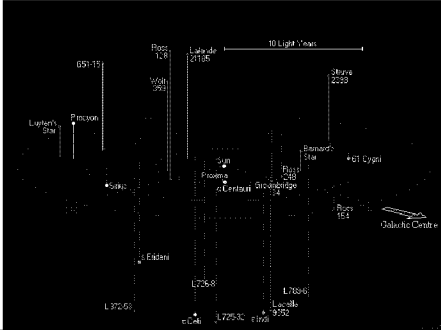


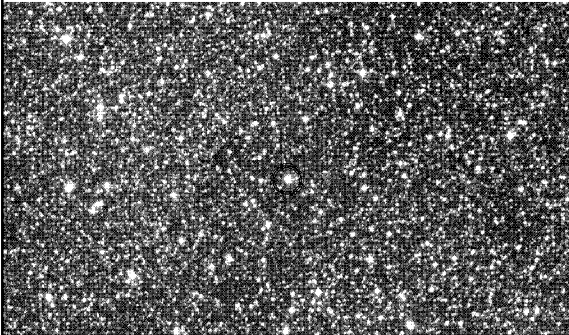
Tuesday, November 9 Meet the Neighbors



Meet the Neighbors Key Concepts

- 1) The Sun's closest neighbor among the stars is Proxima Centauri, an M main sequence star.
- 2) Most stars in the Solar Neighborhood are also dim, small, cool, red M main sequence stars.
- 3) The Sun is part of the Milky Way galaxy, a flattened disk containing 300 billion stars.

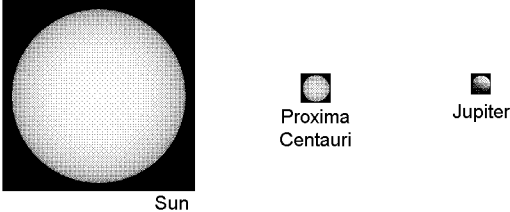
The Sun's closest neighboring star is Proxima Centauri, an inconspicuous star in the constellation Centaurus.



Too faint to be seen by the naked eye!

Proxima Centauri is a main sequence star of spectral class M (cool & red).

Distance = 4.24 light-years
 Radius = 0.15 R_{sun}
 Luminosity = 0.0017 L_{sun}

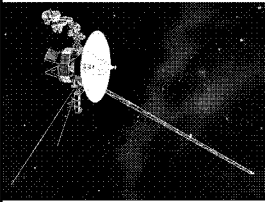


Sun

Proxima Centauri

Jupiter

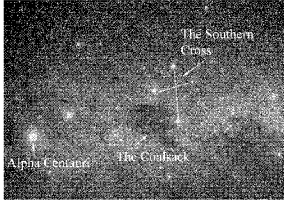
The fastest-moving, most distant spacecraft launched by humans: Voyager 1.



At its current speed, it would take over 70,000 years to reach Proxima Centauri.

Space is very big.
 Space is very nearly empty.
 Stars are very far apart.

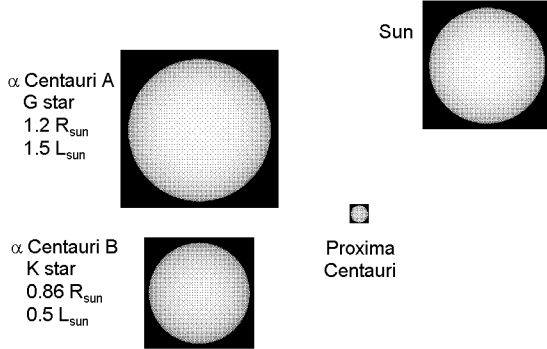
The Sun's next nearest neighbors are also in Centaurus: Alpha Centauri A & B.



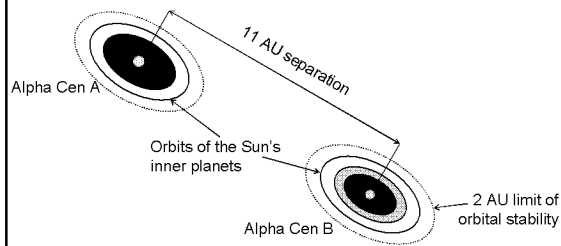
Alpha Centauri A & B form a tightly bound binary star system, 4.37 light-years away.

Proxima Centauri is loosely bound to Alpha Centauri A & B.

Alpha Centauri A & B are fairly similar to the Sun.

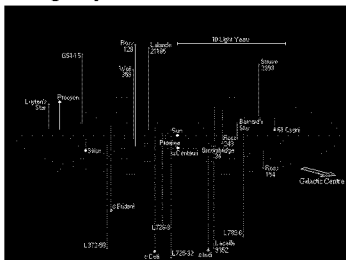


We don't know of any planets around Alpha Centauri A or B, but we're looking.



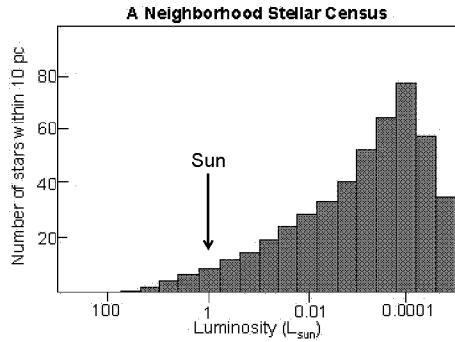
The Solar Neighborhood is the collection of stars within ~15 light-years of the Sun.

- 24 single stars.
- 10 binary systems.
- 4 triple systems.
- 58 stars in all.

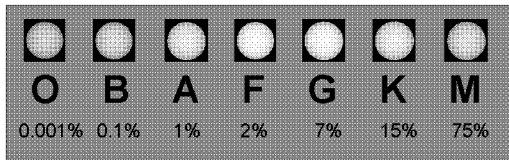


Typically it's several light-years from any star system to its nearest neighbor.

Most stars in the Solar Neighborhood are **less luminous** than the Sun.

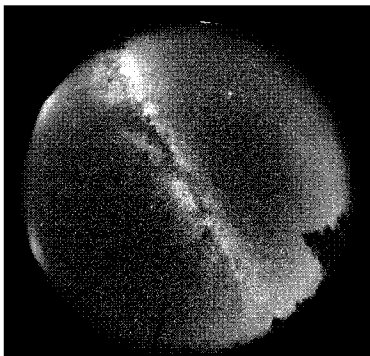


Most main sequence stars are faint, cool M stars (sometimes called "red dwarfs").

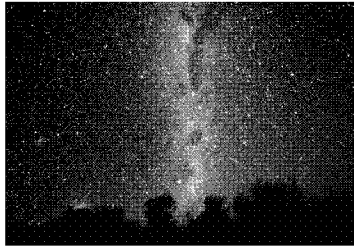


G stars like the Sun are relatively rare.

In the dark night sky, we see a luminous path called the **Milky Way**.

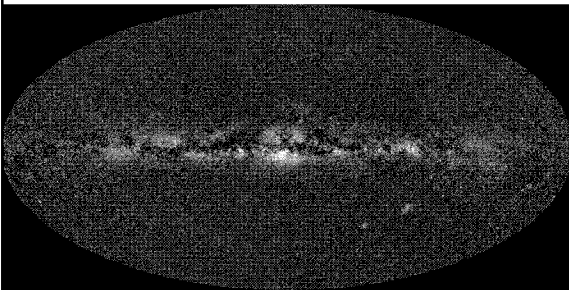


Ancient Greek astronomers called the Milky Way "galaktikos kuklos", or "milky circle".

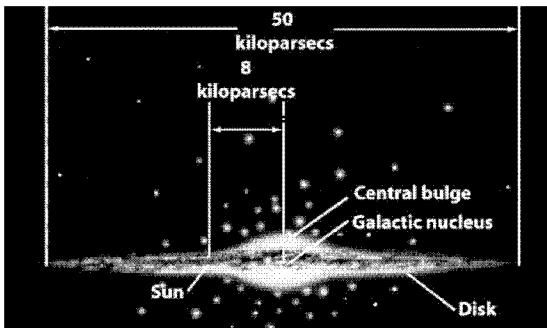


(This is the origin of the word "galaxy".)

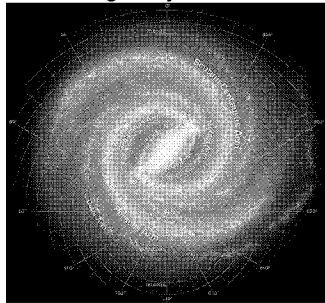
Galileo looked at the Milky Way with his telescope: he found it was made of an "immense number" of faint stars.



If we could see our "Milky Way" galaxy edge-on from outside:



If we could see our galaxy face-on from outside:



There are ~300 billion stars in our galaxy. Fewer than 20 billion are G main sequence stars like the Sun.

Average score = 37.2 correct (out of 50)

Number correct (raw score)	Letter grade
44 – 50	A
37 – 43	B
30 – 36	C
23 – 29	D
0 – 22	E

Tomorrow's Lecture:
"Life" and "Death" of Stars

This Week's Reading:
Chapter 11
