

mathematics

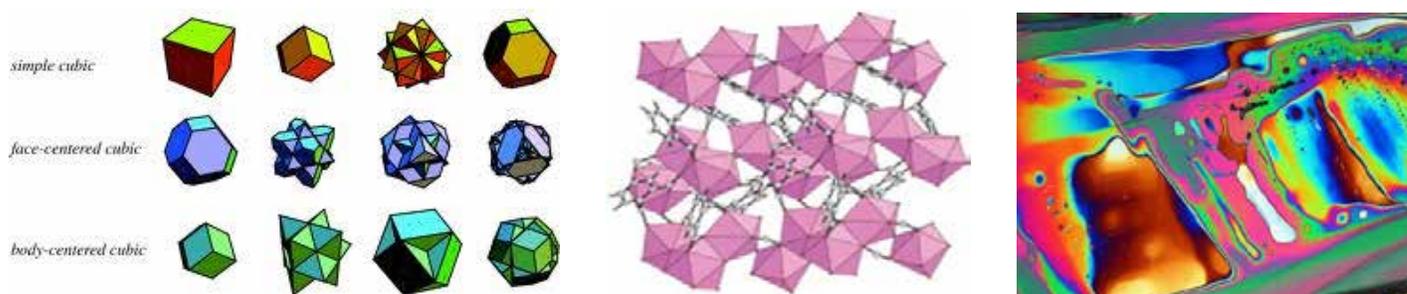
Quasicrystals Seminar

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Electronic Structure and the Stability of Metal Alloys: Crystals, Quasicrystals, and Ionic/Metallic Glasses

The problem of stability of crystal lattices, quasicrystals of metal alloys and the metastability of ionic/metallic glasses is discussed at an introductory level in terms of electronic distributions and properties in such systems. Basic concepts, such as: crystal lattice, Brillouin zones, electron density of states, Fermi level, Fermi pseudogap, pseudo- Brillouin zones, average number of valence electrons per atom (e/a) and the Hume-Rothery rules for binary metal alloys will be presented in relation to both crystal and quasicrystal stability. Recent *ab initio* computation results will be discussed for Hume-Rothery complex AITM-alloys and quasicrystals. 3D images of photonic quasicrystals and other structural illustrations will be presented for binary metal alloys, hydrated Lanthanide crystals and ionic glasses with distorted-icosahedral, local structures.



3:00 p.m.

Illinois Geometry Lab (102 Altgeld)

Friday, February 8, 2013

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