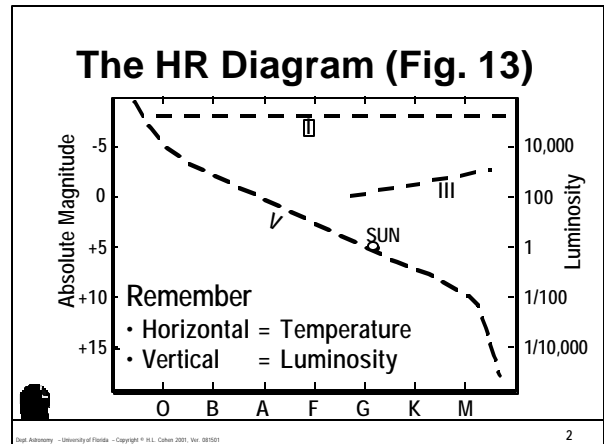


Topic F

Part 2. "Interpreting The HR Diagram"

(Web Version: 08-15-01)





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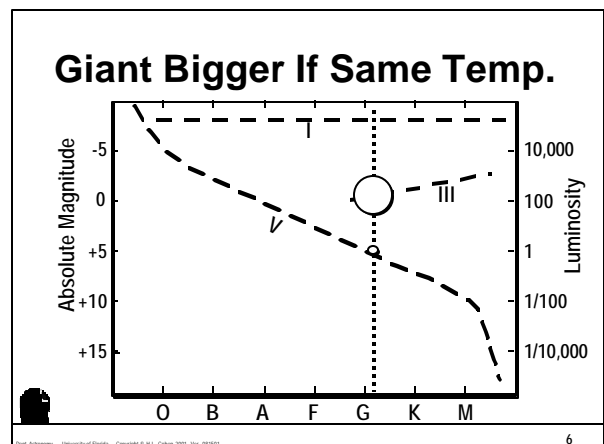
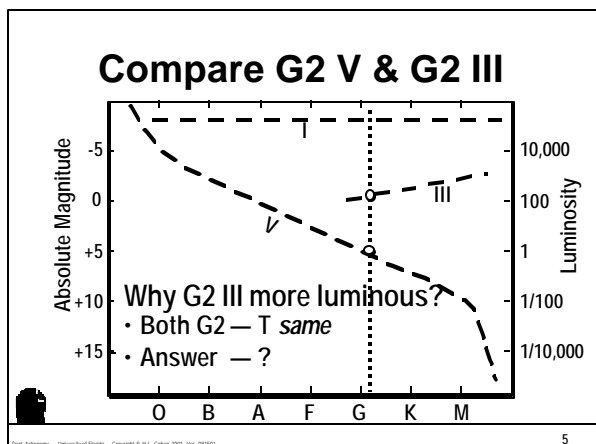
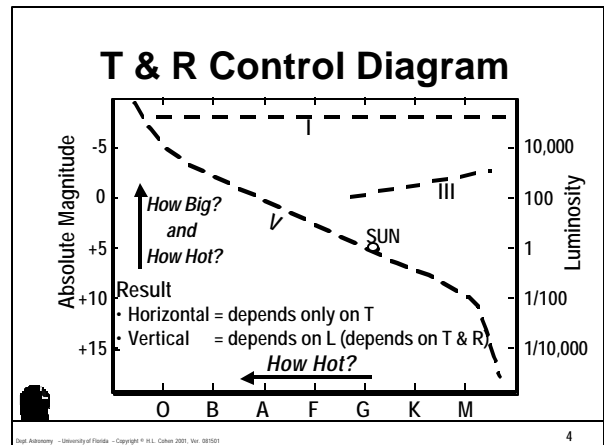
What Determines Luminosity?

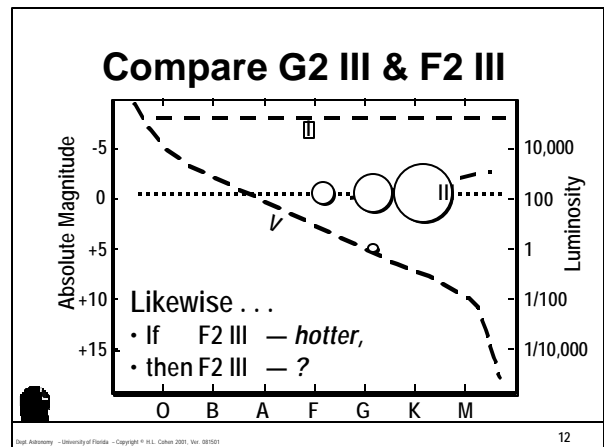
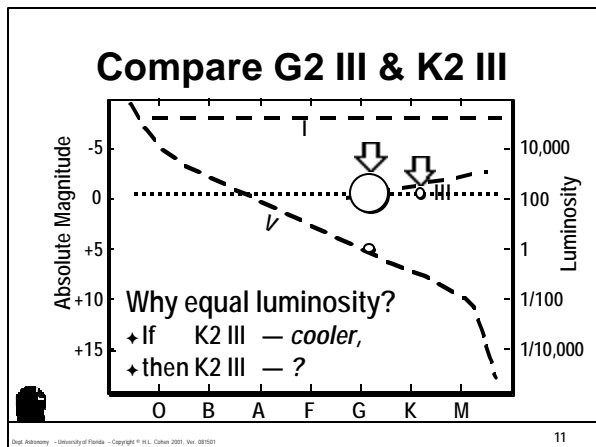
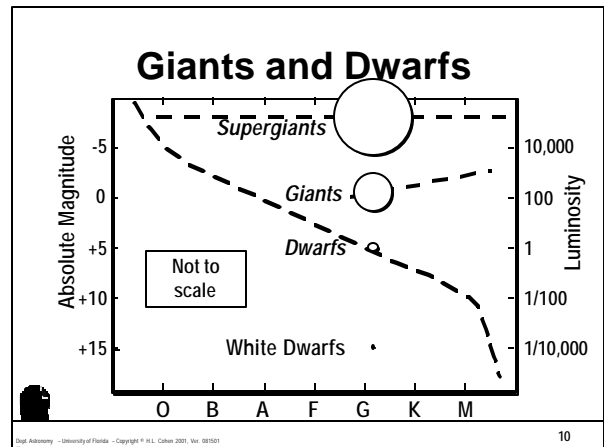
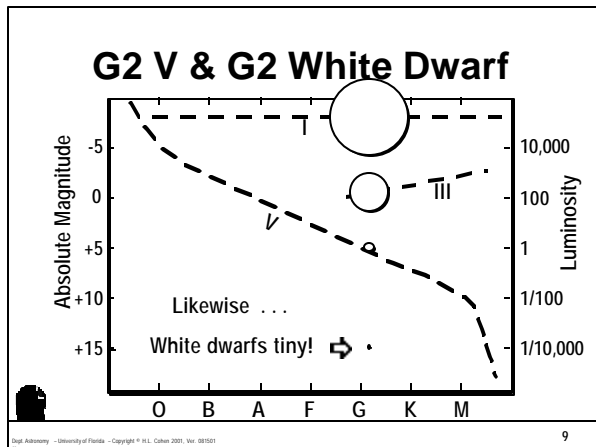
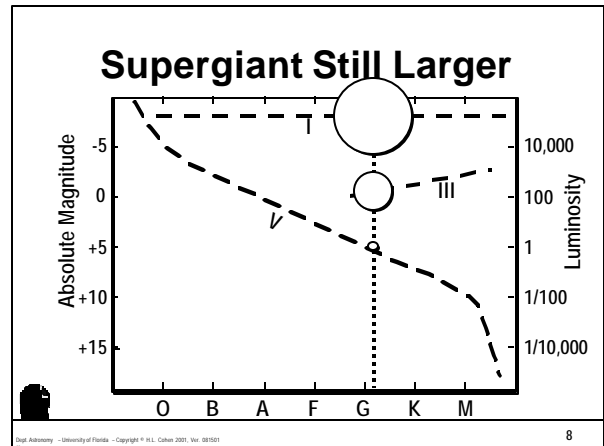
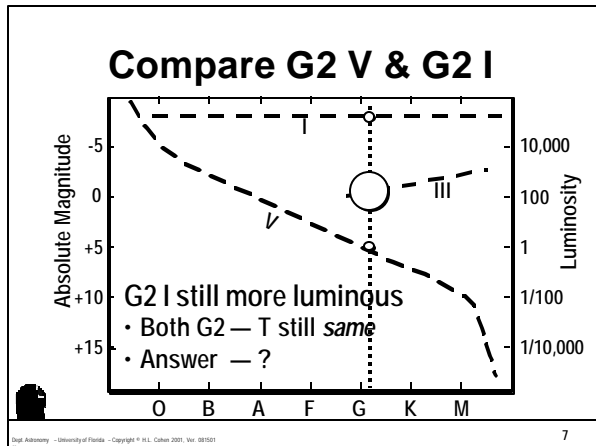
Luminosity depends on

- How hot — Temperature
(Hotter surfaces radiate more)
- How big — Radius
(Large areas radiate more)

Cool  Small Lum	Hot  Big Lum
Small Surface  Small Lum	Big Surface  Big Lum

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Conclusions: L, R & T Related

- Vertical: *Constant Temperature*
Move Up \Rightarrow Larger
Larger Surface Area So Brighter
- Horizontal: *Constant Luminosity*
Move Right \Rightarrow Larger
Larger Surface Offsets Lower Temperature

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Think About This . . .

Questions

- Where are largest stars?
- Where are smallest?

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The Main Sequence

- Most important
 - Most stars here (Why?)
 - Numbers increase toward lower end (Why?)
 - Sun also here (Why?)
- What does main sequence signify?
 - Need more info on main sequence stars

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The Main Sequence

Diagonal

- Which larger . . . G2 V or A1 V?
- Both L and T differ

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What Do You Think?

Diagonal

- Both L and T differ
- Which larger . . . G2 V or A1 V?

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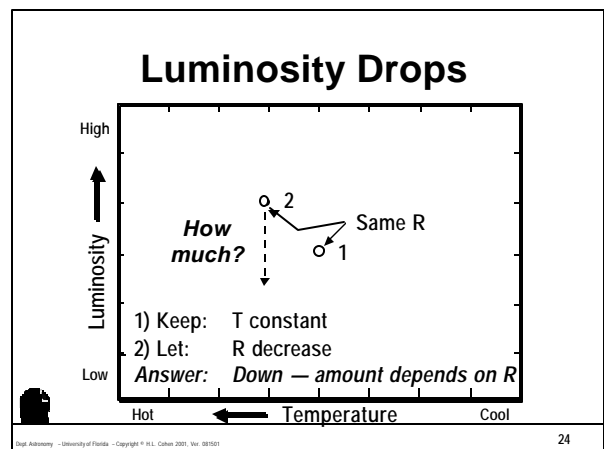
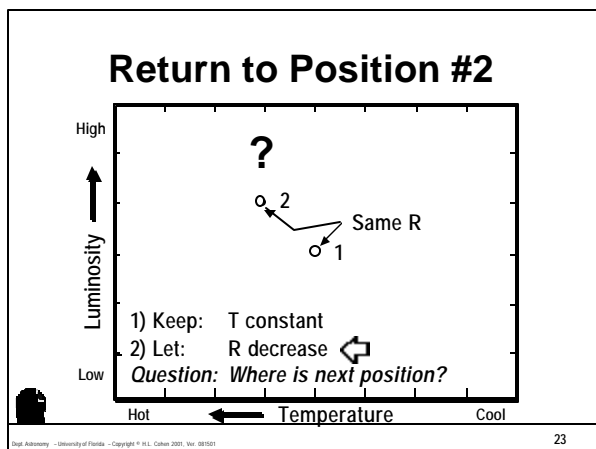
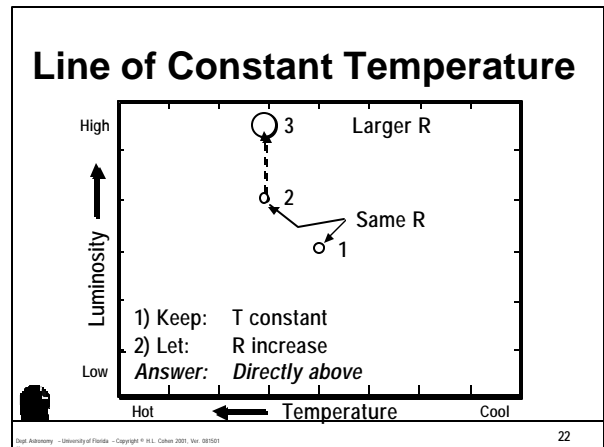
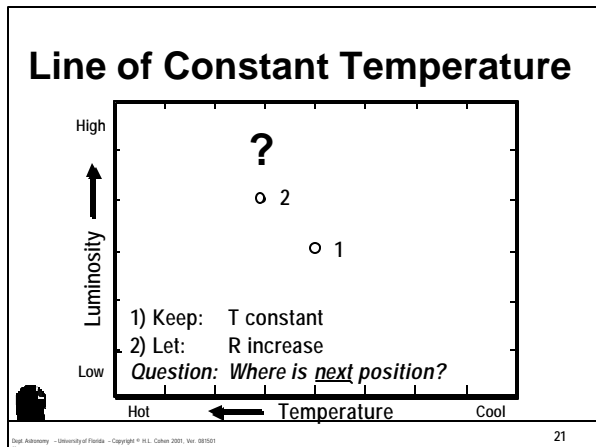
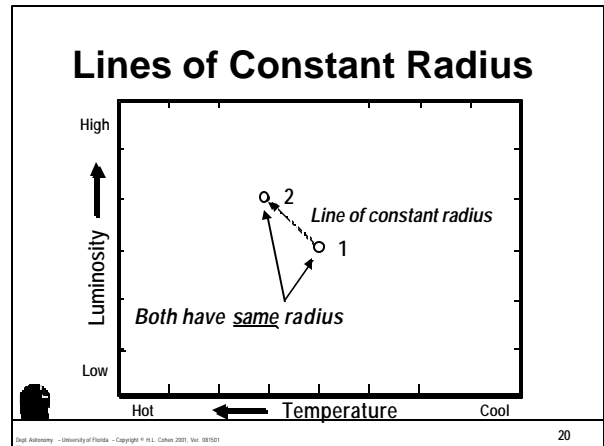
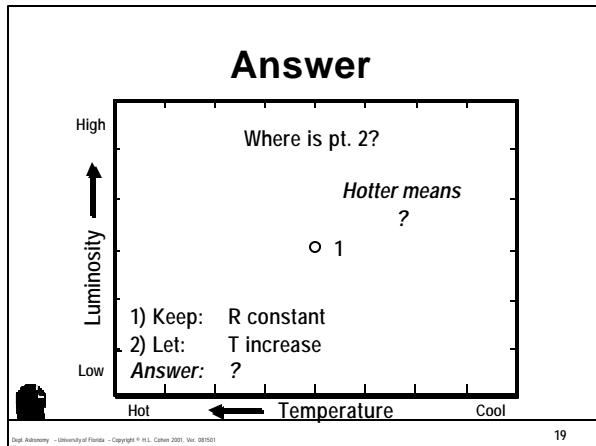
Example Scenario

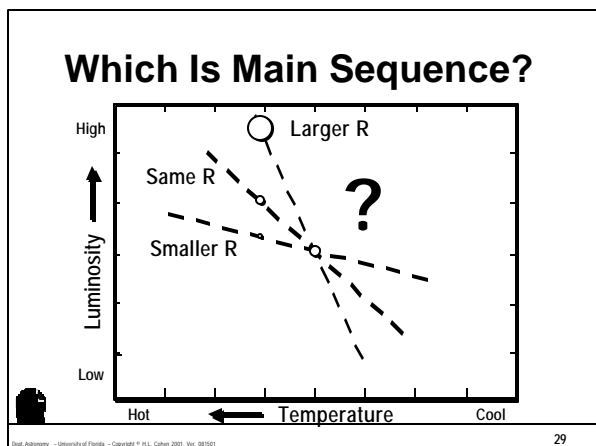
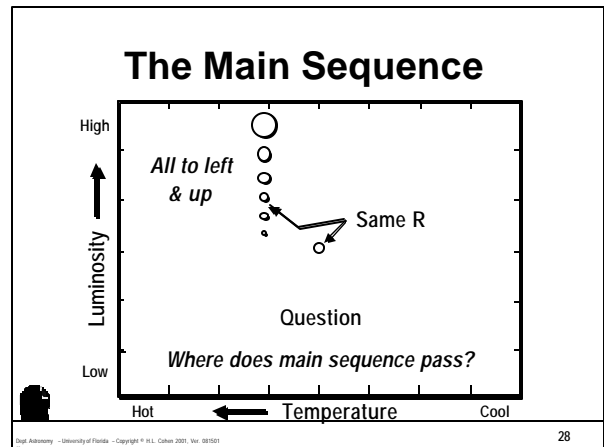
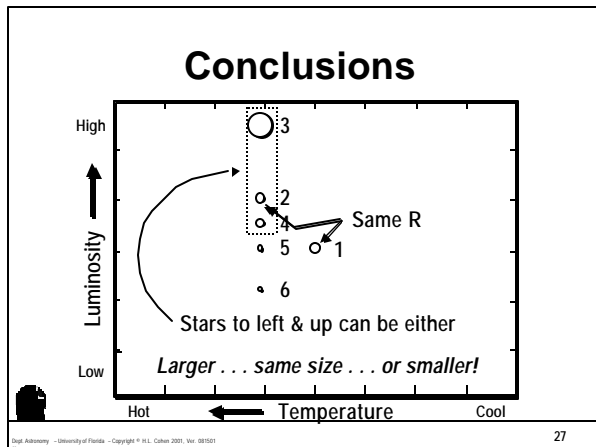
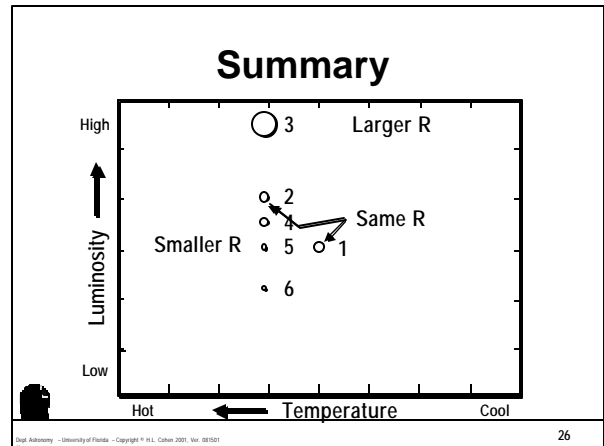
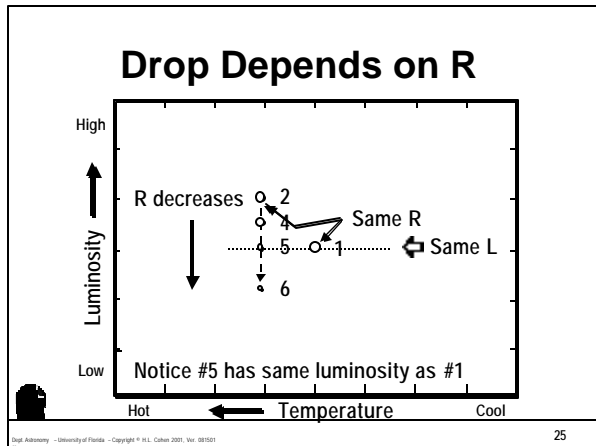
Star initially at position #1

- Keep: R constant
- Let: T increase

Question: *Where is new position?*

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Slope of Main Sequence?

- Moving up main sequence, does size . . .
 - Increase?
 - Remain same? (i.e., a slope of *constant radii*?)
 - Decrease?
- Solution
 - Must "compute slope"
 - (need to *calculate* actual radii)

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