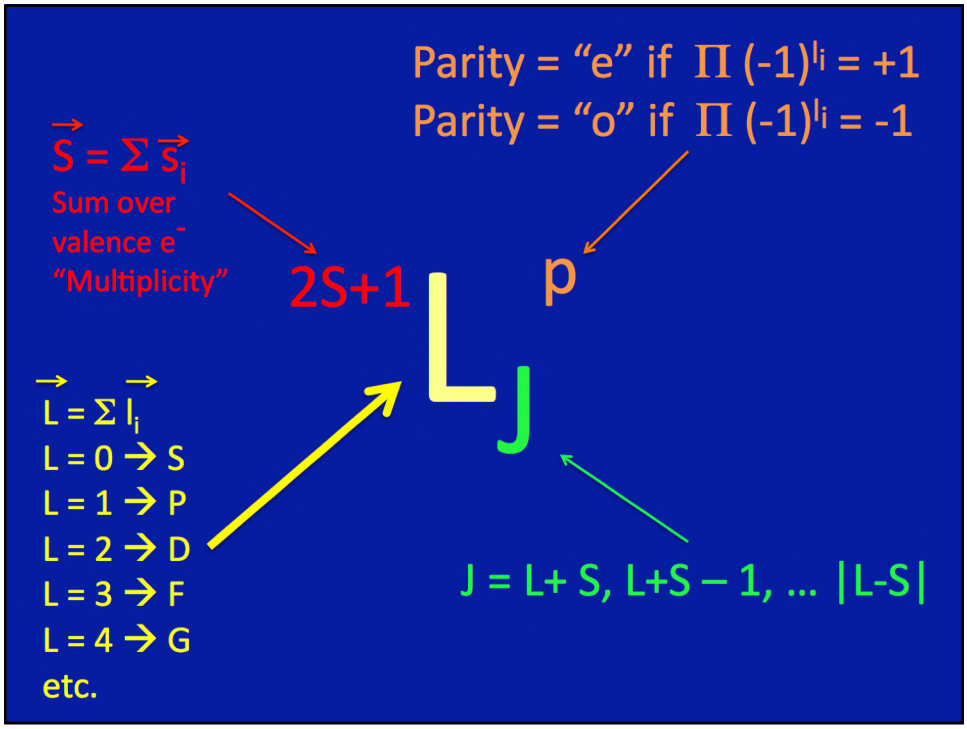
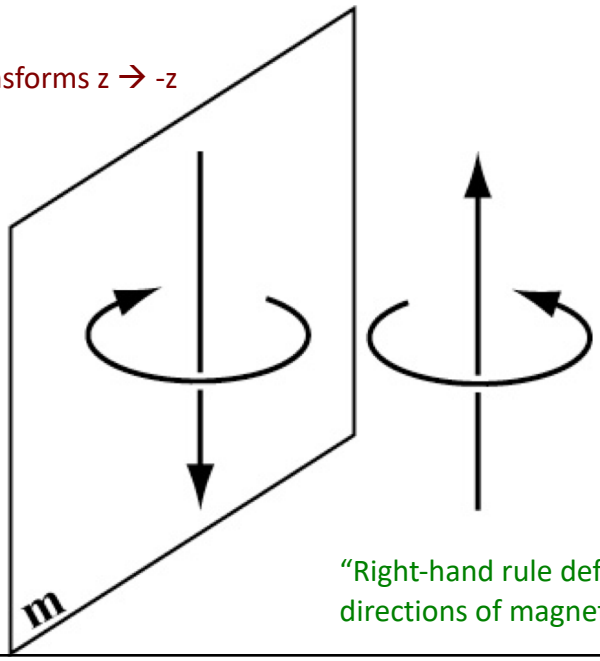
Hund's Rules

- RULE 1: The term(s) arising from the ground electronic conifguration with the maximum multiplicity (2S+1) lies lowest in energy
- RULE 2: Of several levels with the same multiplicity. The one with the maximum value of L lies lowest in energy
- RULE 3: Of several sublevels with the same multiplicity and total quantum number L:
  - (a) the sublevel with the minimum value of J lies lowest in energy if the configuration has a shell that is less than half-filled
  - (b) the sublevel with the maximum value of J lies lowest in energy if the configuration has a shell that is more than half-filled



Mirror Image of Magnetic Dipole

Mirror transforms z → -z



"Right-hand rule defines directions of magnetic dipole

Parity Rules for Multipole Transitions

Parity Behavior for Multipole Operators

k	pole	Name	Parity Electric	Parity Magnetic
1	2^1	dipole	odd	even
2	2^2	quadrupole	even	odd
3	2^3	octupole	odd	even

Table 2.2
Allowed Transition Multipoles

	Electric	Magnetic	Allowed k
Parity	must change	cannot change	$k = 1, 3, \cdots$
Parity	cannot change	must change	$k = 2, 4, \cdots$