Presentation for the Calera Elementary School STEM Night March 8, 2018

Mitzi Adams, Heliophysicist
NASA/MSFC

Images Courtesy of: Jesse-Lee Dimech/Renee Weber, Joe Matus, Debra Needham, Mitzi Adams, NASA/MSFC

Who Am I ?
Mitzi Lynn Adams

-- From Atlanta, Georgia

-- In high school, was an observatory/planetarium assistant at Fernbank Science Center

-- Bachelor of Science in physics with a mathematics minor from Georgia State University
Master of Science in physics from University of Alabama in Huntsville, in co-op program with NASA/MSFC

-- Have been a NASA Solar Scientist since 1988

-- Was planetarium director of the Von Braun Astronomical Society's planetarium from 1988-2006

-- Have completed five marathons and observed five total solar eclipses

-- Like to visit Peru

-- Like languages, Spanish, Latin, and German

What Objects are in the Sky?

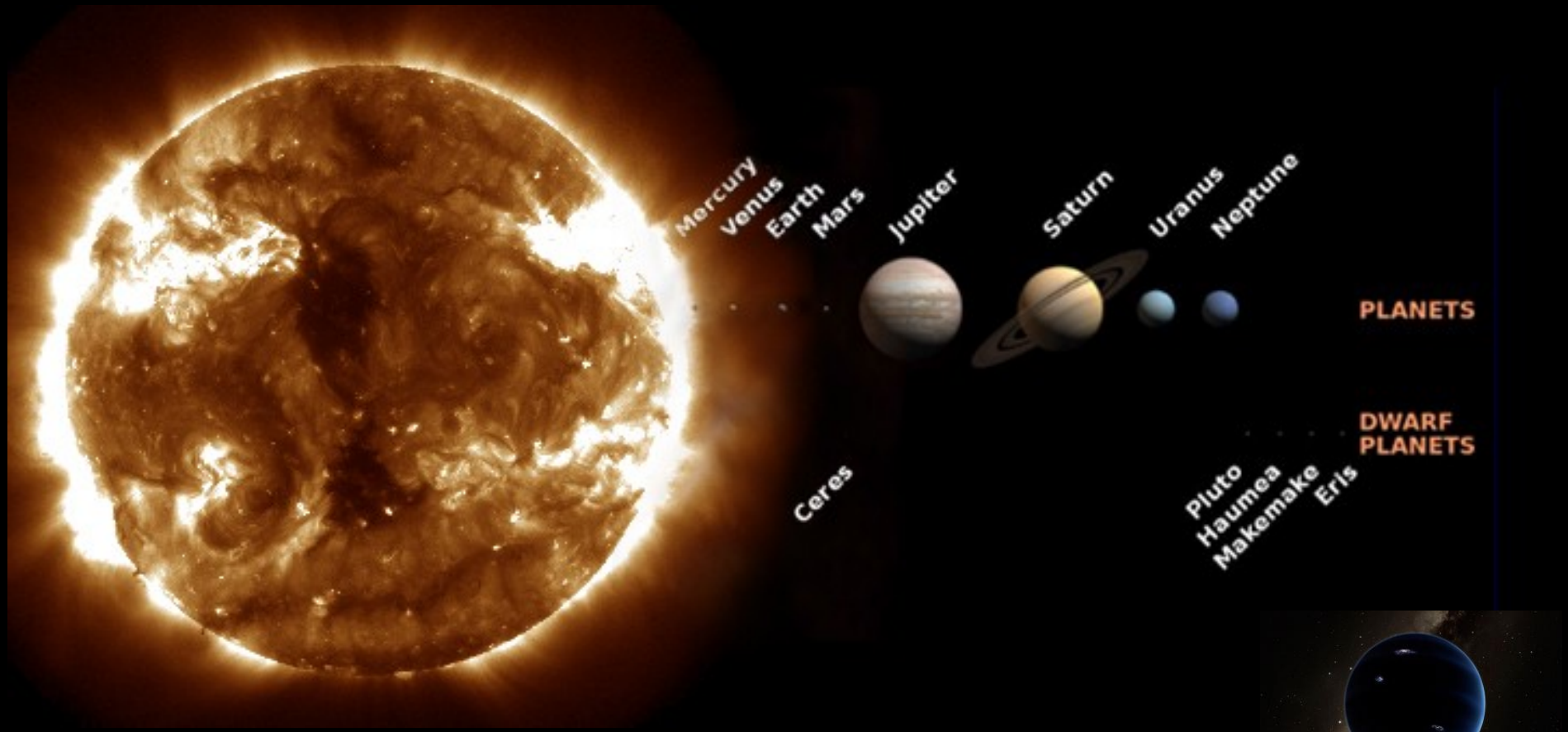
There are Stars in the Sky!!

Globular Cluster NGC 1846, Nov. 22, 2011
From: http://heritage.stsci.edu/gallery/galindex.html

Hubble Heritage

NASA, ESA, and the Hubble Heritage Team (STScI/AURA) • *HST* ACS/WFC • STScI-PRC11-35b

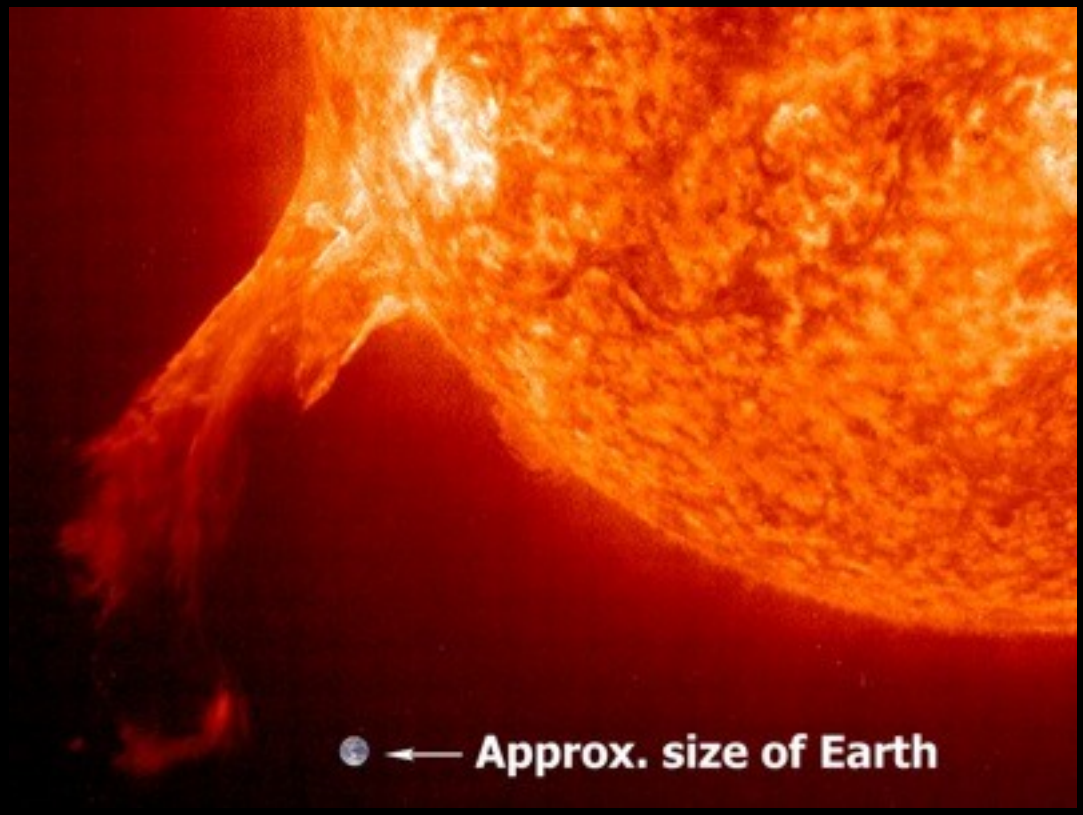
Our Dynamic Sun: A Star at the Center of the Solar System with a System of Planets



Planet Nine?

Images From: https://sdo.gsfc.nasa.gov/data/ and https://solarsystem.nasa.gov/planets/hypothetical-planet-x/in-depth/ and Credit: Caltech/R. Hurt (IPAC)

There is a star at the center of our solar system!

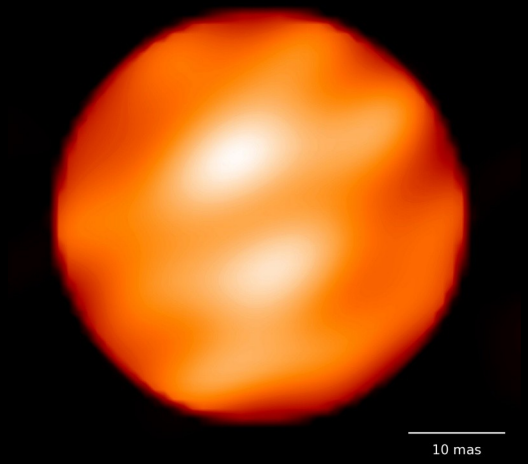


But what is a star?

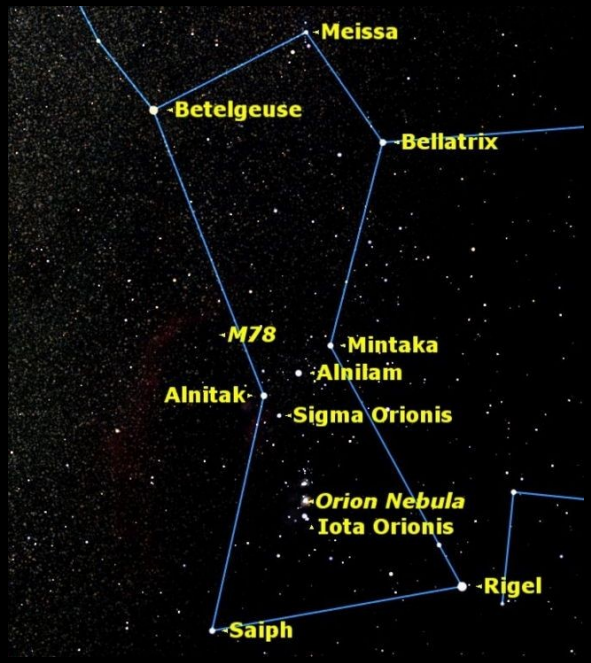
What is a Star?

A Star is an object in space that ***produces*** its light.

Planets and Moons ***reflect*** light



Betelgeuse: A red giant star, about 600 ly away, 3500 K, 1,180 $R_{\odot}$, 7.7 $M_{\odot}$.



Rigel: A blue-white star, about 770 ly away, 11,000 K, 80 $R_{\odot}$, 20 $M_{\odot}$.

Closest Star System
Alpha Centauri -- Three Stars!

α-Cen-A and α-Cen-B are about 4.4 light years away

α-Cen-C or Proxima-Centauri is 4.2 light years away

If Sun were grapefruit sized, Alpha Centauri system would be 4,000 kilometers or 2,500 miles away

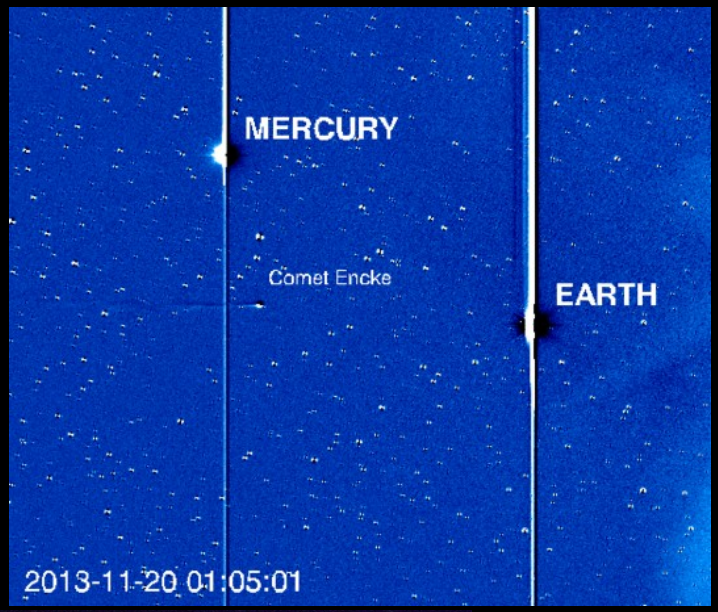
From Hubble: https://www.nasa.gov/image-feature/goddard/2016/hubbles-best-image-of-alpha-centauri-a-and-b

Comets and Asteroids

Dawn at Ceres in April, 2017

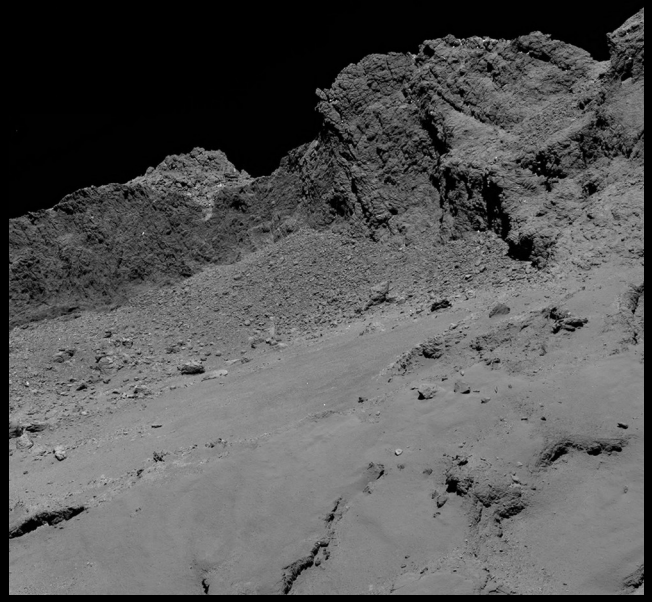
Animation here:
https://www.nasa.gov/feature/jpl/movie-shows-ceres-at-opposition-from-sun

Comets



Images from STEREO-A,
November 22, 2013

Source: NASA/MSFC/Aaron Kingery
Published: November 19, 2013



Source: ESA/Rosetta/MPS for OSIRIS Team
MPS/UPD/LAM/IAA/SSO/INTA/UPM/DASP/IDA
Published: September 30, 2016

Images From: https://solarsystem.nasa.gov/small-bodies/comets/galleries/

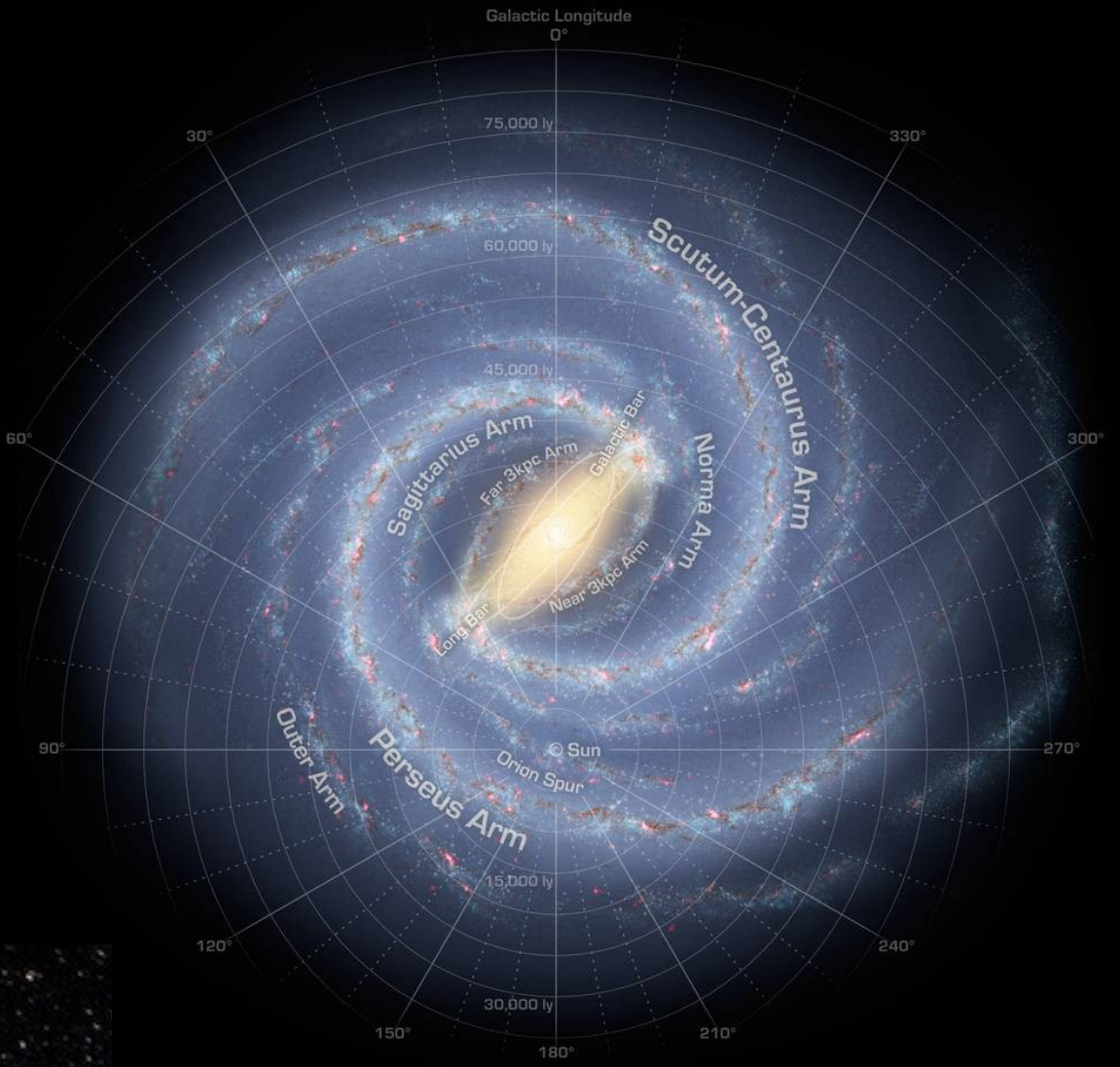
Galaxies

100 billion stars in the Milky Way galaxy

More than 30 galaxies in the local group (d= ~10 million light years

The Sun is 25,000 light years from the middle of the galaxy

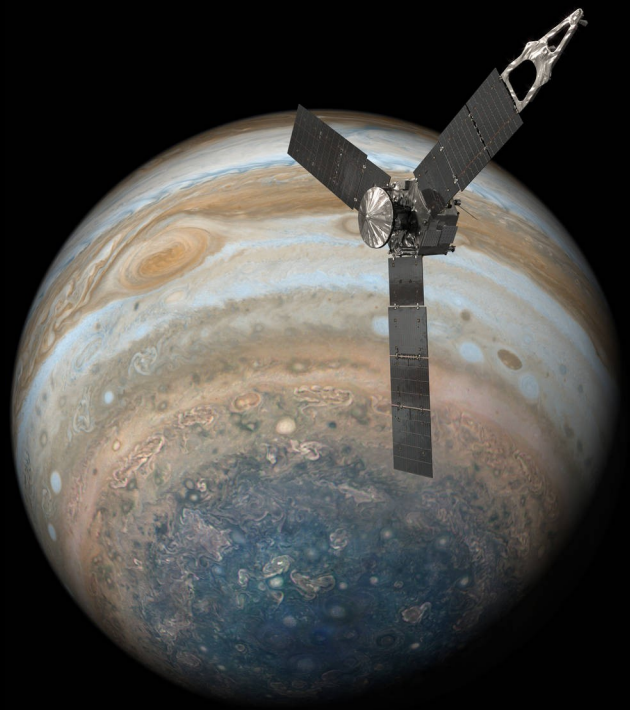
The Sun goes around the center (a galactic “year”) in about 250 million years.



Artist's Concept from best data (2015)
(https://www.nasa.gov/jpl/charting-the-milky-way-from-the-inside-out)

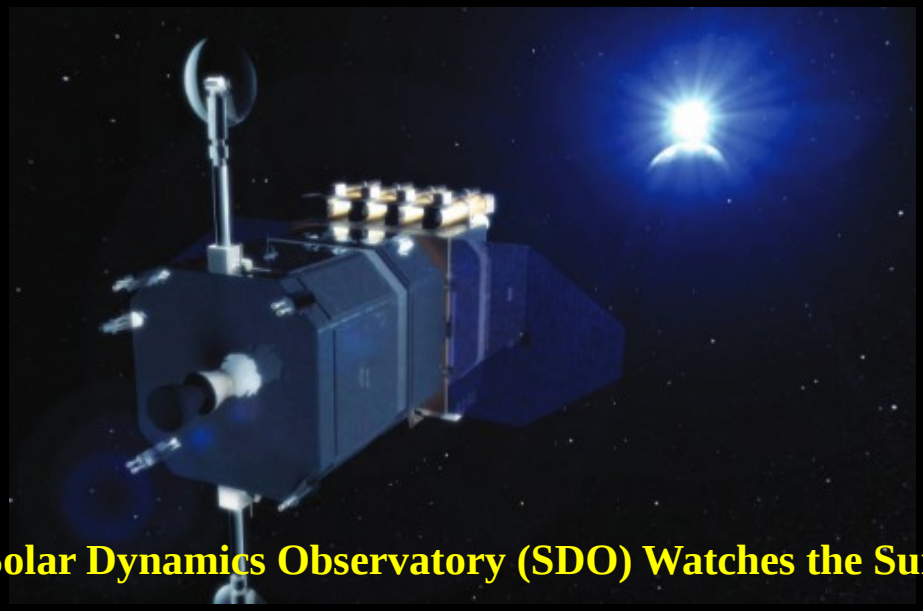
Image above looks into the center of Milky Way from the COBE Project, see: https://imagine.gsfc.nasa.gov/science/objects/milkyway1.html

NASA has Satellites in Space



Juno, at Jupiter

Mars Global Surveyor



Solar Dynamics Observatory (SDO) Watches the Sun

Lunar Reconnaisance Orbiter

All images from NASA's Mission Pages:
https://www.nasa.gov/missions

What is in Space?

Stars
Planets
Comets
Asteroids
Galaxies
Satellites Made by Humans