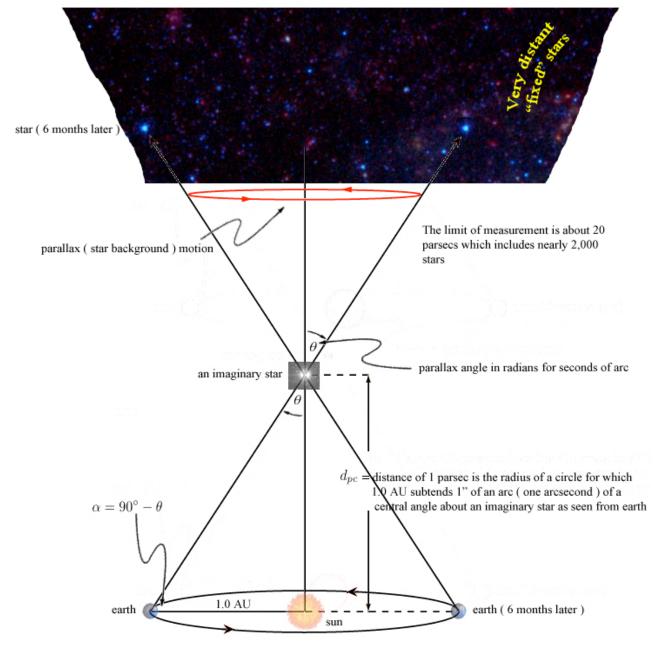
Structure and Evolution of Stars

Lecture 2







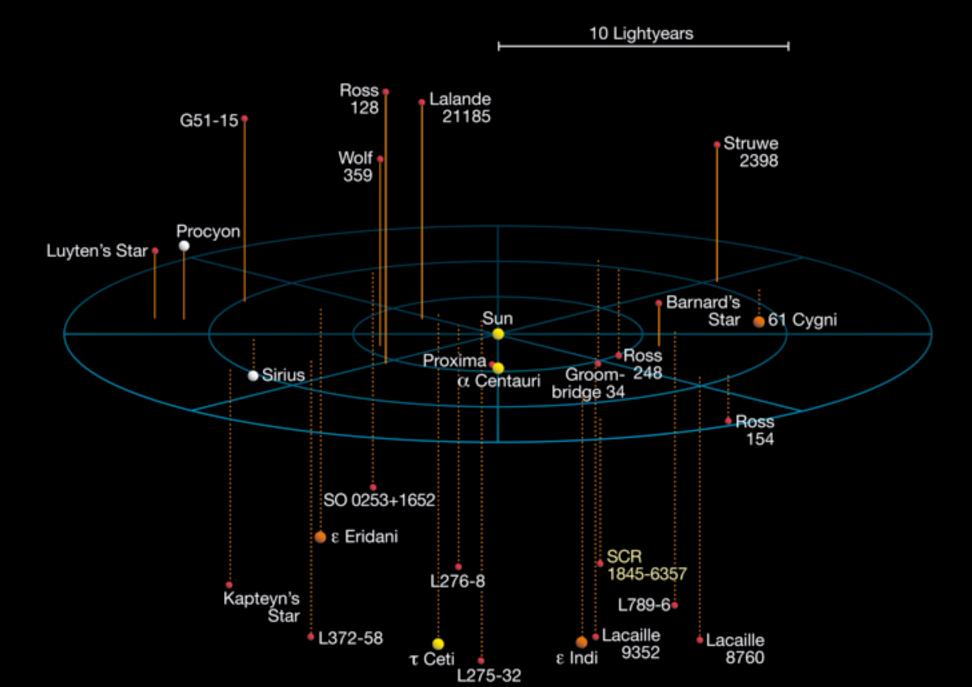


Where:

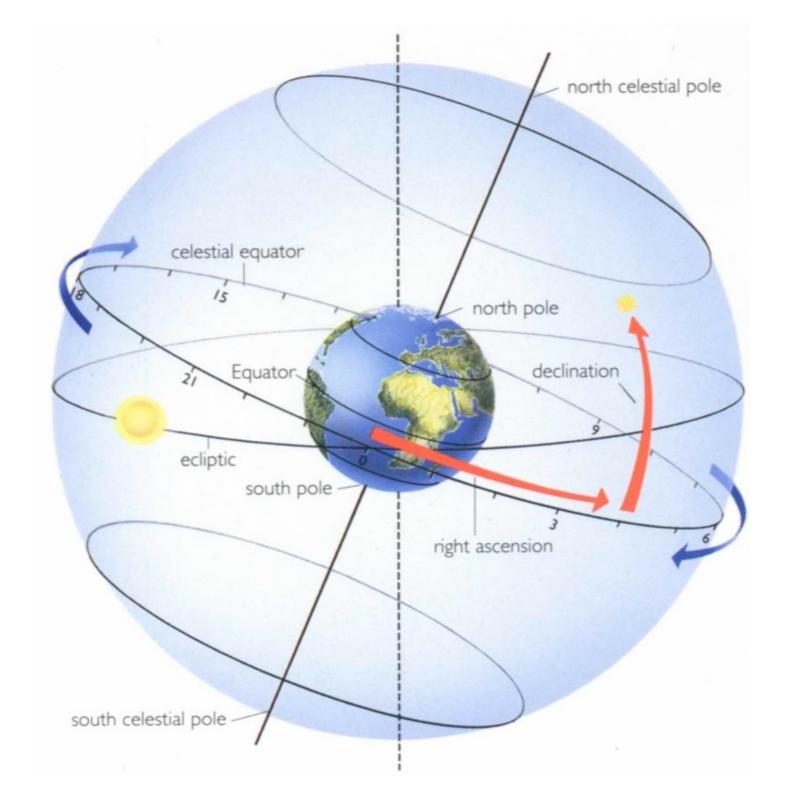
 θ = angle of parallax in radians for seconds of arc d_{P^c} = 1/ θ , distance to an imaginary star in parsecs and is the radius of a circle for which

1.0 AU subtends 1.0" (one second) of arc of a central angle about an imaginary star as seen from earth

note: the word parsec stands for "Parallax of one arcsecond"





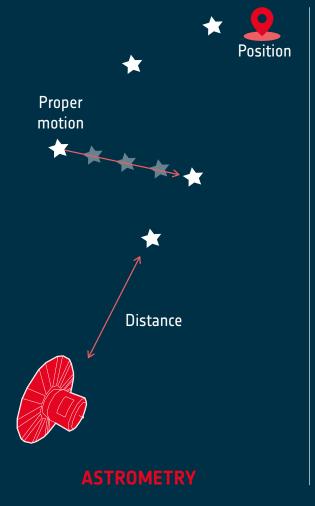


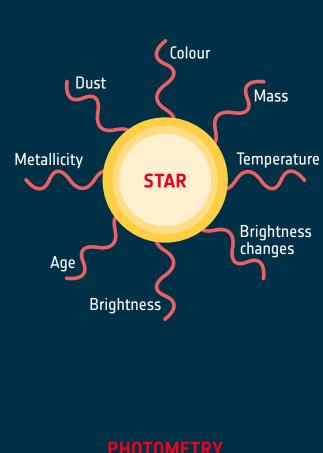


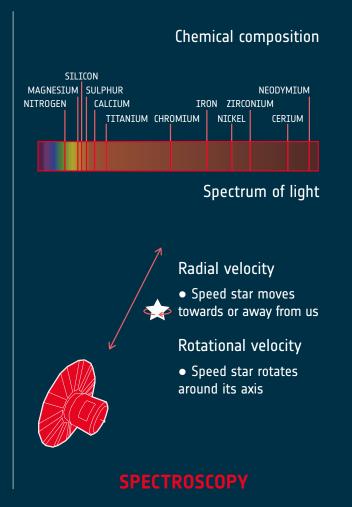
GAIA'S OBSERVING TECHNIQUES



Techniques to study the stars in our cosmic neighbourhood.













MILKY WAY STARS



Data release 3 includes a total of 1.8 billion Milky Way stars – providing astronomers with an unprecedented view of stellar characteristics and their life cycle,

and the galaxy's structure

and evolution.

Object classifications 1.5 billion

What type of star is it? Variable stars 10 million

> Changing brightness over time

Low resolution spectroscopy

470 million astrophysical parameters 220 million spectra

> Temperature | Mass Age | Colour Metallicity

Binary star systems 813 thousand

Position | Distance Orbit | Mass

1.8 billion stars

Radial velocity 33 million

Speed star moves towards or away from us

> Third velocity dimension

Astrometry and photometry 1.5 billion

Already released in the last of the last o Brightness and colour Position | Distance **Proper motions**

High resolution spectroscopy

5.6 million astrophysical parameters

2.5 million chemical compositions

1 million spectra

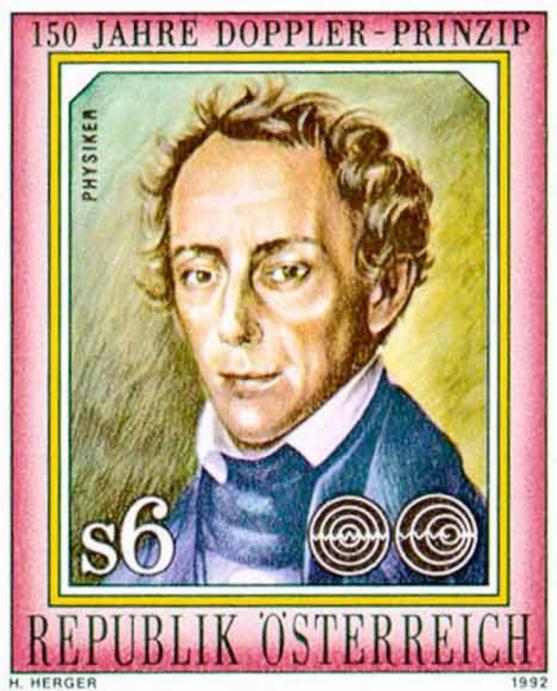
Chemical composition Temperature | Mass | Age



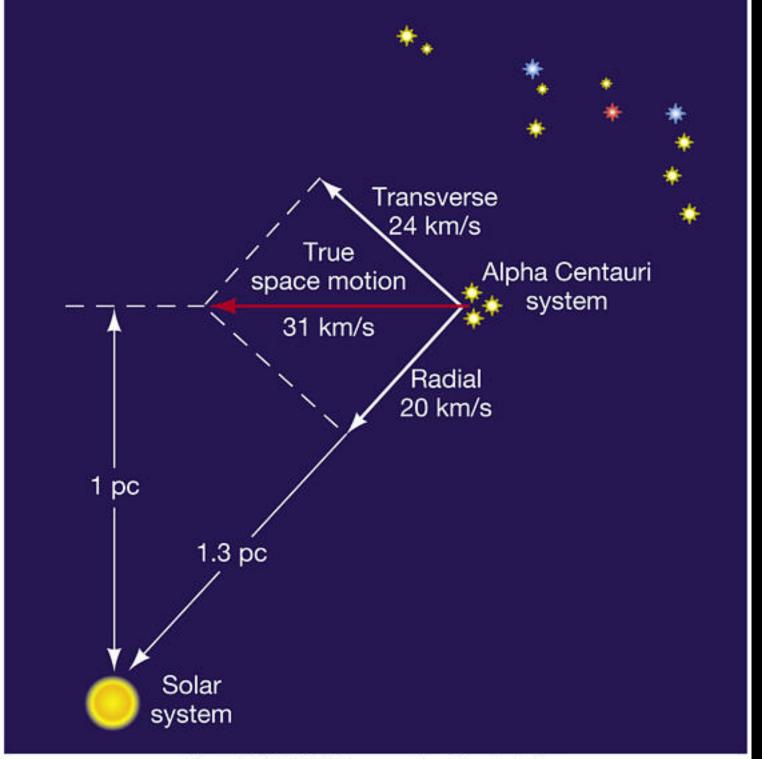




- 2007



H. HERGER



Copyright © 2005 Pearson Prentice Hall, Inc.

MILKY WAY STARS



Data release 3 includes a total of 1.8 billion Milky Way stars – providing astronomers with an unprecedented view of stellar characteristics and their life cycle,

and the galaxy's structure

and evolution.

Object classifications 1.5 billion

What type of star is it? Variable stars 10 million

> Changing brightness over time

Low resolution spectroscopy

470 million astrophysical parameters 220 million spectra

> Temperature | Mass Age | Colour Metallicity

Binary star systems 813 thousand

Position | Distance Orbit | Mass

1.8 billion stars

Radial velocity 33 million

Speed star moves towards or away from us

> Third velocity dimension

Astrometry and photometry 1.5 billion

Already released in the last of the last o Brightness and colour Position | Distance **Proper motions**

High resolution spectroscopy

5.6 million astrophysical parameters

2.5 million chemical compositions

1 million spectra

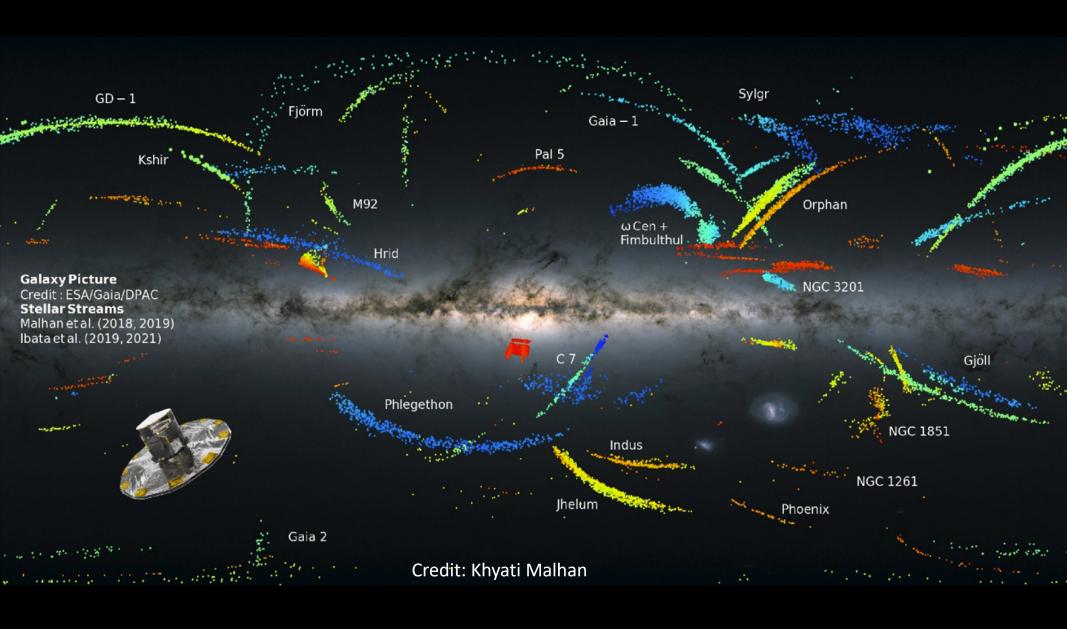
Chemical composition Temperature | Mass | Age

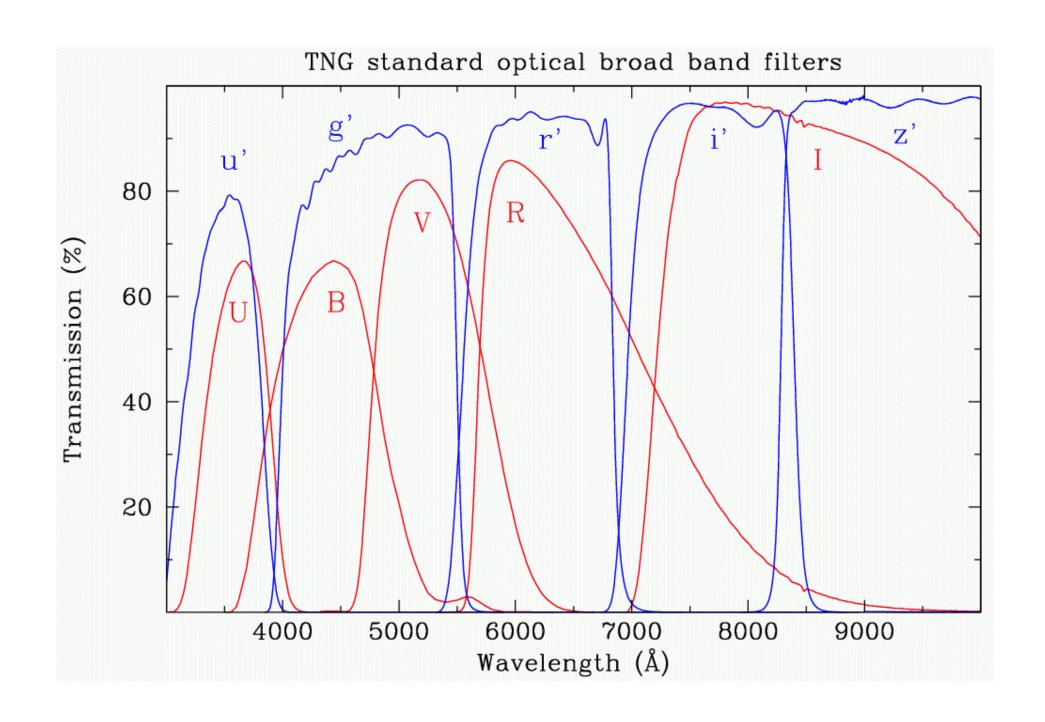




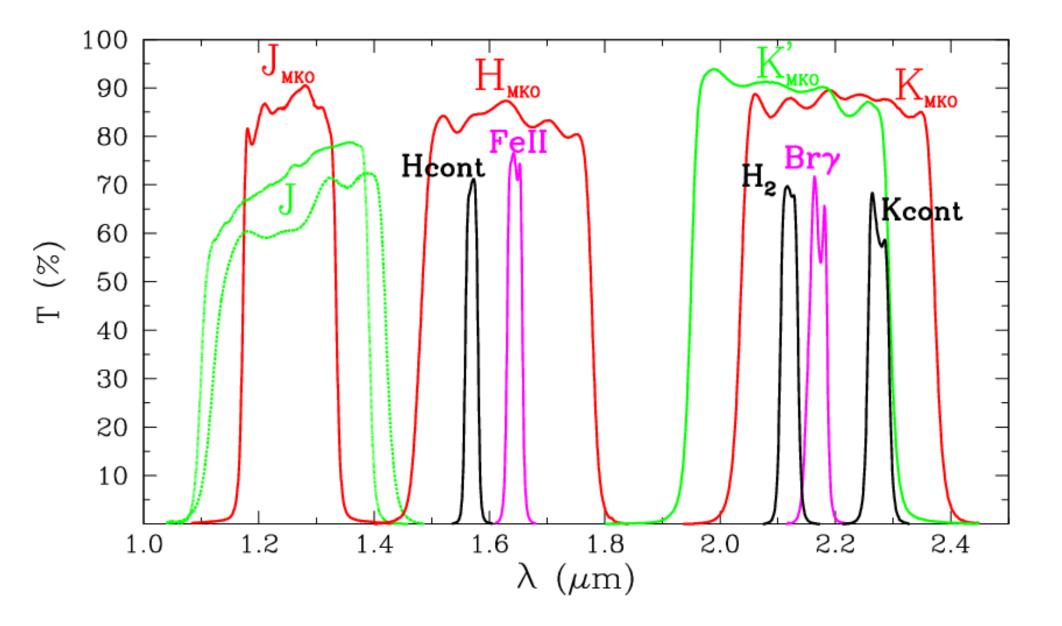


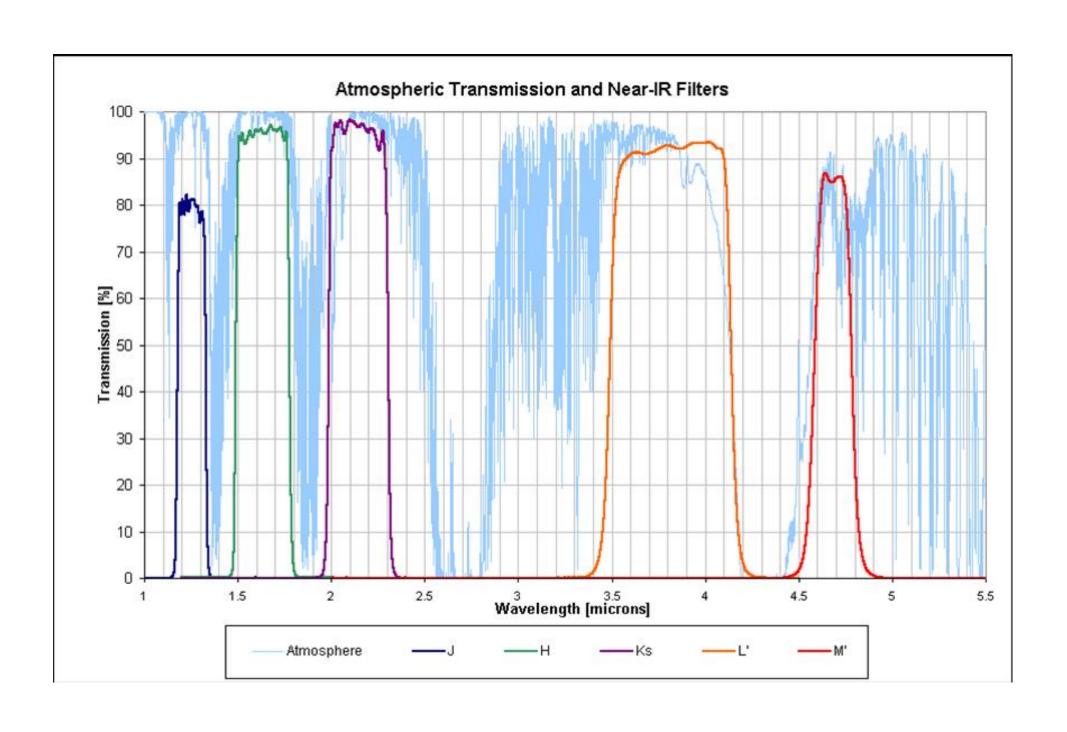




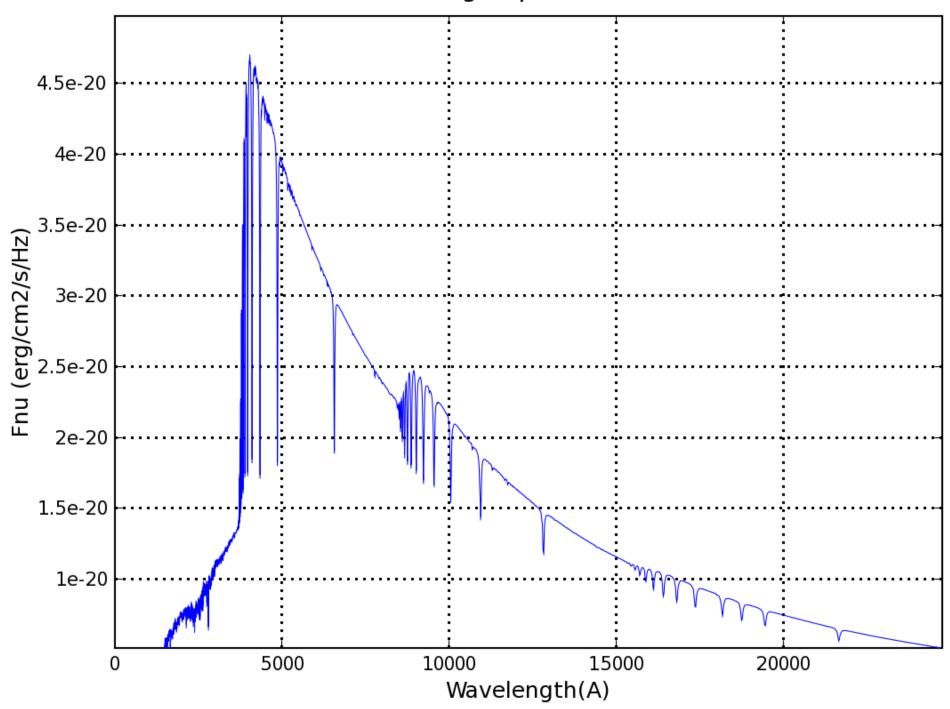


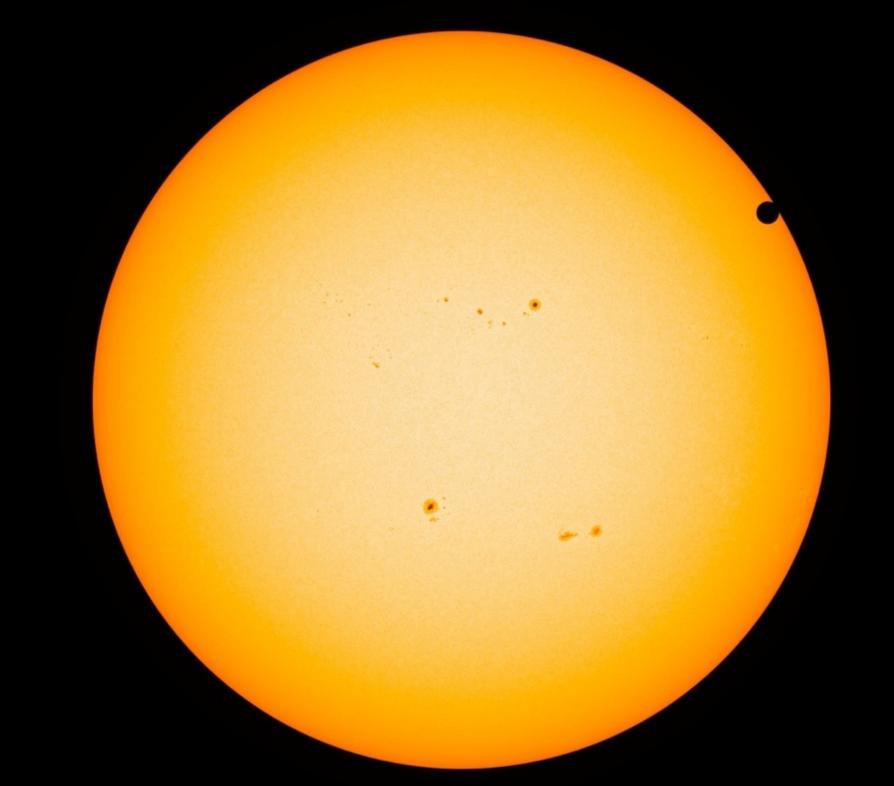


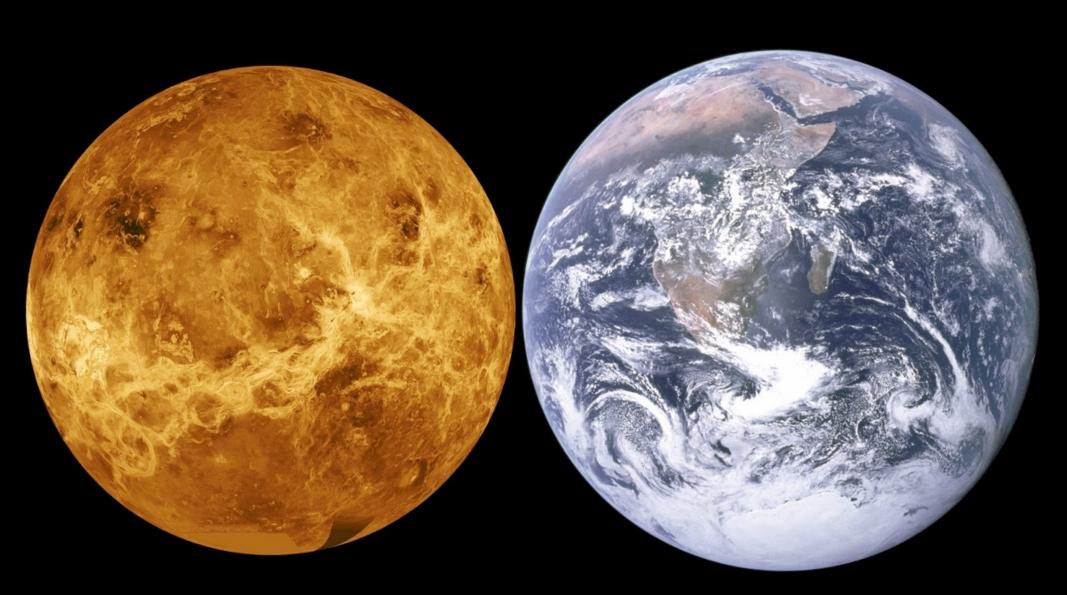




Vega Spectrum







Sun's Spectrum vs. Thermal Radiator

of a single temperature T = 5777 K

