



# THE COMETS ARE HERE!

Comets in the sky in 2014



# How Many Comets?

- ▣ As of July 2013 there were 4,894 known comets, and this number is steadily increasing. However, this represents only a tiny fraction of the total potential comet population, as the reservoir of comet-like bodies in the outer Solar System may number one trillion. Roughly one comet per year is visible to the naked eye, though many of these are faint and unspectacular. Particularly bright examples are called "Great Comets".

# Comet Designation

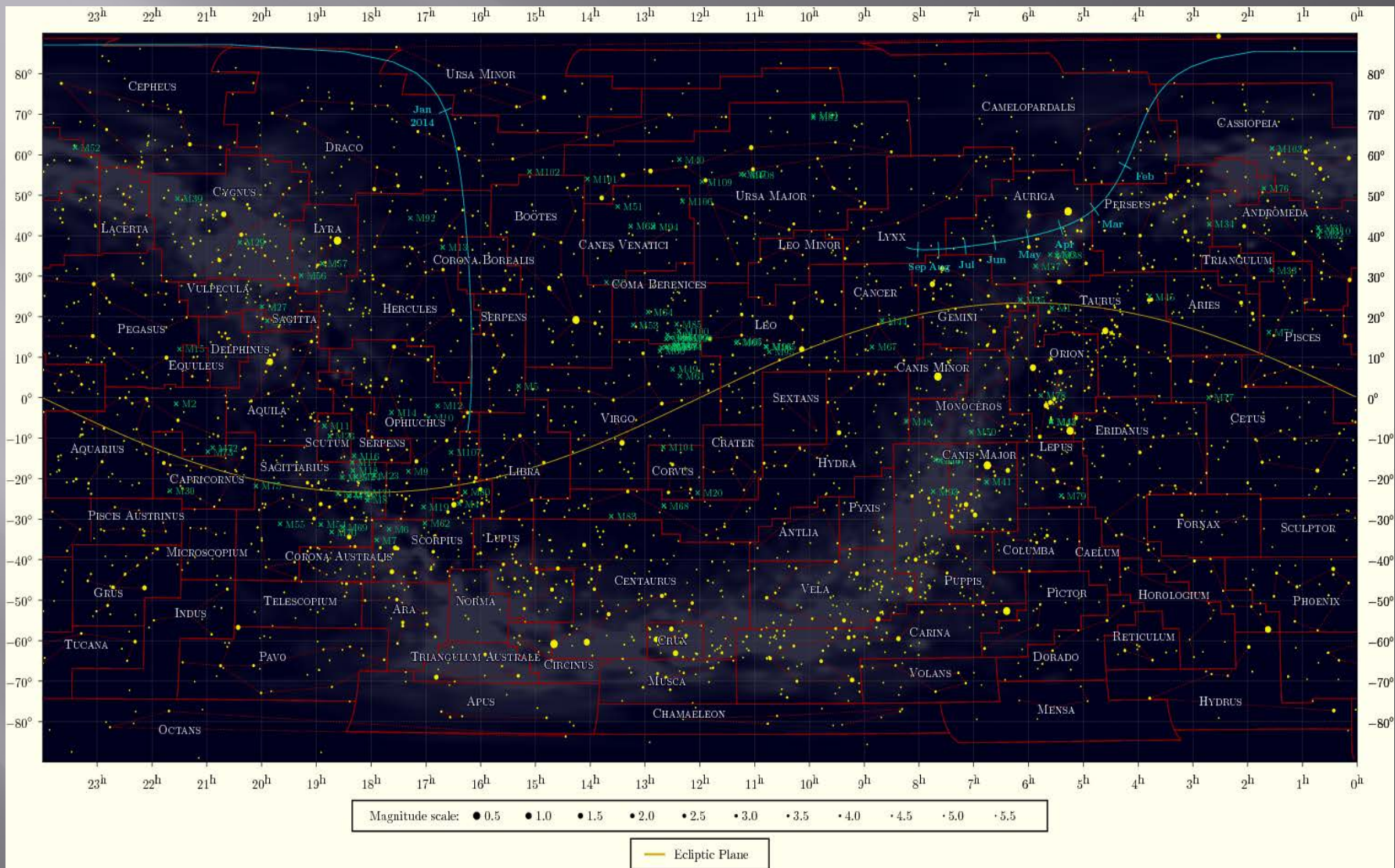
- A comet goes by many names, the most important of which to its discoverer is his or her surname. Many bright comets that frequently return retain their popular names, such as Comet Halley. (Halley did not discover the comet, but he predicted its orbit and return.)
- Frequently, two or more observers discover a comet simultaneously or independently. The names of the first three observers to report their discovery properly are affixed to the new comet.
- The rapid growth in the number of known comets has prompted the International Astronomical Union (IAU) to catalogue them according to precise rules. A new cometary designation system was adopted 1 January 1995. The new system resembles that of minor planets, with objects recorded by the half-month. Thus the third comet reported as discovered during the second half of February 1997 would be designated 1997 D3. When appropriate, the nature (or suggested nature) of an object can be indicated by preceding the designation with A/ (for minor planet), C/ (for comet), P/ (for periodic comet), etc. Hence, under the new cometary designation system, Comet Hale-Bopp was designated C/1995 O1.

Comet name	Mag	Constellation	Separation from Sun	Trend
C/2012 S1 (ISON)	6.0	Hercules	48°	Fading
C/2013 R1 (Lovejoy)	8.6	Hercules	53°	Fading
154P/Brewington	9.2	Pegasus	89°	Fading
2P/Encke	10.3	Ophiuchus	5°	Fading
C/2012 X1 (LINEAR)	12.5	Serpens Caput	46°	Brightening (peak at mag 11.5 on 4 Mar 2014)
C/2012 K1 (PANSTARRS)	13.3	Hercules	39°	Brightening
C/2013 A1 (Siding Spring)	14.9	Eridanus	112°	Brightening (peak at mag 7.7 on 11 Sep 2014)
289P/Blanpain	17.5	Sagittarius	32°	Brightening (peak at mag 10.8 on 23 Aug 2014)
C/2013 V5 (Oukaimeden)	17.9	Gemini	162°	Brightening (peak at mag 5.7 on 18 Sep 2014)
209P/LINEAR	18.9	Lynx	131°	Brightening (peak at mag 10.9 on 29 May 2014)

# Comet C/2012 S1 (ISON)

- ▣ Comet ISON, formally known as C/2012 S1, was a sungrazing comet discovered on 21 September 2012 by Vitali Nevski and Artyom Novichonok . The discovery was made using the 16 in reflector of the International Scientific Optical Network (ISON) near Kislovodsk, Russia.

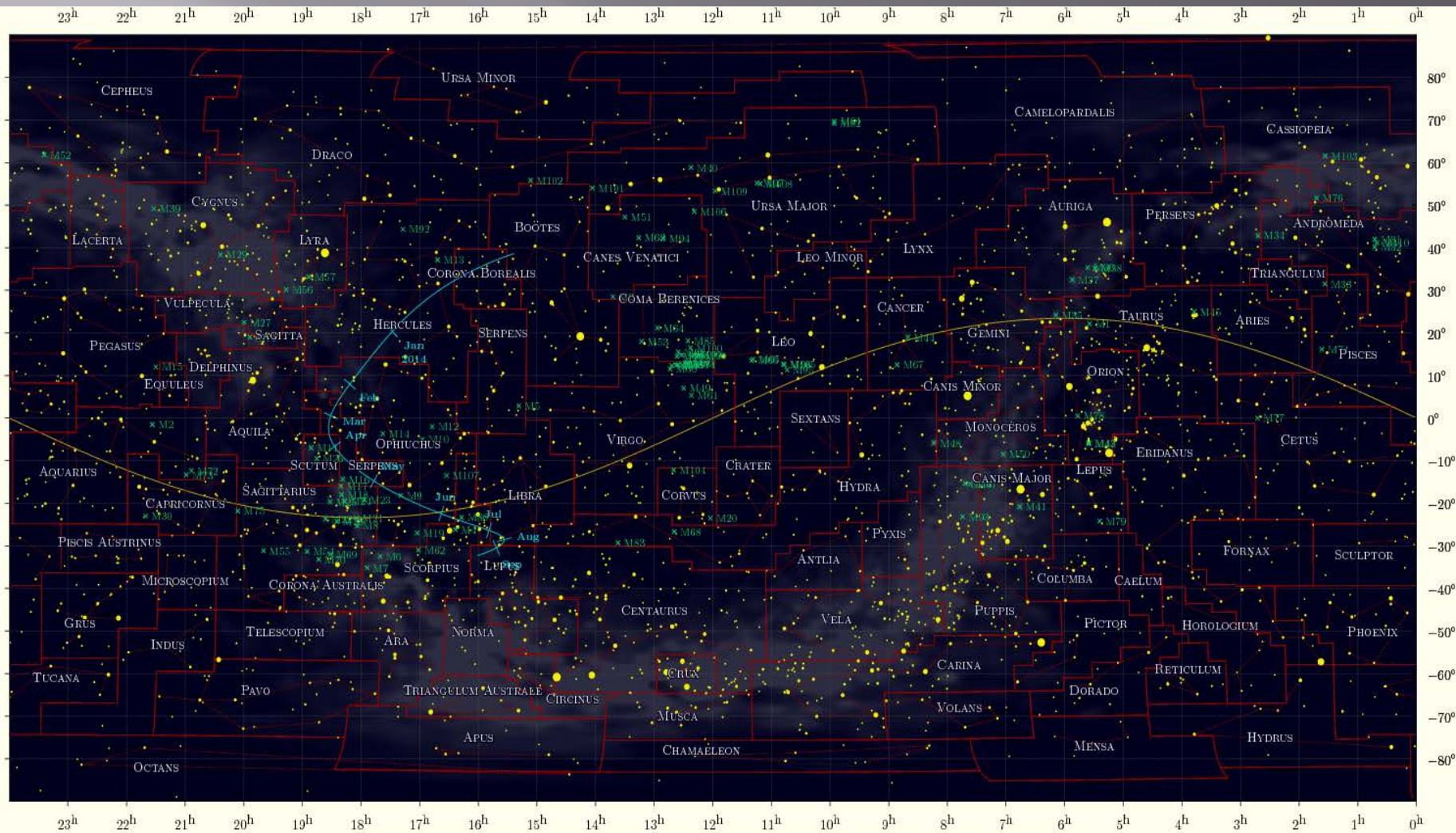




# Comet C/2013 R1 (Lovejoy)

- ▣ C/2013 R1 (Lovejoy) is a long-period comet discovered on 7 September 2013 by Terry Lovejoy using an 8 in Schmidt-Cassegrain telescope. C/2013 R1 crossed the celestial equator on 14 October 2013, becoming a better northern hemisphere object.



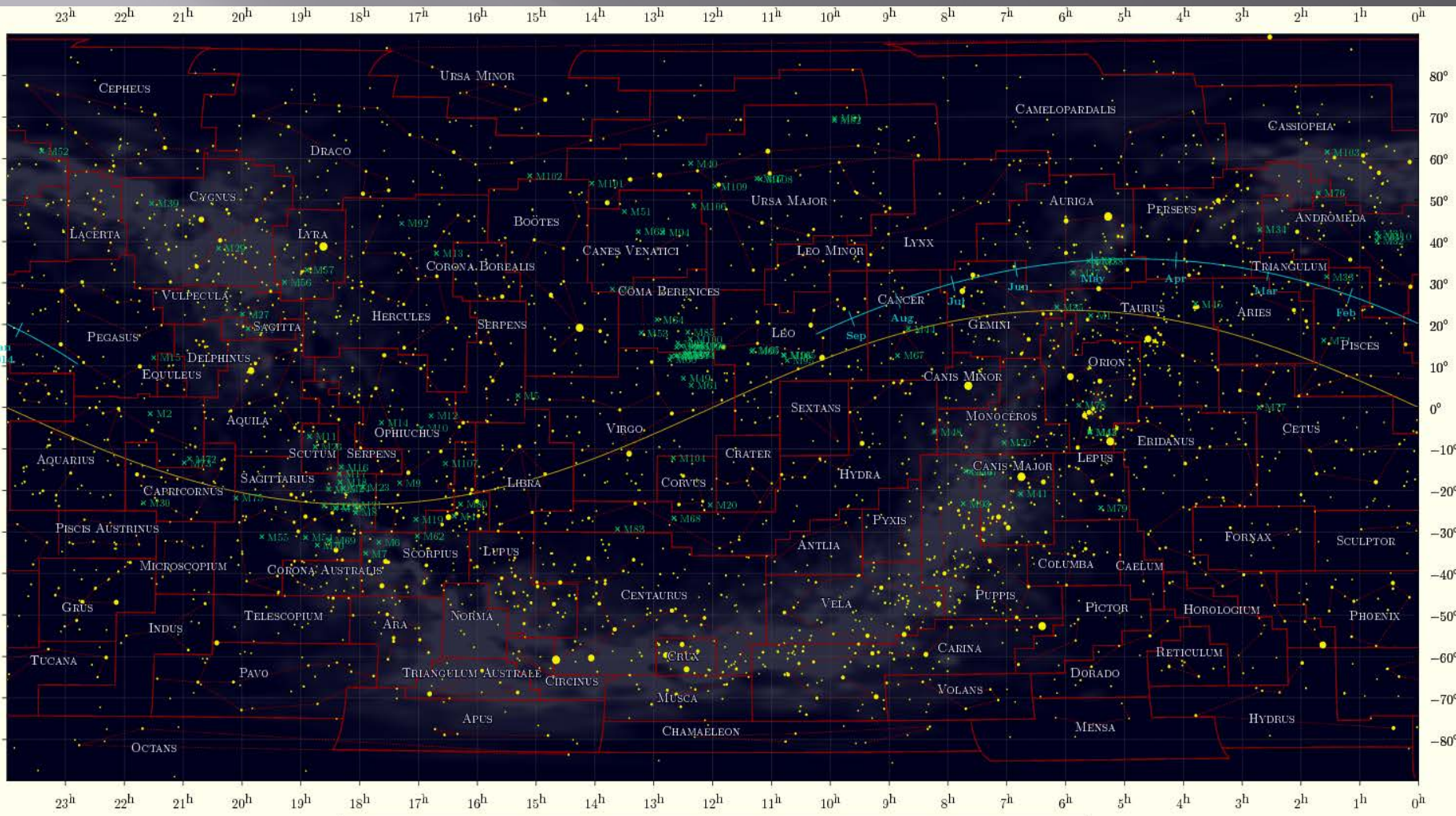


Magnitude scale: ● 0.5 ● 1.0 ● 1.5 ● 2.0 ● 2.5 ● 3.0 ● 3.5 ● 4.0 ● 4.5 ● 5.0 ● 5.5

— Ecliptic Plane







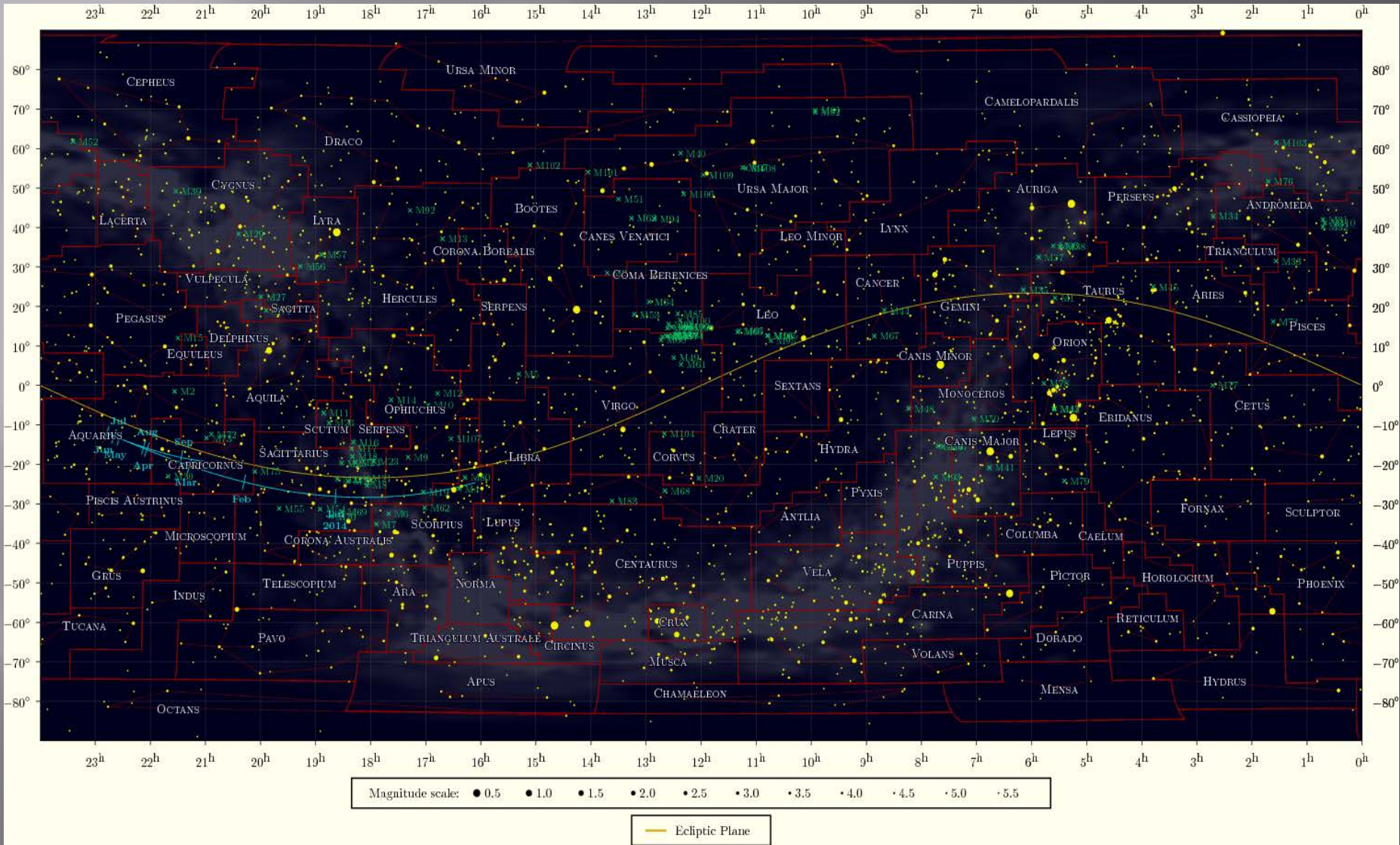
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— Ecliptic Plane

# Comet 2P/Encke

- Encke's Comet was the first periodic comet discovered after Halley's Comet (designated 1P/Halley). Its orbit was calculated by Johann Franz Encke, who through laborious calculations was able to link observations of comets in 1786 (designated 2P/1786 B1), 1795 (2P/1795 V1), 1805 (2P/1805 U1) and 1818 (2P/1818 W1) to the same object. In 1819 he published his conclusions in the journal *Correspondance astronomique*, and predicted correctly its return in 1822 (2P/1822 L1).

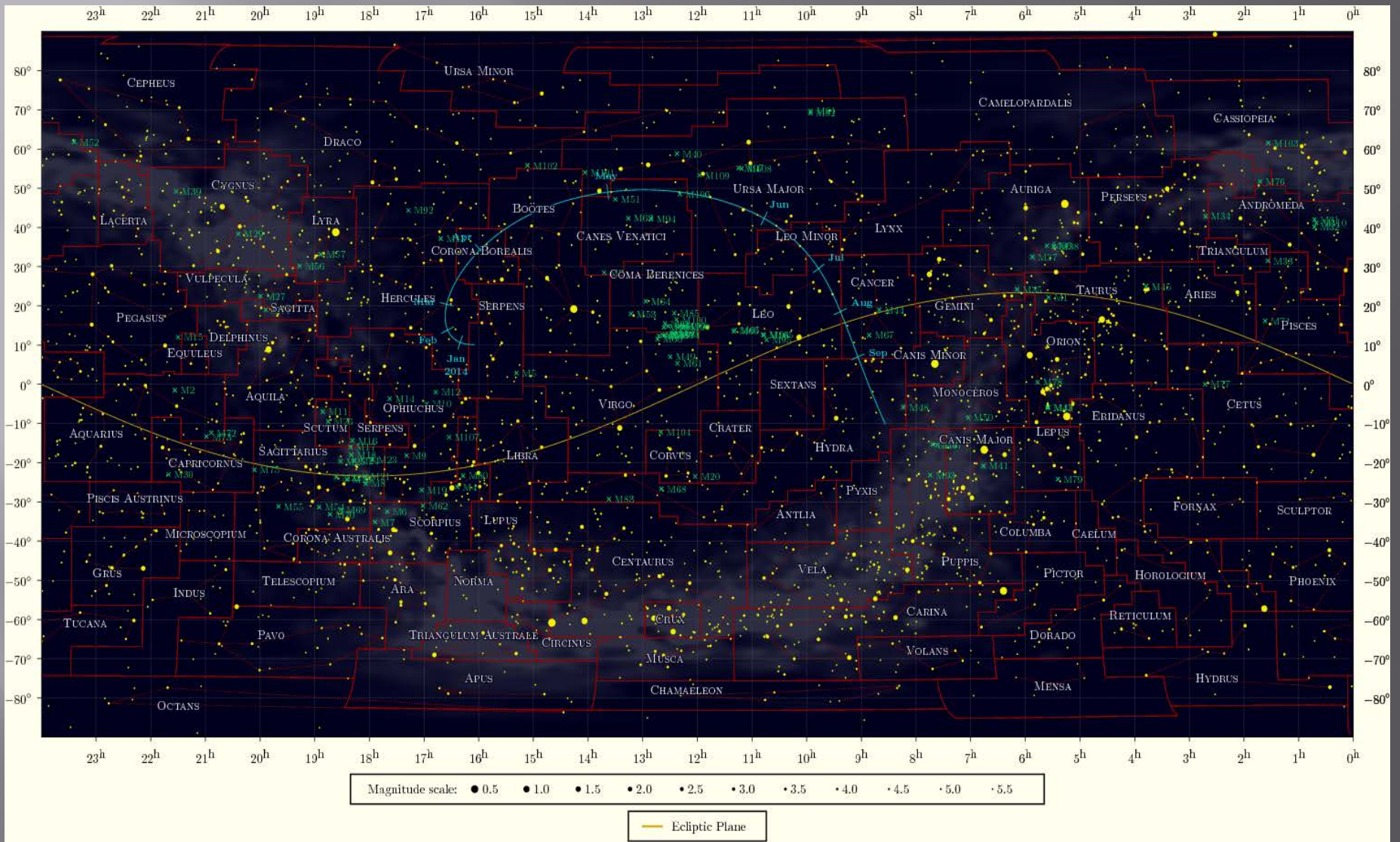




# C/2012 K1 (PANSTARRS)

- C/2012 K1 (PANSTARRS) is a comet discovered 8.7 AU from the Sun on 19 May 2012 using the Pan-STARRS telescope located near the summit of Haleakalā.
- The comet starts 2014 as a northern hemisphere object. By late April 2014 it is expected to have brightened to roughly apparent magnitude  $\sim 9$  making it a small telescope/binoculars target for experienced observers.

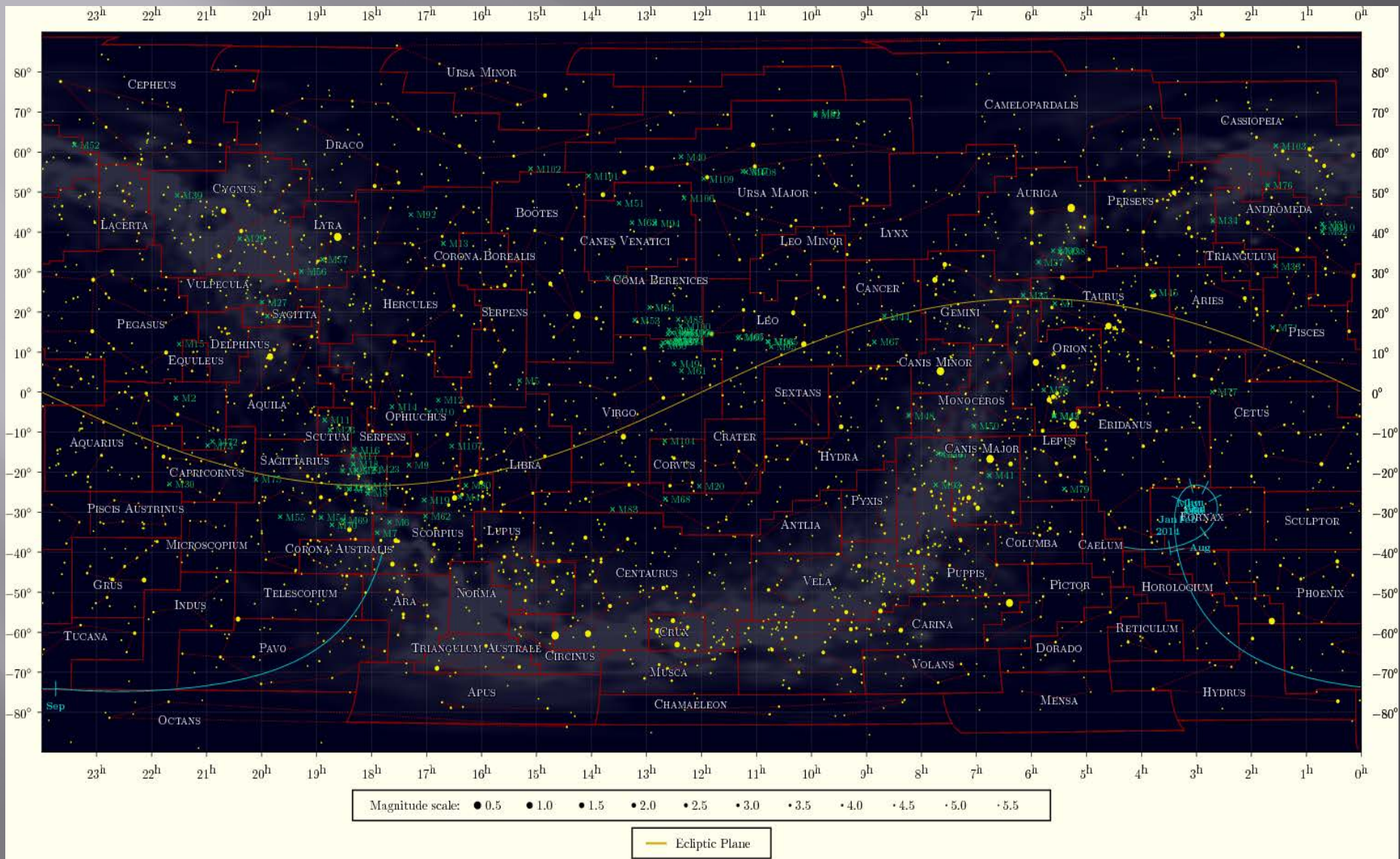




# Comet C/2013 A1 (Siding Spring)

- ▣ C/2013 A1 (Siding Spring) is an Oort cloud comet discovered on 3 January 2013 by Robert H. McNaught at Siding Spring Observatory using the 20 in Uppsala Southern Schmidt Telescope.



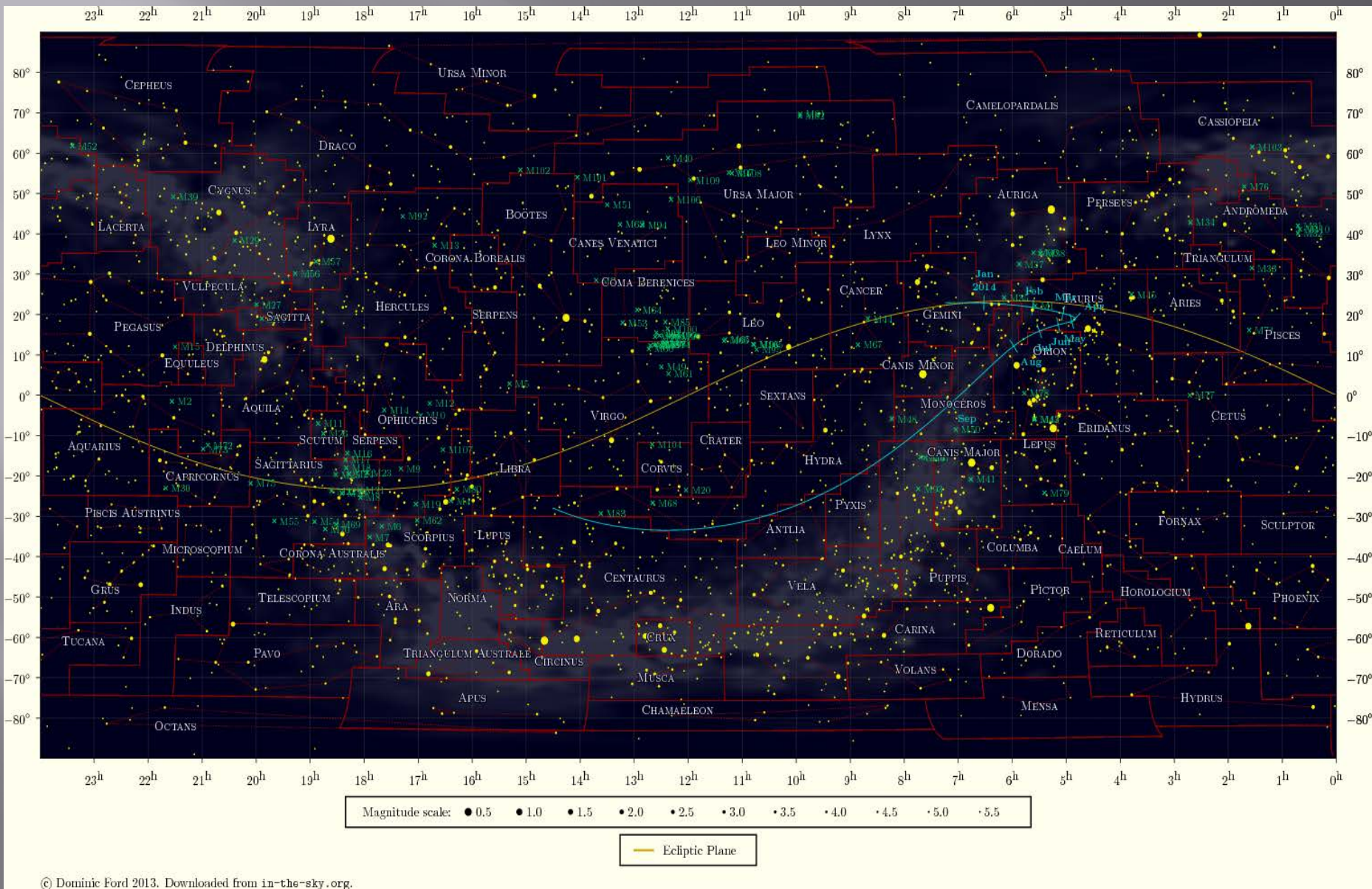




# Comet C/2013 V5 (Oukaimeden)

- November 15, 2013, announces the discovery of an apparently asteroidal object by *Michel Ory* on CCD images obtained with a 0.5-m f/3 reflector at the Oukaimeden Observatory, Marrakech. The object has been found to show cometary appearance by CCD astrometrists elsewhere. The new comet has been designated C/2013 V5 (OUKAIMEDEN).





# Comet Observers Program

- ▣ As of 1995, 878 comets have been cataloged and their orbits at least roughly calculated. Of these, 184 are periodic comets (orbital periods less than 200 years); some of the remainder are no doubt periodic as well, but their orbits have not been determined with sufficient accuracy to tell for sure.



# Comet Observers Program

- ▣ Observers can receive a certificate from the Astronomical League for two different levels of observations. A lapel pin will also be awarded for the Silver Level. The levels are:
  - **Silver Level - observe at least 12 different comets.**
  - Comets observed and logged can be at any magnitude. Two of these comets can be observed prior to January 1, 2001, considering that all appropriate documentation is provided.
  - **Gold Level - observe at least 18 additional comets**
  - Comets observed and logged can be at any magnitude. Two of these comets can be observed prior to January 1, 2001, considering that all appropriate documentation is provided.
- ▣ The observations can be accomplished through the use of:
  - binoculars
  - observatory telescope
  - observer's personal telescope
  - or accessible robotic telescope.

# Comet Observers Program

- Your observation log should be recorded in a notebook, hard copy print out or some other method. You can also use the observing form attached. Whatever method you use to record your observations, the following needs to be included:
  - (1) Name of the observer, email and location of the observer
  - (2) Date and time of observations/image and location at which the observation/image taken
  - (3) Official designation of the comet and name
  - (4) The size of the telescope, location of telescope, exposure length, time of exposure (UT time) and additional information, power used, etc
  - (5) Documentation of observations:
    - (5a) A sketch/ drawing or CCD image or photograph. When it is a faint comet with no tail, at least two should be submitted indicating the movement of the object against the background stars. Planetarium programs may be used to indicate comet position and stars names.
    - (5b) Regarding the drawings made by the observer- The nucleus, tail and background stars (drawn as dots) should be identified and labeled especially when the comets are very faint and non-comet like (little or no tail or coma). Tick marks can indicate the direction of movement against the star background, indicating hourly/ daily movement of fainter comets, to indicate movement against the stars either on a hourly basis or over two nights.
  - (5c) Computer based images can be submitted on 3.5-inch floppy diskette, CD, or ZIP disc in jpg, gif, or tiff format or on a html page, word document, etc. Images can be inverted (a negative exposure) if it brings out more detail in the comet. The name of a electronic file should indicate the common name of the comet and/or letter designation and date photographed-month/date/year (example, Ikeya-Zhang2001c10402).
  - (5d) Each photograph/image should be numbered and identified appropriately in the log/journal (ex. cometlinearwm1112001.jpg)
  - (5e) Photographs/Images can be printed out and included with the journal/log either background sky as dark with stars and comet white on black or an inverted image (black on white). An option is place the images on an html page, PowerPoint or other multimedia product on a ZIP disc or 3.5-inch floppy diskette. Appropriate documentation of the files and application used should be also sent.
  - (5f) While comets are quite noticeable because of the coma/tail, two or more observations should be used to verify the motion and identity of the comet that is dimmer than 6th magnitude and/or does not have a noticeable tail or coma.

# Get out under the night sky

- ▣ Unlike the other small bodies in the solar system, comets have been known since antiquity. There are Chinese records of Comet Halley going back to at least 240 BC. The famous Bayeux Tapestry, which commemorates the Norman Conquest of England in 1066, depicts an apparition of Comet Halley.
- ▣ Follow in the footsteps of ancient astronomers and take a look at these solar system wonders.