Lecture 2: Crystal Properties and Growth of Semiconductors

- Semiconductors are a group of materials having electrical conductivities intermediate between metals and insulators. The conductivity of these materials is significantly varies with temperature, optical excitation and impurity content.
- Semiconductors are found in Column IV and neighboring columns of the periodic table

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Periodic Structures

- A crystalline solid is distinguished by the fact that the atoms making up the crystal are arranged in a periodic fashion. There is some basic arrangement of atoms that is repeated throughout the entire solid.
- Not all solids are crystal; some have no periodic structure at all *amorphous solids*, others are composed of many small regions of single-crystal material *polycrystalline solids*

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Face Centered Cubic (FCC) Lattice

	Atoms per cellNo. of nearest neighborsNearest neighbor distanceNo. of 2nd nearest neighbors2nd nearest neighbor distance	
Primitive Cell	• Elements with FCC lattice: Al, Ag, Ca, Cu, Ni, Pb, and Pt.	
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