



Astro 301/ Spring 2005 (46690)



Introduction to Astronomy

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TAs: Nick Sterling & Nairn Baliber

MWF 12-1 Welch 3.502

Lecture 29,30,31 ; MWF Apr 11,13,15

Lecture 29: Announcements

- 1) Homework 5 due today at start of class.
- 2) Pick up homework 6 due next Monday 6
Review and ask for help before the weekend!
- 3) Quiz on Wed Apr 13 based on reading assignment
Ch 20, Galaxies: From Here to the Horizon (Cosmic Perspectives, 3rd Ed)
Main ideas in “Summary of Key Concepts” at end of chapter.
- 4) Exam on Monday May 2

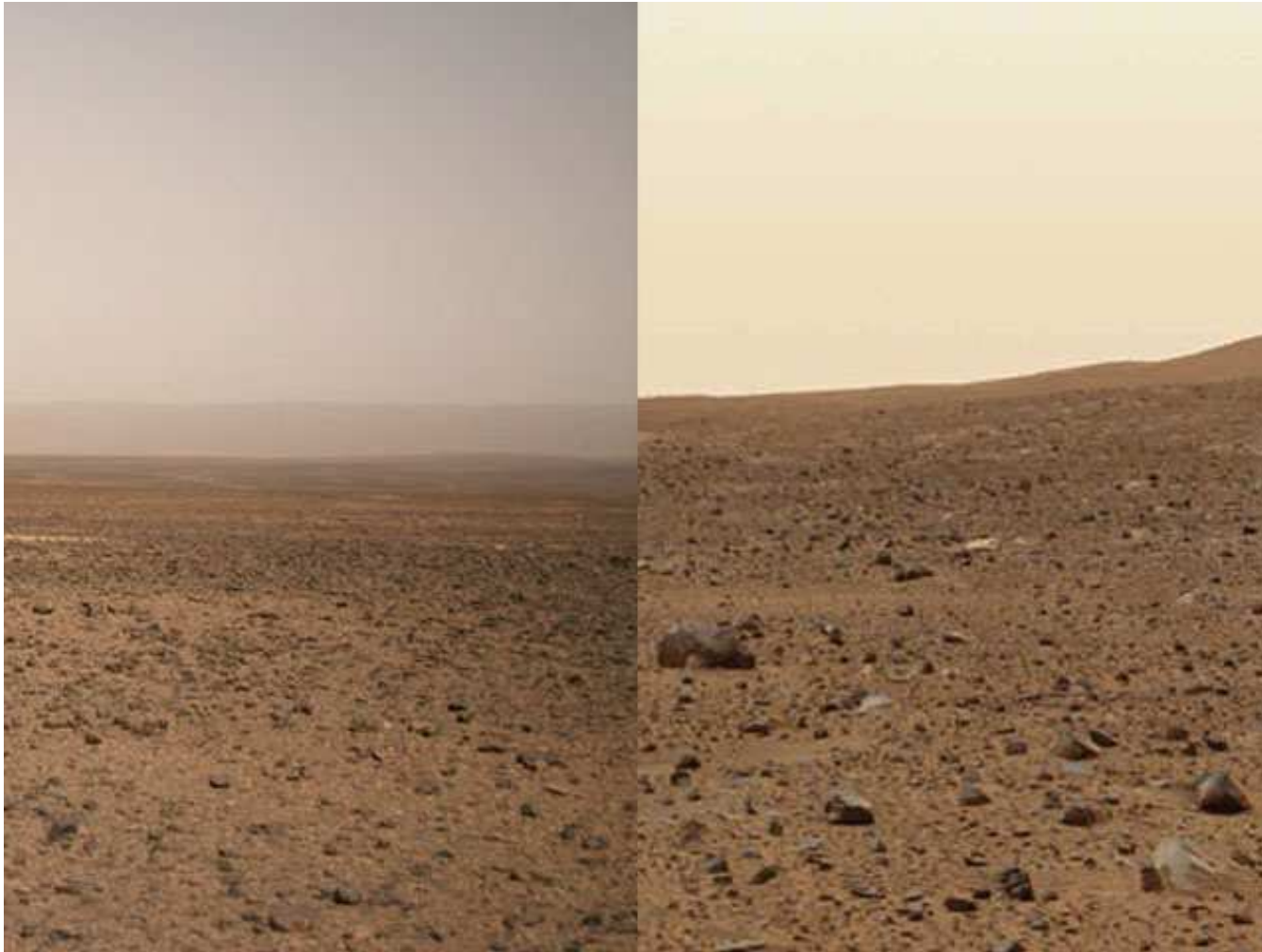
How to improve your grades and get extra credit (EC)?

- 1) EC: Answer questions in class, give me your name at end of lecture.
EC can bump your grade up by up to 10% in final grade.
- 2) EC: Get certified to use Painter Hall Telescope – see details on class website. Bring me certification note from telescope training staff e.g.,
Lara Eakins
- 3) Homeworks make up 50% of your total grade and are based on lectures.
Exams are largely based on homeworks. Start early and get help before the weekend.

In-class notes

- Solution for hwk 4

Lecture 30: Astronomy Picture of the Day

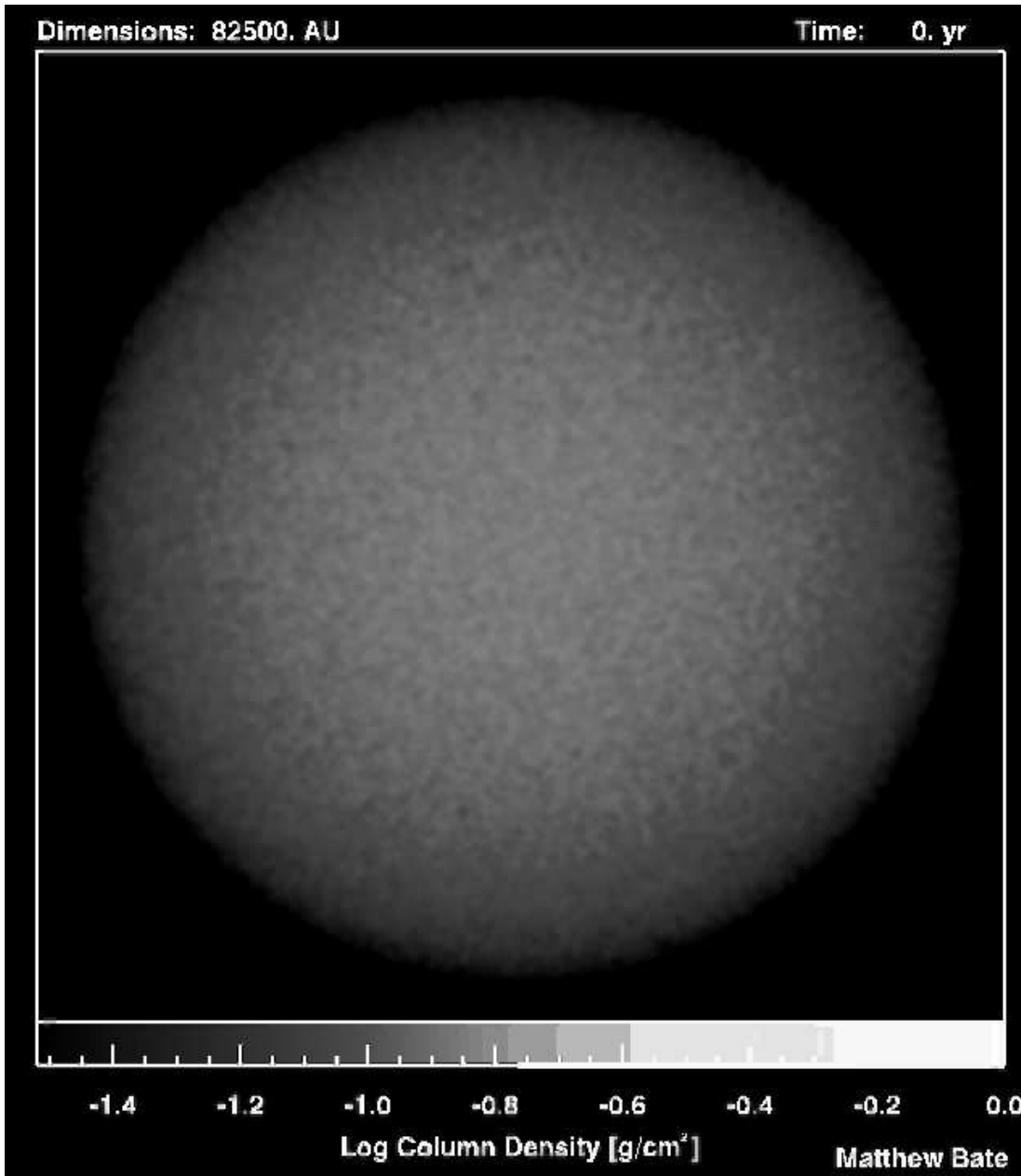


- à One image is taken by robot Spirit rover currently on Mars. (Twin Rovers landed on Mars in Jan 2004 as part of NASA's Mars Exploration Rover mission.)
- à Other image taken by a human across the desert south of Morocco on Earth

In-class notes

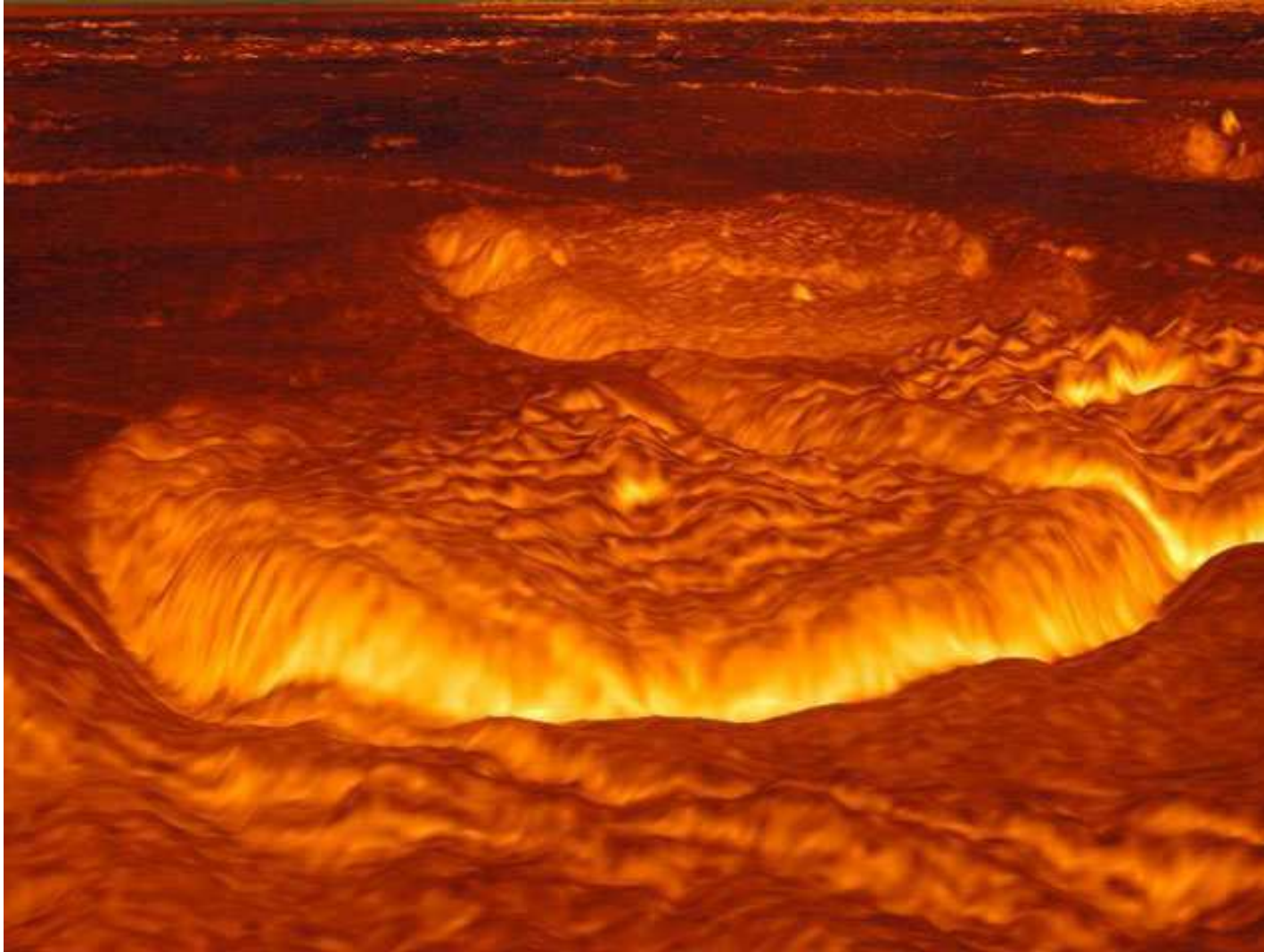
- Summary of evolution of low, intermediate and high mass star
- Movie: collapse of a cloud to form a Sun-like star and its planetary system.
- Life on Earth requires both high and low mass stars. Why?

Collapse of a cloud to form a Sun-like star and its planetary system



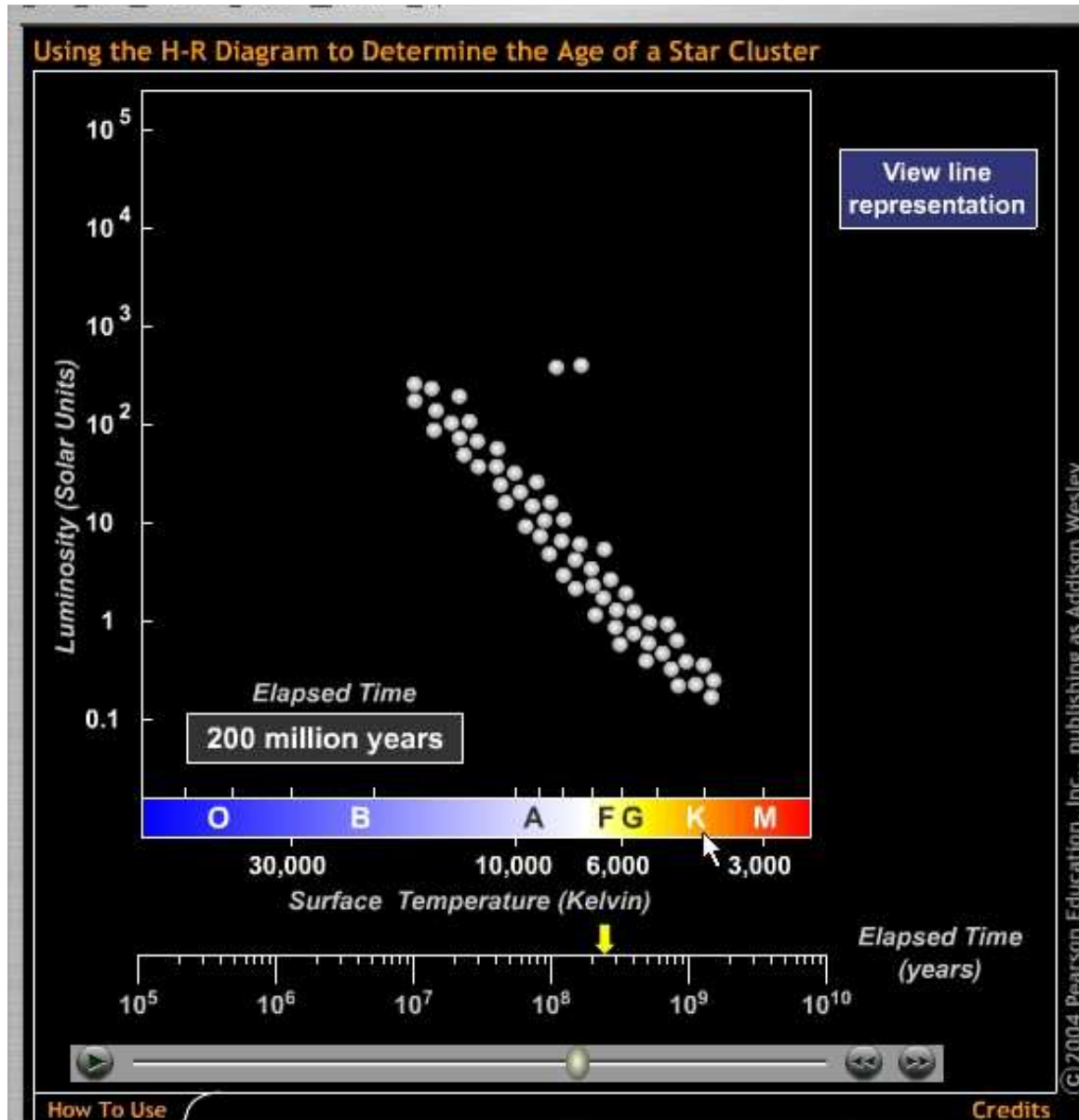
Collapse and fragmentation of a molecular cloud with a mass 50 times that of our Sun. The cloud initially has a diameter of 1.2 light-years (9.5 million million km) and a temperature of 10 K.

Condition for life on a planet



- à Computer reconstruction of the surface of Venus was created from Magellan spacecraft data
- à Venus' surface is so hot and hostile that no surface probe has lasted more than a few minutes.

Age-dating stellar clusters



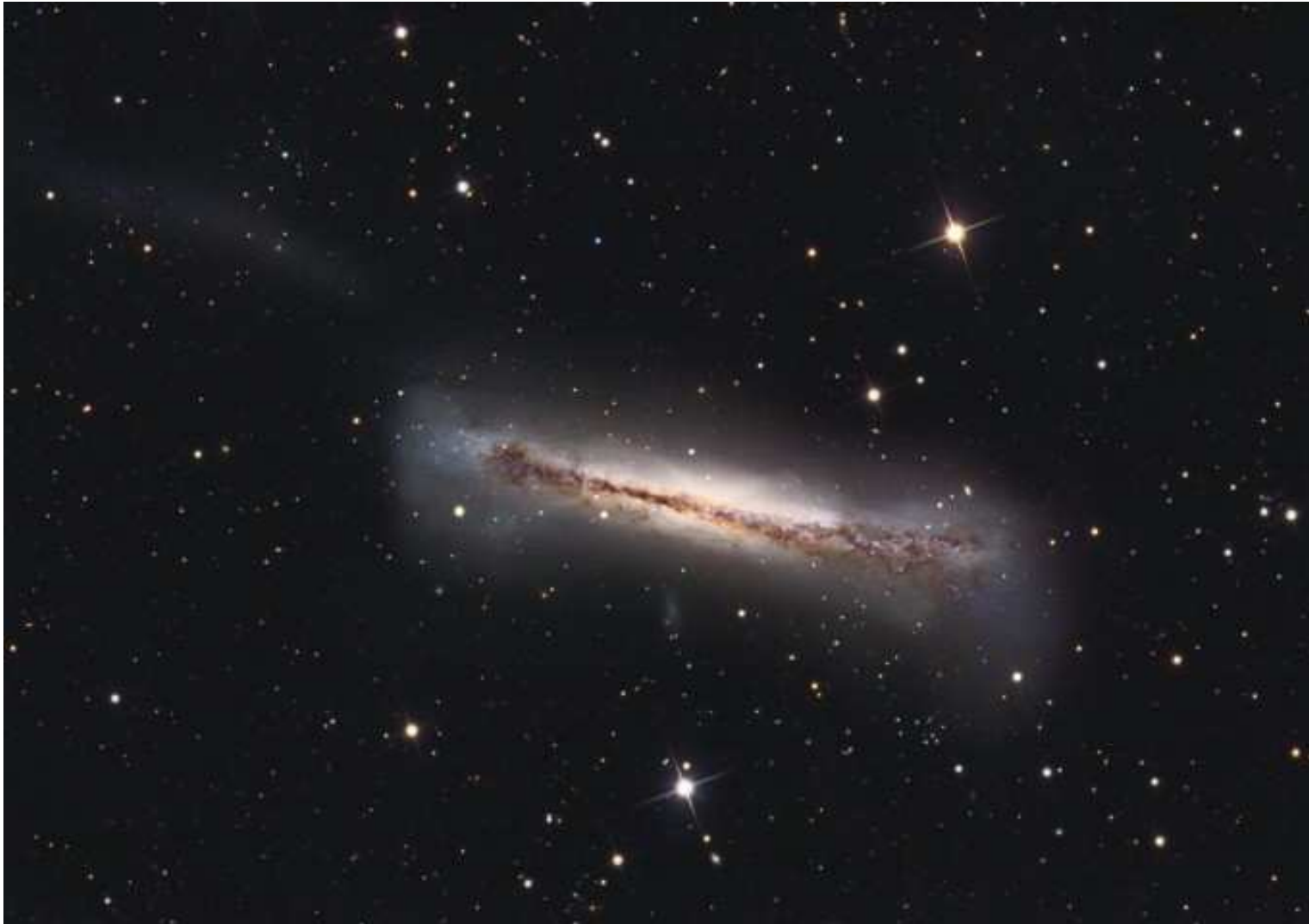
In class-movie

Using H-R diagram
to date clusters

Lecture 31: Announcements

- 1) Quiz on Wed Apr 20 based on reading assignment
Ch 22, (Cosmic Perspectives, 3rd Ed)
Main ideas in “Summary of Key Concepts” at end of chapter.
- 2) Exam has been moved to Wed May 4, 2005

Lecture 31: Astronomy Picture of the Day



- à Edge-on view of NGC 3628. Dust lanes in a disk-like structure suggest it is a spiral
- à Interacting or isolated?

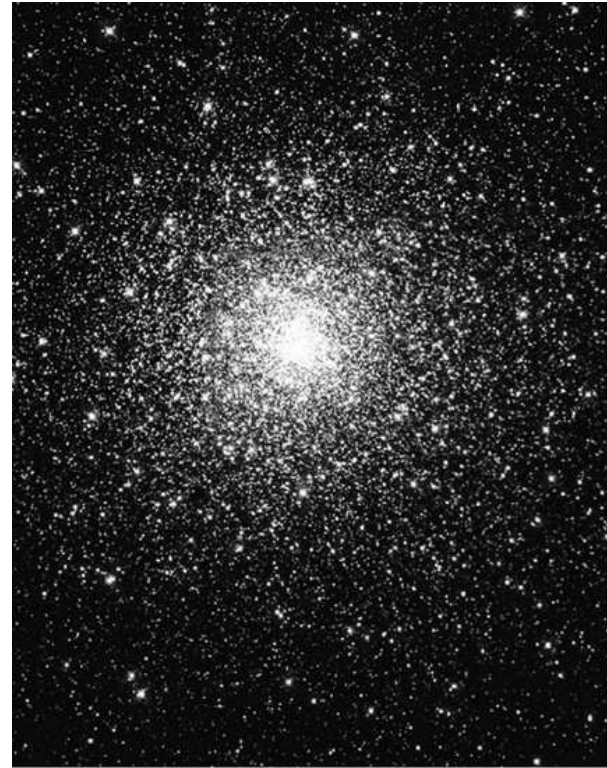
In-class notes

- Quiz and homework questions
- Age-dating stellar clusters and the Universe with an H-R diagram.

Age-dating stellar clusters

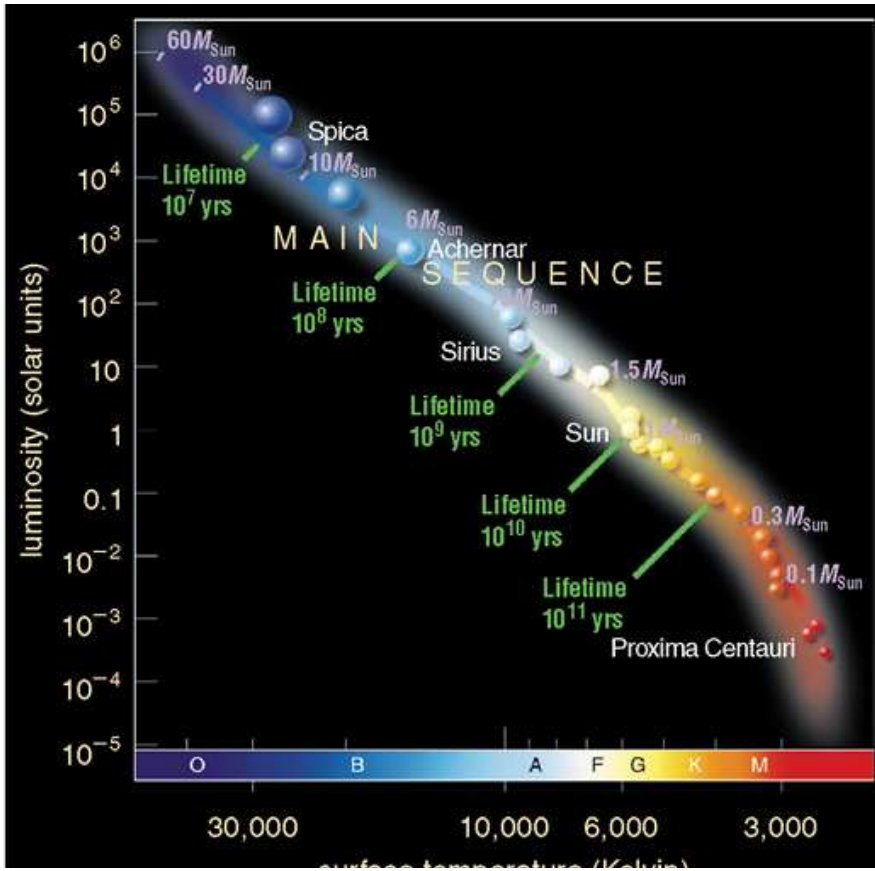


Open Cluster Pleades
100 million yrs old

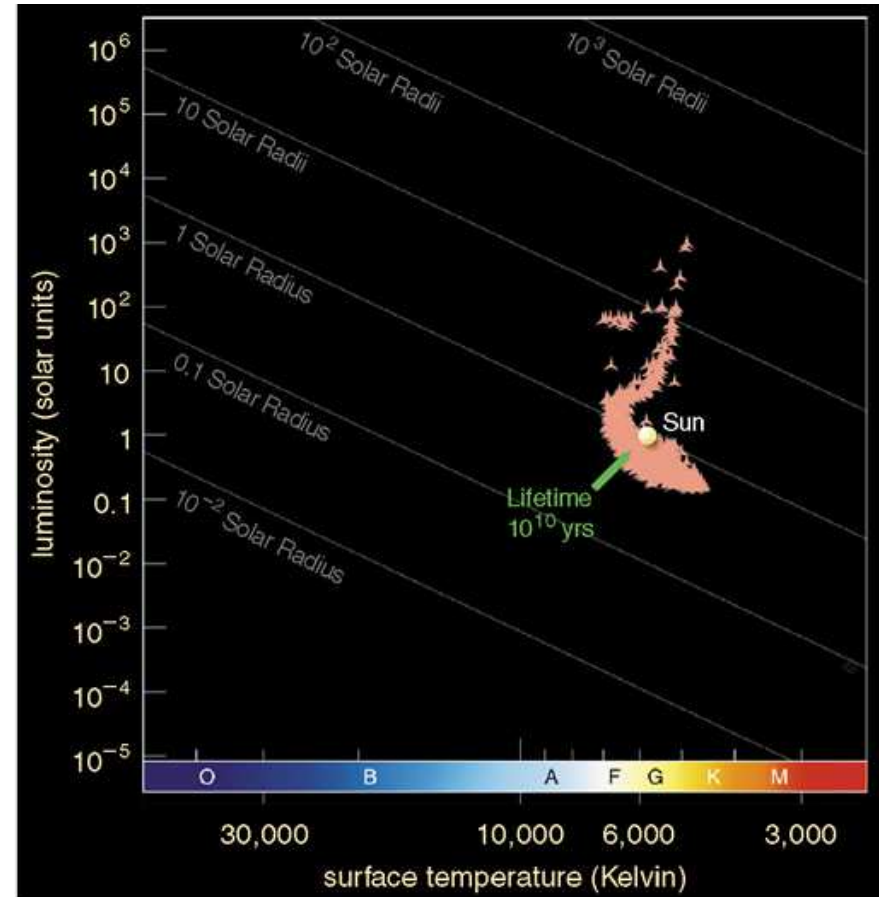


Globular cluster M80
12 billion yrs old

Age-dating stellar clusters

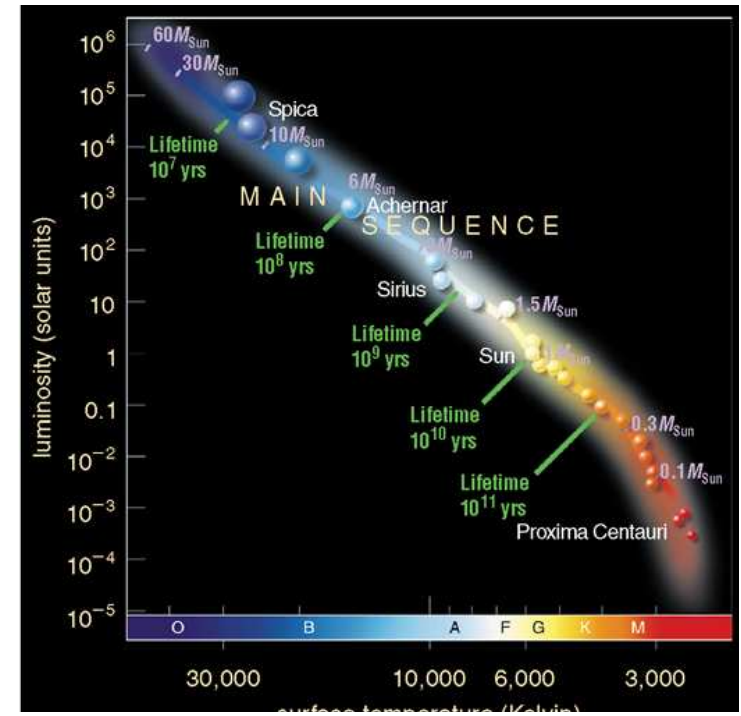
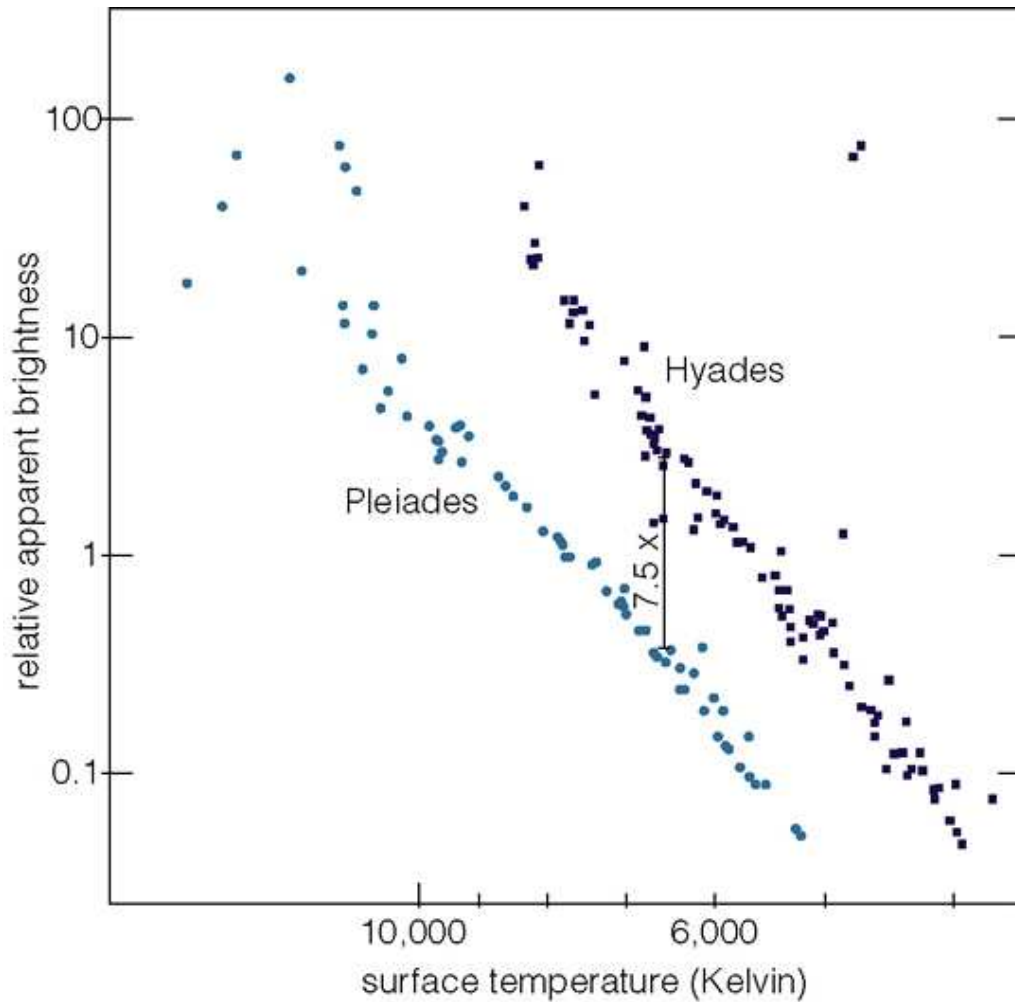


Higher mass stars (hot luminous) at top LH corner of the main sequence corner will evolve off the main sequence before low mass stars



H-R diagram for globular cluster Pal 3. The main sequence turnoff corresponds to a low-mass star with a MS lifetime of order 10 Gyr. This cluster is ~ 10 Gyr.

Age-dating stellar clusters

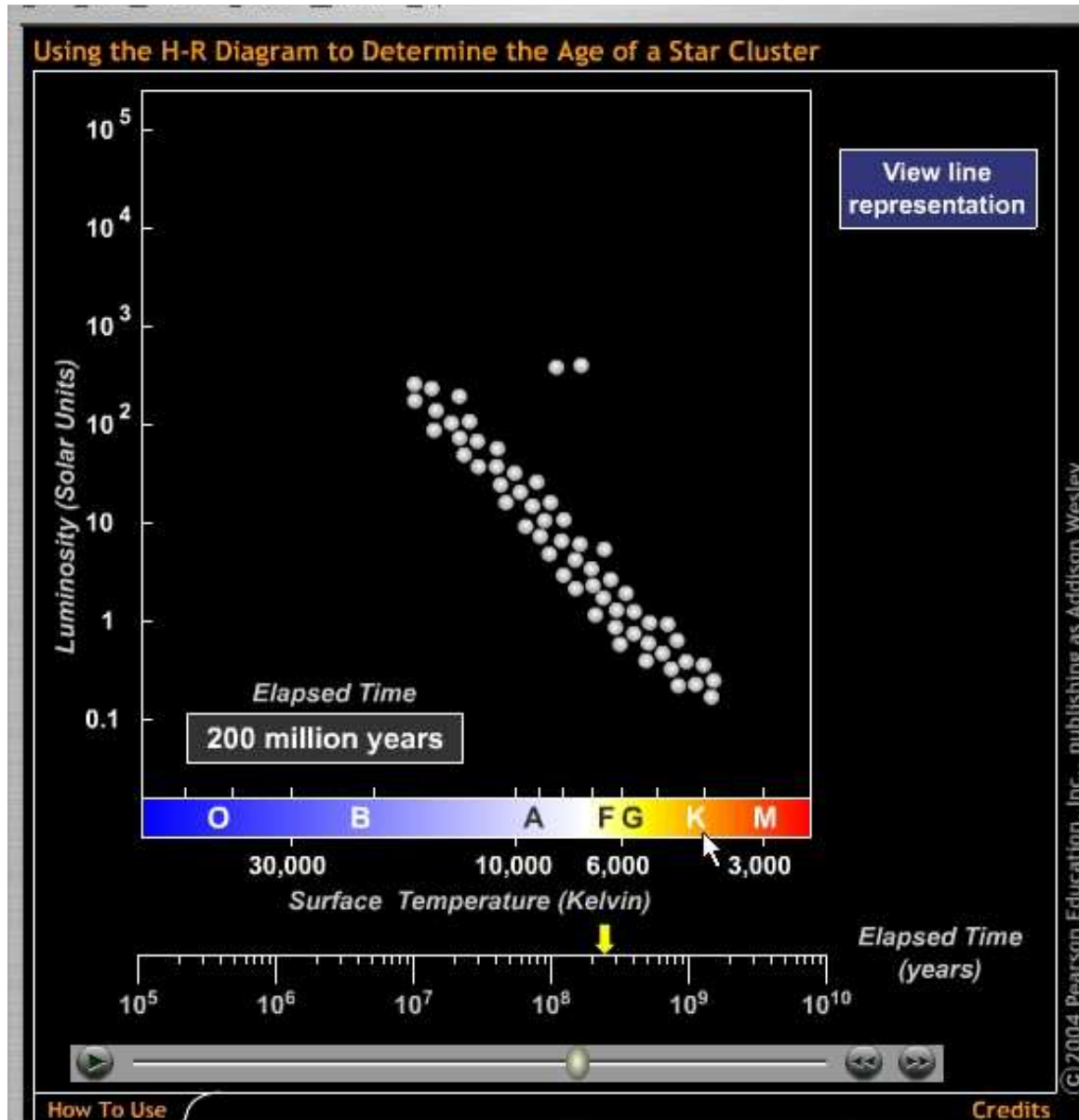


Offset between MS of the two stellar clusters

à along temperature axis is due to difference in age of clusters

à along luminosity axis is due to difference in distance

Age-dating stellar clusters



In class-movie

Using H-R diagram
to date clusters