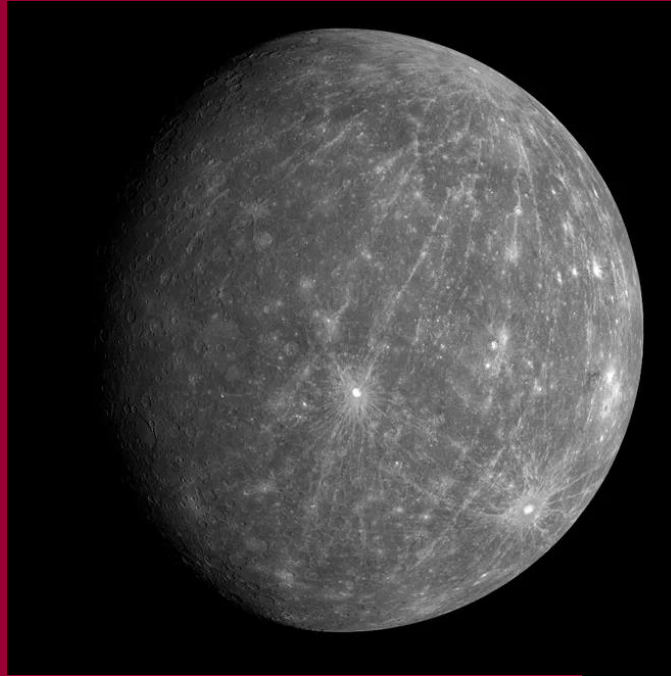


The Inferior Planets



Culpeper Astronomy Club Meeting
October 23, 2017

Overview

- Introductions
- Dark Matter (Ben Abbott)
- Mercury and Venus
- Stellarium
- Constellations: Aquila, Cygnus
- Observing Session (?)

Image of the Month



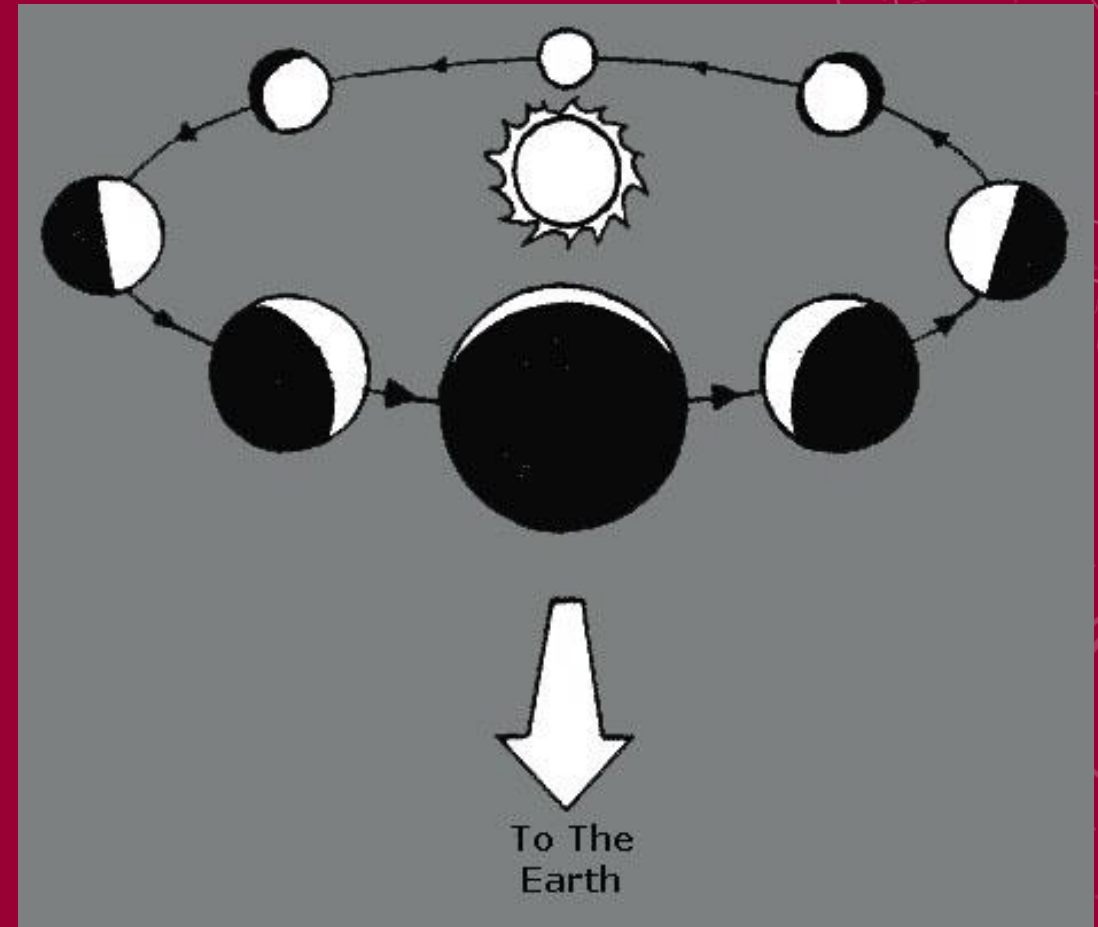
Mercury and Venus

- Two innermost planets from the Sun
- Mercury very difficult to observe because of closeness to Sun
 - Close to sunset or sunrise
 - Displays phases
 - Transits the Sun: 11 Nov 2019
- Venus: brightest “Evening/Morning Star”
 - Covered in highly reflective clouds
 - Presents distinct phases
 - Best viewing during “half” or “crescent” phase
 - Next Transit: Dec 2117



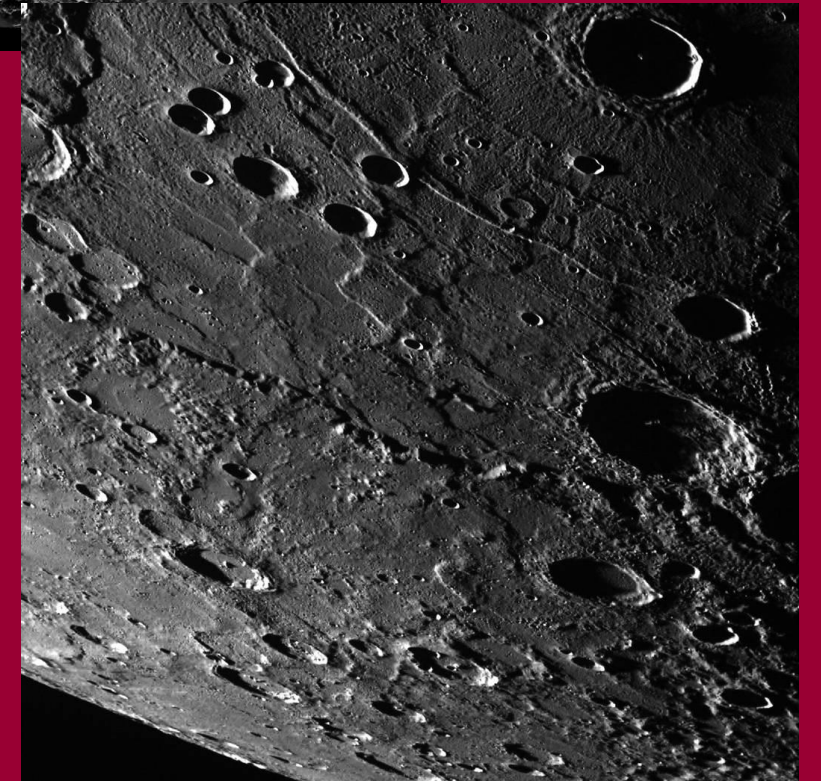
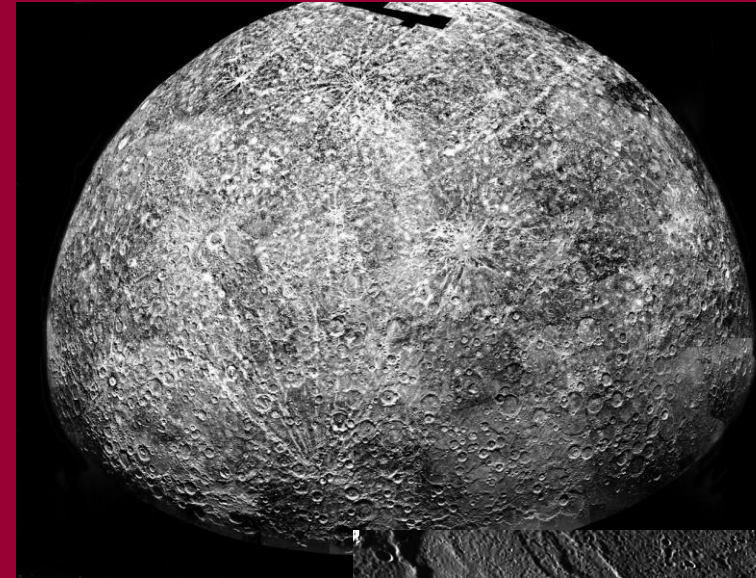
Inferior Planets - Phasing

- Mercury and Venus show phases like those of the Moon
- As they pass behind the Sun – at superior conjunction – we see those parts of their surfaces which are also directed towards the Sun and are illuminated
- When they pass between the Earth and the Sun – at inferior conjunction – we see those parts of their surfaces which are directed away from the Sun and are not illuminated



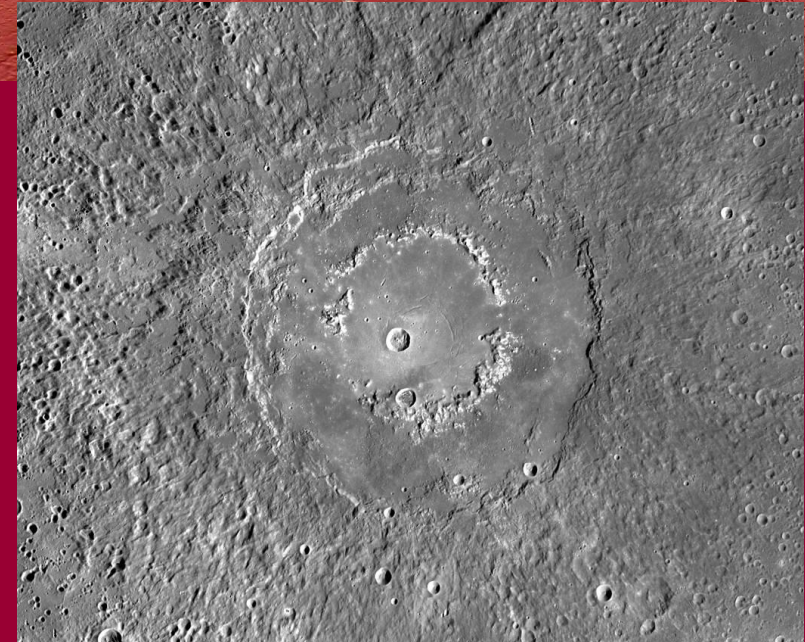
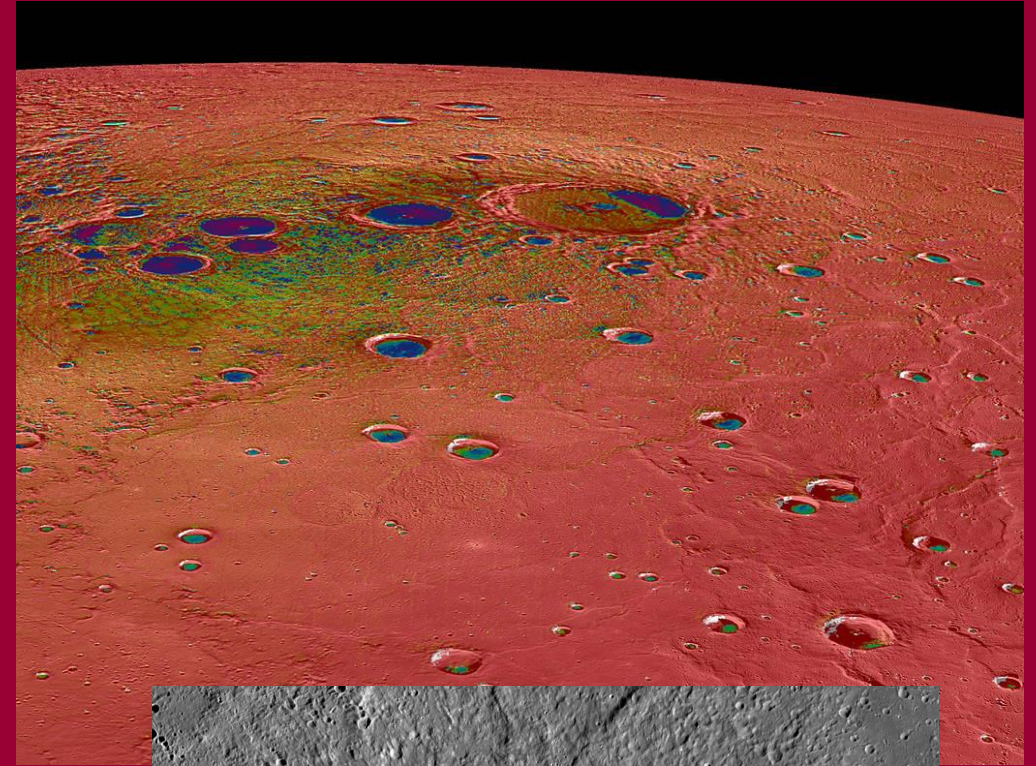
Mercury

- Mercury was named for the swift Roman "messenger" god
 - Orbits Sun faster than any other planet
 - Revolution - 88 days; Rotation – 59 days
- Smallest planet in our solar system
 - Only slightly larger than our moon
 - Ganymede and Titan are larger
- Mercury's surface resembles that of Earth's Moon
 - Scarred by many impact craters resulting from collisions with meteoroids and comets
 - Has very little atmosphere to stop impacts: is covered with craters
 - Mercury is the second densest planet after Earth, with a large metallic core



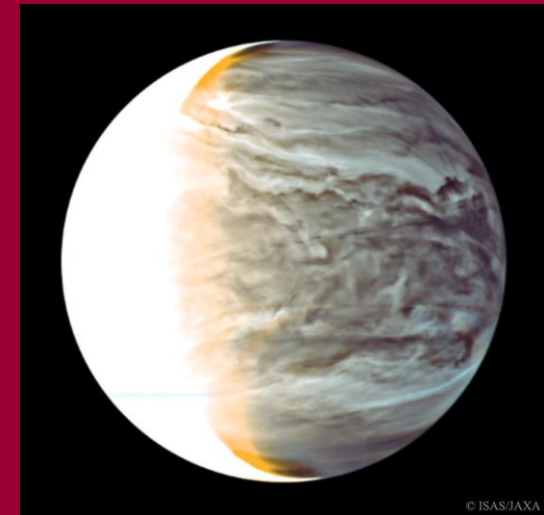
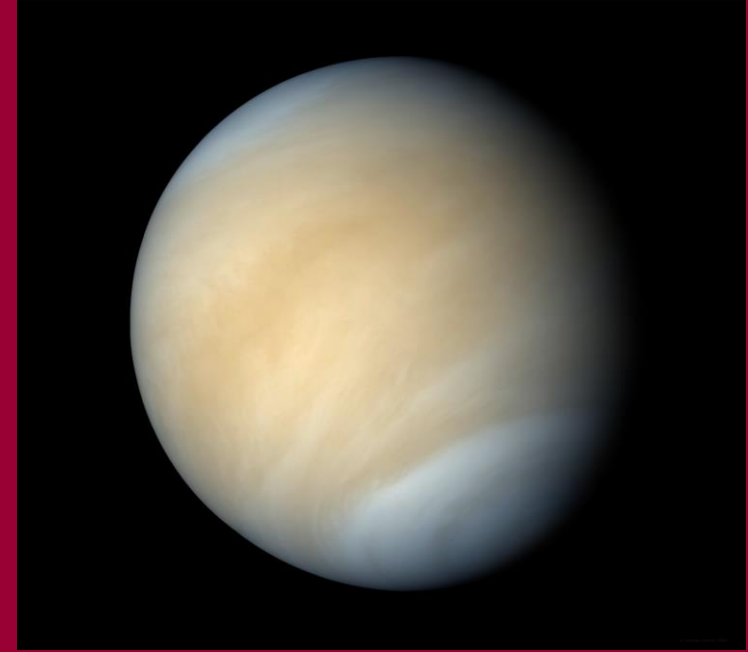
Mercury

- Only two NASA spacecraft has visited Mercury
 - Mariner 10 in 1974 and 1975
 - Messenger in 2011
 - 2008-2009 – Flyby's
 - March 2011 -- Yearlong science orbit
- Dayside is super-heated by the sun: night side hundreds of degrees below freezing
- Mercury's surface temperatures can reach about 840 degrees Fahrenheit
- Mercury's axis of rotation is such that sections of the planet, the deep floors and walls of craters near its poles, are always shaded
 - In these frigid areas of Mercury, temperatures can dip to minus 350 degrees Fahrenheit



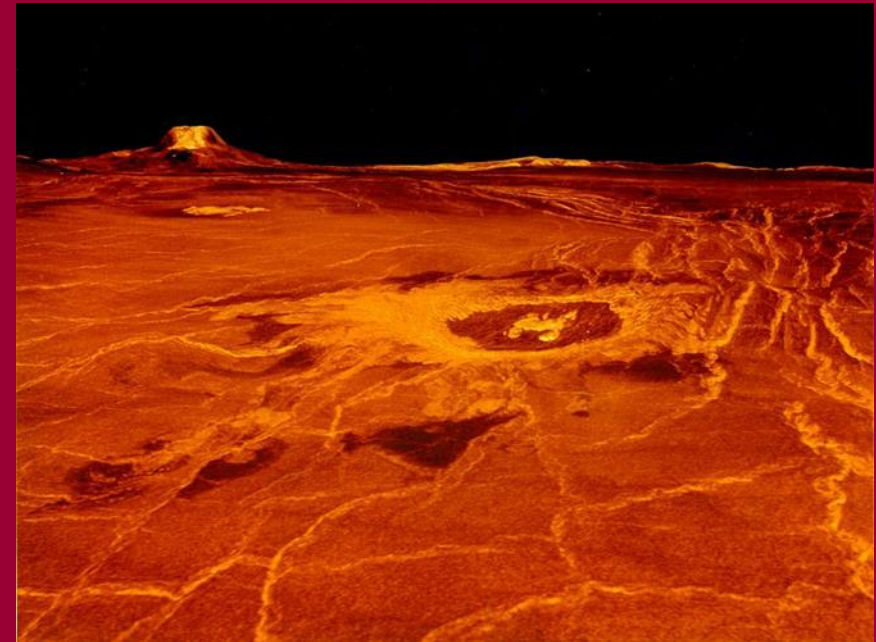
Venus

- Venus is named for the ancient Roman goddess of love and beauty
 - Counterpart to the Greek goddess Aphrodite
- Similar in structure and size to Earth, Venus spins slowly in the opposite direction most planets do
 - It completes one rotation in 243 Earth days — the longest day of any planet in our solar system
 - Its orbit around the sun is the most circular of any planet — nearly a perfect circle
- Thick atmosphere traps heat in a greenhouse effect
 - The hottest planet in our solar system with surface temperatures hot enough to melt lead

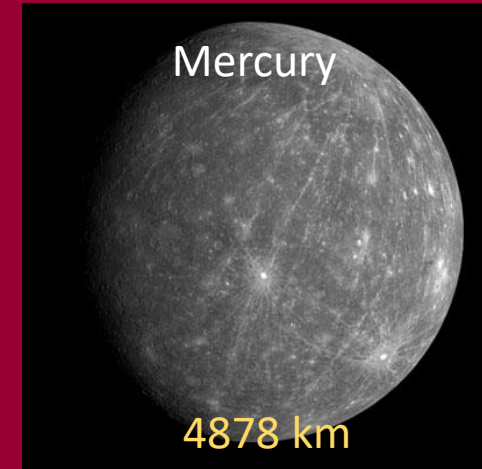


Venus

- Venus is bright white because it is covered with clouds that reflect and scatter sunlight
 - At the surface, the rocks are different shades of grey, like rocks on Earth
- Venus has mountains, valleys, and tens of thousands of volcanoes
- Venus is covered in craters, but none are smaller than 0.9 to 1.2 miles (1.5 to 2 kilometers) across
 - Small meteoroids burn up in the dense atmosphere
 - Only large meteoroids reach the surface and create impact craters

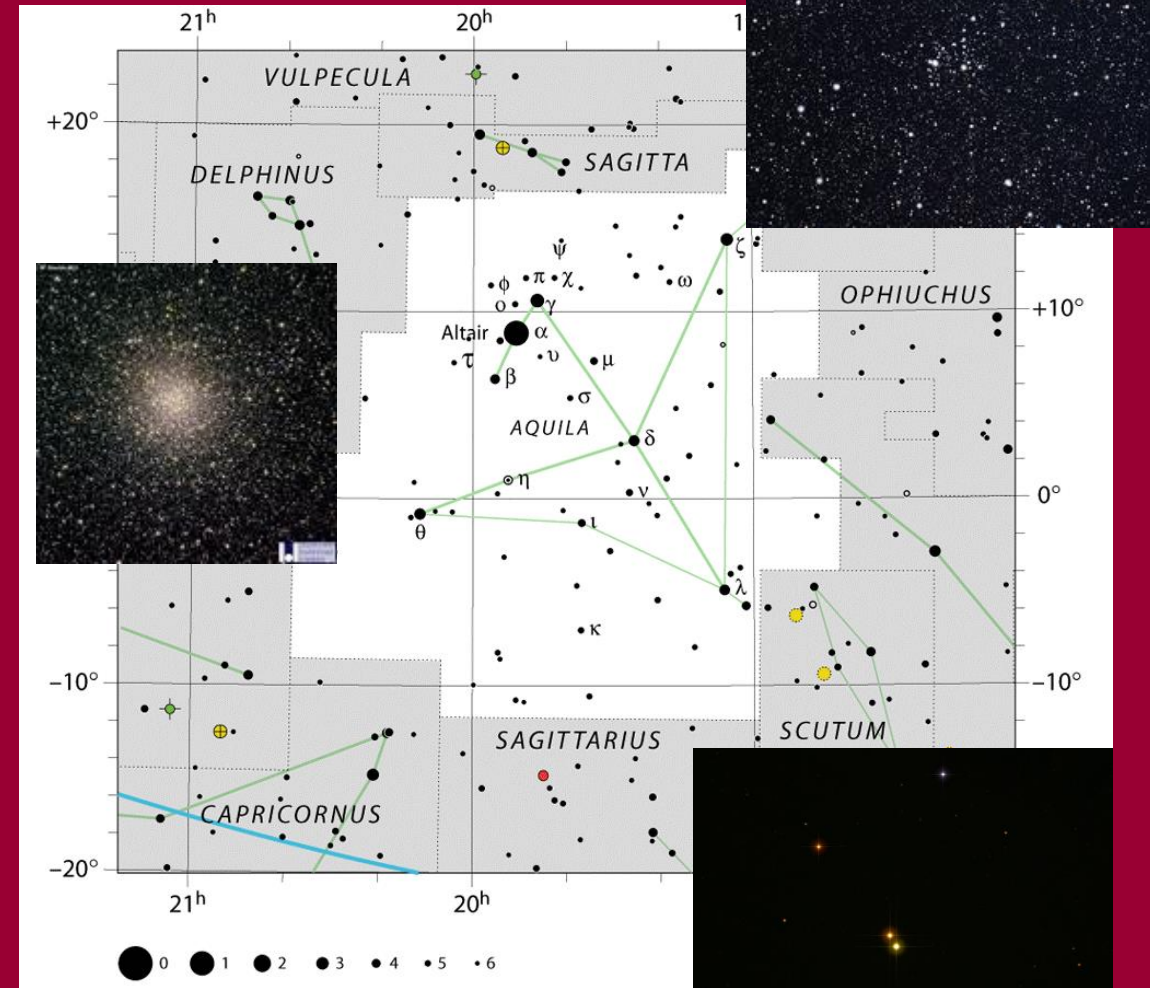


Largest Moons of the Solar System



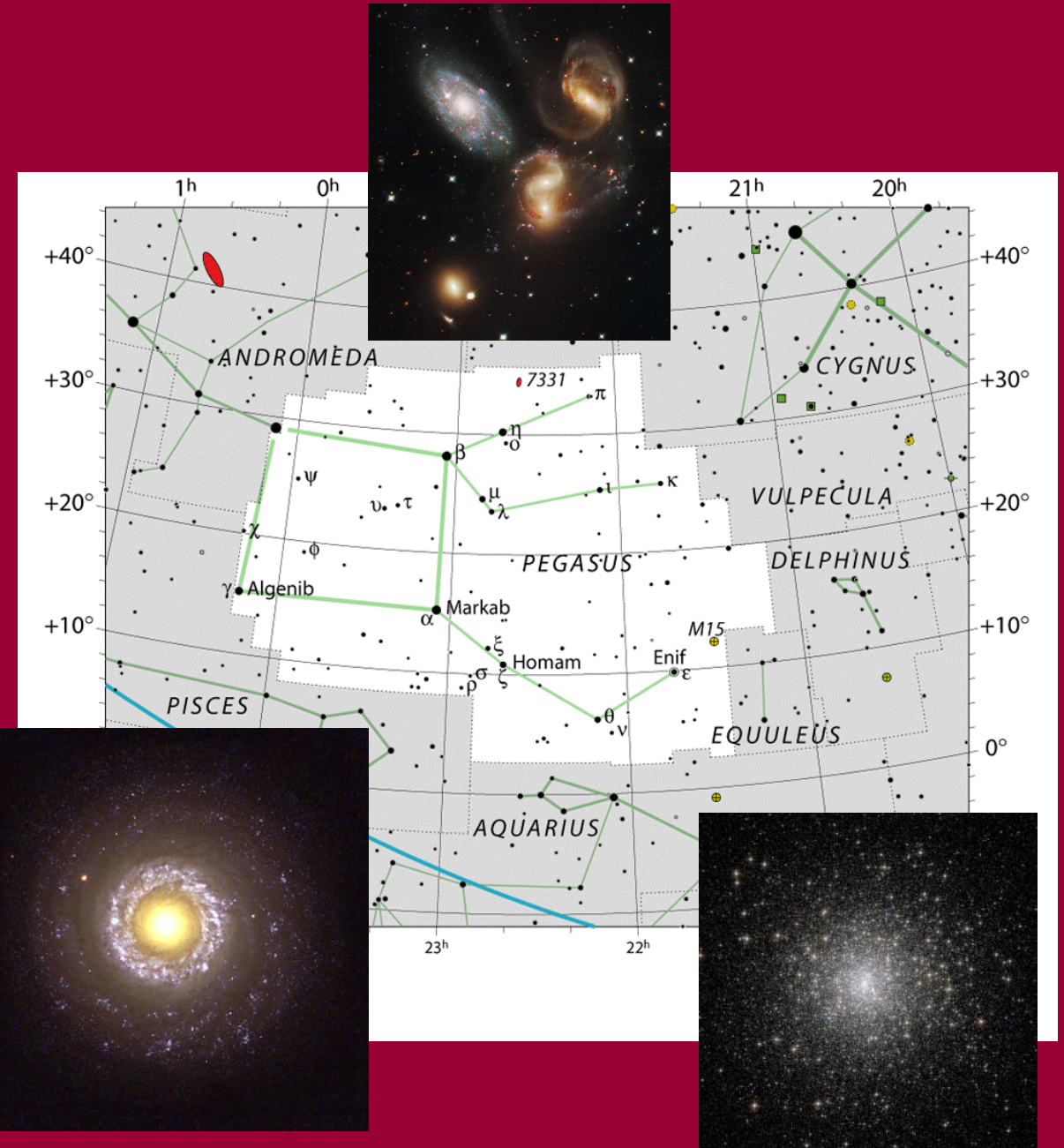
Aquila- “The Eagle”

- Aquila is identified as the eagle that carried Zeus’ thunderbolts
 - Altair: “flying eagle” or “vulture”; one of the three stars that form the Summer Triangle
 -
- Double Stars:
 - 15 Aquilae: binary star; 5 mag yellow star and 7 mag companion
- Deep Sky Objects:
 - NGC 6709: Open Star Cluster; stars are loosely arranged into a diamond-like shape
 - NGC 6760: Globular Cluster



Pegasus – “The Horse”

- It is one of the largest constellations in the sky
 - Named the winged horse in Greek mythology
 - Identifiable as the “Great Square of Pegasus”
-
- Double Stars:
 - Struve 2799: 1.9”; Matched White-white
 - Struve 2968: 3.3”: Yellow-Gray
- Deep Sky Objects:
 - Messier 15, Globular Cluster
 - Stephan’s Quintet (of Galaxies)
 - Spiral galaxy NGC 7742



Meteor Showers

- Some of the best are listed below along with dates when the most meteors are visible
 - Quadrantids, January 3-4 (Comet 2003 EH1)
 - Lyrids, April 22-23 (Comet Thatcher)
 - Perseids, August 12-13 (Comet Swift-Tuttle)
 - Orionids, October 20-21 (Halley's Comet)
 - Leonids, November 17-18 (Comet Tempel-Tuttle)
 - Geminids, December 13-14 (Asteroid 3200 Phaethon)
 - Ursids, December 23-24 (Comet 8P/Tuttle)
- The name of each shower refers to the constellation to which the meteors trace their apparent paths



Upcoming Events

- Next Meeting: November 27
 - Primary Topic: The Mars - “The Red Planet”
 - Last meeting for 2017!
- Leonid Meteor Shower – November 17/18 (New Moon)
- Geminid Meteor Shower – December 13/14