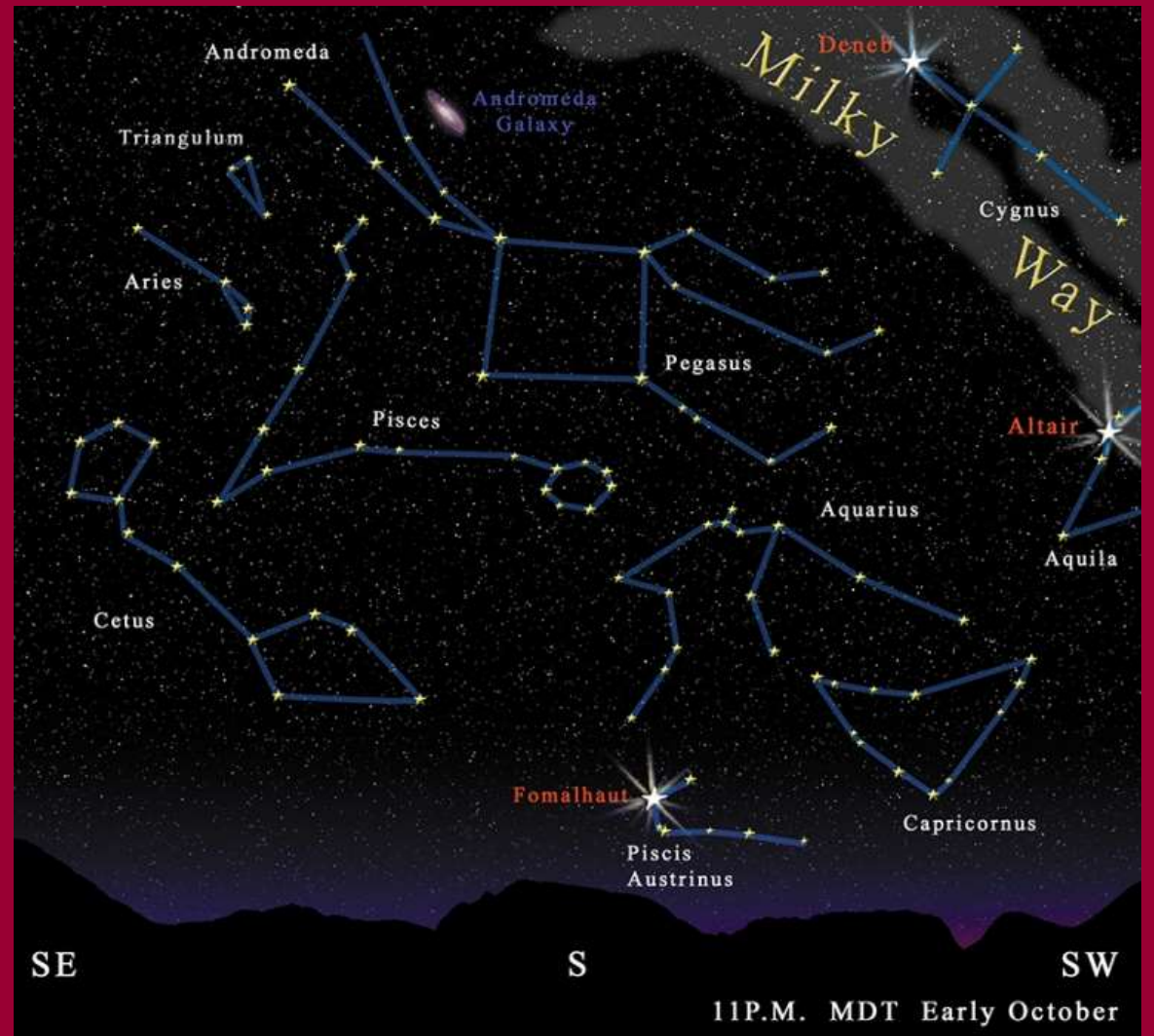


Autumn Constellations



Culpeper Astronomy Club Meeting
September 23, 2019

Overview

- Introductions
- Special Topics
- Video - Pluto
- Video - Fall Constellations
- Constellations: Andromeda, Pegasus, Triangulum
- Observing Session?

Observing Sessions

- August 30, CAC Session, MCO
 - Jupiter, Saturn
 - Double stars
 - Variety of Deep Sky Objects
 - Several meteors – possible Epsilon Perseid's

Special Topics

Mercury Transit – 11 November 2019

- Transit: passage of the planet across the Sun
- The orbits of Mercury and Venus lie inside Earth's orbit, so they are the only planets which can pass between Earth and Sun to produce a transit
- Transits are rare astronomical events
 - On average 13 Mercury transits each century
 - Last was May 2016; next November 2032
- Planet can be seen as a small black disk slowly moving in front of the Sun
 - Apparent diameters of the Sun and Mercury are 1937 and 10 arc-seconds, respectively
 - Mercury appears to be 1/194 the Sun
- Plan to setup in front of library



Mercury Transit – 11 November 2019

Eclipse Map — November 11–12, 2019 Mercury Transit

Transit Information

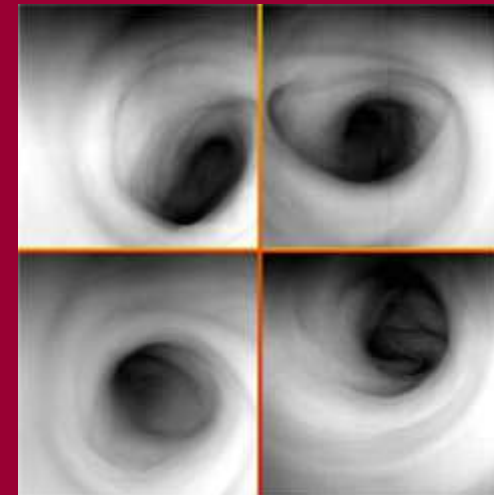
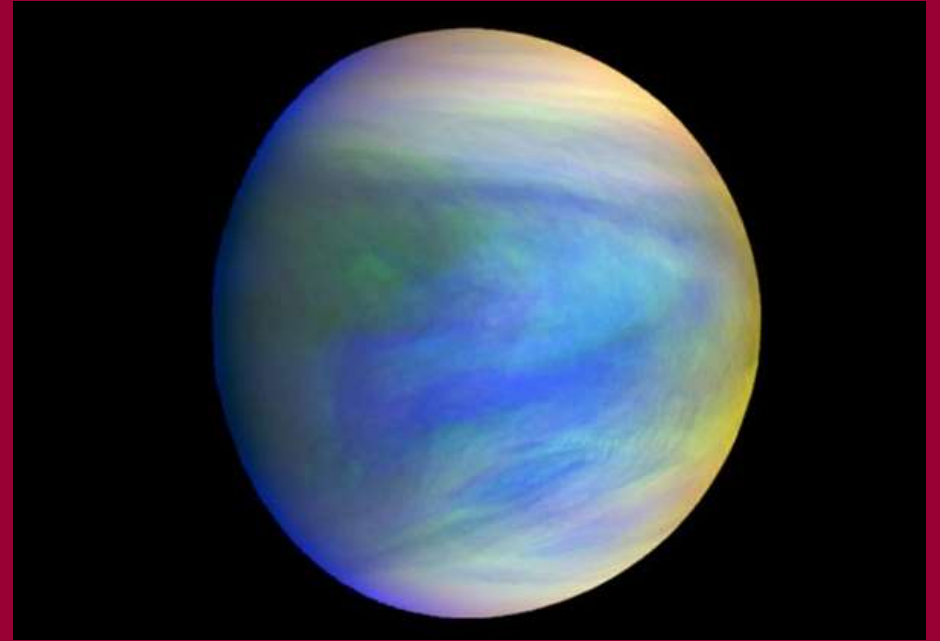
Transit Map

3D Globe Map



Mysterious Dark Patches In Venus' Clouds

- The planet's hot, harsh atmosphere is thick with carbon dioxide and sulfuric acid
 - Atmospheric gases circulate amid cloud layers according to patterns that scientists don't fully understand
 - Venusian clouds also contain strange, dark patches, called "unknown absorbers" because they absorb large amounts of solar radiation
- No one has yet determined what these dark patches are, but scientists have speculated that they might be forms of sulfur, ferric chloride or even microscopic life possibly extraterrestrial
- Now, a team of scientists at the Center for Astronomy and Astrophysics at the Technical University of Berlin, has shown that the unknown absorbers are affecting Venus's weather
 - Variations in temperature and wind speeds in Venus' upper atmosphere



America's Largest Asteroid Impact

- About 35M years ago, an asteroid traveling nearly 144,000 mph (231,000 km/h) smashed into the Atlantic Ocean near Cape Charles, Virginia
- It vaporized instantly, but its impact triggered a gargantuan tsunami, cast up shattered rocks and molten glass that spanned hundreds of miles and carved out the single largest crater in the United States — the so-called Chesapeake Bay impact structure
- Today, that 25-mile-wide (40 kilometers) crater is buried half a mile below Chesapeake Bay — the 200-mile-long (320 km) estuary linking Virginia and Maryland on the East Coast
- This rain of meteoric debris formed the North American tektite which stretches from Texas to Massachusetts to Barbados, covering about 4 million square miles (10 million square km)



Pluto

- NASA Update:
<https://www.youtube.com/watch?v=6l4kr36TzQ4>

Fall Constellations

- Lecture Series
- Our Night Sky
- Duration: 30 minutes

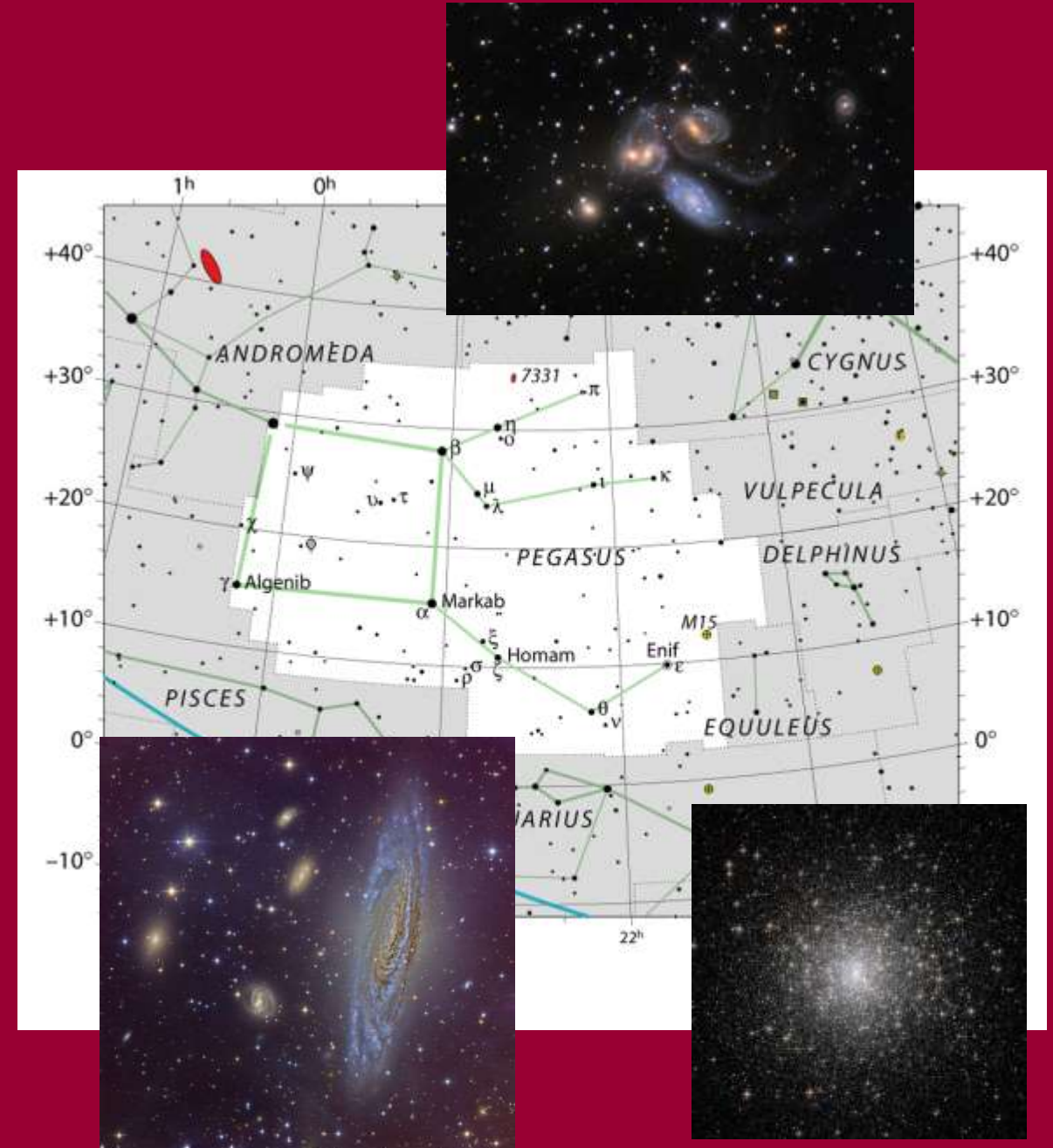
Constellations

- Constellations:
 - Pegasus, Horse
 - Andromeda, Princess
 - Triangulum, Triangle



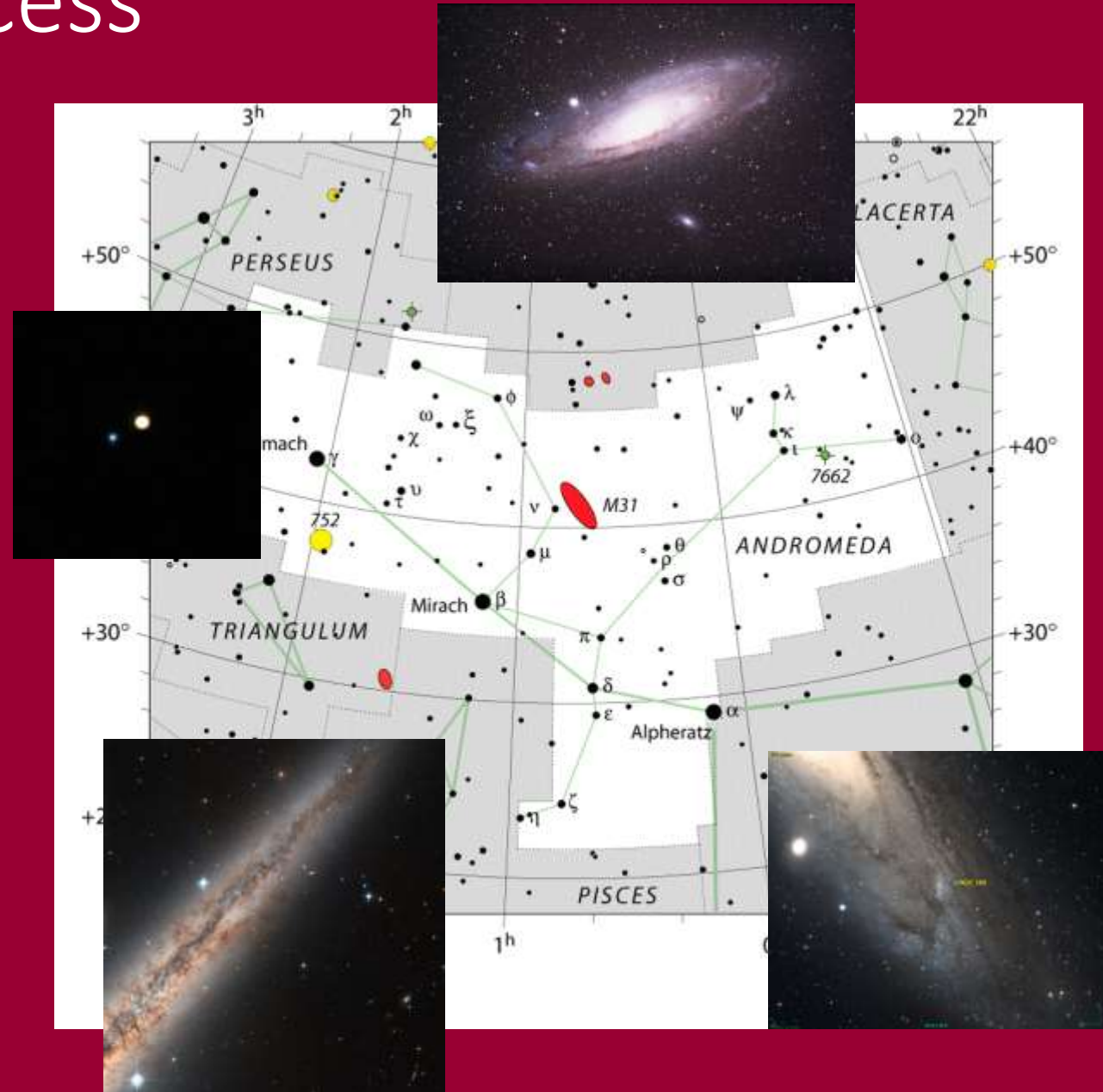
Pegasus – “The Horse”

- 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:
 - M15 - Globular Cluster; one of the oldest at 12B years old; contains 100K stars; significant variables and pulsars
 - Stephan’s Quintet (of Galaxies) - Four of the five galaxies were the first compact galaxy group ever discovered; NGC 7320, is only 40M LY distant
 - NGC 7331 - Spiral galaxy; mag 10.4; 40M LY distant; similar to Milky Way



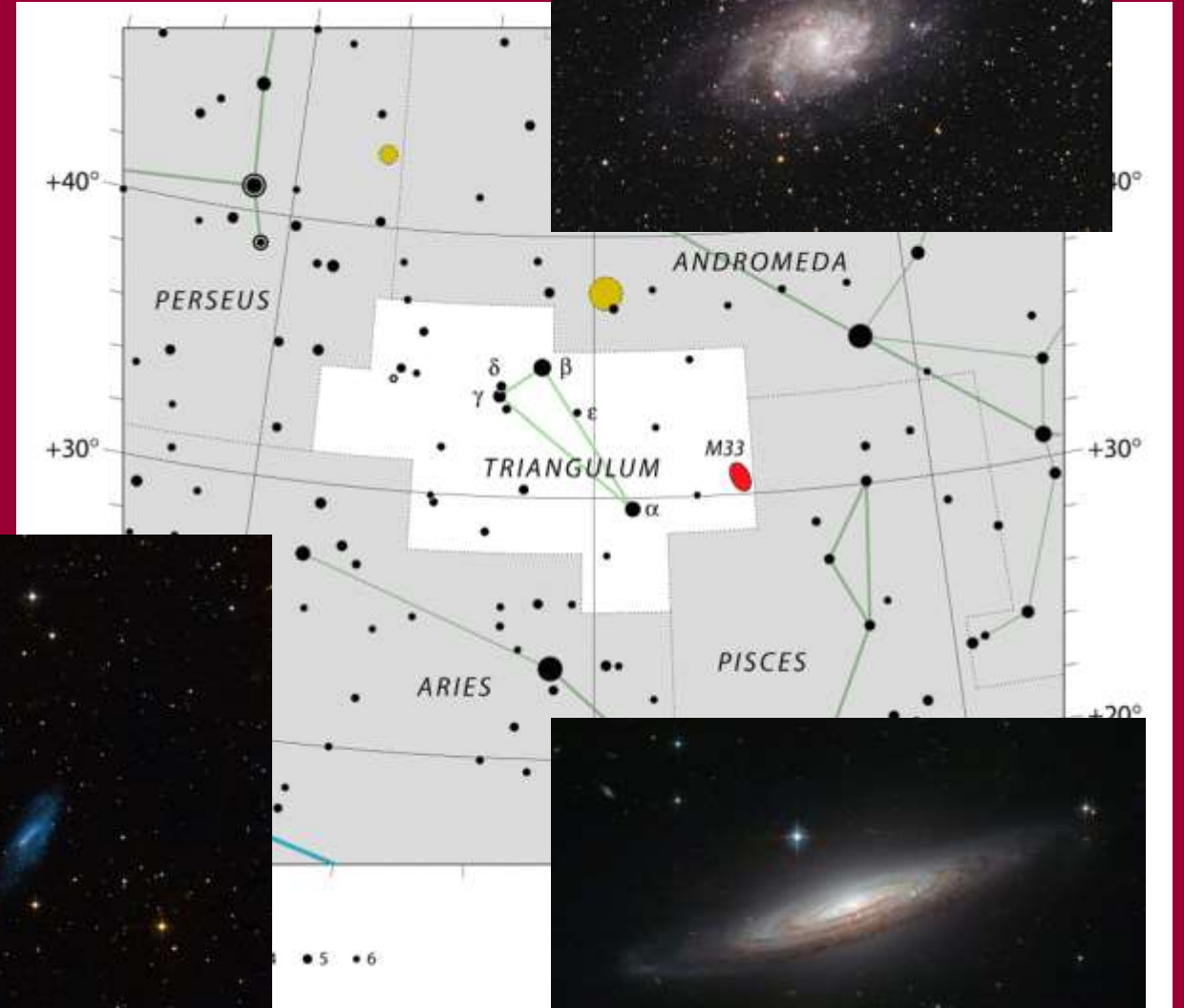
Andromeda – “The Princess”

- Named after the mythical princess Andromeda, the wife of the Greek hero Perseus
- Almach, Gamma Andromedae, is the third brightest star in the constellation and also another binary star; approx 10 arcsec apart
- Contains Andromeda Galaxy (Messier 31) and the dwarf elliptical galaxies Messier 32 and Messier 110
- NGC 206: brightest star cloud in M31 seen from Earth; one of the largest star forming regions in the Local Group of galaxies
- NGC 891: edge-on spiral galaxy 4 deg east of Almach; visible in 4.5” telescopes



Triangulum – “The Triangle”

- The Greeks knew the constellation as Deltoton, named for its shape, which resembled the capital Greek letter delta. Eratosthenes said that the constellation represented the delta of the river Nile
- The constellation is home to the Triangulum Galaxy (Messier 33), one of the nearest and best known galaxies in the night sky
- Other galaxies:
 - NGC 634 –Spiral
 - NGC 925 – Barred Spiral
 - NGC 672 and IC 1727



Upcoming Events

- Next Meeting: October 28
 - Primary Topic: TBD
- Orionid Meteor Shower – October 21/22
- Mercury Transit – November 11

Backup Slides

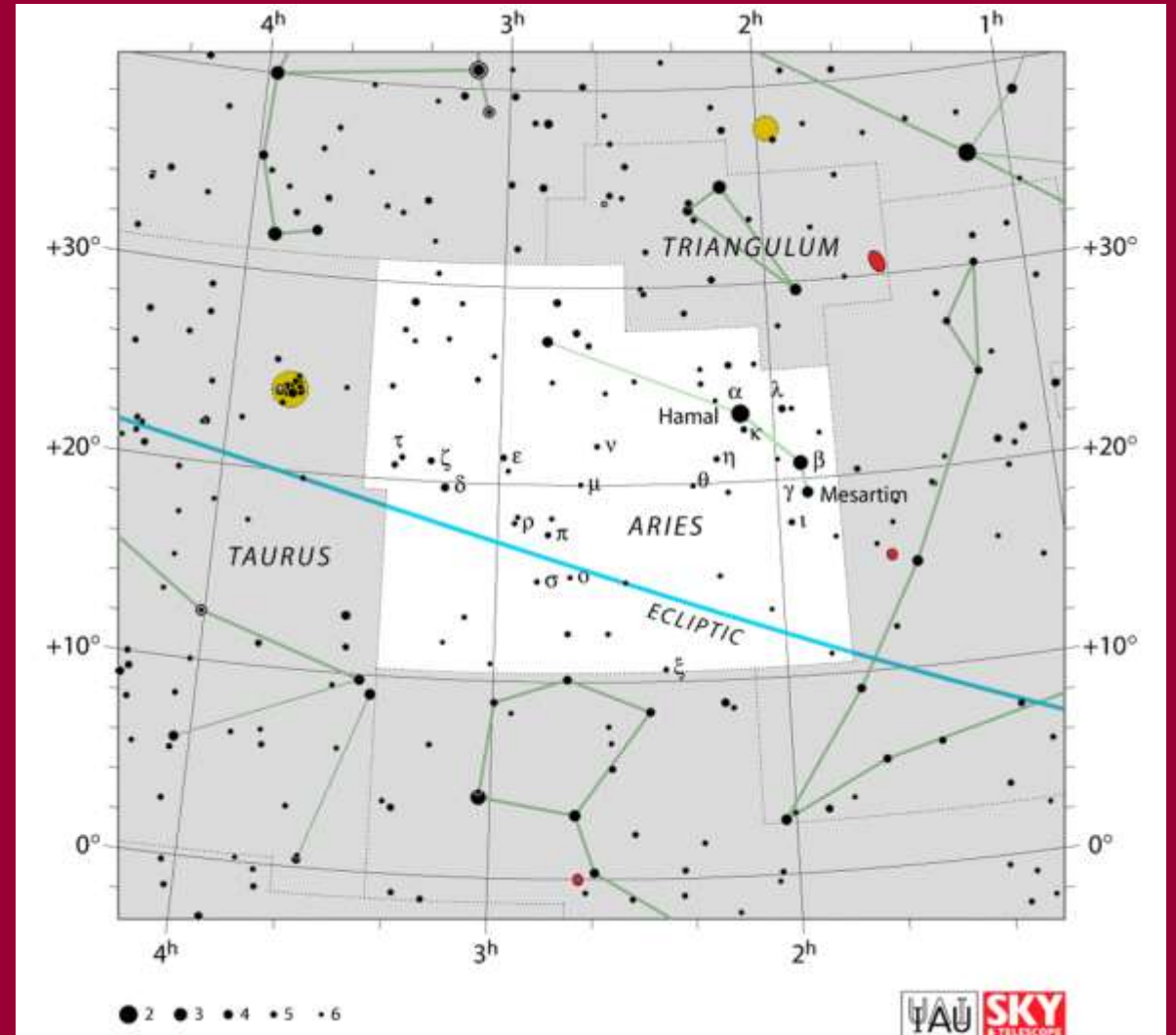
Meteor Showers

- 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

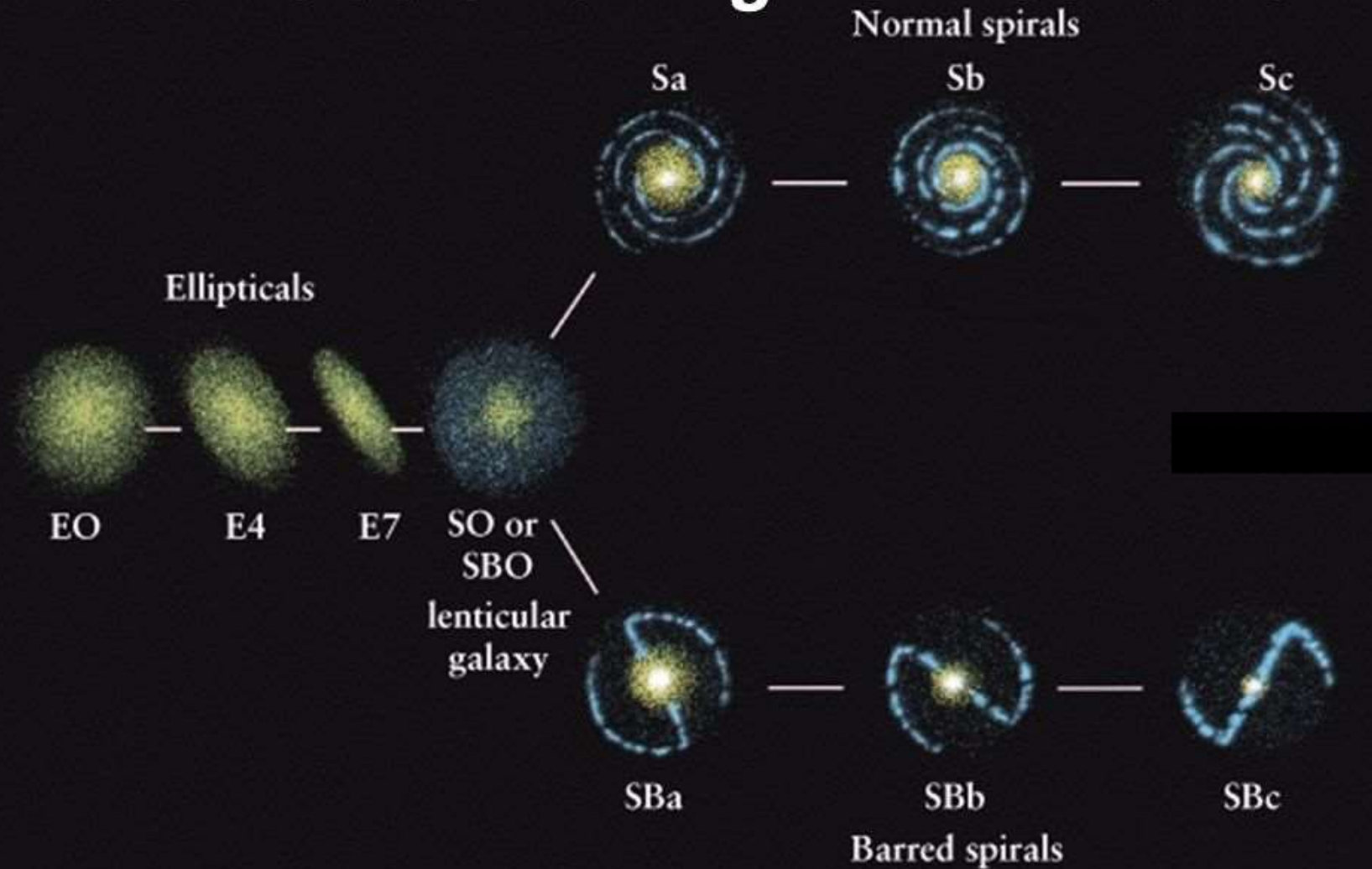


Aries – “The Ram”

- Aries is identified with the golden ram that rescued Phrixus and took him to Colchis, where he sacrificed the ram to the gods
- The ram’s skin that he placed in a temple was the Golden Fleece, which later appears in the story of Jason and the Argonauts



This classification scheme is known as the *Hubble Tuning Fork Scheme*



Hertzprung-Russell Diagram

- A graphical tool that astronomers use to classify stars according to their luminosity, spectral type, color, temperature and evolutionary stage
- Stars in the stable phase of hydrogen burning lie along the Main Sequence according to their mass

