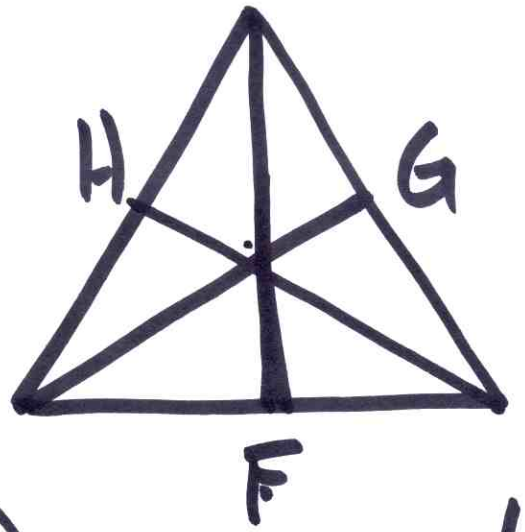
⊗	I	A	B	F	G	H
I						
A						
B						
F						
G						
H						



$$\underline{I} = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix} \qquad A = \frac{1}{2}\begin{pmatrix} -1 & -\sqrt{3} \\ \sqrt{3} & -1 \end{pmatrix}$$

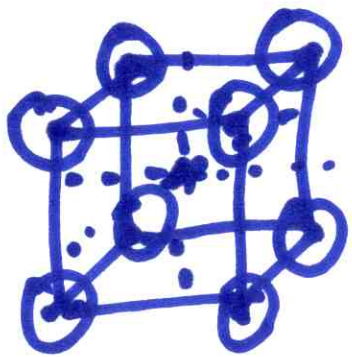
$$B = \frac{1}{2}\begin{pmatrix} -1 & \sqrt{3} \\ -\sqrt{3} & -1 \end{pmatrix} \qquad F = \begin{pmatrix} -1 & 0 \\ 0 & 1 \end{pmatrix} \qquad G = \frac{1}{2}\begin{pmatrix} 1 & -\sqrt{3} \\ -\sqrt{3} & -1 \end{pmatrix}$$

$$H = \frac{1}{2}\begin{pmatrix} 1 & \sqrt{3} \\ \sqrt{3} & -1 \end{pmatrix}$$

Lattice - Points in space - Periodic

Motif

Unit cell



Crystal structure

Centre of symmetry - Inversion

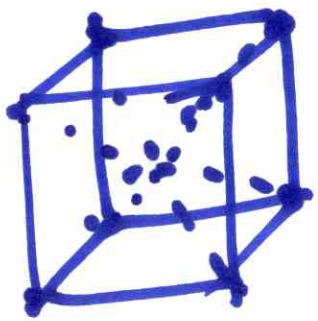
$(x, y, z) \longrightarrow (-x, -y, -z)$

Inversion

Mirror plane

1, 2, 3, 4, or 6-fold rot. n-fold $\frac{2\pi}{n}$.

1, 2, 3, 4, or 6-fold inversion.



$\frac{2\pi}{n}$ rotation, choose a point on the rotation axis — do an inversion about that point.

Physical

Response $\longleftrightarrow$ Stimuli

Property

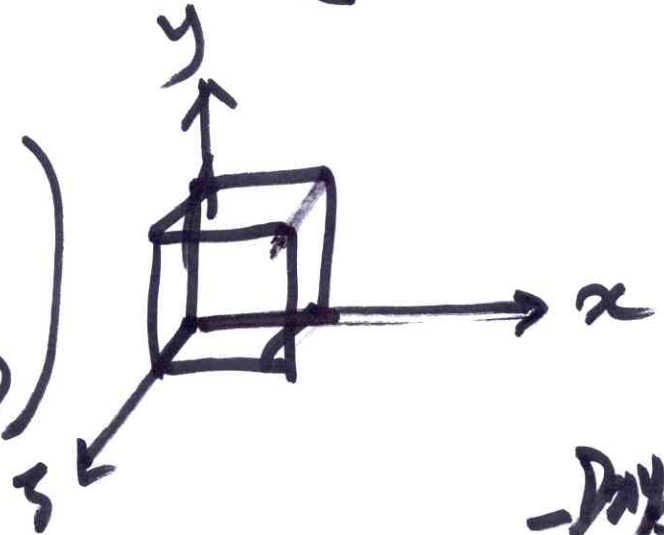
$$\bar{J} = -\underline{\underline{D}}\,\nabla C$$

$D\delta_{ij}$

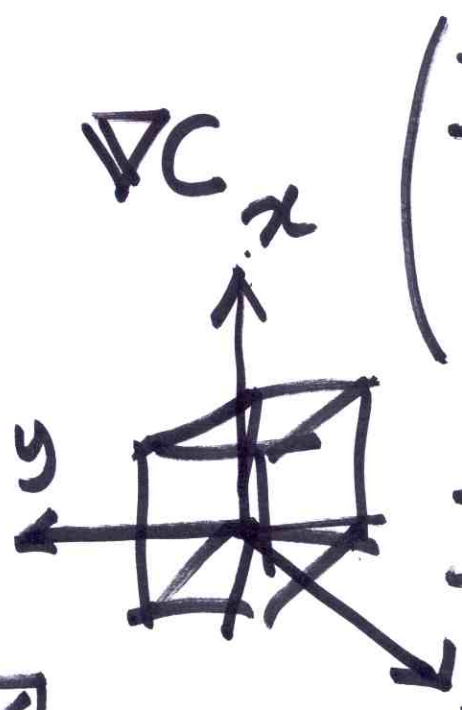
$$\begin{pmatrix} D & 0 & 0 \\ 0 & D & 0 \\ 0 & 0 & D \end{pmatrix}$$

$D\underline{\underline{I}}$

$$\underline{\underline{=}}$$

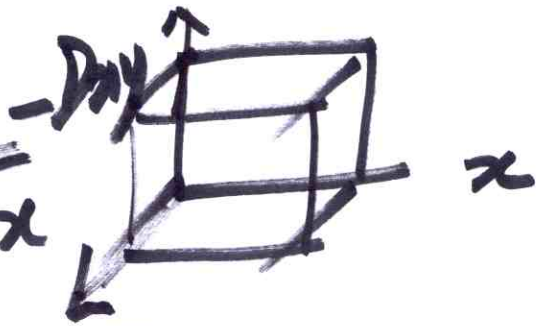


$$\begin{pmatrix} D_x & 0 \\ 0 & D_x \end{pmatrix}$$



$$D_x \underbrace{\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}}$$

$D_x \delta_{ij}$.



$D_{xy} = -D_{yx}$

$D_{ij} = D_{ji}$

$D_{xx} = D_{yy}$

$D_{xy} = 0$

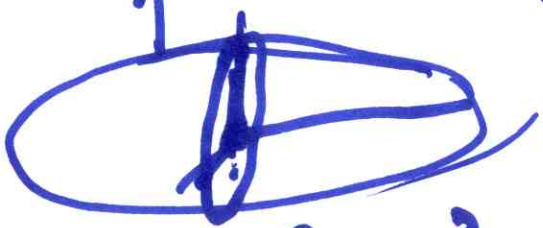
$$S_{ij}\, x_i\, x_j = 1$$

$$S_{11}x_1^2 + S_{22}x_2^2 + S_{33}x_3^2 +$$

$$2S_{12}x_1x_2 + 2S_{13}x_1x_3 + 2S_{23}x_2x_3 = 1$$

Symmetric II rank tensor.

Sphere



$$\boxed{S_{ij}\, x_i\, x_j = 1}$$

Representation quadric

$$\frac{x_1^2}{a^2} + \frac{x_2^2}{b^2} + \frac{x_3^2}{c^2} = 1 \qquad S_1x_1^2 + S_2x_2^2 + S_3x_3^2 = 1$$

Isotropic