Catching the Serpent by the tail

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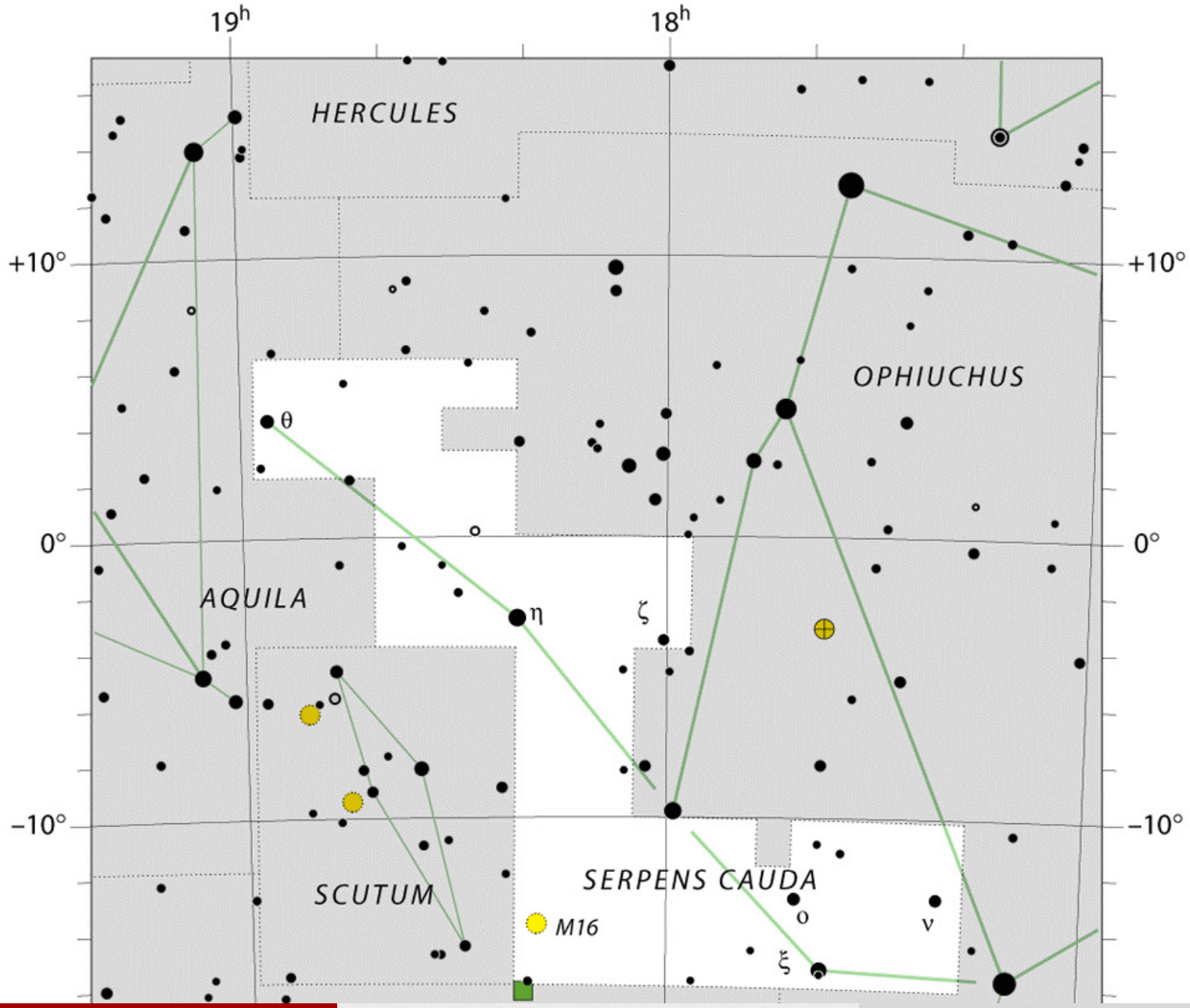
Palouse Divide Lodge Star Party 2018

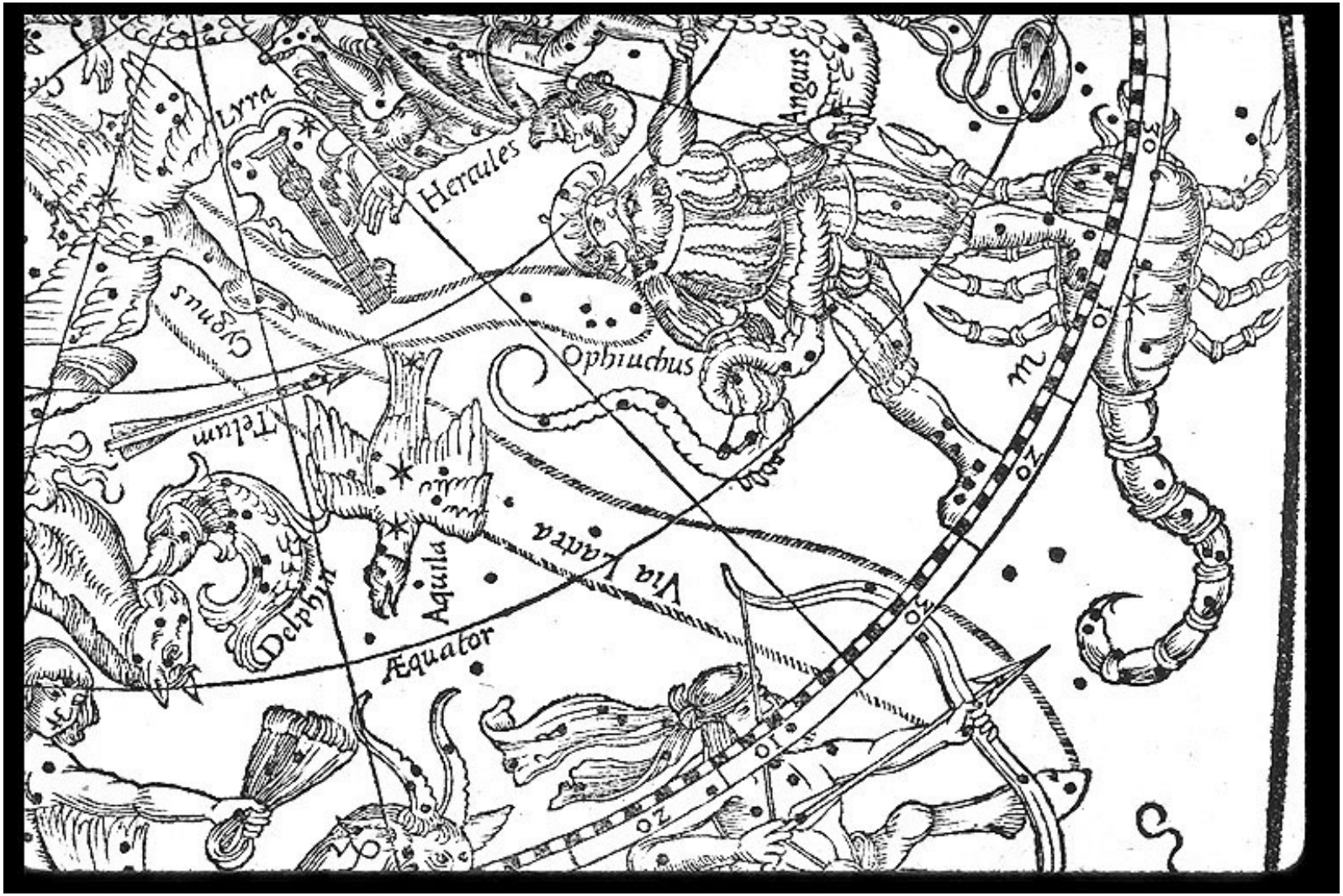
Outline

1. Serpens Cauda in the sky
2. Mythological Serpens
3. Stars in the tail of Serpens
4. Star clusters
5. A colorful (!) planetary nebula

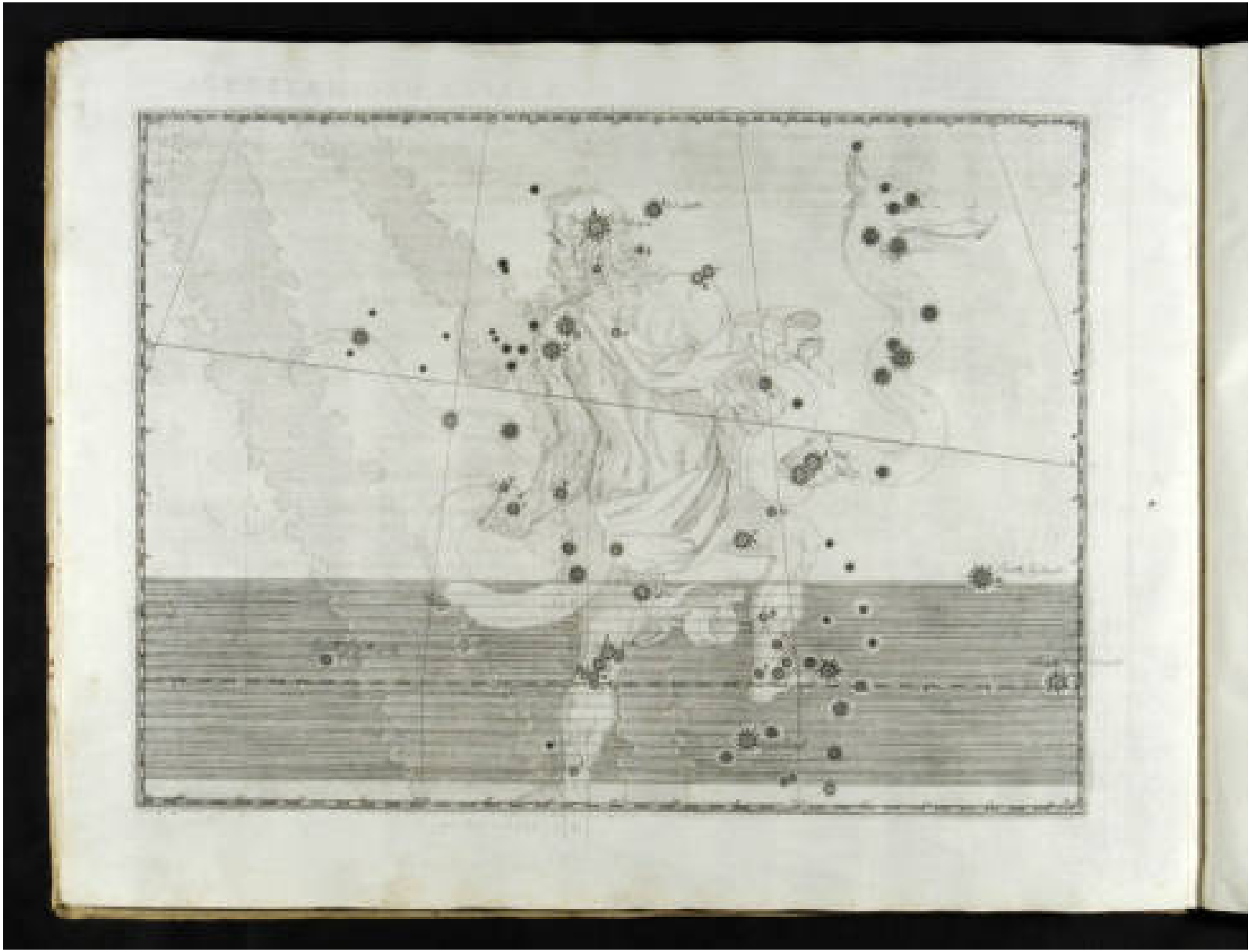
Serpens in the sky (from constellation-guide.com)



Albrecht Dürer (1515); first printed star chart

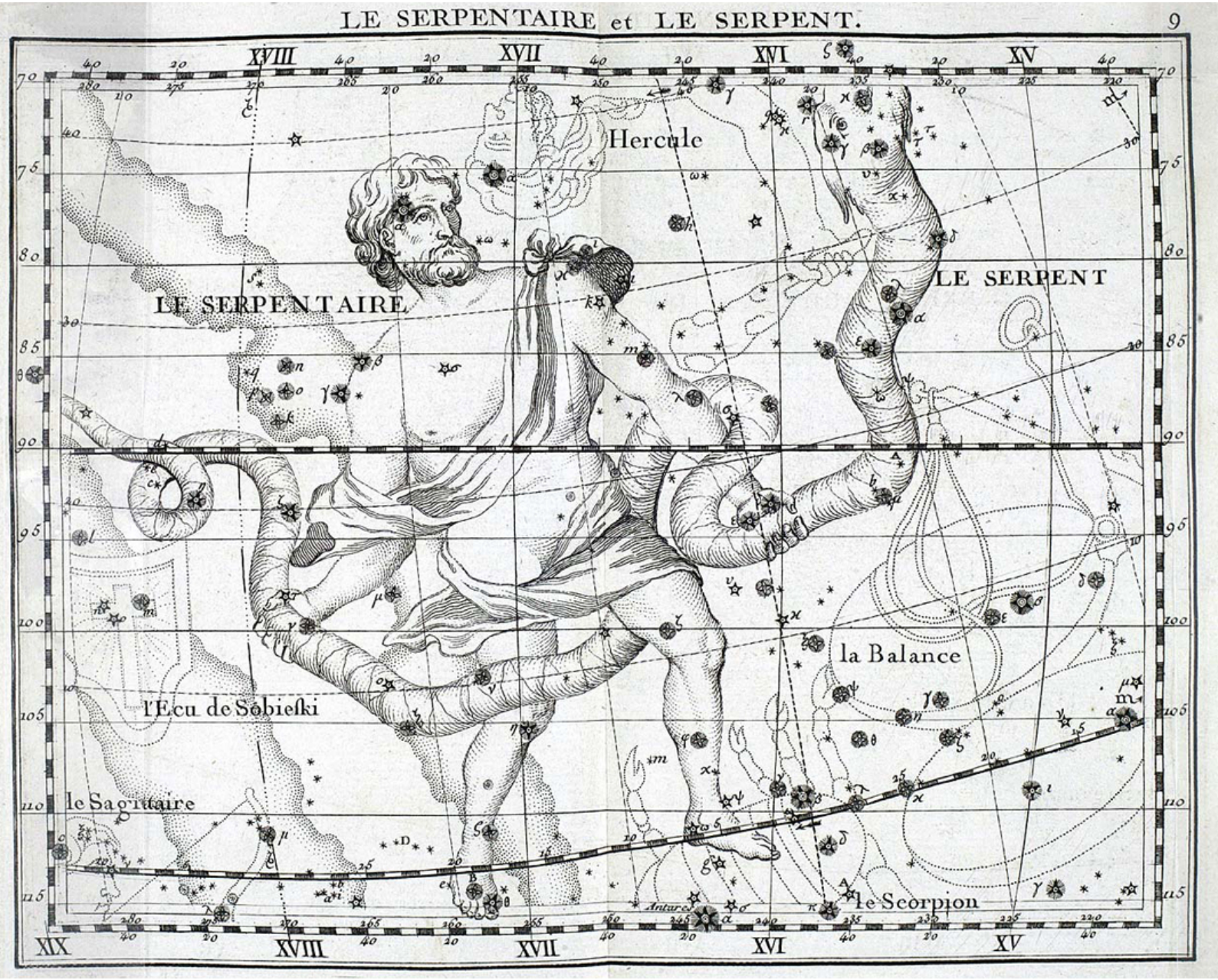


Johann Bayer (1603); first atlas-style charts

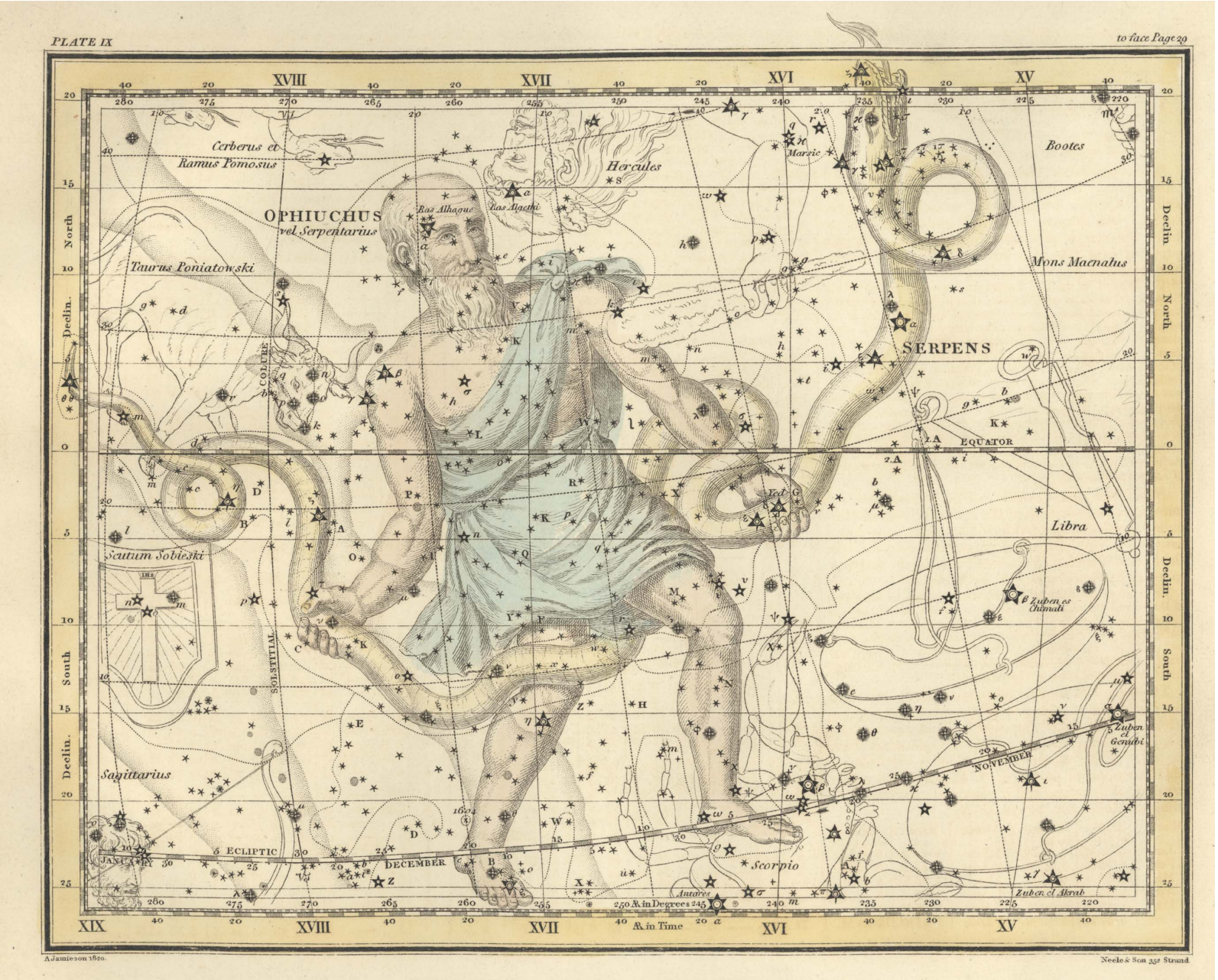


Johannes Hevelius (1690)

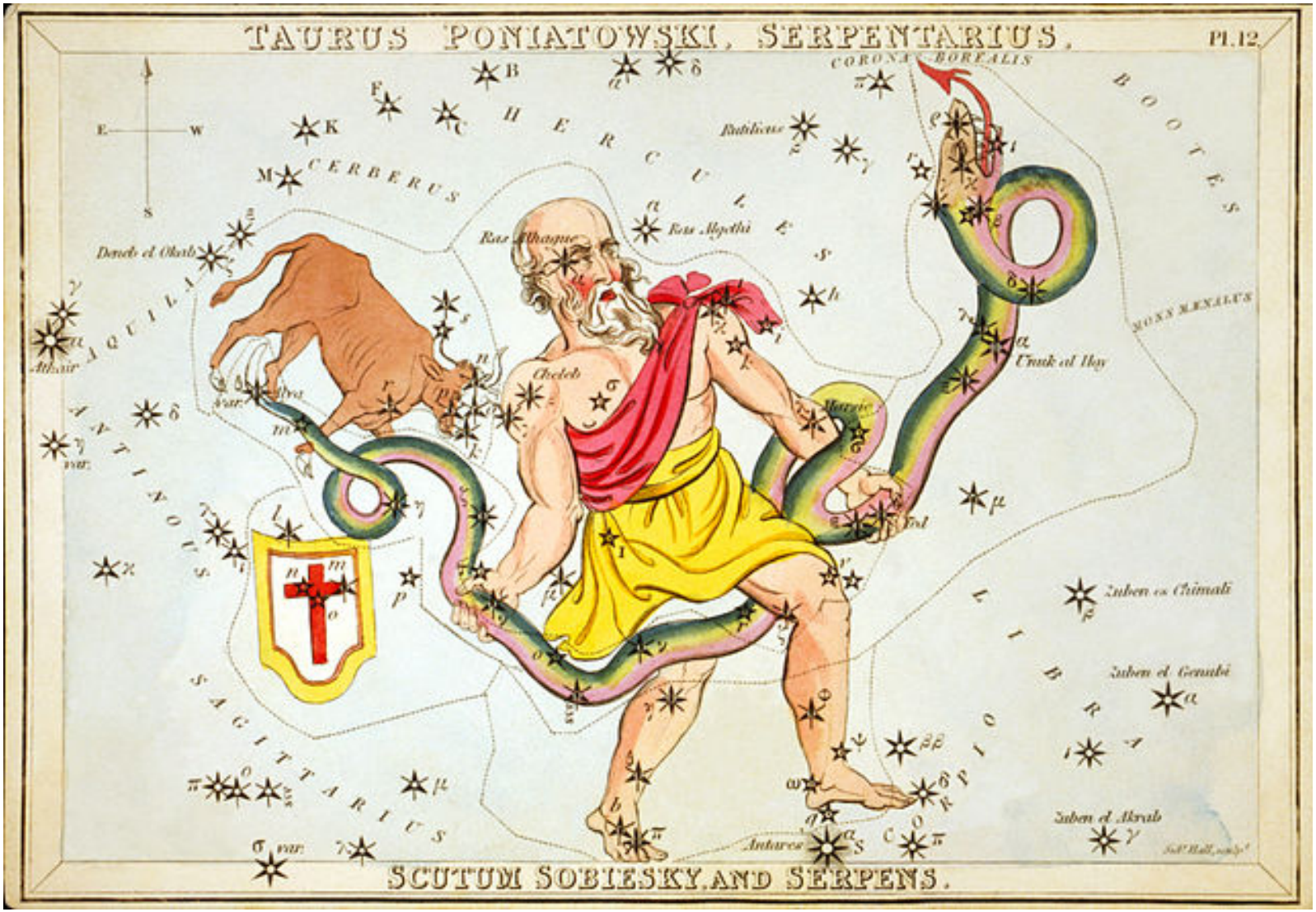
John Flamsteed (1776)



Alexander Jamieson (1821)



Urania's Mirror (1825)



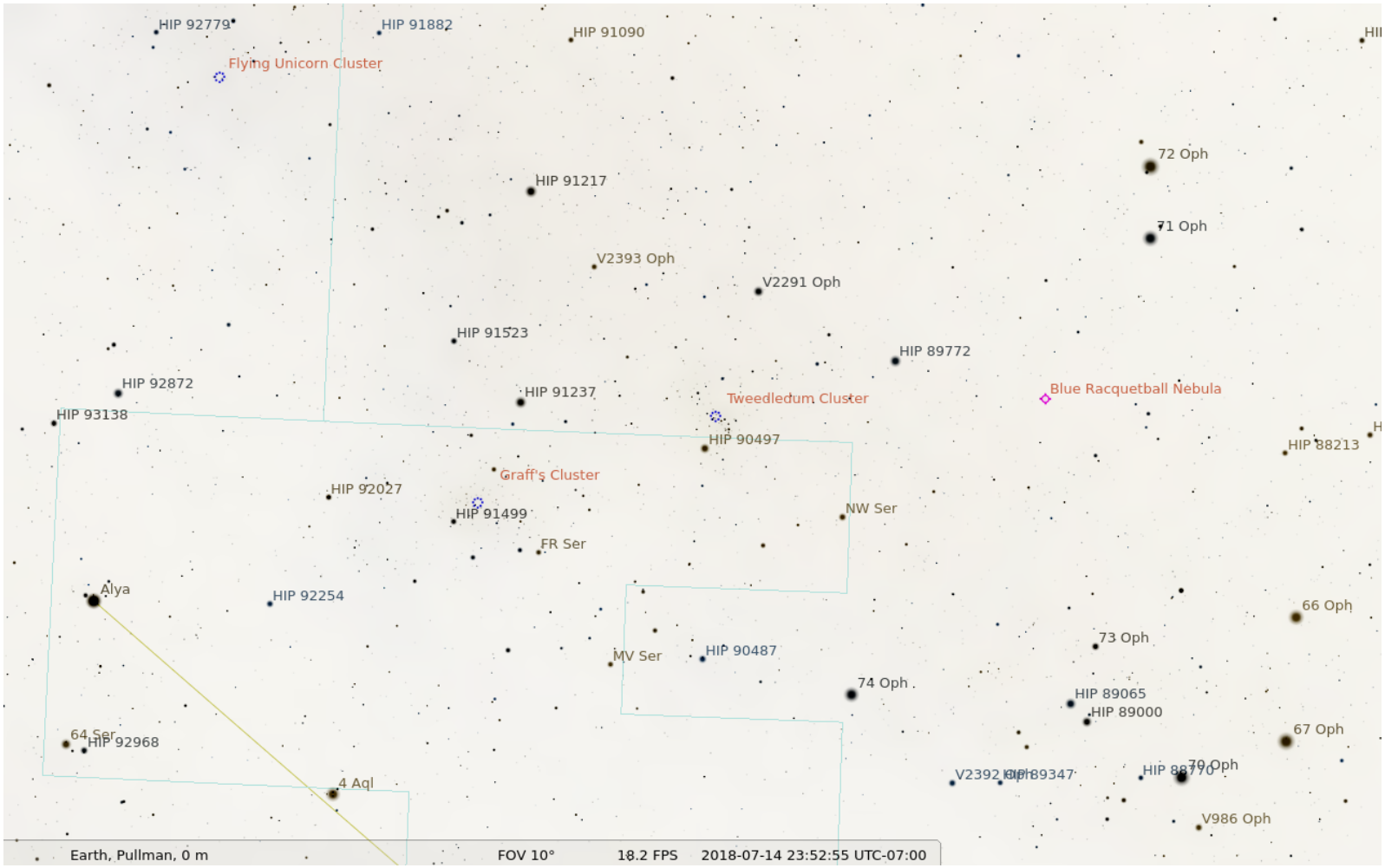
History of Serpens

- An old constellation; one of Ptolemy's 48 (ca. 150 CE)
- Serpens is intertwined with Ophiuchus, the Serpent-tamer
- Few historical astro-cartographers, like Bayer, showed Serpens as separate from Ophuichus
- Most considered Serpens and Ophuichus as one constellation
- The "official" constellation boundaries were set in the 1920s by Eugène Delporte; he divided Serpens into two parts, Serpens Caput (head) and Serpens Cauda (tail)
- Head and tail are separated by Ophiuchus
- Ranks 23rd by size of the 88 constellations

Mythological Serpens

- In the Greek & Roman tradition, the serpent is the symbol of rebirth (because it sheds its skin)
- The Romans identified the serpent variously with many different figures, e.g., Aesculapius the healer; Phorbas who rid the island of Rhodes of snakes; Cadmus, founder of Thebes and slayer of Draco, who transformed into a snake at the end of his life
- The ancient Arabs: the Pasture; the stars of Hercules's club were the sheep
- The ancient Hebrews: the Serpent
- In China, star charts made during the Han Dynasty (206 BCE - 220 CE) identified the stars of Serpens as forming a wall enclosing the celestial marketplace, Tianshi

Stellar Serpens (from Stellarium)



Stellar Serpens

- I will speak only of Serpens Cauda (the tail)
- Guide star: the tip of the Serpent's tail (Bayer's star θ Serpentis) has the proper name Alya, from the Arabic for the tail of a sheep
- Double stars:

Name	**Magnitudes**	**Separation**
Alya (θ Ser)	4.6 / 4.9	22 arcsec
HIP 92027 (Struve 2375)	6.3 / 7.9	2.5 arcsec
FR Ser (Struve 2342)	6.5 / 9.6	33 arcsec

Star clusters

- A pair of open clusters: IC 4756, and NGC 6633
- Dubbed Tweedledee and Tweedledum by Stephen James O'Meara in his book, "Deep sky companions: hidden treasures" (2007); O'Meara
- Tweedledee
  - Appeared in 1908 as Index Catalog # 4756
  - Visible to the unaided eye
  - aka Graff's Cluster - presumably (?) named for Kasimir Graff (1878-1950), who accurately measured steller brightnesses and colors
  - aka Secret Garden Cluster
  - About 1° diameter - about a half-dozen stars brighter than 7^{mag} - 50-100 stars brighter than 10th magnitude
  - 1300-1500 light years distant

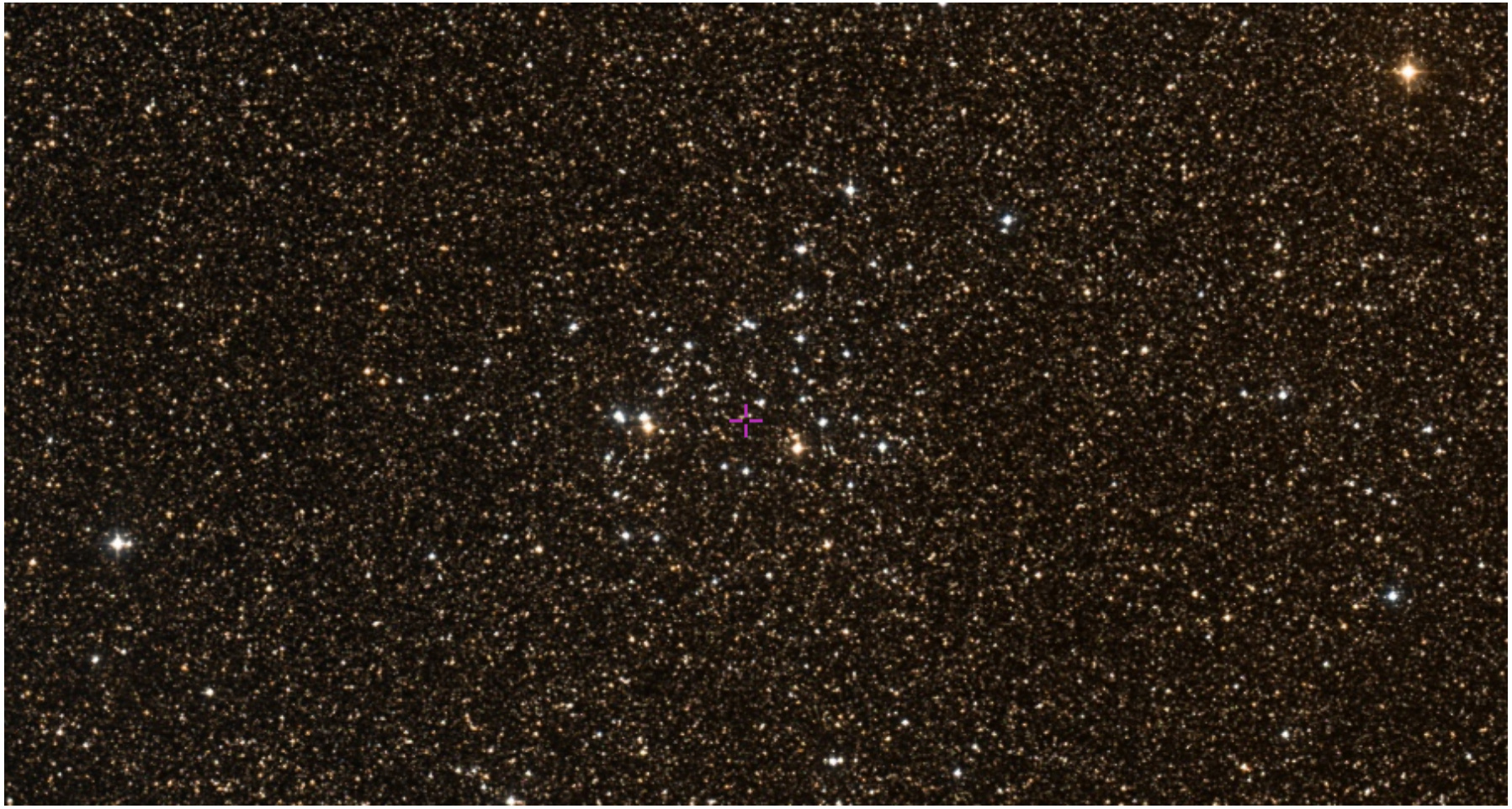
Star clusters

- Tweedledum
  - Appeared in 1888 as NGC # 6633
  - aka Captain Hook Cluster, aka Wasp-Waist Cluster, both names by Stephen James O'Meara
  - About 1° diameter - perhaps a dozen stars brighter than 10th magnitude - perhaps 50 stars fainter than 10th
  - 1000 light years distant
- Flying unicorn cluster
  - Appeared in 1888 as NGC # 6709
  - About $1/4^\circ$ diameter - a few dozen stars at about 10th mag
  - 3900 light years distant

Tweedledee (IC 4756; FOV = 3°; DSS2/blue)

Tweedledum (NGC 6633; FOV = 2°; DSS2/blue)

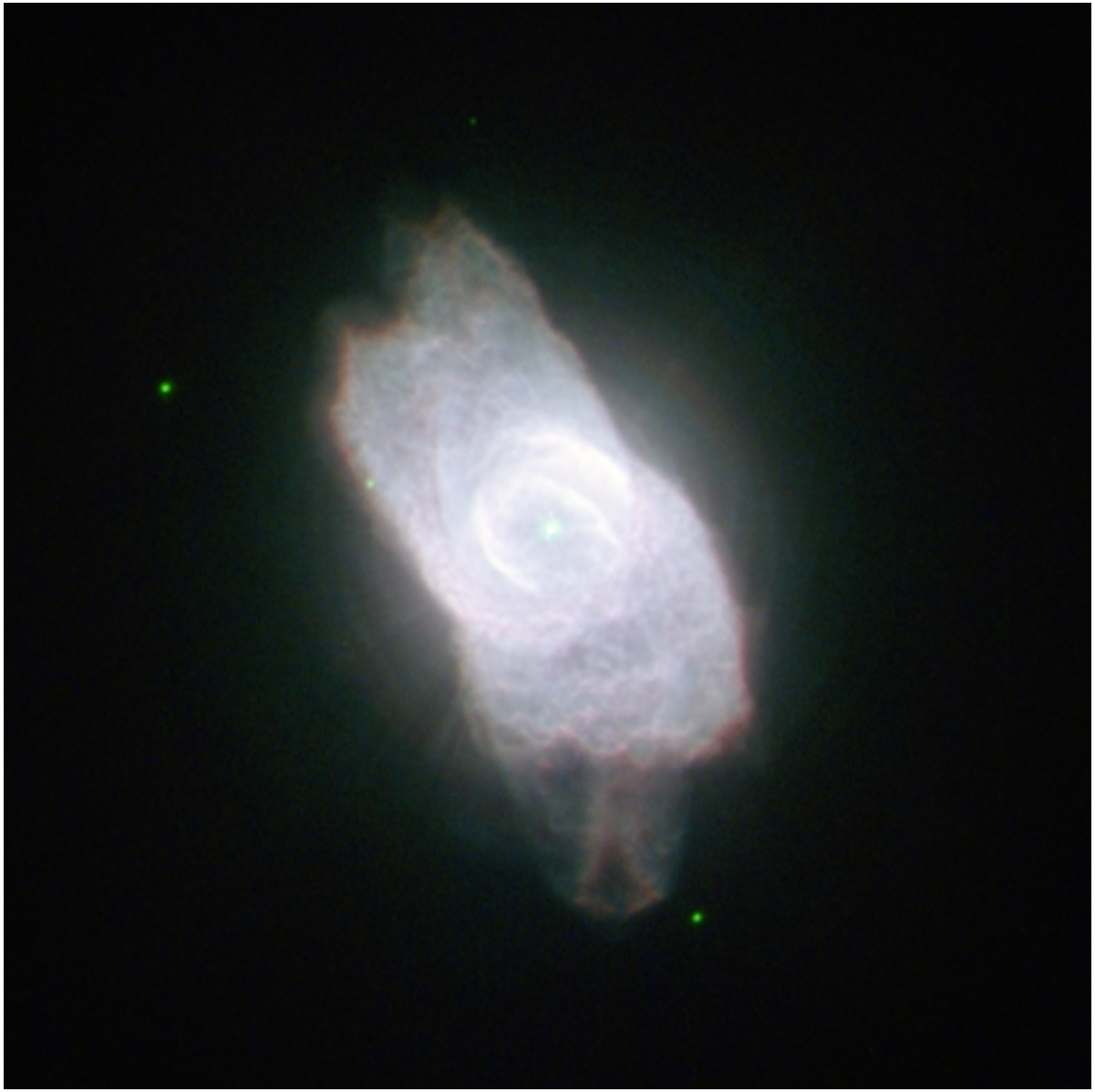
Flying unicorn (NGC 6709; FOV=1°; DSS2/blue)



A planetary nebula

- Blue Racquetball Nebula, aka NGC 6572, Emerald Nebula, Turquoise Orb Nebula, Planet Krypton Nebula
- Magnitude 10.8 (Simbad), blue to the eye with large aperture and dark sky
- Discovered in 1825 by Friedrich von Struve
- Young, compact ($\sim$10 arcsec diameter), isolated, hence relatively high surface brightness
- Roughly 4900 light years distant (b/w 1000 and 6000)

Blue Racquetball (Hubble Space Telescope)



Final words

A little west of Theta (θ), in the tail of Serpens, is a beautiful swarm of little stars, upon which a field-glass may be used with advantage. The star θ itself is a charming double, just within the separating power of a very powerful field-glass under favorable circumstances, the component stars being only about one third of a minute apart.

Do not fail to notice the remarkable subdivisions of the Milky-Way in this neighborhood. Its current seems divided into numerous channels and bays, interspersed with gaps that might be likened to islands, and the θ star appears to be situated upon one of these islands of the galaxy.

- Garrett P. Serviss, "Astronomy with an opera-glass" (1910)

List of sources

Aladin Lite (aladin.u-strasbg.fr/aladin.gml)

Richard Hinckley Allen, Star lore - their names and meanings (1899; reprinted by Dover 1963)

Constellation Guide (constellation-guide.com)

Deep Sky Forum (deepskyforum.com)

Ian Ridpath's Star Tales (ianridpath.com)

Linda Hall Library (http://lhldigital.lindahall.org/cdm/ref/collection/astro_atlas/id/37)

Simbad database (simbad.harvard.edu)

Stellarium desktop planetarium software (stellarium.org)

Wikimedia Commons (commons.wikimedia.org)