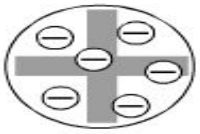
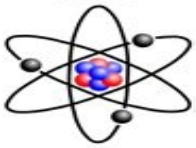
Atomic Structure

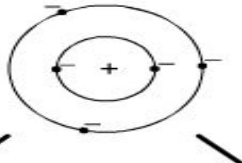
1904
Plum Pudding Model
Electrons embedded in positive charge



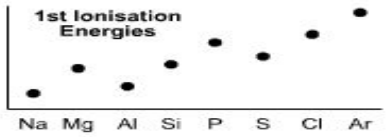
1911
Rutherford Experiment
Tiny, very dense, positive nucleus
Diffuse electron cloud (unexplained)

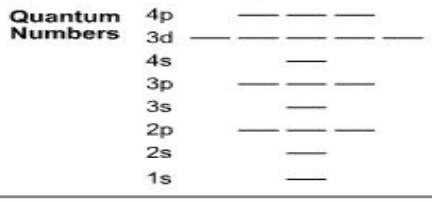


1913
Bohr Planetry Model
A first explanation of atomic spectra
Primitive first atom



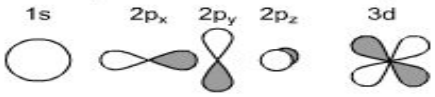
physics ***chemistry***





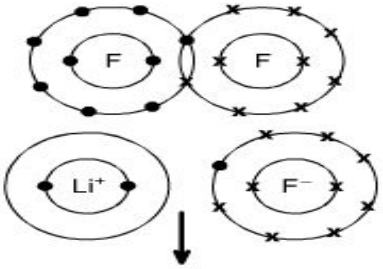
1924
De Broglie: Electron is a wave

1926
Schrodinger Wave Equation
Explanation of 1s, 2s, 2p, etc.
Orbitals percieved to have shape:



Molecular Orbital Theory
FMO Theory

1916-23
Lewis Octet Theory
Covalent bonding
(Ionic bonding)



Lewis theory is all about counting electrons and noting & exploiting magic numbers of electrons. Lewis theory is numerology, it expoits but does not explain or predict anything about the quantum patterns that lie behind the magic numbers... but it is astonishingly efficient as a model for understanding *most* reaction chemistry.

- The filled octet
- 2, 8, 8, 18, 18...
- Two electron chemical bond
- Lone pairs
- Electron accountancy
- Mechanistic theory in terms of: Lewis acids, Lewis bases, Electrophiles, Nucleophiles, Radicals, Curly arrows, fish-hook half arrows, E2, S$_N$2, S$_E$Ar, etc.
- VSEPR