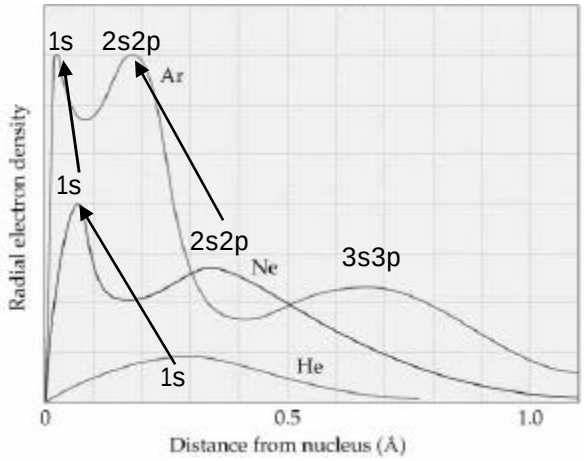
# Announcements – 11/3/00

- Problem Set Solutions:
  -Chapter 6 solutions now online
- Quiz today!
- Demos return next week!
- Advising

1

# Electron Configuration and Atomic Size

- We need to look at the *radial distribution* of electrons:

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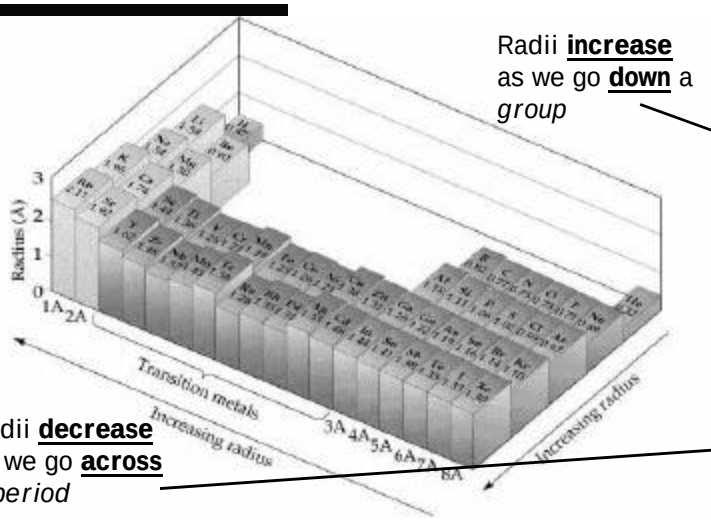
# Atomic Size: Perodic Trends

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# Effect of Ionization on Size

- **Removal of an electron**
  - -makes a *positive* ion
  - -cation is *smaller* than the neutral atom . . . WHY?
    - -removing an electron *increases* $Z_{eff}$ remaining $e^-$
    - -thus, greater *coulombic attraction* giving a smaller radius
- **Addition of an electron**
  - -makes a *negative* ion
  - -anion is *larger* than the neutral atom . . . WHY?
    - -added electron experiences *less* of positive charge of nucleus and *increases* mutual repulsion of electrons

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# Ion Electron Configurations

- Usually add or remove electrons to reach nearest Noble Gas configuration: $Na^+$ [Ne]
  $Cl^-$ [Ar]
- What about ***Transition Metal Ions***?

  -can't accommodate the loss/addition of enough electrons to reach Noble Gas configuration

  -electrons removed from ***ns orbitals*** first, and *then* from ***(n-1)d orbitals:***

  Fe [Ar]$3d^6 4s^2$
  $Fe^{2+}$ [Ar]$3d^6$ *electrons removed from 4s*
  $Fe^{3+}$ [Ar]$3d^5$ *electrons removed from 3d*

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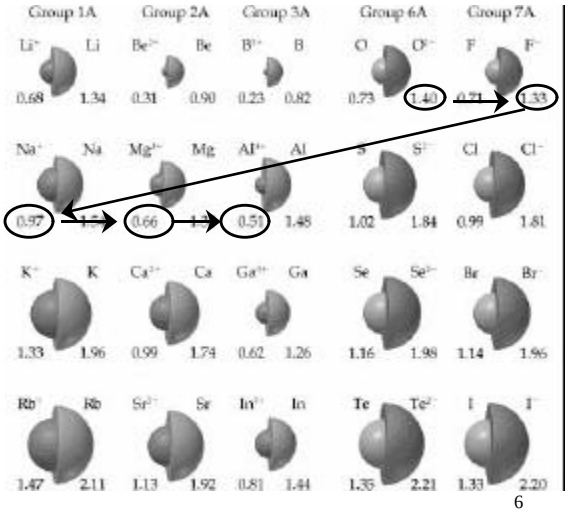
# Ionic Sizes

•**Cations:** *smaller*

•**Anions:** *larger*

-**increasing Z** gives ***decreasing size*** for *isoelectronic ions*:

$O^{2-} > F^- > Na^+ > Mg^{2+} > Al^{3+}$

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