 } Ph{ 1/2, −1/2, 0, 1/√2, −1/2, −1/(2√3), 1/√2, −1/√6 }	Rt{ 1, 1, 2, 3, 1, 2, 3, 1 } Wt{ 1, −1, 0, 1, 0, 0, 0, −1 } Ht 14	Fr 87	Flipped Triad fpi=27 BC_8 R fp_sm=4→7BH {1, 7, 2}, {1, 5, 3}, {1, 4, 6}, {2, 4, 3}, {2, 6, 5}, {3, 7, 6}, {4, 7, 5} flat triad/mask bits {1, 2, 7, 5, 3, 4, 6} {1, 1, 0, 1, 1, 1, 1}	Not Flipped Triad fpi=29 BC_8 R fp_sm=7→72H {1, 2, 7}, {1, 6, 3}, {1, 4, 5}, {2, 4, 3}, {2, 5, 4}, {3, 7, 6}, {4, 7, flat triad/mask bits {1, 2, 7, 6, 3, 4, 5} {0, 1, 0, 0, 1, 1, 1}
112	$\overline{t_b}^{\,-2/3}_{d}\,\vee\,L$		{BC8, H4Φ, dualSnub24, snub24H4Φ, Idempot}	$0apggsscc$ 011110011_2	Bn{ 1, 0, 1, 1, 0, 0, 0, 1 } E8{ 1/2, −1/2, 1/2, 1/2, −1/2, −1/(2√3), 1/√2, −1/√6 } Ph{ 1/2, −1/2, 0, 1/√2, −1/2, −1/(2√3), 0, √(2/3) }	Rt{ 0, −1, −1, −1, −1, −2, −2, −1 } Wt{ 1, −1, 0, 1, 0, −1, 0, 0 } Ht 9	Cc 58	Flipped Triad fpi=30 BC_8 R fp_sm=6→71H {1, 7, 2}, {1, 3, 6}, {1, 4, 5}, {2, 3, 5}, {2, 6, 4}, {3, 7, 4}, {5, 7, 6} flat triad/mask bits {1, 2, 7, 3, 6, 4, 5} {1, 0, 0, 0, 1, 1, 1}	Not Flipped Triad fpi=28 BC_8 R fp_sm=3→7AH {1, 2, 7}, {1, 5, 3}, {1, 4, 6}, {2, 3, 7}, {2, 6, 3}, {2, 5, 4}, {3, 7, 4}, {5, 7, flat triad/mask bits {1, 7, 2, 5, 3, 4, 6} {0, 1, 0, 1, 1, 1, 1}
113	$\overline{d_{6m}}^{\,1/3}\,\wedge\,L$		{BC8, E7, 6Cube, C4, H4, snub24, altSnub24, snub24E8, snub24H4, Idempot}	$0apggsscc$ 010011001_2	Bn{ 1, 0, 1, 0, 1, 1, 0, 0 } E8{ 1/2, −1/2, 1/√2, −1/2, 1/2, 1/(2√3), −1/√2, −1/√6 } Ph{ 1/2, −1/2, 1/√2, 0, 1/2, −1/(2√3), −1/√2, −1/√6 }	Rt{ 1, 1, 2, 2, 1, 2, 3, 2 } Wt{ 1, −1, 1, −1, 0, 0, 0, 1 } Ht 14	Rn 86	Flipped Triad fpi=10 BC_8 L fp_sm=5→5AH {1, 2, 4}, {1, 6, 3}, {1, 5, 7}, {2, 7, 3}, {2, 6, 5}, {3, 4, 5}, {4, 7, 6} flat triad/mask bits {1, 4, 2, 6, 3, 5, 7} {0, 1, 0, 1, 1, 0, 1}	Not Flipped Triad fpi=8 BC_8 L fp_sm=2→53H {1, 4, 2}, {1, 5, 3}, {1, 6, 7}, {2, 7, 3}, {2, 6, 5}, {3, 4, 6}, {4, 7, flat triad/mask bits {1, 4, 2, 5, 3, 6, 7} {1, 1, 0, 0, 1, 0, 1}
114	$\overline{d_{6m}}^{\,1/3}\,\wedge\,L$		{BC8, 6Cube, H4, snub24, altSnub24, snub24E8, 24cellH4, Hamming}	$0apggsscc$ 010011010_2	Bn{ 1, 0, 1, 0, 1, 0, 1, 0 } E8{ 1/2, −1/2, 1/2, −1/2, 1/2, 1/(2√3), 1/√2, −1/√6 } Ph{ 1/2, −1/2, 1/√2, 0, 1/2, −1/(2√3), 1/√2, −1/√6 }	Rt{ 1, 1, 2, 2, 1, 2, 3, 1 } Wt{ 1, −1, 1, −1, 0, 0, 1, −1 } Ht 13	Bi 83	Flipped Triad fpi=12 BC_8 L fp_sm=4→51H {1, 4, 2}, {1, 3, 7}, {1, 5, 6}, {2, 3, 6}, {2, 7, 5}, {3, 4, 5}, {4, 7, 6} flat triad/mask bits {1, 2, 4, 3, 7, 5, 6} {1, 0, 0, 0, 1, 0, 1}	Not Flipped Triad fpi=11 BC_8 L fp_sm=1→52H {1, 4, 2}, {1, 7, 3}, {1, 5, 6}, {2, 3, 5}, {2, 7, 6}, {3, 4, 6}, {4, 7, flat triad/mask bits {1, 2, 4, 7, 3, 6, 5} {0, 1, 0, 0, 1, 0, 1}
115	$\overline{d_{m_m}}^{\,1/3}\,\wedge\,L$		{BC8, H4Φ, dualSnub24, snub24H4Φ}	$0apggsscc$ 010011011_2	Bn{ 1, 0, 1, 0, 1, 0, 0, 1 } E8{ 1/2, −1/2, 1/2, −1/2, 1/2, −1/(2√3), −1/2, 1/2 } Ph{ 1/2, −1/2, 1/√2, 0, 1/2, −1/(2√3), 0, √(2/3) }	Rt{ 0, −1, −1, −2, −1, −2, −2, −1 } Wt{ 1, −1, 1, −1, 0, −1, 1, 0 } Ht 10	Gd 64	Flipped Triad fpi=13 BC_8 L fp_sm=6→5BH {1, 5, 2}, {1, 4, 3}, {1, 6, 7}, {2, 6, 3}, {2, 7, 4}, {3, 5, 7}, {4, 6, 5} flat triad/mask bits {1, 2, 5, 4, 3, 6, 7} {1, 1, 0, 1, 1, 0, 1}	Not Flipped Triad fpi=14 BC_8 L fp_sm=7→58H {1, 5, 2}, {1, 4, 3}, {1, 6, 7}, {2, 7, 3}, {2, 6, 4}, {3, 5, 6}, {4, 7, flat triad/mask bits {1, 2, 5, 3, 4, 6, 7} {0, 0, 0, 1, 1, 0, 1}
116	$\overline{u_{b_m}}^{\,2/3}\,\vee\,R$		{BC8, 6Cube, H4, snub24, altSnub24, snub24E8, snub24H4}	$0apggsscc$ 001011111_2	Bn{ 1, 0, 1, 0, 0, 1, 1, 0 } E8{ 1/2, −1/2, 1/2, −1/2, 1/2, 1/2, 1/2, 1/2 } Ph{ 1/2, −1/2, 1/√2, 0, 1/2, 1/(2√3), 0, −√(2/3) }	Rt{ 1, 1, 2, 2, 1, 2, 2, 1 } Wt{ 1, −1, 1, 0, 0, 1, −1, 0 } Ht 12	Pt 78	Flipped Triad fpi=13 BC_8 R fp_sm=6→3DH {1, 5, 2}, {1, 3, 4}, {1, 7, 6}, {2, 6, 3}, {2, 7, 4}, {3, 7, 5}, {4, 5, 6} flat triad/mask bits {1, 2, 5, 3, 4, 7, 6} {1, 0, 1, 1, 1, 1, 0}	Not Flipped Triad fpi=14 BC_8 R fp_sm=7→3EH {1, 2, 5}, {1, 4, 3}, {1, 7, 6}, {2, 6, 3}, {2, 7, 4}, {3, 6, 5}, {4, 5, flat triad/mask bits {1, 2, 5, 4, 3, 7, 6} {0, 1, 1, 1, 1, 1, 0}
117	$\overline{u_{g_m}}^{\,2/3}\,\vee\,R$		{BC8, H4Φ, dualSnub24, 24cellH4Φ, Hamming}	$0apggsscc$ 001011110_2	Bn{ 1, 0, 1, 0, 0, 1, 0, 1 } E8{ 1/2, −1/2, 1/2, −1/2, 1/2, 1/(2√3), −1/√2, 1/√6 } Ph{ 1/2, −1/2, 1/√2, 0, 1/2, 1/(2√3), −1/√2, 1/√6 }	Rt{ 0, −1, −1, −2, −1, −2, −3, −1 } Wt{ 1, −1, 1, 0, 0, 0, −1, 1 } Ht 11	Yb 70	Flipped Triad fpi=12 BC_8 R fp_sm=4→37H {1, 4, 2}, {1, 7, 3}, {1, 6, 5}, {2, 3, 6}, {2, 7, 5}, {3, 5, 4}, {4, 6, 7} flat triad/mask bits {1, 2, 4, 7, 3, 6, 5} {1, 1, 1, 0, 1, 1, 0}	Not Flipped Triad fpi=11 BC_8 R fp_sm=1→34H {1, 4, 2}, {1, 3, 7}, {1, 6, 5}, {2, 3, 5}, {2, 7, 6}, {3, 6, 4}, {4, 5, flat triad/mask bits {1, 2, 4, 3, 7, 6, 5} {0, 0, 1, 0, 1, 1, 0}
118	$\overline{u_{r_m}}^{\,2/3}\,\vee\,R$		{BC8, E7, H4Φ, dualSnub24, snub24H4Φ}	$0apggsscc$ 001011101_2	Bn{ 1, 0, 1, 0, 0, 0, 1, 1 } E8{ 1/2, −1/2, 1/2, −1/2, 1/2, 1/(2√3), 1/√2, 1/√6 } Ph{ 1/2, −1/2, 1/√2, 0, 1/2, 1/(2√3), 1/√2, 1/√6 }	Rt{ 0, −1, −1, −2, −1, −2, −3, −2 } Wt{ 1, −1, 1, 0, 0, 0, 0, −1 } Ht 12	Re 75	Flipped Triad fpi=10 BC_8 R fp_sm=5→3CH {1, 2, 4}, {1, 3, 6}, {1, 7, 5}, {2, 7, 3}, {2, 6, 5}, {3, 5, 4}, {4, 6, 7} flat triad/mask bits {1, 4, 2, 3, 6, 7, 5} {0, 0, 1, 1, 1, 1, 0}	Not Flipped Triad fpi=8 BC_8 R fp_sm=2→35H {1, 4, 2}, {1, 3, 5}, {1, 7, 6}, {2, 7, 3}, {2, 6, 5}, {3, 6, 4}, {4, 5, flat triad/mask bits {1, 4, 2, 3, 5, 7, 6} {1, 0, 1, 0, 1, 1, 0}
119	$\overline{u_{r_m}}^{\,-2/3}\,\wedge\,L$		{BC8, E7, 6Cube, C4, H4Φ, dualSnub24, snub24H4Φ}	$0apggsscc$ 011011001_2	Bn{ 1, 0, 0, 1, 1, 1, 0, 0 } E8{ 1/2, −1/2, −1/√2, 1/2, 1/2, 1/(2√3), −1/√2, −1/√6 } Ph{ 1/2, −1/2, −1/√2, 0, 1/2, −1/(2√3), −1/√2, −1/√6 }	Rt{ 1, 1, 1, 2, 1, 2, 3, 2 } Wt{ 1, 0, −1, 0, 0, 0, 0, 1 } Ht 13	Pb 82	Flipped Triad fpi=8 BC_8 R fp_sm=2→54H {1, 2, 4}, {1, 3, 5}, {1, 7, 6}, {2, 3, 7}, {2, 6, 5}, {3, 4, 6}, {4, 7, 5} flat triad/mask bits {1, 4, 2, 3, 5, 7, 6} {0, 0, 1, 0, 1, 0, 1}	Not Flipped Triad fpi=10 BC_8 R fp_sm=5→5DH {1, 2, 4}, {1, 3, 6}, {1, 7, 5}, {2, 7, 3}, {2, 6, 5}, {3, 4, 5}, {4, 7, flat triad/mask bits {1, 4, 2, 3, 6, 7, 5} {1, 0, 1, 1, 1, 0, 1}
120	$\overline{u_{g_m}}^{\,-2/3}\,\wedge\,L$		{BC8, 6Cube, H4, snub24, altSnub24, snub24E8, snub24H4}	$0apggsscc$ 011011010_2	Bn{ 1, 0, 0, 1, 1, 0, 1, 0 } E8{ 1/2, −1/2, −1/√2, 1/2, 1/2, 1/(2√3), 1/√2, −1/√6 } Ph{ 1/2, −1/2, −1/√2, 0, 1/2, −1/(2√3), 1/√2, −1/√6 }	Rt{ 1, 1, 1, 2, 1, 2, 3, 1 } Wt{ 1, 0, −1, 0, 0, 0, 1, −1 } Ht 12	Ir 77	Flipped Triad fpi=11 BC_8 R fp_sm=1→55H {1, 4, 2}, {1, 3, 7}, {1, 6, 5}, {2, 3, 5}, {2, 7, 6}, {3, 4, 6}, {4, 7, 5} flat triad/mask bits {1, 2, 4, 3, 7, 6, 5} {1, 0, 1, 0, 1, 0, 1}	Not Flipped Triad fpi=12 BC_8 R fp_sm=4→56H {1, 2, 4}, {1, 7, 3}, {1, 6, 5}, {2, 3, 6}, {2, 7, 5}, {3, 4, 5}, {4, 7, flat triad/mask bits {1, 2, 4, 7, 3, 6, 5} {0, 1, 1, 0, 1, 0, 1}
121	$\overline{u_{b_m}}^{\,-2/3}\,\wedge\,L$		{BC8, H4, snub24, altSnub24, cellE8, 24cellH4, Hamming}	$0apggsscc$ 011011011_2	Bn{ 1, 0, 0, 1, 1, 0, 0, 1 } E8{ 1/2, −1/2, −1/√2, 1/2, 1/2, −1/(2√3), −1/2, 1/2 } Ph{ 1/2, −1/2, −1/√2, 0, 1/2, −1/(2√3), 0, √(2/3) }	Rt{ 0, −1, −2, −2, −1, −2, −2, −1 } Wt{ 1, 0, −1, 0, 0, −1, 1, 0 } Ht 11	Lu 71	Flipped Triad fpi=14 BC_8 R fp_sm=7→5FH {1, 5, 2}, {1, 4, 3}, {1, 7, 6}, {2, 7, 3}, {2, 6, 4}, {3, 5, 6}, {4, 7, 5} flat triad/mask bits {1, 2, 5, 4, 3, 7, 6} {1, 1, 1, 1, 1, 0, 1}	Not Flipped Triad fpi=13 BC_8 R fp_sm=6→5CH {1, 5, 2}, {1, 3, 4}, {1, 7, 6}, {2, 5, 3}, {2, 7, 4}, {3, 7, 5}, {4, 6, flat triad/mask bits {1, 2, 5, 3, 4, 7, 6} {0, 0, 1, 1, 1, 0, 1}
122	$\overline{d_{m_m}}^{\,-1/3}\,\vee\,R$		{BC8, 6Cube, H4Φ, dualSnub24, 24cellH4Φ, Hamming, Idempot}	$0apggsscc$ 000011111_2	Bn{ 1, 0, 0, 1, 0, 1, 1, 0 } E8{ 1/2, −1/2, −1/√2, 1/2, −1/2, 1/(2√3), 1/2, −1/2 } Ph{ 1/2, −1/2, −1/√2, 0, −1/2, 1/(2√3), 0, −√(2/3) }	Rt{ 1, 1, 1, 2, 1, 2, 2, 1 } Wt{ 1, 0, −1, 1, 0, 1, −1, 0 } Ht 11	Hf 72	Flipped Triad fpi=14 BC_8 L fp_sm=7→39H {1, 5, 2}, {1, 3, 4}, {1, 6, 7}, {2, 7, 3}, {2, 6, 4}, {3, 6, 5}, {4, 5, 7} flat triad/mask bits {1, 2, 5, 3, 4, 6, 7} {1, 0, 0, 1, 1, 1, 0}	Not Flipped Triad fpi=13 BC_8 L fp_sm=6→3AH {1, 2, 5}, {1, 4, 3}, {1, 6, 7}, {2, 7, 3}, {2, 6, 4}, {3, 7, 5}, {4, 5, flat triad/mask bits {1, 2, 5, 4, 3, 6, 7} {0, 1, 0, 1, 1, 1, 0}

123	$\overset{d}{c}_m \overset{-1/3}{\vee} R$	{BC8, H4Φ, dualSnub24, snub24H4Φ}	$0apggsscc\ 000011110_2$	Bn{	1	0	0	1	0	1	0	1 }	Rt{	0	−1	−2	−2	−1	−2	−3	−1 }	Os 76	Flipped: Triad fpi=11 BC_8 E fp_sm=1→33H	Not Flipped: Triad fpi=12 BC_8 E fp_sm=4→30H
				E8{	$\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$ }	Wt{	1	0	−1	1	0	0	−1	1 }		{1, 4, 2}, {1, 7, 3}, {1, 5, 6}, {2, 3, 5}, {2, 7, 6}, {3, 6, 4}, {4, 5, 7}	{1, 2, 4}, {1, 3, 7}, {1, 5, 6}, {2, 3, 6}, {2, 7, 5}, {3, 5, 4}, {4, 6,
				Ph{	$\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{\sqrt{2}}$	0	$-\frac{1}{2}$	$\frac{1}{2\sqrt{3}}$	$-\frac{1}{\sqrt{2}}$	$\frac{1}{\sqrt{6}}$ }	Ht	12									flat triad/mask bits: {1, 2, 4, 7, 3, 5, 6}, {1, 1, 0, 0, 1, 1, 0}	flat triad/mask bits: {1, 2, 4, 3, 7, 5, 6}, {0, 0, 0, 0, 1, 1, 0}
124	$\overset{d}{o}_m \overset{-1/3}{\vee} R$	{BC8, E7, H4, snub24, altSnub24, snub24E8, snub24H4}	$0apggsscc\ 000011101_2$	Bn{	1	0	0	1	0	0	1	1 }	Rt{	0	−1	−2	−2	−1	−2	−3	−2 }	Hg 80	Flipped: Triad fpi=8 BC_8 E fp_sm=2→32H	Not Flipped: Triad fpi=10 BC_8 E fp_sm=5→3BH
				E8{	$\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2\sqrt{3}}$	$\frac{1}{\sqrt{2}}$	$\frac{1}{\sqrt{6}}$ }	Wt{	1	0	−1	1	0	0	0	−1 }		{1, 2, 4}, {1, 5, 3}, {1, 6, 7}, {2, 3, 7}, {2, 6, 5}, {3, 6, 4}, {4, 5, 7}	{1, 2, 4}, {1, 6, 3}, {1, 5, 7}, {2, 6, 5}, {3, 5, 4}, {4, 6,
				Ph{	$\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{\sqrt{2}}$	0	$-\frac{1}{2}$	$\frac{1}{2\sqrt{3}}$	$\frac{1}{\sqrt{2}}$	$\frac{1}{\sqrt{6}}$ }	Ht	13									flat triad/mask bits: {1, 4, 2, 5, 3, 6, 7}, {0, 1, 0, 0, 1, 1, 0}	flat triad/mask bits: {1, 4, 2, 6, 3, 5, 7}, {1, 1, 0, 1, 1, 1, 0}
125	$\overset{t}{b}_l \overset{2/3}{\wedge} R$	{BC8, 6Cube, H4Φ, dualSnub24, 24cellE8Φ, snub24H4Φ}	$0apggsscc\ 001110111_2$	Bn{	1	0	0	0	1	1	1	0 }	Rt{	1	1	1	1	1	2	2	1 }	Dy 66	Flipped: Triad fpi=28 BC_8 R fp_sm=3→1BH	Not Flipped: Triad fpi=30 BC_8 R fp_sm=6→10H
				E8{	$\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$ }	Wt{	1	0	0	−1	0	1	0	0 }		{1, 7, 2}, {1, 5, 3}, {1, 4, 6}, {2, 6, 3}, {2, 5, 4}, {3, 4, 7}	{1, 2, 7}, {1, 3, 6}, {1, 4, 5}, {2, 6, 5}, {3, 6, 7}, {4, 5,
				Ph{	$\frac{1}{2}$	$-\frac{1}{2}$	0	$-\frac{1}{\sqrt{2}}$	$\frac{1}{2}$	$\frac{1}{2\sqrt{3}}$	0	$-\sqrt{\frac{2}{3}}$ }	Ht	10									flat triad/mask bits: {1, 7, 2, 5, 3, 4, 6}, {1, 1, 0, 1, 1, 0, 0}	flat triad/mask bits: {1, 2, 7, 3, 6, 4, 5}, {0, 0, 0, 0, 1, 0, 0}
126	$\overset{t}{g}_l \overset{2/3}{\wedge} R$	{BC8, H4Φ, dualSnub24, 24cellE8Φ, snub24H4Φ}	$0apggsscc\ 001110110_2$	Bn{	1	0	0	0	1	1	0	1 }	Rt{	0	−1	−2	−3	−1	−2	−3	−1 }	Tl 81	Flipped: Triad fpi=29 BC_8 R fp_sm=7→13H	Not Flipped: Triad fpi=27 BC_8 R fp_sm=4→1AH
				E8{	$\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$ }	Wt{	1	0	0	−1	0	0	0	1 }		{1, 7, 2}, {1, 6, 3}, {1, 4, 5}, {2, 3, 4}, {2, 6, 5}, {3, 5, 7}	{1, 2, 7}, {1, 5, 3}, {1, 4, 6}, {2, 6, 5}, {3, 6, 7}, {4, 5,
				Ph{	$\frac{1}{2}$	$-\frac{1}{2}$	0	$-\frac{1}{\sqrt{2}}$	$\frac{1}{2}$	$\frac{1}{2\sqrt{3}}$	$-\frac{1}{\sqrt{2}}$	$\frac{1}{\sqrt{6}}$ }	Ht	13									flat triad/mask bits: {1, 2, 7, 6, 3, 4, 5}, {1, 1, 0, 0, 1, 0, 0}	flat triad/mask bits: {1, 2, 7, 5, 3, 4, 6}, {0, 1, 0, 0, 1, 0, 0}
127	$\overset{t}{r}_l \overset{2/3}{\wedge} R$	{BC8, E7, H4Φ, dualSnub24, 24cellE8Φ, snub24H4Φ, Idempot}	$0apggsscc\ 001110101_2$	Bn{	1	0	0	0	1	0	1	1 }	Rt{	0	−1	−2	−3	−1	−2	−3	−2 }	At 85	Flipped: Triad fpi=26 BC_8 R fp_sm=8→12H	Not Flipped: Triad fpi=25 BC_8 R fp_sm=5→11H
				E8{	$\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$ }	Wt{	1	0	0	−1	0	0	1	−1 }		{1, 2, 7}, {1, 4, 3}, {1, 5, 6}, {2, 3, 6}, {2, 5, 4}, {3, 5, 7}	{1, 2, 7}, {1, 3, 4}, {1, 5, 6}, {2, 6, 4}, {3, 6, 7}, {4, 5,
				Ph{	$\frac{1}{2}$	$-\frac{1}{2}$	0	$-\frac{1}{\sqrt{2}}$	$\frac{1}{2}$	$\frac{1}{2\sqrt{3}}$	$\frac{1}{\sqrt{2}}$	$\frac{1}{\sqrt{6}}$ }	Ht	14									flat triad/mask bits: {1, 7, 2, 4, 3, 5, 6}, {0, 1, 0, 0, 1, 0, 0}	flat triad/mask bits: {1, 7, 2, 3, 4, 5, 6}, {1, 0, 0, 0, 1, 0, 0}
128	$\overset{v_r}{v}_l \overset{0}{\wedge} R$	{BC8, E7, E6, H4Φ, dualSnub24, 24cellE8Φ, 24cellH4Φ}	$0apggsscc\ 001110100_2$	Bn{	1	0	0	0	0	1	1	1 }	Rt{	0	−1	−2	−3	−1	−2	−4	−2 }	Ac 89	Flipped: Triad fpi=23 BC_8 R fp_sm=2→18H	Not Flipped: Triad fpi=24 BC_8 R fp_sm=3→1BH
				E8{	$\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{\sqrt{3}}$	$\frac{1}{2}$	$\frac{1}{2}$ }	Wt{	1	0	0	0	0	1	−1	0 }		{1, 2, 6}, {1, 3, 7}, {1, 4, 5}, {2, 4, 3}, {2, 7, 5}, {3, 5, 6}	{1, 2, 6}, {1, 7, 3}, {1, 4, 5}, {2, 4, 6}, {3, 7, 5}, {5, 6,
				Ph{	$\frac{1}{2}$	$-\frac{1}{2}$	0	$-\frac{1}{\sqrt{2}}$	$-\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	0	0 }	Ht	15									flat triad/mask bits: {1, 6, 2, 3, 7, 4, 5}, {0, 0, 0, 1, 1, 0, 0}	flat triad/mask bits: {1, 6, 2, 7, 3, 4, 5}, {1, 1, 0, 1, 1, 0, 0}
129	$\overline{v_r}\ \overset{0}{\wedge} R$	{BC8, E7, E6, 6Cube, C4, H4Φ, 24cell, 8Cell, dualSnub24, 24cellE8Φ, 24cellH4Φ}	$0apggsscc\ 011110100_2$	Bn{	0	1	1	1	1	0	0	0 }	Rt{	0	1	2	3	1	2	4	2 }	Ac 89	Flipped: Triad fpi=24 BC_8 R fp_sm=3→64H	Not Flipped: Triad fpi=23 BC_8 R fp_sm=2→67H
				E8{	$-\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{\sqrt{3}}$	$-\frac{1}{2}$	$-\frac{1}{2}$ }	Wt{	−1	0	0	0	−1	1	0 }		{1, 6, 2}, {1, 3, 7}, {1, 5, 4}, {2, 3, 5}, {2, 4, 7}, {3, 6, 4}	{1, 6, 2}, {1, 7, 3}, {1, 5, 4}, {2, 4, 6}, {3, 7, 5}, {4, 7,
				Ph{	$-\frac{1}{2}$	$\frac{1}{2}$	0	$\frac{1}{\sqrt{2}}$	$\frac{1}{2}$	$-\frac{\sqrt{3}}{2}$	0	0 }	Ht	15									flat triad/mask bits: {1, 6, 2, 3, 7, 5, 4}, {0, 0, 1, 0, 0, 1, 1}	flat triad/mask bits: {1, 6, 2, 7, 3, 5, 4}, {1, 1, 1, 0, 0, 1, 1}
130	$\overline{\overset{t}{r}_l} \overset{-2/3}{\wedge} R$	{BC8, E7, 6Cube, C4, H4Φ, dualSnub24, snub24H4Φ, Idempot}	$0apggsscc\ 011110101_2$	Bn{	0	1	1	1	0	1	0	0 }	Rt{	0	1	2	3	1	2	3	2 }	At 85	Flipped: Triad fpi=25 BC_8 R fp_sm=5→6EH	Not Flipped: Triad fpi=26 BC_8 R fp_sm=8→6DH
				E8{	$-\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$ }	Wt{	−1	0	0	1	0	0	−1	1 }		{1, 2, 7}, {1, 4, 3}, {1, 6, 5}, {2, 5, 3}, {2, 4, 6}, {3, 7, 6}	{1, 2, 7}, {1, 3, 4}, {1, 6, 5}, {2, 5, 4}, {3, 7, 5}, {4, 7,
				Ph{	$-\frac{1}{2}$	$\frac{1}{2}$	0	$\frac{1}{\sqrt{2}}$	$-\frac{1}{2}$	$-\frac{1}{2\sqrt{3}}$	$-\frac{1}{\sqrt{2}}$	$-\frac{1}{\sqrt{6}}$ }	Ht	14									flat triad/mask bits: {1, 7, 2, 4, 3, 6, 5}, {0, 1, 1, 1, 0, 1, 1}	flat triad/mask bits: {1, 7, 2, 3, 4, 6, 5}, {1, 0, 1, 1, 0, 1, 1}
131	$\overline{\overset{t}{g}_l} \overset{-2/3}{\wedge} R$	{BC8, 6Cube, H4Φ, dualSnub24, snub24H4Φ}	$0apggsscc\ 011110110_2$	Bn{	0	1	1	1	0	0	1	0 }	Rt{	0	1	2	3	1	2	3	1 }	Tl 81	Flipped: Triad fpi=27 BC_8 R fp_sm=4→65H	Not Flipped: Triad fpi=29 BC_8 R fp_sm=7→6CH
				E8{	$-\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$ }	Wt{	−1	0	0	1	0	0	0	−1 }		{1, 7, 2}, {1, 3, 5}, {1, 6, 4}, {2, 3, 4}, {2, 5, 6}, {3, 7, 6}	{1, 2, 7}, {1, 3, 6}, {1, 5, 4}, {2, 4, 3}, {2, 5, 6}, {3, 7, 5}, {4, 7,
				Ph{	$-\frac{1}{2}$	$\frac{1}{2}$	0	$\frac{1}{\sqrt{2}}$	$-\frac{1}{2}$	$-\frac{1}{2\sqrt{3}}$	$\frac{1}{\sqrt{2}}$	$-\frac{1}{\sqrt{6}}$ }	Ht	13									flat triad/mask bits: {1, 2, 7, 3, 5, 6, 4}, {1, 0, 1, 0, 0, 1, 1}	flat triad/mask bits: {1, 2, 7, 3, 6, 5, 4}, {0, 0, 1, 1, 0, 1, 1}
132	$\overline{\overset{t}{h}_l} \overset{-2/3}{\wedge} R$	{BC8, H4Φ, dualSnub24, snub24H4Φ}	$0apggsscc\ 011110111_2$	Bn{	0	1	1	1	0	0	0	1 }	Rt{	−1	−1	−1	−1	−1	−2	−2	−1 }	Dy 66	Flipped: Triad fpi=30 BC_8 R fp_sm=6→6FH	Not Flipped: Triad fpi=28 BC_8 R fp_sm=3→64H
				E8{	$-\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$ }	Wt{	−1	0	0	1	0	−1	0	0 }		{1, 7, 2}, {1, 6, 3}, {1, 5, 4}, {2, 5, 3}, {2, 4, 6}, {3, 7, 4}	{1, 2, 7}, {1, 3, 5}, {1, 6, 4}, {2, 4, 5}, {3, 7, 4}, {5, 7,
				Ph{	$-\frac{1}{2}$	$\frac{1}{2}$	0	$\frac{1}{\sqrt{2}}$	$-\frac{1}{2}$	$-\frac{1}{2\sqrt{3}}$	0	$\sqrt{\frac{2}{3}}$ }	Ht	10									flat triad/mask bits: {1, 2, 7, 6, 3, 5, 4}, {1, 1, 1, 1, 0, 1, 1}	flat triad/mask bits: {1, 7, 2, 3, 5, 6, 4}, {1, 1, 1, 1, 0, 1, 1}
133	$\overline{\overset{d}{o}_m} \overset{1/3}{\vee} R$	{BC8, E7, 6Cube, C4, H4, snub24, altSnub24, cellE8, snub24H4}	$0apggsscc\ 010011101_2$	Bn{	0	1	1	0	1	1	0	0 }	Rt{	0	1	2	2	1	2	3	2 }	Hg 80	Flipped: Triad fpi=10 BC_8 E fp_sm=5→44H	Not Flipped: Triad fpi=8 BC_8 E fp_sm=2→4DH
				E8{	$-\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$ }	Wt{	−1	0	1	−1	0	0	0	1 }		{1, 2, 4}, {1, 3, 6}, {1, 7, 5}, {2, 3, 7}, {2, 5, 6}, {3, 4, 5}	{1, 2, 4}, {1, 3, 5}, {1, 7, 6}, {2, 5, 6}, {3, 4, 6}, {4, 7,
				Ph{	$-\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{\sqrt{2}}$	0	$-\frac{1}{2}$	$-\frac{1}{2\sqrt{3}}$	$-\frac{1}{\sqrt{2}}$	$-\frac{1}{\sqrt{6}}$ }	Ht	13									flat triad/mask bits: {1, 4, 2, 3, 6, 7, 5}, {0, 0, 1, 0, 0, 0, 1}	flat triad/mask bits: {1, 4, 2, 3, 5, 7, 6}, {1, 0, 1, 1, 0, 0, 1}
134	$\overline{\overset{d}{c}_m} \overset{1/3}{\vee} R$	{BC8, 6Cube, H4Φ, dualSnub24, snub24H4Φ}	$0apggsscc\ 010011110_2$	Bn{	0	1	1	0	1	0	1	0 }	Rt{	0	1	2	2	1	2	3	1 }	Os 76	Flipped: Triad fpi=12 BC_8 E fp_sm=4→4FH	Not Flipped: Triad fpi=11 BC_8 E fp_sm=1→4CH
				E8{	$-\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$ }	Wt{	−1	0	1	−1	0	0	1	−1 }		{1, 4, 2}, {1, 7, 3}, {1, 6, 5}, {2, 6, 3}, {2, 5, 7}, {3, 4, 5}	{1, 2, 4}, {1, 3, 7}, {1, 6, 5}, {2, 6, 7}, {3, 4, 6}, {4, 7,
				Ph{	$-\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{\sqrt{2}}$	0	$\frac{1}{2}$	$-\frac{1}{2\sqrt{3}}$	$\frac{1}{\sqrt{2}}$	$-\frac{1}{\sqrt{6}}$ }	Ht	12									flat triad/mask bits: {1, 2, 4, 7, 3, 6, 5}, {1, 1, 1, 1, 0, 0, 1}	flat triad/mask bits: {1, 2, 4, 3, 7, 6, 5}, {0, 0, 1, 1, 0, 0, 1}
135	$\overline{\overset{d}{m}_m} \overset{1/3}{\vee} R$	{BC8, H4Φ, dualSnub24, 24cellH4Φ, Hamming, Idempot}	$0apggsscc\ 010011111_2$	Bn{	0	1	1	0	1	0	0	1 }	Rt{	−1	−1	−1	−2	−1	−2	−2	−1 }	Hf 72	Flipped: Triad fpi=13 BC_8 E fp_sm=6→45H	Not Flipped: Triad fpi=14 BC_8 E fp_sm=7→46H
				E8{	$-\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$ }	Wt{	−1	0	1	−1	0	−1	1	0 }		{1, 5, 2}, {1, 3, 4}, {1, 7, 6}, {2, 3, 6}, {2, 4, 7}, {3, 5, 7}	{1, 2, 5}, {1, 4, 3}, {1, 7, 6}, {2, 4, 6}, {3, 5, 6}, {4, 7,
				Ph{	$-\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{\sqrt{2}}$	0	$\frac{1}{2}$	$-\frac{1}{2\sqrt{3}}$	0	$\sqrt{\frac{2}{3}}$ }	Ht	11									flat triad/mask bits: {1, 2, 5, 3, 4, 7, 6}, {1, 1, 0, 0, 0, 0, 1}	flat triad/mask bits: {1, 2, 5, 4, 3, 7, 6}, {0, 1, 1, 0, 0, 0, 1}
136	$\overset{u}{b}_m \overset{2/3}{\wedge} L$	{BC8, 6Cube, H4, snub24, altSnub24, cellE8, 24cellH4, Hamming}	$0apggsscc\ 001011011_2$	Bn{	0	1	1	0	0	1	1	0 }	Rt{	0	1	2	2	1	2	2	1 }	Lu 71	Flipped: Triad fpi=13 BC_8 R fp_sm=6→23H	Not Flipped: Triad fpi=14 BC_8 R fp_sm=7→20H
				E8{	$-\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$ }	Wt{	−1	0	1	0	0	1	−1	0 }		{1, 5, 2}, {1, 4, 3}, {1, 6, 7}, {2, 3, 6}, {2, 4, 7}, {3, 7, 5}	{1, 2, 5}, {1, 3, 4}, {1, 6, 7}, {2, 4, 6}, {3, 6, 5}, {4, 5,
				Ph{	$-\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{\sqrt{2}}$	0	$-\frac{1}{2}$	$\frac{1}{2\sqrt{3}}$	0	$-\sqrt{\frac{2}{3}}$ }	Ht	11									flat triad/mask bits: {1, 2, 5, 4, 3, 6, 7}, {1, 1, 0, 0, 0, 1, 0}	flat triad/mask bits: {1, 2, 5, 3, 4, 6, 7}, {0, 0, 0, 0, 0, 1, 0}

137	$^{u}_{g_m}{}^{2/3}_{\wedge}{}_{L}$		{BC8, H4, snub24, altSnub24, cellE8, snub24H4}	$0apggsscc$ 001011010_2	Bn{	0	1	1	0	0	1	0	1	}	Rt{	−1	−1	−1	−2	−1	−2	−3	−1	}	Ir 77	Flipped Triad fpi=12 BC_8 R fp_sm=4→29H {1, 4, 2}, {1, 3, 7}, {1, 5, 6}, {2, 6, 3}, {2, 5, 7}, {3, 5, 4}, {4, 6, 7}‡2, 5, 3}, {2, 6, 7}, {3, 6, 4}, {4, 5, flat triad/mask bits {1, 2, 4, 3, 7, 5, 6} {1, 0, 0, 1, 0, 1, 0} Not Flipped Triad fpi=11 BC_8 R fp_sm=1→2AH {1, 2, 4}, {1, 7, 3}, {1, 5, 6}, flat triad/mask bits {1, 2, 4, 7, 3, 5, 6} {0, 1, 0, 1, 0, 1, 0}
138	$^{u}_{r_m}{}^{2/3}_{\wedge}{}_{L}$		{BC8, E7, H4Φ, dualSnub24, snub24H4Φ}	$0apggsscc$ 001011001_2	Bn{	0	1	1	0	0	0	1	1	}	Rt{	−1	−1	−1	−2	−1	−2	−3	−2	}	Pb 82	Flipped Triad fpi=10 BC_8 R fp_sm=5→22H {1, 2, 4}, {1, 6, 3}, {1, 5, 7}, {2, 3, 7}, {2, 5, 6}, {3, 5, 4}, {4, 6, 7}‡2, 7, 3}, {2, 5, 6}, {3, 6, 4}, {4, 5, flat triad/mask bits {1, 4, 2, 6, 3, 5, 7} {0, 1, 0, 0, 0, 1, 0} Not Flipped Triad fpi=8 BC_8 R fp_sm=2→2BH {1, 4, 2}, {1, 5, 3}, {1, 6, 7}, flat triad/mask bits {1, 4, 2, 5, 3, 6, 7} {1, 1, 0, 1, 0, 1, 0}
139	$\overline{^{u}_{r_m}}{}^{-2/3}_{\vee}{}_{R}$		{BC8, E7, 6Cube, C4, H4Φ, dualSnub24, snub24H4Φ}	$0apggsscc$ 011011101_2	Bn{	0	1	0	1	1	1	0	0	}	Rt{	0	1	1	2	1	2	3	2	}	Rc 75	Flipped Triad fpi=8 BC_8 R fp_sm=2→4AH {1, 2, 4}, {1, 5, 3}, {1, 6, 7}, {2, 7, 3}, {2, 5, 6}, {3, 4, 6}, {4, 7, 5}‡2, 3, 7}, {2, 5, 6}, {3, 4, 5}, {4, 7, flat triad/mask bits {1, 4, 2, 5, 3, 6, 7} {0, 1, 0, 1, 0, 0, 1} Not Flipped Triad fpi=10 BC_8 R fp_sm=5→43H {1, 4, 2}, {1, 6, 3}, {1, 5, 7}, flat triad/mask bits {1, 4, 2, 6, 3, 5, 7} {1, 1, 0, 0, 0, 0, 1}
140	$\overline{^{u}_{g_m}}{}^{-2/3}_{\vee}{}_{R}$		{BC8, 6Cube, H4Φ, dualSnub24, 24cellH4Φ, Hamming}	$0apggsscc$ 011011110_2	Bn{	0	1	0	1	1	0	1	0	}	Rt{	0	1	1	2	1	2	3	1	}	Yb 70	Flipped Triad fpi=11 BC_8 R fp_sm=1→4BH {1, 4, 2}, {1, 7, 3}, {1, 5, 6}, {2, 5, 3}, {2, 6, 7}, {3, 4, 6}, {4, 7, 5}‡2, 6, 3}, {2, 5, 7}, {3, 4, 5}, {4, 7, flat triad/mask bits {1, 2, 4, 7, 3, 5, 6} {1, 1, 0, 1, 0, 0, 1} Not Flipped Triad fpi=12 BC_8 R fp_sm=4→48H {1, 2, 4}, {1, 3, 7}, {1, 5, 6}, flat triad/mask bits {1, 2, 4, 3, 7, 5, 6} {0, 0, 0, 1, 0, 0, 1}
141	$\overline{^{u}_{b_m}}{}^{-2/3}_{\vee}{}_{R}$		{BC8, H4, snub24, altSnub24, cellE8, snub24H4}	$0apggsscc$ 011011111_2	Bn{	0	1	0	1	1	0	0	1	}	Rt{	−1	−1	−2	−2	−1	−2	−2	−1	}	Pt 78	Flipped Triad fpi=14 BC_8 R fp_sm=7→41H {1, 5, 2}, {1, 3, 4}, {1, 6, 7}, {2, 3, 7}, {2, 4, 6}, {3, 5, 6}, {4, 7, 5}‡2, 3, 6}, {2, 4, 7}, {3, 5, 7}, {4, 6, flat triad/mask bits {1, 2, 5, 3, 4, 6, 7} {1, 0, 0, 0, 0, 0, 1} Not Flipped Triad fpi=13 BC_8 R fp_sm=6→42H {1, 5, 2}, {1, 4, 3}, {1, 6, 7}, flat triad/mask bits {1, 2, 5, 4, 3, 6, 7} {0, 1, 0, 0, 0, 0, 1}
142	$^{d}_{m_m}{}^{-1/3}_{\wedge}{}_{L}$		{BC8, 6Cube, H4Φ, dualSnub24, snub24H4Φ}	$0apggsscc$ 000011011_2	Bn{	0	1	0	1	0	1	1	0	}	Rt{	0	1	1	2	1	2	2	1	}	Gd 64	Flipped Triad fpi=14 BC_8 L fp_sm=7→27H {1, 5, 2}, {1, 4, 3}, {1, 7, 6}, {2, 3, 7}, {2, 4, 6}, {3, 6, 5}, {4, 5, 7}‡2, 3, 6}, {2, 4, 7}, {3, 7, 5}, {4, 5, flat triad/mask bits {1, 2, 5, 4, 3, 7, 6} {1, 1, 1, 0, 0, 1, 0} Not Flipped Triad fpi=13 BC_8 L fp_sm=6→24H {1, 5, 2}, {1, 3, 4}, {1, 7, 6}, flat triad/mask bits {1, 2, 5, 3, 4, 7, 6} {0, 0, 1, 0, 0, 1, 0}
143	$^{d}_{r_m}{}^{-1/3}_{\wedge}{}_{L}$		{BC8, H4, snub24, altSnub24, snub24E8, 24cellH4, Hamming}	$0apggsscc$ 000011010_2	Bn{	0	1	0	1	0	1	0	1	}	Rt{	−1	−1	−2	−2	−1	−2	−3	−1	}	Bi 83	Flipped Triad fpi=11 BC_8 L fp_sm=1→2DH {1, 4, 2}, {1, 3, 7}, {1, 6, 5}, {2, 5, 3}, {2, 6, 7}, {3, 6, 4}, {4, 5, 7}‡2, 6, 3}, {2, 5, 7}, {3, 5, 4}, {4, 6, flat triad/mask bits {1, 2, 4, 3, 7, 6, 5} {1, 0, 1, 1, 0, 1, 0} Not Flipped Triad fpi=12 BC_8 L fp_sm=4→2EH {1, 4, 2}, {1, 3, 7}, {1, 6, 5}, flat triad/mask bits {1, 2, 4, 7, 3, 6, 5} {0, 1, 1, 1, 0, 1, 0}
144	$^{d}_{o_m}{}^{-1/3}_{\wedge}{}_{L}$		{BC8, E7, H4, snub24, altSnub24, snub24E8, snub24H4, Idempot}	$0apggsscc$ 000011001_2	Bn{	0	1	0	1	0	0	1	1	}	Rt{	−1	−1	−2	−2	−1	−2	−3	−2	}	Rn 86	Flipped Triad fpi=8 BC_8 L fp_sm=2→2CH {1, 2, 4}, {1, 3, 5}, {1, 7, 6}, {2, 7, 3}, {2, 5, 6}, {3, 6, 4}, {4, 5, 7}‡2, 3, 7}, {2, 5, 6}, {3, 5, 4}, {4, 6, flat triad/mask bits {1, 4, 2, 3, 5, 7, 6} {0, 0, 1, 1, 0, 1, 0} Not Flipped Triad fpi=10 BC_8 L fp_sm=5→25H {1, 4, 2}, {1, 3, 6}, {1, 7, 5}, flat triad/mask bits {1, 4, 2, 3, 6, 7, 5} {0, 1, 0, 1, 0, 0, 1}
145	$^{t}_{b_d}{}^{2/3}_{\vee}{}_{L}$		{BC8, 6Cube, H4Φ, dualSnub24, snub24H4Φ, Idempot}	$0apggsscc$ 001110011_2	Bn{	0	1	0	0	1	1	1	0	}	Rt{	0	1	1	1	1	2	2	1	}	Cc 58	Flipped Triad fpi=28 BC_8 R fp_sm=3→05H {1, 7, 2}, {1, 3, 5}, {1, 6, 4}, {2, 3, 6}, {2, 4, 5}, {3, 4, 7}, {5, 6, 7}‡2, 5, 3}, {2, 4, 6}, {3, 4, 7}, {5, 6, flat triad/mask bits {1, 7, 2, 3, 5, 6, 4} {1, 0, 1, 0, 0, 0, 0} Not Flipped Triad fpi=30 BC_8 R fp_sm=6→0EH {1, 2, 7}, {1, 6, 3}, {1, 5, 4}, flat triad/mask bits {1, 2, 7, 6, 3, 5, 4} {0, 1, 1, 1, 0, 0, 0}
146	$^{t}_{g_d}{}^{2/3}_{\vee}{}_{L}$		{BC8, H4, snub24, altSnub24, snub24E8, snub24H4}	$0apggsscc$ 001110010_2	Bn{	0	1	0	0	1	1	0	1	}	Rt{	−1	−1	−2	−3	−1	−2	−3	−1	}	Fr 87	Flipped Triad fpi=29 BC_8 R fp_sm=7→0DH {1, 7, 2}, {1, 3, 6}, {1, 5, 4}, {2, 4, 3}, {2, 5, 6}, {3, 5, 7}, {4, 6, 7}‡2, 3, 4}, {2, 5, 6}, {3, 6, 7}, {4, 5, flat triad/mask bits {1, 2, 7, 3, 6, 5, 4} {1, 0, 1, 1, 0, 0, 0} Not Flipped Triad fpi=27 BC_8 R fp_sm=4→04H {1, 2, 7}, {1, 3, 5}, {1, 6, 4}, flat triad/mask bits {1, 2, 7, 3, 5, 6, 4} {0, 0, 1, 0, 0, 0, 0}
147	$^{t}_{r_d}{}^{2/3}_{\vee}{}_{L}$		{BC8, E7, H4Φ, dualSnub24, 24cellH4Φ}	$0apggsscc$ 001110001_2	Bn{	0	1	0	0	1	0	1	1	}	Rt{	−1	−1	−2	−3	−1	−2	−3	−2	}	Tb 90	Flipped Triad fpi=26 BC_8 R fp_sm=8→0CH {1, 2, 7}, {1, 3, 4}, {1, 6, 5}, {2, 6, 3}, {2, 4, 5}, {3, 5, 7}, {4, 6, 7}‡2, 5, 3}, {2, 4, 6}, {3, 6, 7}, {4, 5, flat triad/mask bits {1, 7, 2, 3, 4, 6, 5} {0, 0, 1, 1, 0, 0, 0} Not Flipped Triad fpi=25 BC_8 R fp_sm=5→0FH {1, 7, 2}, {1, 4, 3}, {1, 6, 5}, flat triad/mask bits {1, 7, 2, 4, 3, 6, 5} {1, 1, 1, 1, 0, 0, 0}
148	$^{\gamma_{\Gamma}}_{w_d}{}^{0}_{\vee}{}_{L}$		{BC8, E7, E6, H4, snub24, altSnub24, snub24E8, snub24H4}	$0apggsscc$ 001110000_2	Bn{	0	1	0	0	0	1	1	1	}	Rt{	−1	−1	−2	−3	−1	−2	−4	−2	}	Pu 94	Flipped Triad fpi=23 BC_8 R fp_sm=2→06H {1, 2, 4}, {1, 7, 3}, {1, 5, 4}, {2, 3, 4}, {2, 5, 7}, {3, 5, 6}, {4, 6, 7}‡2, 3, 5}, {2, 4, 7}, {3, 4, 6}, {5, 6, flat triad/mask bits {1, 6, 2, 7, 3, 5, 4} {0, 1, 1, 0, 0, 0, 0} Not Flipped Triad fpi=24 BC_8 R fp_sm=3→05H {1, 6, 2}, {1, 3, 5}, {1, 4, 7}, flat triad/mask bits {1, 6, 2, 3, 7, 5, 4} {1, 0, 1, 0, 0, 0, 0}
149	$\overline{^{u}_{r_d}}{}^{-2/3}_{\vee}{}_{L}$		{BC8, E7, 6Cube, C4, H4Φ, dualSnub24, 24cellH4Φ, Hamming}	$0apggsscc$ 011010001_2	Bn{	0	0	1	1	1	1	0	0	}	Rt{	0	0	1	2	1	2	3	2	}	Tm 69	Flipped Triad fpi=8 BC_8 R fp_sm=2→79H {1, 4, 2}, {1, 3, 5}, {1, 6, 7}, {2, 7, 3}, {2, 6, 5}, {3, 6, 4}, {4, 7, 5}‡2, 3, 7}, {2, 6, 5}, {3, 5, 4}, {4, 7, flat triad/mask bits {1, 2, 4, 3, 5, 6, 7} {1, 0, 0, 1, 1, 1, 1} Not Flipped Triad fpi=10 BC_8 R fp_sm=5→70H {1, 4, 2}, {1, 3, 6}, {1, 5, 7}, flat triad/mask bits {1, 2, 4, 3, 6, 5, 7} {0, 0, 0, 1, 1, 1, 1}
150	$\overline{^{u}_{g_d}}{}^{-2/3}_{\vee}{}_{L}$		{BC8, 6Cube, H4, snub24, altSnub24, snub24E8, snub24H4, Idempot}	$0apggsscc$ 011010010_2	Bn{	0	0	1	1	1	0	1	0	}	Rt{	0	0	1	2	1	2	3	1	}	Eu 63	Flipped Triad fpi=11 BC_8 R fp_sm=1→78H {1, 2, 4}, {1, 3, 7}, {1, 5, 6}, {2, 5, 3}, {2, 7, 6}, {3, 6, 4}, {4, 7, 5}‡2, 6, 3}, {2, 7, 5}, {3, 5, 4}, {4, 7, flat triad/mask bits {1, 4, 2, 3, 7, 5, 6} {0, 0, 0, 1, 1, 1, 1} Not Flipped Triad fpi=12 BC_8 R fp_sm=4→7BH {1, 2, 4}, {1, 7, 3}, {1, 5, 6}, flat triad/mask bits {1, 4, 2, 7, 3, 5, 6} {1, 1, 0, 1, 1, 1, 1}

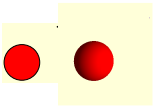
Seq #	Symbol	2D/3D Shape	Groups	Particle Quantum Bits	Binary / E8 / Physics Coordinates	Algebra Root Weight / Height / RtH=Atomic Element Number -->	Ele #	Octonions
151	$\overline{{}^{u}_{b}}{}^{-2/3}_{d}\,\overset{\vee}{L}$		{BC8, H4Φ, dualSnub24, snub24H4Φ}	0apggssec 011010011_2	Bn{ 0 0 1 1 1 0 0 1 } E8{ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ } Ph{ $-\frac{1}{2}$ $-\frac{1}{2}$ 0 $\frac{1}{\sqrt{2}}$ $\frac{1}{2}$ $-\frac{1}{2\sqrt{3}}$ 0 $\sqrt{\frac{2}{3}}$ }	Rt{ −1 −2 −2 −2 −1 −2 −2 −1 } Wt{ 0 −1 0 0 0 −1 1 0 } Ht 13	Po 84	Flipped Triad fpi=14 BC_8 R fp_sm=7→72H {1, 2, 5}, {1, 4, 3}, {1, 6, 7}, {2, 3, 7}, {2, 6, 4}, {3, 6, 5}, {4, 7, 5}{2, 3, 6}, {2, 7, 4}, {3, 7, 5}, {4, 6, flat triad/mask bits {1, 5, 2, 4, 3, 6, 7} {0, 1, 0, 0, 1, 1, 1} Not Flipped Triad fpi=13 BC_8 R fp_sm=6→71H {1, 5, 2}, {1, 3, 4}, {1, 6, 7}, {1, 2, 6}, {3, 4, 7}, {4, 5, 7}{2, 3, 5}, {2, 6, 4}, {3, 7, 5}, {4, 6, flat triad/mask bits {1, 5, 2, 3, 4, 6, 7} {1, 0, 0, 0, 1, 1, 1}
152	$\overline{{}^{d}_{m}}{}^{-1/3}_{l}\,\hat{R}$		{BC8, 6Cube, H4, snub24, altSnub24, snub24E8, snub24H4}	0apggssec 000010111_2	Bn{ 0 0 1 1 0 1 1 0 } E8{ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ } Ph{ $-\frac{1}{2}$ $-\frac{1}{2}$ 0 $\frac{1}{\sqrt{2}}$ $-\frac{1}{2}$ $\frac{1}{2\sqrt{3}}$ 0 $-\sqrt{\frac{2}{3}}$ }	Rt{ 0 0 1 2 1 2 2 1 } Wt{ 0 −1 0 1 0 1 −1 0 } Ht 9	La 57	Flipped Triad fpi=14 BC_8 L fp_sm=7→14H {1, 2, 5}, {1, 3, 4}, {1, 7, 6}, {2, 3, 7}, {2, 6, 4}, {3, 5, 6}, {4, 5, 7}{2, 3, 6}, {2, 7, 4}, {3, 5, 7}, {4, 5, flat triad/mask bits {1, 5, 2, 3, 4, 3, 7, 6} {0, 0, 1, 0, 1, 0, 0} Not Flipped Triad fpi=13 BC_8 L fp_sm=6→17H {1, 5, 2}, {1, 4, 3}, {1, 7, 6}, {1, 2, 6}, {2, 3, 7}, {2, 7, 4}, {3, 5, 7}, {4, 5, flat triad/mask bits {1, 5, 2, 4, 3, 7, 6} {1, 1, 1, 0, 1, 0, 0}
153	$\overline{{}^{d}_{c}}{}^{-1/3}_{l}\,\hat{R}$		{BC8, H4Φ, dualSnub24, snub24H4Φ}	0apggssec 000010110_2	Bn{ 0 0 1 1 0 1 0 1 } E8{ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ } Ph{ $-\frac{1}{2}$ $-\frac{1}{2}$ 0 $\frac{1}{\sqrt{2}}$ $-\frac{1}{2}$ $\frac{1}{2\sqrt{3}}$ $-\frac{1}{\sqrt{2}}$ $\frac{1}{\sqrt{6}}$ }	Rt{ −1 −2 −2 −2 −1 −2 −3 −1 } Wt{ 0 −1 0 1 0 0 −1 1 } Ht 14	Ra 88	Flipped Triad fpi=11 BC_8 L fp_sm=1→1EH {1, 2, 4}, {1, 7, 3}, {1, 6, 5}, {2, 5, 3}, {2, 7, 6}, {3, 4, 6}, {4, 5, 7}{2, 6, 3}, {2, 7, 5}, {3, 4, 5}, {4, 6, flat triad/mask bits {1, 4, 2, 7, 3, 6, 5} {0, 1, 1, 1, 1, 0, 0} Not Flipped Triad fpi=12 BC_8 L fp_sm=4→1DH {1, 4, 2}, {1, 3, 7}, {1, 6, 5}, {2, 5, 3}, {2, 7, 6}, {3, 4, 6}, {4, 5, 7}{2, 6, 3}, {2, 7, 5}, {3, 4, 5}, {4, 6, flat triad/mask bits {1, 4, 2, 3, 7, 6, 5} {1, 0, 1, 1, 1, 0, 0}
154	$\overline{{}^{d}_{n}}{}^{-1/3}_{l}\,\hat{R}$		{BC8, E7, H4, snub24, altSnub24, snub24E8, 24cellH4, Hamming}	0apggssec 000010101_2	Bn{ 0 0 1 1 0 0 1 1 } E8{ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ } Ph{ $-\frac{1}{2}$ $-\frac{1}{2}$ 0 $\frac{1}{\sqrt{2}}$ $-\frac{1}{2}$ $\frac{1}{2\sqrt{3}}$ $\frac{1}{\sqrt{2}}$ $\frac{1}{\sqrt{6}}$ }	Rt{ −1 −2 −2 −2 −1 −2 −3 −2 } Wt{ 0 −1 0 1 0 0 0 −1 } Ht 15	Pa 91	Flipped Triad fpi=8 BC_8 L fp_sm=2→1FH {1, 4, 2}, {1, 5, 3}, {1, 7, 6}, {2, 7, 3}, {2, 6, 5}, {3, 4, 6}, {4, 5, 7}{2, 3, 7}, {2, 6, 5}, {3, 4, 5}, {4, 6, flat triad/mask bits {1, 2, 4, 5, 3, 7, 6} {1, 1, 1, 1, 1, 0, 0} Not Flipped Triad fpi=10 BC_8 L fp_sm=5→16H {1, 2, 4}, {1, 6, 3}, {1, 7, 5}, {1, 4, 2}, {1, 3, 7}, {1, 6, 5}, {2, 6, 5}, {3, 4, 5}, {4, 6, flat triad/mask bits {1, 2, 4, 6, 3, 7, 5} {0, 1, 1, 0, 1, 0, 0}
155	$\overline{{}^{t}_{b}}{}^{2/3}_{m}\,\overset{\vee}{R}$		{BC8, 6Cube, H4, snub24, altSnub24, snub24E8, snub24H4}	0apggssec 001111111_2	Bn{ 0 0 1 0 1 1 1 0 } E8{ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ } Ph{ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{\sqrt{2}}$ 0 $\frac{1}{2}$ $\frac{1}{2\sqrt{3}}$ 0 $-\sqrt{\frac{2}{3}}$ }	Rt{ 0 0 1 1 1 2 2 1 } Wt{ 0 −1 1 −1 0 1 0 0 } Ht 8	Sb 51	Flipped Triad fpi=28 BC_8 R fp_sm=3→36H {1, 2, 7}, {1, 5, 3}, {1, 6, 4}, {2, 3, 6}, {2, 5, 4}, {3, 7, 4}, {5, 6, 7}{2, 5, 3}, {2, 6, 4}, {3, 7, 4}, {5, 6, flat triad/mask bits {1, 2, 7, 5, 3, 6, 4} {0, 1, 1, 0, 1, 1, 0} Not Flipped Triad fpi=30 BC_8 R fp_sm=6→3DH {1, 2, 7}, {1, 5, 3}, {1, 6, 4}, {2, 3, 6}, {2, 5, 4}, {3, 7, 4}, {5, 6, 7}{2, 5, 3}, {2, 6, 4}, {3, 7, 4}, {5, 6, flat triad/mask bits {1, 7, 2, 3, 6, 5, 4} {1, 0, 1, 1, 1, 1, 0}
156	$\overline{{}^{t}_{g}}{}^{2/3}_{m}\,\overset{\vee}{R}$		{BC8, H4Φ, dualSnub24, 24cellH4Φ}	0apggssec 001111110_2	Bn{ 0 0 1 0 1 1 0 1 } E8{ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ } Ph{ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{\sqrt{2}}$ 0 $\frac{1}{2}$ $\frac{1}{2\sqrt{3}}$ $-\frac{1}{\sqrt{2}}$ $\frac{1}{\sqrt{6}}$ }	Rt{ −1 −2 −2 −3 −1 −2 −3 −1 } Wt{ 0 −1 1 −1 0 0 0 1 } Ht 15	U 92	Flipped Triad fpi=29 BC_8 R fp_sm=7→3EH {1, 2, 7}, {1, 6, 3}, {1, 5, 4}, {2, 4, 3}, {2, 6, 5}, {3, 7, 5}, {4, 6, 7}{2, 3, 4}, {2, 6, 5}, {3, 7, 6}, {4, 5, flat triad/mask bits {1, 7, 2, 6, 3, 5, 4} {0, 1, 1, 1, 1, 1, 0} Not Flipped Triad fpi=27 BC_8 R fp_sm=4→37H {1, 7, 2}, {1, 5, 3}, {1, 6, 4}, {2, 4, 3}, {2, 6, 5}, {3, 7, 5}, {4, 6, 7}{2, 3, 4}, {2, 6, 5}, {3, 7, 6}, {4, 5, flat triad/mask bits {1, 7, 2, 5, 3, 6, 4} {1, 1, 1, 0, 1, 1, 0}
157	$\overline{{}^{t}_{r}}{}^{2/3}_{m}\,\overset{\vee}{R}$		{BC8, E7, H4Φ, dualSnub24, snub24H4Φ}	0apggssec 001111101_2	Bn{ 0 0 1 0 1 0 1 1 } E8{ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ } Ph{ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{\sqrt{2}}$ 0 $\frac{1}{2}$ $\frac{1}{2\sqrt{3}}$ $\frac{1}{\sqrt{2}}$ $\frac{1}{\sqrt{6}}$ }	Rt{ −1 −2 −2 −3 −1 −2 −3 −2 } Wt{ 0 −1 1 −1 0 0 1 −1 } Ht 16	Am 95	Flipped Triad fpi=26 BC_8 R fp_sm=8→3FH {1, 7, 2}, {1, 4, 3}, {1, 6, 5}, {2, 6, 3}, {2, 5, 4}, {3, 7, 5}, {4, 6, 7}{2, 5, 3}, {2, 6, 4}, {3, 7, 6}, {4, 5, flat triad/mask bits {1, 2, 7, 4, 3, 6, 5} {1, 1, 1, 1, 1, 1, 0} Not Flipped Triad fpi=25 BC_8 R fp_sm=5→3CH {1, 7, 2}, {1, 4, 3}, {1, 6, 5}, {2, 6, 3}, {2, 5, 4}, {3, 7, 5}, {4, 6, 7}{2, 5, 3}, {2, 6, 4}, {3, 7, 6}, {4, 5, flat triad/mask bits {1, 2, 7, 3, 4, 6, 5} {0, 0, 1, 1, 1, 1, 0}
158	$\overline{{}^{v_r}_{w}}{}^{0}_{m}\,\overset{\vee}{R}$		{BC8, E7, E6, H4, snub24, altSnub24, snub24E8, snub24H4, Idempot}	0apggssec 001111100_2	Bn{ 0 0 1 0 0 1 1 1 } E8{ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ } Ph{ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{\sqrt{2}}$ 0 $-\frac{1}{2}$ $\frac{\sqrt{3}}{2}$ 0 0 }	Rt{ −1 −2 −2 −3 −1 −2 −4 −2 } Wt{ 0 −1 1 0 0 1 −1 0 } Ht 17	Es 99	Flipped Triad fpi=23 BC_8 R fp_sm=2→35H {1, 6, 2}, {1, 3, 7}, {1, 5, 4}, {2, 3, 4}, {2, 7, 5}, {3, 6, 5}, {4, 6, 7}{2, 3, 5}, {2, 7, 4}, {3, 6, 4}, {5, 6, flat triad/mask bits {1, 2, 6, 3, 7, 5, 4} {1, 0, 1, 0, 1, 1, 0} Not Flipped Triad fpi=24 BC_8 R fp_sm=3→36H {1, 2, 6}, {1, 7, 3}, {1, 5, 4}, {2, 3, 4}, {2, 7, 5}, {3, 6, 5}, {4, 6, 7}{2, 3, 5}, {2, 7, 4}, {3, 6, 4}, {5, 6, flat triad/mask bits {1, 2, 6, 7, 3, 5, 4} {0, 1, 1, 0, 1, 1, 0}
159	$\overline{{}^{t}_{b}}{}^{2/3}_{m}\,\hat{L}$		{BC8, 6Cube, H4Φ, dualSnub24, 24cellH4Φ}	0apggssec 001111011_2	Bn{ 0 0 0 1 1 1 1 0 } E8{ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ } Ph{ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{\sqrt{2}}$ 0 $\frac{1}{2}$ $\frac{1}{2\sqrt{3}}$ 0 $-\sqrt{\frac{2}{3}}$ }	Rt{ 0 0 0 1 1 2 2 1 } Wt{ 0 0 −1 0 0 1 0 0 } Ht 7	Ru 44	Flipped Triad fpi=28 BC_8 R fp_sm=3→28H {1, 2, 7}, {1, 3, 5}, {1, 4, 6}, {2, 6, 3}, {2, 4, 5}, {3, 7, 4}, {5, 6, 7}{2, 3, 5}, {2, 4, 6}, {3, 7, 4}, {5, 6, flat triad/mask bits {1, 2, 7, 3, 5, 4, 6} {0, 0, 0, 1, 0, 1, 0} Not Flipped Triad fpi=30 BC_8 R fp_sm=6→23H {1, 2, 7}, {1, 6, 3}, {1, 4, 5}, {2, 6, 3}, {2, 4, 5}, {3, 7, 4}, {5, 6, 7}{2, 3, 5}, {2, 4, 6}, {3, 7, 4}, {5, 6, flat triad/mask bits {1, 7, 2, 6, 3, 4, 5} {1, 1, 0, 0, 0, 1, 0}
160	$\overline{{}^{t}_{g}}{}^{2/3}_{m}\,\hat{L}$		{BC8, H4Φ, dualSnub24, snub24H4Φ, Idempot}	0apggssec 001111010_2	Bn{ 0 0 0 1 1 1 0 1 } E8{ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ } Ph{ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{\sqrt{2}}$ 0 $\frac{1}{2}$ $\frac{1}{2\sqrt{3}}$ $-\frac{1}{\sqrt{2}}$ $\frac{1}{\sqrt{6}}$ }	Rt{ −1 −2 −3 −3 −1 −2 −3 −1 } Wt{ 0 0 −1 0 0 0 0 1 } Ht 16	Cm 96	Flipped Triad fpi=29 BC_8 R fp_sm=7→20H {1, 2, 7}, {1, 3, 6}, {1, 4, 5}, {2, 3, 4}, {2, 5, 6}, {3, 7, 5}, {4, 6, 7}{2, 4, 3}, {2, 5, 6}, {3, 7, 6}, {4, 5, flat triad/mask bits {1, 7, 2, 3, 6, 4, 5} {0, 0, 0, 0, 0, 1, 0} Not Flipped Triad fpi=27 BC_8 R fp_sm=4→29H {1, 7, 2}, {1, 3, 5}, {1, 4, 6}, {2, 3, 4}, {2, 5, 6}, {3, 7, 5}, {4, 6, 7}{2, 4, 3}, {2, 5, 6}, {3, 7, 6}, {4, 5, flat triad/mask bits {1, 7, 2, 3, 5, 4, 6} {1, 0, 0, 1, 0, 1, 0}
161	$\overline{{}^{t}_{r}}{}^{2/3}_{m}\,\hat{L}$		{BC8, E7, H4, snub24, altSnub24, snub24E8, snub24H4}	0apggssec 001111001_2	Bn{ 0 0 0 1 1 0 1 1 } E8{ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ } Ph{ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{\sqrt{2}}$ 0 $\frac{1}{2}$ $\frac{1}{2\sqrt{3}}$ $\frac{1}{\sqrt{2}}$ $\frac{1}{\sqrt{6}}$ }	Rt{ −1 −2 −3 −3 −1 −2 −3 −2 } Wt{ 0 0 −1 0 0 0 1 −1 } Ht 17	Fm 100	Flipped Triad fpi=26 BC_8 R fp_sm=8→21H {1, 7, 2}, {1, 3, 4}, {1, 5, 6}, {2, 3, 6}, {2, 4, 5}, {3, 7, 5}, {4, 6, 7}{2, 3, 5}, {2, 4, 6}, {3, 7, 6}, {4, 5, flat triad/mask bits {1, 2, 7, 3, 4, 5, 6} {1, 0, 0, 0, 0, 1, 0} Not Flipped Triad fpi=25 BC_8 R fp_sm=5→22H {1, 7, 2}, {1, 4, 3}, {1, 5, 6}, {2, 3, 6}, {2, 4, 5}, {3, 7, 5}, {4, 6, 7}{2, 3, 5}, {2, 4, 6}, {3, 7, 6}, {4, 5, flat triad/mask bits {1, 2, 7, 4, 3, 5, 6} {0, 1, 0, 0, 0, 1, 0}
162	$\overline{{}^{v_r}_{w}}{}^{0}_{m}\,\hat{L}$		{BC8, E7, E6, H4, snub24, altSnub24, snub24E8, snub24H4}	0apggssec 001111000_2	Bn{ 0 0 0 1 0 1 1 1 } E8{ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ } Ph{ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{\sqrt{2}}$ 0 $-\frac{1}{2}$ $\frac{\sqrt{3}}{2}$ 0 0 }	Rt{ −1 −2 −3 −3 −1 −2 −4 −2 } Wt{ 0 0 −1 1 0 1 −1 0 } Ht 18	Lr 103	Flipped Triad fpi=23 BC_8 R fp_sm=2→2BH {1, 6, 2}, {1, 7, 3}, {1, 4, 5}, {2, 4, 3}, {2, 5, 7}, {3, 6, 5}, {4, 6, 7}{2, 5, 3}, {2, 4, 7}, {3, 6, 4}, {5, 6, flat triad/mask bits {1, 2, 6, 7, 3, 4, 5} {1, 1, 0, 1, 0, 1, 0} Not Flipped Triad fpi=24 BC_8 R fp_sm=3→28H {1, 6, 2}, {1, 3, 7}, {1, 4, 5}, {2, 4, 3}, {2, 5, 7}, {3, 6, 5}, {4, 6, 7}{2, 5, 3}, {2, 4, 7}, {3, 6, 4}, {5, 6, flat triad/mask bits {1, 2, 6, 3, 7, 4, 5} {0, 0, 0, 1, 0, 1, 0}
163	$\overline{{}^{e}_{y}}{}^{+}_{d}\,\overset{\vee}{L}$		{BC8, E7, E6, E5, H4Φ, dualSnub24, 24cellE8Φ, 24cellH4Φ, Hamming}	0apggssec 010010000_2	Bn{ 0 0 0 0 1 1 1 1 } E8{ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ } Ph{ $-\frac{1}{2}$ $-\frac{1}{2}$ 0 $-\frac{1}{\sqrt{2}}$ $\frac{1}{2}$ $\frac{\sqrt{3}}{2}$ 0 0 }	Rt{ −1 −2 −3 −4 −1 −2 −4 −2 } Wt{ 0 0 0 −1 0 1 0 0 } Ht 19	Sg 106	Flipped Triad fpi=7 BC_8 L fp_sm=3→7DH {1, 4, 2}, {1, 3, 5}, {1, 7, 6}, {2, 6, 3}, {2, 7, 5}, {3, 7, 4}, {4, 6, 5}{2, 7, 4}, {2, 6, 5}, {3, 5, 4}, {3, 7, flat triad/mask bits {1, 2, 4, 3, 5, 7, 6} {1, 0, 1, 1, 1, 1, 1} Not Flipped Triad fpi=4 BC_8 L fp_sm=3→7DH {1, 3, 2}, {1, 4, 6}, {1, 7, 5}, {2, 6, 3}, {2, 7, 5}, {3, 5, 4}, {3, 7, flat triad/mask bits {1, 3, 2, 4, 6, 7, 5} {1, 0, 1, 1, 1, 1, 1}

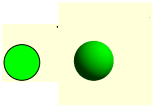
pascalRow@6

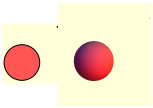
Seq #	Symbol	2D/3D Shape	Groups	Particle Quantum Bits	Binary / E8 / Physics Coordinates	Algebra Root Weight / Height / RtH=Atomic Element Number -->	Ele #	Octonions
164	$\overline{\overline{{}^{gb}_{o}}}{}^{0}_{m}\,\overset{\vee}{R}$		{D8, D4, F4, H4Φ, dualSnub24, snub24H4Φ, G2s}	0apggssec 010001101_2	Bn{ 1 1 1 1 1 0 0 0 } E8{ 0 0 0 0 0 0 1 −1 } Ph{ 0 0 0 0 0 0 $\frac{1}{\sqrt{2}}$ $-\sqrt{\frac{3}{2}}$ }	Rt{ 1 2 3 4 2 4 5 2 } Wt{ 0 0 0 0 0 1 0 −1 } Ht 23	Fl 114	Flipped Triad fpi=2 D_8 L fp_sm=8→47H {1, 3, 2}, {1, 5, 4}, {1, 7, 6}, {2, 4, 7}, {2, 5, 6}, {3, 4, 6}, {3, 7, 5}{2, 4, 6}, {2, 5, 7}, {3, 4, 7}, {3, 6 flat triad/mask bits {1, 2, 3, 5, 4, 7, 6} {1, 1, 1, 0, 0, 0, 1} Not Flipped Triad fpi=1 D_8 L fp_sm=5→44H {1, 3, 2}, {1, 4, 5}, {1, 7, 6}, {2, 4, 7}, {2, 5, 6}, {3, 4, 6}, {3, 7, 5}{2, 4, 6}, {2, 5, 7}, {3, 4, 7}, {3, 6 flat triad/mask bits {1, 2, 3, 4, 5, 7, 6} {0, 0, 1, 0, 0, 0, 1}

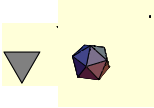
165	$\overline{\Phi x_1}^{0}_{o_l}$ ^ R			{D8, E7, D4, F4, H4, snub24, snub24E8, snub24H4}	0apggssec 010000101_2	Bn{ 1 1 1 1 0 1 0 0 } E8{ 0 0 0 0 0 0 $\frac{2}{\sqrt{3}}$ $\frac{1}{\sqrt{2}}$ $\frac{1}{\sqrt{6}}$ } Ph{ 0 0 0 0 0 } Rt{ −1 −2 −3 −4 −2 −3 −5 −3 } Wt{ 0 0 0 0 −1 1 0 −1 } Ht 23	Unt 113	Flipped Triad fpi=2 D_8 L fp_sm=8→6AH {1, 2, 3}, {1, 5, 4}, {1, 6, 7}, {2, 7, 4}, {2, 5, 6}, {3, 6, 4}, {3, 7, 5} flat triad/mask bits {1, 3, 2, 5, 4, 6, 7} {0, 1, 0, 1, 0, 1, 1}	Not Flipped Triad fpi=1 D_8 L fp_sm=5→69H {1, 3, 2}, {1, 4, 5}, {1, 6, 7}, {2, 6, 4}, {2, 5, 7}, {3, 7, 4}, {3, 6 flat triad/mask bits {1, 3, 2, 4, 5, 6, 7} {1, 0, 0, 1, 0, 1, 1}
166	$\overline{g^{rb}_{c_m}}^{0}$ v R			{D8, D7, D4, F4, H4Φ, dualSnub24, snub24H4Φ, G2s}	0apggssec 010001110_2	Bn{ 1 1 1 1 0 0 1 0 } E8{ 0 0 0 0 0 1 −1 0 } Ph{ 0 0 0 0 0 0 $-\sqrt{2}$ 0 } Rt{ 0 0 0 0 0 0 0 1 } Wt{ 0 0 0 0 0 0 −1 2 } Ht 1	H 1	Flipped Triad fpi=5 D_8 L fp_sm=7→46H {1, 2, 3}, {1, 7, 4}, {1, 6, 5}, {2, 4, 5}, {2, 6, 7}, {3, 4, 6}, {3, 7, 5} flat triad/mask bits {1, 3, 2, 7, 4, 6, 5} {0, 1, 1, 0, 0, 0, 1}	Not Flipped Triad fpi=3 D_8 L fp_sm=4→4FH {1, 3, 2}, {1, 6, 4}, {1, 7, 5}, {2, 6, 7}, {3, 4, 7}, {3, 6 flat triad/mask bits {1, 3, 2, 6, 4, 7, 5} {1, 1, 1, 1, 0, 0, 1}
167	$\overline{g^{rg}_{m_m}}^{0}$ v R			{D8, D4, F4, H4Φ, dualSnub24, snub24H4Φ, G2s}	0apggssec 010001111_2	Bn{ 1 1 1 1 0 0 0 1 } E8{ 0 0 0 0 0 1 0 −1 } Ph{ 0 0 0 0 0 0 $-\frac{1}{\sqrt{2}}$ $-\sqrt{\frac{3}{2}}$ } Rt{ 1 2 3 4 2 4 5 3 } Wt{ 0 0 0 0 0 1 −1 1 } Ht 24	Unp 115	Flipped Triad fpi=9 D_8 L fp_sm=6→45H {1, 4, 2}, {1, 3, 6}, {1, 7, 5}, {2, 3, 5}, {2, 6, 7}, {3, 4, 7}, {4, 6, 5} flat triad/mask bits {1, 2, 4, 3, 6, 7, 5} {1, 0, 1, 0, 0, 0, 1}	Not Flipped Triad fpi=6 D_8 L fp_sm=6→45H {1, 3, 2}, {1, 4, 7}, {1, 6, 5}, {2, 6, 7}, {3, 4, 5}, {4, 6, 7}, {5, 6 flat triad/mask bits {1, 3, 2, 4, 7, 6, 5} {1, 0, 1, 0, 0, 0, 1}
168	$\overline{\Phi x_2}^{0}_{c_l}$ v ^ R			{D8, D4, F4, H4, snub24, snub24E8, snub24H4}	0apggssec 010000110_2	Bn{ 1 1 1 0 1 1 0 0 } E8{ 0 0 0 0 0 1 0 1 } Ph{ 0 0 0 0 0 $\frac{2}{\sqrt{3}}$ $-\frac{1}{\sqrt{2}}$ $\frac{1}{\sqrt{6}}$ } Rt{ −1 −2 −3 −4 −2 −3 −5 −2 } Wt{ 0 0 0 0 −1 1 −1 1 } Ht 22	Cn 112	Flipped Triad fpi=5 D_8 L fp_sm=7→6BH {1, 3, 2}, {1, 7, 4}, {1, 5, 6}, {2, 5, 4}, {2, 6, 7}, {3, 6, 4}, {3, 7, 5} flat triad/mask bits {1, 2, 3, 7, 4, 5, 6} {1, 1, 0, 1, 0, 1, 1}	Not Flipped Triad fpi=3 D_8 L fp_sm=4→62H {1, 3, 2}, {1, 6, 4}, {1, 5, 7}, {2, 4, 5}, {2, 6, 7}, {3, 6 flat triad/mask bits {1, 2, 3, 6, 4, 5, 7} {0, 1, 0, 0, 0, 1, 1}
169	$\overline{\Phi x_3}^{0}_{m_l}$ ^ R			{D8, D7, D4, F4, H4, snub24, snub24E8, snub24H4}	0apggssec 010000111_2	Bn{ 1 1 1 0 1 0 1 0 } E8{ 0 0 0 0 0 1 1 0 } Ph{ 0 0 0 0 0 $\frac{2}{\sqrt{3}}$ 0 $-\sqrt{\frac{2}{3}}$ } Rt{ 0 0 0 0 0 1 0 0 } Wt{ 0 0 0 0 −1 2 −1 0 } Ht 1	Li 3	Flipped Triad fpi=9 D_8 L fp_sm=6→68H {1, 2, 4}, {1, 3, 6}, {1, 5, 7}, {2, 5, 3}, {2, 6, 7}, {3, 7, 4}, {4, 6, 5} flat triad/mask bits {1, 4, 2, 3, 6, 5, 7} {0, 0, 0, 1, 0, 1, 1}	Not Flipped Triad fpi=6 D_8 L fp_sm=6→68H {1, 2, 3}, {1, 4, 7}, {1, 5, 6}, {2, 5, 4}, {2, 6, 7}, {3, 7, 5} flat triad/mask bits {1, 2, 3, 4, 7, 5, 6} {0, 0, 0, 1, 0, 1, 1}
170	$\overline{\Phi x_1}^{0}_{o_d}$ v L			{D8, E7, D7, D6, D4, F4, H4, snub24, snub24E8, snub24H4}	0apggssec 010000001_2	Bn{ 1 1 1 0 1 0 0 1 } E8{ 0 0 0 0 1 −1 0 0 } Ph{ 0 0 0 0 1 $-\frac{1}{\sqrt{3}}$ $\frac{1}{\sqrt{2}}$ $\frac{1}{\sqrt{6}}$ } Rt{ 0 0 0 0 0 0 1 0 } Wt{ 0 0 0 −1 0 −1 2 −1 } Ht 1	He 2	Flipped Triad fpi=2 D_8 L fp_sm=8→74H {1, 2, 3}, {1, 4, 5}, {1, 7, 6}, {2, 4, 7}, {2, 6, 5}, {3, 6, 4}, {3, 7, 5} flat triad/mask bits {1, 3, 2, 4, 5, 7, 6} {0, 0, 1, 0, 1, 1, 1}	Not Flipped Triad fpi=1 D_8 L fp_sm=5→77H {1, 3, 2}, {1, 5, 4}, {1, 7, 6}, {2, 6, 7}, {3, 6, 4}, {3, 7, 5} flat triad/mask bits {1, 3, 2, 5, 4, 7, 6} {1, 1, 1, 0, 1, 1, 1}
171	$\overline{\Phi x_2}^{0}_{c_d}$ v L			{D8, D7, D4, F4, H4, snub24, snub24E8, snub24H4}	0apggssec 010000010_2	Bn{ 1 1 1 0 0 1 1 0 } E8{ 0 0 0 0 1 0 −1 0 } Ph{ 0 0 0 0 1 $-\frac{1}{\sqrt{3}}$ $-\frac{1}{\sqrt{2}}$ $\frac{1}{\sqrt{6}}$ } Rt{ 0 0 0 0 0 0 1 1 } Wt{ 0 0 0 −1 0 −1 1 1 } Ht 2	F 9	Flipped Triad fpi=5 D_8 L fp_sm=7→75H {1, 3, 2}, {1, 4, 7}, {1, 6, 5}, {2, 4, 5}, {2, 7, 6}, {3, 6, 4}, {3, 7, 5} flat triad/mask bits {1, 2, 3, 4, 7, 6, 5} {1, 0, 1, 0, 1, 1, 1}	Not Flipped Triad fpi=3 D_8 L fp_sm=4→7CH {1, 2, 3}, {1, 4, 6}, {1, 7, 5}, {2, 4, 7}, {2, 6, 5}, {3, 7, 4}, {3, 6 flat triad/mask bits {1, 2, 3, 4, 6, 7, 5} {0, 0, 1, 1, 1, 1, 1}
172	$\overline{\Phi x_3}^{0}_{m_d}$ v L			{D8, D4, F4, H4, snub24, snub24E8, snub24H4}	0apggssec 010000011_2	Bn{ 1 1 1 0 0 1 0 1 } E8{ 0 0 0 0 1 0 0 −1 } Ph{ 0 0 0 0 1 $-\frac{1}{\sqrt{3}}$ 0 $-\sqrt{\frac{2}{3}}$ } Rt{ 1 2 3 4 2 4 6 3 } Wt{ 0 0 0 −1 0 0 1 0 } Ht 25	Lv 116	Flipped Triad fpi=9 D_8 L fp_sm=6→76H {1, 2, 4}, {1, 6, 3}, {1, 7, 5}, {2, 3, 5}, {2, 7, 6}, {3, 7, 4}, {4, 6, 5} flat triad/mask bits {1, 4, 2, 6, 3, 7, 5} {0, 1, 1, 0, 1, 1, 1}	Not Flipped Triad fpi=6 D_8 L fp_sm=6→76H {1, 2, 3}, {1, 7, 4}, {1, 6, 5}, {2, 3, 5}, {2, 6, 7}, {3, 7, 4}, {4, 6, 5} flat triad/mask bits {1, 2, 3, 7, 4, 6, 5} {0, 1, 1, 0, 1, 1, 1}
173	$\Phi x_3}^{0}_{m_m}$ ^ L			{D8, D4, F4, H4, snub24, snub24E8, snub24H4}	0apggssec 000001011_2	Bn{ 1 1 1 0 0 0 1 1 } E8{ 0 0 0 0 1 0 0 1 } Ph{ 0 0 0 0 1 $\frac{1}{\sqrt{3}}$ 0 $\sqrt{\frac{2}{3}}$ } Rt{ −1 −2 −3 −4 −2 −3 −4 −2 } Wt{ 0 0 0 −1 −1 0 1 0 } Ht 21	Ds 110	Flipped Triad fpi=6 D_8 L fp_sm=6→24H {1, 2, 3}, {1, 4, 7}, {1, 6, 5}, {2, 4, 6}, {2, 5, 7}, {3, 5, 4}, {3, 6, 7} flat triad/mask bits {1, 3, 2, 4, 7, 6, 5} {0, 0, 1, 0, 0, 1, 0}	Not Flipped Triad fpi=9 D_8 L fp_sm=6→24H {1, 2, 4}, {1, 3, 6}, {1, 7, 5}, {2, 4, 6}, {2, 5, 7}, {3, 5, 4} flat triad/mask bits {1, 2, 4, 3, 6, 7, 5} {0, 0, 1, 0, 0, 1, 0}
174	$\Phi x_2}^{0}_{c_m}$ ^ L			{D8, D7, D4, F4, H4, snub24, snub24E8, snub24H4}	0apggssec 000001010_2	Bn{ 1 1 0 1 1 1 0 0 } E8{ 0 0 0 0 1 0 1 0 } Ph{ 0 0 0 0 1 $\frac{1}{\sqrt{3}}$ $\frac{1}{\sqrt{2}}$ $-\frac{1}{\sqrt{6}}$ } Rt{ 0 0 0 0 0 1 1 0 } Wt{ 0 0 0 −1 −1 1 1 −1 } Ht 2	Ne 10	Flipped Triad fpi=3 D_8 L fp_sm=4→2EH {1, 2, 3}, {1, 6, 4}, {1, 7, 5}, {2, 5, 4}, {2, 6, 7}, {3, 7, 4}, {3, 5 flat triad/mask bits {1, 3, 2, 6, 4, 7, 5} {0, 1, 1, 1, 0, 1, 0}	Not Flipped Triad fpi=5 D_8 L fp_sm=7→27H {1, 3, 2}, {1, 7, 4}, {1, 6, 5}, {2, 6, 7}, {3, 6, 4}, {3, 5 flat triad/mask bits {1, 3, 2, 7, 4, 6, 5} {1, 1, 1, 0, 0, 1, 0}
175	$\Phi x_1}^{0}_{o_m}$ ^ L			{D8, E7, D7, D6, D4, F4, H4, snub24, snub24E8, snub24H4}	0apggssec 000001001_2	Bn{ 1 1 0 1 1 0 1 0 } E8{ 0 0 0 0 1 1 0 0 } Ph{ 0 0 0 0 1 $\frac{1}{\sqrt{3}}$ $-\frac{1}{\sqrt{2}}$ $-\frac{1}{\sqrt{6}}$ } Rt{ 0 0 0 0 0 1 1 1 } Wt{ 0 0 0 −1 −1 1 0 1 } Ht 3	S 16	Flipped Triad fpi=1 D_8 L fp_sm=5→25H {1, 3, 2}, {1, 4, 5}, {1, 7, 6}, {2, 4, 6}, {2, 5, 7}, {3, 7, 4}, {3, 5 flat triad/mask bits {1, 2, 3, 4, 5, 7, 6} {1, 0, 1, 0, 0, 1, 0}	Not Flipped Triad fpi=2 D_8 L fp_sm=8→26H {1, 3, 2}, {1, 5, 4}, {1, 7, 6}, {2, 5, 7}, {3, 6, 4}, {3, 5 flat triad/mask bits {1, 2, 3, 5, 4, 7, 6} {0, 1, 1, 0, 0, 1, 0}
176	$\overline{r_\mu}^{0}_{w_l}$ ^ R			{D8, E7, D7, E6, D6, D5, H4, 24cell, 16Cell, altSnub24, snub24E8, snub24H4}	0apggssec 011100100_2	Bn{ 1 1 0 1 1 0 0 1 } E8{ 0 0 0 1 −1 0 0 0 } Ph{ 0 0 $-\frac{1}{\sqrt{2}}$ $\frac{1}{\sqrt{2}}$ −1 0 0 0 } Rt{ 0 0 0 1 0 0 0 0 } Wt{ 0 0 −1 2 0 0 −1 0 } Ht 1	B 5	Flipped Triad fpi=16 D̄ R̄ fp_sm=3→64H {1, 2, 5}, {1, 3, 6}, {1, 7, 4}, {2, 3, 7}, {2, 4, 6}, {3, 5, 4}, {5, 7, 6} flat triad/mask bits {1, 5, 2, 3, 6, 7, 4} {0, 0, 1, 0, 0, 1, 1}	Not Flipped Triad fpi=15 D_8 R̄ fp_sm=3→64H {1, 2, 5}, {1, 3, 6}, {1, 7, 4}, {2, 3, 7}, {2, 4, 6}, {3, 5, 4}, {5, 7, 6} flat triad/mask bits {1, 2, 5, 3, 6, 7, 4} {0, 0, 1, 0, 0, 1, 1}
177	$^{s}_{o_d}{}^{-1/3}_{L}$			{D8, E7, D7, D6, H4, snub24, altSnub24, snub24E8, snub24H4}	0apggssec 000100001_2	Bn{ 1 1 0 1 0 1 1 0 } E8{ 0 0 0 1 0 −1 0 0 } Ph{ 0 0 $-\frac{1}{\sqrt{2}}$ $\frac{1}{\sqrt{2}}$ 0 $-\frac{1}{\sqrt{3}}$ $\frac{1}{\sqrt{2}}$ $\frac{1}{\sqrt{6}}$ } Rt{ 0 0 0 1 0 0 1 0 } Wt{ 0 0 −1 1 0 −1 1 −1 } Ht 2	Mg 12	Flipped Triad fpi=17 D_8 L fp_sm=8→0BH {1, 5, 2}, {1, 7, 3}, {1, 4, 6}, {2, 4, 3}, {2, 6, 7}, {3, 5, 6}, {4, 5, 7} flat triad/mask bits {1, 2, 5, 7, 3, 4, 6} {1, 1, 0, 1, 0, 0, 0}	Not Flipped Triad fpi=19 D_8 L fp_sm=3→02H {1, 2, 6}, {1, 4, 3}, {1, 5, 7}, {2, 4, 7}, {3, 5, 6}, {4, 5, 7} flat triad/mask bits {1, 2, 6, 4, 3, 5, 7} {0, 1, 0, 0, 0, 0, 0}
178	$^{s}_{c_d}{}^{-1/3}_{L}$			{D8, D7, H4Φ, dualSnub24, snub24H4Φ}	0apggssec 000100010_2	Bn{ 1 1 0 1 0 1 0 1 } E8{ 0 0 0 1 0 0 −1 0 } Ph{ 0 0 $-\frac{1}{\sqrt{2}}$ $\frac{1}{\sqrt{2}}$ 0 $-\frac{1}{\sqrt{3}}$ $-\frac{1}{\sqrt{2}}$ $\frac{1}{\sqrt{6}}$ } Rt{ 0 0 0 1 0 0 1 1 } Wt{ 0 0 −1 1 0 −1 0 1 } Ht 3	Ar 18	Flipped Triad fpi=18 D̄ R̄ fp_sm=6→09H {1, 5, 2}, {1, 3, 7}, {1, 4, 6}, {2, 6, 3}, {2, 4, 7}, {3, 4, 5}, {5, 6, 7} flat triad/mask bits {1, 2, 5, 3, 7, 4, 6} {1, 0, 0, 1, 0, 0, 0}	Not Flipped Triad fpi=20 D_8 L fp_sm=1→00H {1, 2, 6}, {1, 3, 4}, {1, 5, 7}, {2, 6, 3}, {2, 4, 5}, {3, 4, 5}, {5, 6, 7} flat triad/mask bits {1, 2, 6, 3, 4, 5, 7} {0, 0, 0, 0, 0, 0, 0}

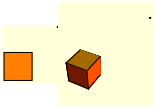
179	$\overset{s}{m}{}_{d}^{\overset{-1/3}{\vee}}{}_{L}$			{D8, H4Φ, dualSnub24, 24cellH4Φ, 16cellH4Φ}	$0_{apggsscc}$ 000100011_2	Bn{	1	1	0	1	0	0	1	1	}	Rt{	1	2	3	5	2	4	6	3	}	Uus 117	Flipped Triad fpi=22 D_8 L fp_sm=6→09H	Not Flipped Triad fpi=21 D_8 L fp_sm=6→09H
						E8{	0	0	0	1	0	0	0	−1	}	Wt{	0	0	−1	1	0	0	0	0	}		{1, 6, 2}, {1, 3, 5}, {1, 4, 7},	{1, 6, 2}, {1, 3, 5}, {1, 4, 7},
						Ph{	0	0	$-\frac{1}{\sqrt{2}}$	$\frac{1}{\sqrt{2}}$	0	$-\frac{1}{\sqrt{3}}$	0	$-\sqrt{\frac{2}{3}}$	}	Ht	26										{2, 7, 3}, {2, 4, 5}, {3, 4, 6}, {5, 6, 7}	{2, 4, 3}, {2, 5, 7}, {3, 6, 7}, {4, 5
																											flat triad/mask bits	flat triad/mask bits
																											{1, 2, 6, 3, 5, 4, 7}	{1, 6, 2, 3, 5, 4, 7}
																											{1, 0, 0, 1, 0, 0, 0}	{1, 0, 0, 1, 0, 0, 0}
180	$\overline{c}_{l}^{\overset{-2/3}{\wedge}}{}_{R}$			{D8, H4, snub24, altSnub24, 16cellE8, 24cellH4, 16cellH4}	$0_{apggsscc}$ 011100111_2	Bn{	1	1	0	0	1	1	1	0	}	Rt{	−1	−2	−3	−3	−2	−3	−4	−2	}	$\overline{Bh}$ 107	Flipped Triad fpi=22 D_8 R fp_sm=6→6FH	Not Flipped Triad fpi=21 D_8 R fp_sm=6→6FH
						E8{	0	0	0	1	0	0	0	1	}	Wt{	0	0	−1	1	−1	0	0	0	}		{1, 6, 2}, {1, 5, 3}, {1, 7, 4},	{1, 6, 2}, {1, 5, 3}, {1, 7, 4},
						Ph{	0	0	$-\frac{1}{\sqrt{2}}$	$\frac{1}{\sqrt{2}}$	0	$\frac{1}{\sqrt{3}}$	0	$\sqrt{\frac{2}{3}}$	}	Ht	20										{2, 7, 3}, {2, 4, 5}, {3, 6, 4}, {5, 7, 6}	{2, 4, 3}, {2, 5, 7}, {3, 7, 6}, {4, 6
																											flat triad/mask bits	flat triad/mask bits
																											{1, 2, 6, 5, 3, 7, 4}	{1, 6, 2, 5, 3, 7, 4}
																											{1, 1, 1, 1, 0, 1, 1}	{1, 1, 1, 1, 0, 1, 1}
181	$\overline{g}_{l}^{\overset{-2/3}{\wedge}}{}_{R}$			{D8, D7, H4, snub24, altSnub24, 16cellE8, snub24H4}	$0_{apggsscc}$ 011100110_2	Bn{	1	1	0	0	1	1	0	1	}	Rt{	0	0	0	1	0	1	1	0	}	K 19	Flipped Triad fpi=18 D_8 R fp_sm=6→6FH	Not Flipped Triad fpi=20 D_8 R fp_sm=1→66H
						E8{	0	0	0	1	0	0	1	0	}	Wt{	0	0	−1	1	−1	1	0	−1	}		{1, 5, 2}, {1, 7, 3}, {1, 6, 4},	{1, 2, 6}, {1, 4, 3}, {1, 7, 5},
						Ph{	0	0	$-\frac{1}{\sqrt{2}}$	$\frac{1}{\sqrt{2}}$	0	$\frac{1}{\sqrt{3}}$	$\frac{1}{\sqrt{2}}$	$-\frac{1}{\sqrt{6}}$	}	Ht	3										{2, 6, 3}, {2, 4, 7}, {3, 5, 4}, {5, 7, 6}	{2, 3, 7}, {2, 4, 5}, {3, 6, 5}, {4, 7
																											flat triad/mask bits	flat triad/mask bits
																											{1, 2, 5, 7, 3, 6, 4}	{1, 2, 6, 4, 3, 7, 5}
																											{1, 1, 1, 1, 0, 1, 1}	{0, 1, 1, 0, 0, 1, 1}
182	$\overline{r}_{l}^{\overset{-2/3}{\wedge}}{}_{R}$			{D8, E7, D7, D6, H4Φ, dualSnub24, snub24H4Φ}	$0_{apggsscc}$ 011100101_2	Bn{	1	1	0	0	1	0	1	1	}	Rt{	0	0	0	1	0	1	1	1	}	Cr 24	Flipped Triad fpi=17 D_8 R fp_sm=8→6DH	Not Flipped Triad fpi=19 D_8 R fp_sm=3→64H
						E8{	0	0	0	1	0	1	0	0	}	Wt{	0	0	−1	1	−1	1	−1	1	}		{1, 5, 2}, {1, 3, 7}, {1, 6, 4},	{1, 2, 6}, {1, 3, 4}, {1, 7, 5},
						Ph{	0	0	$-\frac{1}{\sqrt{2}}$	$\frac{1}{\sqrt{2}}$	0	$\frac{1}{\sqrt{3}}$	$-\frac{1}{\sqrt{2}}$	$-\frac{1}{\sqrt{6}}$	}	Ht	4										{2, 4, 3}, {2, 6, 7}, {3, 6, 5}, {4, 7, 5}	{2, 3, 5}, {2, 4, 7}, {3, 7, 6}, {4, 6
																											flat triad/mask bits	flat triad/mask bits
																											{1, 2, 5, 3, 7, 6, 4}	{1, 2, 6, 3, 4, 7, 5}
																											{1, 0, 1, 1, 0, 1, 1}	{0, 0, 1, 0, 1, 1}
183	$\overset{\mu}{y}{}_{d}^{\overset{-}{\vee}}{}_{L}$			{D8, E7, D7, E6, D6, D5, H4, snub24, altSnub24, 16cellE8, snub24H4}	$0_{apggsscc}$ 000100000_2	Bn{	1	1	0	0	0	1	1	1	}	Rt{	0	0	0	1	0	1	2	1	}	Zn 30	Flipped Triad fpi=16 D_8 L fp_sm=3→02H	Not Flipped Triad fpi=15 D_8 L fp_sm=3→02H
						E8{	0	0	0	1	1	0	0	0	}	Wt{	0	0	−1	0	−1	0	1	0	}		{1, 2, 5}, {1, 6, 3}, {1, 4, 7},	{1, 2, 5}, {1, 6, 3}, {1, 4, 7},
						Ph{	0	0	$-\frac{1}{\sqrt{2}}$	$\frac{1}{\sqrt{2}}$	1	0	0	0	}	Ht	5										{2, 3, 7}, {2, 4, 6}, {3, 4, 5}, {5, 6, 7}	{2, 3, 4}, {2, 6, 7}, {3, 5, 7}, {4, 5
																											flat triad/mask bits	flat triad/mask bits
																											{1, 5, 2, 6, 3, 4, 7}	{1, 2, 5, 6, 3, 4, 7}
																											{0, 1, 0, 0, 0, 0, 0}	{0, 1, 0, 0, 0, 0, 0}
184	$\overline{B}_{m}^{\overset{0}{\wedge}}{}_{L}$			{D8, E7, D7, E6, D6, E5, D5, D4, F4s, H4, snub24, altSnub24, snub24E8, snub24H4}	$0_{apggsscc}$ 011001011_2	Bn{	1	0	1	1	1	1	0	0	}	Rt{	0	0	1	0	0	0	0	0	}	C 6	Flipped Triad fpi=6 D_8 R fp_sm=6→5CH	Not Flipped Triad fpi=9 D_8 R fp_sm=6→5CH
						E8{	0	0	1	−1	0	0	0	0	}	Wt{	0	−1	2	−1	0	0	0	0	}		{1, 2, 3}, {1, 4, 7}, {1, 6, 5},	{1, 2, 4}, {1, 3, 6}, {1, 7, 5},
						Ph{	0	0	$\sqrt{2}$	0	0	0	0	0	}	Ht	1										{2, 6, 4}, {2, 7, 5}, {3, 4, 5}, {3, 7, 6}	{2, 5, 3}, {2, 7, 6}, {3, 4, 7}, {4, 6
																											flat triad/mask bits	flat triad/mask bits
																											{1, 3, 2, 4, 7, 6, 5}	{1, 2, 4, 3, 6, 7, 5}
																											{0, 0, 1, 1, 1, 0, 1}	{0, 0, 1, 1, 1, 0, 1}
185	$\overline{v}_{\mu}^{\overset{0}{\vee}}{}_{L}$			{D8, E7, D7, E6, D6, D5, H4, 24cell, 16Cell, altSnub24, snub24E8, snub24H4}	$0_{apggsscc}$ 011100000_2	Bn{	1	0	1	1	1	0	1	0	}	Rt{	0	0	1	1	0	0	0	0	}	Al 13	Flipped Triad fpi=16 D_8 R fp_sm=3→7AH	Not Flipped Triad fpi=15 D_8 R fp_sm=3→7AH
						E8{	0	0	1	0	−1	0	0	0	}	Wt{	0	−1	1	1	0	0	−1	0	}		{1, 2, 5}, {1, 6, 3}, {1, 4, 7},	{1, 2, 5}, {1, 6, 3}, {1, 4, 7},
						Ph{	0	0	$\frac{1}{\sqrt{2}}$	$\frac{1}{\sqrt{2}}$	−1	0	0	0	}	Ht	2										{2, 7, 3}, {2, 6, 4}, {3, 5, 4}, {5, 7, 6}	{2, 4, 3}, {2, 7, 6}, {3, 7, 5}, {4, 6
																											flat triad/mask bits	flat triad/mask bits
																											{1, 5, 2, 6, 3, 4, 7}	{1, 2, 5, 6, 3, 4, 7}
																											{0, 1, 0, 1, 1, 1, 1}	{0, 1, 0, 1, 1, 1, 1}
186	$\overset{s}{o}{}_{l}^{\overset{-1/3}{\wedge}}{}_{R}$			{D8, E7, D7, D6, H4Φ, dualSnub24, 24cellE8Φ, 16cellE8Φ, snub24H4Φ}	$0_{apggsscc}$ 000100101_2	Bn{	1	0	1	1	1	0	0	1	}	Rt{	0	0	1	1	0	0	1	0	}	Ca 20	Flipped Triad fpi=17 D_8 L fp_sm=8→15H	Not Flipped Triad fpi=19 D_8 L fp_sm=3→1CH
						E8{	0	0	1	0	0	−1	0	0	}	Wt{	0	−1	1	0	0	−1	1	−1	}		{1, 5, 2}, {1, 3, 7}, {1, 6, 4},	{1, 2, 6}, {1, 3, 4}, {1, 7, 5},
						Ph{	0	0	$\frac{1}{\sqrt{2}}$	$\frac{1}{\sqrt{2}}$	0	$-\frac{1}{\sqrt{3}}$	$\frac{1}{\sqrt{2}}$	$\frac{1}{\sqrt{6}}$	}	Ht	3										{2, 3, 4}, {2, 7, 6}, {3, 5, 6}, {4, 5, 7}	{2, 5, 3}, {2, 7, 4}, {3, 6, 7}, {4, 5
																											flat triad/mask bits	flat triad/mask bits
																											{1, 2, 5, 3, 7, 6, 4}	{1, 2, 6, 3, 4, 7, 5}
																											{1, 0, 1, 0, 1, 0, 0}	{0, 0, 1, 1, 1, 0, 0}
187	$\overset{s}{c}{}_{l}^{\overset{-1/3}{\wedge}}{}_{R}$			{D8, D7, H4Φ, dualSnub24, 24cellH4Φ, 16cellH4Φ}	$0_{apggsscc}$ 000100110_2	Bn{	1	0	1	1	0	1	1	0	}	Rt{	0	0	1	1	0	0	1	1	}	Fe 26	Flipped Triad fpi=18 D_8 L fp_sm=6→17H	Not Flipped Triad fpi=20 D_8 L fp_sm=1→1EH
						E8{	0	0	1	0	0	0	−1	0	}	Wt{	0	−1	1	0	0	−1	0	1	}		{1, 5, 2}, {1, 7, 3}, {1, 6, 4},	{1, 2, 6}, {1, 4, 3}, {1, 7, 5},
						Ph{	0	0	$\frac{1}{\sqrt{2}}$	$\frac{1}{\sqrt{2}}$	0	$-\frac{1}{\sqrt{3}}$	$-\frac{1}{\sqrt{2}}$	$\frac{1}{\sqrt{6}}$	}	Ht	4										{2, 3, 6}, {2, 7, 4}, {3, 4, 5}, {5, 6, 7}	{2, 5, 4}, {3, 5, 6}, {4, 6, 7}
																											flat triad/mask bits	flat triad/mask bits
																											{1, 2, 5, 3, 7, 6, 4}	{1, 2, 6, 4, 3, 7, 5}
																											{1, 1, 1, 0, 1, 0, 0}	{0, 1, 1, 1, 1, 0, 0}
188	$\overset{s}{m}{}_{l}^{\overset{-1/3}{\wedge}}{}_{R}$			{D8, H4, snub24, altSnub24, snub24E8, snub24H4}	$0_{apggsscc}$ 000100111_2	Bn{	1	0	1	1	0	1	0	1	}	Rt{	1	2	4	5	2	4	6	3	}	Uuo 118	Flipped Triad fpi=22 D_8 L fp_sm=6→17H	Not Flipped Triad fpi=21 D_8 L fp_sm=6→17H
						E8{	0	0	1	0	0	0	0	−1	}	Wt{	0	−1	1	0	0	0	0	0	}		{1, 6, 2}, {1, 5, 3}, {1, 7, 4},	{1, 6, 2}, {1, 5, 3}, {1, 7, 4},
						Ph{	0	0	$\frac{1}{\sqrt{2}}$	$\frac{1}{\sqrt{2}}$	0	$-\frac{1}{\sqrt{3}}$	0	$-\sqrt{\frac{2}{3}}$	}	Ht	27										{2, 3, 7}, {2, 5, 4}, {3, 4, 6}, {5, 6, 7}	{2, 3, 4}, {2, 7, 5}, {3, 6, 7}, {4, 5
																											flat triad/mask bits	flat triad/mask bits
																											{1, 2, 6, 5, 3, 7, 4}	{1, 6, 2, 5, 3, 7, 4}
																											{1, 1, 1, 0, 1, 0, 0}	{1, 1, 1, 0, 1, 0, 0}
189	$\overline{c}_{d}^{\overset{-2/3}{\vee}}{}_{L}$			{D8, H4Φ, dualSnub24, snub24H4Φ}	$0_{apggsscc}$ 011100011_2	Bn{	1	0	1	1	0	0	1	1	}	Rt{	−1	−2	−2	−3	−2	−3	−4	−2	}	$\overline{Rf}$ 104	Flipped Triad fpi=22 D_8 R fp_sm=6→71H	Not Flipped Triad fpi=21 D_8 R fp_sm=6→71H
						E8{	0	0	1	0	0	0	0	1	}	Wt{	0	−1	1	0	−1	0	0	0	}		{1, 6, 2}, {1, 3, 5}, {1, 4, 7},	{1, 6, 2}, {1, 3, 5}, {1, 4, 7},
						Ph{	0	0	$\frac{1}{\sqrt{2}}$	$\frac{1}{\sqrt{2}}$	0	$\frac{1}{\sqrt{3}}$	0	$\sqrt{\frac{2}{3}}$	}	Ht	19										{2, 3, 7}, {2, 5, 4}, {3, 6, 4}, {5, 7, 6}	{2, 4, 3}, {2, 7, 5}, {3, 7, 6}, {4, 6
																											flat triad/mask bits	flat triad/mask bits
																											{1, 2, 6, 3, 5, 4, 7}	{1, 6, 2, 3, 5, 4, 7}
																											{1, 0, 0, 1, 1, 1, 1}	{1, 0, 0, 0, 1, 1, 1}
190	$\overline{c}_{d}^{\overset{-2/3}{\vee}}{}_{L}$			{D8, D7, H4, snub24, altSnub24, snub24E8, 24cellH4, 16cellH4}	$0_{apggsscc}$ 011100010_2	Bn{	1	0	1	0	1	1	1	0	}	Rt{	0	0	1	1	0	1	1	0	}	Co 27	Flipped Triad fpi=18 D_8 R fp_sm=6→71H	Not Flipped Triad fpi=20 D_8 R fp_sm=1→78H
						E8{	0	0	1	0	0	0	1	0	}	Wt{	0	−1	1	0	−1	1	0	−1	}		{1, 5, 2}, {1, 3, 7}, {1, 4, 6},	{1, 2, 6}, {1, 3, 4}, {1, 5, 7},
						Ph{	0	0	$\frac{1}{\sqrt{2}}$	$\frac{1}{\sqrt{2}}$	0	$\frac{1}{\sqrt{3}}$	$\frac{1}{\sqrt{2}}$	$-\frac{1}{\sqrt{6}}$	}	Ht	4										{2, 3, 6}, {2, 7, 4}, {3, 5, 4}, {5, 7, 6}	{2, 7, 3}, {2, 5, 4}, {3, 6, 5}, {4, 7
																											flat triad/mask bits	flat triad/mask bits
																											{1, 2, 5, 3, 7, 4, 6}	{1, 2, 6, 3, 4, 5, 7}
																											{1, 0, 0, 0, 1, 1, 1}	{0, 0, 0, 1, 1, 1, 1}
191	$\overline{c}_{d}^{\overset{-2/3}{\vee}}{}_{L}$			{D8, E7, D7, D6, H4, snub24, altSnub24, snub24E8, snub24H4}	$0_{apggsscc}$ 011100001_2	Bn{	1	0	1	0	1	1	0	1	}	Rt{	0	0	1	1	0	1	1	1	}	Ge 32	Flipped Triad fpi=17 D_8 R fp_sm=8→73H	Not Flipped Triad fpi=19 D_8 R fp_sm=3→7AH
						E8{	0	0	1	0	0	1	0	0	}	Wt{	0	−1	1	0	−1	1	−1	1	}		{1, 5, 2}, {1, 7, 3}, {1, 4, 6},	{1, 2, 6}, {1, 4, 3}, {1, 5, 7},
						Ph{	0	0	$\frac{1}{\sqrt{2}}$	$\frac{1}{\sqrt{2}}$	0	$\frac{1}{\sqrt{3}}$	$-\frac{1}{\sqrt{2}}$	$-\frac{1}{\sqrt{6}}$	}	Ht	5										{2, 3, 4}, {2, 7, 6}, {3, 6, 5}, {4, 7, 5}	{2, 5, 3}, {2, 7, 4}, {3, 7, 6}, {4, 6
																											flat triad/mask bits	flat triad/mask bits
																											{1, 2, 5, 7, 3, 4, 6}	{1, 2, 6, 4, 3, 5, 7}
																											{1, 1, 0, 0, 1, 1, 1}	{0, 1, 0, 1, 1, 1, 1}
192	$\overset{\mu}{y}{}_{l}^{\overset{-}{\wedge}}{}_{R}$			{D8, E7, D7, E6, D6, D5, H4, snub24, altSnub24, snub24E8, snub24H4}	$0_{apggsscc}$ 000100100_2	Bn{	1	0	1	0	1	0	1	1	}	Rt{	0	0	1	1	0	1	2	1	}	Sr 38	Flipped Triad fpi=16 D_8 L fp_sm=3→1CH	Not Flipped Triad fpi=15 D_8 L fp_sm=3→1CH
						E8{	0	0	1	0	1	0	0	0	}	Wt{	0	−1	1	−1	−1	0	1	0	}		{1, 2, 5}, {1, 3, 6}, {1, 7, 4},	{1, 2, 5}, {1, 3, 6}, {1, 7, 4},
						Ph{	0	0	$\frac{1}{\sqrt{2}}$	$\frac{1}{\sqrt{2}}$	1	0	0	0	}	Ht	6										{2, 7, 3}, {2, 6, 4}, {3, 4, 5}, {5, 6, 7}	{2, 4, 3}, {2, 7, 6}, {3, 5, 7}, {4, 5
																											flat triad/mask bits	flat triad/mask bits
																											{1, 5, 2, 3, 6, 7, 4}	{1, 2, 5, 3, 6, 7, 4}
																											{0, 0, 1, 1, 1, 0, 0}	{0, 0, 1, 1, 1, 0, 0}

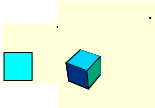
193	ω_L 0
	r_m R
			{D8, E7, D7, E6, D6, E5, D5, D4, F4s, H4Φ, snub24H4Φ}	0apggssec
				001001101_2
					Bn{
					E8{
					Ph{
						1 0 1 0 0 1 1 1 }
						0 0 1 1 0 0 0 0 }
						0 0 0 $\sqrt{2}$ 0 0 0 0 }
							Rt{
							Wt{
							Ht
								0 0 1 2 0 1 2 1 }
								0 −1 0 1 −1 0 0 0 }
								7
									Pd
									46
										Flipped
										Triad fpi=2 D_8 R fp_sm=8→3FH
										{1, 3, 2}, {1, 5, 4}, {1, 7, 6},
										{2, 7, 4}, {2, 6, 5}, {3, 6, 4}, {3, 5, 7}{2, 6, 4}, {2, 7, 5}, {3, 7, 4}, {3, 5
										flat triad/mask bits
										{1, 2, 3, 5, 4, 7, 6}
										{1, 1, 1, 1, 1, 1, 0}
											Not Flipped
											Triad fpi=1 D_8 R fp_sm=5→3CH
											{1, 2, 3}, {1, 4, 5}, {1, 7, 6},
											{2, 7, 5}, {3, 7, 4}, {3, 5
											flat triad/mask bits
											{1, 2, 3, 4, 5, 7, 6}
											{0, 0, 1, 1, 1, 1, 0}

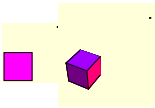
194	c_T 0
	g_m L
			{D8, E7, D7, E6, D6, E5, D5, E4, D4, F4s, H4, snub24, altSnub24, snub24E8, snub24H4, D3, D3}	0apggssec
				001001010_2
					Bn{
					E8{
					Ph{
						1 0 0 1 1 1 0 }
						0 1 −1 0 0 0 0 }
						0 1 $-\frac{1}{\sqrt{2}}$ $-\frac{1}{\sqrt{2}}$ 0 0 0 0 }
							Rt{
							Wt{
							Ht
								0 1 0 0 0 0 0 0 }
								−1 2 −1 0 0 0 0 0 }
								1
									N
									7
										Flipped
										Triad fpi=5 D_8 R fp_sm=7→20H
										{1, 2, 3}, {1, 4, 7}, {1, 5, 6},
										{2, 4, 5}, {2, 6, 7}, {3, 6, 4}, {3, 5, 7}{2, 5, 4}, {2, 6, 7}, {3, 7, 4}, {3, 5
										flat triad/mask bits
										{1, 3, 2, 4, 7, 5, 6}
										{0, 0, 0, 0, 0, 1, 0}
											Not Flipped
											Triad fpi=3 D_8 R fp_sm=4→29H
											{1, 3, 2}, {1, 4, 6}, {1, 5, 7},
											{2, 6, 7}, {3, 7, 4}, {3, 5
											flat triad/mask bits
											{1, 3, 2, 4, 6, 5, 7}
											{1, 0, 0, 1, 0, 1, 0}

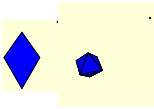
195	c_S 0
	r_l R
			{D8, E7, D7, E6, D6, E5, D5, D4, F4s, H4, snub24, altSnub24, snub24E8, snub24H4}	0apggssec
				001000101_2
					Bn{
					E8{
					Ph{
						1 0 0 1 1 1 0 1 }
						0 1 0 −1 0 0 0 0 }
						0 1 $\frac{1}{\sqrt{2}}$ $-\frac{1}{\sqrt{2}}$ 0 0 0 0 }
							Rt{
							Wt{
							Ht
								0 1 1 0 0 0 0 0 }
								−1 1 1 −1 0 0 0 0 }
								2
									Si
									14
										Flipped
										Triad fpi=2 D_8 R fp_sm=8→12H
										{1, 2, 3}, {1, 5, 4}, {1, 6, 7},
										{2, 4, 7}, {2, 6, 5}, {3, 4, 6}, {3, 5, 7}{2, 4, 6}, {2, 7, 5}, {3, 4, 7}, {3, 5
										flat triad/mask bits
										{1, 3, 2, 5, 4, 6, 7}
										{0, 1, 0, 0, 1, 0, 0}
											Not Flipped
											Triad fpi=1 D_8 R fp_sm=5→11H
											{1, 3, 2}, {1, 4, 5}, {1, 6, 7},
											{2, 4, 7}, {3, 4, 6}, {3, 5, 7}{2, 4, 6}, {2, 7, 5}, {3, 4, 7}, {3, 5
											flat triad/mask bits
											{1, 3, 2, 4, 5, 6, 7}
											{1, 0, 0, 0, 1, 0, 0}

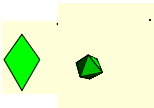
196	$\overline{\gamma_\mu}$ 0
	w_m R
			{D8, E7, D7, E6, D6, D5, H4, 24cell, 16Cell, altSnub24, snub24E8, snub24H4}	0apggssec
				011101100_2
					Bn{
					E8{
					Ph{
						1 0 0 1 1 0 1 1 }
						0 1 0 0 −1 0 0 0 }
						0 1 0 0 −1 0 0 0 }
							Rt{
							Wt{
							Ht
								0 1 1 1 0 0 0 0 }
								−1 1 0 1 0 0 −1 0 }
								3
									Sc
									21
										Flipped
										Triad fpi=16 D_8 R fp_sm=3→49H
										{1, 5, 2}, {1, 3, 6}, {1, 4, 7},
										{2, 7, 3}, {2, 4, 6}, {3, 4, 5}, {5, 7, 6}{2, 4, 3}, {2, 6, 7}, {3, 5, 7}, {4, 6
										flat triad/mask bits
										{1, 2, 5, 3, 6, 4, 7}
										{1, 0, 0, 1, 0, 0, 1}
											Not Flipped
											Triad fpi=15 D_8 R fp_sm=3→49H
											{1, 5, 2}, {1, 3, 6}, {1, 4, 7},
											{2, 7, 3}, {2, 4, 6}, {3, 5, 7}, {4, 6
											flat triad/mask bits
											{1, 5, 2, 3, 6, 4, 7}
											{1, 0, 0, 1, 0, 0, 1}

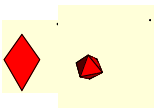
197	s_m −1/3
	L
			{D8, E7, D7, D6, H4Φ, dualSnub24, 24cellE8Φ, 16cellE8Φ, 24cellH4Φ, 16cellH4Φ}	0apggssec
				000101001_2
					Bn{
					E8{
					Ph{
						1 0 0 1 0 1 1 1 }
						0 1 0 0 0 −1 0 0 }
						0 1 0 0 0 $-\frac{1}{\sqrt{3}}$ $\frac{1}{\sqrt{2}}$ $\frac{1}{\sqrt{6}}$ }
							Rt{
							Wt{
							Ht
								0 1 1 1 0 0 1 0 }
								−1 1 0 0 0 −1 1 −1 }
								4
									Ni
									28
										Flipped
										Triad fpi=17 D_8 L fp_sm=8→26H
										{1, 2, 5}, {1, 7, 3}, {1, 6, 4},
										{2, 3, 4}, {2, 6, 7}, {3, 6, 5}, {4, 5, 7}{2, 5, 3}, {2, 4, 7}, {3, 7, 6}, {4, 5
										flat triad/mask bits
										{1, 5, 2, 7, 3, 6, 4}
										{0, 1, 1, 0, 0, 1, 0}
											Not Flipped
											Triad fpi=19 D_8 L fp_sm=3→2FH
											{1, 2, 5}, {1, 7, 3}, {1, 6, 4},
											{2, 3, 4}, {2, 6, 7}, {3, 6, 5}, {4, 5, 7}{2, 5, 3}, {2, 4, 7}, {3, 7, 6}, {4, 5
											flat triad/mask bits
											{1, 6, 2, 4, 3, 7, 5}
											{1, 1, 1, 1, 0, 1, 0}

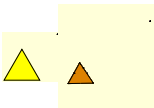
198	s_m −1/3
	L
			{D8, D7, H4, snub24, altSnub24, snub24E8, snub24H4}	0apggssec
				000101010_2
					Bn{
					E8{
					Ph{
						1 0 0 0 1 1 1 1 }
						0 1 0 0 0 0 −1 0 }
						0 1 0 0 0 $-\frac{1}{\sqrt{3}}$ $-\frac{1}{\sqrt{2}}$ $\frac{1}{\sqrt{6}}$ }
							Rt{
							Wt{
							Ht
								0 1 1 1 0 0 1 1 }
								−1 1 0 0 0 −1 0 1 }
								5
									Se
									34
										Flipped
										Triad fpi=18 D_8 L fp_sm=6→24H
										{1, 2, 5}, {1, 3, 7}, {1, 6, 4},
										{2, 3, 6}, {2, 4, 7}, {3, 5, 4}, {5, 6, 7}{2, 7, 3}, {2, 4, 5}, {3, 6, 5}, {4, 6
										flat triad/mask bits
										{1, 5, 2, 3, 7, 6, 4}
										{0, 0, 1, 0, 0, 1, 0}
											Not Flipped
											Triad fpi=20 D_8 L fp_sm=1→2DH
											{1, 6, 2}, {1, 3, 4}, {1, 7, 5},
											{2, 4, 7}, {3, 5, 4}, {5, 6, 7}{2, 7, 3}, {2, 4, 5}, {3, 6, 5}, {4, 6
											flat triad/mask bits
											{1, 6, 2, 3, 4, 7, 5}
											{1, 0, 1, 1, 0, 1, 0}

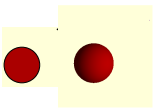
199	s_m −1/3
	L
			{D8, H4Φ, dualSnub24, snub24H4Φ}	0apggssec
				000101011_2
					Bn{
					E8{
					Ph{
						0 1 1 1 1 1 0 0 }
						0 1 0 0 0 0 0 −1 }
						0 1 0 0 0 $-\frac{1}{\sqrt{3}}$ 0 $-\sqrt{\frac{2}{3}}$ }
							Rt{
							Wt{
							Ht
								1 3 4 5 2 4 6 3 }
								−1 1 0 0 0 0 0 0 }
								28
									Uue
									119
										Flipped
										Triad fpi=22 D_8 L fp_sm=6→24H
										{1, 2, 6}, {1, 3, 5}, {1, 7, 4},
										{2, 3, 7}, {2, 4, 5}, {3, 6, 4}, {5, 6, 7}{2, 3, 4}, {2, 5, 7}, {3, 7, 6}, {4, 5
										flat triad/mask bits
										{1, 6, 2, 3, 5, 7, 4}
										{0, 0, 1, 0, 0, 1, 0}
											Not Flipped
											Triad fpi=21 D_8 L fp_sm=6→24H
											{1, 2, 6}, {1, 3, 5}, {1, 7, 4},
											{2, 3, 7}, {2, 4, 5}, {3, 6, 4}, {5, 6, 7}{2, 3, 4}, {2, 5, 7}, {3, 7, 6}, {4, 5
											flat triad/mask bits
											{1, 2, 6, 3, 5, 7, 4}
											{0, 0, 1, 0, 0, 1, 0}

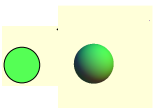
200	$\overline{c_m}$ −2/3
	R
			{D8, H4, snub24, altSnub24, 16cellE8, snub24H4}	0apggssec
				011101111_2
					Bn{
					E8{
					Ph{
						0 1 1 1 1 0 1 0 }
						0 1 0 0 0 0 0 1 }
						0 1 0 0 0 $\frac{1}{\sqrt{3}}$ 0 $\sqrt{\frac{2}{3}}$ }
							Rt{
							Wt{
							Ht
								−1 −1 −2 −3 −2 −3 −4 −2 }
								−1 1 0 0 −1 0 0 0 }
								18
									Md
									101
										Flipped
										Triad fpi=22 D_8 R fp_sm=6→42H
										{1, 2, 6}, {1, 5, 3}, {1, 4, 7},
										{2, 3, 7}, {2, 4, 5}, {3, 4, 6}, {5, 7, 6}{2, 3, 4}, {2, 5, 7}, {3, 6, 7}, {4, 6
										flat triad/mask bits
										{1, 6, 2, 5, 3, 4, 7}
										{0, 1, 0, 0, 0, 0, 1}
											Not Flipped
											Triad fpi=21 D_8 R fp_sm=6→42H
											{1, 2, 6}, {1, 5, 3}, {1, 4, 7},
											{2, 3, 7}, {2, 4, 5}, {3, 4, 6}, {5, 7, 6}{2, 3, 4}, {2, 5, 7}, {3, 6, 7}, {4, 6
											flat triad/mask bits
											{1, 2, 6, 5, 3, 4, 7}
											{0, 1, 0, 0, 0, 0, 1}

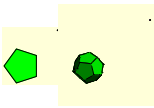
201	$\overline{c_m}$ −2/3
	R
			{D8, D7, H4Φ, dualSnub24, snub24H4Φ}	0apggssec
				011101110_2
					Bn{
					E8{
					Ph{
						0 1 1 1 1 0 0 1 }
						0 1 0 0 0 0 1 0 }
						0 1 0 0 0 $\frac{1}{\sqrt{3}}$ $\frac{1}{\sqrt{2}}$ $-\frac{1}{\sqrt{6}}$ }
							Rt{
							Wt{
							Ht
								0 1 1 1 0 1 1 0 }
								−1 1 0 0 −1 1 0 −1 }
								5
									Br
									35
										Flipped
										Triad fpi=18 D_8 R fp_sm=6→42H
										{1, 2, 5}, {1, 7, 3}, {1, 4, 6},
										{2, 3, 6}, {2, 4, 7}, {3, 4, 5}, {5, 7, 6}{2, 7, 3}, {2, 4, 5}, {3, 5, 6}, {4, 7
										flat triad/mask bits
										{1, 5, 2, 7, 3, 4, 6}
										{0, 1, 0, 0, 0, 0, 1}
											Not Flipped
											Triad fpi=20 D_8 R fp_sm=1→4BH
											{1, 6, 2}, {1, 4, 3}, {1, 5, 7},
											{2, 3, 6}, {2, 4, 7}, {3, 4, 5}, {5, 7, 6}{2, 7, 3}, {2, 4, 5}, {3, 5, 6}, {4, 7
											flat triad/mask bits
											{1, 6, 2, 4, 3, 5, 7}
											{1, 1, 0, 1, 0, 0, 1}

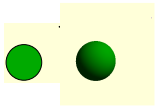
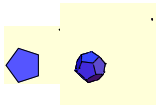
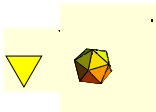
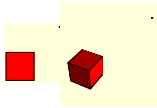
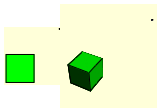
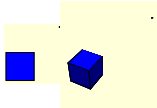
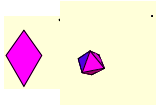
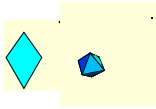
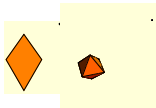
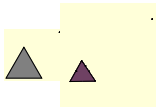
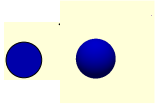
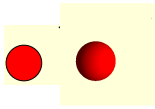
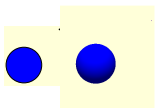
202	$\overline{c_m}$ −2/3
	R
			{D8, E7, D7, D6, H4, snub24, altSnub24, snub24E8, 24cellH4, 16cellH4}	0apggssec
				011101101_2
					Bn{
					E8{
					Ph{
						0 1 1 1 0 1 1 0 }
						0 1 0 0 0 1 0 0 }
						0 1 0 0 0 $\frac{1}{\sqrt{3}}$ $-\frac{1}{\sqrt{2}}$ $-\frac{1}{\sqrt{6}}$ }
							Rt{
							Wt{
							Ht
								0 1 1 1 0 1 1 1 }
								−1 1 0 0 −1 1 −1 1 }
								6
									Zr
									40
										Flipped
										Triad fpi=17 D_8 R fp_sm=8→40H
										{1, 2, 5}, {1, 3, 7}, {1, 4, 6},
										{2, 3, 4}, {2, 6, 7}, {3, 5, 6}, {4, 7, 5}{2, 5, 3}, {2, 4, 7}, {3, 6, 7}, {4, 6
										flat triad/mask bits
										{1, 5, 2, 3, 7, 4, 6}
										{0, 0, 0, 0, 0, 0, 1}
											Not Flipped
											Triad fpi=19 D_8 R fp_sm=3→49H
											{1, 6, 2}, {1, 3, 4}, {1, 5, 7},
											{2, 3, 4}, {2, 6, 7}, {3, 5, 6}, {4, 7, 5}{2, 5, 3}, {2, 4, 7}, {3, 6, 7}, {4, 6
											flat triad/mask bits
											{1, 6, 2, 3, 4, 5, 7}
											{1, 0, 0, 1, 0, 0, 1}

203	μ_m −
	L
			{D8, E7, D7, E6, D6, D5, H4, snub24, altSnub24, snub24E8, snub24H4}	0apggssec
				000101000_2
					Bn{
					E8{
					Ph{
						0 1 1 1 0 1 0 1 }
						0 1 0 0 1 0 0 0 }
						0 1 0 0 1 0 0 0 }
							Rt{
							Wt{
							Ht
								0 1 1 1 0 1 2 1 }
								−1 1 0 −1 −1 0 1 0 }
								7
									Ag
									47
										Flipped
										Triad fpi=16 D_8 L fp_sm=3→2FH
										{1, 5, 2}, {1, 6, 3}, {1, 7, 4},
										{2, 7, 3}, {2, 4, 6}, {3, 5, 4}, {5, 6, 7}{2, 4, 3}, {2, 6, 7}, {3, 7, 5}, {4, 5
										flat triad/mask bits
										{1, 2, 5, 6, 3, 7, 4}
										{1, 1, 1, 1, 0, 1, 0}
											Not Flipped
											Triad fpi=15 D_8 L fp_sm=3→2FH
											{1, 5, 2}, {1, 6, 3}, {1, 7, 4},
											{2, 7, 3}, {2, 4, 6}, {3, 5, 7}, {4, 5
											flat triad/mask bits
											{1, 5, 2, 6, 3, 7, 4}
											{1, 1, 1, 1, 0, 1, 0}

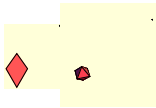
204	c_S 0
	r_d L
			{D8, E7, D7, E6, D6, E5, D5, D4, F4s, H4Φ, snub24H4Φ}	0apggssec
				001000001_2
					Bn{
					E8{
					Ph{
						0 1 1 1 0 0 1 1 }
						0 1 0 1 0 0 0 0 }
						0 1 $-\frac{1}{\sqrt{2}}$ $\frac{1}{\sqrt{2}}$ 0 0 0 0 }
							Rt{
							Wt{
							Ht
								0 1 1 2 0 1 2 1 }
								−1 1 −1 1 −1 0 0 0 }
								8
									Xe
									54
										Flipped
										Triad fpi=2 D_8 R fp_sm=8→0CH
										{1, 2, 3}, {1, 4, 5}, {1, 7, 6},
										{2, 7, 4}, {2, 5, 6}, {3, 4, 6}, {3, 5, 7}{2, 6, 4}, {2, 5, 7}, {3, 4, 7}, {3, 5
										flat triad/mask bits
										{1, 3, 2, 4, 5, 7, 6}
										{0, 0, 1, 1, 0, 0, 0}
											Not Flipped
											Triad fpi=1 D_8 R fp_sm=5→0FH
											{1, 3, 2}, {1, 5, 4}, {1, 7, 6},
											{2, 7, 4}, {3, 4, 6}, {3, 5, 7}{2, 6, 4}, {2, 5, 7}, {3, 4, 7}, {3, 5
											flat triad/mask bits
											{1, 3, 2, 5, 4, 7, 6}
											{1, 1, 1, 1, 0, 0, 0}

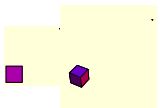
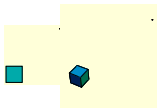
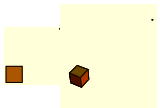
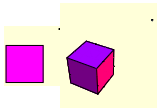
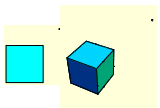
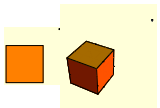
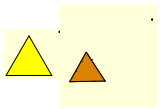
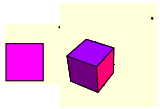
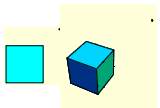
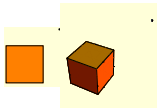
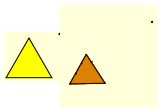
205	c_T 0
	g_l R
			{D8, E7, D7, E6, D6, E5, D5, E4, D4, F4s, H4Φ, snub24H4Φ, D3, D3}	0apggssec
				001000110_2
					Bn{
					E8{
					Ph{
						0 1 1 0 1 1 1 0 }
						0 1 1 0 0 0 0 0 }
						0 1 $\frac{1}{\sqrt{2}}$ $\frac{1}{\sqrt{2}}$ 0 0 0 0 }
							Rt{
							Wt{
							Ht
								0 1 2 2 0 1 2 1 }
								−1 0 1 0 −1 0 0 0 }
								9
									Nd
									60
										Flipped
										Triad fpi=5 D_8 R fp_sm=7→13H
										{1, 3, 2}, {1, 7, 4}, {1, 5, 6},
										{2, 4, 5}, {2, 7, 6}, {3, 4, 6}, {3, 5, 7}{2, 5, 4}, {2, 7, 6}, {3, 4, 7}, {3, 5
										flat triad/mask bits
										{1, 2, 3, 7, 4, 5, 6}
										{1, 1, 0, 0, 1, 0, 0}
											Not Flipped
											Triad fpi=3 D_8 R fp_sm=4→1AH
											{1, 2, 3}, {1, 6, 4}, {1, 5, 7},
											{2, 4, 5}, {2, 7, 6}, {3, 4, 6}, {3, 5, 7}{2, 5, 4}, {2, 7, 6}, {3, 4, 7}, {3, 5
											flat triad/mask bits
											{1, 2, 3, 6, 4, 5, 7}
											{0, 1, 0, 1, 1, 0, 0}

206	$\overline{\omega_R}$ 0
	g_m R
			{D8, E7, D7, E6, D6, E5, D5, E4, D4, F4s, H4Φ, snub24H4Φ, D3, D3, D2}	0apggssec
				011001110_2
					Bn{
					E8{
					Ph{
						0 1 1 0 1 1 0 1 }
						1 −1 0 0 0 0 0 0 }
						1 −1 0 0 0 0 0 0 }
							Rt{
							Wt{
							Ht
								1 0 0 0 0 0 0 0 }
								2 −1 0 0 0 0 0 0 }
								1
									O
									8
										Flipped
										Triad fpi=3 D_8 R fp_sm=4→48H
										{1, 2, 3}, {1, 4, 6}, {1, 5, 7},
										{2, 5, 4}, {2, 6, 7}, {3, 4, 7}, {3, 6, 5}{2, 4, 5}, {2, 6, 7}, {3, 4, 6}, {3, 7
										flat triad/mask bits
										{1, 3, 2, 4, 6, 5, 7}
										{0, 0, 0, 1, 0, 0, 1}
											Not Flipped
											Triad fpi=5 D_8 R fp_sm=7→41H
											{1, 3, 2}, {1, 5, 6},
											{2, 5, 4}, {2, 6, 7}, {3, 4, 6}, {3, 7
											flat triad/mask bits
											{1, 3, 2, 4, 7, 5, 6}
											{1, 0, 0, 0, 0, 0, 1}

Seq #	Symbol	2D/3D Shape	Groups	Particle Quantum Bits	Binary / E8 / Physics Coordinates	Algebra Root Weight / Height / RtH=Atomic Element Number -->	Ele #	Octonions: Flipped	Octonions: Not Flipped
207	${}^{c}_{T}\phi^{0}_{g_d}$		{D8, E7, D7, E6, D6, E5, D5, E4, D4, F4s, H4Φ, snub24H4Φ, D3, D3}	0apggssec 001000010_2	Bn{ 0 1 1 0 1 0 1 1 } E8{ 1 0 −1 0 0 0 0 0 } Ph{ 1 0 $-\frac{1}{\sqrt{2}}$ $-\frac{1}{\sqrt{2}}$ 0 0 0 0 }	Rt{ 1 1 0 0 0 0 0 0 } Wt{ 1 1 −1 0 0 0 0 0 } Ht 2	P 15	Triad fpi=5 D_8 R fp_sm=7→0DH {1, 3, 2}, {1, 4, 7}, {1, 6, 5}, {2, 5, 4}, {2, 6, 7}, {3, 4, 6}, {3, 5, 7} flat triad/mask bits {1, 2, 3, 4, 7, 6, 5} {1, 0, 1, 1, 0, 0, 0}	Triad fpi=3 D_8 R fp_sm=4→04H {1, 2, 3}, {1, 4, 6}, {1, 7, 5}, {2, 4, 5}, {2, 6, 7}, {3, 4, 7}, {3, 5 flat triad/mask bits {1, 2, 3, 4, 6, 7, 5} {0, 0, 1, 0, 0, 0, 0}
208	$\overline{{}^{c}_{T}\phi^{0}_{b_l}}$		{D8, E7, D7, E6, D6, E5, D5, D4, F4s, H4Φ, snub24H4Φ}	0apggssec 011000111_2	Bn{ 0 1 1 0 0 1 1 1 } E8{ 1 0 0 −1 0 0 0 0 } Ph{ 1 0 $\frac{1}{\sqrt{2}}$ $-\frac{1}{\sqrt{2}}$ 0 0 0 0 }	Rt{ 1 1 1 0 0 0 0 0 } Wt{ 1 0 1 −1 0 0 0 0 } Ht 3	Ti 22	Triad fpi=6 D_8 R fp_sm=6→6FH {1, 3, 2}, {1, 7, 4}, {1, 6, 5}, {2, 6, 4}, {2, 5, 7}, {3, 5, 4}, {3, 7, 6} flat triad/mask bits {1, 2, 3, 7, 4, 6, 5} {1, 1, 1, 1, 0, 1, 1}	Triad fpi=9 D_8 R fp_sm=6→6FH {1, 4, 2}, {1, 6, 3}, {1, 7, 5}, {2, 6, 7}, {2, 5, 3}, {3, 7, 4}, {4, 6 flat triad/mask bits {1, 4, 2, 6, 3, 7, 5} {1, 1, 1, 1, 0, 1, 1}
209	$\overline{{}^{\mu}_{y_m}}^{+}$		{D8, E7, D7, E6, D6, D5, H4Φ, 24cell, 16Cell, dualSnub24, 24cellH4Φ, 16cellH4Φ}	0apggssec 010101100_2	Bn{ 0 1 0 1 1 1 1 0 } E8{ 1 0 0 0 −1 0 0 0 } Ph{ 1 0 0 0 −1 0 0 0 }	Rt{ 1 1 1 1 0 0 0 0 } Wt{ 1 0 0 1 0 0 −1 0 } Ht 4	Cu 29	Triad fpi=15 D_8 L fp_sm=3→4EH {1, 2, 5}, {1, 6, 3}, {1, 7, 4}, {2, 4, 3}, {2, 6, 7}, {3, 5, 7}, {4, 6, 5} flat triad/mask bits {1, 5, 2, 6, 3, 7, 4} {0, 1, 1, 1, 0, 0, 1}	Triad fpi=16 D_8 L fp_sm=3→4EH {1, 2, 5}, {1, 6, 3}, {1, 7, 4}, {2, 4, 3}, {2, 6, 7}, {3, 5, 7}, {5, 7 flat triad/mask bits {1, 2, 5, 6, 3, 7, 4} {0, 1, 1, 1, 0, 0, 1}
210	${}^{c}_{r_m}^{2/3}$		{D8, E7, D7, D6, H4Φ, dualSnub24, 24cellE8Φ, 16cellE8Φ, snub24H4Φ}	0apggssec 001101001_2	Bn{ 0 1 0 1 1 1 0 1 } E8{ 1 0 0 0 0 −1 0 0 } Ph{ 1 0 0 0 0 $-\frac{1}{\sqrt{3}}$ $\frac{1}{\sqrt{2}}$ $\frac{1}{\sqrt{6}}$ }	Rt{ 1 1 1 1 0 0 1 0 } Wt{ 1 0 0 0 0 −1 1 −1 } Ht 5	Kr 36	Triad fpi=19 D_8 R fp_sm=3→28H {1, 2, 6}, {1, 3, 4}, {1, 5, 7}, {2, 5, 3}, {2, 4, 7}, {3, 7, 6}, {4, 5, 6} flat triad/mask bits {1, 6, 2, 3, 4, 5, 7} {0, 0, 0, 1, 0, 1, 0}	Triad fpi=17 D_8 R fp_sm=8→21H {1, 5, 2}, {1, 3, 7}, {1, 4, 6}, {2, 4, 3}, {2, 6, 7}, {3, 5, 6}, {4, 5 flat triad/mask bits {1, 5, 2, 3, 7, 4, 6} {1, 0, 0, 0, 0, 1, 0}
211	${}^{c}_{E_m}^{2/3}$		{D8, D7, H4Φ, dualSnub24, snub24H4Φ}	0apggssec 001101010_2	Bn{ 0 1 0 1 1 0 1 1 } E8{ 1 0 0 0 0 0 −1 0 } Ph{ 1 0 0 0 0 $-\frac{1}{\sqrt{3}}$ $-\frac{1}{\sqrt{2}}$ $\frac{1}{\sqrt{6}}$ }	Rt{ 1 1 1 1 0 0 1 1 } Wt{ 1 0 0 0 0 −1 0 1 } Ht 6	Mo 42	Triad fpi=20 D_8 R fp_sm=1→2AH {1, 2, 6}, {1, 4, 3}, {1, 5, 7}, {2, 7, 3}, {2, 4, 5}, {3, 6, 5}, {4, 6, 7} flat triad/mask bits {1, 6, 2, 4, 3, 5, 7} {0, 1, 0, 1, 0, 1, 0}	Triad fpi=18 D_8 R fp_sm=6→23H {1, 5, 2}, {1, 7, 3}, {1, 4, 6}, {2, 4, 5}, {3, 6, 5}, {4, 6, 7}, {2, 3 flat triad/mask bits {1, 5, 2, 7, 3, 4, 6} {1, 1, 0, 0, 0, 1, 0}
212	${}^{c}_{b_m}^{2/3}$		{D8, H4Φ, dualSnub24, snub24H4Φ}	0apggssec 001101011_2	Bn{ 0 1 0 1 0 1 1 1 } E8{ 1 0 0 0 0 0 0 −1 } Ph{ 1 0 0 0 0 $-\frac{1}{\sqrt{3}}$ 0 $-\sqrt{\frac{2}{3}}$ }	Rt{ 2 3 4 5 2 4 6 3 } Wt{ 1 0 0 0 0 0 0 0 } Ht 29	Ubn 120	Triad fpi=21 D_8 R fp_sm=6→23H {1, 6, 2}, {1, 5, 3}, {1, 4, 7}, {2, 3, 4}, {2, 5, 7}, {3, 7, 6}, {4, 5, 6} flat triad/mask bits {1, 2, 6, 5, 3, 4, 7} {1, 1, 0, 0, 0, 1, 0}	Triad fpi=22 D_8 R fp_sm=6→23H {1, 6, 2}, {1, 5, 3}, {1, 4, 7}, {2, 3, 4}, {2, 5, 7}, {3, 6, 5}, {4, 6 flat triad/mask bits {1, 6, 2, 5, 3, 4, 7} {1, 1, 0, 0, 0, 1, 0}
213	$\overline{{}^{s}_{m_m}}^{1/3}$		{D8, H4Φ, dualSnub24, snub24H4Φ}	0apggssec 010101111_2	Bn{ 0 1 0 0 1 1 1 1 } E8{ 1 0 0 0 0 0 0 1 } Ph{ 1 0 0 0 0 $\frac{1}{\sqrt{3}}$ 0 $\sqrt{\frac{2}{3}}$ }	Rt{ 0 −1 −2 −3 −2 −3 −4 −2 } Wt{ 1 0 0 0 −1 0 0 0 } Ht 17	— Bk 97	Triad fpi=21 D_8 L fp_sm=6→45H {1, 6, 2}, {1, 3, 5}, {1, 7, 4}, {2, 3, 4}, {2, 5, 7}, {3, 6, 7}, {4, 6, 5} flat triad/mask bits {1, 2, 6, 3, 5, 7, 4} {1, 0, 1, 0, 0, 0, 1}	Triad fpi=22 D_8 L fp_sm=6→45H {1, 6, 2}, {1, 3, 5}, {1, 7, 4}, {2, 3, 4}, {2, 5, 7}, {3, 6, 7}, {4, 6, 5} flat triad/mask bits {1, 6, 2, 3, 5, 7, 4} {1, 0, 1, 0, 0, 0, 1}
214	$\overline{{}^{s}_{c_m}}^{1/3}$		{D8, D7, H4Φ, dualSnub24, snub24H4Φ}	0apggssec 010101110_2	Bn{ 0 0 1 1 1 1 1 0 } E8{ 1 0 0 0 0 0 1 0 } Ph{ 1 0 0 0 0 $\frac{1}{\sqrt{3}}$ $\frac{1}{\sqrt{2}}$ $-\frac{1}{\sqrt{6}}$ }	Rt{ 1 1 1 1 0 1 1 0 } Wt{ 1 0 0 0 −1 1 0 −1 } Ht 6	Tc 43	Triad fpi=20 D_8 L fp_sm=1→4CH {1, 2, 6}, {1, 3, 4}, {1, 7, 5}, {2, 7, 3}, {2, 4, 5}, {3, 5, 6}, {4, 7, 6} flat triad/mask bits {1, 6, 2, 3, 4, 7, 5} {0, 0, 1, 1, 0, 0, 1}	Triad fpi=18 D_8 L fp_sm=6→45H {1, 5, 2}, {1, 3, 7}, {1, 6, 4}, {2, 4, 3}, {2, 6, 7}, {3, 5, 6}, {4, 7, 6} flat triad/mask bits {1, 5, 2, 3, 7, 6, 4} {1, 0, 1, 0, 0, 0, 1}
215	$\overline{{}^{s}_{o_m}}^{1/3}$		{D8, E7, D7, D6, H4Φ, dualSnub24, snub24H4Φ}	0apggssec 010101101_2	Bn{ 0 0 1 1 1 1 1 0 } E8{ 1 0 0 0 0 1 0 0 } Ph{ 1 0 0 0 0 $\frac{1}{\sqrt{3}}$ $-\frac{1}{\sqrt{2}}$ $-\frac{1}{\sqrt{6}}$ }	Rt{ 1 1 1 1 0 1 1 1 } Wt{ 1 0 0 0 −1 1 −1 1 } Ht 7	In 49	Triad fpi=19 D_8 L fp_sm=3→4EH {1, 2, 6}, {1, 4, 3}, {1, 7, 5}, {2, 5, 3}, {2, 4, 7}, {3, 6, 7}, {4, 6, 5} flat triad/mask bits {1, 6, 2, 4, 3, 7, 5} {0, 1, 1, 1, 0, 0, 1}	Triad fpi=17 D_8 L fp_sm=8→47H {1, 5, 2}, {1, 7, 3}, {1, 6, 4}, {2, 4, 3}, {2, 6, 7}, {3, 5, 6}, {4, 7 flat triad/mask bits {1, 5, 2, 7, 3, 6, 4} {1, 1, 1, 0, 0, 0, 1}
216	${}^{\gamma_\mu}_{w_m}^{0}$		{D8, E7, D7, E6, D6, D5, H4, snub24, altSnub24, snub24E8, 24cellH4, 16cellH4}	0apggssec 001101000_2	Bn{ 0 0 1 1 1 0 1 1 } E8{ 1 0 0 0 1 0 0 0 } Ph{ 1 0 0 0 1 0 0 0 }	Rt{ 1 1 1 1 0 1 2 1 } Wt{ 1 0 0 −1 −1 0 1 0 } Ht 8	Cs 55	Triad fpi=15 D_8 R fp_sm=3→28H {1, 2, 5}, {1, 3, 6}, {1, 4, 7}, {2, 4, 3}, {2, 6, 7}, {3, 7, 5}, {4, 5, 6} flat triad/mask bits {1, 5, 2, 3, 6, 4, 7} {0, 0, 0, 1, 0, 1, 0}	Triad fpi=16 D_8 R fp_sm=3→28H {1, 2, 5}, {1, 3, 6}, {1, 4, 7}, {2, 4, 3}, {2, 6, 7}, {3, 5, 6}, {5, 6 flat triad/mask bits {1, 2, 5, 3, 6, 4, 7} {0, 0, 0, 1, 0, 1, 0}
217	${}^{c_S}_{b_d}\phi^{0}$		{D8, E7, D7, E6, D6, E5, D5, D4, F4s, H4Φ, snub24H4Φ}	0apggssec 001000011_2	Bn{ 0 0 1 1 0 1 1 1 } E8{ 1 0 0 1 0 0 0 0 } Ph{ 1 0 $-\frac{1}{\sqrt{2}}$ $\frac{1}{\sqrt{2}}$ 0 0 0 0 }	Rt{ 1 1 1 2 0 1 2 1 } Wt{ 1 0 −1 1 −1 0 0 0 } Ht 9	Sm 62	Triad fpi=9 D_8 R fp_sm=6→0EH {1, 2, 4}, {1, 6, 3}, {1, 7, 5}, {2, 5, 3}, {2, 6, 7}, {3, 4, 7}, {4, 5, 6} flat triad/mask bits {1, 4, 2, 6, 3, 7, 5} {0, 1, 1, 1, 0, 0, 0}	Triad fpi=6 D_8 R fp_sm=6→0EH {1, 2, 3}, {1, 7, 4}, {1, 6, 5}, {2, 5, 7}, {3, 4, 7}, {4, 5, 6}, {2, 6 flat triad/mask bits {1, 2, 3, 7, 4, 6, 5} {0, 1, 1, 1, 0, 0, 0}
218	${}^{c_S}_{r_m}\phi^{0}$		{D8, E7, D7, E6, D6, E5, D5, E4, D4, F4s, H4Φ, snub24H4Φ, D3, D3}	0apggssec 001001001_2	Bn{ 0 0 1 0 1 1 1 1 } E8{ 1 0 1 0 0 0 0 0 } Ph{ 1 0 $\frac{1}{\sqrt{2}}$ $\frac{1}{\sqrt{2}}$ 0 0 0 0 }	Rt{ 1 1 2 2 0 1 2 1 } Wt{ 1 −1 1 0 −1 0 0 0 } Ht 10	Er 68	Triad fpi=8 D_8 R fp_sm=8→21H {1, 3, 2}, {1, 4, 5}, {1, 6, 7}, {2, 4, 7}, {2, 5, 6}, {3, 6, 4}, {3, 5, 7} flat triad/mask bits {1, 2, 3, 4, 5, 6, 7} {1, 0, 0, 0, 0, 1, 0}	Triad fpi=1 D_8 R fp_sm=5→22H {1, 2, 3}, {1, 5, 4}, {1, 6, 7}, {2, 4, 7}, {2, 5, 6}, {3, 5, 7}, {3, 7, 4} flat triad/mask bits {1, 2, 3, 5, 4, 6, 7} {0, 1, 0, 0, 0, 1, 0}
219	${}^{W}_{b_m}^{0}$		{D8, E7, D7, E6, D6, E5, D5, E4, D4, F4s, H4Φ, snub24H4Φ, D3, D3, D2}	0apggssec 001001111_2	Bn{ 0 0 0 1 1 1 1 1 } E8{ 1 1 0 0 0 0 0 0 } Ph{ 1 1 0 0 0 0 0 0 }	Rt{ 1 2 2 2 0 1 2 1 } Wt{ 0 1 0 0 −1 0 0 0 } Ht 11	W 74	Triad fpi=9 D_8 R fp_sm=6→3DH {1, 4, 2}, {1, 3, 6}, {1, 7, 5}, {2, 5, 3}, {2, 7, 6}, {3, 7, 4}, {4, 5, 6} flat triad/mask bits {1, 2, 4, 3, 6, 7, 5} {1, 0, 1, 1, 1, 1, 0}	Triad fpi=6 D_8 R fp_sm=6→3DH {1, 3, 2}, {1, 4, 7}, {1, 6, 5}, {2, 5, 7}, {3, 4, 6}, {2, 7, 5}, {3, 5, 4}, {3, 6 flat triad/mask bits {1, 3, 2, 4, 7, 6, 5} {1, 0, 1, 1, 1, 1, 0}

pascalRow@7

Seq #	Symbol	2D/3D Shape	Groups	Particle Quantum Bits	Binary / E8 / Physics Coordinates	Algebra Root Weight / Height / RtH=Atomic Element Number -->	Ele #	Octonions: Flipped	Octonions: Not Flipped
220	$\overline{{}^{u}_{r_l}}^{-2/3}$		{BC8, E7, 6Cube, C4, H4Φ, dualSnub24, snub24H4Φ}	0apggssec 011010101_2	Bn{ 1 1 1 1 1 1 0 0 } E8{ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $-\frac{1}{2}$ $-\frac{1}{2}$ } Ph{ $\frac{1}{2}$ $\frac{1}{2}$ 0 $\frac{1}{\sqrt{2}}$ $\frac{1}{2}$ $-\frac{1}{2\sqrt{3}}$ $-\frac{1}{\sqrt{2}}$ $-\frac{1}{\sqrt{6}}$ }	Rt{ 1 2 3 4 1 3 5 3 } Wt{ 0 0 0 0 −1 0 0 1 } Ht 22	Rg 111	Triad fpi=8 BC_8 R fp_sm=2→67H {1, 4, 2}, {1, 5, 3}, {1, 7, 6}, {2, 3, 7}, {2, 5, 6}, {3, 6, 4}, {4, 7, 5} flat triad/mask bits {1, 2, 4, 5, 3, 7, 6} {1, 1, 1, 0, 0, 1, 1}	Triad fpi=10 BC_8 R fp_sm=5→6EH {1, 2, 4}, {1, 6, 3}, {1, 7, 5}, {2, 3, 7}, {2, 5, 6}, {3, 6, 4}, {4, 7, 5} flat triad/mask bits {1, 2, 4, 6, 3, 7, 5} {0, 1, 1, 1, 0, 1, 1}

221	$\overline{\overset{u}{g}}_{l}^{\,-2/3}\,\hat{R}$		{BC8, 6Cube, H4Φ, dualSnub24, snub24H4Φ}	$0_{\text{apggsscc}}\,011010110_2$	Bn{	1	1	1	1	1	0	1	0 }	Rt{	1	2	3	4	1	3	5	2 }	Mt 109	Flipped Triad fpi=11 BC_8 $\overline{R}$ fp_sm=1→66H {1, 2, 4}, {1, 7, 3}, {1, 6, 5}, {2, 3, 5}, {2, 6, 7}, {3, 6, 4}, {4, 7, 5} flat triad/mask bits {1, 4, 2, 7, 3, 6, 5} {0, 1, 1, 0, 0, 1, 1}	Not Flipped Triad fpi=12 BC_8 $\overline{R}$ fp_sm=4→65H {1, 4, 2}, {1, 3, 7}, {1, 6, 5}, {2, 3, 6}, {2, 5, 7}, {3, 5, 4}, {4, 7, flat triad/mask bits {1, 4, 2, 3, 7, 6, 5} {1, 0, 1, 0, 0, 1, 1}
					E8{	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$ }	Wt{	0	0	0	0	−1	0	1	−1 }							
					Ph{	$\frac{1}{2}$	$\frac{1}{2}$	0	$\frac{1}{\sqrt{2}}$	$\frac{1}{2}$	$-\frac{1}{2\sqrt{3}}$	$\frac{1}{\sqrt{2}}$	$-\frac{1}{\sqrt{6}}$ }	Ht	21														
222	$\overline{\overset{u}{b}}_{l}^{\,-2/3}\,\hat{R}$		{BC8, H4Φ, dualSnub24, snub24H4Φ}	$0_{\text{apggsscc}}\,011010111_2$	Bn{	1	1	1	1	1	0	0	1 }	Rt{	0	0	0	0	−1	−1	0	0 }	Na 11	Flipped Triad fpi=14 BC_8 $\overline{R}$ fp_sm=7→6CH {1, 2, 5}, {1, 3, 4}, {1, 7, 6}, {2, 7, 3}, {2, 4, 6}, {3, 6, 5}, {4, 7, 5} flat triad/mask bits {1, 5, 2, 3, 4, 7, 6} {0, 0, 1, 1, 0, 1, 1}	Not Flipped Triad fpi=13 BC_8 $\overline{R}$ fp_sm=6→6FH {1, 5, 2}, {1, 4, 3}, {1, 7, 6}, {2, 3, 6}, {2, 4, 7}, {3, 7, 5}, {4, 6, flat triad/mask bits {1, 5, 2, 4, 3, 7, 6} {1, 1, 1, 1, 0, 1, 1}
					E8{	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$ }	Wt{	0	0	0	0	−1	−1	1	0 }							
					Ph{	$\frac{1}{2}$	$\frac{1}{2}$	0	$\frac{1}{\sqrt{2}}$	$\frac{1}{2}$	$-\frac{1}{2\sqrt{3}}$	0	$\sqrt{\frac{2}{3}}$ }	Ht	2														
223	$\overset{d}{\overset{\vee}{m}}_{d}^{\,-1/3}\,\hat{L}$		{BC8, 6Cube, H4Φ, dualSnub24, snub24H4Φ}	$0_{\text{apggsscc}}\,000010011_2$	Bn{	1	1	1	1	0	1	1	0 }	Rt{	1	2	3	4	1	3	4	2 }	Hs 108	Flipped Triad fpi=14 BC_8 $\overline{E}$ fp_sm=7→0AH {1, 2, 5}, {1, 4, 3}, {1, 6, 7}, {2, 7, 3}, {2, 4, 6}, {3, 5, 6}, {4, 5, 7} flat triad/mask bits {1, 5, 2, 4, 3, 6, 7} {0, 1, 0, 1, 0, 0, 0}	Not Flipped Triad fpi=13 BC_8 $\overline{E}$ fp_sm=6→09H {1, 5, 2}, {1, 3, 4}, {1, 6, 7}, {2, 3, 6}, {2, 4, 7}, {3, 5, 7}, {4, 5, flat triad/mask bits {1, 5, 2, 3, 4, 6, 7} {1, 0, 0, 1, 0, 0, 0}
					E8{	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$ }	Wt{	0	0	0	1	−1	1	−1	0 }							
					Ph{	$\frac{1}{2}$	$\frac{1}{2}$	0	$\frac{1}{\sqrt{2}}$	$-\frac{1}{2}$	$\frac{1}{2\sqrt{3}}$	0	$-\sqrt{\frac{2}{3}}$ }	Ht	20														
224	$\overset{d}{\overset{\vee}{c}}_{d}^{\,-1/3}\,\hat{L}$		{BC8, H4Φ, dualSnub24, snub24H4Φ}	$0_{\text{apggsscc}}\,000010010_2$	Bn{	1	1	1	1	0	1	0	1 }	Rt{	0	0	0	0	−1	−1	−1	0 }	Cl 17	Flipped Triad fpi=11 BC_8 $\overline{E}$ fp_sm=1→00H {1, 2, 4}, {1, 3, 7}, {1, 5, 6}, {2, 3, 5}, {2, 6, 7}, {3, 4, 6}, {4, 5, 7} flat triad/mask bits {1, 4, 2, 3, 7, 5, 6} {0, 0, 0, 0, 0, 0, 0}	Not Flipped Triad fpi=12 BC_8 $\overline{E}$ fp_sm=4→03H {1, 4, 2}, {1, 7, 3}, {1, 5, 6}, {2, 3, 6}, {2, 5, 7}, {3, 4, 5}, {4, 6, flat triad/mask bits {1, 4, 2, 7, 3, 5, 6} {1, 1, 0, 0, 0, 0, 0}
					E8{	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$ }	Wt{	0	0	0	1	−1	0	−1	1 }							
					Ph{	$\frac{1}{2}$	$\frac{1}{2}$	0	$\frac{1}{\sqrt{2}}$	$-\frac{1}{2}$	$\frac{1}{2\sqrt{3}}$	$-\frac{1}{\sqrt{2}}$	$\frac{1}{\sqrt{6}}$ }	Ht	3														
225	$\overset{d}{\overset{\vee}{a}}_{d}^{\,-1/3}\,\hat{L}$		{BC8, E7, H4Φ, dualSnub24, snub24H4Φ}	$0_{\text{apggsscc}}\,000010001_2$	Bn{	1	1	1	1	0	0	1	1 }	Rt{	0	0	0	0	−1	−1	−1	−1 }	V 23	Flipped Triad fpi=8 BC_8 $\overline{E}$ fp_sm=2→01H {1, 4, 2}, {1, 3, 5}, {1, 6, 7}, {2, 3, 7}, {2, 5, 6}, {3, 4, 6}, {4, 5, 7} flat triad/mask bits {1, 2, 4, 3, 5, 6, 7} {1, 0, 0, 0, 0, 0, 0}	Not Flipped Triad fpi=10 BC_8 $\overline{E}$ fp_sm=5→08H {1, 4, 2}, {1, 3, 6}, {1, 5, 7}, {2, 4, 7}, {2, 5, 6}, {3, 4, 5}, {4, 6, flat triad/mask bits {1, 2, 4, 3, 6, 5, 7} {0, 0, 0, 1, 0, 0, 0}
					E8{	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$ }	Wt{	0	0	0	1	−1	0	0	−1 }							
					Ph{	$\frac{1}{2}$	$\frac{1}{2}$	0	$\frac{1}{\sqrt{2}}$	$-\frac{1}{2}$	$\frac{1}{2\sqrt{3}}$	$\frac{1}{\sqrt{2}}$	$\frac{1}{\sqrt{6}}$ }	Ht	4														
226	$\overset{b}{\overset{\vee}{m}}_{m}^{\,-1/3}\,\hat{R}$		{BC8, 6Cube, H4, snub24, altSnub24, cellE8, 24cellH4}	$0_{\text{apggsscc}}\,000111111_2$	Bn{	1	1	1	0	1	1	1	0 }	Rt{	1	2	3	3	1	3	4	2 }	Db 105	Flipped Triad fpi=30 BC_8 $\overline{E}$ fp_sm=6→3AH {1, 2, 7}, {1, 6, 3}, {1, 4, 5}, {2, 5, 3}, {2, 6, 4}, {3, 7, 4}, {5, 6, 7} flat triad/mask bits {1, 7, 2, 6, 3, 4, 5} {0, 1, 0, 1, 1, 1, 0}	Not Flipped Triad fpi=28 BC_8 $\overline{E}$ fp_sm=3→31H {1, 7, 2}, {1, 5, 3}, {1, 4, 6}, {2, 6, 3}, {2, 5, 4}, {3, 7, 4}, {5, 6, flat triad/mask bits {1, 2, 7, 3, 5, 4, 6} {1, 0, 0, 0, 1, 1, 0}
					E8{	$\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$ }	Wt{	0	0	1	−1	−1	1	0	0 }							
					Ph{	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{\sqrt{2}}$	0	$\frac{1}{2}$	$\frac{1}{2\sqrt{3}}$	0	$-\sqrt{\frac{2}{3}}$ }	Ht	19														
227	$\overset{b}{\overset{\vee}{c}}_{m}^{\,-1/3}\,\hat{R}$		{BC8, H4, snub24, altSnub24, cellE8, snub24H4}	$0_{\text{apggsscc}}\,000111110_2$	Bn{	1	1	1	0	1	1	0	1 }	Rt{	0	0	0	−1	−1	−1	−1	0 }	Mn 25	Flipped Triad fpi=27 BC_8 $\overline{E}$ fp_sm=4→30H {1, 2, 7}, {1, 3, 5}, {1, 4, 6}, {2, 3, 4}, {2, 6, 5}, {3, 7, 6}, {4, 5, 7} flat triad/mask bits {1, 7, 2, 3, 5, 4, 6} {0, 0, 0, 0, 1, 1, 0}	Not Flipped Triad fpi=29 BC_8 $\overline{E}$ fp_sm=7→39H {1, 7, 2}, {1, 3, 6}, {1, 4, 5}, {2, 4, 3}, {2, 6, 5}, {3, 5, 4}, {4, 6, flat triad/mask bits {1, 7, 2, 3, 6, 4, 5} {1, 0, 0, 1, 1, 1, 0}
					E8{	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$ }	Wt{	0	0	1	−1	−1	0	0	1 }							
					Ph{	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{\sqrt{2}}$	0	$\frac{1}{2}$	$\frac{1}{2\sqrt{3}}$	$-\frac{1}{\sqrt{2}}$	$\frac{1}{\sqrt{6}}$ }	Ht	4														
228	$\overset{b}{\overset{\vee}{o}}_{m}^{\,-1/3}\,\hat{R}$		{BC8, E7, H4Φ, dualSnub24, snub24H4Φ}	$0_{\text{apggsscc}}\,000111101_2$	Bn{	1	1	1	0	1	0	1	1 }	Rt{	0	0	0	−1	−1	−1	−1	−1 }	Ga 31	Flipped Triad fpi=25 BC_8 $\overline{E}$ fp_sm=5→3BH {1, 7, 2}, {1, 4, 3}, {1, 5, 6}, {2, 5, 3}, {2, 6, 4}, {3, 7, 6}, {4, 5, 7} flat triad/mask bits {1, 2, 7, 4, 3, 5, 6} {1, 1, 0, 1, 1, 1, 0}	Not Flipped Triad fpi=26 BC_8 $\overline{E}$ fp_sm=8→38H {1, 2, 7}, {1, 3, 4}, {1, 5, 6}, {2, 5, 3}, {2, 6, 4}, {3, 7, 6}, {4, 5, 7} flat triad/mask bits {1, 2, 7, 3, 4, 5, 6} {0, 0, 0, 1, 1, 1, 0}
					E8{	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$ }	Wt{	0	0	1	−1	−1	0	1	−1 }							
					Ph{	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{\sqrt{2}}$	0	$\frac{1}{2}$	$\frac{1}{2\sqrt{3}}$	$\frac{1}{\sqrt{2}}$	$\frac{1}{\sqrt{6}}$ }	Ht	5														
229	$\overset{\tau}{\overset{\vee}{y}}_{m}^{\,-}\,\hat{R}$		{BC8, E7, E6, H4, snub24, altSnub24, cellE8, snub24H4}	$0_{\text{apggsscc}}\,000111100_2$	Bn{	1	1	1	0	0	1	1	1 }	Rt{	0	0	0	−1	−1	−1	−2	−1 }	Rb 37	Flipped Triad fpi=24 BC_8 $\overline{E}$ fp_sm=3→31H {1, 6, 2}, {1, 3, 7}, {1, 4, 5}, {2, 3, 5}, {2, 7, 4}, {3, 6, 4}, {5, 6, 7} flat triad/mask bits {1, 2, 6, 3, 7, 4, 5} {1, 0, 0, 0, 1, 1, 0}	Not Flipped Triad fpi=23 BC_8 $\overline{E}$ fp_sm=2→32H {1, 6, 2}, {1, 7, 3}, {1, 4, 5}, {2, 7, 5}, {3, 6, 5}, {3, 6, 4}, {4, 6, flat triad/mask bits {1, 2, 6, 7, 3, 4, 5} {0, 1, 0, 0, 1, 1, 0}
					E8{	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$ }	Wt{	0	0	1	0	−1	1	−1	0 }							
					Ph{	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{\sqrt{2}}$	0	$-\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	0	0 }	Ht	6														
230	$\overset{b}{\hat{m}}_{m}^{\,-1/3}\,\hat{L}$		{BC8, 6Cube, H4Φ, dualSnub24, snub24H4Φ}	$0_{\text{apggsscc}}\,000111011_2$	Bn{	1	1	0	1	1	1	1	0 }	Rt{	1	2	2	3	1	3	4	2 }	No 102	Flipped Triad fpi=30 BC_8 $\overline{E}$ fp_sm=6→24H {1, 2, 7}, {1, 3, 6}, {1, 5, 4}, {2, 3, 5}, {2, 4, 6}, {3, 7, 4}, {5, 6, 7} flat triad/mask bits {1, 7, 2, 3, 6, 5, 4} {0, 0, 1, 0, 0, 1, 0}	Not Flipped Triad fpi=28 BC_8 $\overline{E}$ fp_sm=3→2FH {1, 7, 2}, {1, 5, 3}, {1, 6, 4}, {2, 6, 3}, {2, 4, 5}, {3, 7, 4}, {5, 6, flat triad/mask bits {1, 2, 7, 5, 3, 6, 4} {1, 1, 1, 1, 0, 1, 0}
					E8{	$\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$ }	Wt{	0	1	−1	0	−1	1	0	0 }							
					Ph{	$\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{\sqrt{2}}$	0	$\frac{1}{2}$	$\frac{1}{2\sqrt{3}}$	0	$-\sqrt{\frac{2}{3}}$ }	Ht	18														
231	$\overset{b}{\hat{c}}_{m}^{\,-1/3}\,\hat{L}$		{BC8, H4, snub24, altSnub24, snub24E8, 24cellH4}	$0_{\text{apggsscc}}\,000111010_2$	Bn{	1	1	0	1	1	1	0	1 }	Rt{	0	0	−1	−1	−1	−1	−1	0 }	As 33	Flipped Triad fpi=27 BC_8 $\overline{E}$ fp_sm=4→2EH {1, 2, 7}, {1, 5, 3}, {1, 6, 4}, {2, 4, 3}, {2, 5, 6}, {3, 7, 6}, {4, 5, 7} flat triad/mask bits {1, 7, 2, 6, 3, 5, 4} {0, 1, 1, 1, 0, 1, 0}	Not Flipped Triad fpi=29 BC_8 $\overline{E}$ fp_sm=7→27H {1, 7, 2}, {1, 6, 3}, {1, 5, 4}, {2, 4, 3}, {2, 5, 6}, {3, 7, 5}, {4, 6, flat triad/mask bits {1, 7, 2, 6, 3, 5, 4} {1, 1, 1, 0, 0, 1, 0}
					E8{	$\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$ }	Wt{	0	1	−1	0	−1	0	0	1 }							
					Ph{	$\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{\sqrt{2}}$	0	$\frac{1}{2}$	$\frac{1}{2\sqrt{3}}$	$-\frac{1}{\sqrt{2}}$	$\frac{1}{\sqrt{6}}$ }	Ht	5														
232	$\overset{b}{\hat{o}}_{m}^{\,-1/3}\,\hat{L}$		{BC8, E7, H4, snub24, altSnub24, snub24E8, snub24H4}	$0_{\text{apggsscc}}\,000111001_2$	Bn{	1	1	0	1	1	0	1	1 }	Rt{	0	0	−1	−1	−1	−1	−1	−1 }	Y 39	Flipped Triad fpi=25 BC_8 $\overline{E}$ fp_sm=5→25H {1, 7, 2}, {1, 3, 4}, {1, 6, 5}, {2, 3, 5}, {2, 4, 6}, {3, 7, 6}, {4, 5, 7} flat triad/mask bits {1, 2, 7, 3, 4, 6, 5} {1, 0, 1, 0, 0, 1, 0}	Not Flipped Triad fpi=26 BC_8 $\overline{E}$ fp_sm=8→26H {1, 2, 7}, {1, 4, 3}, {1, 6, 5}, {2, 3, 5}, {2, 4, 6}, {3, 7, 6}, {4, 5, 7} flat triad/mask bits {1, 2, 7, 4, 3, 6, 5} {0, 1, 1, 0, 0, 1, 0}
					E8{	$\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$ }	Wt{	0	1	−1	0	−1	0	1	−1 }							
					Ph{	$\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{\sqrt{2}}$	0	$\frac{1}{2}$	$\frac{1}{2\sqrt{3}}$	$\frac{1}{\sqrt{2}}$	$\frac{1}{\sqrt{6}}$ }	Ht	6														
233	$\overset{\tau}{\hat{y}}_{m}^{\,-}\,\hat{L}$		{BC8, E7, E6, H4, snub24, altSnub24, snub24E8, snub24H4}	$0_{\text{apggsscc}}\,000111000_2$	Bn{	1	1	0	1	0	1	1	1 }	Rt{	0	0	−1	−1	−1	−1	−2	−1 }	Rh 45	Flipped Triad fpi=24 BC_8 $\overline{E}$ fp_sm=3→2FH {1, 6, 2}, {1, 7, 3}, {1, 5, 4}, {2, 5, 3}, {2, 4, 7}, {3, 6, 4}, {5, 6, 7} flat triad/mask bits {1, 2, 6, 7, 3, 5, 4} {1, 1, 1, 1, 0, 1, 0}	Not Flipped Triad fpi=23 BC_8 $\overline{E}$ fp_sm=2→2CH {1, 6, 2}, {1, 3, 7}, {1, 5, 4}, {2, 5, 7}, {3, 6, 5}, {3, 6, 4}, {4, 6, flat triad/mask bits {1, 2, 6, 3, 7, 5, 4} {0, 0, 1, 1, 0, 1, 0}
					E8{	$\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$ }	Wt{	0	1	−1	1	−1	1	−1	0 }							
					Ph{	$\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{\sqrt{2}}$	0	$-\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	0	0 }	Ht	7														
234	$\overset{-}{\overset{e}{y}}_{l}^{\,+}\,\hat{R}$		{BC8, E7, E6, E5, H4, snub24, altSnub24, snub24E8, snub24H4}	$0_{\text{apggsscc}}\,010010100_2$	Bn{	1	1	0	0	1	1	1	1 }	Rt{	0	0	−1	−2	−1	−1	−2	−1 }	Tc 52	Flipped Triad fpi=7 BC_8 $\overline{E}$ fp_sm=3→63H {1, 4, 2}, {1, 5, 3}, {1, 6, 7}, {2, 3, 6}, {2, 5, 7}, {3, 7, 4}, {4, 6, 5} flat triad/mask bits {1, 2, 4, 5, 3, 6, 7} {1, 1, 0, 0, 0, 1, 1}	Not Flipped Triad fpi=4 BC_8 $\overline{E}$ fp_sm=3→63H {1, 3, 2}, {1, 6, 4}, {1, 5, 7}, {2, 4, 7}, {2, 5, 6}, {3, 5, 4}, {3, 7, flat triad/mask bits {1, 3, 2, 6, 4, 5, 7} {1, 1, 0, 0, 0, 1, 1}
					E8{	$\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$ }	Wt{	0	1	0	−1	−1	1	0	0 }							
					Ph{	$\frac{1}{2}$	$\frac{1}{2}$	0	$-\frac{1}{\sqrt{2}}$	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	0	0 }	Ht	8														

235	$\overset{b}{m}_{l}{}^{\hat{}}{}^{-1/3}_{R}$	{BC8, 6Cube, H4, snub24, altSnub24, snub24E8, snub24H4}	$0apggsscc_{2}$ 000110111	Bn{	1	0	1	1	1	1	1	0	}	Rt{	1	1	2	3	1	3	4	2	}	Cf 98	Flipped Triad fpi=30 BC_8 E fp_sm=6→17H {1, 7, 2}, {1, 6, 3}, {1, 5, 4}, {2, 3, 5}, {2, 6, 4}, {3, 4, 7}, {5, 6, 7}{2, 6, 3}, {2, 5, 4}, {3, 4, 7}, {5, 6, flat triad/mask bits {1, 2, 7, 6, 3, 5, 4} {1, 1, 1, 0, 1, 0, 0}	Not Flipped Triad fpi=28 BC_8 E fp_sm=3→1CH {1, 2, 7}, {1, 3, 5}, {1, 6, 4}, {2, 3, 5}, {2, 6, 4}, {3, 4, 7}, {5, 6, 7}{2, 6, 3}, {2, 5, 4}, {3, 4, 7}, {5, 6, flat triad/mask bits {1, 7, 2, 3, 5, 6, 4} {0, 0, 1, 1, 1, 0, 0}
				E8{	$\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}\sqrt{\frac{2}{3}}$	}	Wt{	1	−1	0	0	−1	1	0	0	}			
				Ph{	$\frac{1}{2}$	$-\frac{1}{2}$	0	$\frac{1}{\sqrt{2}}$	$\frac{1}{2}$	$\frac{1}{2\sqrt{3}}$	0	$-\sqrt{\frac{2}{3}}$	}	Ht	17											
236	$\overset{b}{c}_{l}{}^{\hat{}}{}^{-1/3}_{R}$	{BC8, H4Φ, dualSnub24, snub24H4Φ}	$0apggsscc_{2}$ 000110110	Bn{	1	0	1	1	1	1	0	1	}	Rt{	0	−1	−1	−1	−1	−1	−1	0	}	Nb 41	Flipped Triad fpi=27 BC_8 E fp_sm=4→1DH {1, 7, 2}, {1, 3, 5}, {1, 6, 4}, {2, 4, 3}, {2, 6, 5}, {3, 6, 7}, {4, 5, 7}{2, 3, 4}, {2, 6, 5}, {3, 5, 7}, {4, 6, flat triad/mask bits {1, 2, 7, 3, 5, 6, 4} {1, 0, 1, 1, 1, 0, 0}	Not Flipped Triad fpi=29 BC_8 E fp_sm=7→14H {1, 2, 7}, {1, 3, 6}, {1, 5, 4}, {2, 4, 3}, {2, 6, 5}, {3, 6, 7}, {4, 5, 7}{2, 3, 4}, {2, 6, 5}, {3, 5, 7}, {4, 6, flat triad/mask bits {1, 2, 7, 3, 6, 5, 4} {0, 0, 1, 0, 1, 0, 0}
				E8{	$\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	}	Wt{	1	−1	0	0	−1	0	0	1	}			
				Ph{	$\frac{1}{2}$	$-\frac{1}{2}$	0	$\frac{1}{\sqrt{2}}$	$\frac{1}{2}$	$\frac{1}{2\sqrt{3}}$	$-\frac{1}{\sqrt{2}}$	$\frac{1}{\sqrt{6}}$	}	Ht	6											
237	$\overset{b}{o}_{l}{}^{\hat{}}{}^{-1/3}_{R}$	{BC8, E7, H4, snub24, altSnub24, snub24E8, 24cellH4}	$0apggsscc_{2}$ 000110101	Bn{	1	0	1	1	1	0	1	1	}	Rt{	0	−1	−1	−1	−1	−1	−1	−1	}	Cd 48	Flipped Triad fpi=25 BC_8 E fp_sm=5→16H {1, 2, 7}, {1, 4, 3}, {1, 6, 5}, {2, 3, 5}, {2, 6, 4}, {3, 6, 7}, {4, 5, 7}{2, 3, 6}, {2, 5, 4}, {3, 5, 7}, {4, 6, flat triad/mask bits {1, 7, 2, 4, 3, 6, 5} {0, 1, 1, 0, 1, 0, 0}	Not Flipped Triad fpi=26 BC_8 E fp_sm=8→15H {1, 7, 2}, {1, 3, 4}, {1, 6, 5}, {2, 3, 5}, {2, 6, 4}, {3, 6, 7}, {4, 5, 7}{2, 3, 6}, {2, 5, 4}, {3, 5, 7}, {4, 6, flat triad/mask bits {1, 7, 2, 3, 4, 6, 5} {1, 0, 1, 0, 1, 0, 0}
				E8{	$\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	}	Wt{	1	−1	0	0	−1	0	1	−1	}			
				Ph{	$\frac{1}{2}$	$-\frac{1}{2}$	0	$\frac{1}{\sqrt{2}}$	$\frac{1}{2}$	$\frac{1}{2\sqrt{3}}$	$\frac{1}{\sqrt{2}}$	$\frac{1}{\sqrt{6}}$	}	Ht	7											
238	$\overset{\tau}{y}_{l}{}^{\hat{}}{}^{-}_{R}$	{BC8, E7, E6, H4, snub24, altSnub24, snub24E8, snub24H4}	$0apggsscc_{2}$ 000110100	Bn{	1	0	1	1	0	1	1	1	}	Rt{	0	−1	−1	−1	−1	−1	−2	−1	}	I 53	Flipped Triad fpi=24 BC_8 E fp_sm=3→1CH {1, 2, 6}, {1, 3, 7}, {1, 5, 4}, {2, 5, 3}, {2, 7, 4}, {3, 4, 6}, {5, 6, 7}{2, 4, 3}, {2, 7, 5}, {3, 5, 6}, {4, 6, flat triad/mask bits {1, 6, 2, 3, 7, 5, 4} {0, 0, 1, 1, 1, 0, 0}	Not Flipped Triad fpi=23 BC_8 E fp_sm=2→1FH {1, 6, 2}, {1, 7, 3}, {1, 5, 4}, {2, 5, 3}, {2, 7, 4}, {3, 4, 6}, {5, 6, 7}{2, 4, 3}, {2, 7, 5}, {3, 5, 6}, {4, 6, flat triad/mask bits {1, 6, 2, 7, 3, 5, 4} {1, 1, 1, 1, 1, 0, 0}
				E8{	$\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	}	Wt{	1	−1	0	1	−1	1	−1	0	}			
				Ph{	$\frac{1}{2}$	$-\frac{1}{2}$	0	$\frac{1}{\sqrt{2}}$	$-\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	0	0	}	Ht	8											
239	$\overline{y_{c}}{}^{+}_{m}{}^{\hat{}}_{L}$	{BC8, E7, E6, E5, H4, snub24, altSnub24, snub24E8, snub24H4}	$0apggsscc_{2}$ 010011000	Bn{	1	0	1	0	1	1	1	1	}	Rt{	0	−1	−1	−2	−1	−1	−2	−1	}	Pr 59	Flipped Triad fpi=7 BC_8 E fp_sm=3→50H {1, 2, 4}, {1, 3, 5}, {1, 6, 7}, {2, 3, 6}, {2, 7, 5}, {3, 4, 7}, {4, 6, 5}{2, 4, 7}, {2, 6, 5}, {3, 4, 5}, {3, 7, flat triad/mask bits {1, 4, 2, 3, 5, 6, 7} {0, 0, 0, 0, 1, 0, 1}	Not Flipped Triad fpi=4 BC_8 E fp_sm=3→50H {1, 2, 3}, {1, 4, 6}, {1, 5, 7}, {2, 3, 5}, {2, 7, 6}, {3, 4, 7}, {4, 6, 5}{2, 4, 7}, {2, 6, 5}, {3, 4, 5}, {3, 7, flat triad/mask bits {1, 2, 3, 4, 6, 5, 7} {0, 0, 0, 0, 1, 0, 1}
				E8{	$\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	}	Wt{	1	−1	1	−1	−1	1	0	0	}			
				Ph{	$\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{\sqrt{2}}$	0	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	0	0	}	Ht	9											
240	$\overline{y_{c}}{}^{\theta}_{w_{m}}{}^{\hat{}}_{L}$	{BC8, E7, E6, E5, E4, H4, snub24, altSnub24, snub24E8, snub24H4}	$0apggsscc_{2}$ 011011000	Bn{	1	0	0	1	1	1	1	1	}	Rt{	0	−1	−2	−2	−1	−1	−2	−1	}	Tb 65	Flipped Triad fpi=4 BC_8 R fp_sm=3→57H {1, 3, 2}, {1, 6, 4}, {1, 7, 5}, {2, 4, 7}, {2, 6, 5}, {3, 4, 5}, {3, 7, 6}{2, 3, 6}, {2, 7, 5}, {3, 4, 7}, {4, 6, flat triad/mask bits {1, 2, 3, 6, 4, 7, 5} {1, 1, 1, 0, 1, 0, 1}	Not Flipped Triad fpi=7 BC_8 R fp_sm=3→57H {1, 4, 2}, {1, 5, 3}, {1, 7, 6}, {2, 4, 7}, {2, 6, 5}, {3, 4, 5}, {3, 7, 6}{2, 3, 6}, {2, 7, 5}, {3, 4, 7}, {4, 6, flat triad/mask bits {1, 4, 2, 5, 3, 7, 6} {1, 1, 1, 0, 1, 0, 1}
				E8{	$\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	}	Wt{	1	0	−1	0	−1	1	0	0	}			
				Ph{	$\frac{1}{2}$	$-\frac{1}{2}$	$-\frac{1}{\sqrt{2}}$	0	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	0	0	}	Ht	10											
241	$\overset{b}{m}_{d}{}^{\hat{}}{}^{-1/3}_{L}$	{BC8, 6Cube, H4Φ, dualSnub24, snub24H4Φ}	$0apggsscc_{2}$ 000110011	Bn{	0	1	1	1	1	1	1	0	}	Rt{	0	1	2	3	1	3	4	2	}	Np 93	Flipped Triad fpi=30 BC_8 E fp_sm=6→09H {1, 7, 2}, {1, 3, 6}, {1, 4, 5}, {2, 5, 3}, {2, 4, 6}, {3, 4, 7}, {5, 6, 7}{2, 3, 6}, {2, 4, 5}, {3, 4, 7}, {5, 6, flat triad/mask bits {1, 2, 7, 3, 6, 4, 5} {1, 0, 0, 1, 0, 0, 0}	Not Flipped Triad fpi=28 BC_8 E fp_sm=3→02H {1, 2, 7}, {1, 5, 3}, {1, 4, 6}, {2, 5, 3}, {2, 4, 6}, {3, 4, 7}, {5, 6, 7}{2, 3, 6}, {2, 4, 5}, {3, 4, 7}, {5, 6, flat triad/mask bits {1, 7, 2, 5, 3, 4, 6} {0, 1, 0, 0, 0, 0, 0}
				E8{	$-\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}\sqrt{\frac{2}{3}}$	}	Wt{	−1	0	0	0	−1	1	0	0	}			
				Ph{	$-\frac{1}{2}$	$\frac{1}{2}$	0	$\frac{1}{\sqrt{2}}$	$\frac{1}{2}$	$\frac{1}{2\sqrt{3}}$	0	$-\sqrt{\frac{2}{3}}$	}	Ht	16											
242	$\overset{b}{c}_{d}{}^{\hat{}}{}^{-1/3}_{L}$	{BC8, H4Φ, dualSnub24, snub24H4Φ}	$0apggsscc_{2}$ 000110010	Bn{	0	1	1	1	1	1	0	1	}	Rt{	−1	−1	−1	−1	−1	−1	−1	0	}	Sn 50	Flipped Triad fpi=27 BC_8 E fp_sm=4→03H {1, 7, 2}, {1, 5, 3}, {1, 4, 6}, {2, 3, 4}, {2, 5, 6}, {3, 6, 7}, {4, 5, 7}{2, 4, 3}, {2, 5, 6}, {3, 5, 7}, {4, 6, flat triad/mask bits {1, 2, 7, 5, 3, 4, 6} {1, 1, 0, 0, 0, 0, 0}	Not Flipped Triad fpi=29 BC_8 E fp_sm=7→0AH {1, 2, 7}, {1, 6, 3}, {1, 4, 5}, {2, 3, 4}, {2, 5, 6}, {3, 6, 7}, {4, 5, 7}{2, 4, 3}, {2, 5, 6}, {3, 5, 7}, {4, 6, flat triad/mask bits {1, 2, 7, 6, 3, 4, 5} {0, 1, 0, 1, 0, 0, 0}
				E8{	$-\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	}	Wt{	−1	0	0	0	−1	0	0	1	}			
				Ph{	$-\frac{1}{2}$	$\frac{1}{2}$	0	$\frac{1}{\sqrt{2}}$	$\frac{1}{2}$	$\frac{1}{2\sqrt{3}}$	$-\frac{1}{\sqrt{2}}$	$\frac{1}{\sqrt{6}}$	}	Ht	7											
243	$\overset{b}{o}_{d}{}^{\hat{}}{}^{-1/3}_{L}$	{BC8, E7, H4Φ, dualSnub24, snub24H4Φ}	$0apggsscc_{2}$ 000110001	Bn{	0	1	1	1	1	0	1	1	}	Rt{	−1	−1	−1	−1	−1	−1	−1	−1	}	Ba 56	Flipped Triad fpi=25 BC_8 E fp_sm=5→08H {1, 2, 7}, {1, 3, 4}, {1, 5, 6}, {2, 5, 3}, {2, 4, 6}, {3, 6, 7}, {4, 5, 7}{2, 6, 3}, {2, 4, 5}, {3, 5, 7}, {4, 6, flat triad/mask bits {1, 7, 2, 3, 4, 5, 6} {0, 0, 0, 1, 0, 0, 0}	Not Flipped Triad fpi=26 BC_8 E fp_sm=8→0BH {1, 7, 2}, {1, 4, 3}, {1, 5, 6}, {2, 5, 3}, {2, 4, 6}, {3, 6, 7}, {4, 5, 7}{2, 6, 3}, {2, 4, 5}, {3, 5, 7}, {4, 6, flat triad/mask bits {1, 7, 2, 4, 3, 5, 6} {1, 1, 0, 1, 0, 0, 0}
				E8{	$-\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	}	Wt{	−1	0	0	0	−1	0	1	−1	}			
				Ph{	$-\frac{1}{2}$	$\frac{1}{2}$	0	$\frac{1}{\sqrt{2}}$	$\frac{1}{2}$	$\frac{1}{2\sqrt{3}}$	$\frac{1}{\sqrt{2}}$	$\frac{1}{\sqrt{6}}$	}	Ht	8											
244	$\overset{\tau}{y}_{d}{}^{\hat{}}{}^{-}_{L}$	{BC8, E7, E6, H4, snub24, altSnub24, snub24E8, 24cellH4}	$0apggsscc_{2}$ 000110000	Bn{	0	1	1	1	0	1	1	1	}	Rt{	−1	−1	−1	−1	−1	−1	−2	−1	}	Pm 61	Flipped Triad fpi=24 BC_8 E fp_sm=3→02H {1, 2, 6}, {1, 7, 3}, {1, 4, 5}, {2, 3, 5}, {2, 4, 7}, {3, 4, 6}, {5, 6, 7}{2, 3, 4}, {2, 5, 7}, {3, 5, 6}, {4, 6, flat triad/mask bits {1, 6, 2, 7, 3, 4, 5} {0, 1, 0, 0, 0, 0, 0}	Not Flipped Triad fpi=23 BC_8 E fp_sm=2→01H {1, 6, 2}, {1, 3, 7}, {1, 4, 5}, {2, 3, 5}, {2, 4, 7}, {3, 4, 6}, {5, 6, 7}{2, 3, 4}, {2, 5, 7}, {3, 5, 6}, {4, 6, flat triad/mask bits {1, 6, 2, 3, 7, 4, 5} {1, 0, 0, 0, 0, 0, 0}
				E8{	$-\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	}	Wt{	−1	0	0	1	−1	1	−1	0	}			
				Ph{	$-\frac{1}{2}$	$\frac{1}{2}$	0	$\frac{1}{\sqrt{2}}$	$-\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	0	0	}	Ht	9											
245	$\overline{y_{c}}{}^{+}_{m}{}^{\hat{}}_{R}$	{BC8, E7, E6, E5, H4, snub24, altSnub24, cellE8, snub24H4}	$0apggsscc_{2}$ 010011100	Bn{	0	1	1	0	1	1	1	1	}	Rt{	−1	−1	−1	−2	−1	−1	−2	−1	}	Ho 67	Flipped Triad fpi=7 BC_8 E fp_sm=3→4EH {1, 2, 4}, {1, 5, 3}, {1, 7, 6}, {2, 6, 3}, {2, 5, 7}, {3, 4, 7}, {4, 6, 5}{2, 7, 4}, {2, 5, 6}, {3, 4, 5}, {3, 7, flat triad/mask bits {1, 4, 2, 5, 3, 7, 6} {0, 1, 1, 1, 0, 0, 1}	Not Flipped Triad fpi=4 BC_8 E fp_sm=3→4EH {1, 2, 3}, {1, 6, 4}, {1, 7, 5}, {2, 6, 3}, {2, 5, 7}, {3, 4, 7}, {4, 6, 5}{2, 7, 4}, {2, 5, 6}, {3, 4, 5}, {3, 7, flat triad/mask bits {1, 2, 3, 6, 4, 7, 5} {0, 1, 1, 1, 0, 0, 1}
				E8{	$-\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	}	Wt{	−1	0	1	−1	−1	1	0	0	}			
				Ph{	$-\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{\sqrt{2}}$	0	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	0	0	}	Ht	10											
246	$\overline{y_{c}}{}^{\theta}_{w_{m}}{}^{\hat{}}_{R}$	{BC8, E7, E6, E5, E4, H4, snub24, altSnub24, snub24E8, snub24H4}	$0apggsscc_{2}$ 011011100	Bn{	0	1	0	1	1	1	1	1	}	Rt{	−1	−1	−2	−2	−1	−1	−2	−1	}	Ta 73	Flipped Triad fpi=4 BC_8 R fp_sm=3→49H {1, 3, 2}, {1, 4, 6}, {1, 5, 7}, {2, 7, 4}, {2, 5, 6}, {3, 4, 5}, {3, 7, 6}{2, 6, 3}, {2, 5, 7}, {3, 4, 7}, {4, 6, flat triad/mask bits {1, 2, 3, 4, 6, 5, 7} {1, 0, 0, 1, 0, 0, 1}	Not Flipped Triad fpi=7 BC_8 R fp_sm=3→49H {1, 4, 2}, {1, 3, 5}, {1, 6, 7}, {2, 7, 4}, {2, 5, 6}, {3, 4, 5}, {3, 7, 6}{2, 6, 3}, {2, 5, 7}, {3, 4, 7}, {4, 6, flat triad/mask bits {1, 4, 2, 3, 5, 6, 7} {1, 0, 0, 1, 0, 0, 1}
				E8{	$-\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	}	Wt{	−1	1	−1	0	−1	1	0	0	}			
				Ph{	$-\frac{1}{2}$	$\frac{1}{2}$	$-\frac{1}{\sqrt{2}}$	0	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	0	0	}	Ht	11											
247	$\overline{y_{c}}{}^{\theta}_{w_{d}}{}^{\hat{}}_{L}$	{BC8, E7, E6, E5, E4, H4, snub24, altSnub24, snub24E8, snub24H4}	$0apggsscc_{2}$ 011010000	Bn{	0	0	1	1	1	1	1	1	}	Rt{	−1	−2	−2	−2	−1	−1	−2	−1	}	Au 79	Flipped Triad fpi=4 BC_8 R fp_sm=3→7AH {1, 2, 3}, {1, 6, 4}, {1, 5, 7}, {2, 7, 4}, {2, 6, 5}, {3, 5, 4}, {3, 7, 6}{2, 6, 3}, {2, 7, 5}, {3, 7, 4}, {4, 6, flat triad/mask bits {1, 3, 2, 6, 4, 5, 7} {0, 1, 0, 1, 1, 1, 1}	Not Flipped Triad fpi=7 BC_8 R fp_sm=3→7AH {1, 2, 4}, {1, 5, 3}, {1, 6, 7}, {2, 7, 4}, {2, 6, 5}, {3, 5, 4}, {3, 7, 6}{2, 6, 3}, {2, 7, 5}, {3, 7, 4}, {4, 6, flat triad/mask bits {1, 2, 4, 5, 3, 6, 7} {0, 1, 0, 1, 1, 1, 1}
				E8{	$-\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$	}	Wt{	0	−1	0	0	−1	1	0	0	}			
				Ph{	$-\frac{1}{2}$	$\frac{1}{2}$	0	$\frac{1}{\sqrt{2}}$	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	0	0	}	Ht	12											

pascalRow@8

Seq #	Symbol	2D/3D Shape	Groups	Particle Quantum Bits	Binary / E8 / Physics Coordinates	Algebra Root Weight / Height / Rtt#=Atomic Element Number -->	Ele #	Octonions Flipped	Octonions Not Flipped
248	Ex_2 0 v " " R		{8Ortho}	0apggssce 001001100_2	Bn{ 1 1 1 1 1 1 1 0 } E8{ 1 0 0 0 0 0 0 0 } Ph{ 1 0 0 0 0 0 0 0 }	Rt{ 1 1 1 1 0 $\frac{1}{2}$ 1 $\frac{1}{2}$ } Wt{ 1 0 0 0 $-\frac{1}{2}$ 0 0 0 } Htt 6	Exc 1	Flipped Invalid octonion Fano plane not defined! Invalid octonion Fano plane not defined!	Not Flipped Invalid octonion Fano plane not defined! Invalid octonion Fano plane not defined!
249	Ex_2 0 ^ " " L		{8Ortho}	0apggssce 001001000_2	Bn{ 1 1 1 1 1 1 0 1 } E8{ 0 1 0 0 0 0 0 0 } Ph{ 0 1 0 0 0 0 0 0 }	Rt{ 0 1 1 1 0 $\frac{1}{2}$ 1 $\frac{1}{2}$ } Wt{ −1 1 0 0 $-\frac{1}{2}$ 0 0 0 } Htt 5	Exc 1	Flipped Invalid octonion Fano plane not defined! Invalid octonion Fano plane not defined!	Not Flipped Invalid octonion Fano plane not defined! Invalid octonion Fano plane not defined!
250	Ex_2 0 ^ " " R		{8Ortho}	0apggssce 001000100_2	Bn{ 1 1 1 1 1 0 1 1 } E8{ 0 0 1 0 0 0 0 0 } Ph{ 0 0 $\frac{1}{\sqrt{2}}$ $\frac{1}{\sqrt{2}}$ 0 0 0 0 }	Rt{ 0 0 1 1 0 $\frac{1}{2}$ 1 $\frac{1}{2}$ } Wt{ 0 −1 1 0 $-\frac{1}{2}$ 0 0 0 } Htt 4	Exc 1	Flipped Invalid octonion Fano plane not defined! Invalid octonion Fano plane not defined!	Not Flipped Invalid octonion Fano plane not defined! Invalid octonion Fano plane not defined!
251	Ex_2 0 v " " L		{8Ortho}	0apggssce 001000000_2	Bn{ 1 1 1 1 0 1 1 1 } E8{ 0 0 0 1 0 0 0 0 } Ph{ 0 0 $-\frac{1}{\sqrt{2}}$ $\frac{1}{\sqrt{2}}$ 0 0 0 0 }	Rt{ 0 0 0 1 0 $\frac{1}{2}$ 1 $\frac{1}{2}$ } Wt{ 0 0 −1 1 $-\frac{1}{2}$ 0 0 0 } Htt 3	Exc 1	Flipped Invalid octonion Fano plane not defined! Invalid octonion Fano plane not defined!	Not Flipped Invalid octonion Fano plane not defined! Invalid octonion Fano plane not defined!
252	Ex_1 0 v " " R		{8Ortho}	0apggssce 000001100_2	Bn{ 1 1 1 0 1 1 1 1 } E8{ 0 0 0 0 1 0 0 0 } Ph{ 0 0 0 0 1 0 0 0 }	Rt{ 0 0 0 0 0 $\frac{1}{2}$ 1 $\frac{1}{2}$ } Wt{ 0 0 0 −1 $-\frac{1}{2}$ 0 1 0 } Htt 2	Exc 1	Flipped Invalid octonion Fano plane not defined! Invalid octonion Fano plane not defined!	Not Flipped Invalid octonion Fano plane not defined! Invalid octonion Fano plane not defined!
253	Ex_1 0 ^ " " L		{8Ortho}	0apggssce 000001000_2	Bn{ 1 1 0 1 1 1 1 1 } E8{ 0 0 0 0 0 1 0 0 } Ph{ 0 0 0 0 0 $\frac{1}{\sqrt{3}}$ $-\frac{1}{\sqrt{2}}$ $-\frac{1}{\sqrt{6}}$ }	Rt{ 0 0 0 0 0 $\frac{1}{2}$ 0 $\frac{1}{2}$ } Wt{ 0 0 0 0 $-\frac{1}{2}$ 1 −1 1 } Htt 1	Exc 1	Flipped Invalid octonion Fano plane not defined! Invalid octonion Fano plane not defined!	Not Flipped Invalid octonion Fano plane not defined! Invalid octonion Fano plane not defined!
254	Ex_1 0 ^ " " R		{8Ortho}	0apggssce 000000100_2	Bn{ 1 0 1 1 1 1 1 1 } E8{ 0 0 0 0 0 0 1 0 } Ph{ 0 0 0 0 0 $\frac{1}{\sqrt{3}}$ $\frac{1}{\sqrt{2}}$ $-\frac{1}{\sqrt{6}}$ }	Rt{ 0 0 0 0 0 $\frac{1}{2}$ 0 $-\frac{1}{2}$ } Wt{ 0 0 0 0 $-\frac{1}{2}$ 1 0 −1 } Htt 0	$\overline{\text{Exc}}$ 1	Flipped Invalid octonion Fano plane not defined! Invalid octonion Fano plane not defined!	Not Flipped Invalid octonion Fano plane not defined! Invalid octonion Fano plane not defined!
255	Ex_1 0 v " " L		{8Ortho}	0apggssce 000000000_2	Bn{ 0 1 1 1 1 1 1 1 } E8{ 0 0 0 0 0 0 0 1 } Ph{ 0 0 0 0 0 $\frac{1}{\sqrt{3}}$ 0 $\sqrt{\frac{2}{3}}$ }	Rt{ −1 −2 −3 −4 −2 $-\frac{7}{2}$ −5 $-\frac{5}{2}$ } Wt{ 0 0 0 0 $-\frac{1}{2}$ 0 0 0 } Htt 23	$\overline{\text{Exc}}$ 1	Flipped Invalid octonion Fano plane not defined! Invalid octonion Fano plane not defined!	Not Flipped Invalid octonion Fano plane not defined! Invalid octonion Fano plane not defined!

pascalRow@9

Seq #	Symbol	2D/3D Shape	Groups	Particle Quantum Bits	Binary / E8 / Physics Coordinates	Algebra Root Weight / Height / Rtt#=Atomic Element Number -->	Ele #	Octonions Flipped	Octonions Not Flipped
256	$\overline{\gamma_e}$ 0 ^ $\overline{w_1}$ R		{BC8, E7, E6, E5, E4, H4, snub24, altSnub24, snub24E8, 24cellH4, Hamming, Idempot}	0apggssce 011010100_2	Bn{ 1 1 1 1 1 1 1 1 } E8{ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ } Ph{ $\frac{1}{2}$ $\frac{1}{2}$ 0 $\frac{1}{\sqrt{2}}$ $\frac{1}{2}$ $\frac{\sqrt{3}}{2}$ 0 0 }	Rt{ 0 0 0 0 −1 0 0 0 } Wt{ 0 0 0 0 −2 1 0 0 } Htt 1	$\overline{\text{Be}}$ 4	Flipped Triad fpi=4 BC_8 fp_sm=3→64H {1, 2, 3}, {1, 4, 6}, {1, 7, 5}, {2, 4, 7}, {2, 5, 6}, {3, 5, 4}, {3, 7, 6} flat triad/mask bits {1, 3, 2, 4, 6, 7, 5} {0, 0, 1, 0, 0, 1, 1}	Not Flipped Triad fpi=7 BC_8 fp_sm=3→64H {1, 2, 4}, {1, 3, 5}, {1, 7, 6}, {2, 3, 6}, {2, 5, 7}, {3, 7, 4}, {4, 6, 5} flat triad/mask bits {1, 2, 4, 3, 5, 7, 6} {0, 0, 1, 0, 0, 1, 1}