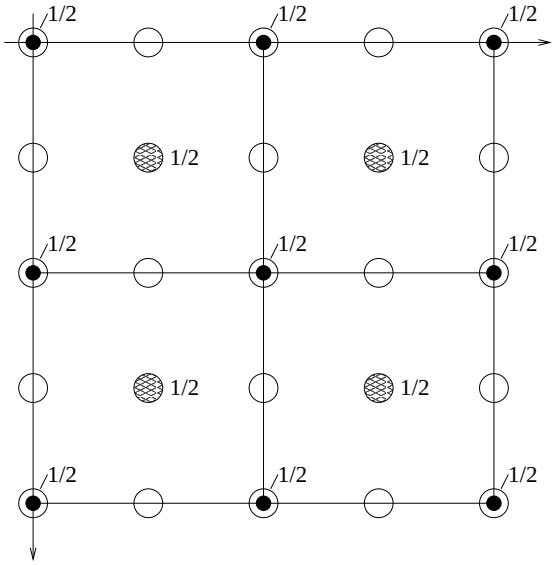
Question A1, 1999:

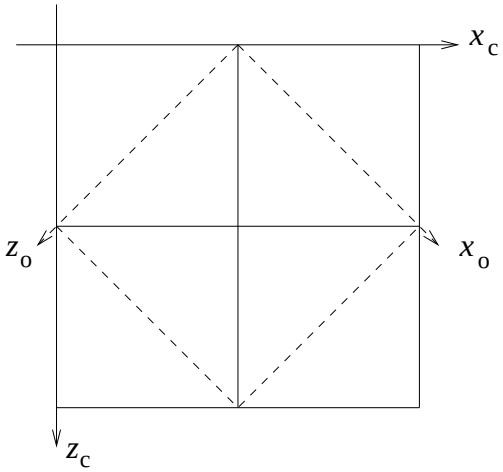
Crystal system: all crystalline solids fall into one of 7 crystal system, defined on the basis of some minimum defining symmetry (e.g. 4 triads // < 111 > in cubic). This determines the shape of the unit cell/

Bravais Lattice: there are 4 types of lattice: P, I, F or C (or A, B) that are combined with the 7 crystals systems to give 14 Bravais lattices. Why not 28 ? Because certain are equivalent (e.g. tetragonal C=P).

Projection:



Coordination and coordination polyhedra: Ti is [6] by oxygen, Ca is [12] by oxygen. The structure can be seen as a network of corner-sharing TiO_6 octahedra, each TiO_6 octahedra joined to 6 others.



b_o can be parallel to a_c, b_c or c_c, in each case there are two possibilities for the orientation of a_o. Therefore 6 twin domains.

$(101)_c$ gives $(200)_o$ or $(002)_o$

$(200)_c$ gives $(\bar{2}02)_o$ or $(202)_o$

$(\bar{1}10)_c$ gives $(\bar{1}11)_o$ or $(\bar{1}1\bar{1})_o$