What is 214 all about? (2)

Quantum Physics

Particles act like waves!

- Particles (electrons, protons, nuclei, atoms, . . .) interfere like classical waves, *i.e.*, wave-like behavior
- Particles have only certain "allowed energies" like waves on a piano
- The Schrodinger equation for quantum waves describes it all.
- Quantum tunneling
  - Particles can "tunnel" through walls!
- QM explains the nature of chemical bonds, molecular structure, solids, metals, semiconductors, lasers, superconductors, . . .

Waves act like particles!

- When you observe a wave (*e.g.*, light), you find "quanta" (particle-like behavior).
- Instead of a continuous intensity, the result is a probability of finding quanta!

Probability and uncertainty are part of nature!

Scanning tunneling microscope (STM) image of atoms and electron waves