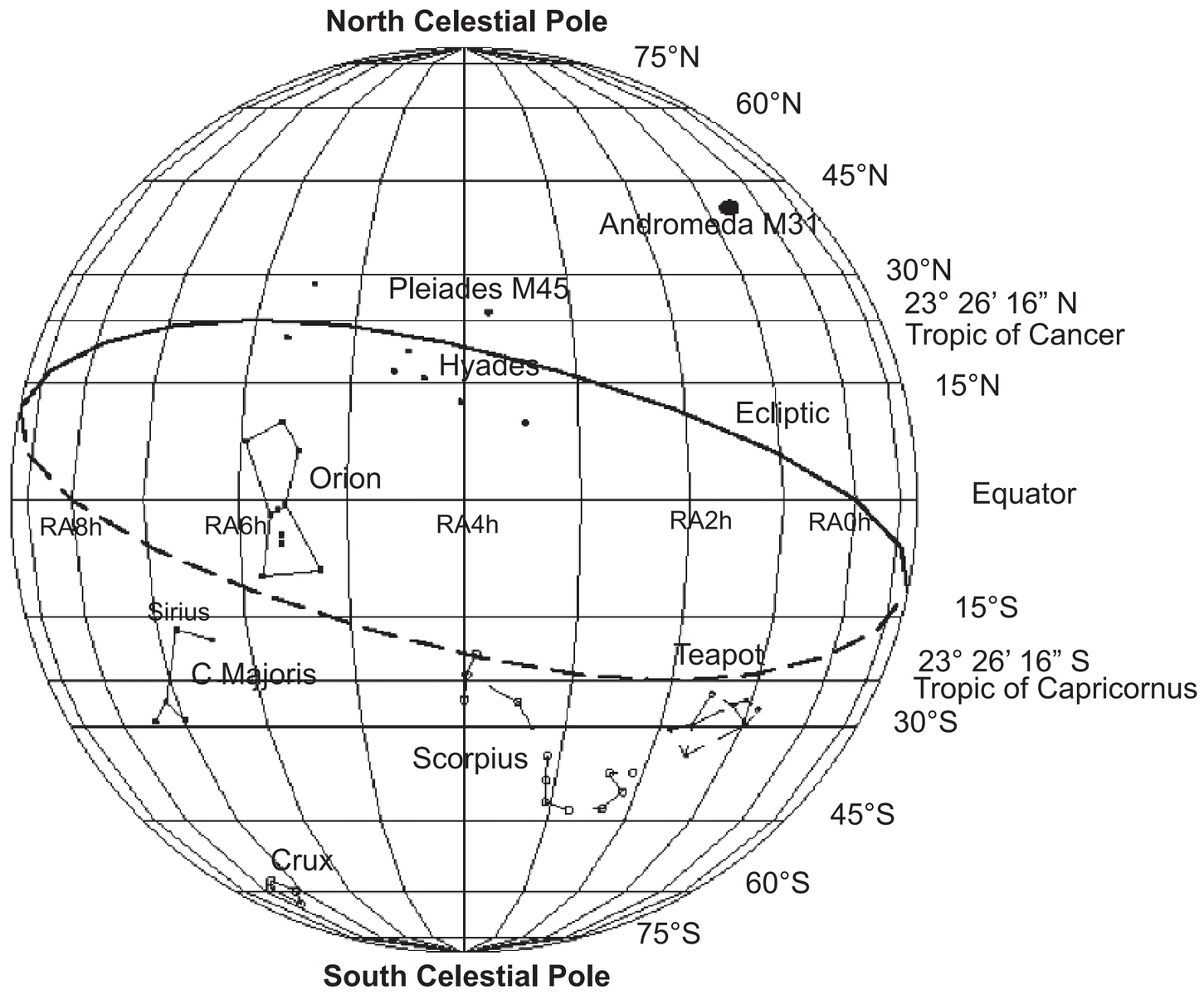
SKY MAPS

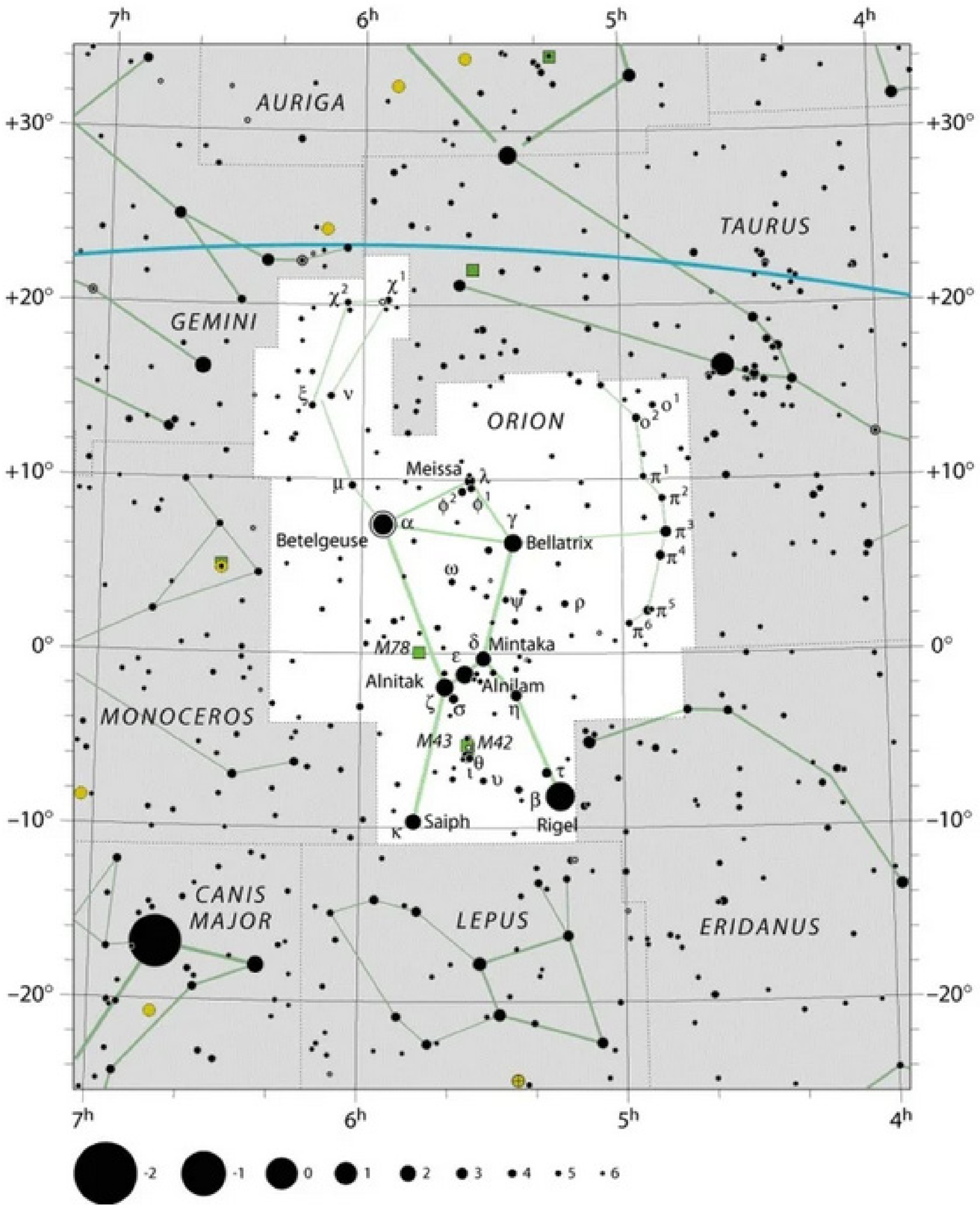
Just like Road Maps are used to navigate on land, Sky Maps or Star Charts are used to navigate between the stars and constellations of the Celestial Sphere (see “Celestial Sphere” tablet for an explanation of the celestial coordinates Declination [DEC] and Right Ascension [RA]).

Suffice to say that Gearings Point’s location on Earth is 34° 25’ 08” S & 19° 14’ 38” E, and *Sirius’s* location on the Celestial Sphere is RA 06h 46m 07.96s & DEC -16° 44’ 19.7”.

The Celestial Sphere’s Reference Grid with the dominant Summer (*Orion* & *Canis Major*) and Winter (*Scorpius* & *Sagittarius’s* Teapot) constellations shown.

The Winter constellations at the “back” of the sphere are shown in dotted lines.





Sky Maps are conventionally printed as rectangular grids with North UP (confirm by looking at the DEC values on the Y-axis) and East to your LEFT, RA increasing to the LEFT on the X-axis.

The maps always show the Northern Hemisphere perspective, so rotate the map through 180° to see our Southern Hemisphere views.

⇦ If you hold a Sky Map ABOVE your head with the TOP pointing North, the map will depict the sky as you see it.

The adjacent IAU/Sky & Telescope map of *Orion* also show part of its adjacent constellations (clockwise from top left) *Gemini, Taurus, Eridanus, Lepus, Canis Majoris* (The Big Dog) and *Monoceros*.

Sky Maps conventionally depict the apparent brightness or visual magnitude of the stars by their size (see the X-axis legend). Ptolemy was the first person to devise a magnitude scale, with the brightest stars being of magnitude 1, and the dimmest stars visible to the naked eye of magnitude 6. This is assumed to be based on Hipparchus' star catalogue, which has since been lost. This magnitude scale was *quantified* in 1856 by the British astronomer Norman Robert Pogson by defining a first magnitude star as being 100 times brighter than one of sixth magnitude. A star of magnitude *m* is about 2.512 brighter than one of magnitude *m+1*. *Vega*, in the constellation *Lyra*, is the standard reference star of magnitude zero.

The IAU/S&T sky map below shows Winter's dominant Scorpius constellation and parts of the adjacent constellations (clockwise from top left) *Ophiuchus, Libra, Lupus, Norma, Ara, Sagittarius* and *Serpens Cauda*.

The western part (spout and lid) of *Sagittarius's* Tea Pot is just visible.

Notice how the RA lines converge towards the South (Celestial Pole).

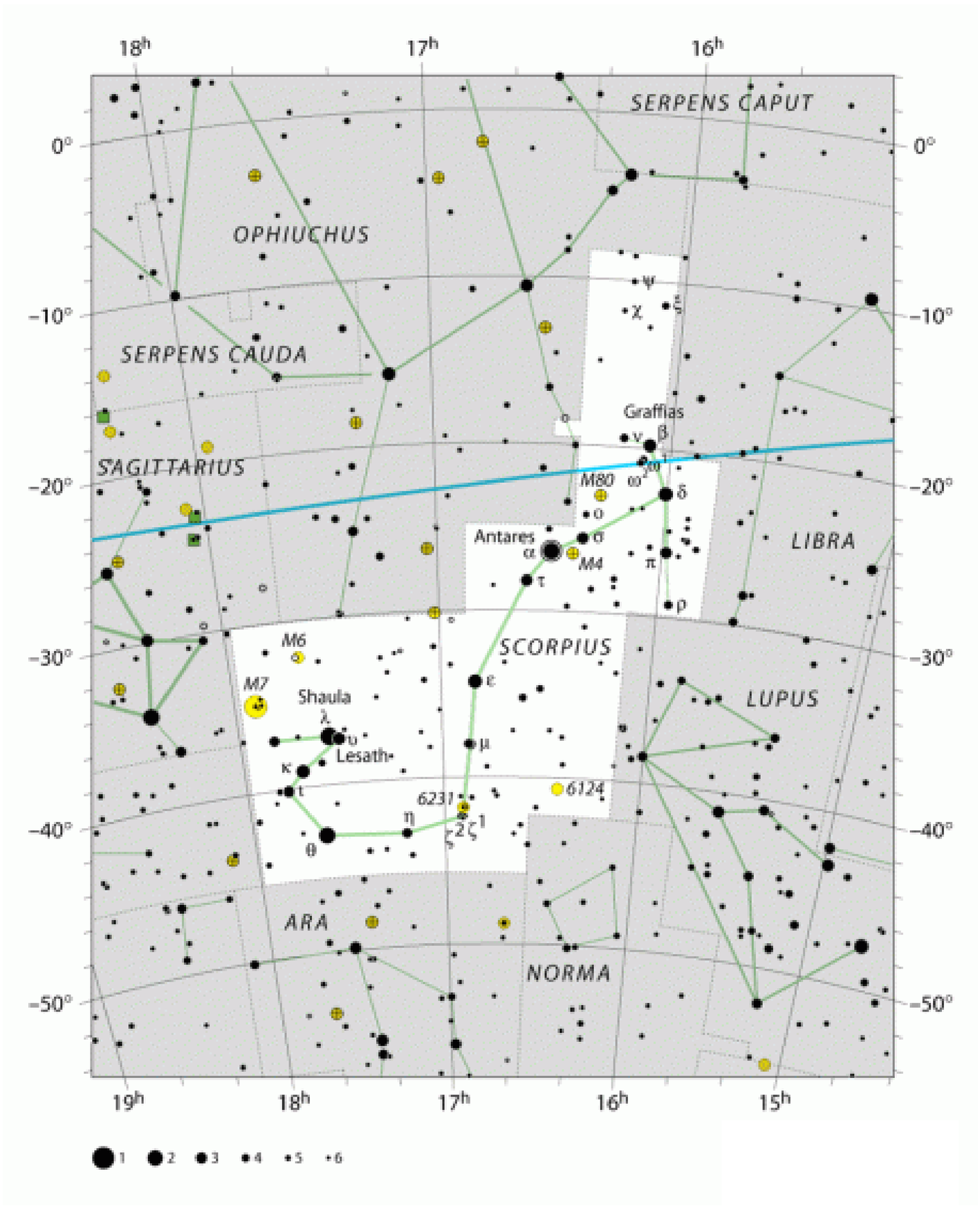


Chart Legend

- Double star
- Variable stars
- Special object
- Reference point

Open star clusters

50′ (to scale) <20′

Globular clusters

50′ (to scale) <20′

Galaxies

100′ x 20′ (to scale)

40′ x 30′ (to scale)

<20′

Bright nebulae

(to scale) <20′

Dark nebulae

(to scale) <20′

Planetary nebulae

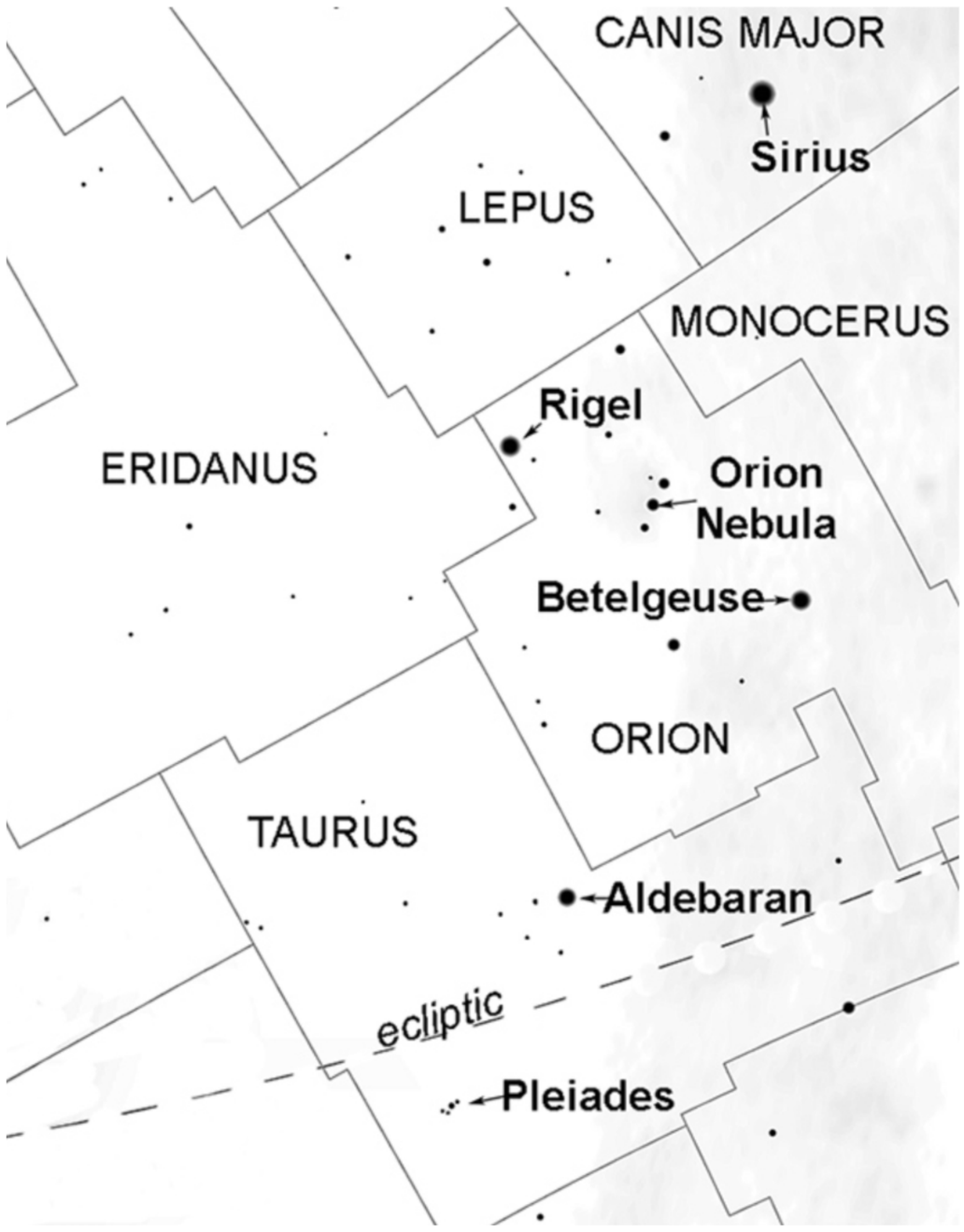
50′ (to scale) <20′

−1 0 1 2 3 4 5 6 7 Fainter star

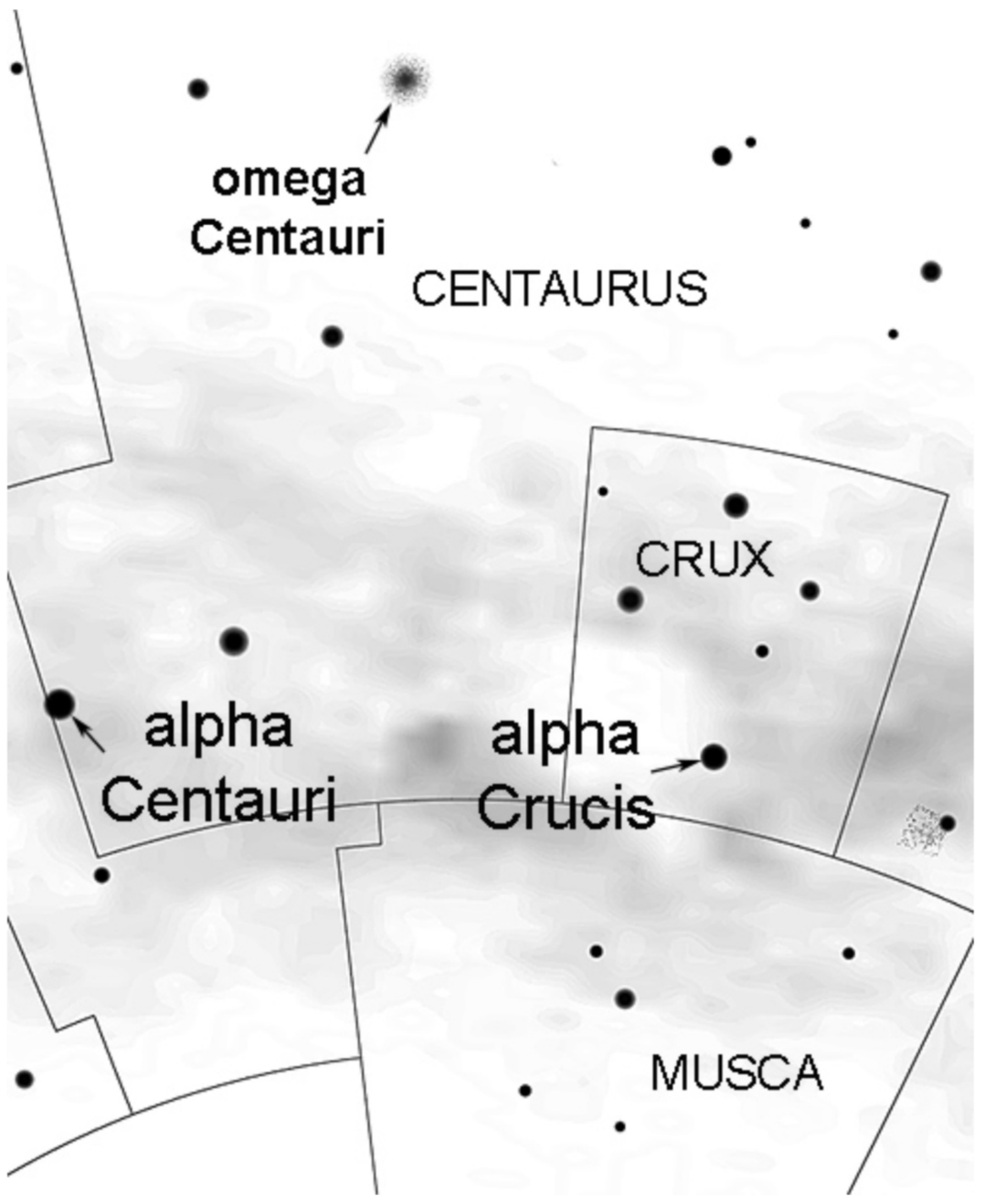
Star magnitudes

Southern Hemisphere Multi-constellation Sky Charts

Summer (looking north)



Winter (looking south)



The charts above depict the night skies as viewed from Hermanus, South Africa

There are various mobile phone applications (Apps) which provide sky maps that are readily available to the user. Some of these apps are interactive and provide a vast amount of information: ‘Heavens Above’, ‘Stellarium’ and ‘SkySafari Pro’ to name a few.

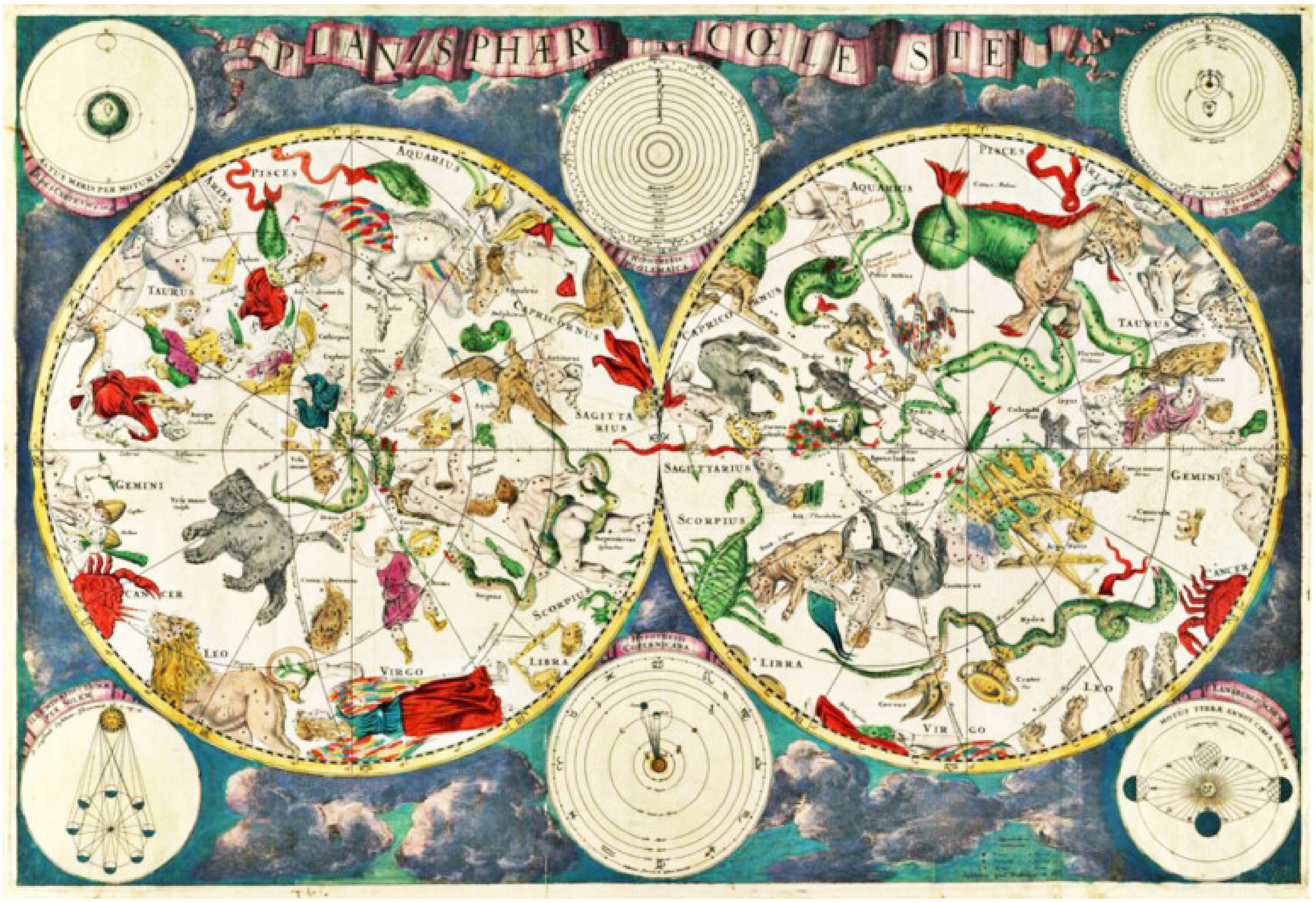
History

The oldest accurately dated star chart appeared in ancient Egyptian astronomy in 1534 BCE. The earliest known star catalogues were compiled by the ancient Babylonian astronomers of Mesopotamia in the late 2nd millennium BCE, during the Kassite Period (ca.1531-1155 BCE). The oldest records of Chinese astronomy date to the Warring States period (476-221 BCE), but the earliest preserved Chinese star catalogues of astronomers Shi Shen and Gan De are found in the 2nd century BCE by the Western Han historian Sima Qian. The oldest Chinese graphical representation of the night sky is a lacquerware box from the 5th century BCE tomb of Marquis Yi of Zeng, although this depiction shows the positions of the Chinese constellations by name and does not show individual stars.

The origins of the zodiac remain historically uncertain; its astrological divisions became prominent c. 400 BCE in Babylonian or Chaldean astronomy. The 48 traditional Western constellations are Greek. They are given in Aratus’ work *Phenomena* (3rd century BCE) and Ptolemy’s *Almagest* (2nd century CE), although their origin probably predates these works by several centuries.

Constellations in the far southern sky were added from the 15th century until the mid-18th century when European explorers began travelling to the Southern Hemisphere. Twelve ancient constellations belong to the zodiac (straddling the *ecliptic*, which is the path of the Sun, Moon and planets).

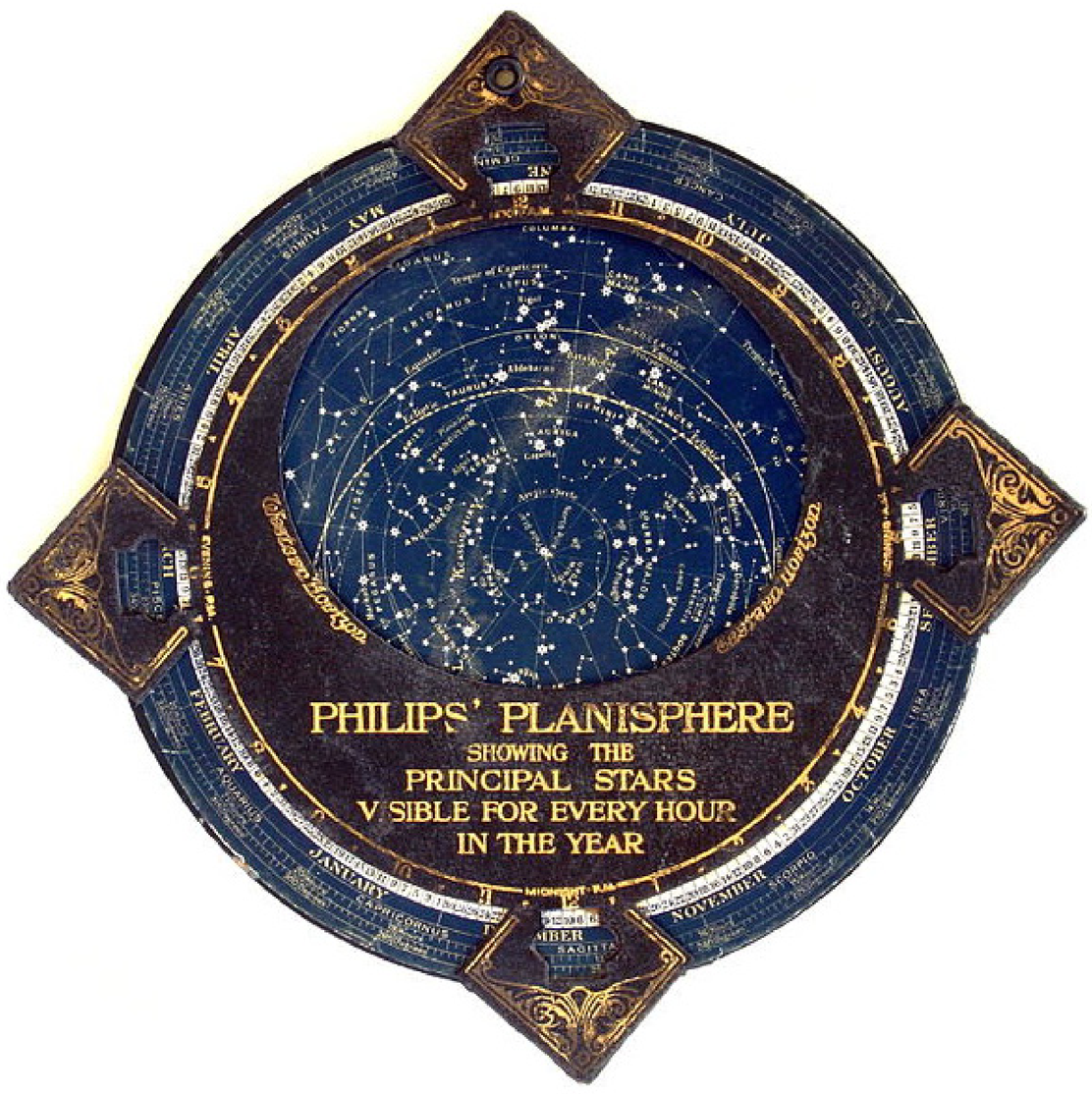
A celestial map by the Dutch cartographer Frederik de Wit dated 1670
from the golden age of age of Netherlandish cartography



In 1922, the **International Astronomical Union** (IAU) formally accepted the modern list of 88 constellations (see “Celestial Objects in the Night Sky” tablet). Their official boundaries were adopted in 1928 to cover the entire celestial sphere. All boundaries are either parallel to the celestial equator (DEC) or along meridian lines (RA). They are used to identify and locate constellations and other celestial objects.

Tools utilising a star chart include the **planisphere** and the **astrolabe**.

Philip’s Planisphere dated 1900



Iranian Astrolabe made in 2013