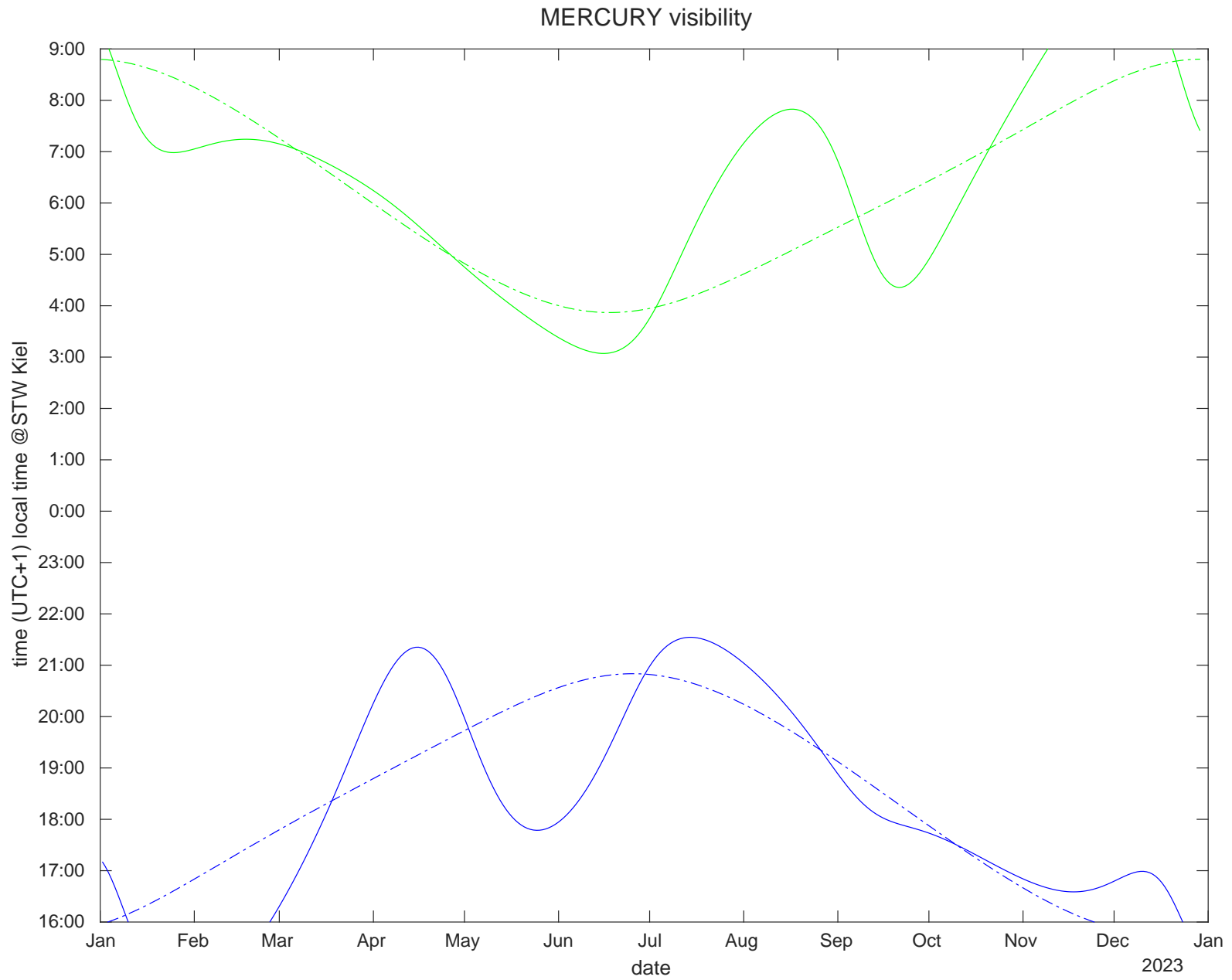


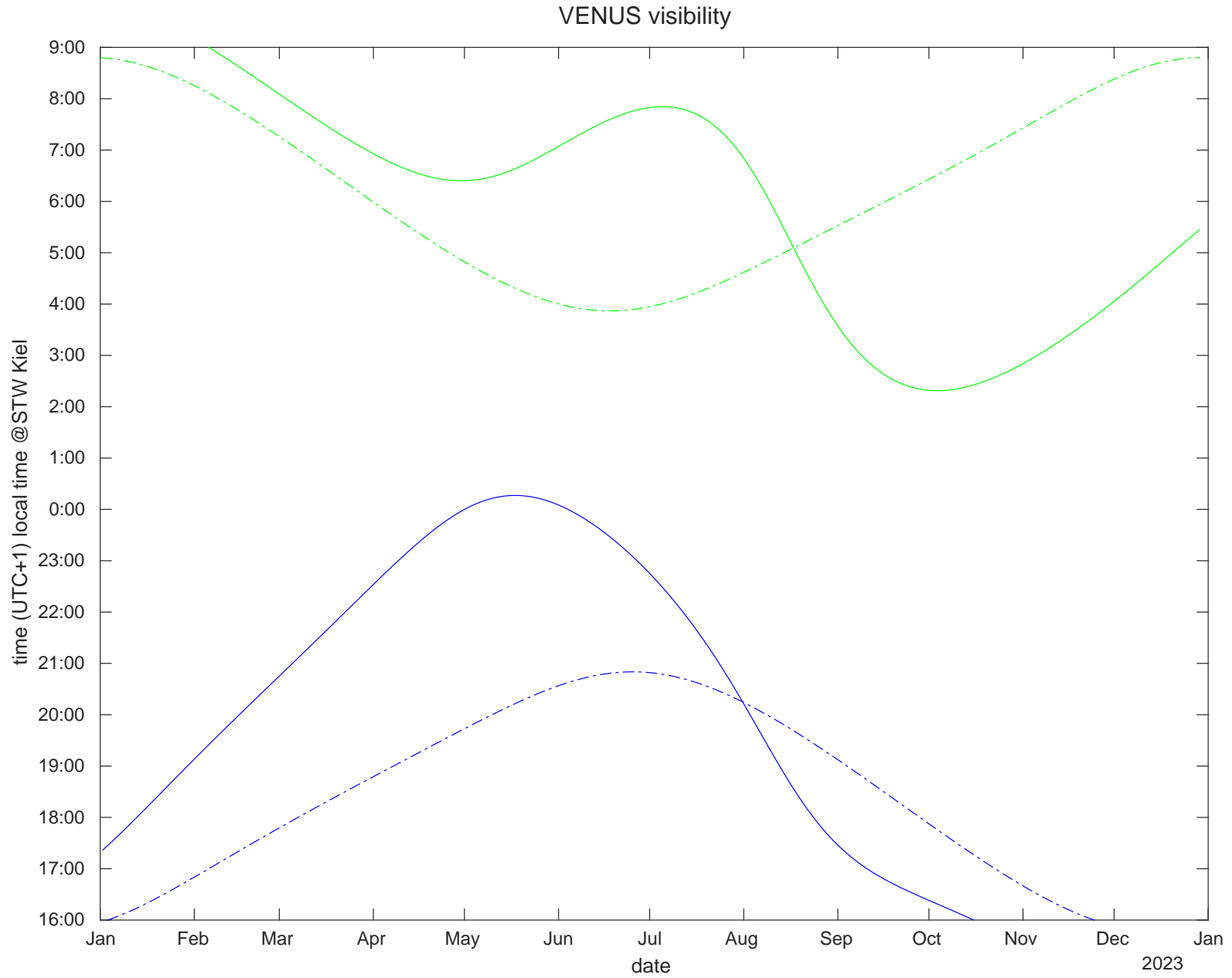
1 Sichtbarkeit der Planeten

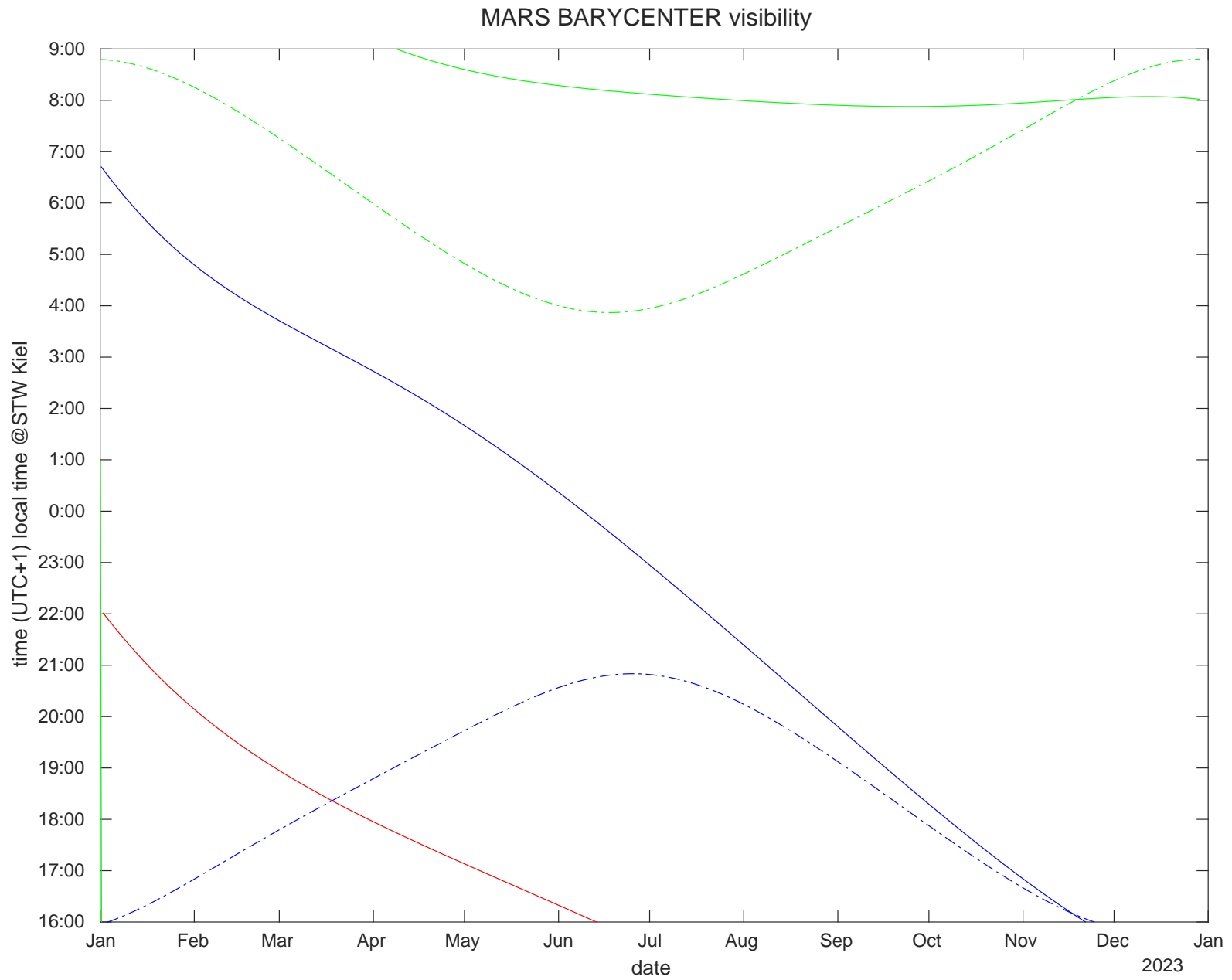
Für Beobachtung eines Planeten ist es hilfreich, wenn er am Nachthimmel oder wenigsten nach dem Sonnenuntergang oder vor dem Sonnenaufgang zu sehen ist. In den Diagrammen können zum Datum die Aufgang, Untergang und der Transit abgelesen werden. Grün ist der Aufgang des Planeten, rot der Transit und blau der Untergang. Gestrichelt ist die Sonne zur groben Orientierung, wann eine Beobachtung am Nachthimmel bzw. in der Dämmerung möglich ist. Wenn wir Sommerzeit haben, muss noch eine Stunde addiert werden.

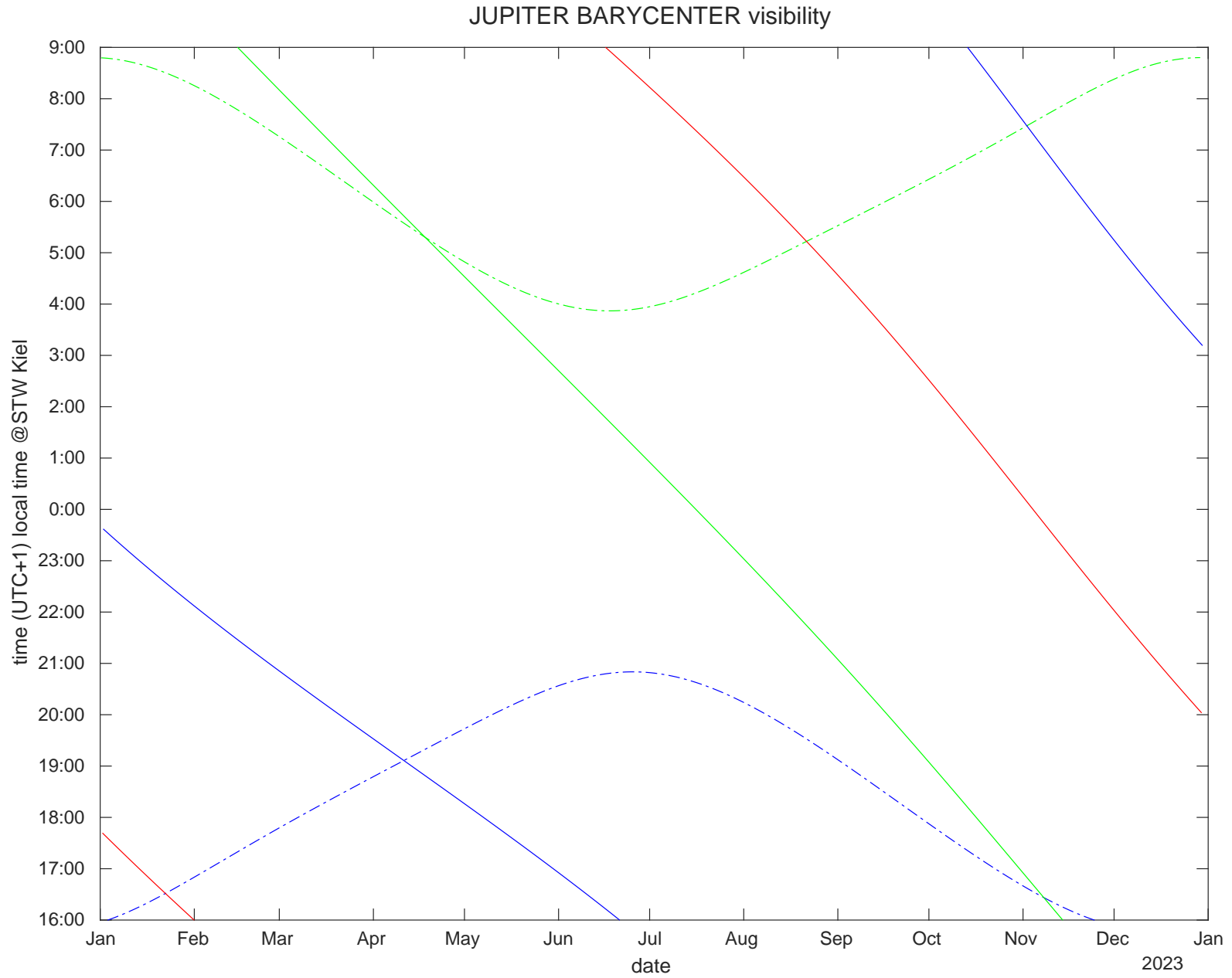
2 Konstellationen

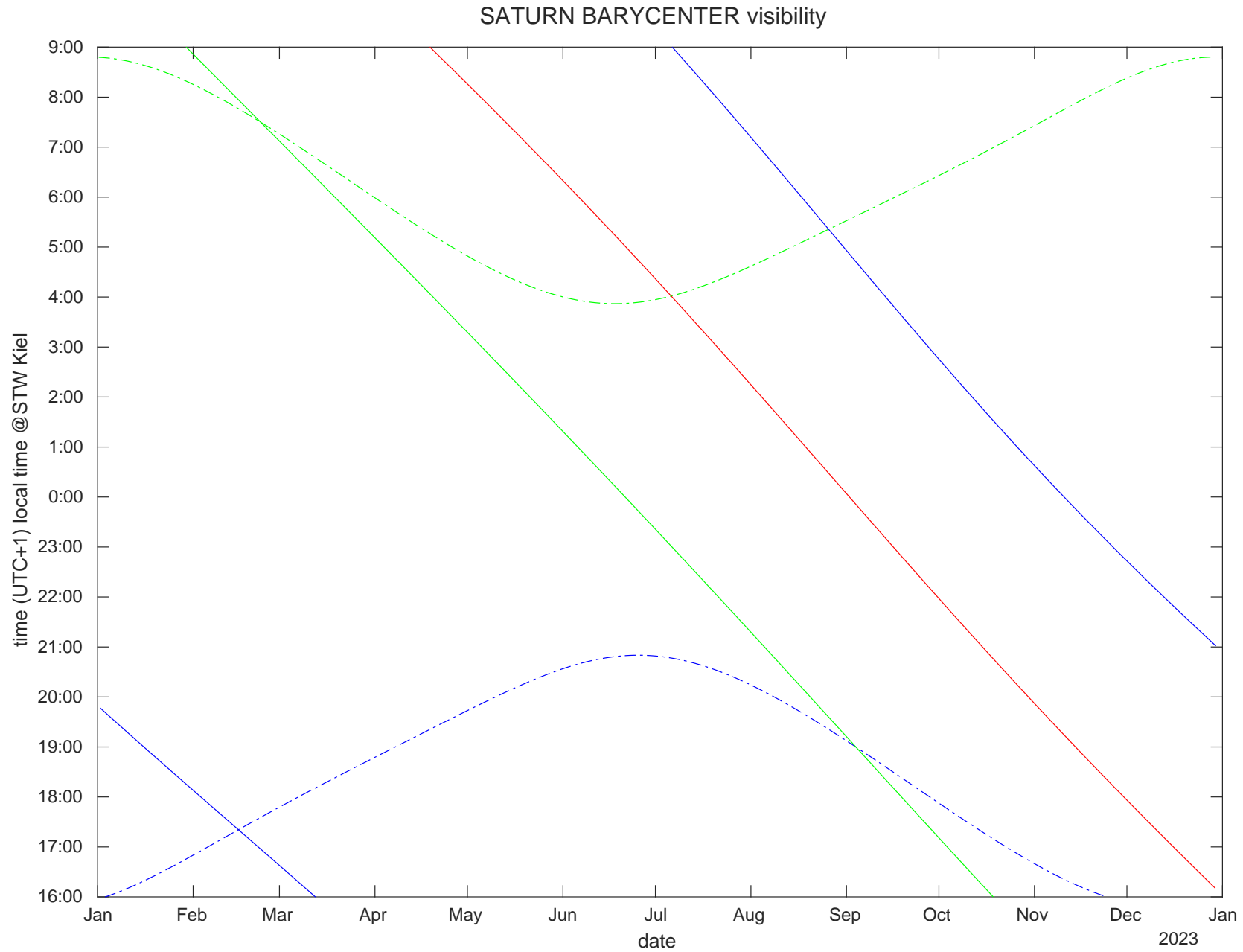
Für Annäherungen von Himmelsobjekten (CloseApproach) sind Datum und Zeit angegeben für die beiden Objekte angegeben. Die Zeitangabe bezieht sich auf den geringsten Abstand zwischen den Objekten am Himmel.

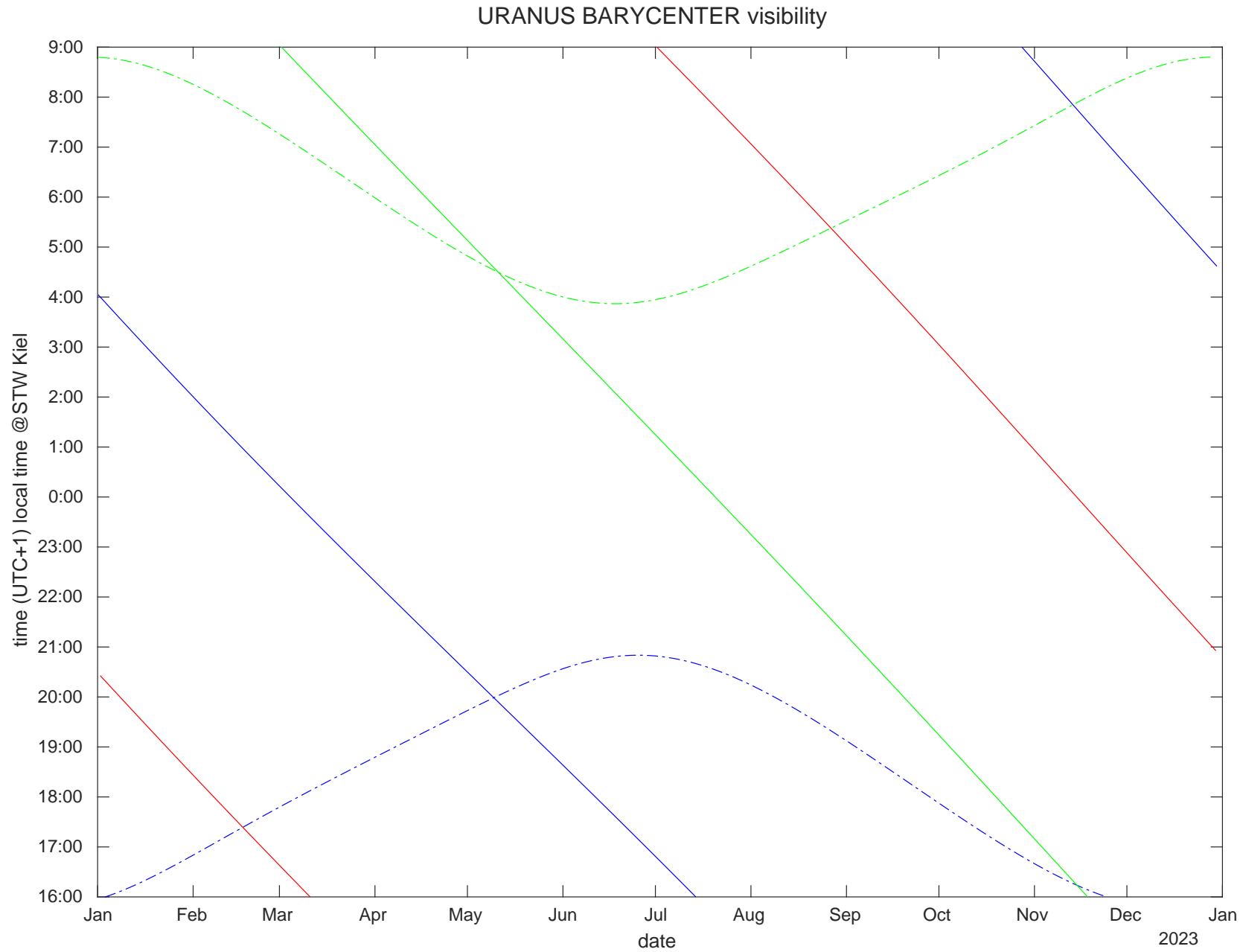


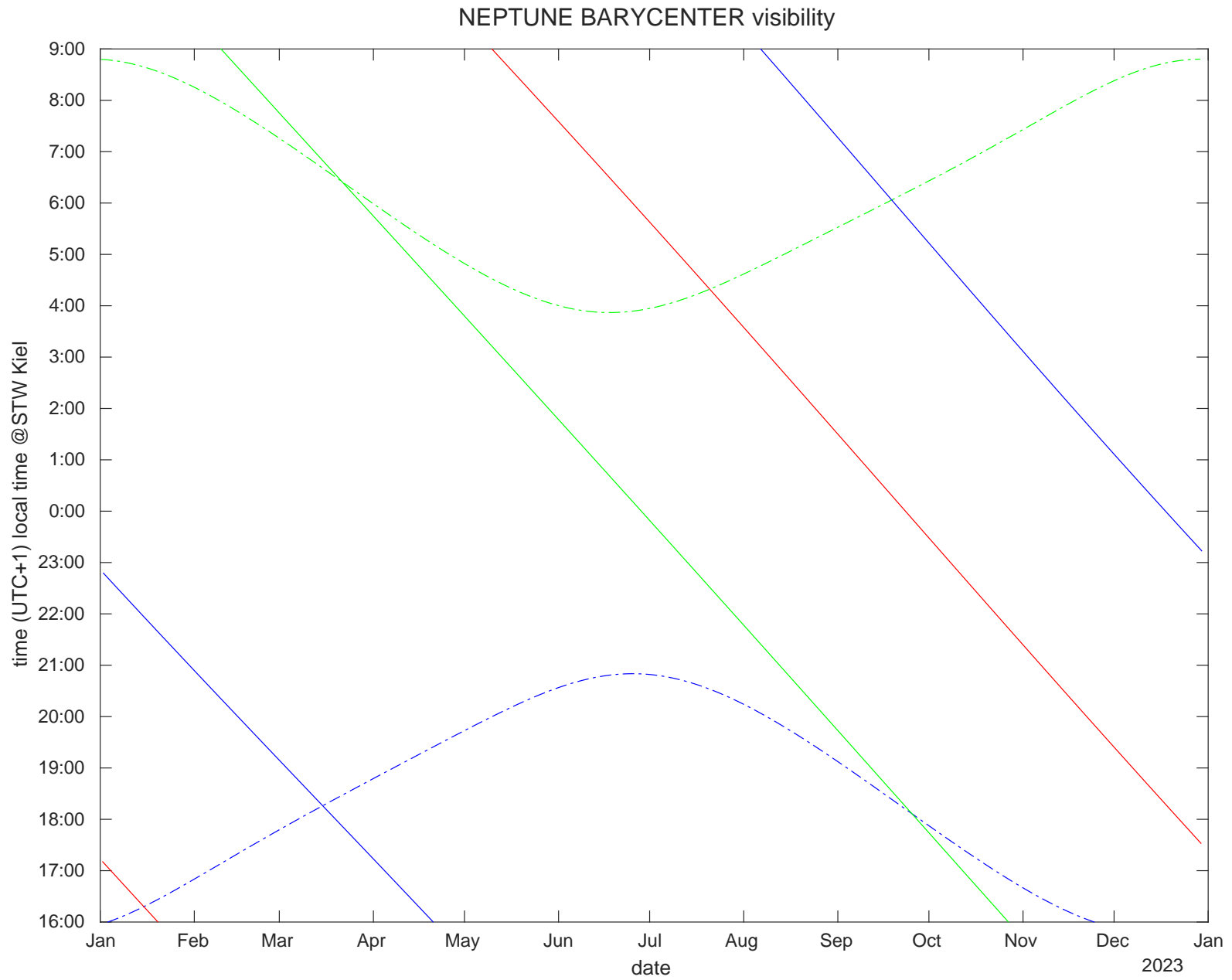


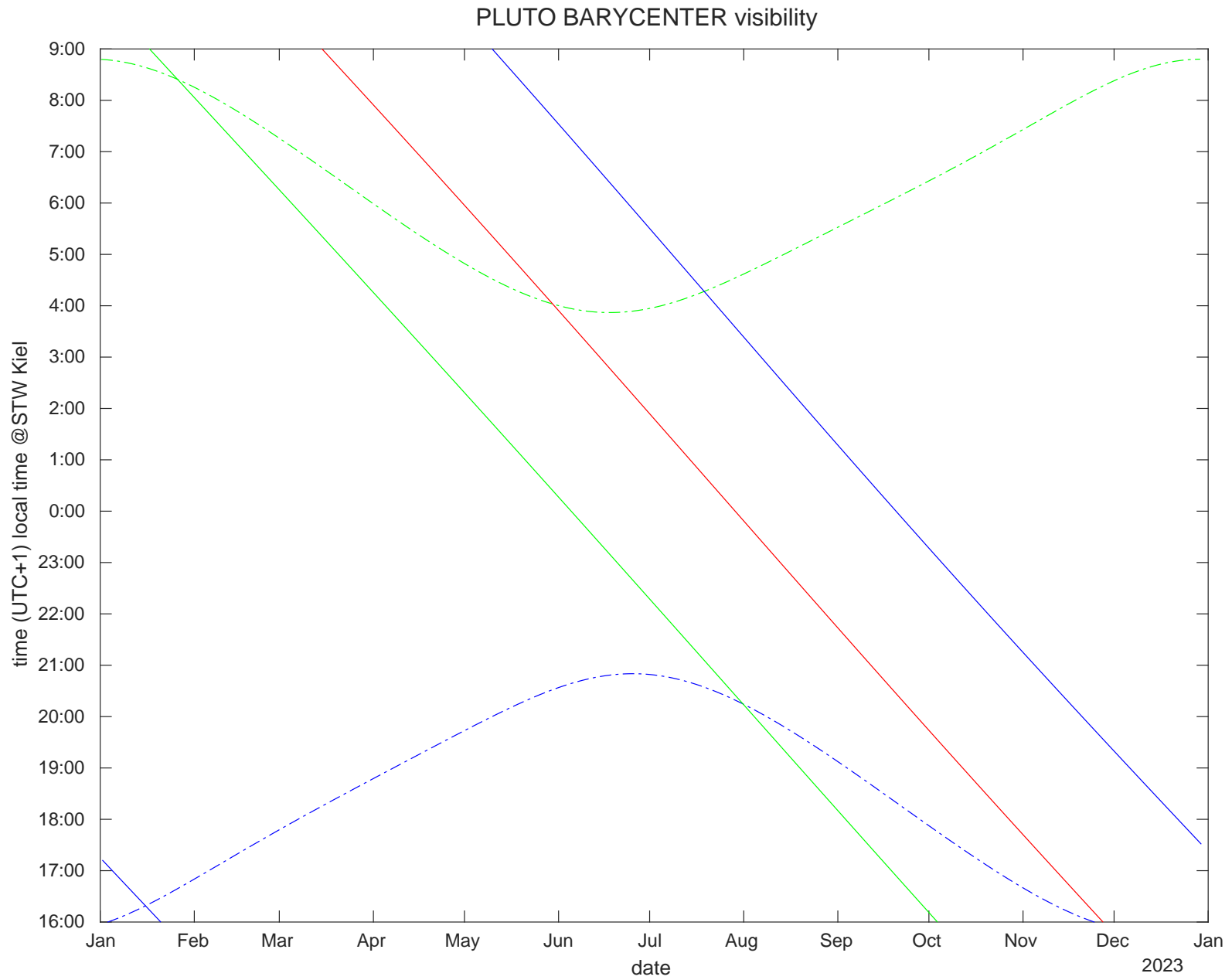


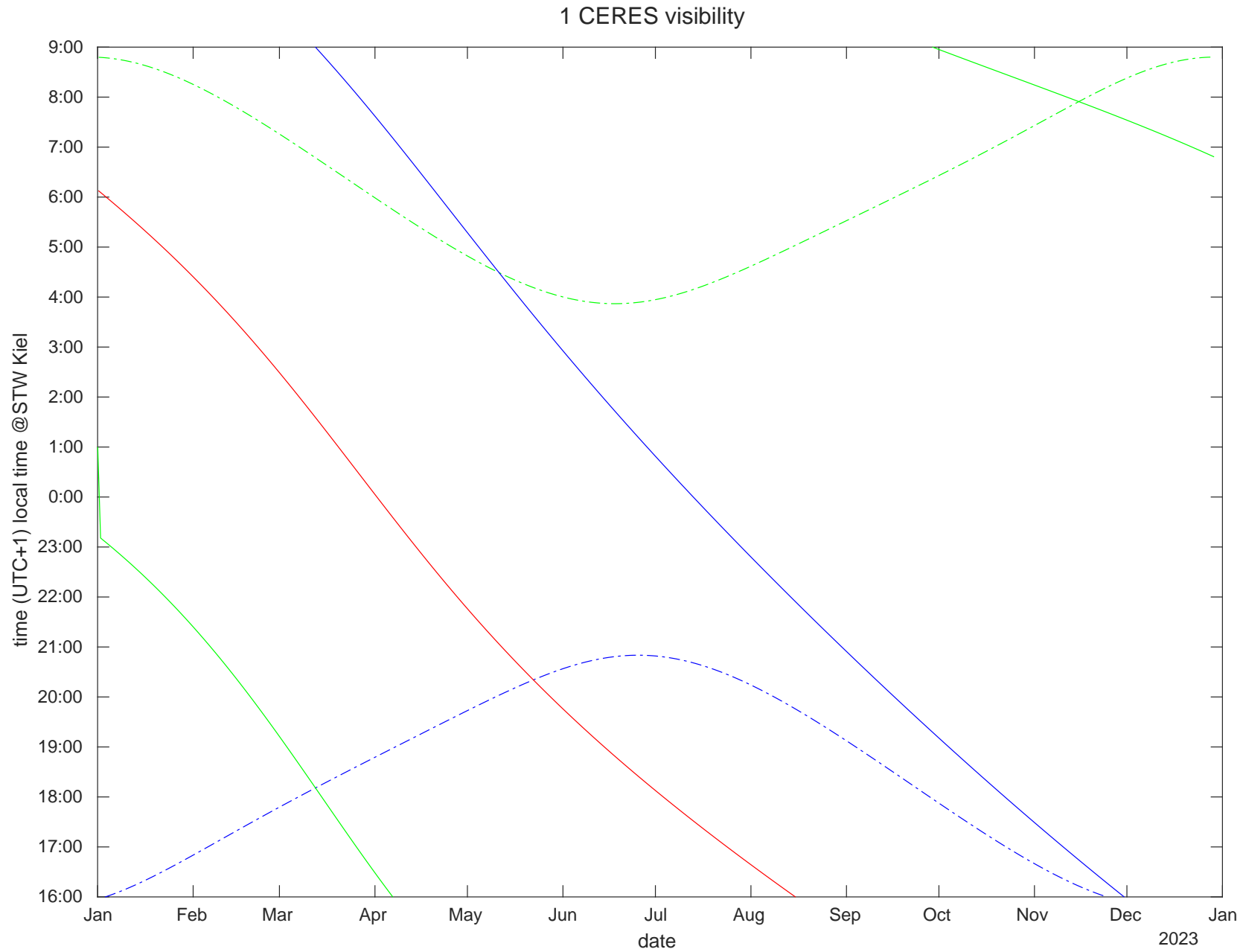


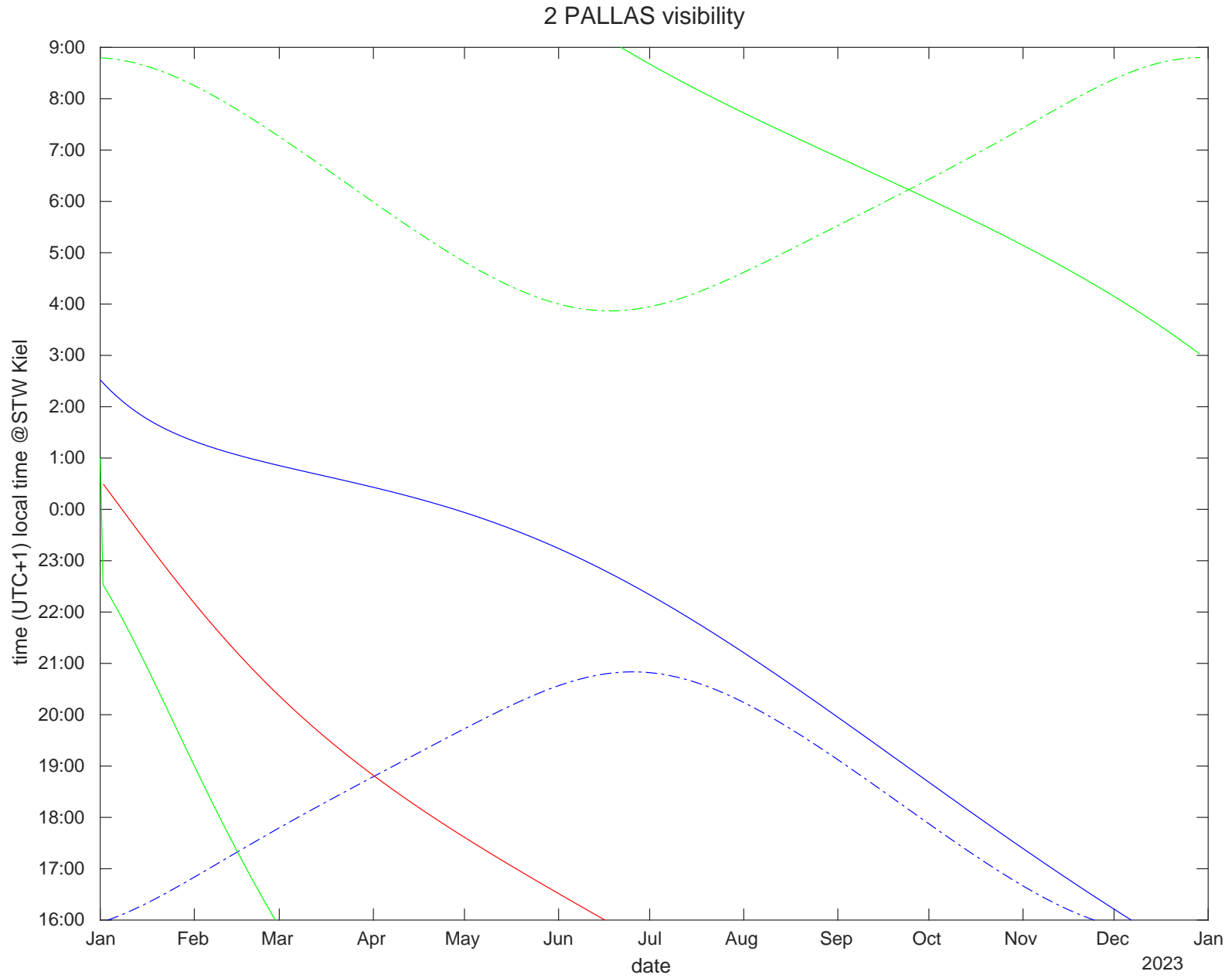


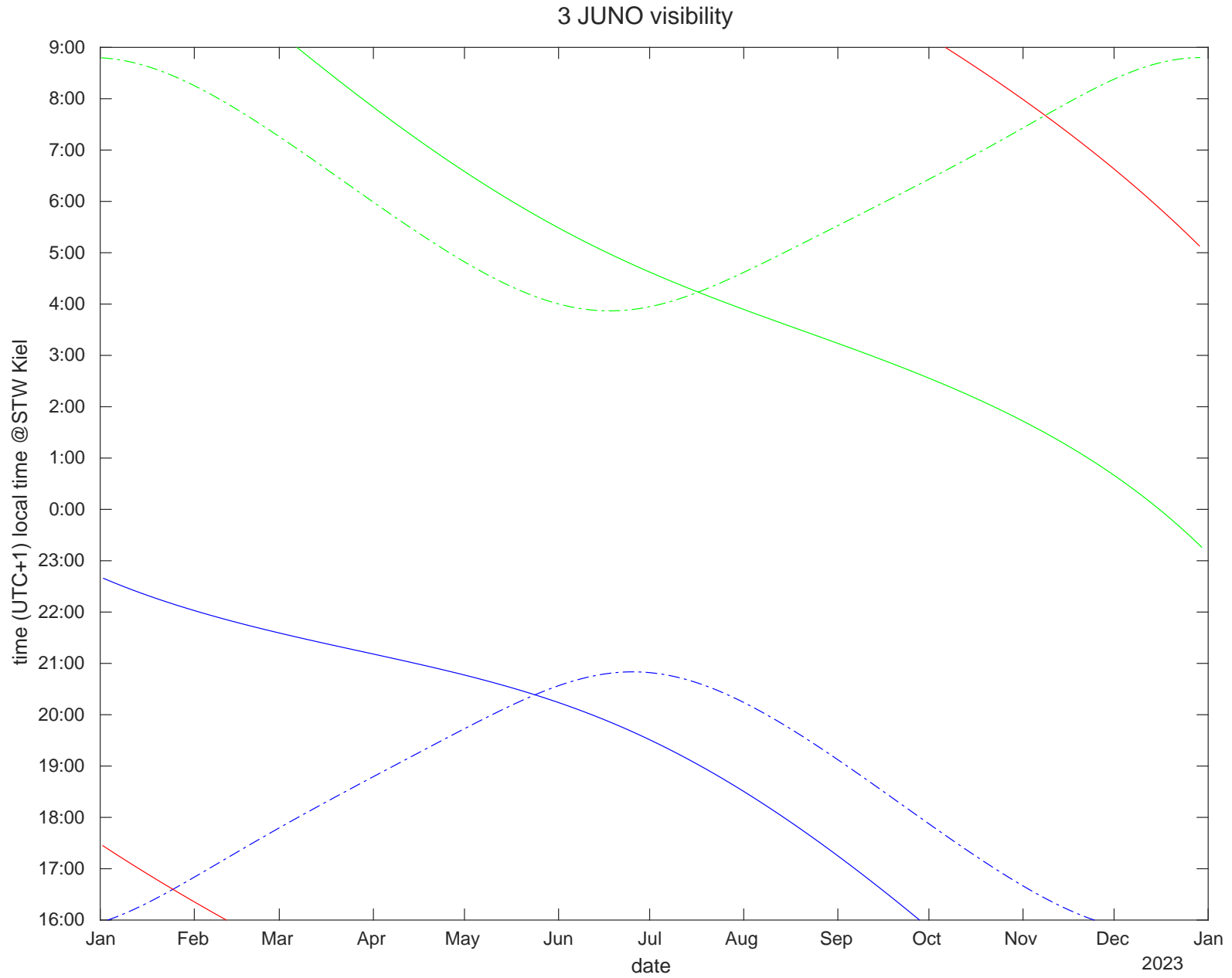


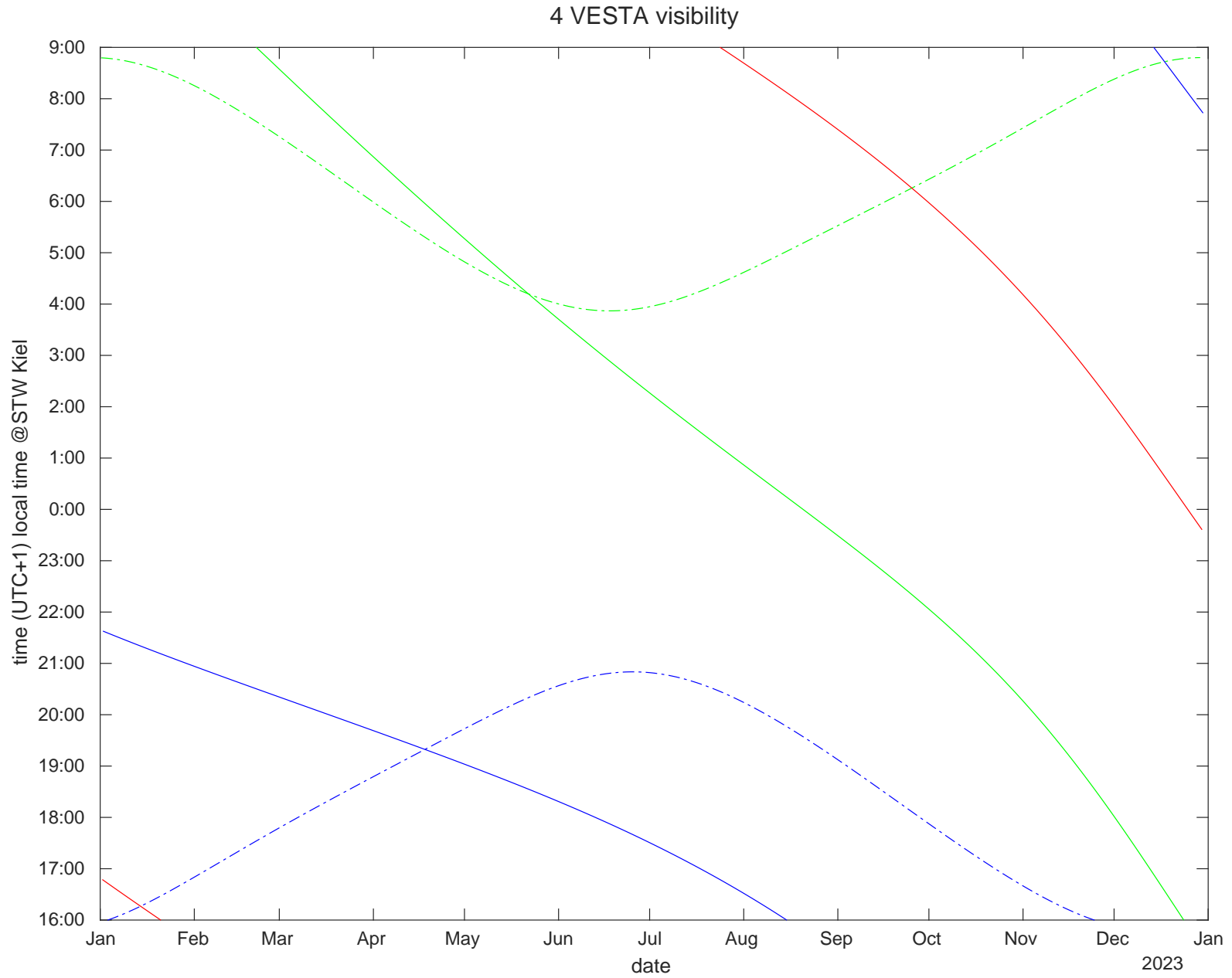




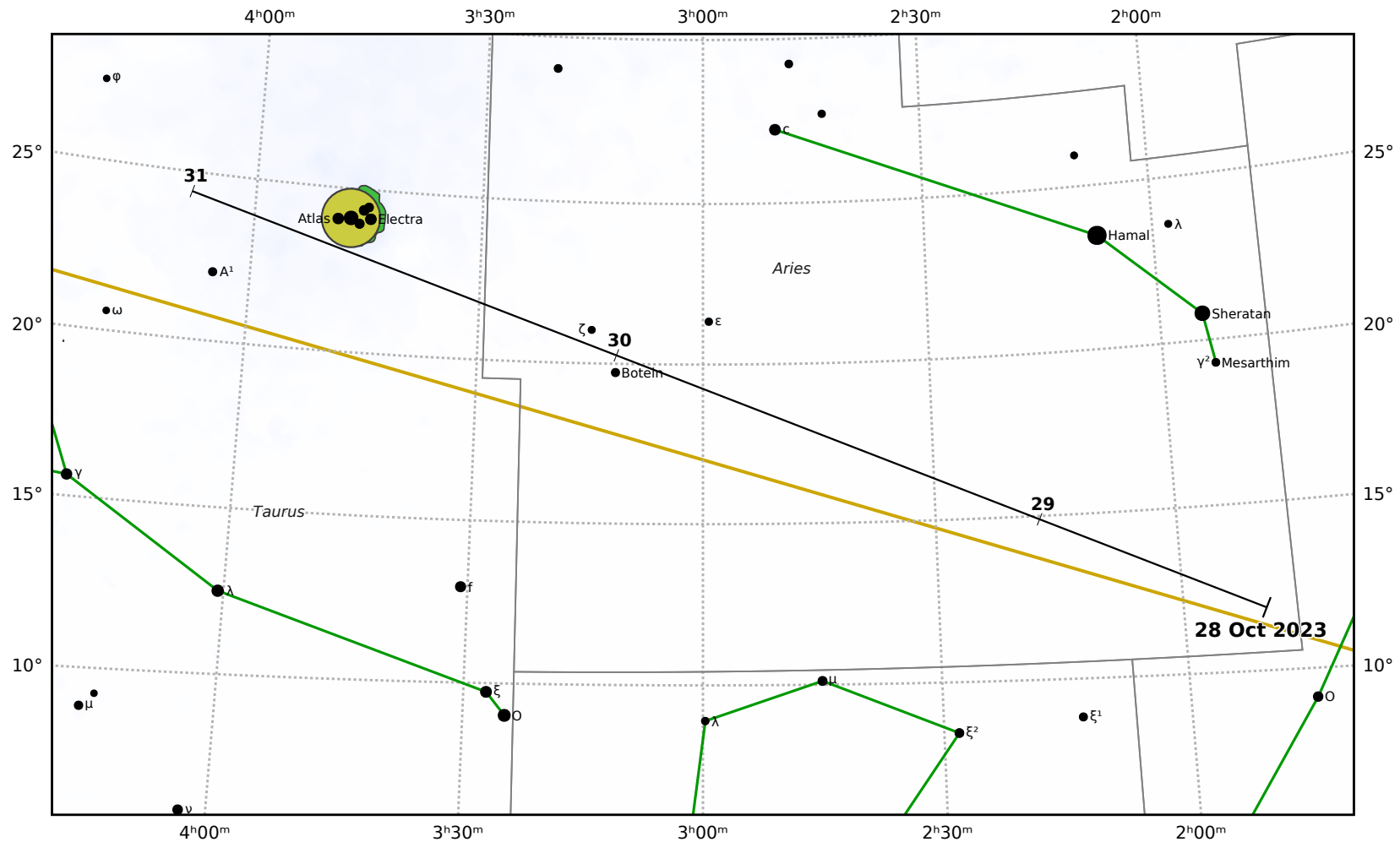








COccultation_2023-10-30_00:25:46.7_(UTC+1)_moon star

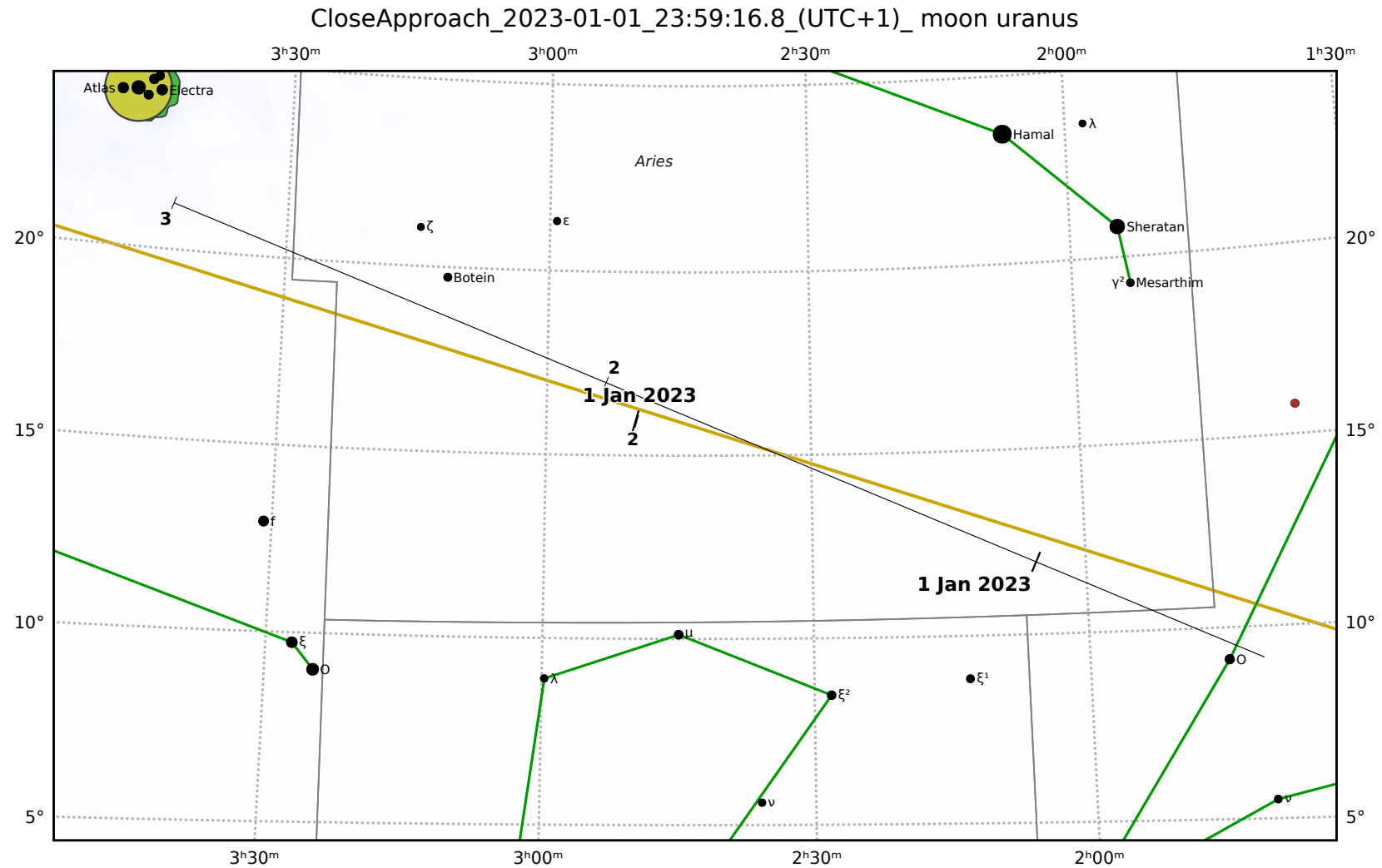


Generated with <https://github.com/dcf21/star-charter>

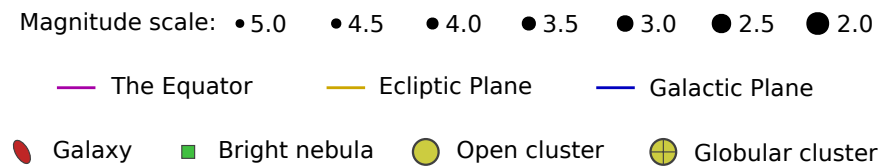
Magnitude scale: ● 5.0 ● 4.5 ● 4.0 ● 3.5 ● 3.0 ● 2.5 ● 2.0

— The Equator — Ecliptic Plane — Galactic Plane

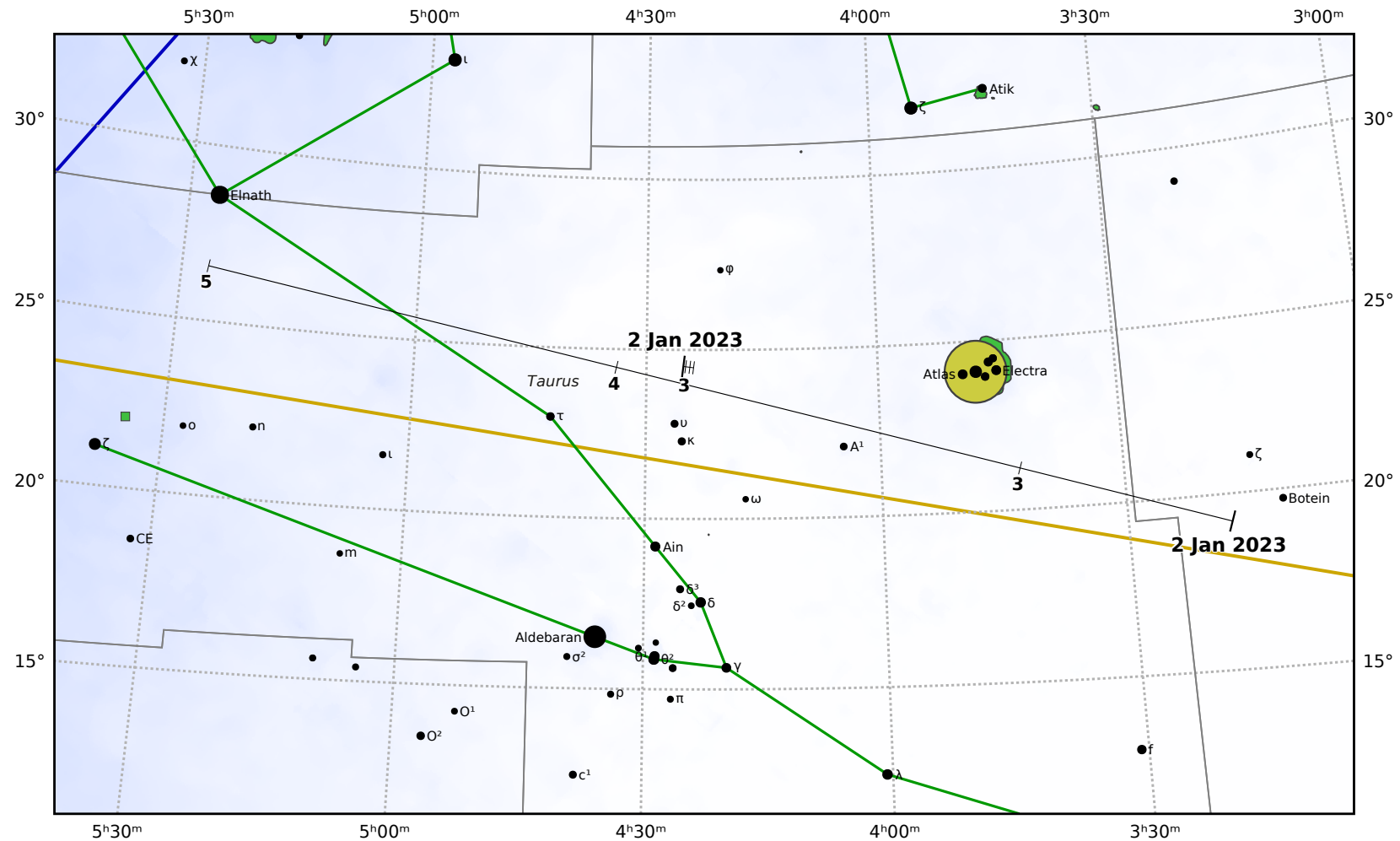
● Galaxy ■ Bright nebula ● Open cluster ● Globular cluster



Generated with <https://github.com/dcf21/star-charter>



CloseApproach_2023-01-03_21:05:19.3_(UTC+1)_ moon mars

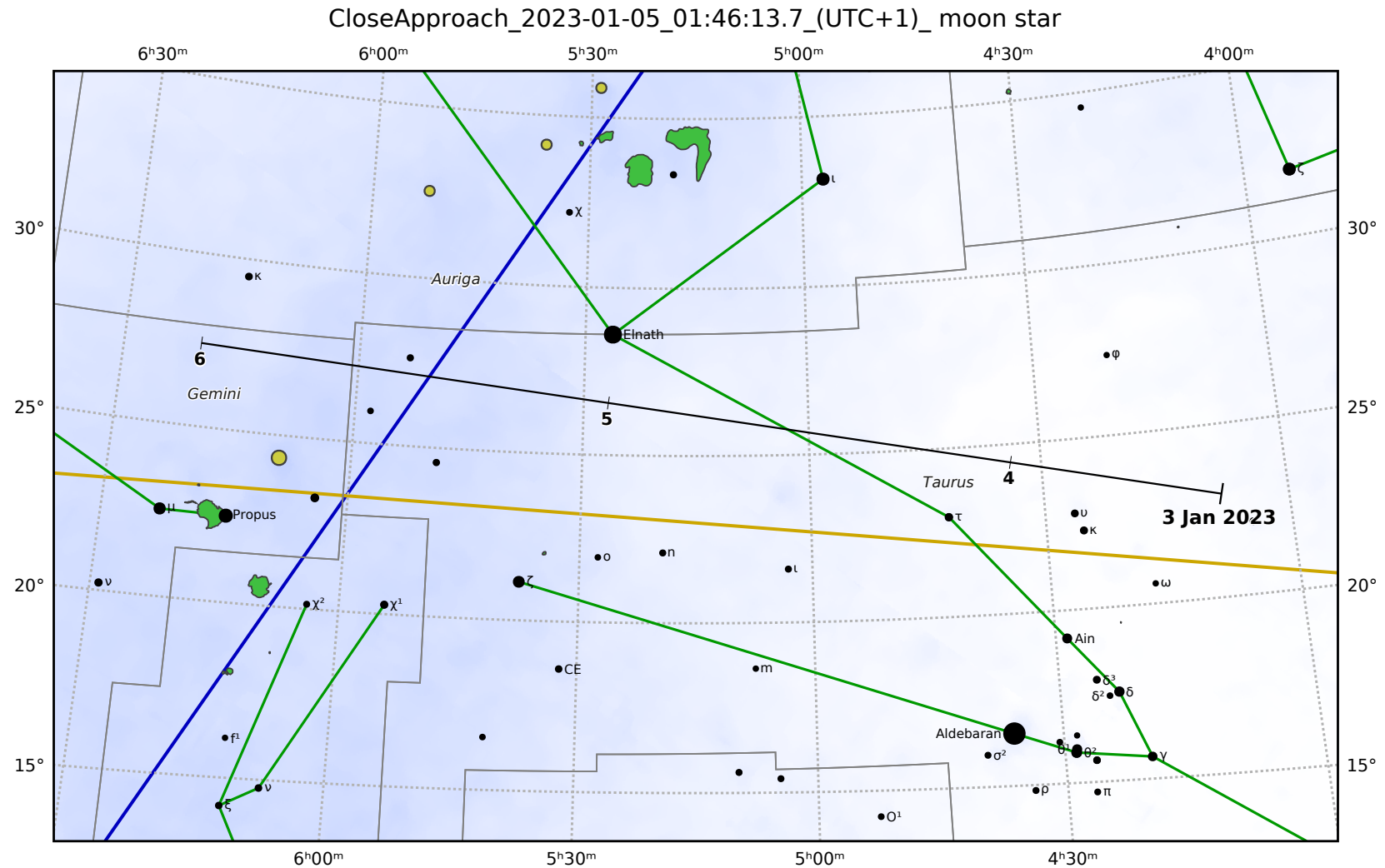


Generated with <https://github.com/dcf21/star-charter>

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

— The Equator — Ecliptic Plane — Galactic Plane

● Galaxy ■ Bright nebula ● Open cluster ● Globular cluster

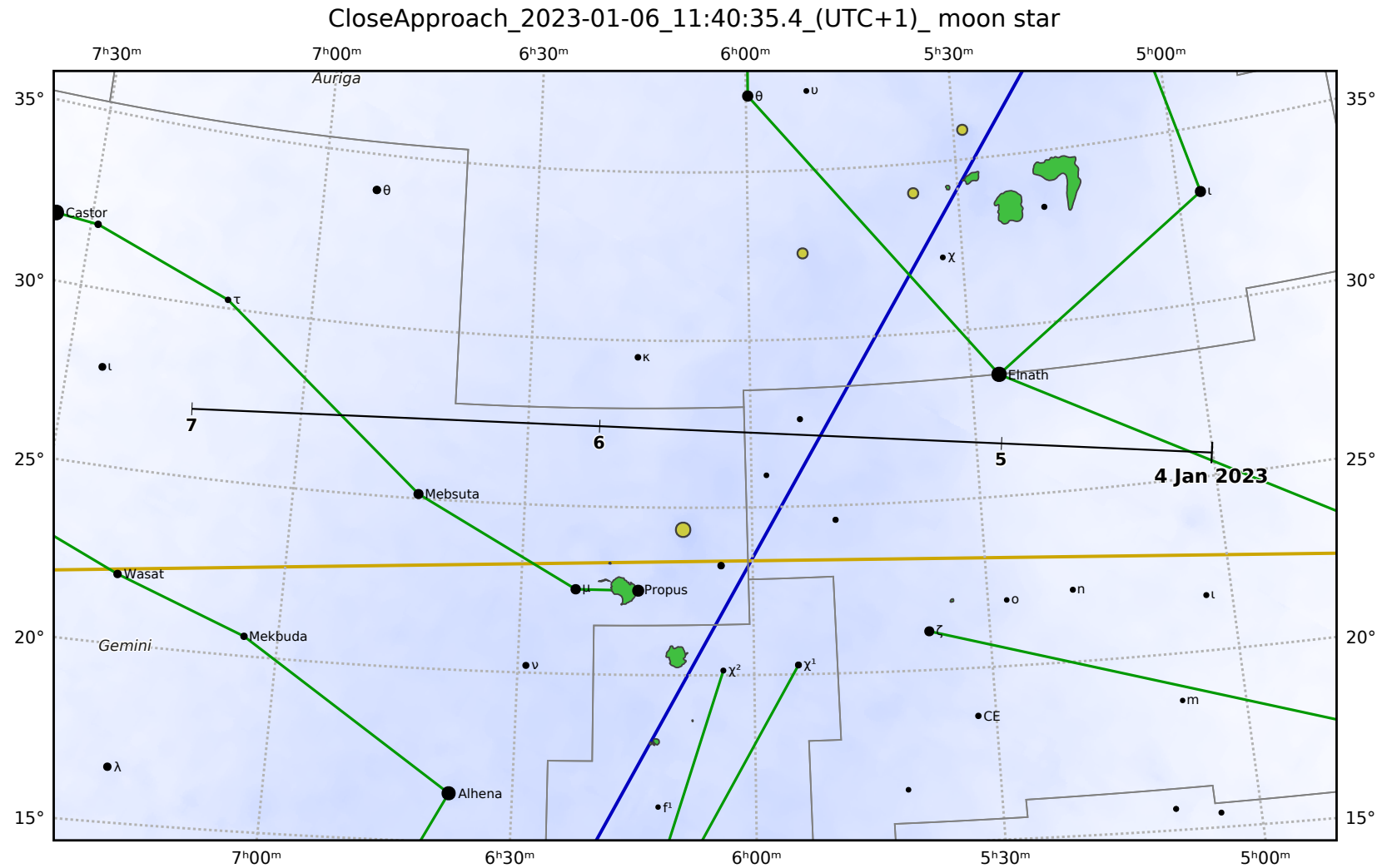


Generated with <https://github.com/dcf21/star-charter>

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

— The Equator — Ecliptic Plane — Galactic Plane

Galaxy Bright nebula Open cluster Globular cluster



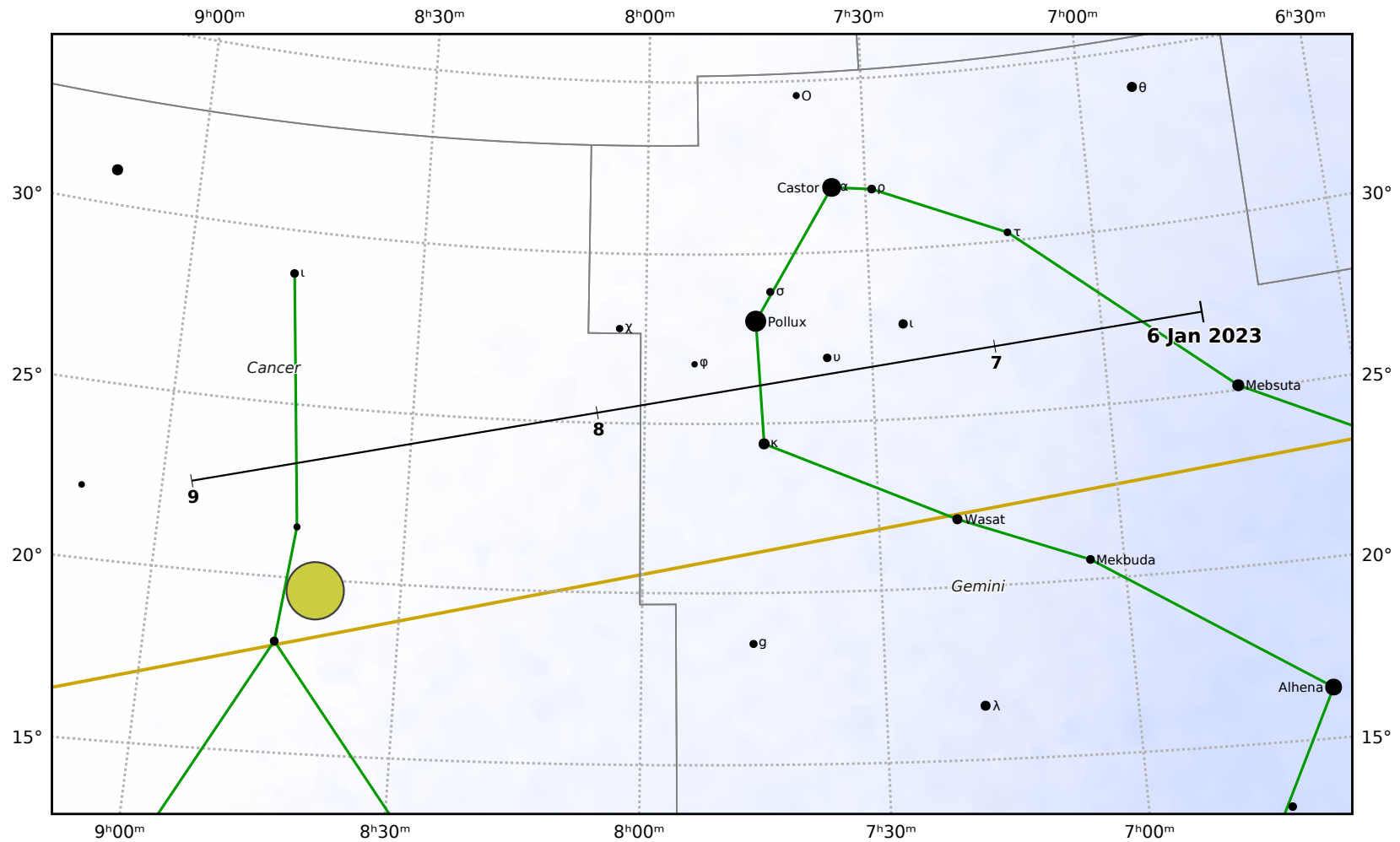
Generated with <https://github.com/dcf21/star-charter>

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

— The Equator — Ecliptic Plane — Galactic Plane

Galaxy Bright nebula Open cluster Globular cluster

CloseApproach_2023-01-07_14:25:14.2_(UTC+1)_ moon star

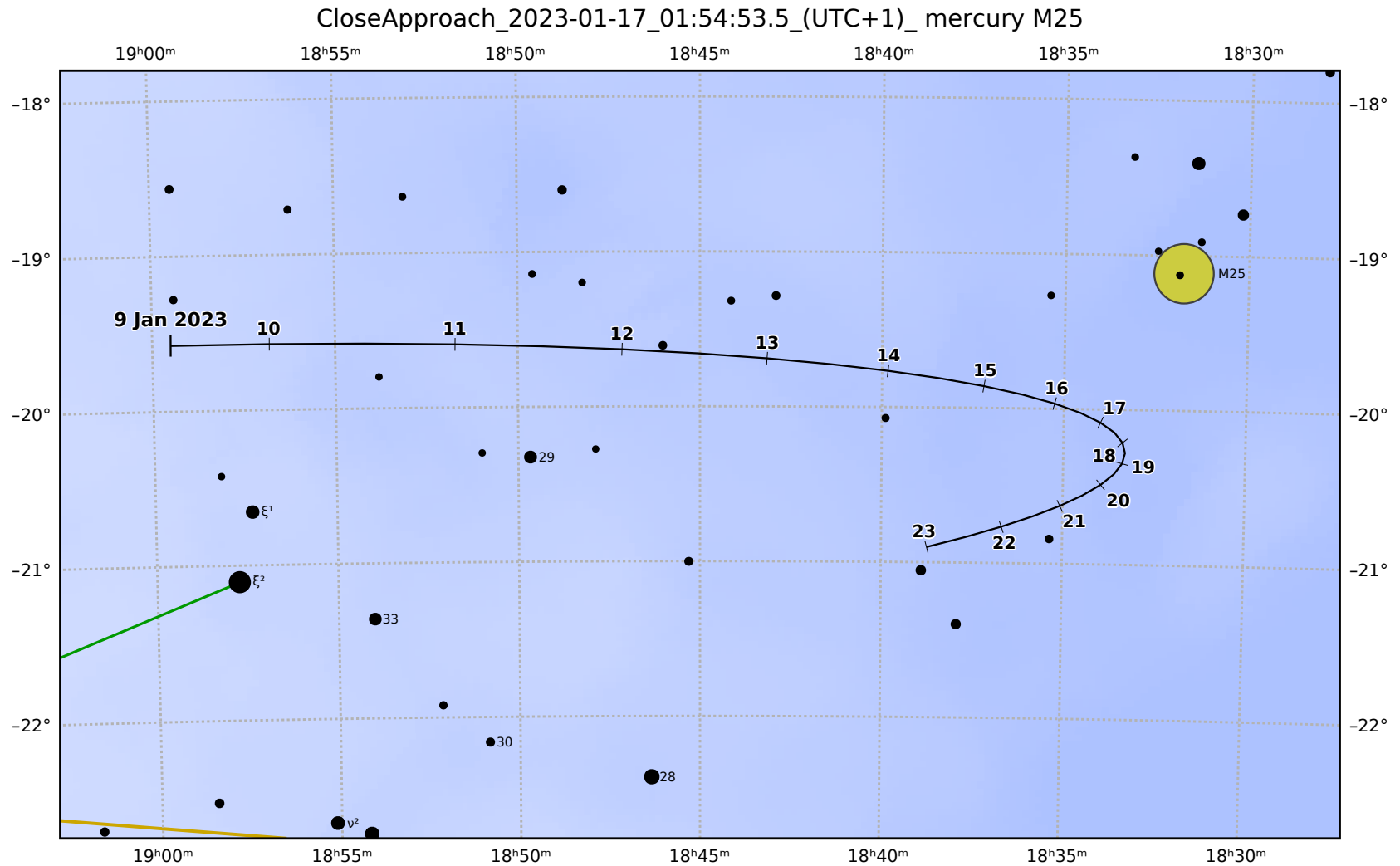


Generated with <https://github.com/dcf21/star-charter>

Magnitude scale: • 5.0 • 4.5 • 4.0 • 3.5 • 3.0 • 2.5 • 2.0 • 1.5 • 1.0

— The Equator — Ecliptic Plane — Galactic Plane

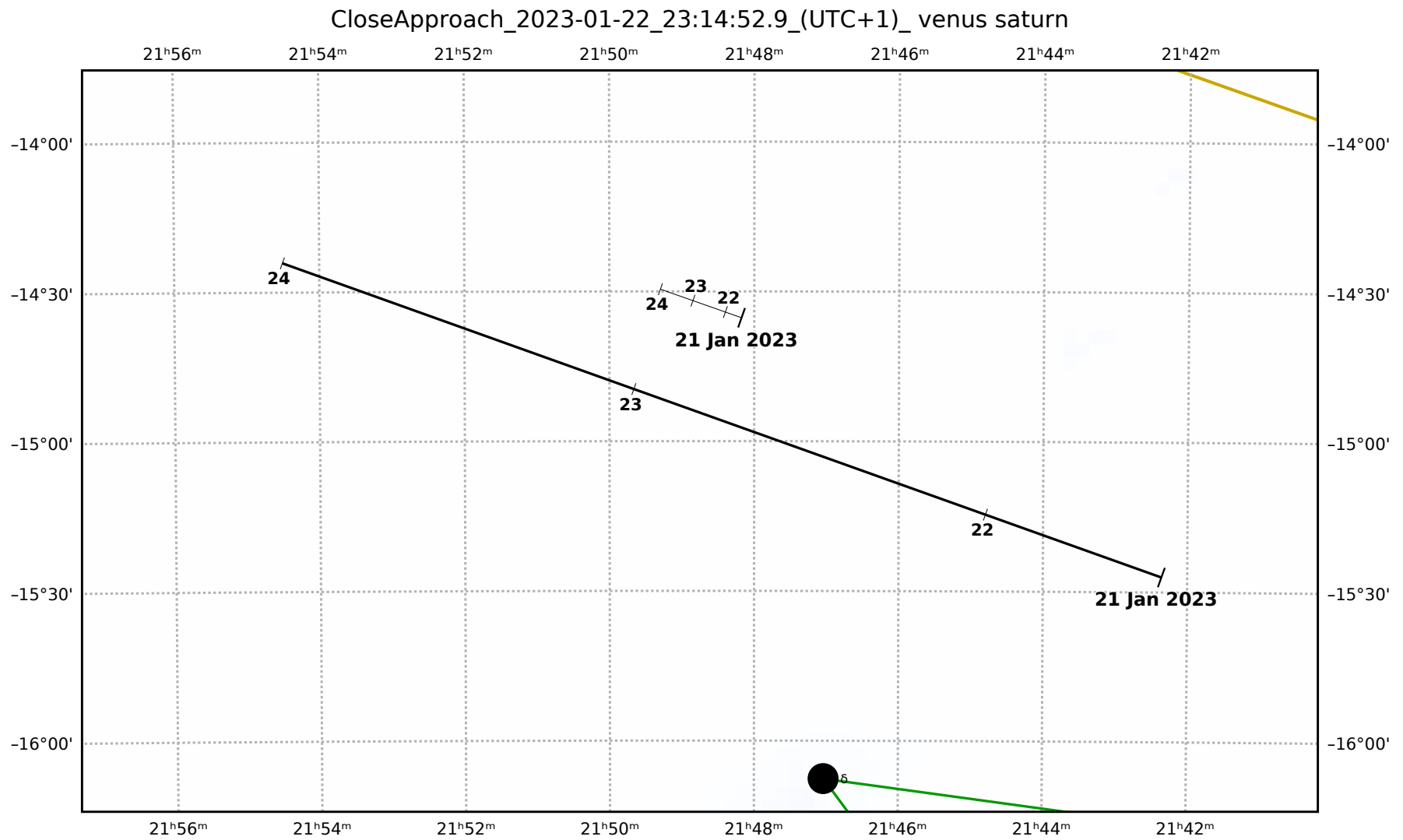
Galaxy Bright nebula Open cluster Globular cluster



Magnitude scale: ● 7.0 ● 6.5 ● 6.0 ● 5.5 ● 5.0 ● 4.5 ● 4.0 ● 3.5

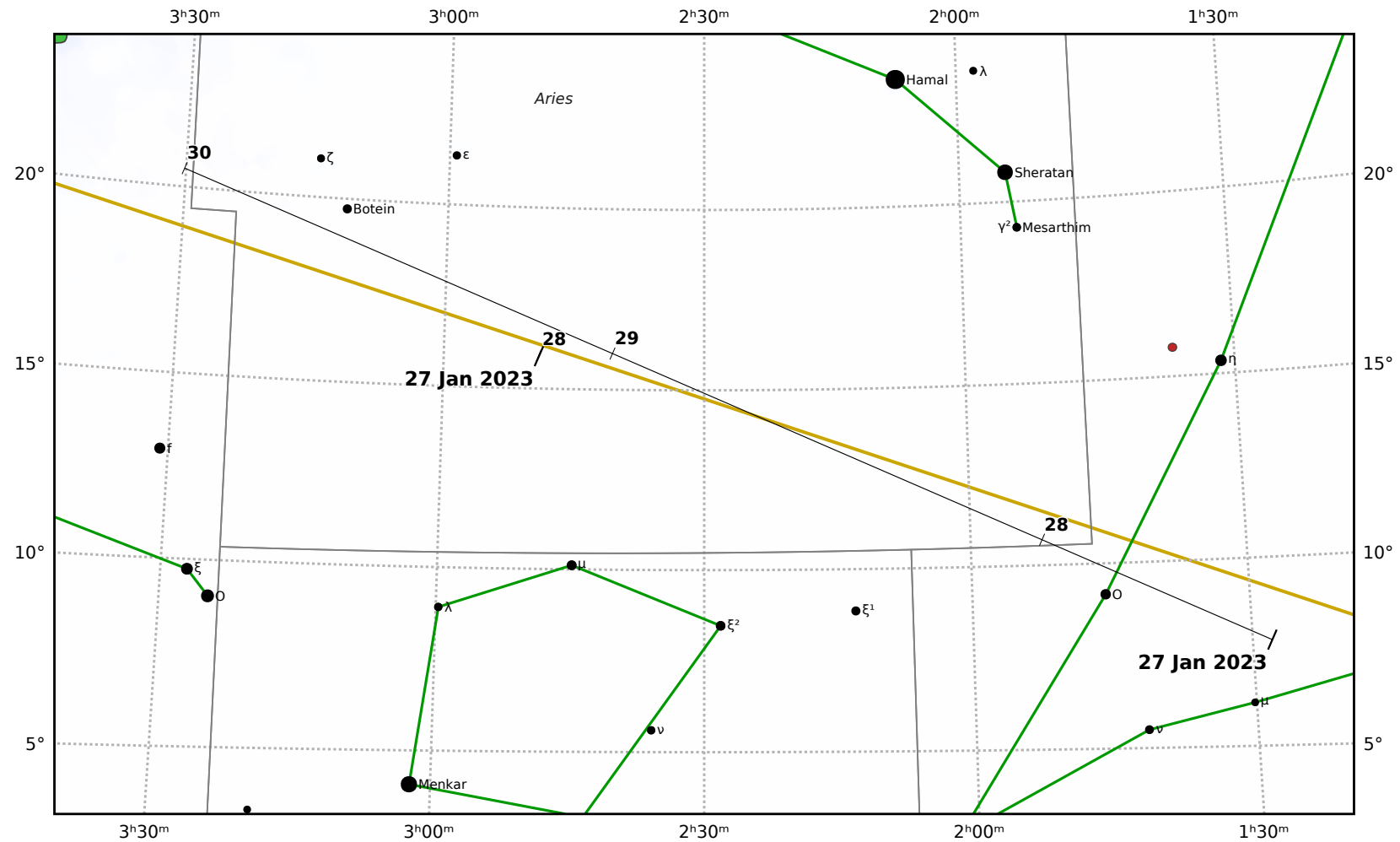
— The Equator — Ecliptic Plane — Galactic Plane

🌀 Galaxy ■ Bright nebula ● Open cluster ⊕ Globular cluster



Generated with <https://github.com/dcf21/star-charter>

CloseApproach_2023-01-29_05:24:35.5_(UTC+1)_moon uranus



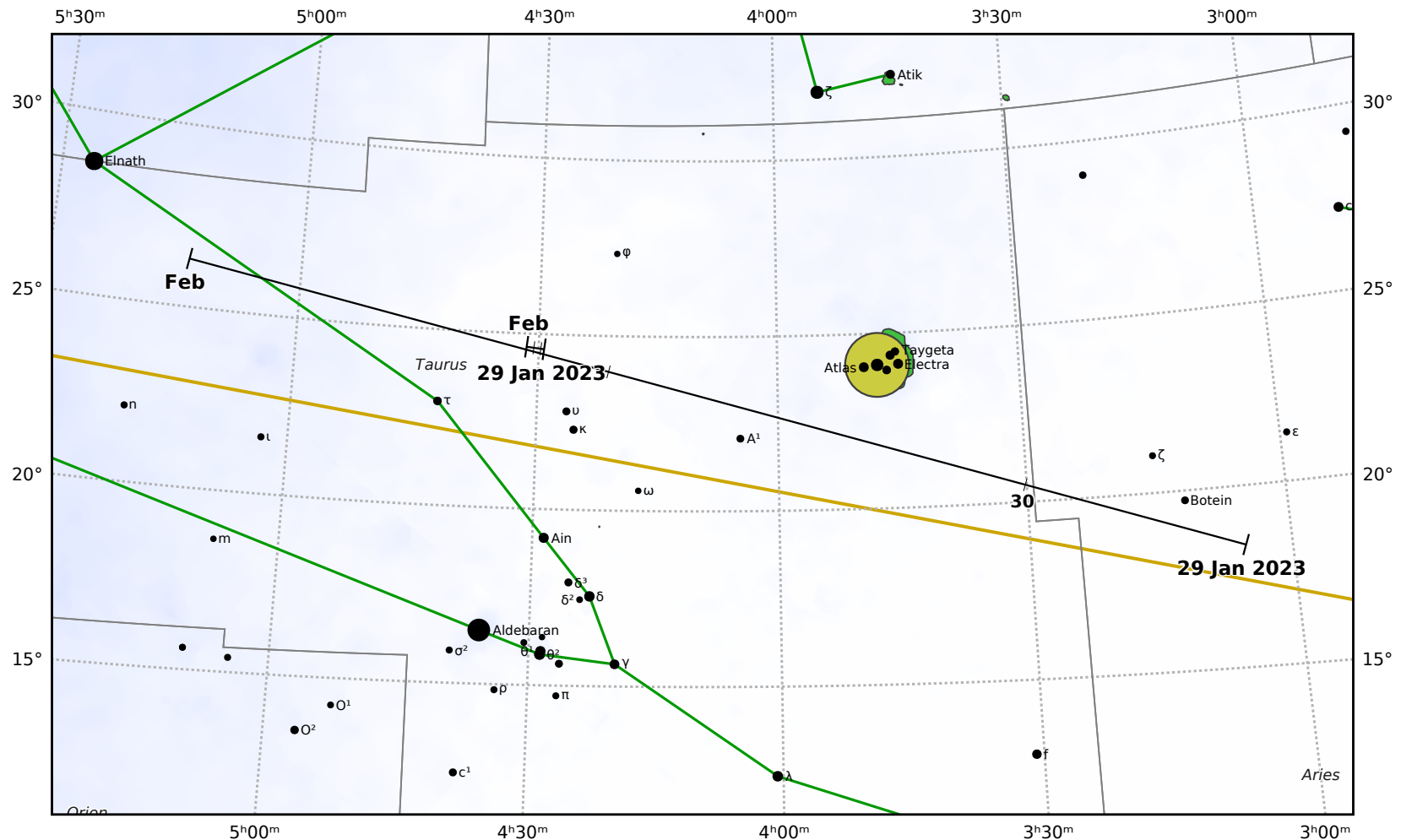
Generated with <https://github.com/dcf21/star-charter>

Magnitude scale: • 5.0 • 4.5 • 4.0 • 3.5 • 3.0 • 2.5 • 2.0

— The Equator — Ecliptic Plane — Galactic Plane

● Galaxy ■ Bright nebula ● Open cluster ⊕ Globular cluster

CloseApproach_2023-01-31_06:12:32.5_(UTC+1)_ moon mars

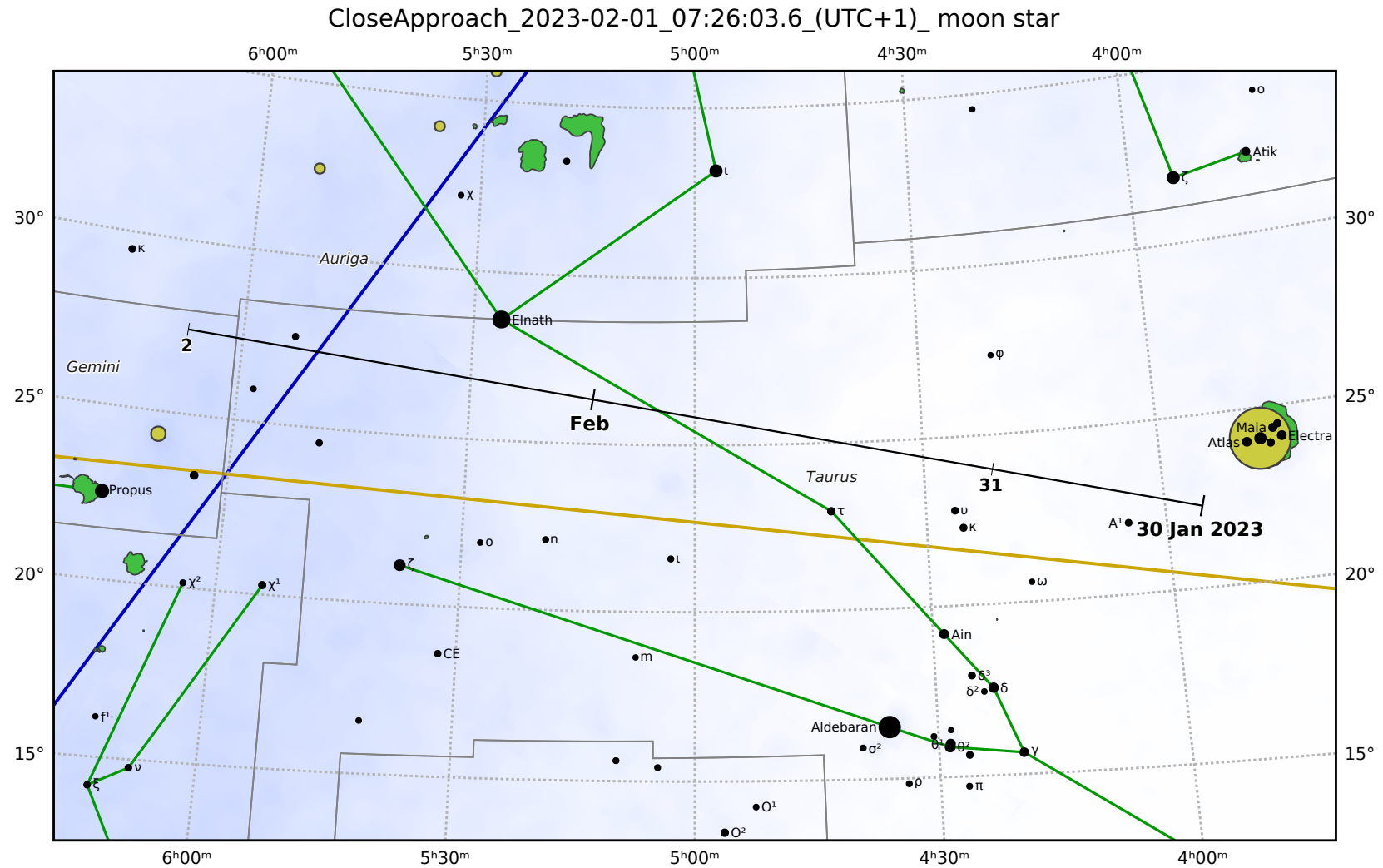


Generated with <https://github.com/dcf21/star-charter>

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

— The Equator — Ecliptic Plane — Galactic Plane

Galaxy Bright nebula Open cluster Globular cluster

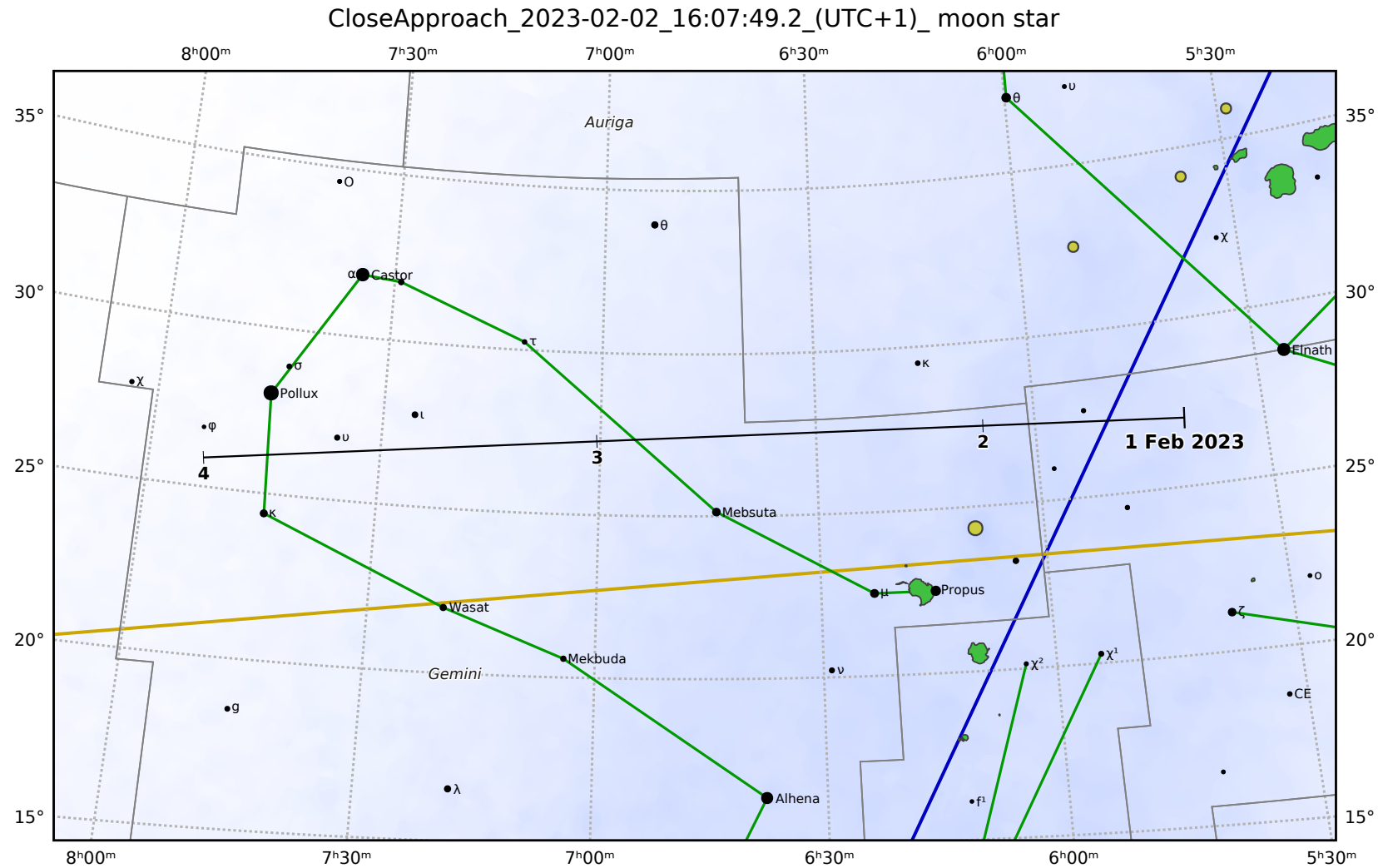


Generated with <https://github.com/dcf21/star-charter>

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

— The Equator — Ecliptic Plane — Galactic Plane

Galaxy Bright nebula Open cluster Globular cluster

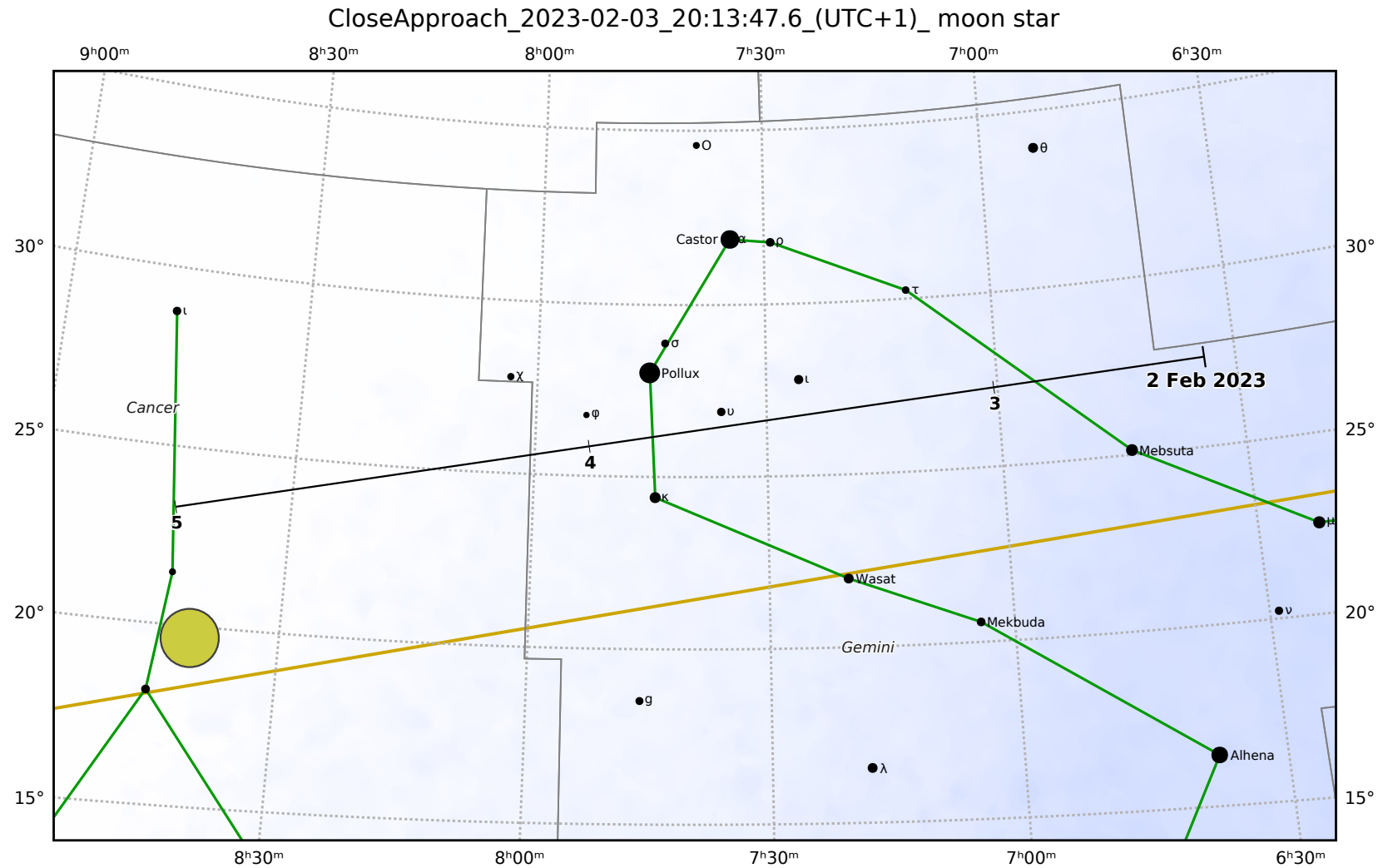


Generated with <https://github.com/dcf21/star-charter>

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

— The Equator — Ecliptic Plane — Galactic Plane

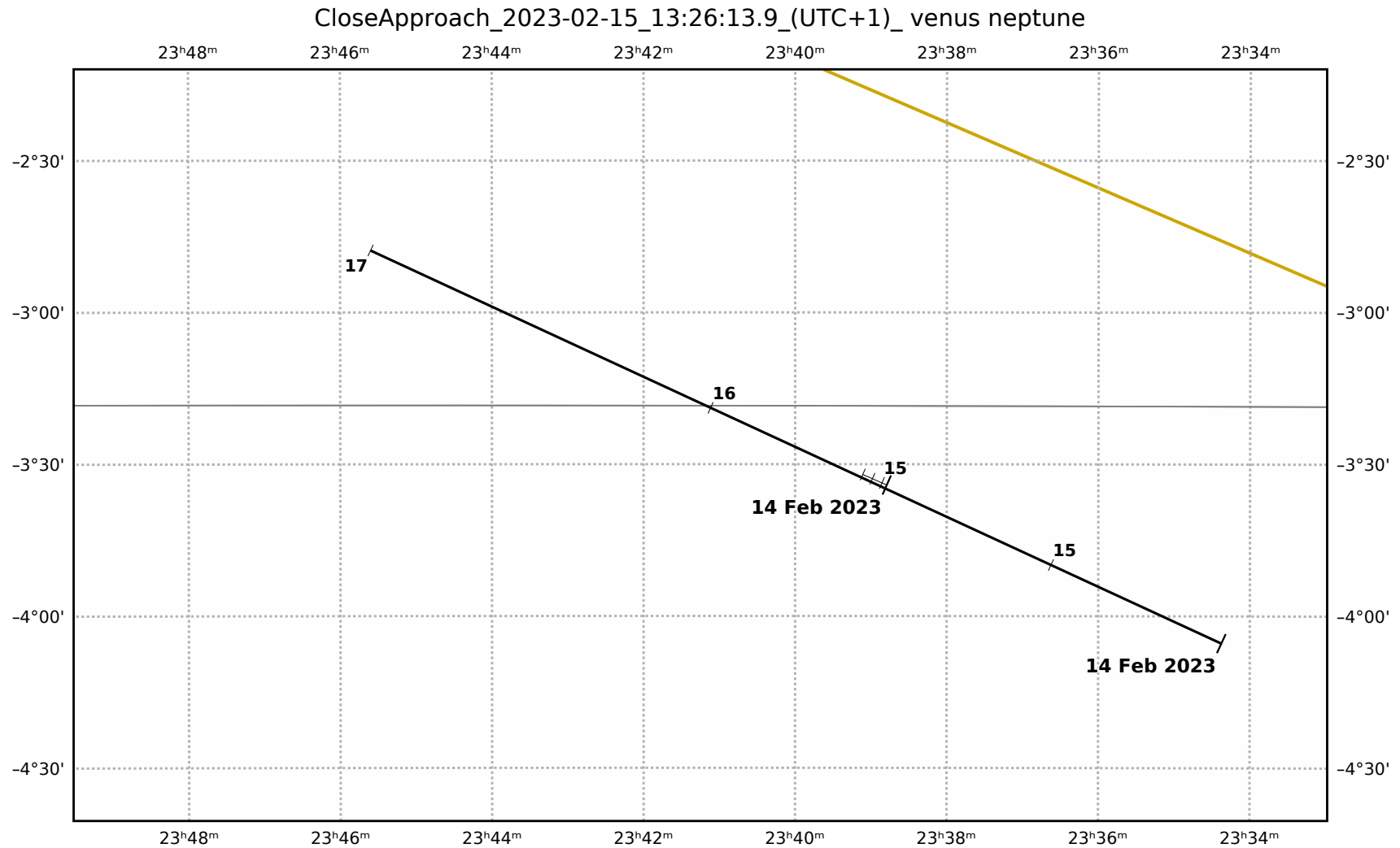
🌌 Galaxy 🟩 Bright nebula 🟡 Open cluster 🟡⊕ Globular cluster



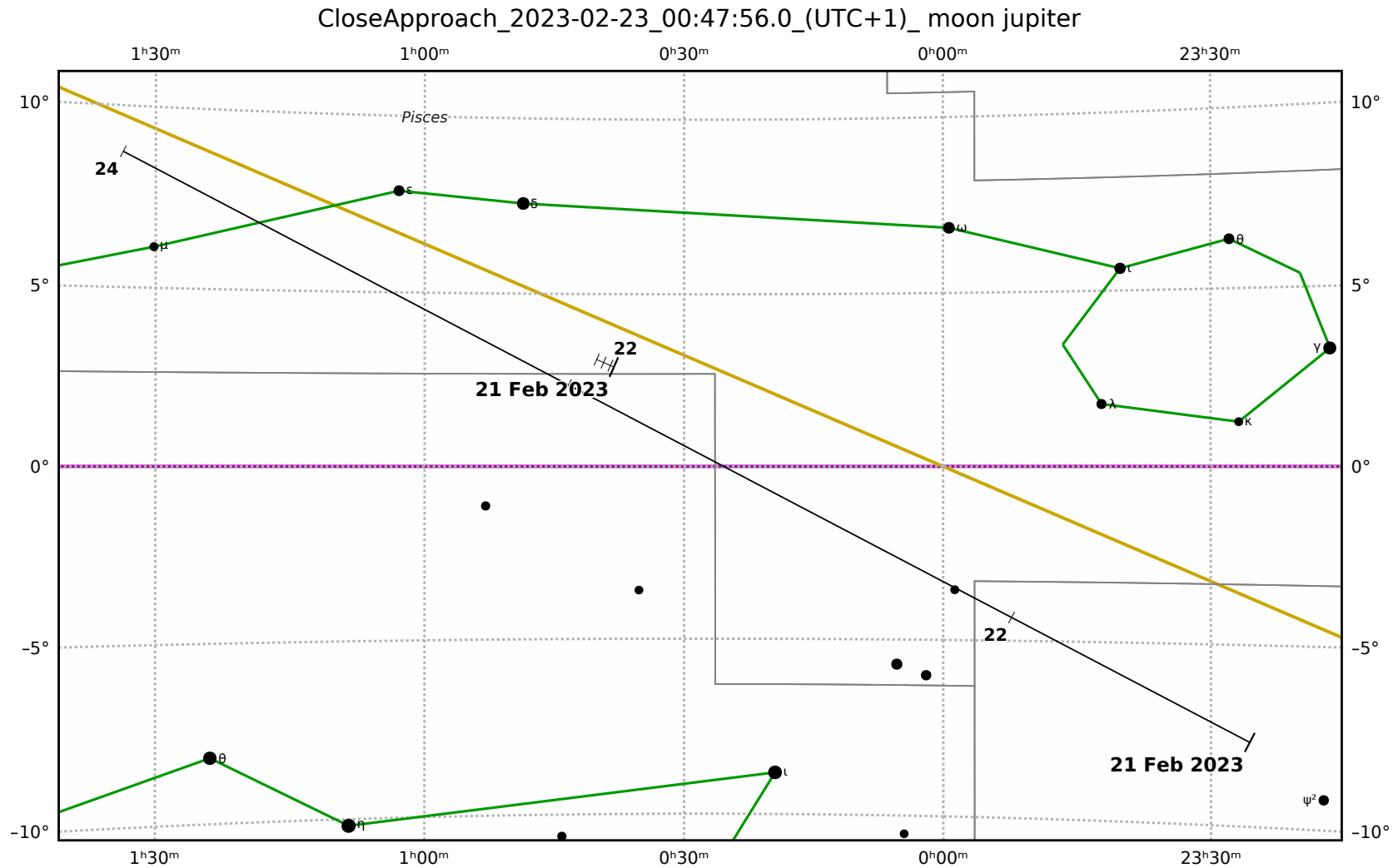
Magnitude scale: • 5.0 • 4.5 • 4.0 • 3.5 • 3.0 • 2.5 • 2.0 • 1.5 • 1.0

— The Equator — Ecliptic Plane — Galactic Plane

Galaxy Bright nebula Open cluster Globular cluster



Generated with <https://github.com/dcf21/star-charter>

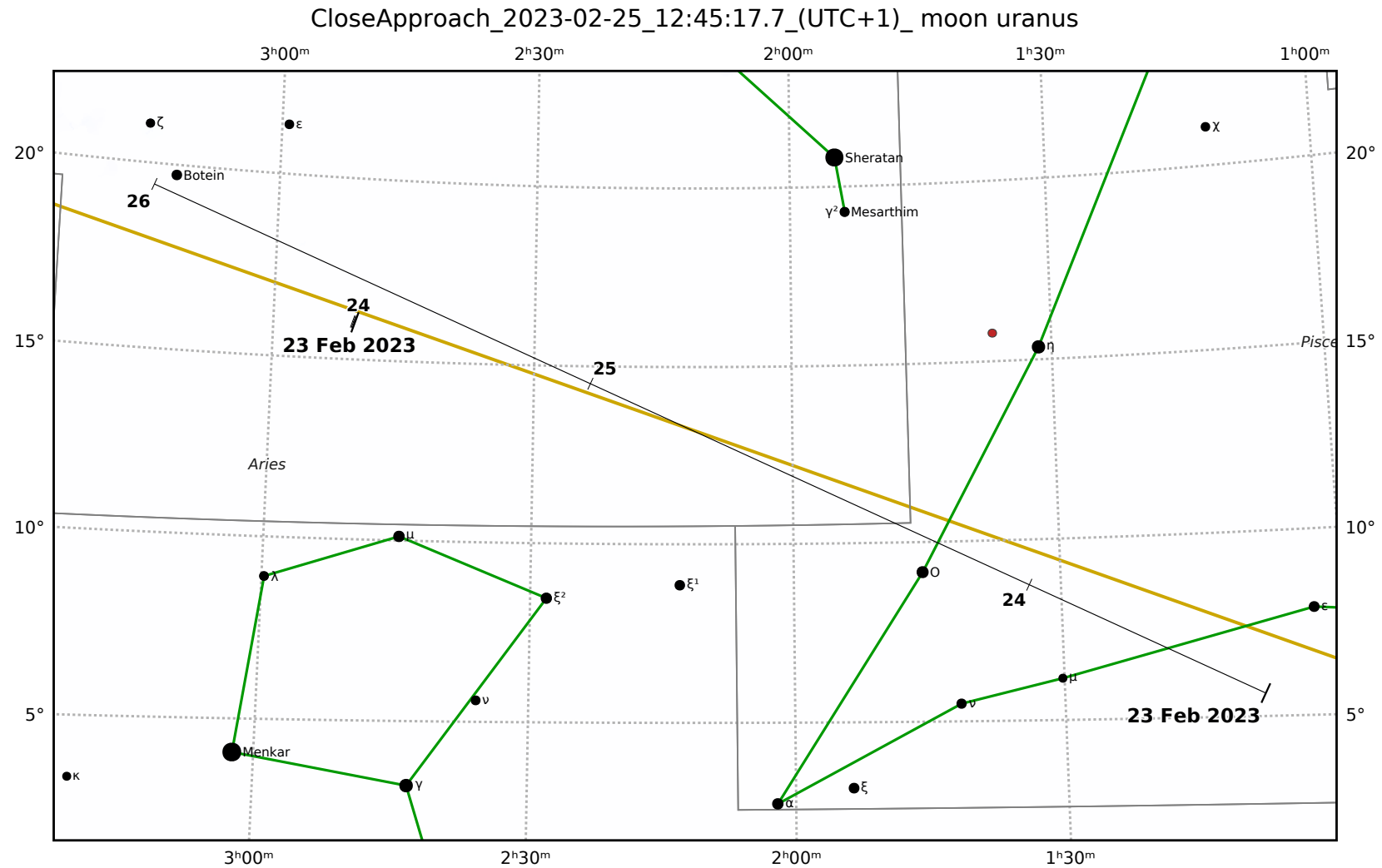


Generated with <https://github.com/dcf21/star-charter>

Magnitude scale: ● 5.0 ● 4.5 ● 4.0 ● 3.5 ● 3.0

— The Equator — Ecliptic Plane — Galactic Plane

● Galaxy ■ Bright nebula ● Open cluster ⊕ Globular cluster

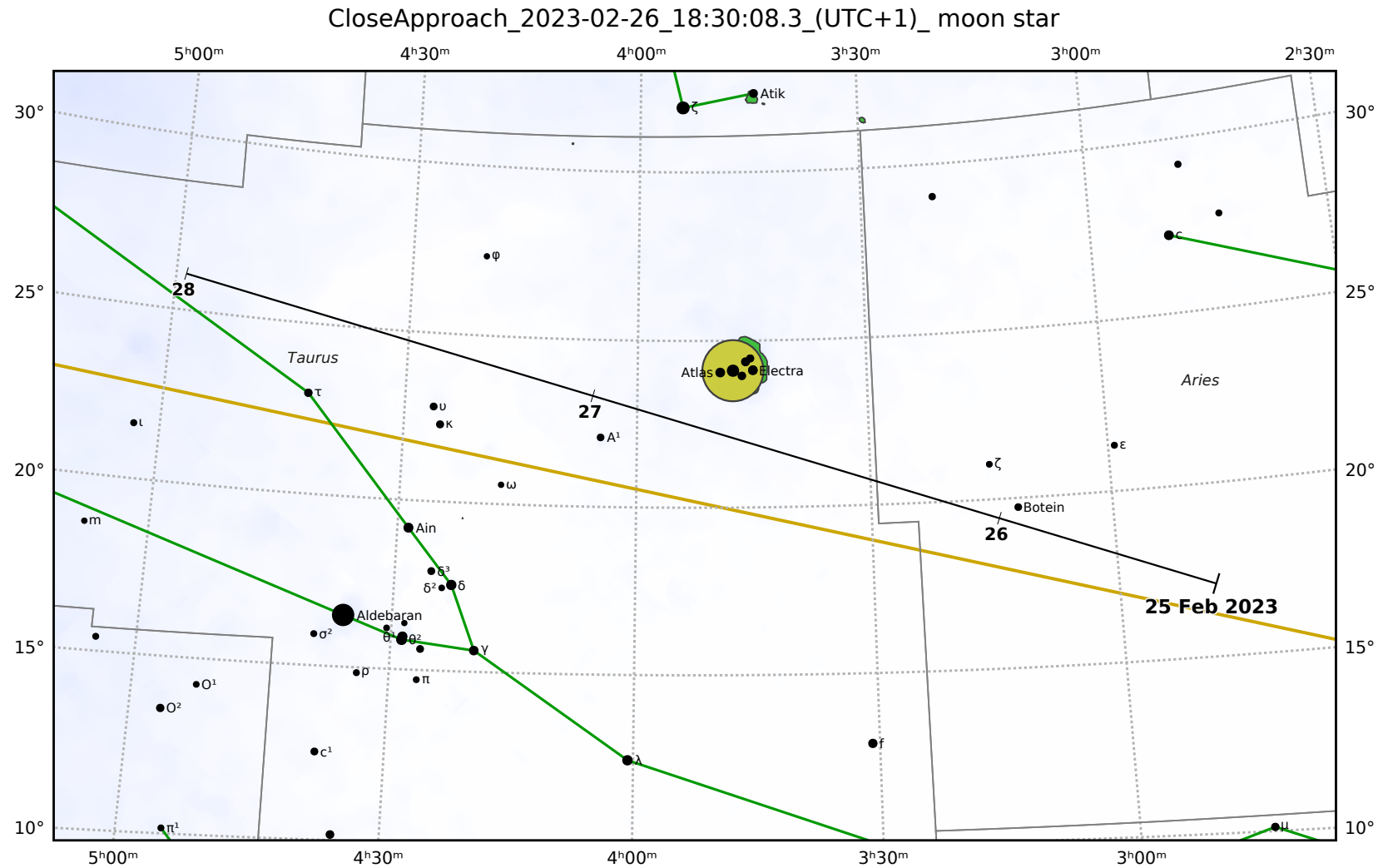


Generated with <https://github.com/dcf21/star-charter>

Magnitude scale: ● 5.0 ● 4.5 ● 4.0 ● 3.5 ● 3.0 ● 2.5

— The Equator — Ecliptic Plane — Galactic Plane

● Galaxy ■ Bright nebula ● Open cluster ⊕ Globular cluster

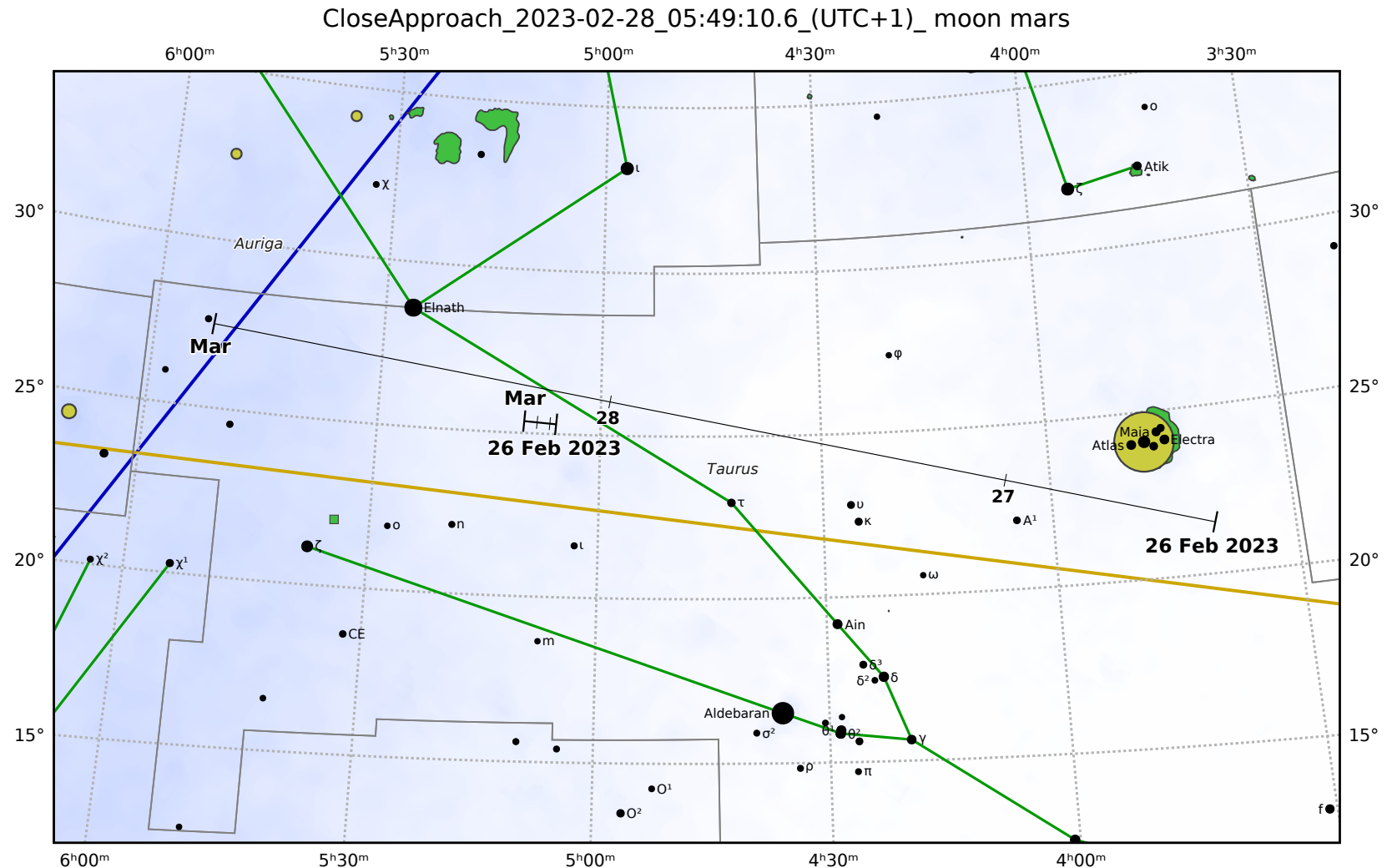


Generated with <https://github.com/dcf21/star-charter>

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

— The Equator — Ecliptic Plane — Galactic Plane

● Galaxy ■ Bright nebula ● Open cluster ● Globular cluster

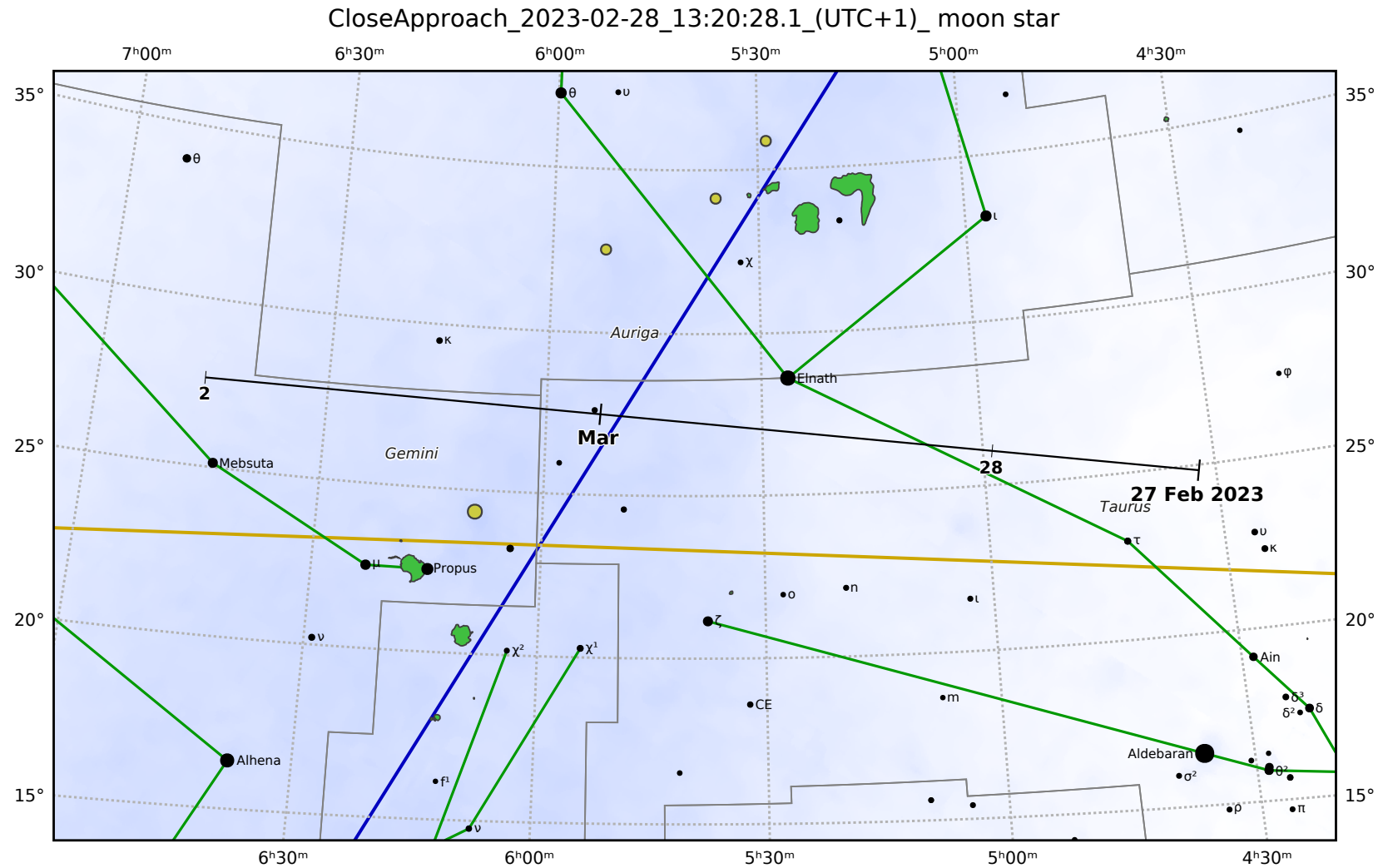


Generated with <https://github.com/dcf21/star-charter>

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

— The Equator — Ecliptic Plane — Galactic Plane

🌌 Galaxy 🟩 Bright nebula 🟡 Open cluster 🟡⊕ Globular cluster

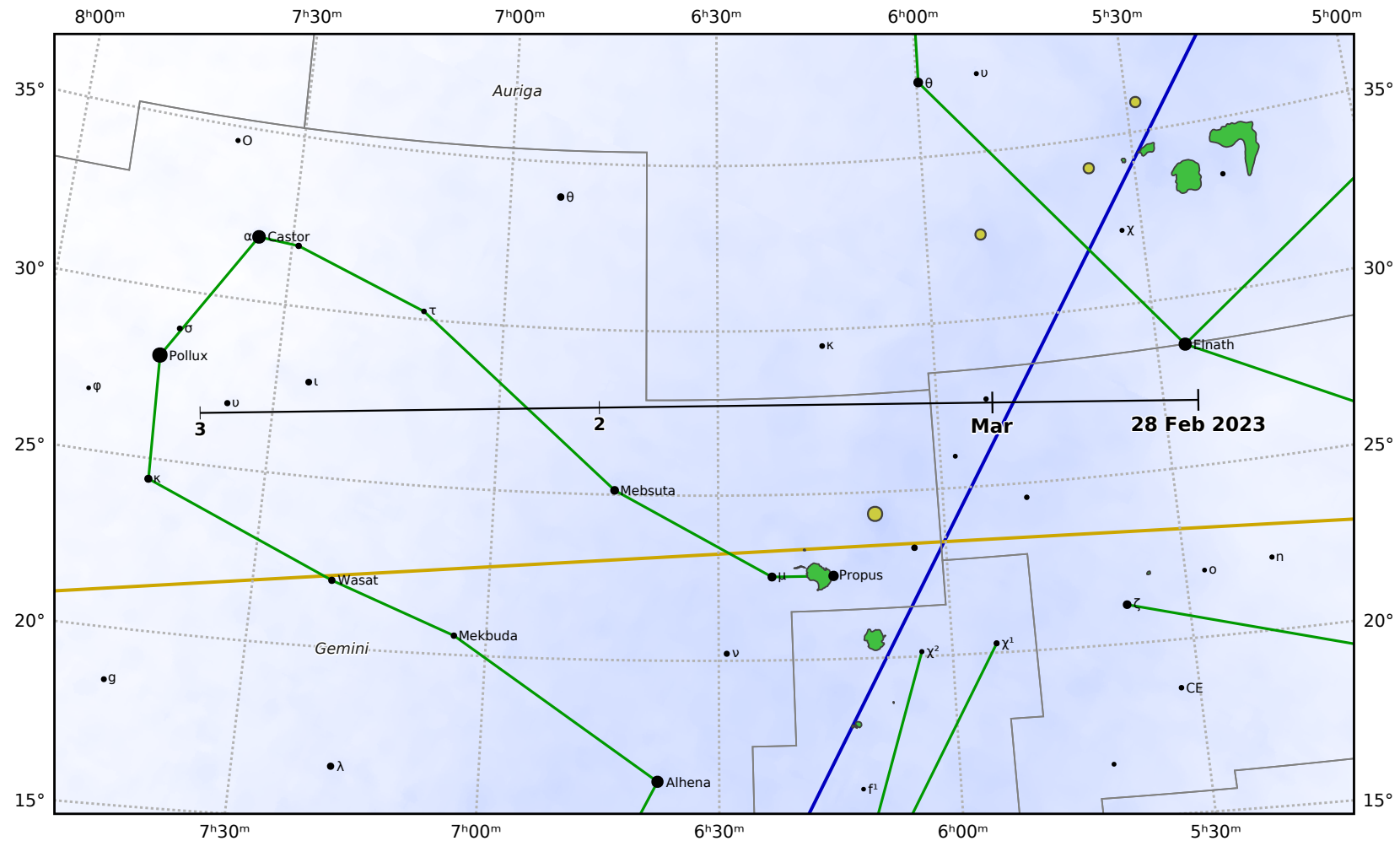


Magnitude scale: • 5.0 • 4.5 • 4.0 • 3.5 • 3.0 • 2.5 • 2.0 • 1.5 • 1.0 • 0.5

— The Equator — Ecliptic Plane — Galactic Plane

Galaxy Bright nebula Open cluster Globular cluster

CloseApproach_2023-03-02_01:36:15.9_(UTC+1)_ moon star

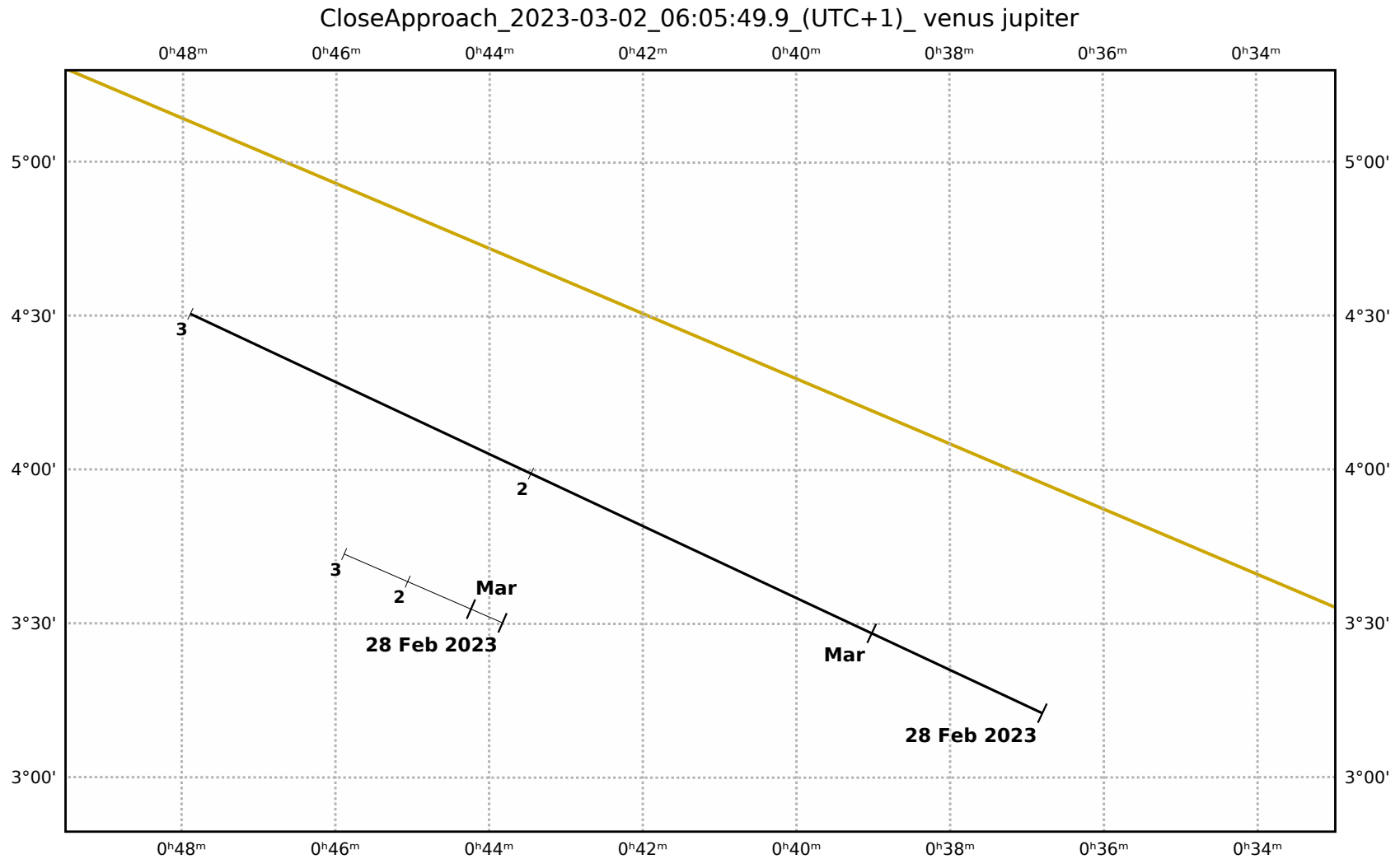


Generated with <https://github.com/dcf21/star-charter>

Magnitude scale: • 5.0 • 4.5 • 4.0 • 3.5 • 3.0 • 2.5 • 2.0 • 1.5 • 1.0

— The Equator — Ecliptic Plane — Galactic Plane

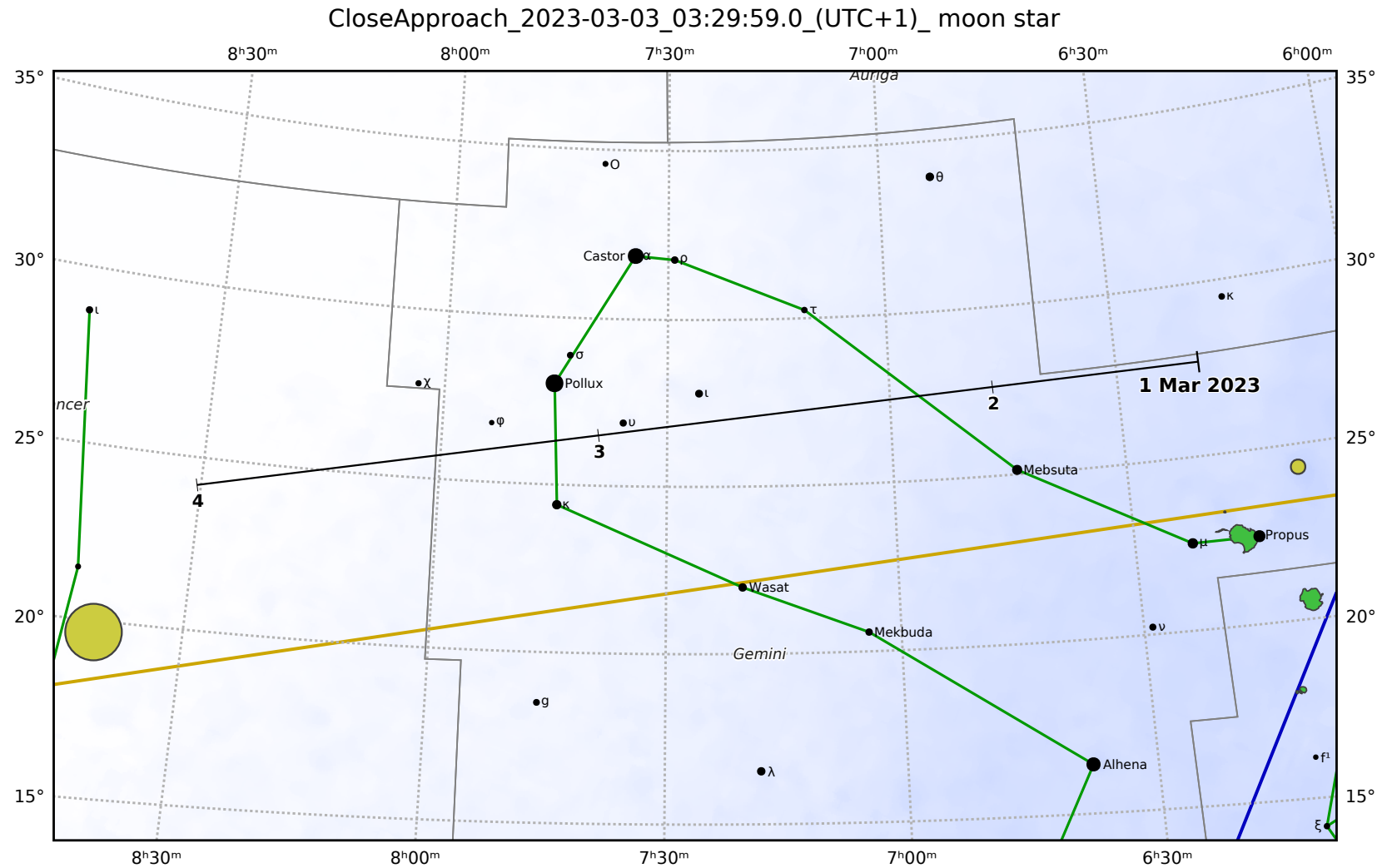
● Galaxy ■ Bright nebula ● Open cluster ⊕ Globular cluster



Generated with <https://github.com/dcf21/star-charter>

Magnitude scale:

- The Equator
- Ecliptic Plane
- Galactic Plane
- Galaxy
- Bright nebula
- Open cluster
- Globular cluster

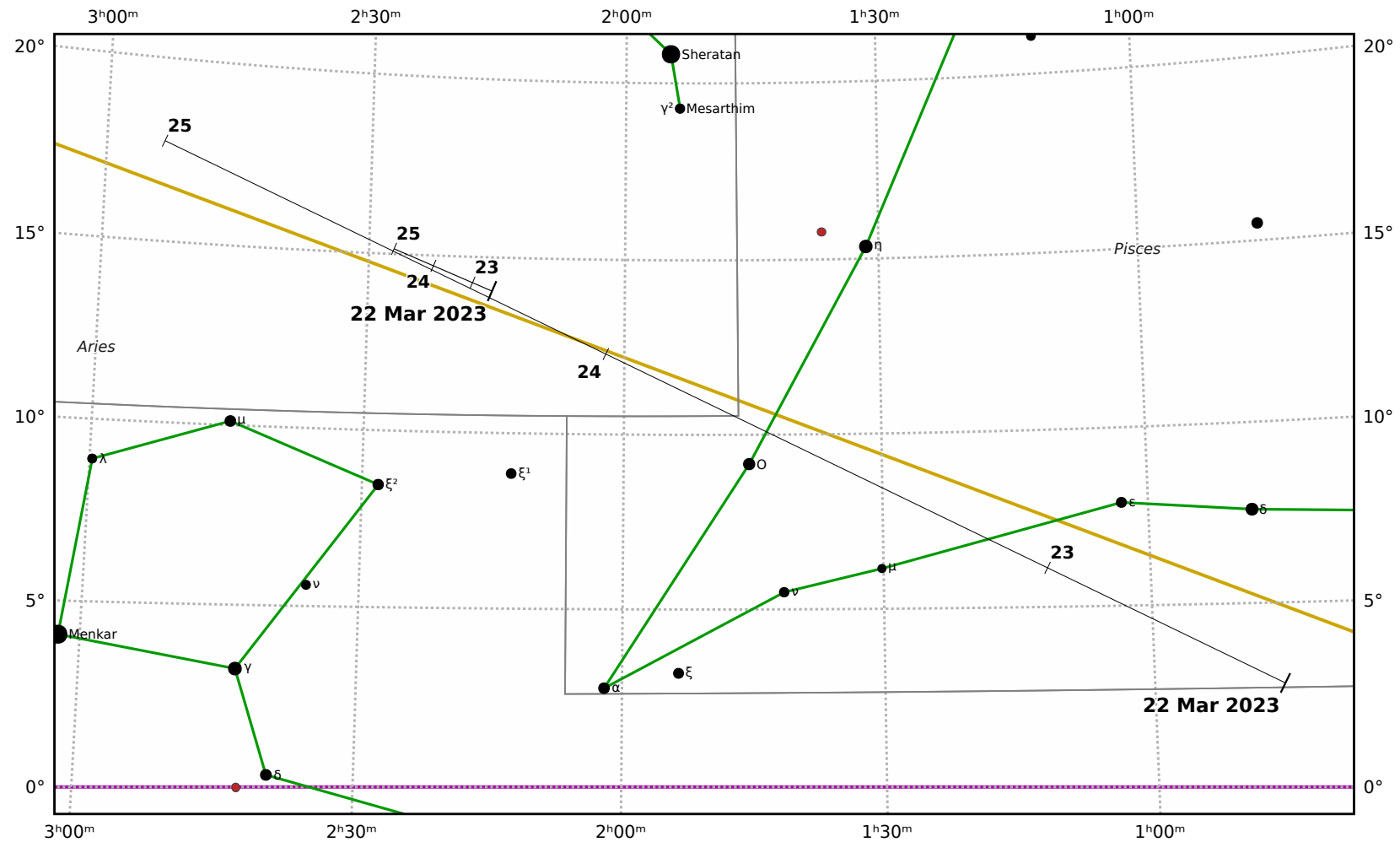


Magnitude scale: •5.0 •4.5 •4.0 •3.5 •3.0 •2.5 •2.0 ●1.5 ●1.0

— The Equator — Ecliptic Plane — Galactic Plane

● Galaxy ■ Bright nebula ● Open cluster ● Globular cluster

CloseApproach_2023-03-24_11:35:10.0_(UTC+1)_venus moon

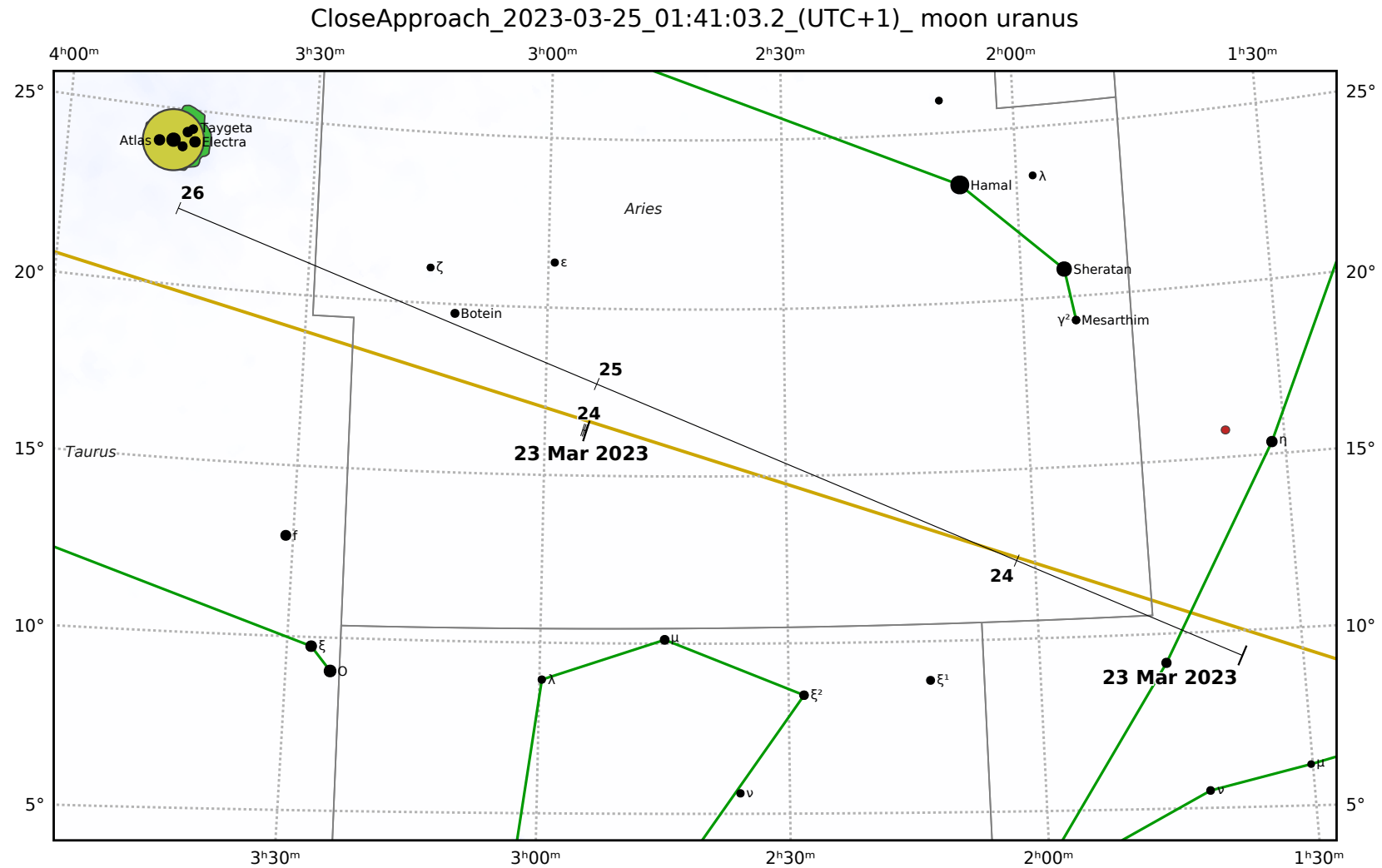


Generated with <https://github.com/dcf21/star-charter>

Magnitude scale: ● 5.0 ● 4.5 ● 4.0 ● 3.5 ● 3.0 ● 2.5

— The Equator — Ecliptic Plane — Galactic Plane

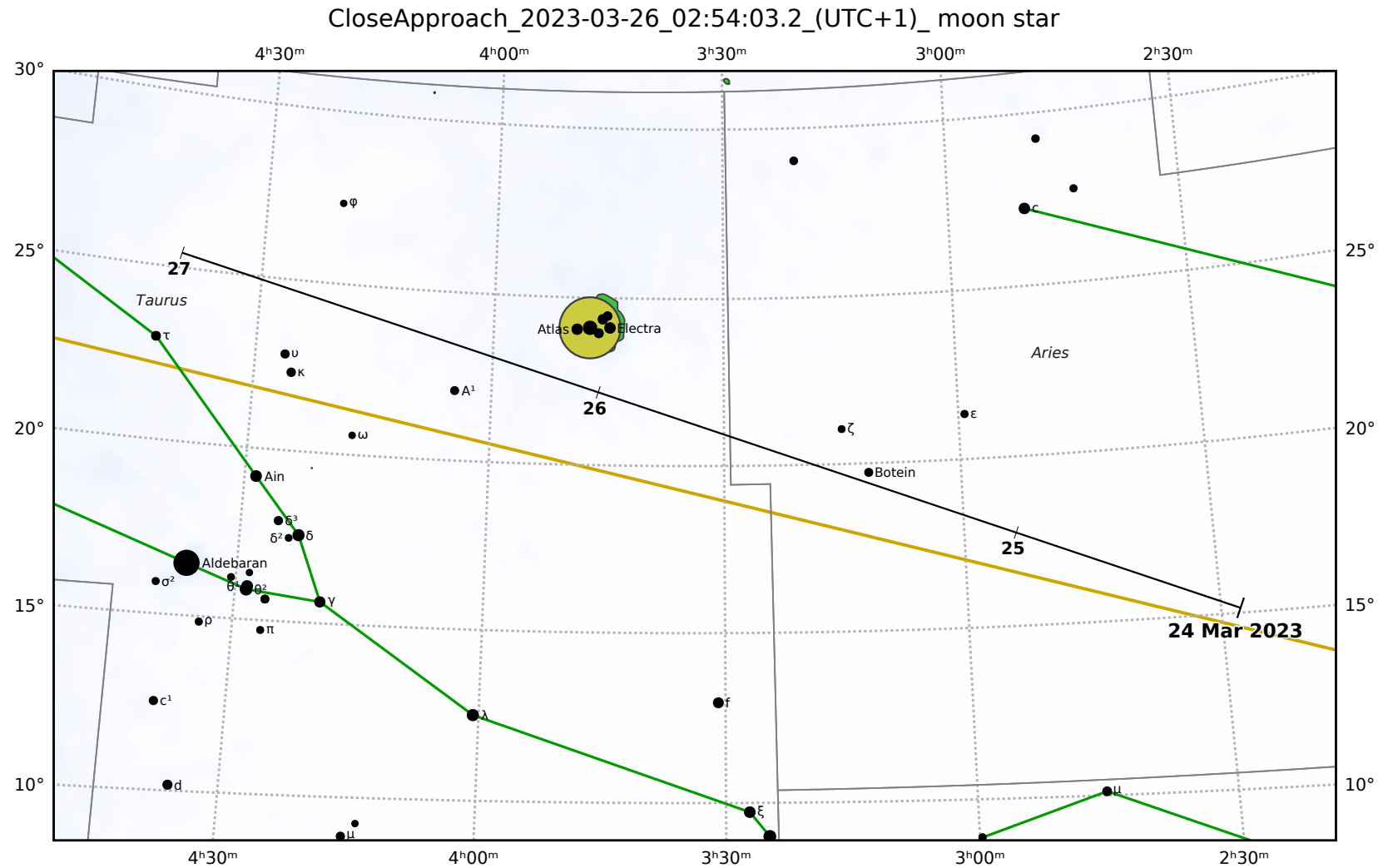
● Galaxy ■ Bright nebula ● Open cluster ⊕ Globular cluster



Magnitude scale: ● 5.0 ● 4.5 ● 4.0 ● 3.5 ● 3.0 ● 2.5 ● 2.0

— The Equator — Ecliptic Plane — Galactic Plane

● Galaxy ■ Bright nebula ● Open cluster ● Globular cluster

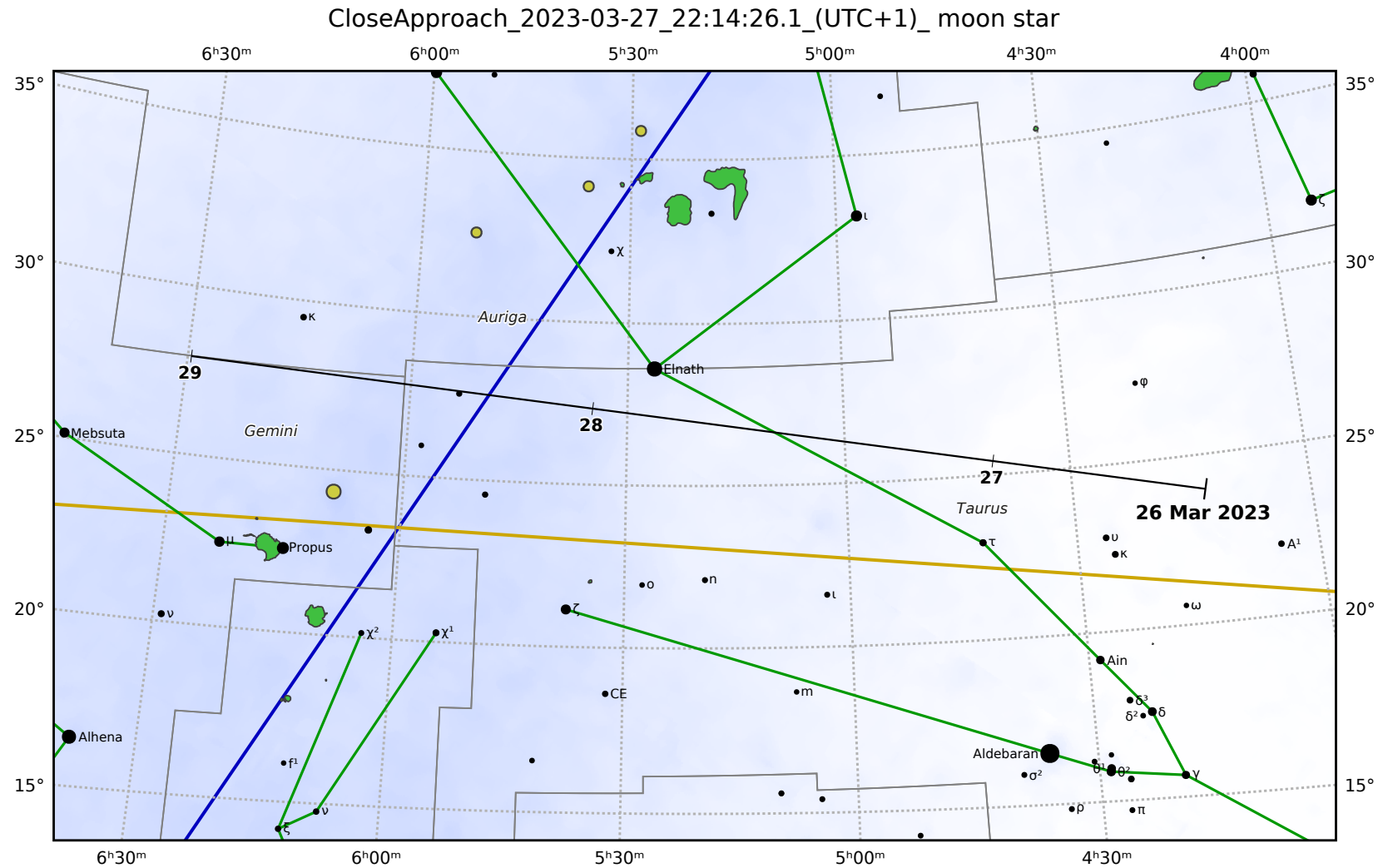


Generated with <https://github.com/dcf21/star-charter>

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

— The Equator — Ecliptic Plane — Galactic Plane

● Galaxy ■ Bright nebula ● Open cluster ● Globular cluster

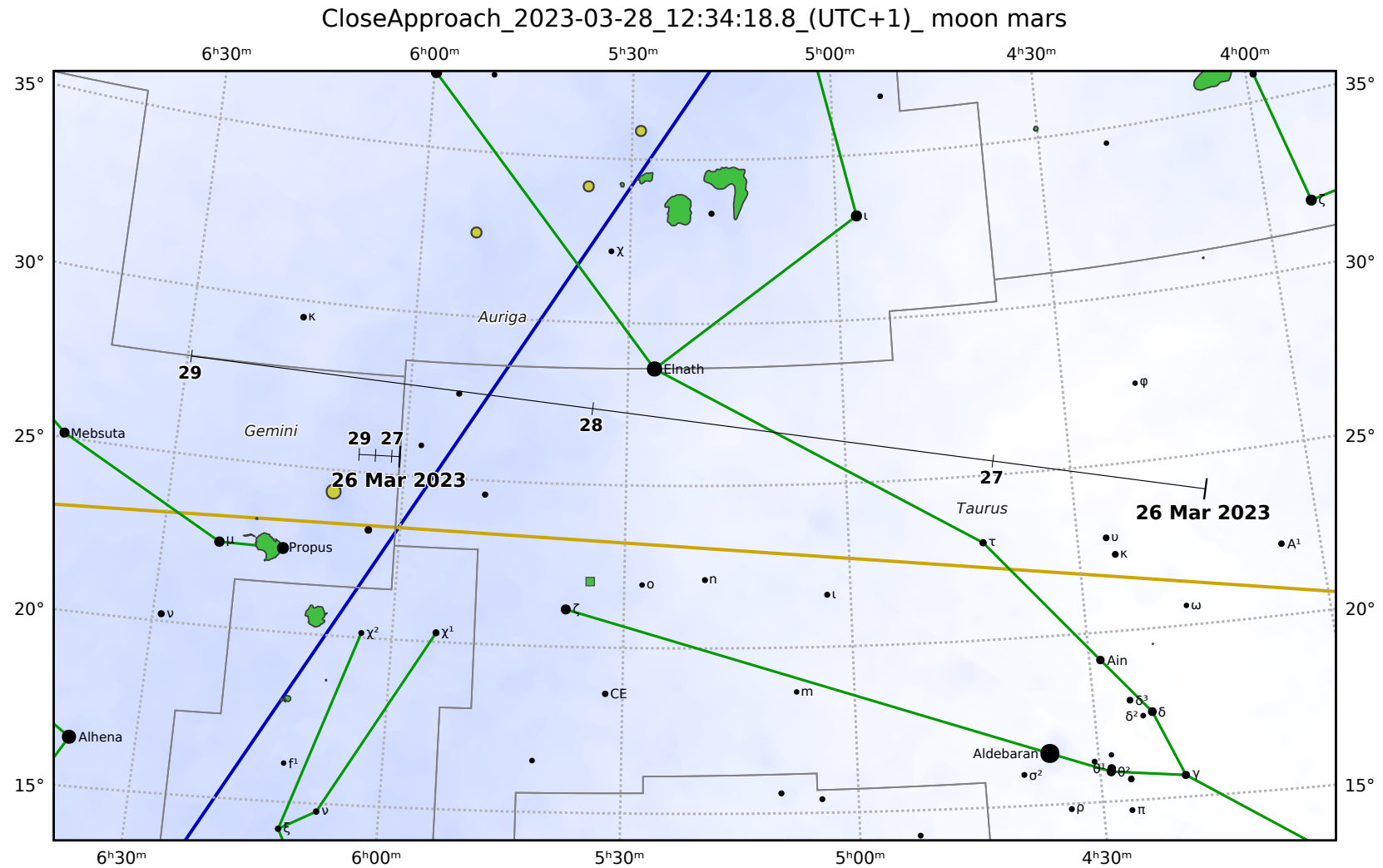


Generated with <https://github.com/dcf21/star-charter>

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

— The Equator — Ecliptic Plane — Galactic Plane

Galaxy Bright nebula Open cluster Globular cluster

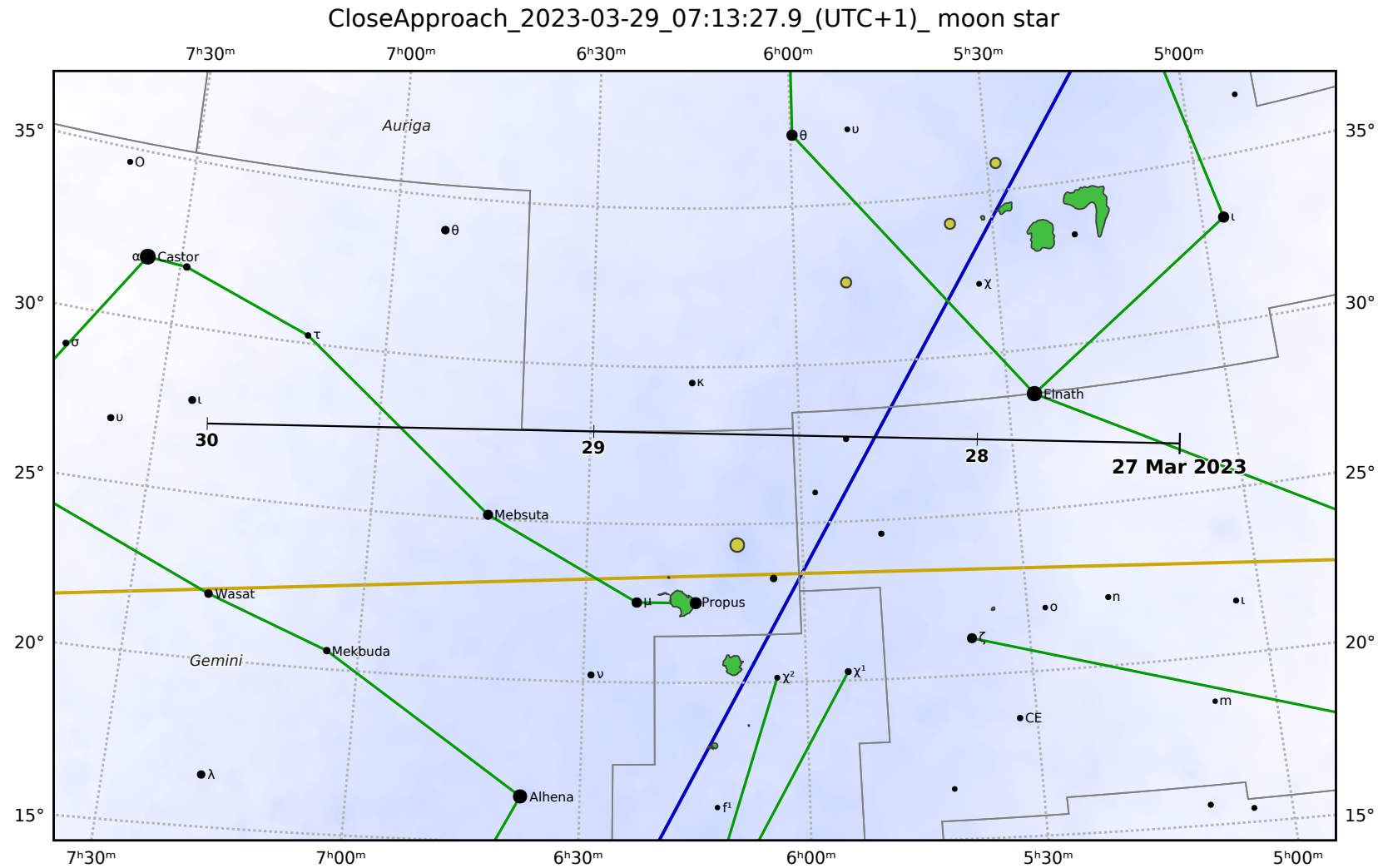


Generated with <https://github.com/dcf21/star-charter>

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

— The Equator — Ecliptic Plane — Galactic Plane

Galaxy Bright nebula Open cluster Globular cluster

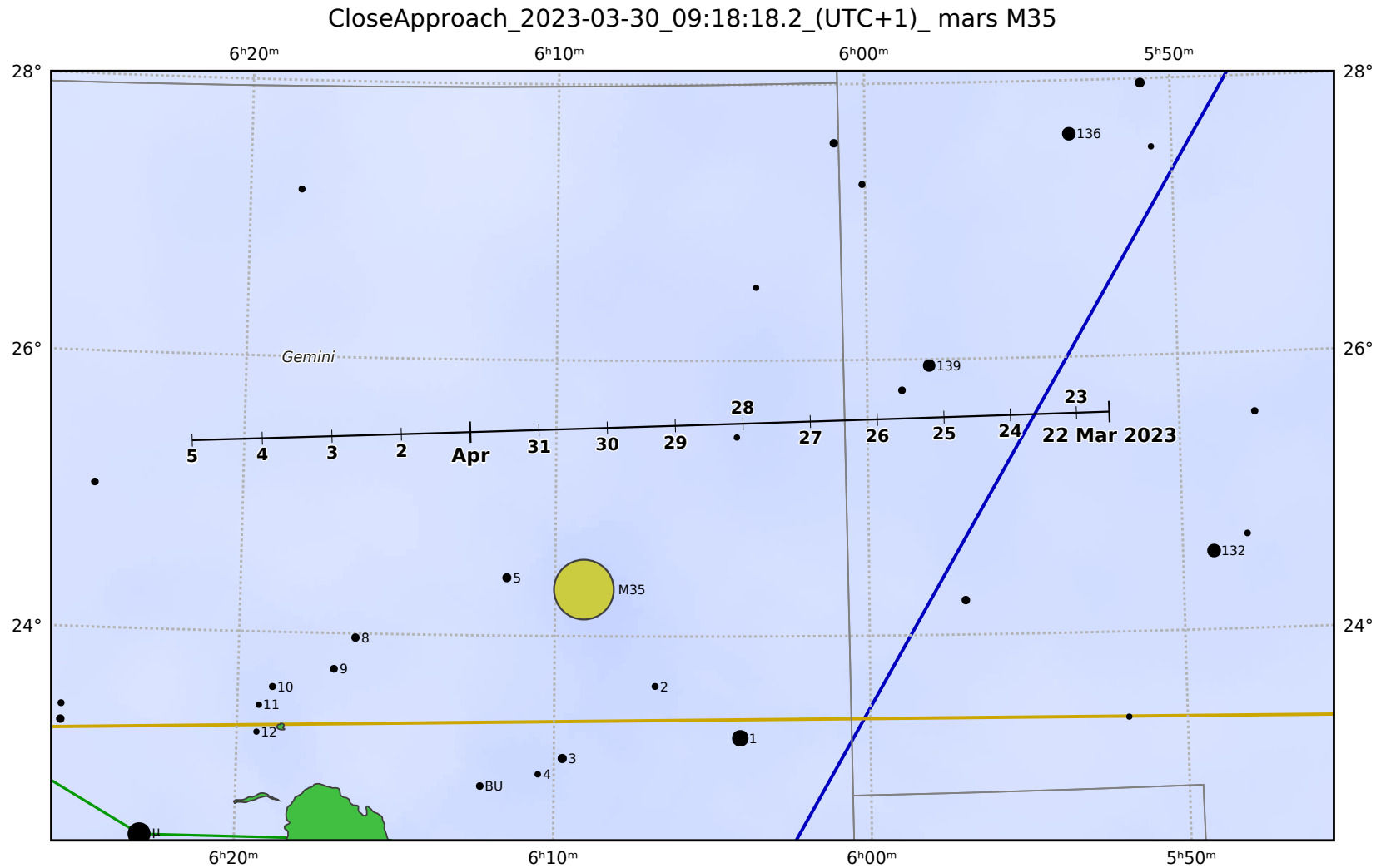


Generated with <https://github.com/dcf21/star-charter>

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

— The Equator — Ecliptic Plane — Galactic Plane

🌀 Galaxy ■ Bright nebula ● Open cluster ⊕ Globular cluster

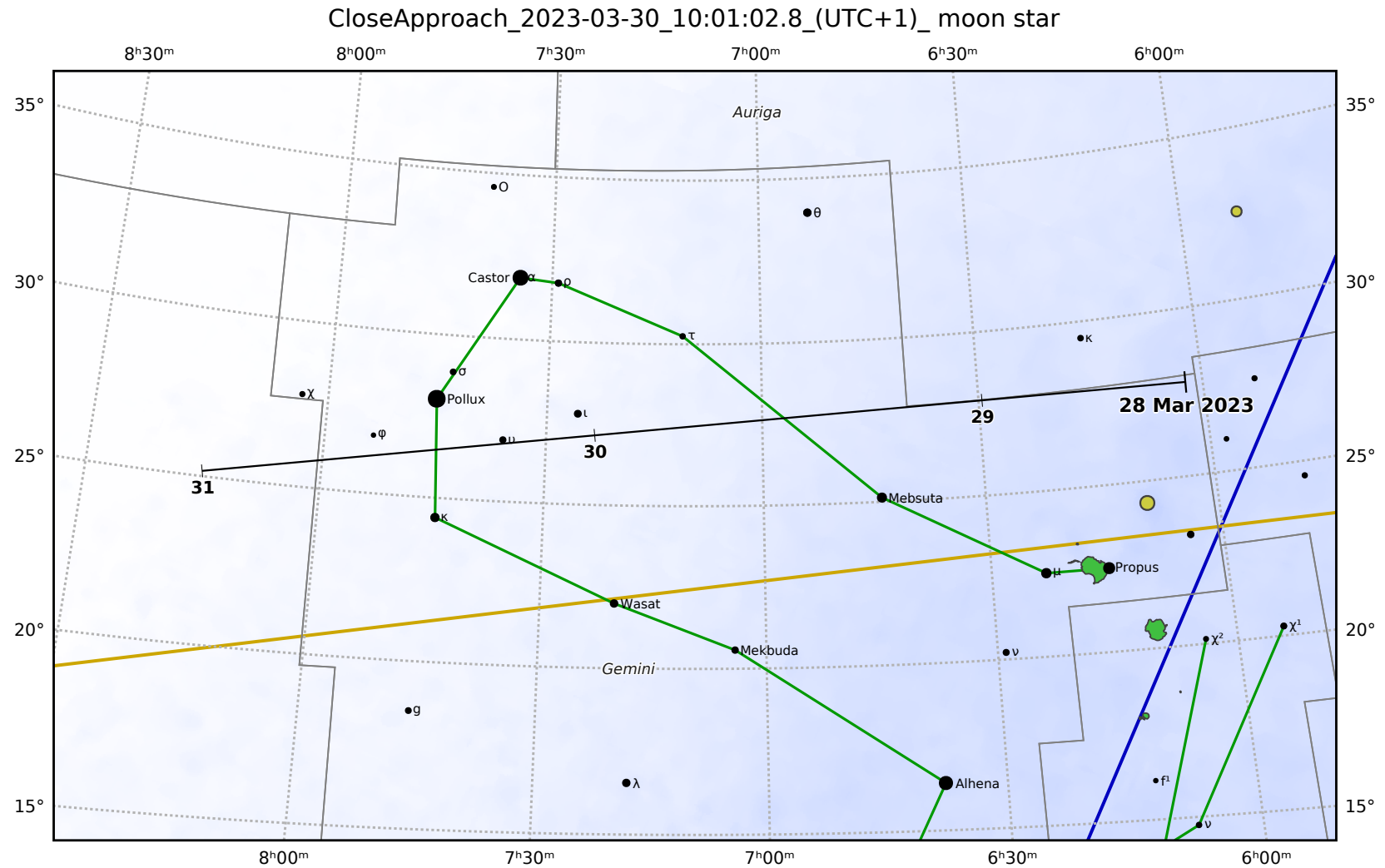


Generated with <https://github.com/dcf21/star-charter>

Magnitude scale: ● 7.0 ● 6.5 ● 6.0 ● 5.5 ● 5.0 ● 4.5 ● 4.0 ● 3.5 ● 3.0 ● 2.5

— The Equator — Ecliptic Plane — Galactic Plane

● Galaxy ■ Bright nebula ● Open cluster ● Globular cluster

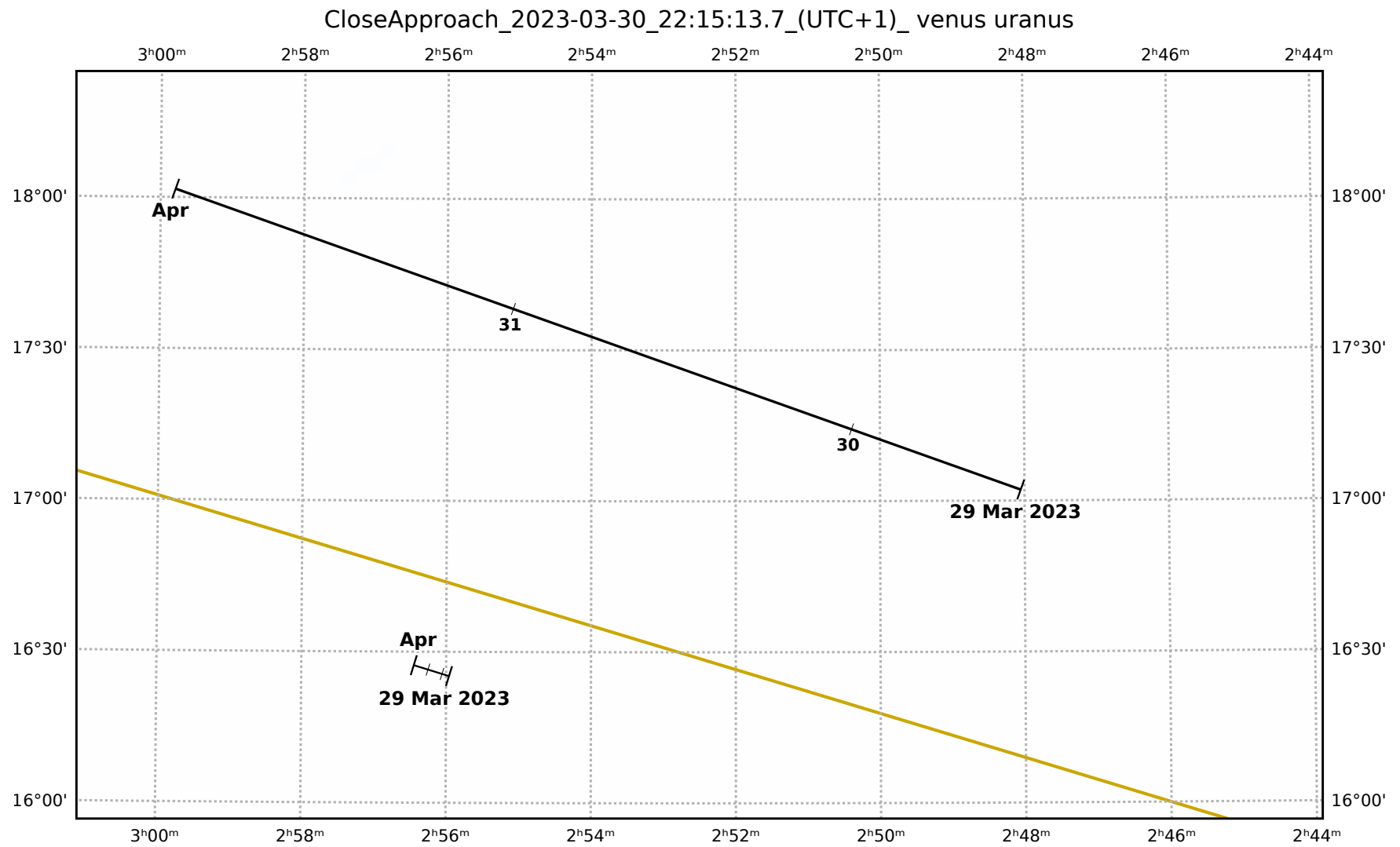


Generated with <https://github.com/dcf21/star-charter>

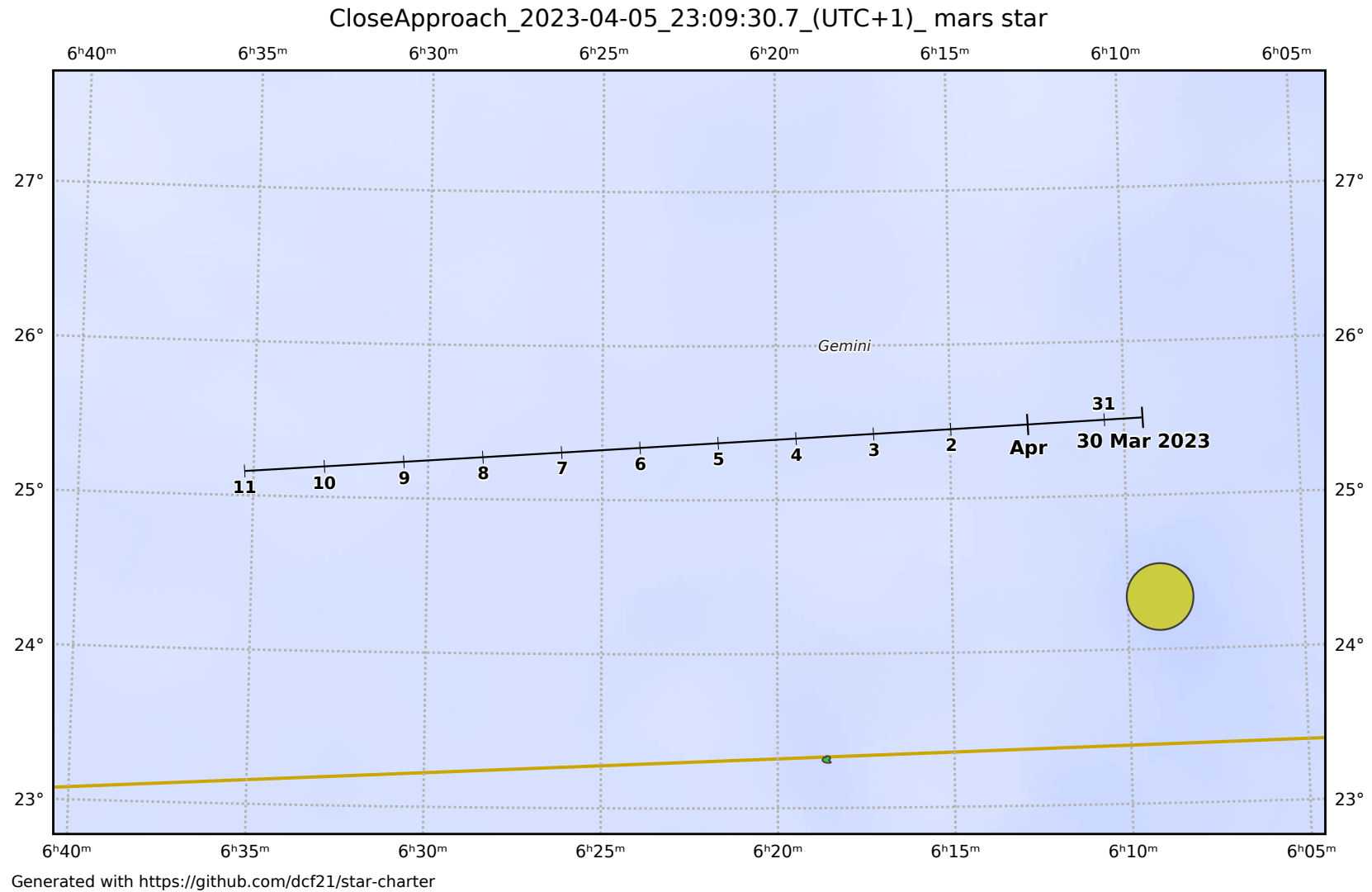
Magnitude scale: •5.0 •4.5 •4.0 •3.5 •3.0 •2.5 ●2.0 ●1.5 ●1.0

— The Equator — Ecliptic Plane — Galactic Plane

🌌 Galaxy 🟩 Bright nebula 🟡 Open cluster 🟡⊕ Globular cluster

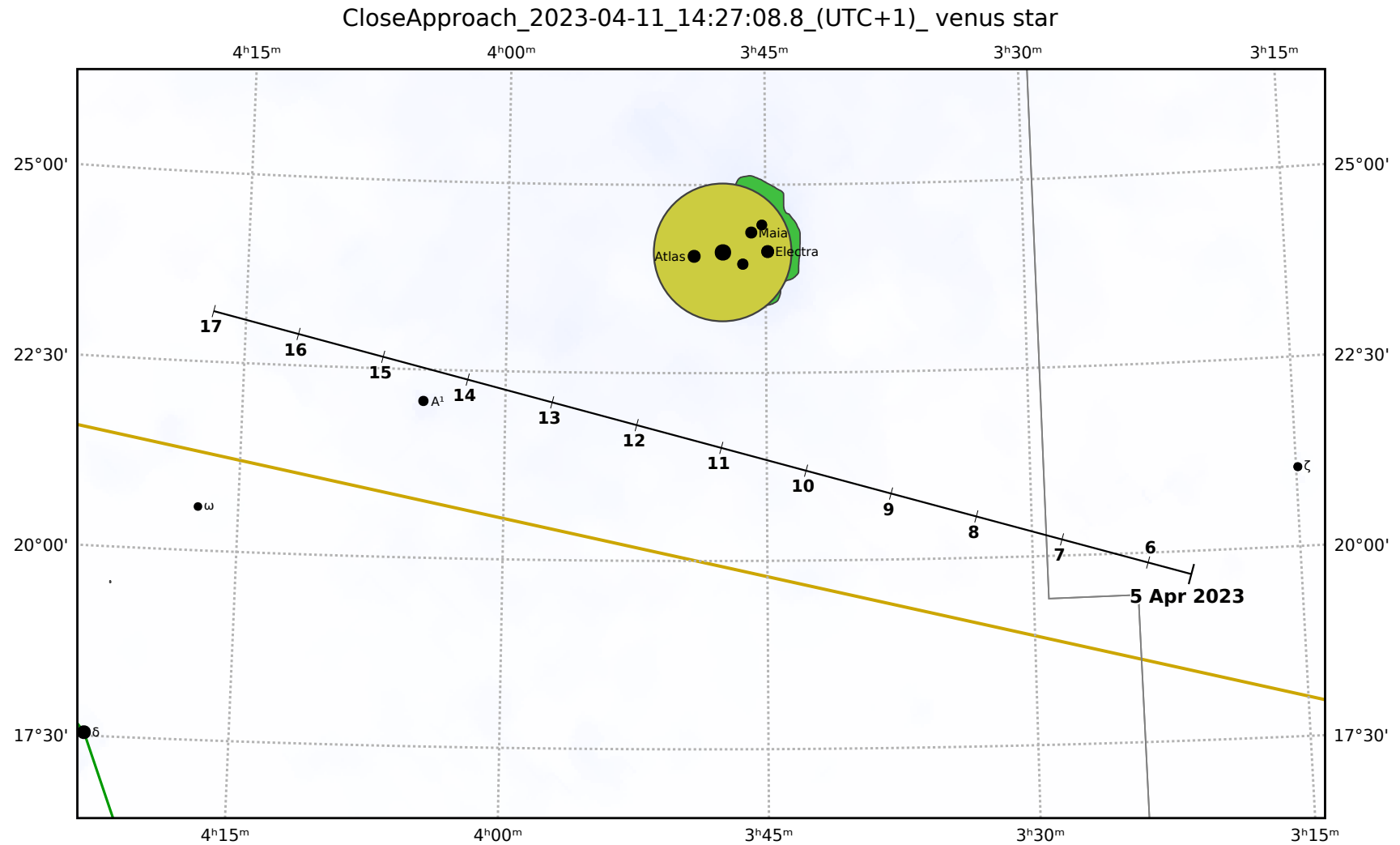


Generated with <https://github.com/dcf21/star-charter>

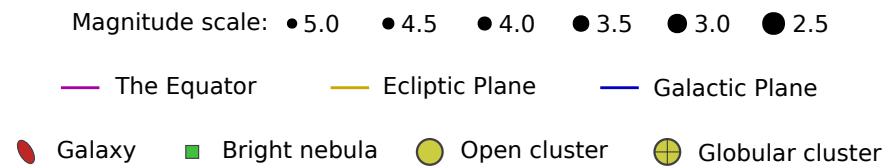


Magnitude scale:

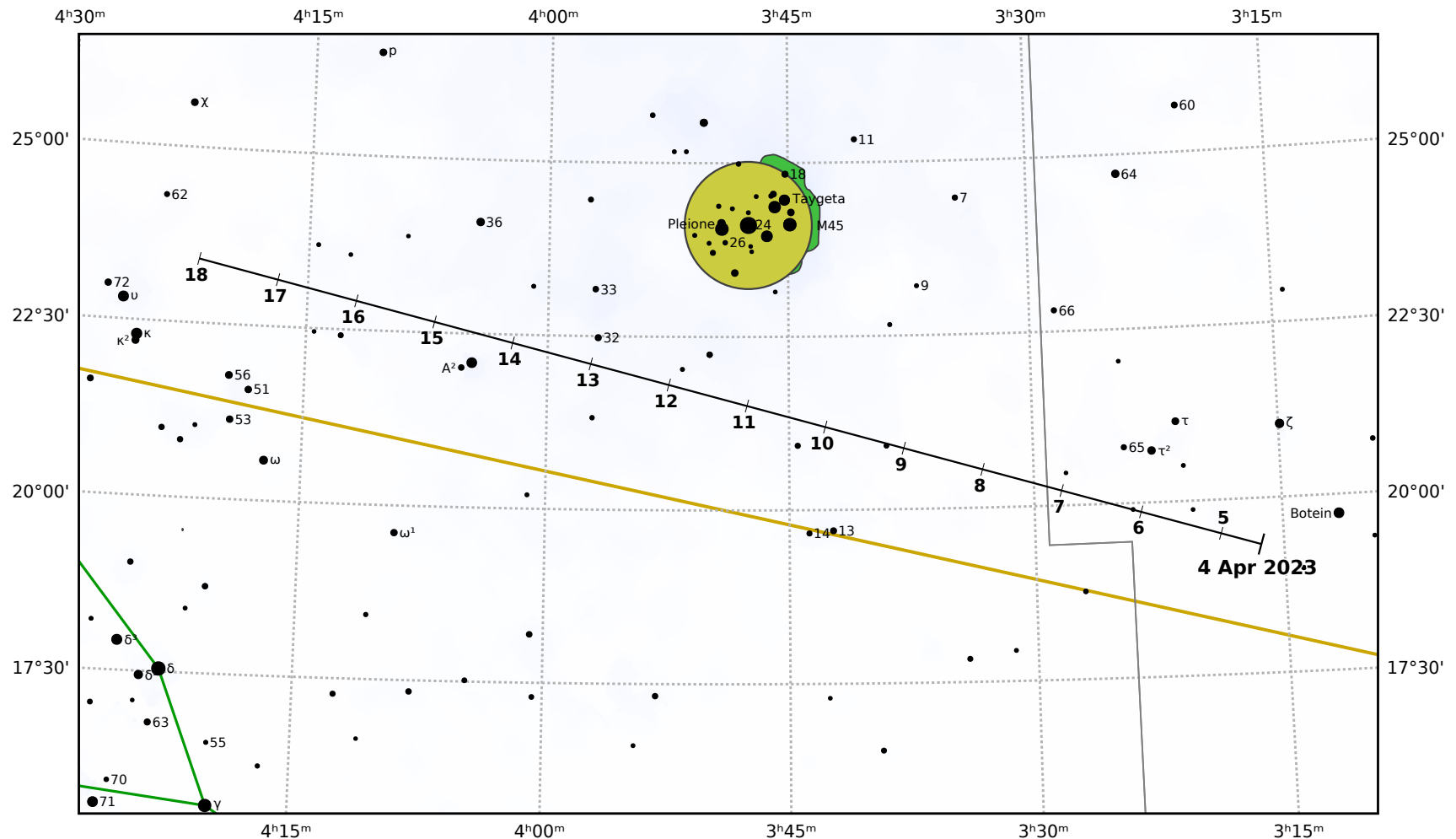
- The Equator
- Ecliptic Plane
- Galactic Plane
- Galaxy
- Bright nebula
- Open cluster
- ⊕ Globular cluster



Generated with <https://github.com/dcf21/star-charter>



CloseApproach_2023-04-11_14:31:12.5_(UTC+1)_venus M45

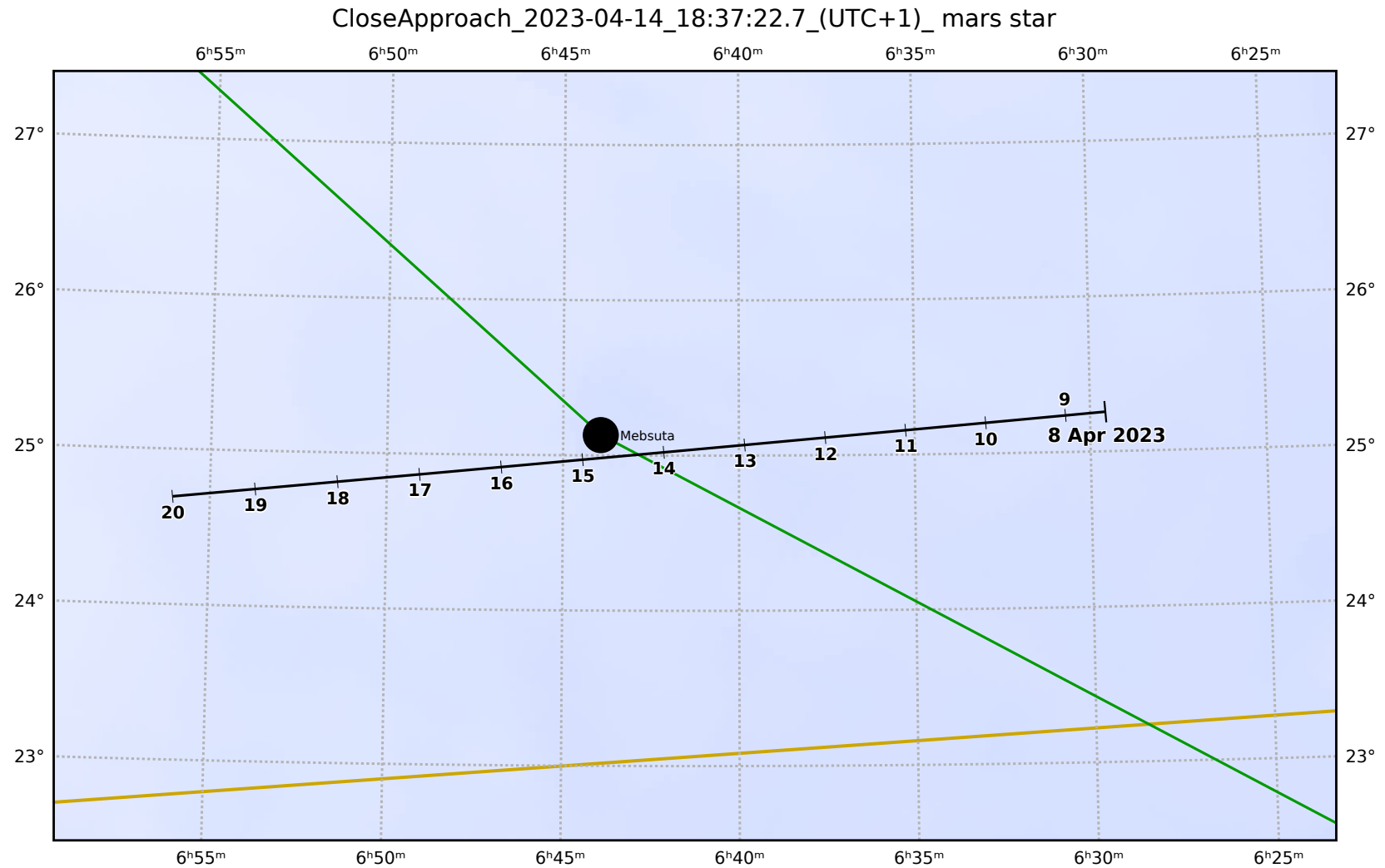


Generated with <https://github.com/dcf21/star-charter>

Magnitude scale: • 7.0 • 6.5 • 6.0 • 5.5 • 5.0 • 4.5 • 4.0 • 3.5 • 3.0 • 2.5

— The Equator — Ecliptic Plane — Galactic Plane

Galaxy Bright nebula Open cluster Globular cluster

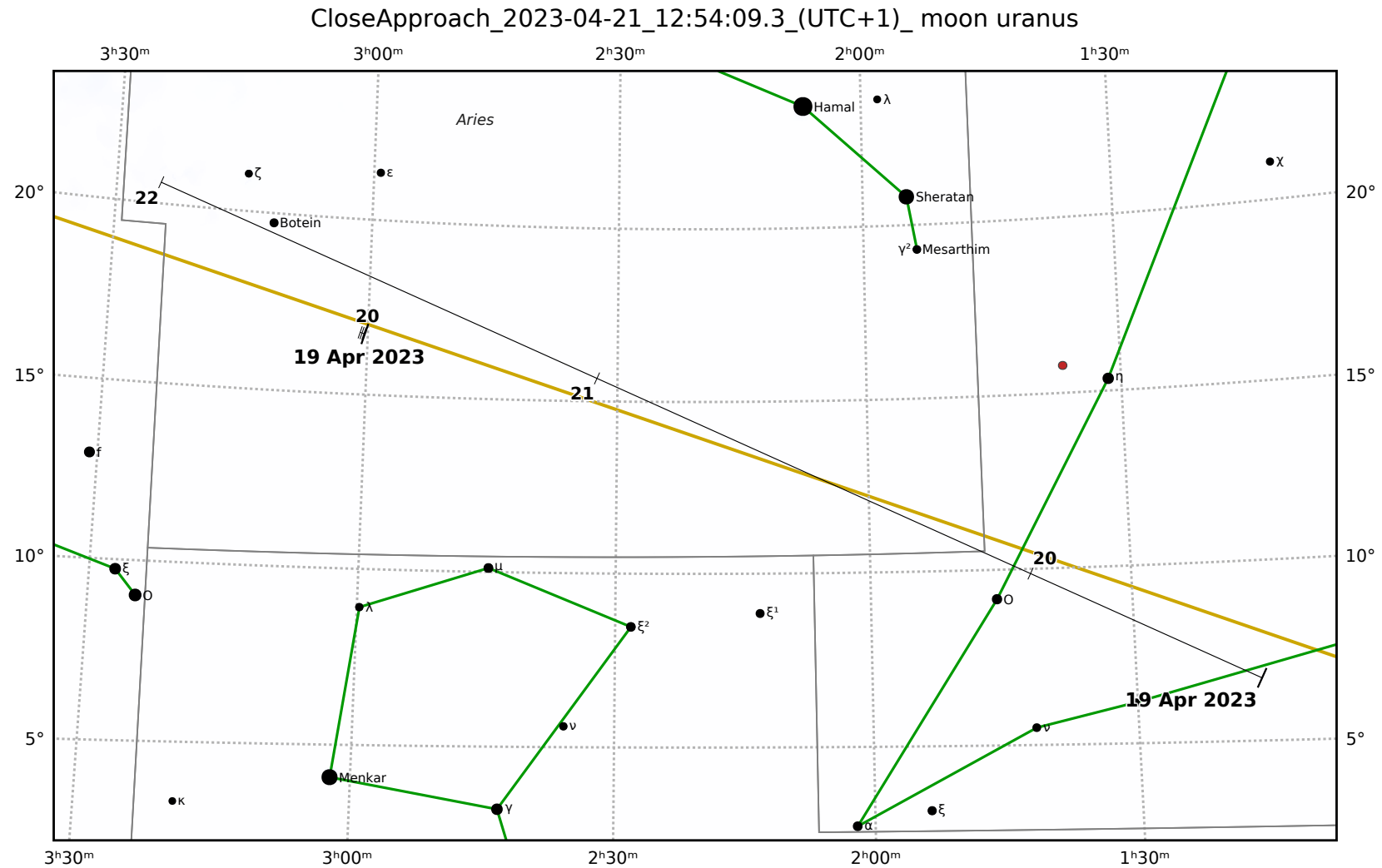


Generated with <https://github.com/dcf21/star-charter>

Magnitude scale: ● 5.0 ● 4.5 ● 4.0 ● 3.5 ● 3.0 ● 2.5

— The Equator — Ecliptic Plane — Galactic Plane

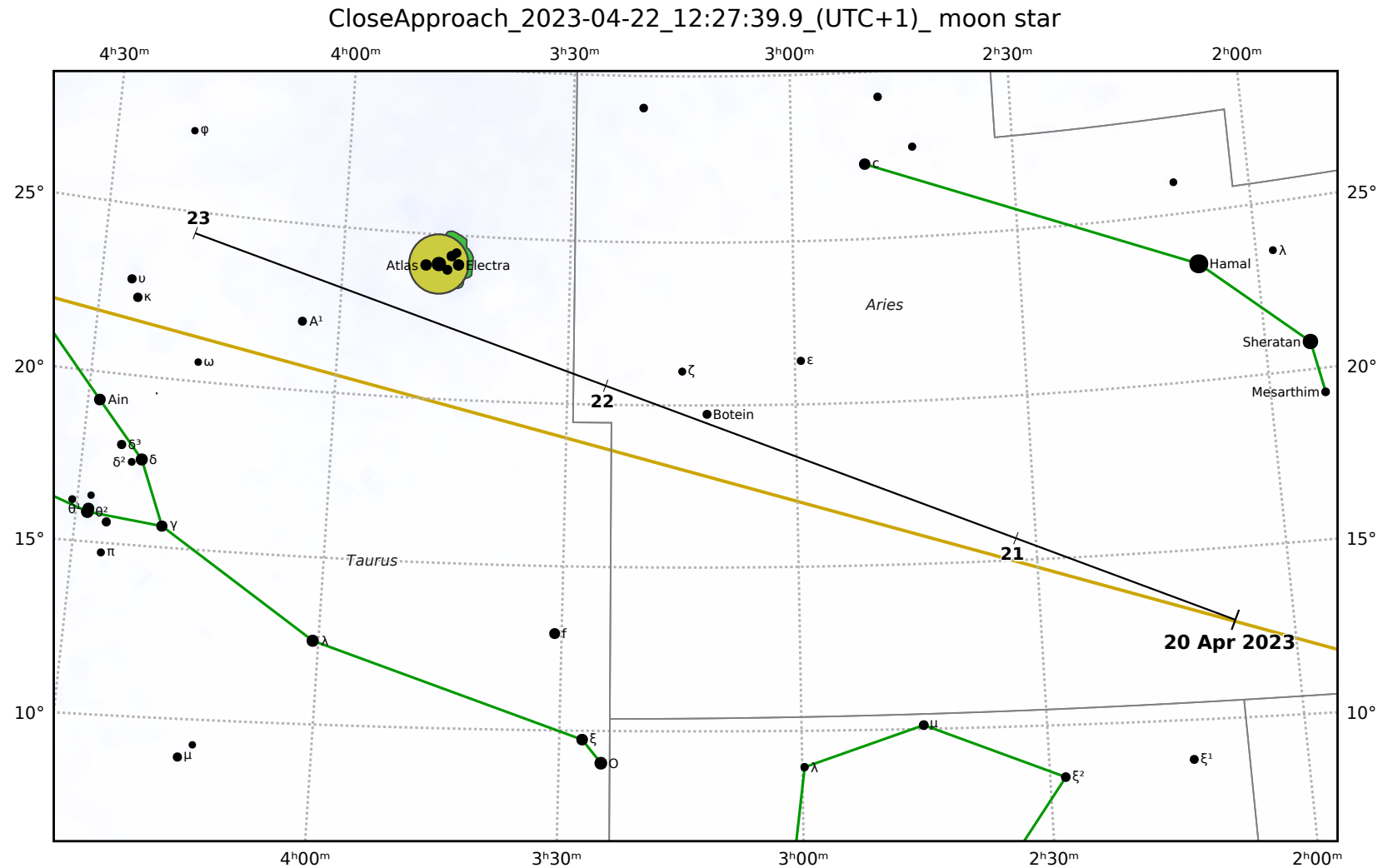
● Galaxy ■ Bright nebula ● Open cluster ⊕ Globular cluster



Magnitude scale: ● 5.0 ● 4.5 ● 4.0 ● 3.5 ● 3.0 ● 2.5 ● 2.0

— The Equator — Ecliptic Plane — Galactic Plane

● Galaxy ■ Bright nebula ● Open cluster ⊕ Globular cluster

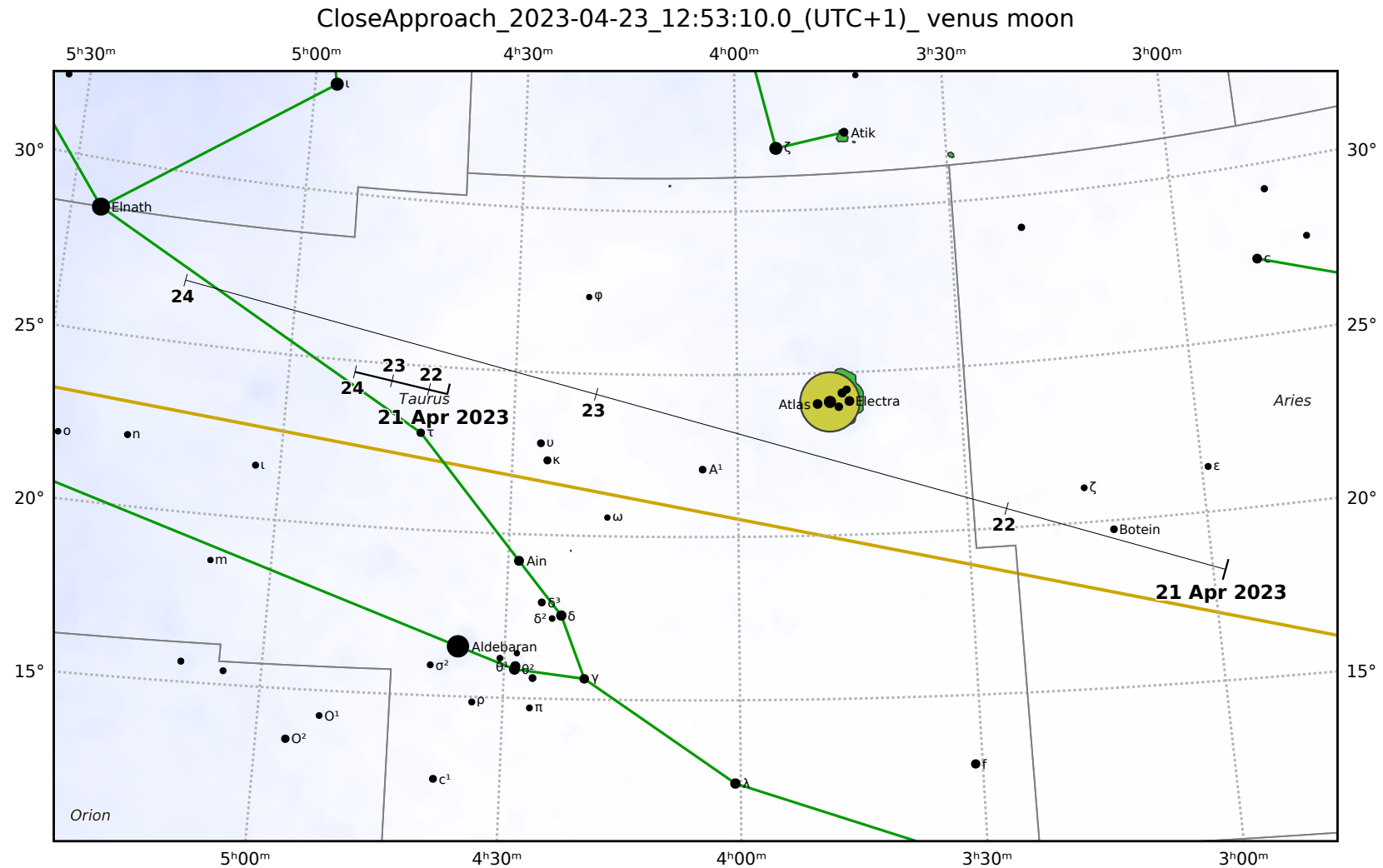


Generated with <https://github.com/dcf21/star-charter>

Magnitude scale: ● 5.0 ● 4.5 ● 4.0 ● 3.5 ● 3.0 ● 2.5 ● 2.0

— The Equator — Ecliptic Plane — Galactic Plane

● Galaxy ■ Bright nebula ● Open cluster ● Globular cluster

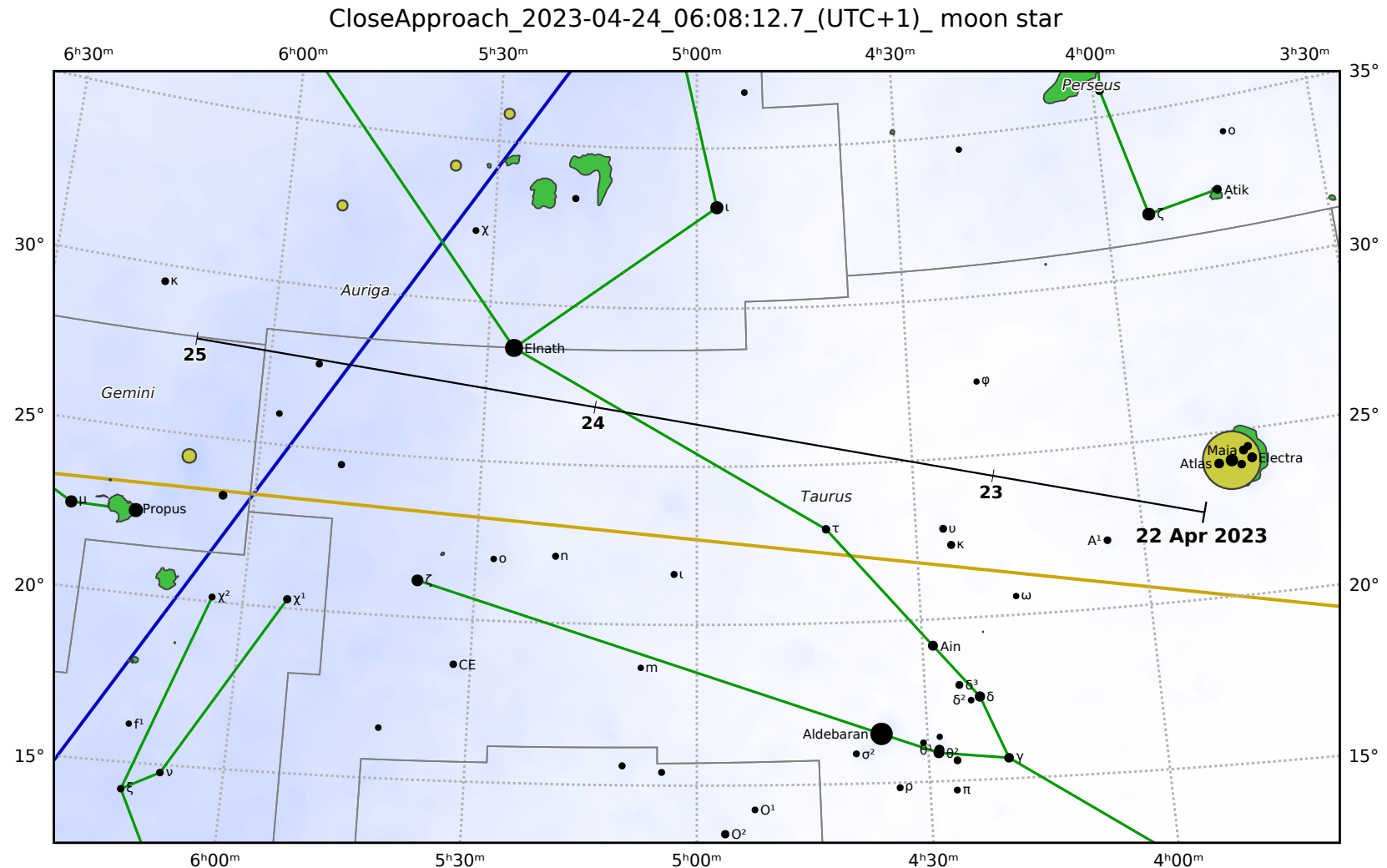


Generated with <https://github.com/dcf21/star-charter>

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

— The Equator — Ecliptic Plane — Galactic Plane

Galaxy Bright nebula Open cluster Globular cluster

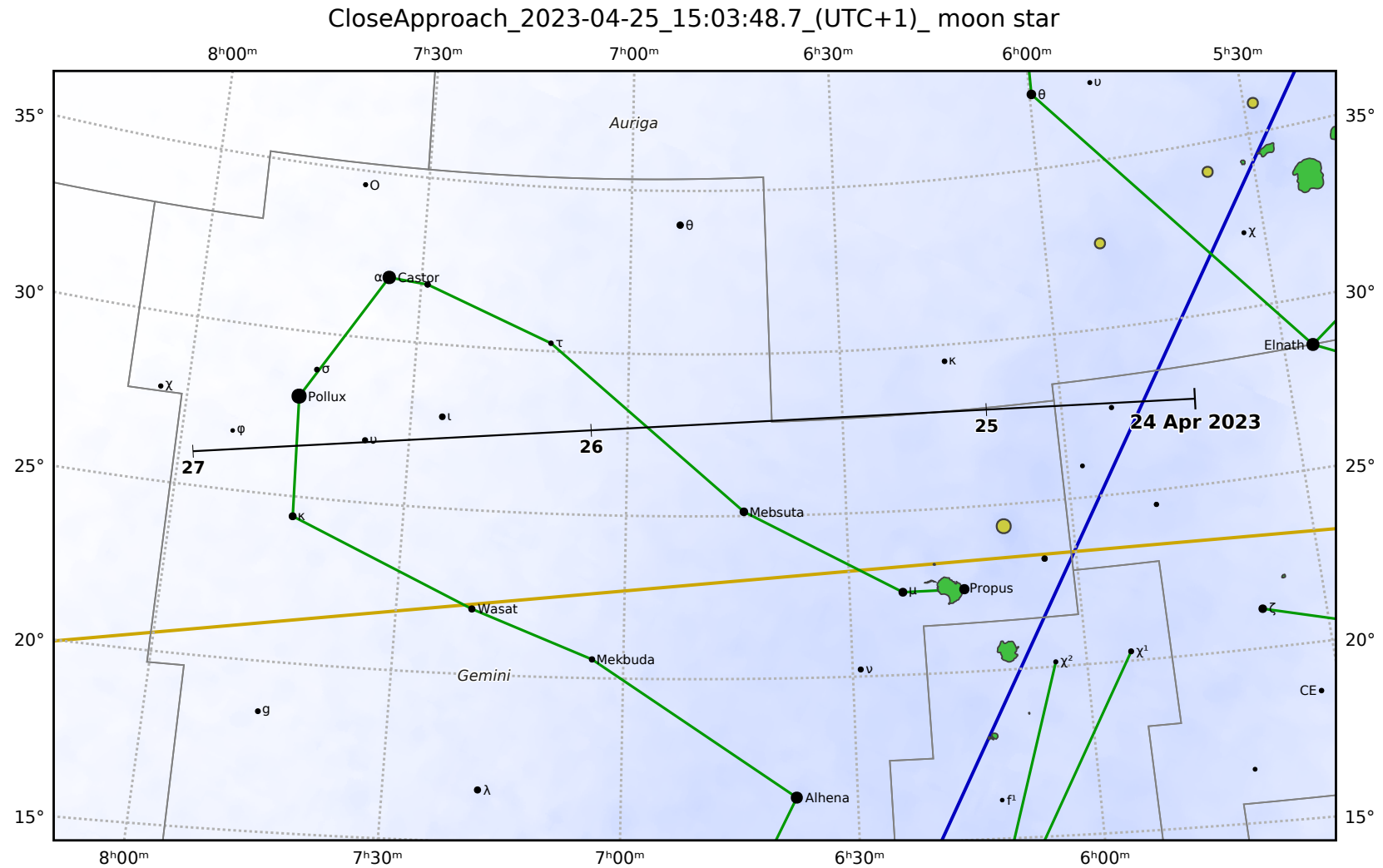


Generated with <https://github.com/dcf21/star-charter>

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

— The Equator — Ecliptic Plane — Galactic Plane

Galaxy Bright nebula Open cluster Globular cluster



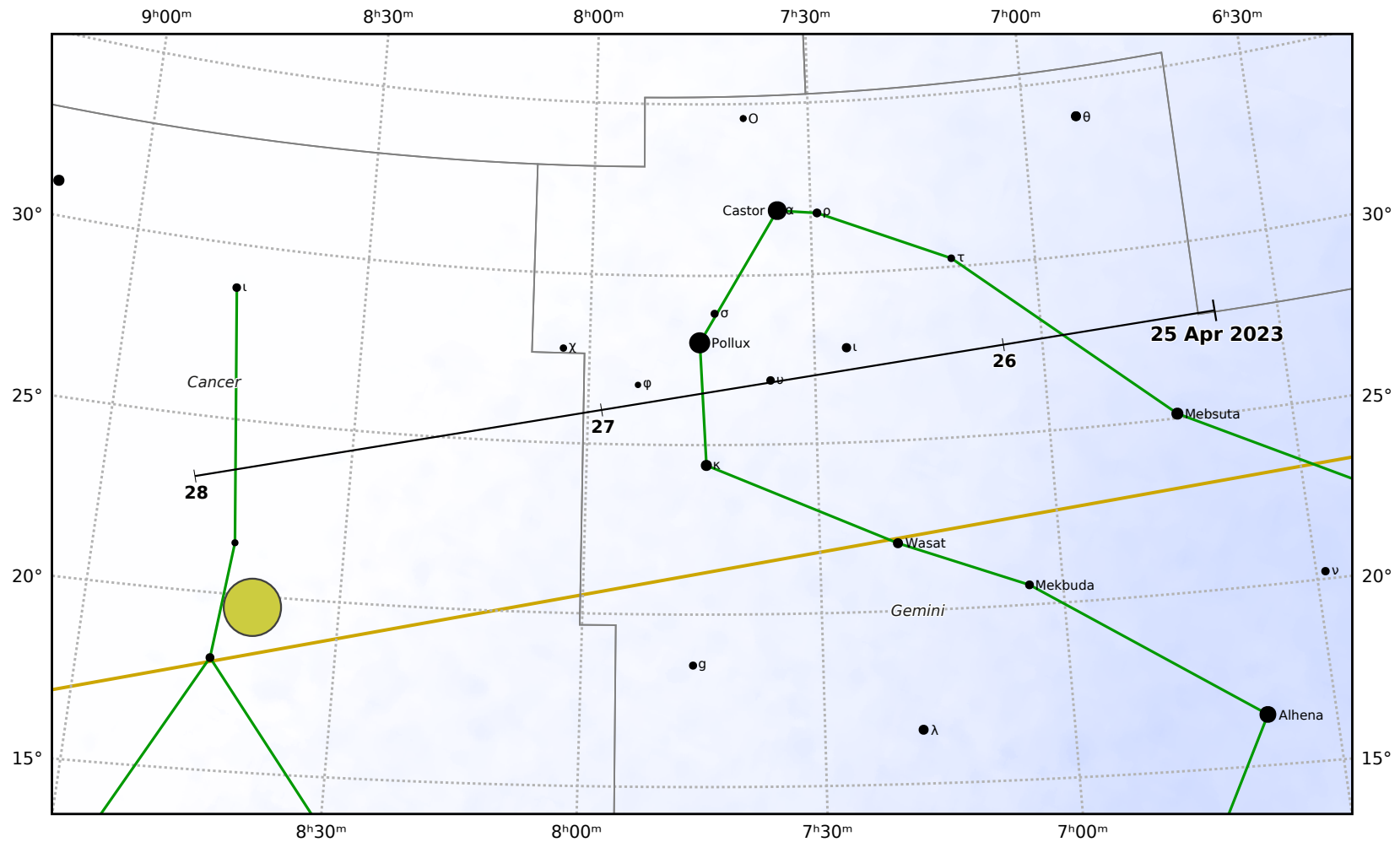
Generated with <https://github.com/dcf21/star-charter>

Magnitude scale: • 5.0 • 4.5 • 4.0 • 3.5 • 3.0 • 2.5 • 2.0 • 1.5 • 1.0

— The Equator — Ecliptic Plane — Galactic Plane

Galaxy Bright nebula Open cluster Globular cluster

CloseApproach_2023-04-26_18:13:46.6_(UTC+1)_ moon star

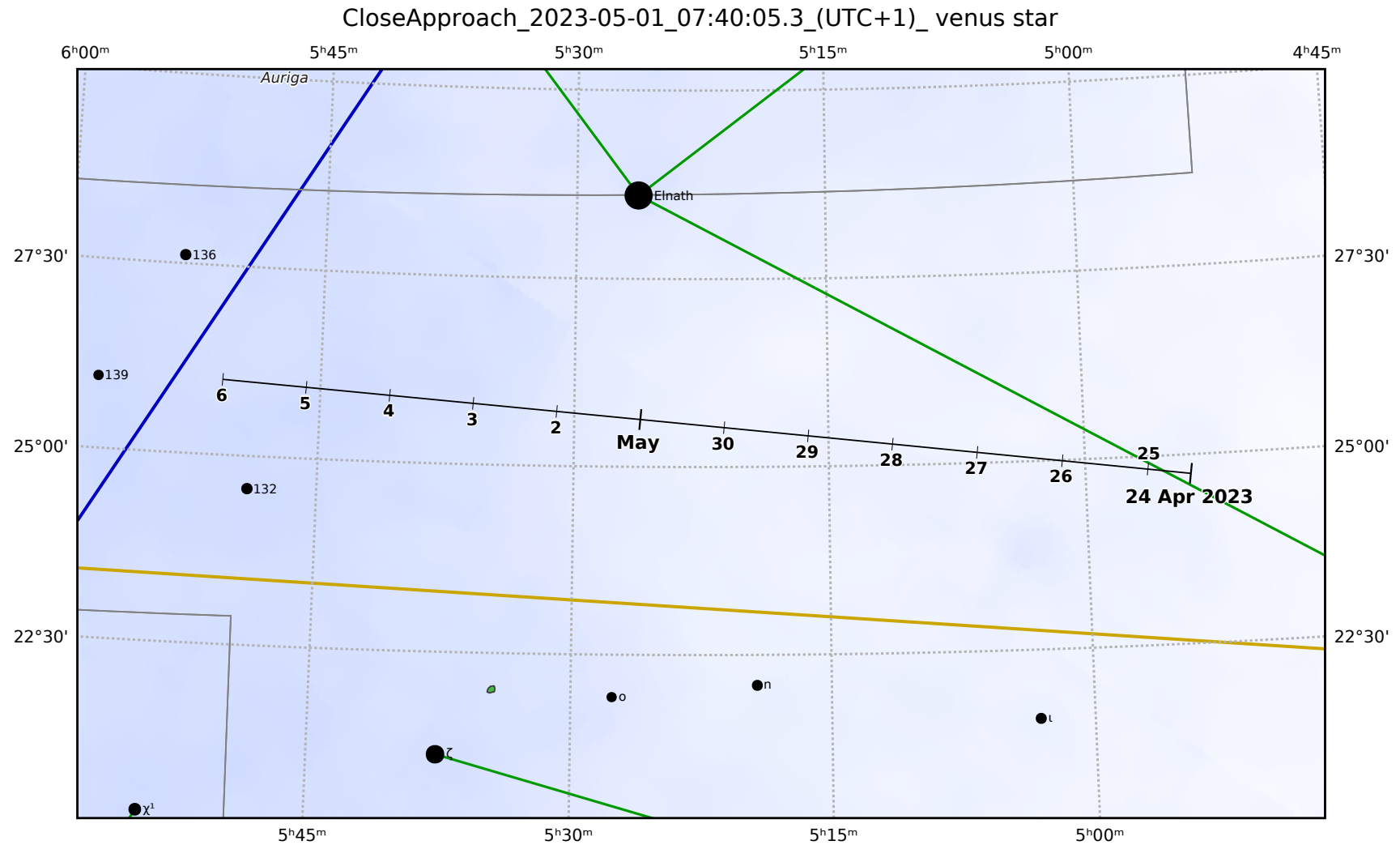


Generated with <https://github.com/dcf21/star-charter>

Magnitude scale: • 5.0 • 4.5 • 4.0 • 3.5 • 3.0 • 2.5 • 2.0 • 1.5 • 1.0

— The Equator — Ecliptic Plane — Galactic Plane

Galaxy Bright nebula Open cluster Globular cluster



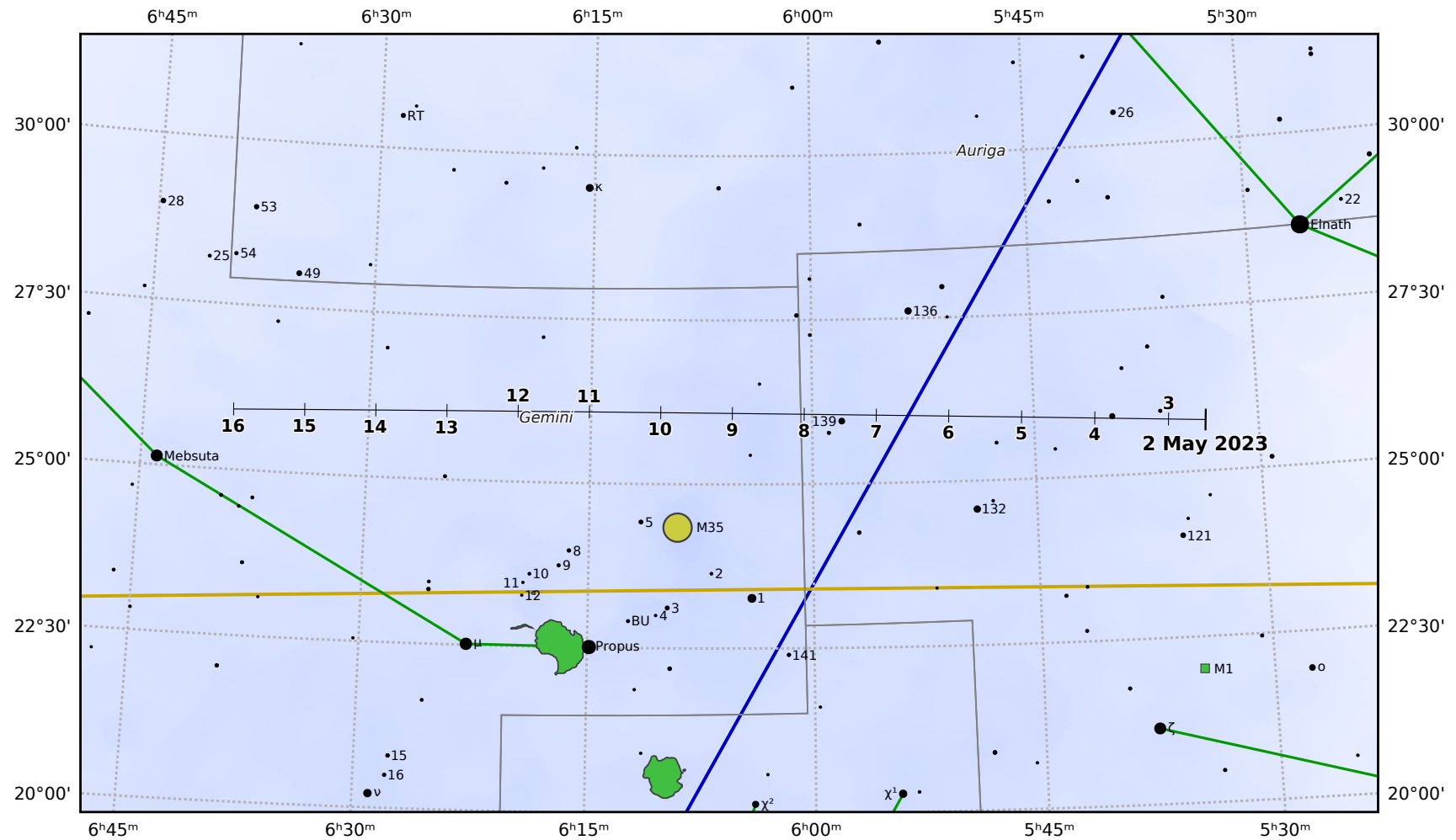
Generated with <https://github.com/dcf21/star-charter>

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

— The Equator — Ecliptic Plane — Galactic Plane

Galaxy Bright nebula Open cluster Globular cluster

CloseApproach_2023-05-09_18:31:14.3_(UTC+1)_venus M35

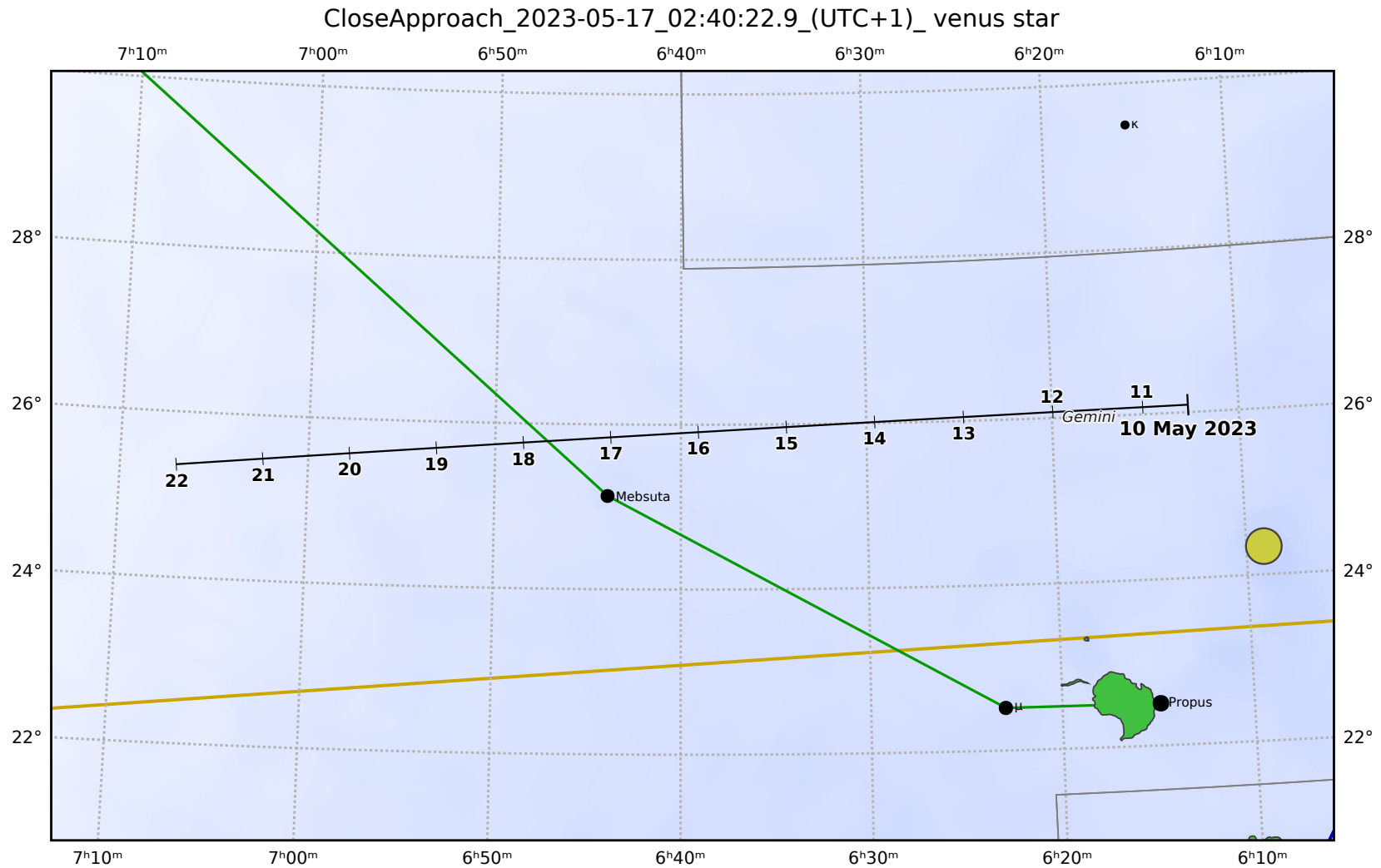


Generated with <https://github.com/dcf21/star-charter>

Magnitude scale: ·7.0 ·6.5 ·6.0 ·5.5 ·5.0 ·4.5 ·4.0 ·3.5 ·3.0 ●2.5 ●2.0 ●1.5

— The Equator — Ecliptic Plane — Galactic Plane

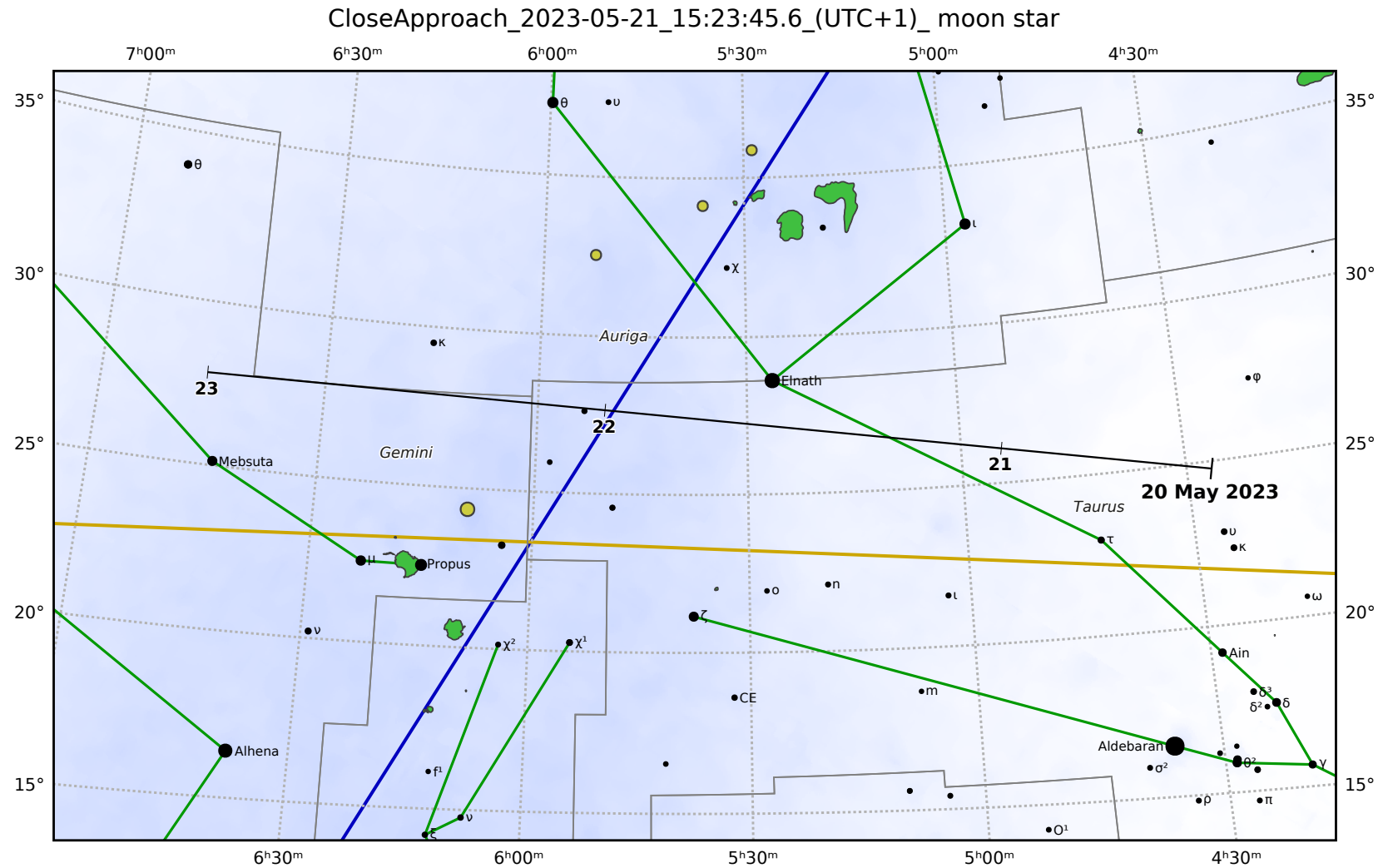
● Galaxy ■ Bright nebula ● Open cluster ⊕ Globular cluster



Magnitude scale: ● 5.0 ● 4.5 ● 4.0 ● 3.5 ● 3.0 ● 2.5 ● 2.0

— The Equator — Ecliptic Plane — Galactic Plane

● Galaxy ■ Bright nebula ● Open cluster ⊕ Globular cluster

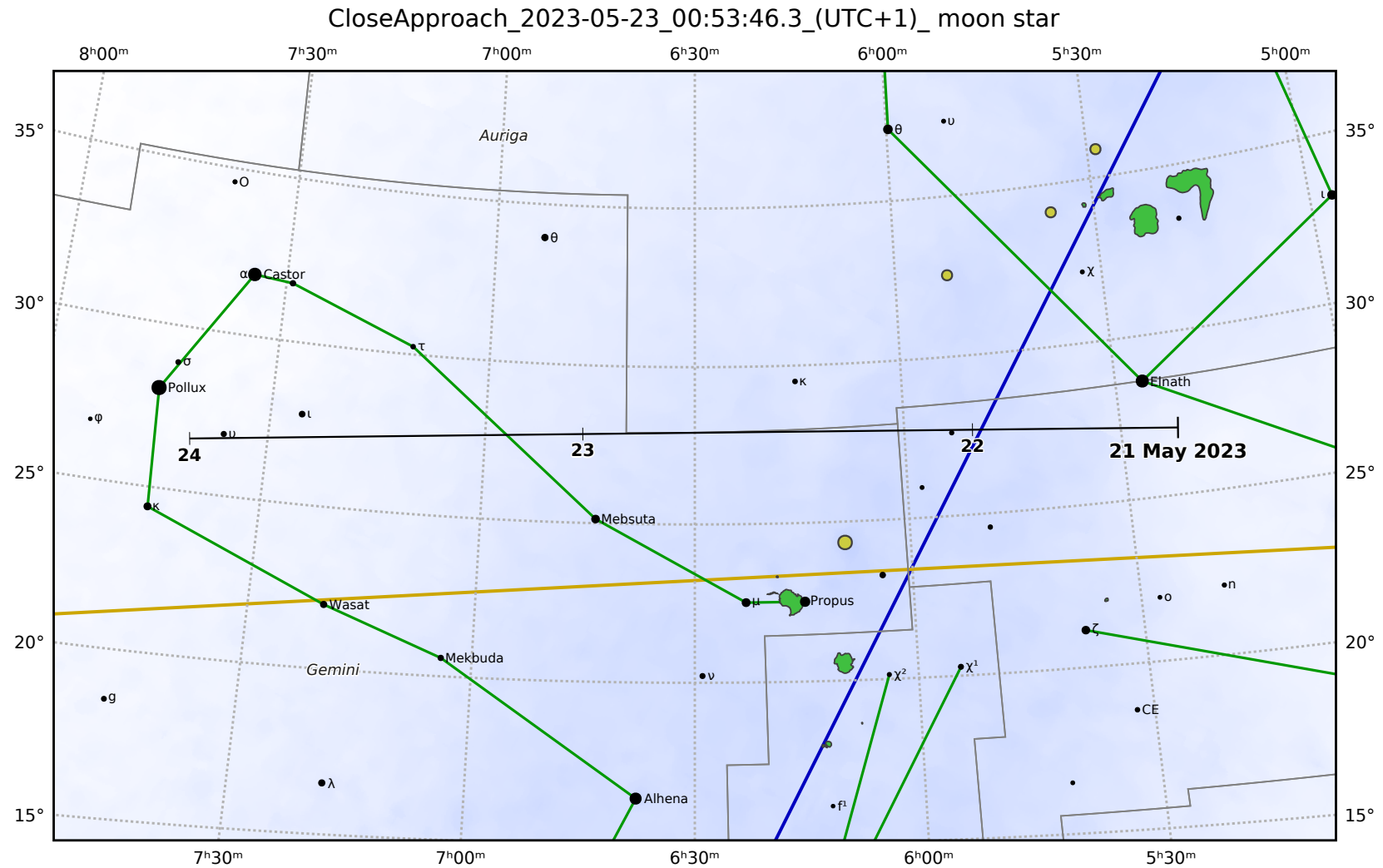


Generated with <https://github.com/dcf21/star-charter>

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

— The Equator — Ecliptic Plane — Galactic Plane

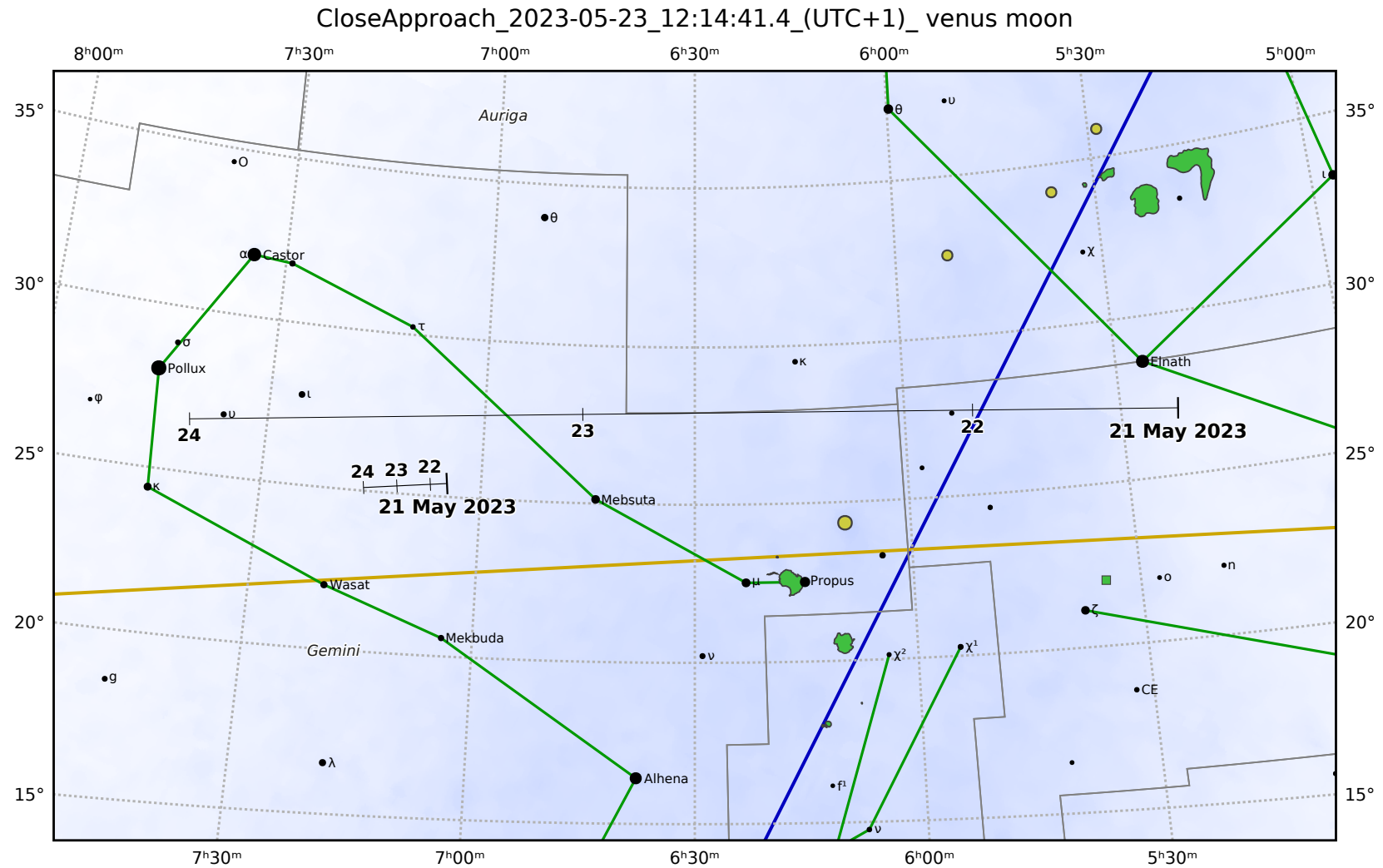
Galaxy Bright nebula Open cluster Globular cluster



Magnitude scale: • 5.0 • 4.5 • 4.0 • 3.5 • 3.0 • 2.5 • 2.0 • 1.5 • 1.0

— The Equator — Ecliptic Plane — Galactic Plane

● Galaxy ■ Bright nebula ● Open cluster ⊕ Globular cluster

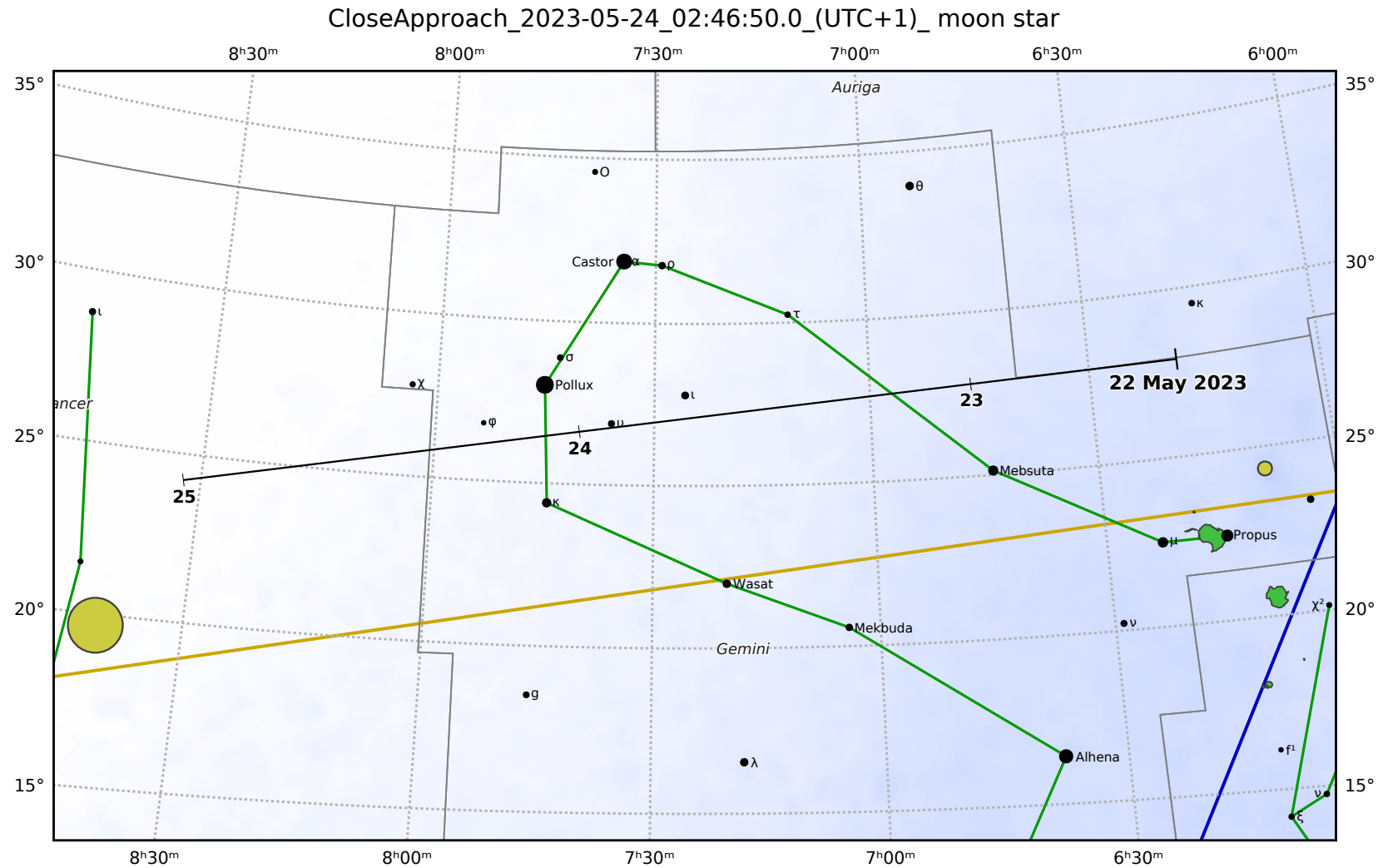


Generated with <https://github.com/dcf21/star-charter>

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

— The Equator — Ecliptic Plane — Galactic Plane

● Galaxy ■ Bright nebula ● Open cluster ⊕ Globular cluster

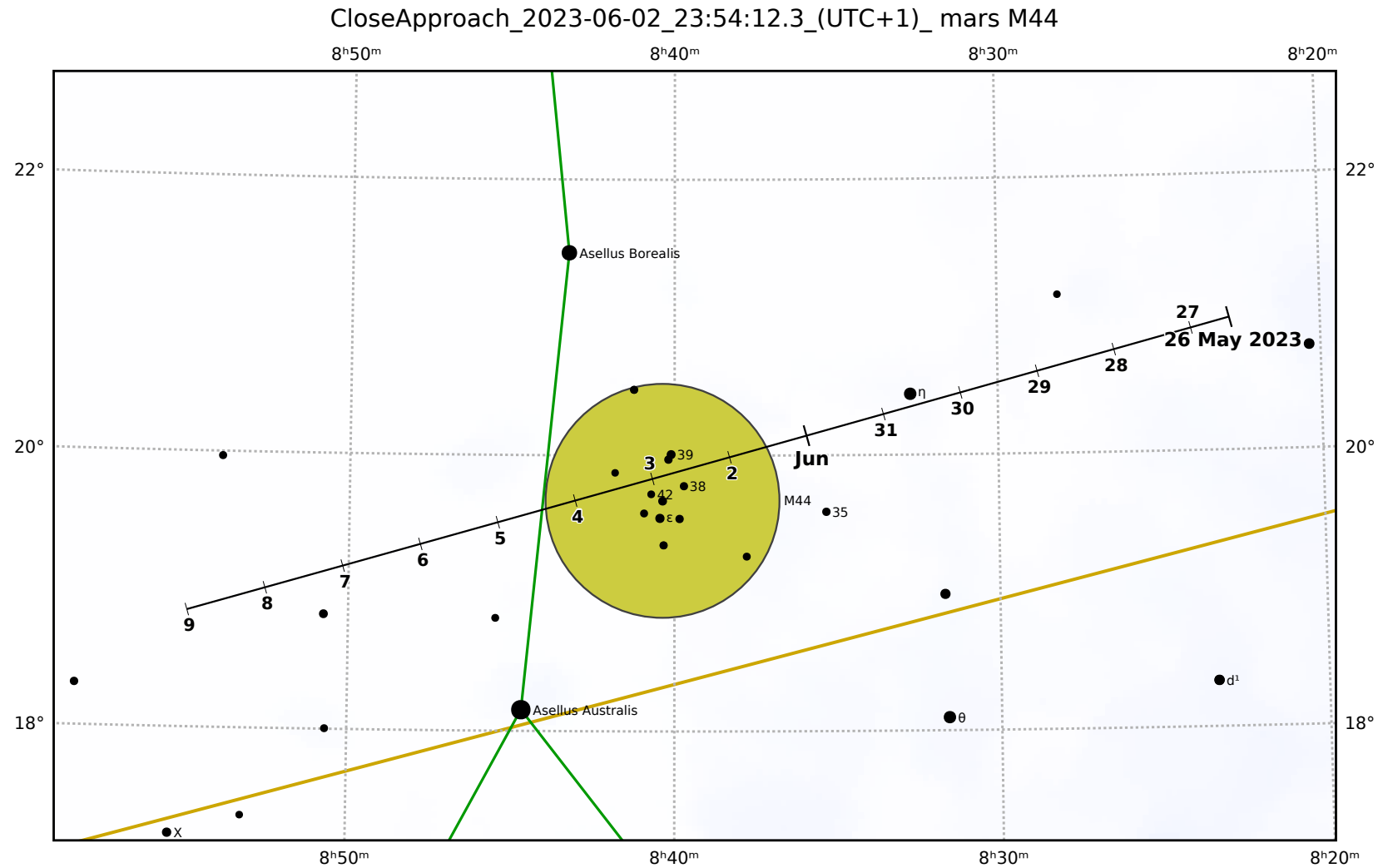


Generated with <https://github.com/dcf21/star-charter>

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

— The Equator — Ecliptic Plane — Galactic Plane

Galaxy Bright nebula Open cluster Globular cluster

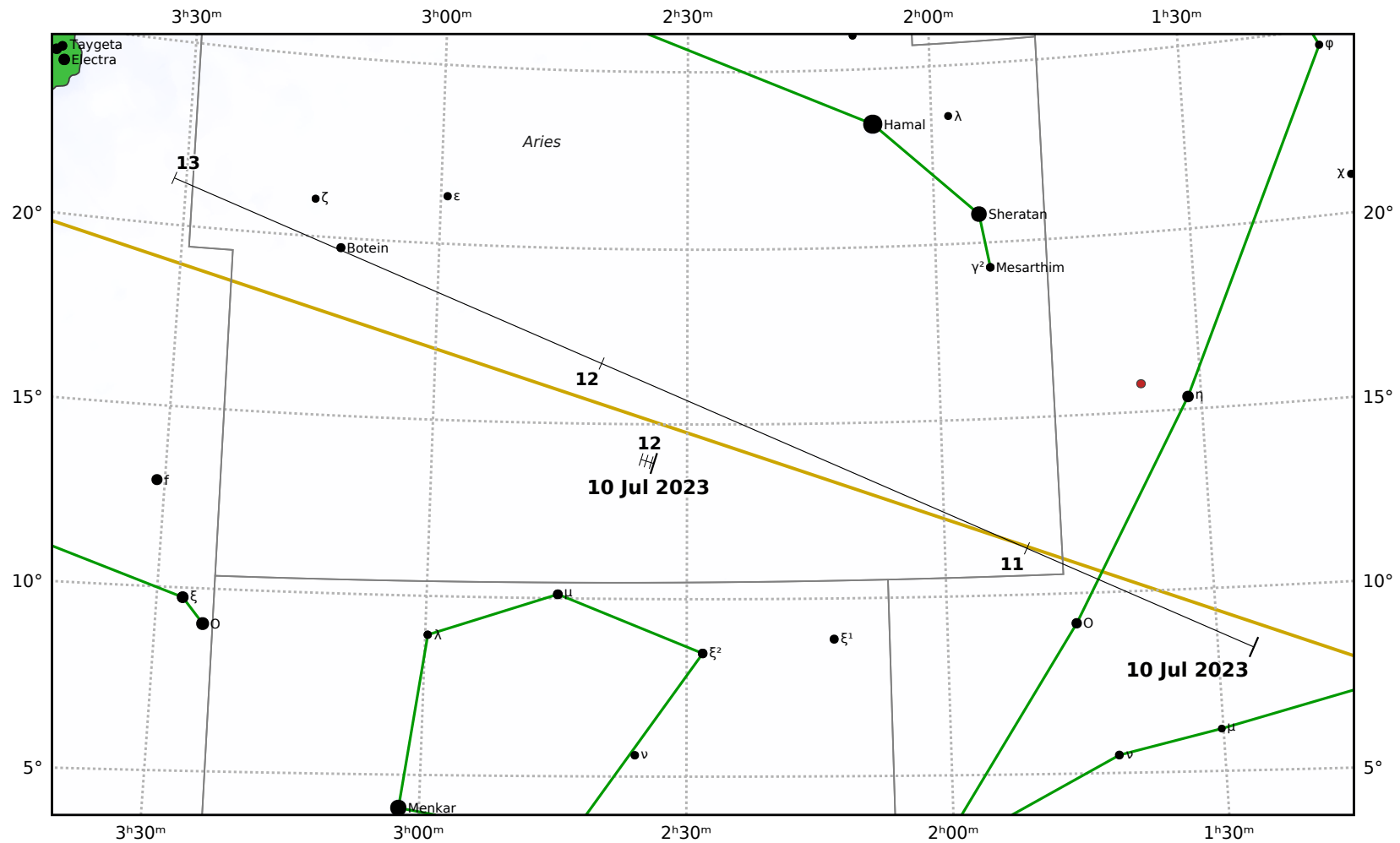


Magnitude scale: ● 7.0 ● 6.5 ● 6.0 ● 5.5 ● 5.0 ● 4.5 ● 4.0 ● 3.5

— The Equator — Ecliptic Plane — Galactic Plane

● Galaxy ■ Bright nebula ● Open cluster ⊕ Globular cluster

CloseApproach_2023-07-11_21:07:31.8_(UTC+1)_moon jupiter



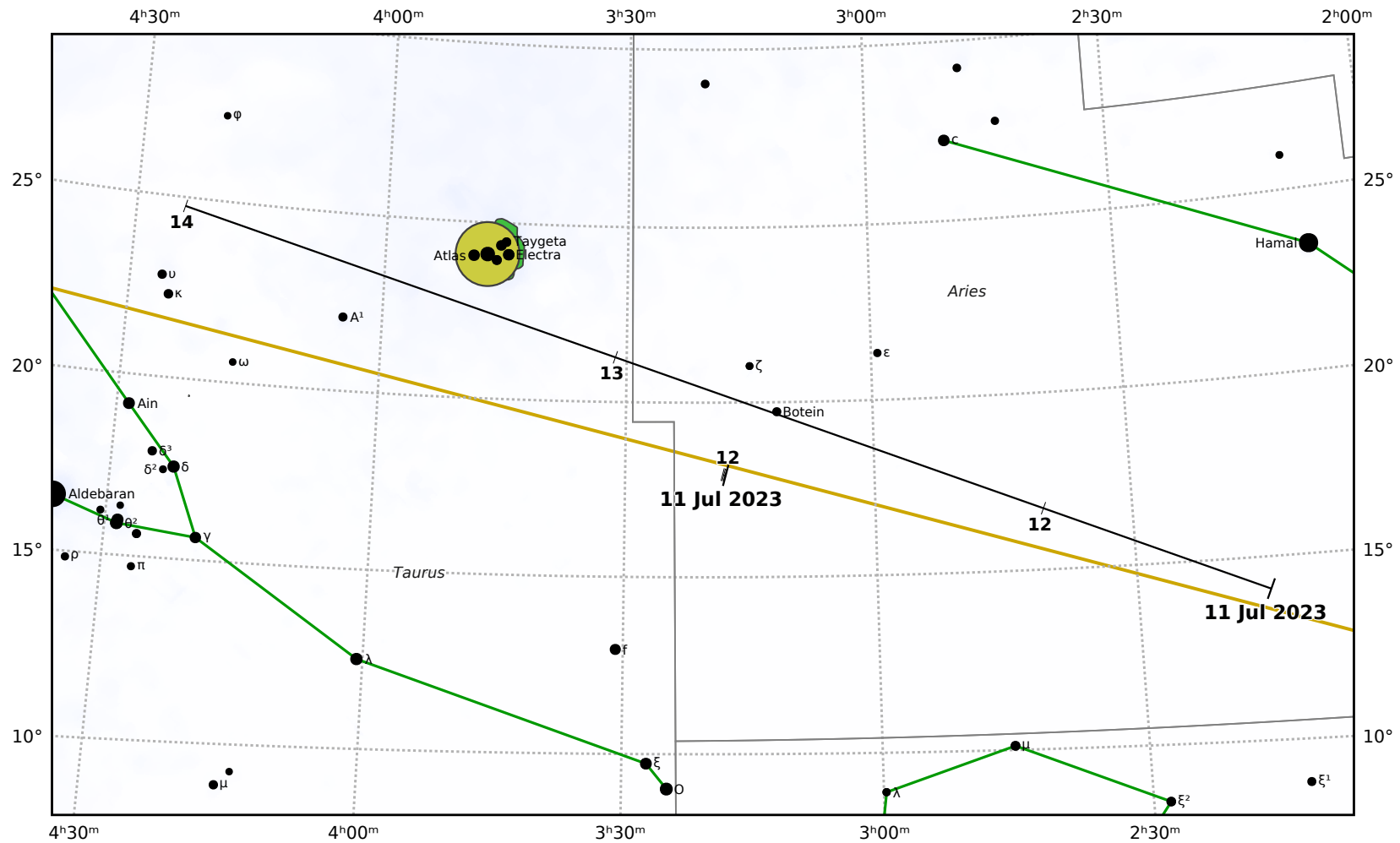
Generated with <https://github.com/dcf21/star-charter>

Magnitude scale: ● 5.0 ● 4.5 ● 4.0 ● 3.5 ● 3.0 ● 2.5 ● 2.0

— The Equator — Ecliptic Plane — Galactic Plane

● Galaxy ■ Bright nebula ● Open cluster ⊕ Globular cluster

CloseApproach_2023-07-12_18:35:12.0_(UTC+1)_moon uranus



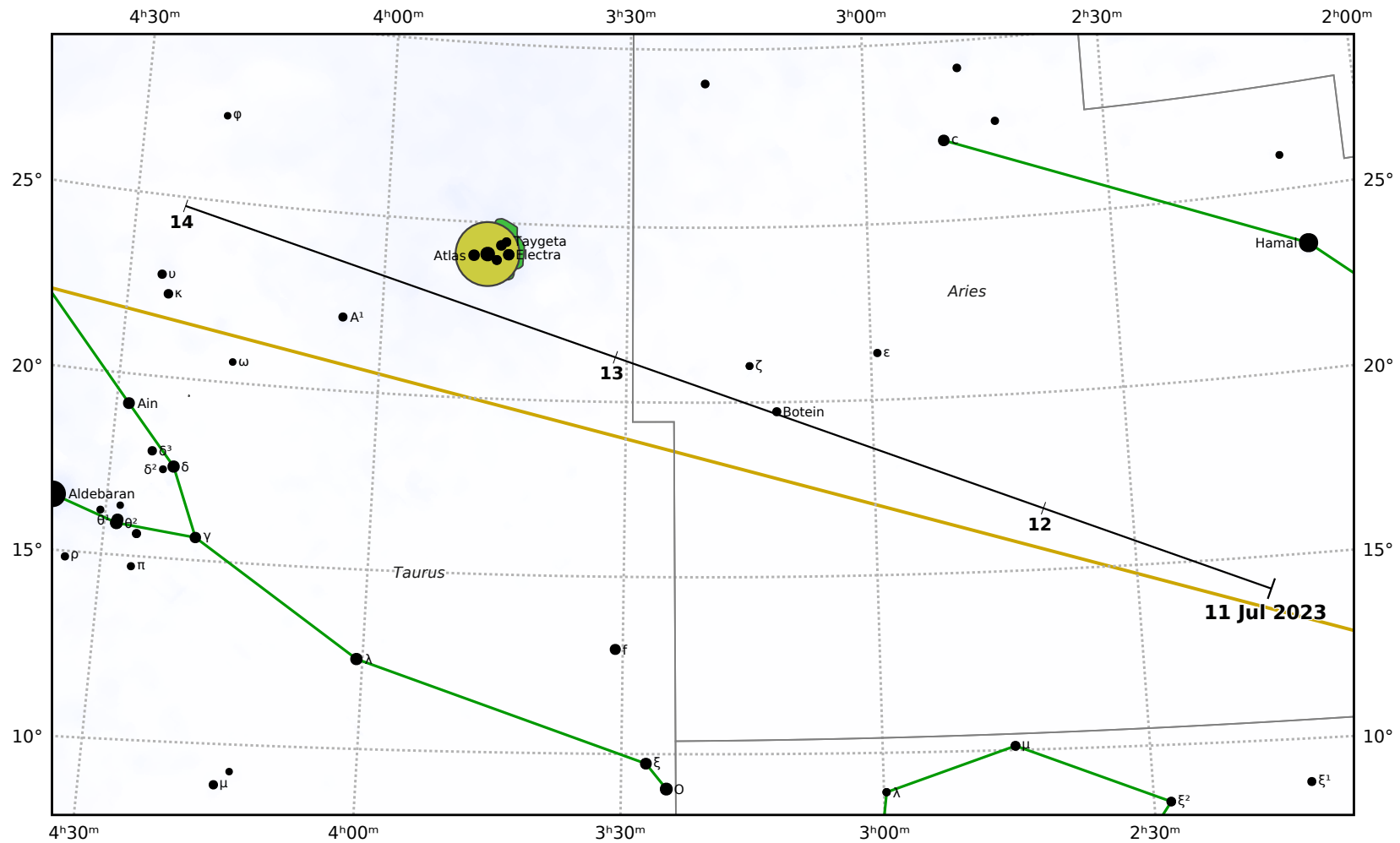
Generated with <https://github.com/dcf21/star-charter>

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

— The Equator — Ecliptic Plane — Galactic Plane

Galaxy Bright nebula Open cluster Globular cluster

CloseApproach_2023-07-13_10:04:37.1_(UTC+1)_ moon star

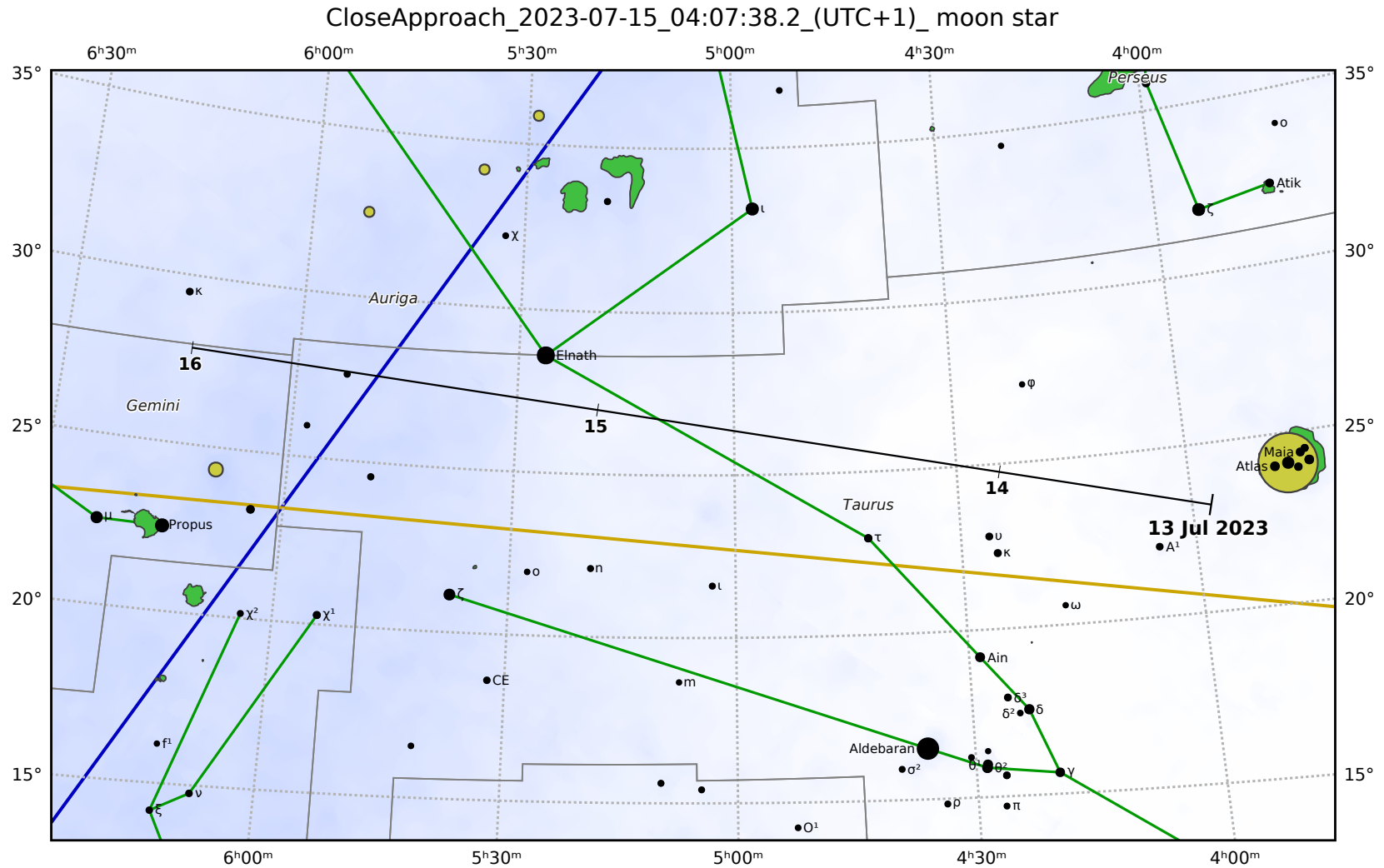


Generated with <https://github.com/dcf21/star-charter>

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

— The Equator — Ecliptic Plane — Galactic Plane

Galaxy Bright nebula Open cluster Globular cluster

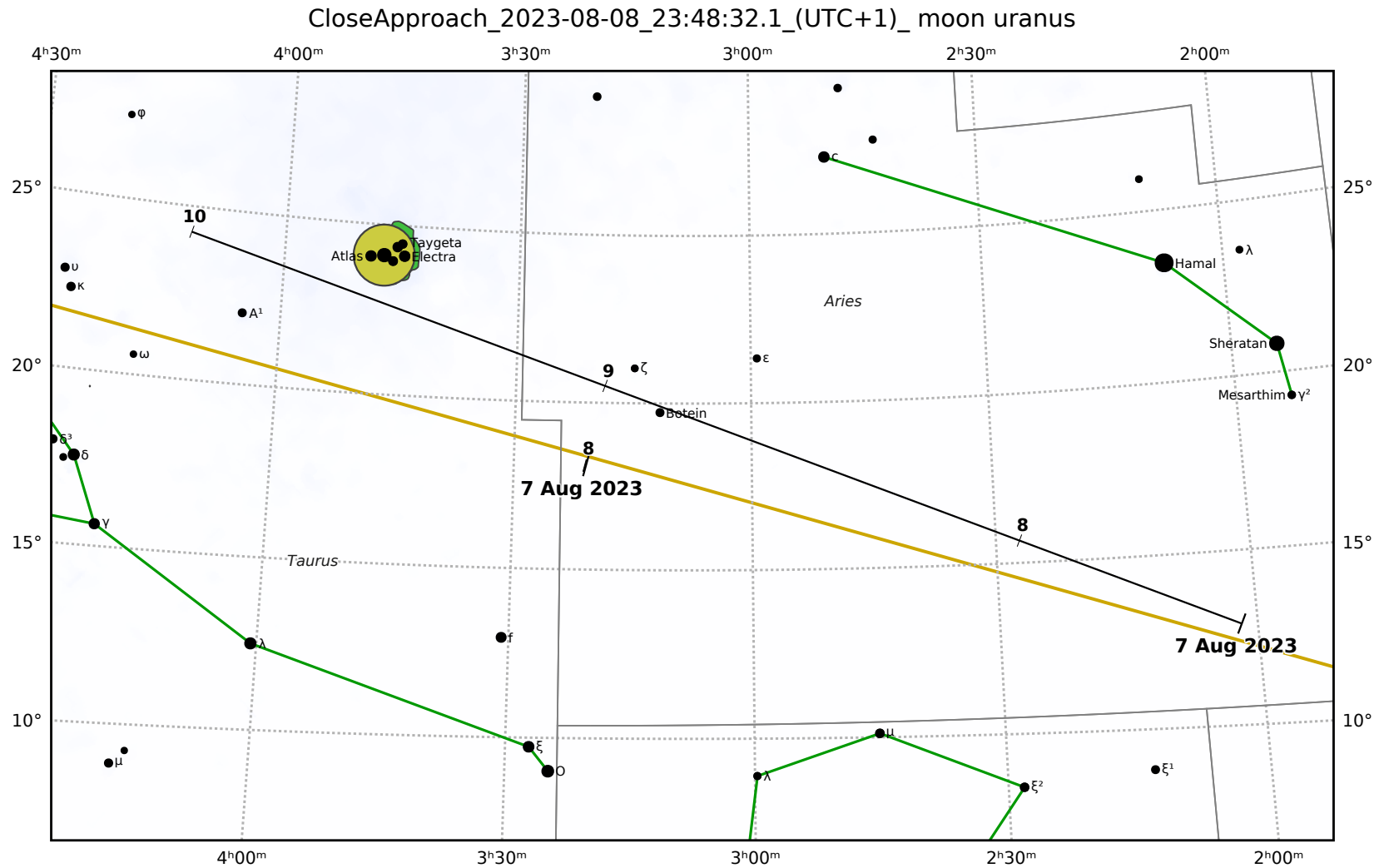


Generated with <https://github.com/dcf21/star-charter>

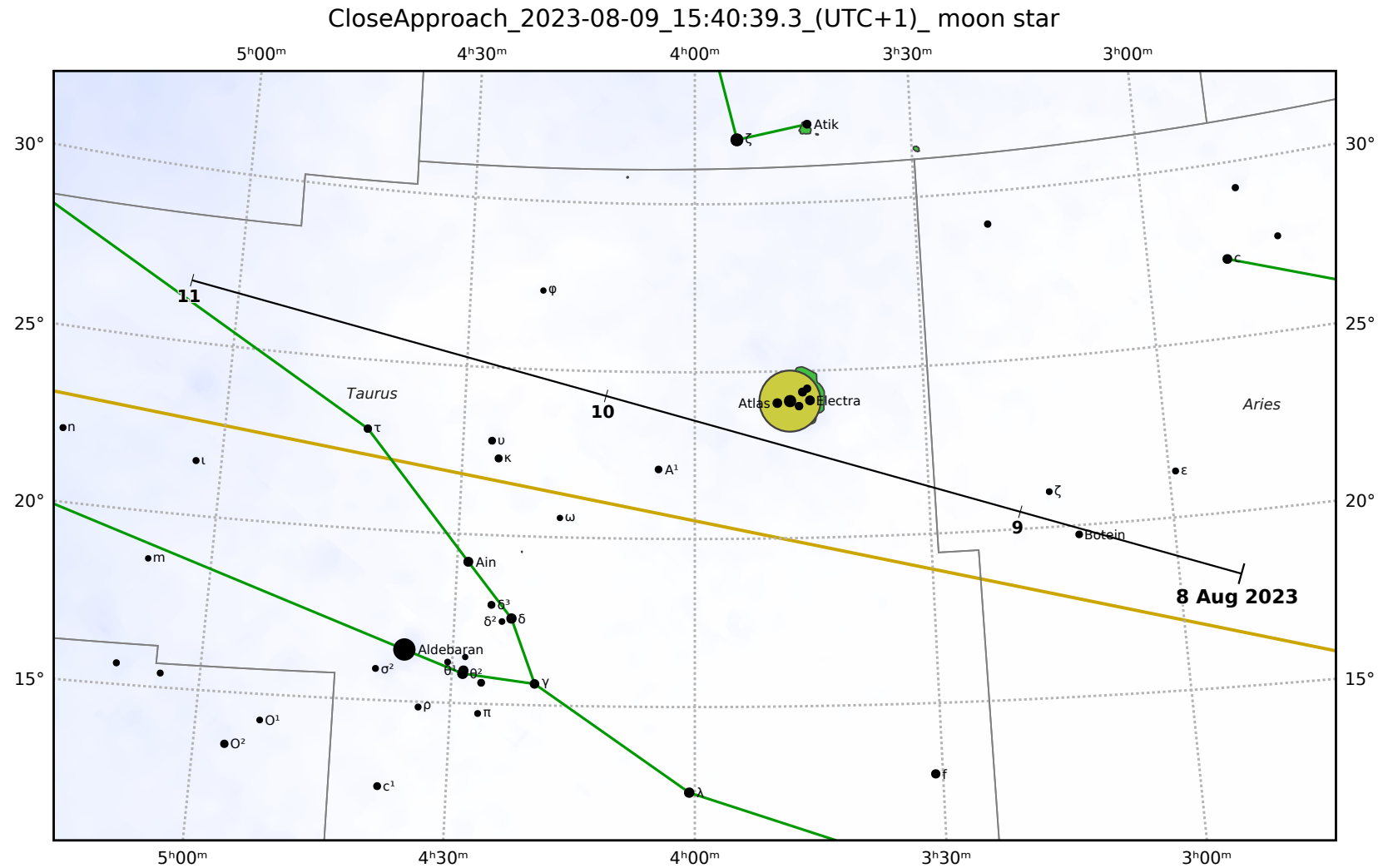
Magnitude scale: • 5.0 • 4.5 • 4.0 • 3.5 • 3.0 • 2.5 • 2.0 • 1.5 • 1.0 • 0.5

— The Equator — Ecliptic Plane — Galactic Plane

● Galaxy ■ Bright nebula ● Open cluster ⊕ Globular cluster



- Magnitude scale: ● 5.0 ● 4.5 ● 4.0 ● 3.5 ● 3.0 ● 2.5 ● 2.0
- The Equator — Ecliptic Plane — Galactic Plane
- Galaxy ■ Bright nebula ● Open cluster ● Globular cluster

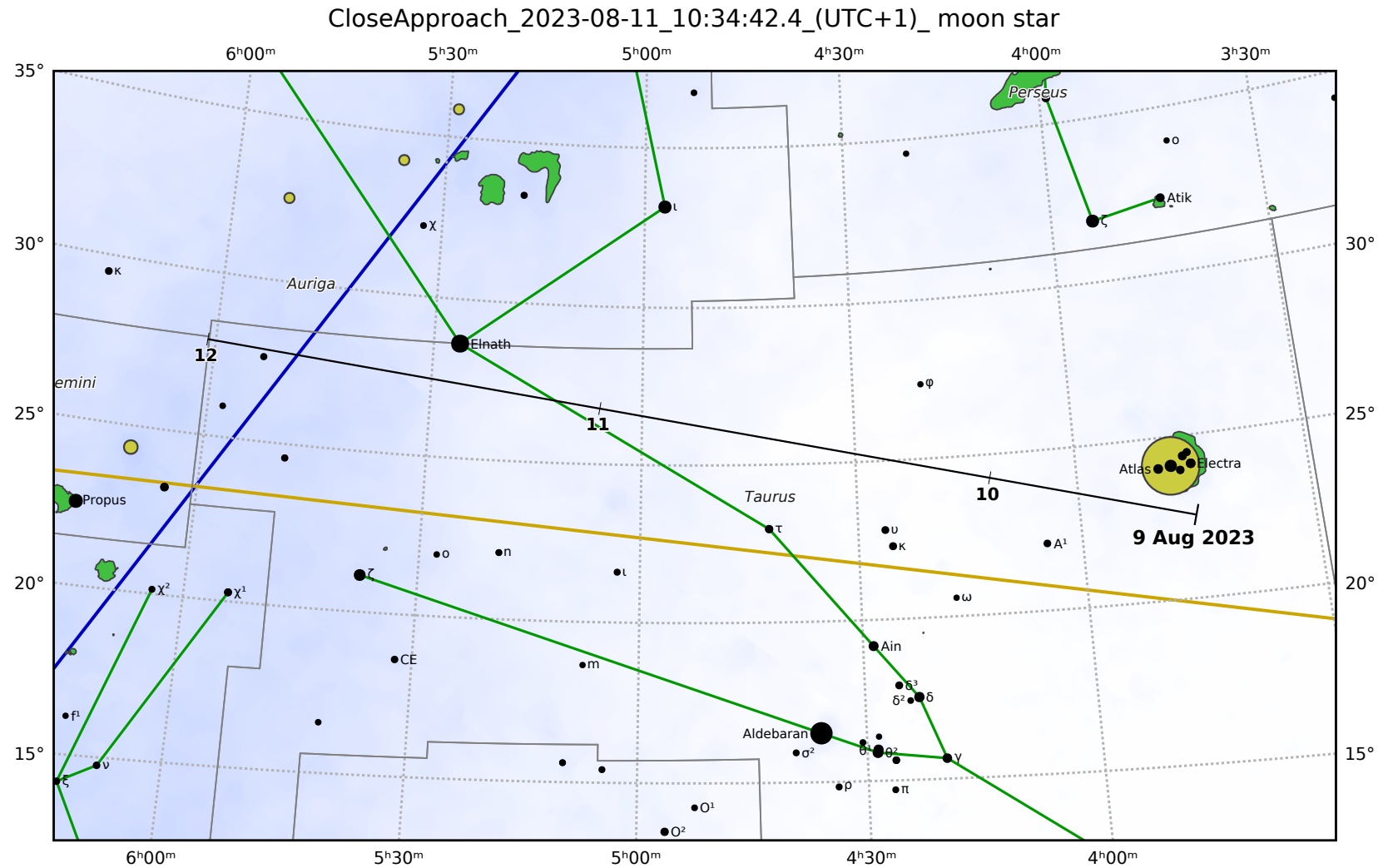


Generated with <https://github.com/dcf21/star-charter>

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

— The Equator — Ecliptic Plane — Galactic Plane

Galaxy Bright nebula Open cluster Globular cluster

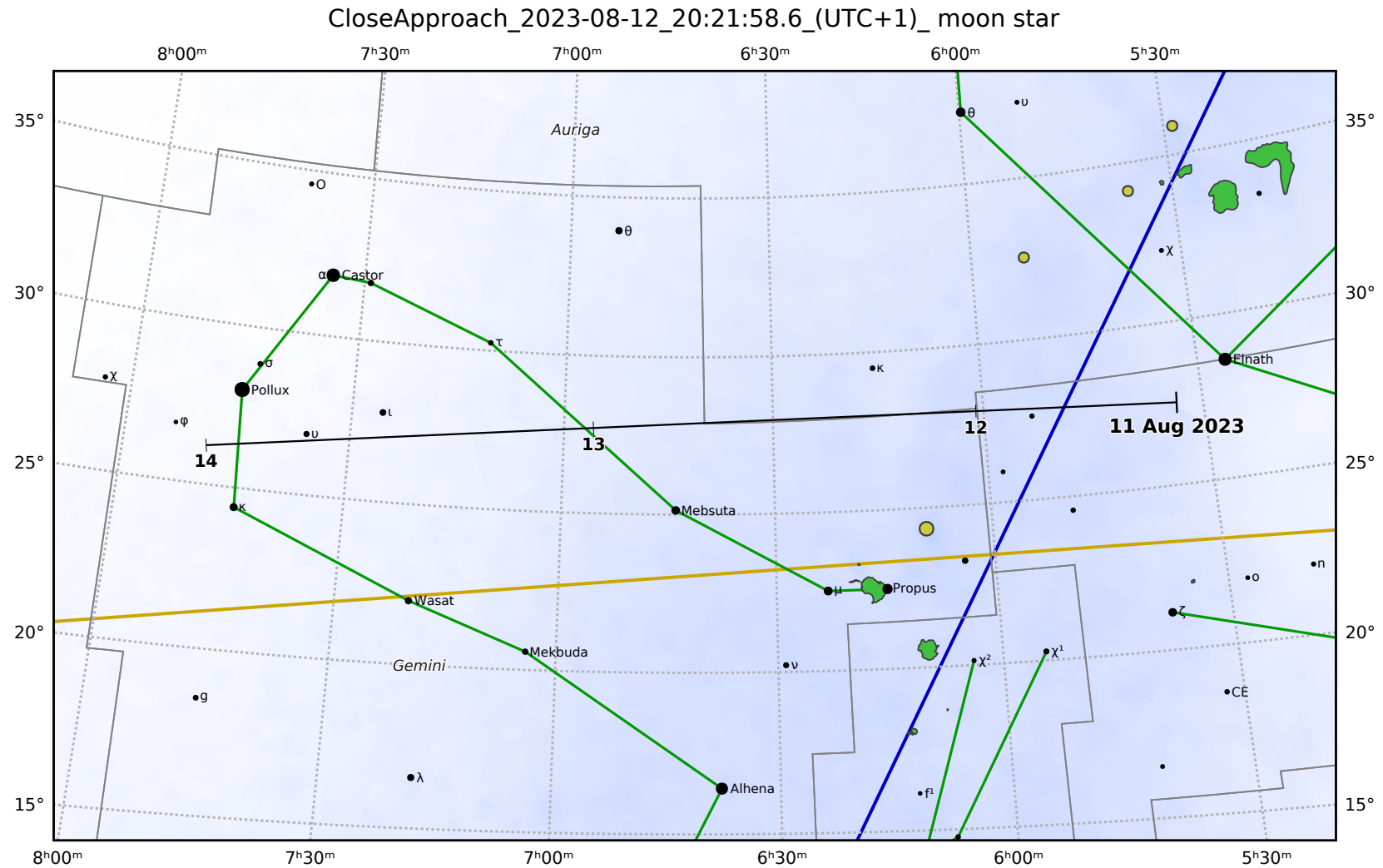


Generated with <https://github.com/dcf21/star-charter>

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

— The Equator — Ecliptic Plane — Galactic Plane

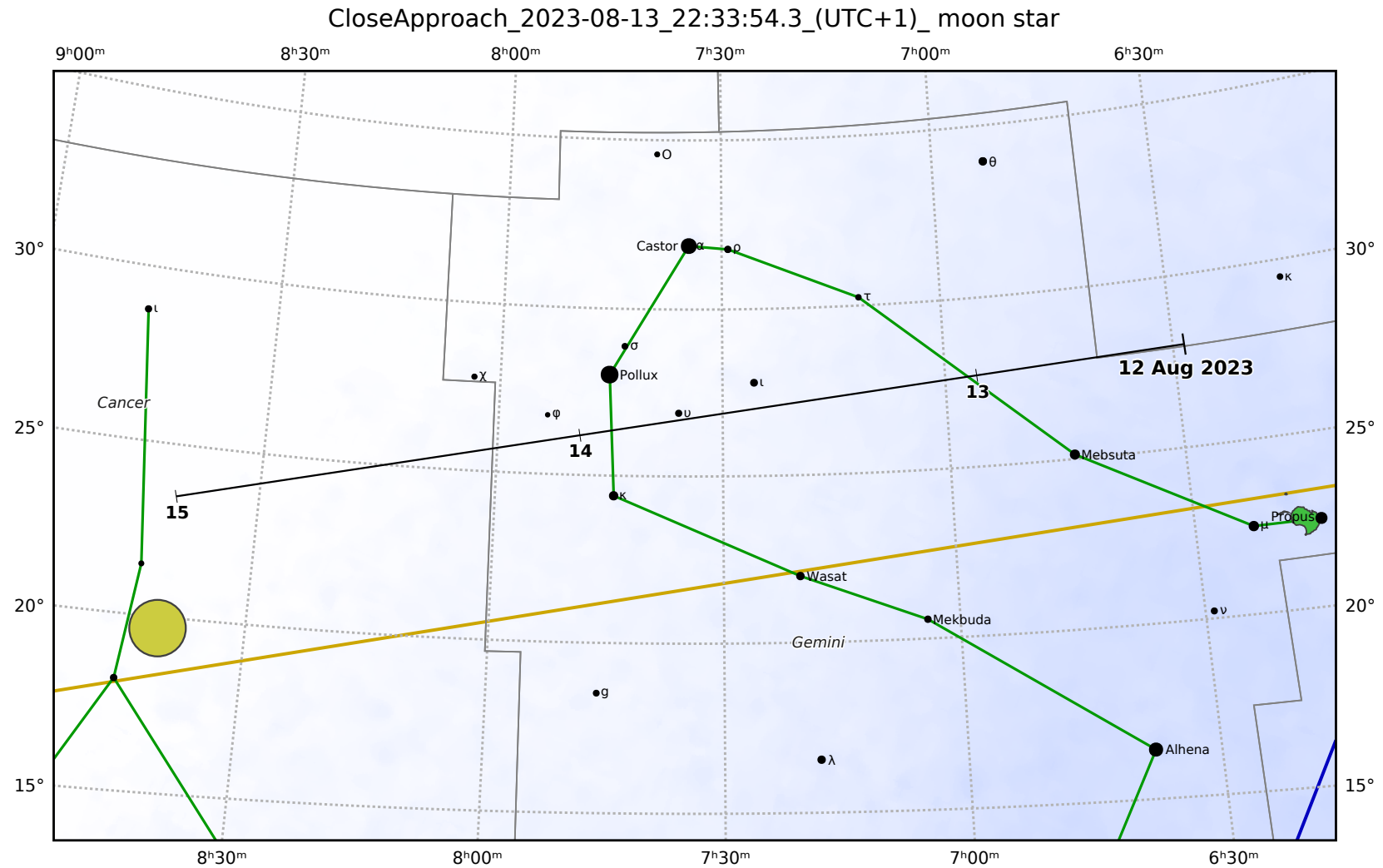
Galaxy Bright nebula Open cluster Globular cluster



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

— The Equator — Ecliptic Plane — Galactic Plane

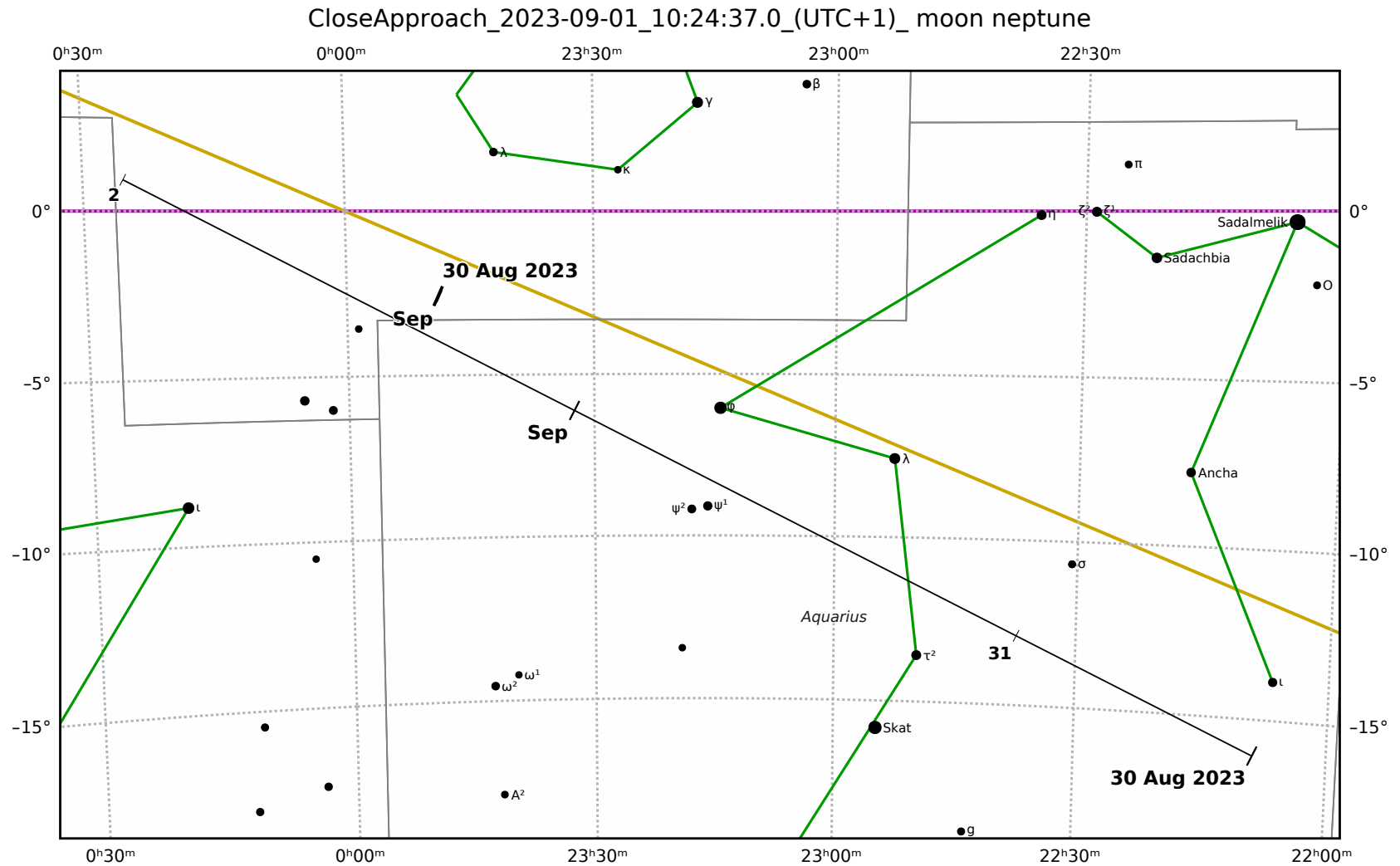
🌌 Galaxy ■ Bright nebula ● Open cluster ⊕ Globular cluster



Magnitude scale: • 5.0 • 4.5 • 4.0 • 3.5 • 3.0 • 2.5 • 2.0 • 1.5 • 1.0

— The Equator — Ecliptic Plane — Galactic Plane

● Galaxy ■ Bright nebula ● Open cluster ● Globular cluster

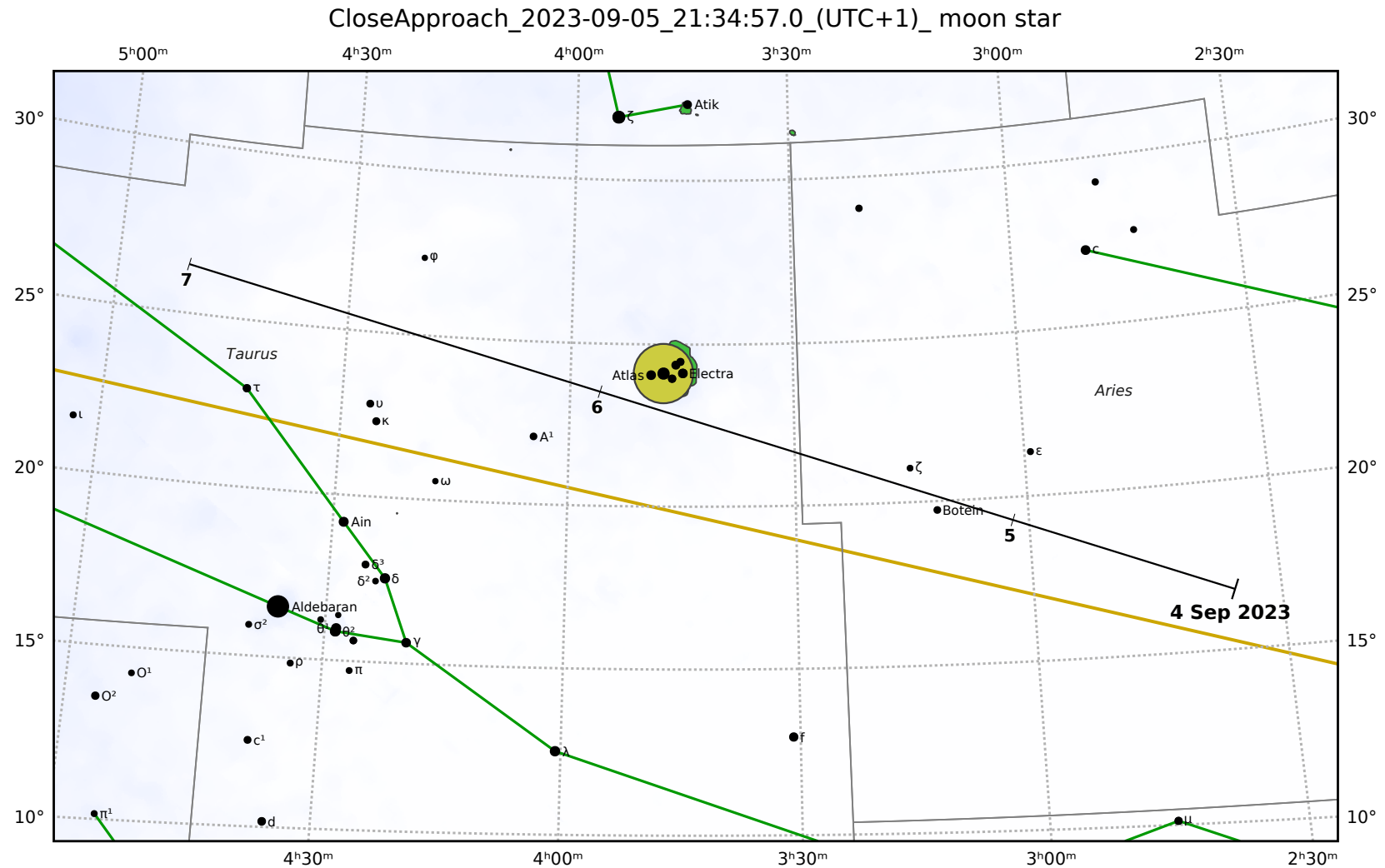


Generated with <https://github.com/dcf21/star-charter>

Magnitude scale: ● 5.0 ● 4.5 ● 4.0 ● 3.5 ● 3.0 ● 2.5

— The Equator — Ecliptic Plane — Galactic Plane

● Galaxy ■ Bright nebula ● Open cluster ⊕ Globular cluster

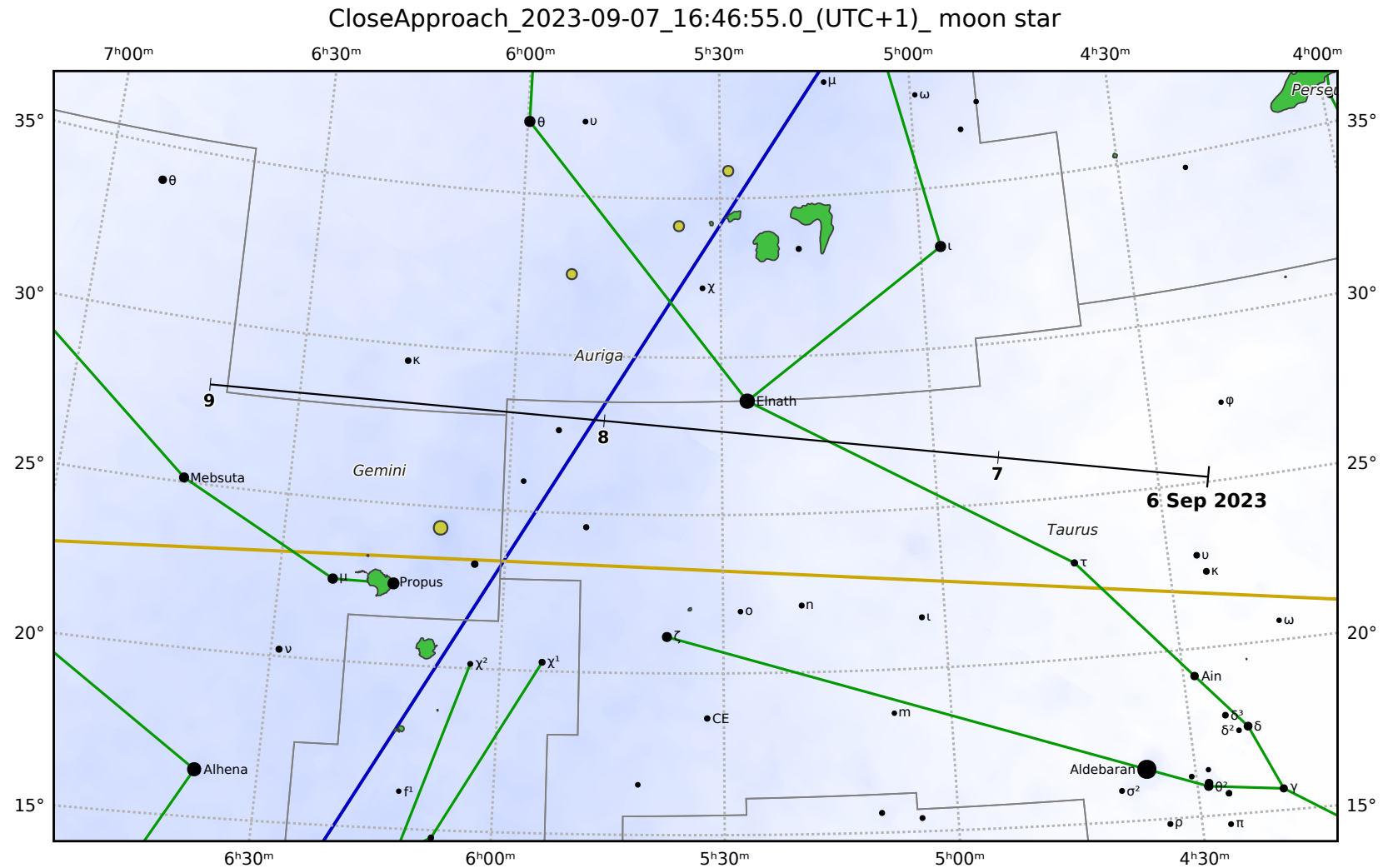


Generated with <https://github.com/dcf21/star-charter>

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

— The Equator — Ecliptic Plane — Galactic Plane

Galaxy Bright nebula Open cluster Globular cluster



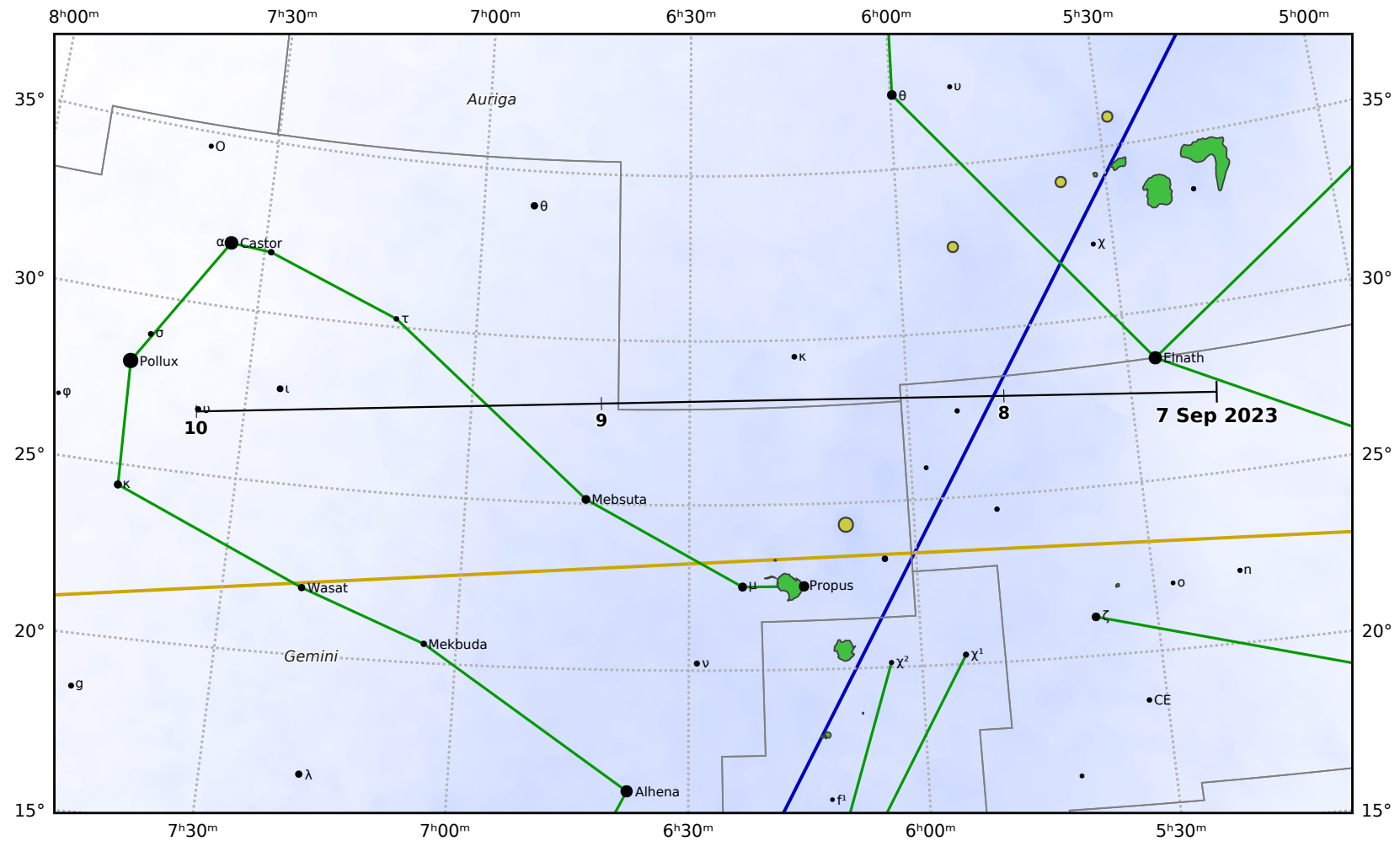
Generated with <https://github.com/dcf21/star-charter>

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

— The Equator — Ecliptic Plane — Galactic Plane

Galaxy Bright nebula Open cluster Globular cluster

CloseApproach_2023-09-09_00:29:01.9_(UTC+1)_ moon star

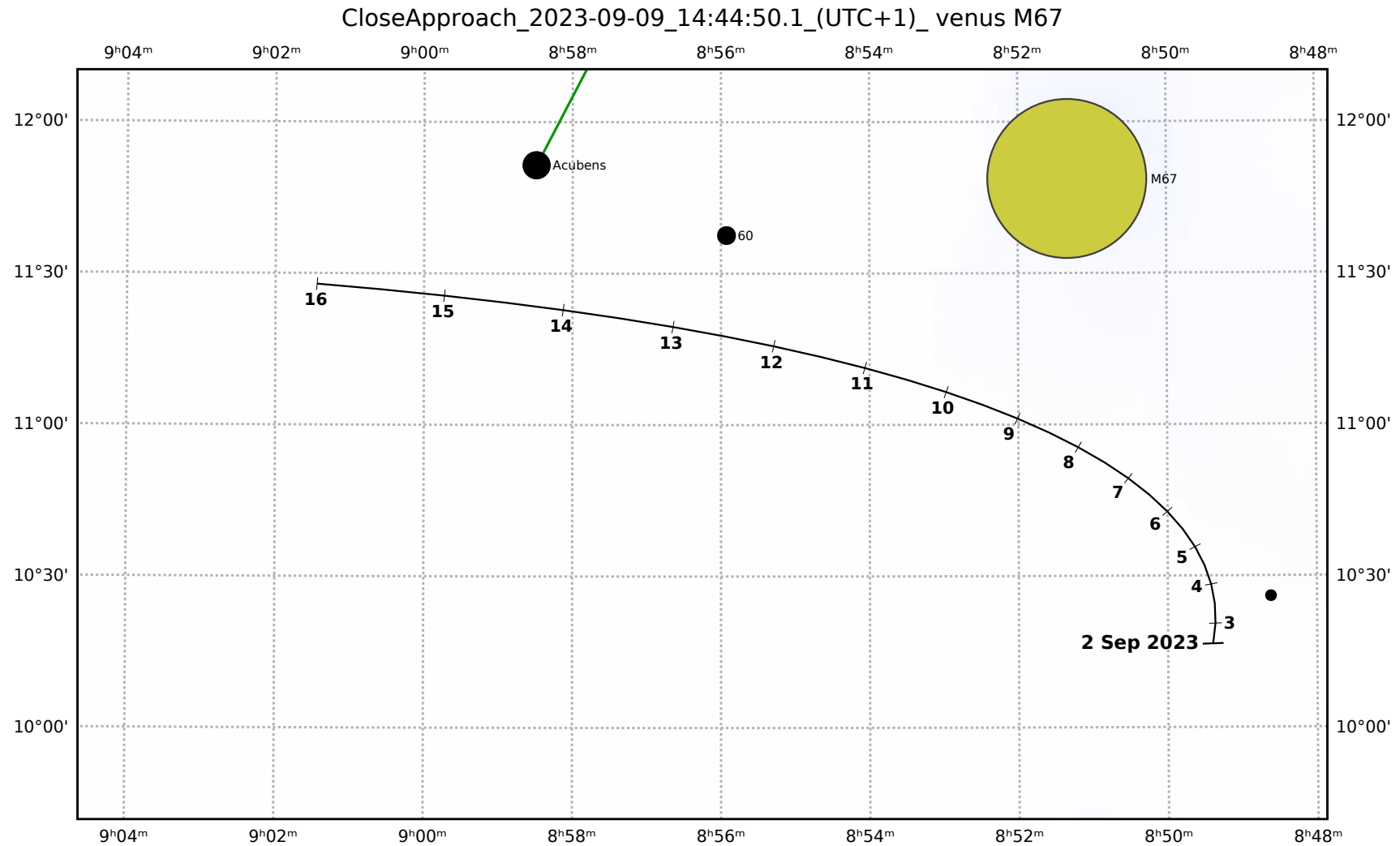


Generated with <https://github.com/dcf21/star-charter>

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

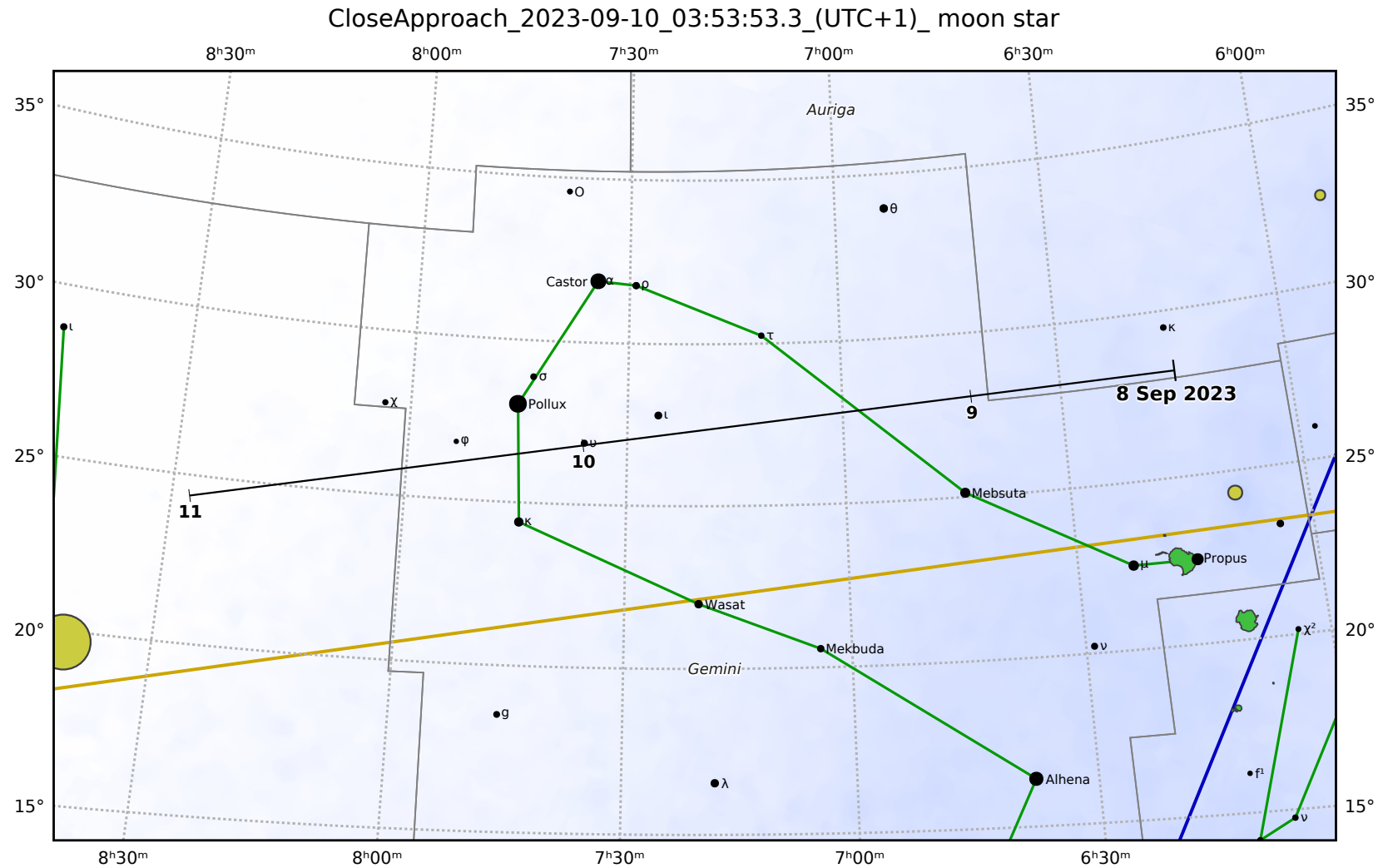
— The Equator — Ecliptic Plane — Galactic Plane

Galaxy Bright nebula Open cluster Globular cluster



Generated with <https://github.com/dcf21/star-charter>

- Magnitude scale: ● 7.0 ● 6.5 ● 6.0 ● 5.5 ● 5.0 ● 4.5 ● 4.0
- The Equator — Ecliptic Plane — Galactic Plane
- Galaxy ■ Bright nebula ● Open cluster ⊕ Globular cluster

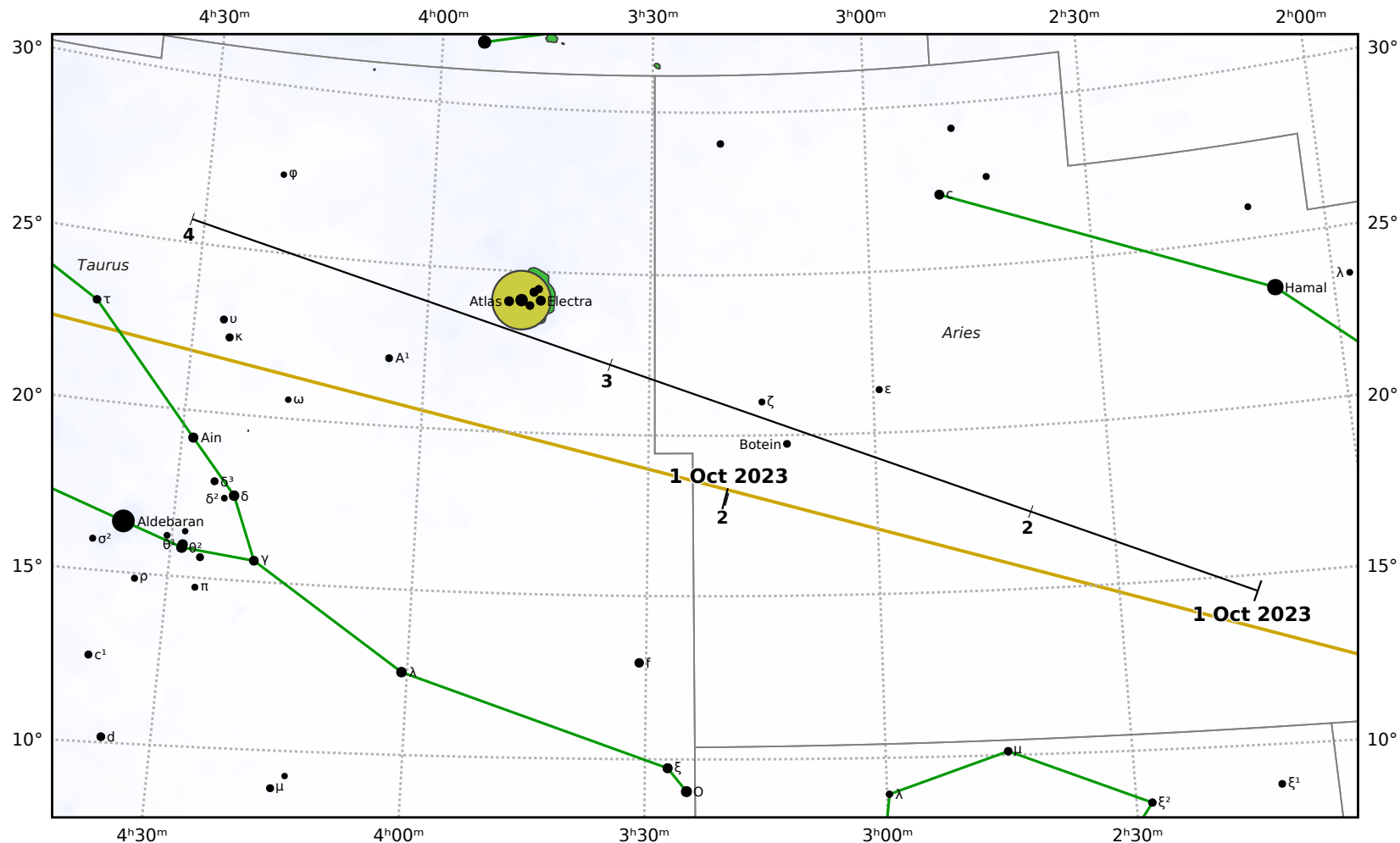


Magnitude scale: •5.0 •4.5 •4.0 •3.5 •3.0 •2.5 ●2.0 ●1.5 ●1.0

— The Equator — Ecliptic Plane — Galactic Plane

🌌 Galaxy ■ Bright nebula 🟡 Open cluster 🟡⊕ Globular cluster

CloseApproach_2023-10-02_16:45:00.2_(UTC+1)_ moon uranus

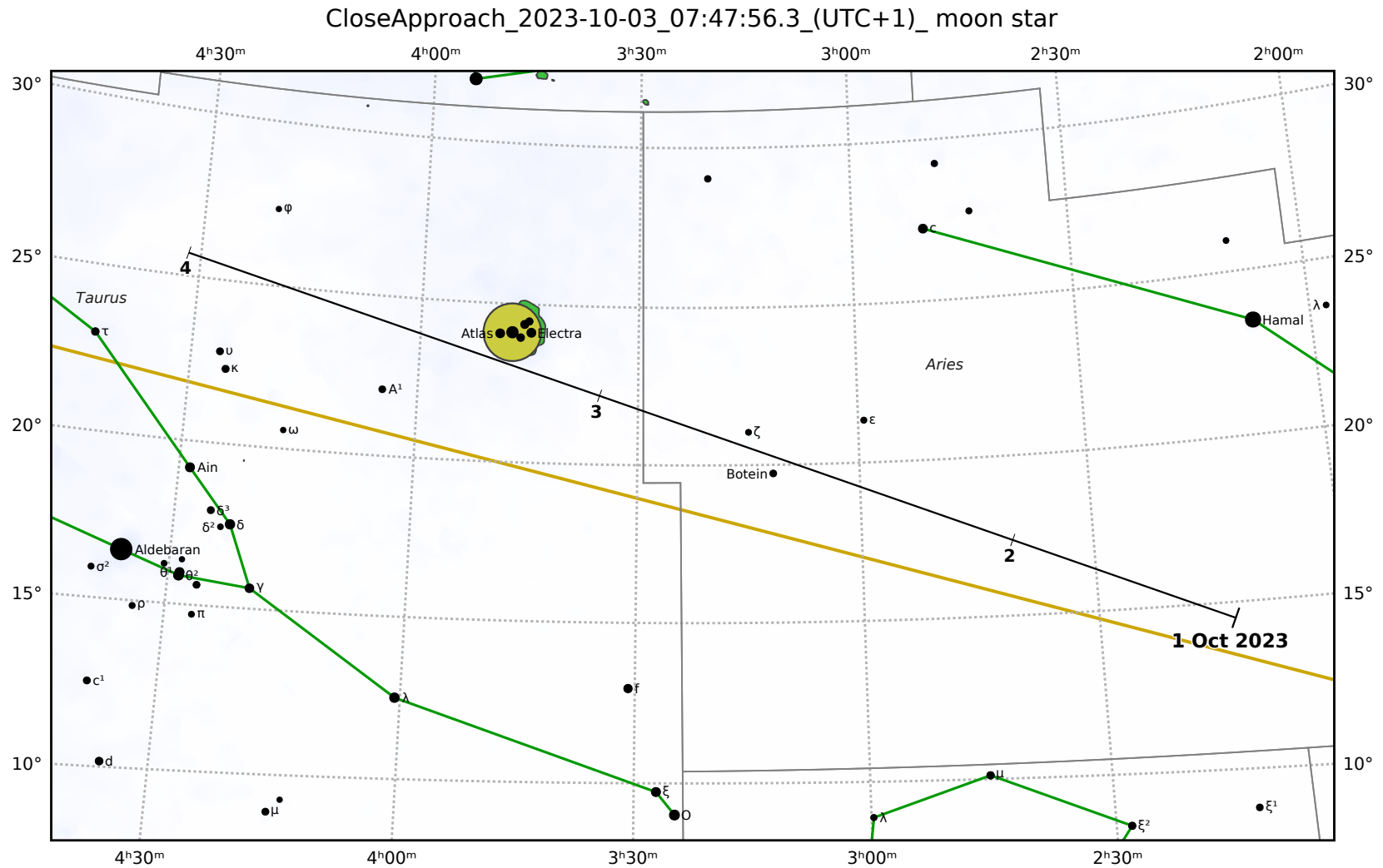


Generated with <https://github.com/dcf21/star-charter>

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

— The Equator — Ecliptic Plane — Galactic Plane

● Galaxy ■ Bright nebula ● Open cluster ● Globular cluster

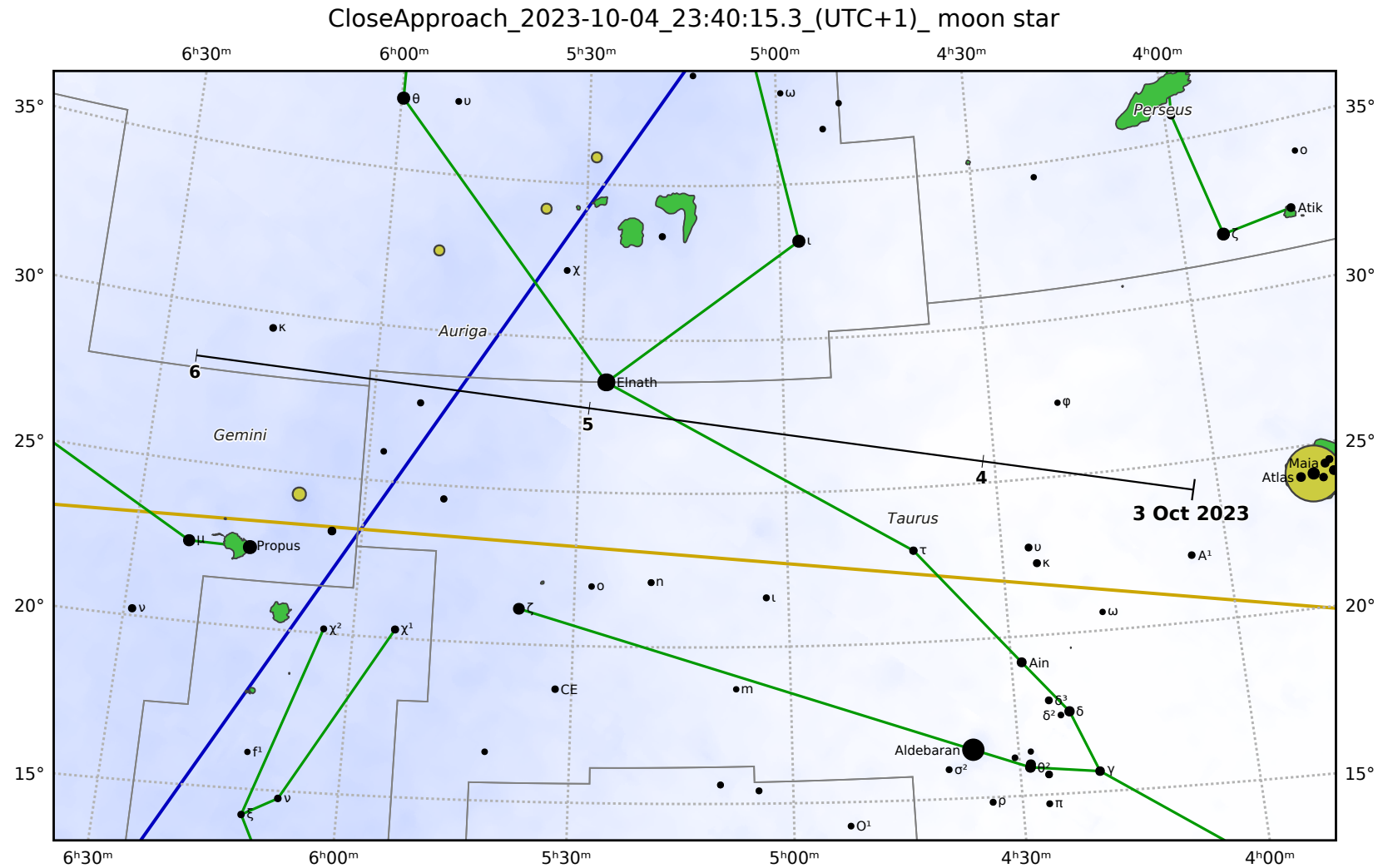


Generated with <https://github.com/dcf21/star-charter>

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

— The Equator — Ecliptic Plane — Galactic Plane

● Galaxy ■ Bright nebula ● Open cluster ● Globular cluster

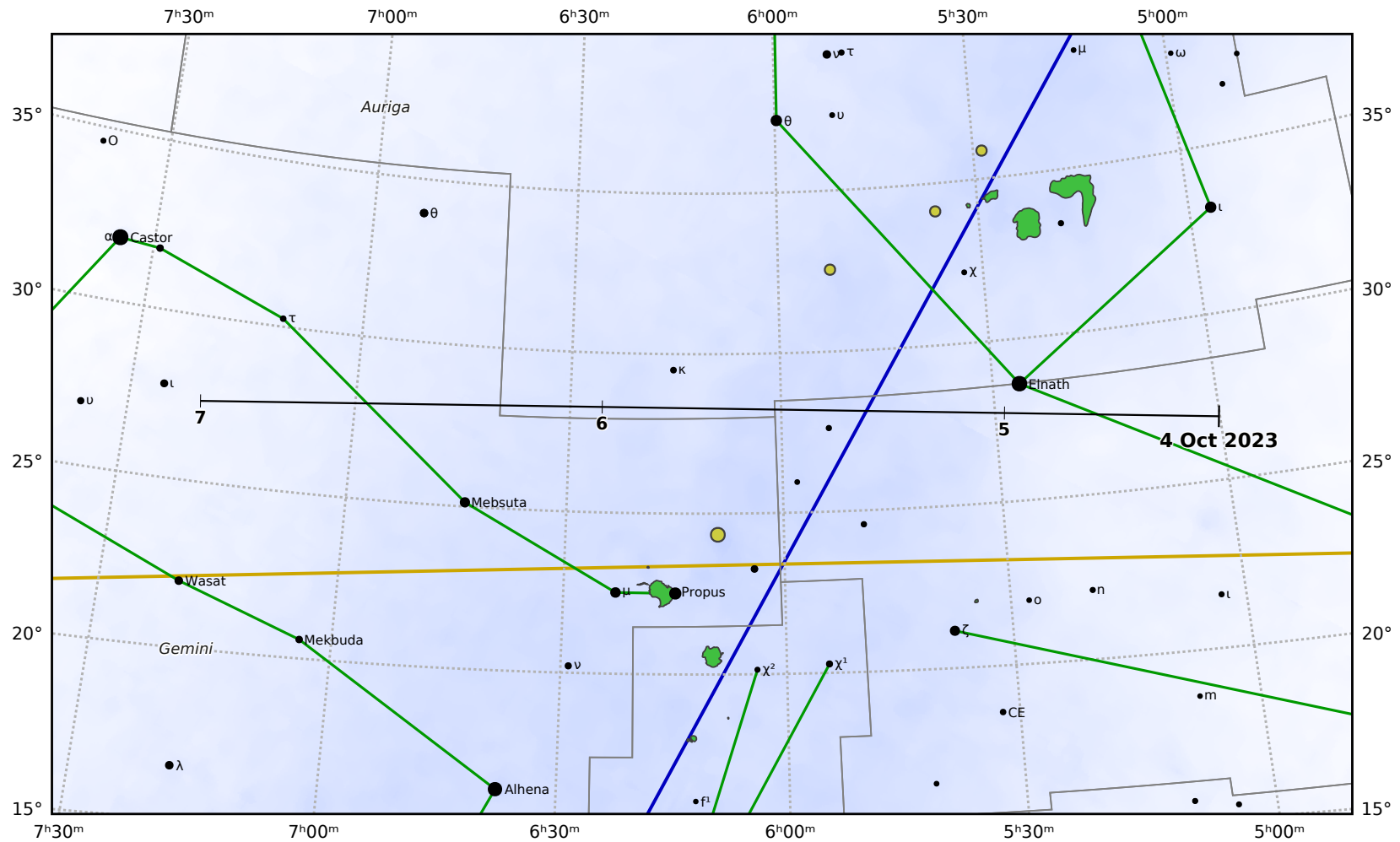


Magnitude scale: ● 5.0 ● 4.5 ● 4.0 ● 3.5 ● 3.0 ● 2.5 ● 2.0 ● 1.5 ● 1.0 ● 0.5

— The Equator — Ecliptic Plane — Galactic Plane

● Galaxy ■ Bright nebula ● Open cluster ● Globular cluster

CloseApproach_2023-10-06_10:48:41.8_(UTC+1)_ moon star

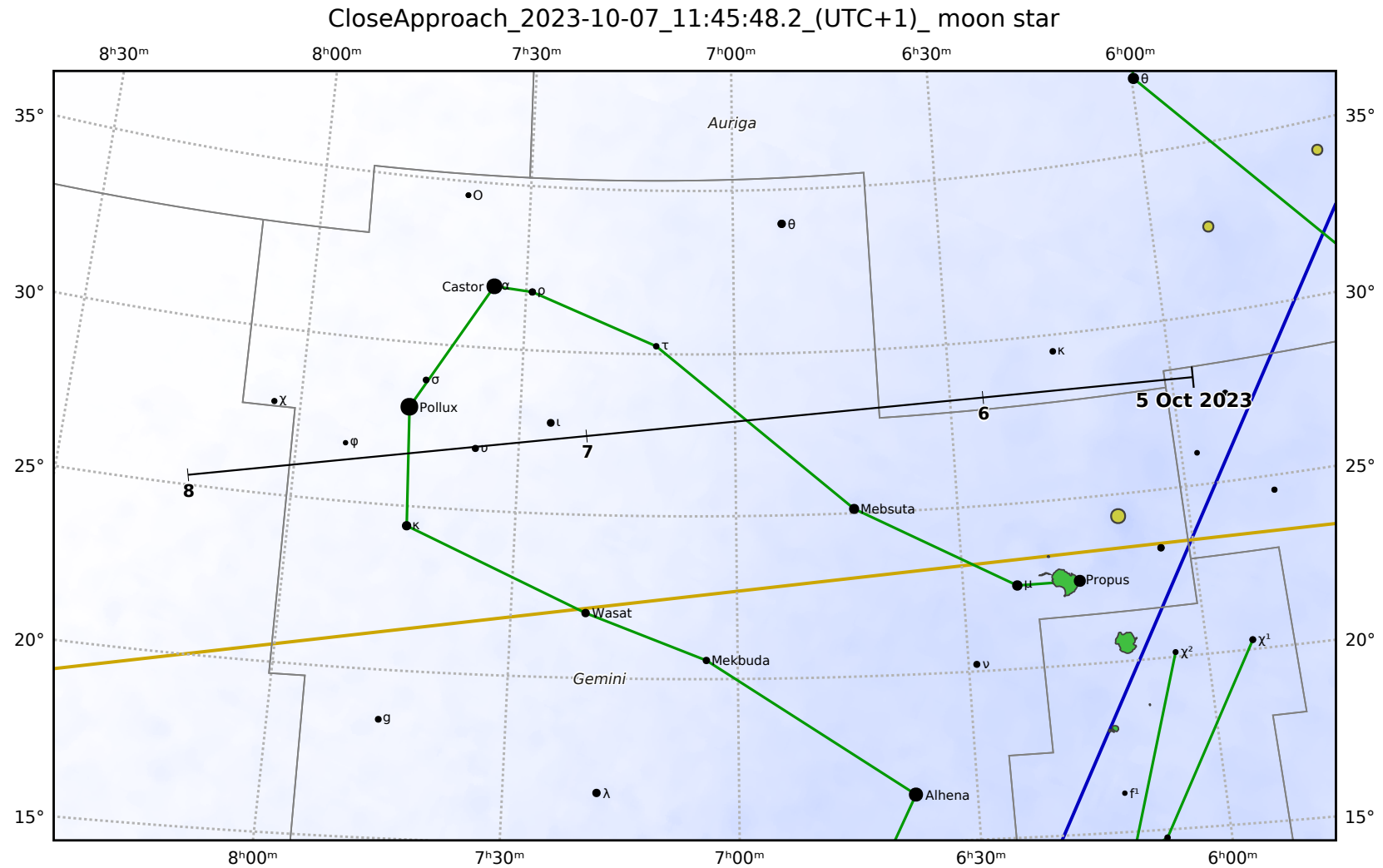


Generated with <https://github.com/dcf21/star-charter>

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

— The Equator — Ecliptic Plane — Galactic Plane

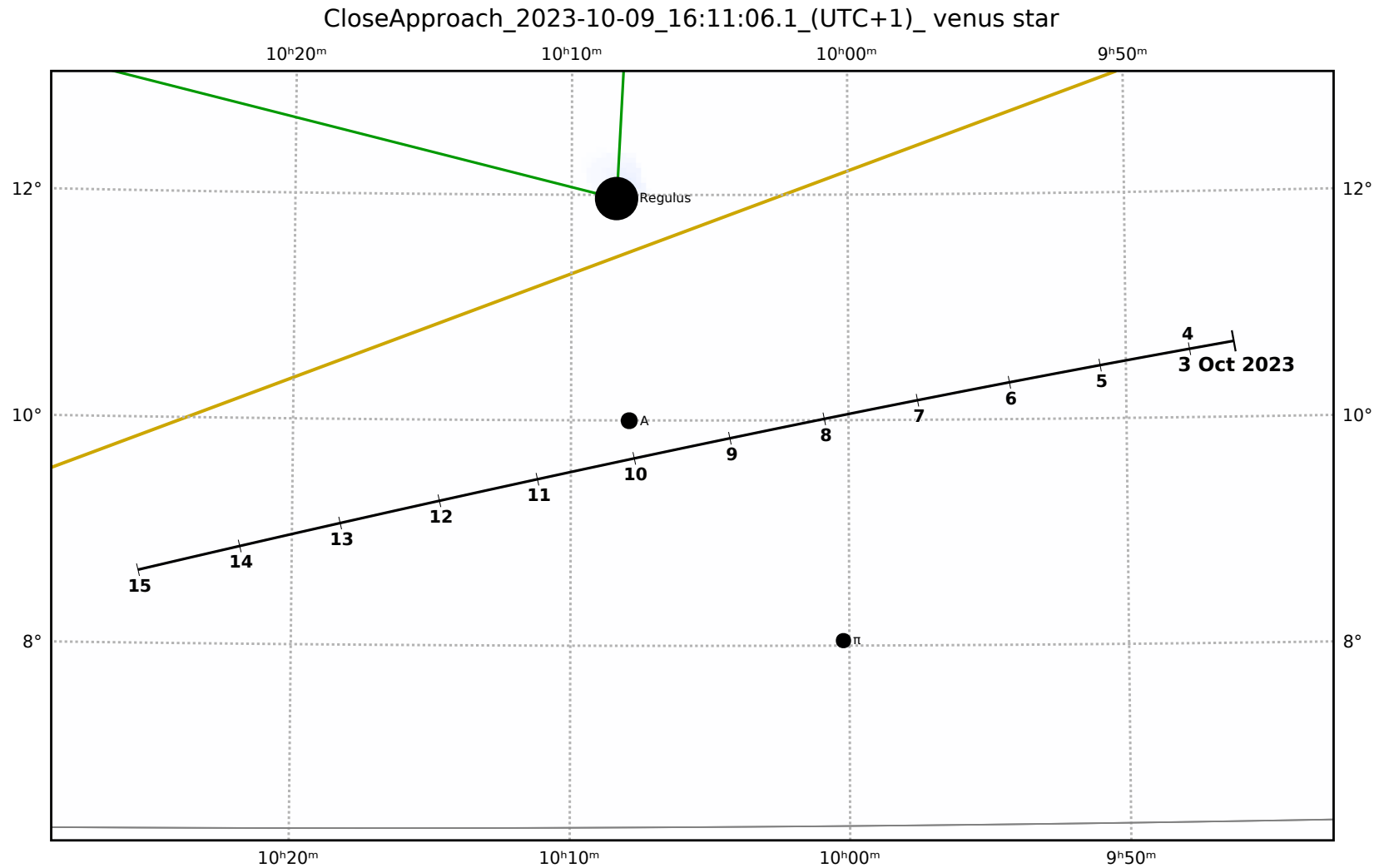
Galaxy Bright nebula Open cluster Globular cluster



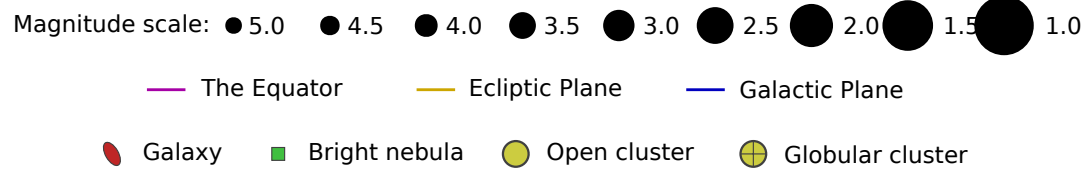
Magnitude scale: •5.0 •4.5 •4.0 •3.5 •3.0 •2.5 ●2.0 ●1.5 ●1.0

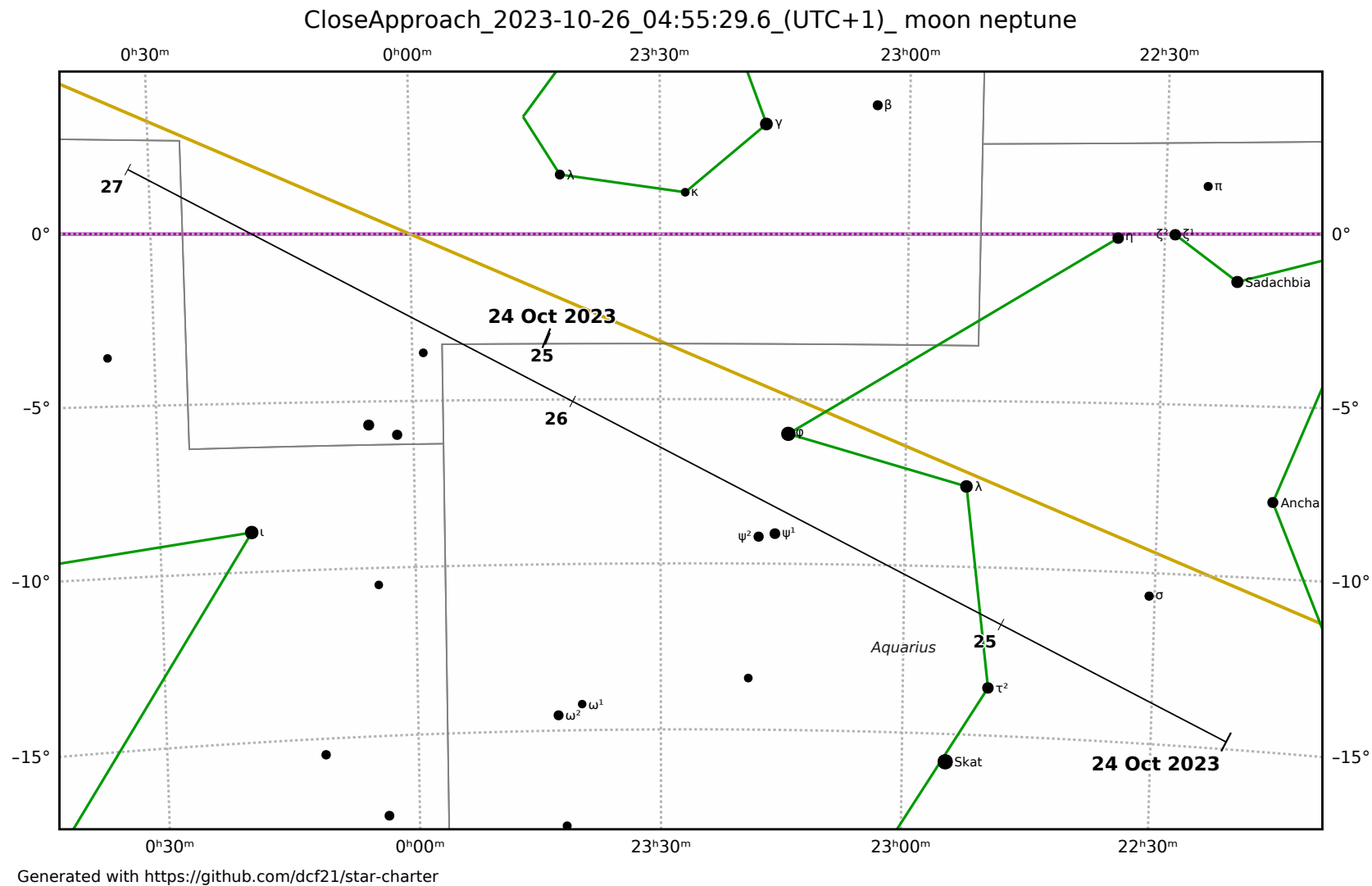
— The Equator — Ecliptic Plane — Galactic Plane

🌌 Galaxy ■ Bright nebula ● Open cluster ⊕ Globular cluster



Generated with <https://github.com/dcf21/star-charter>



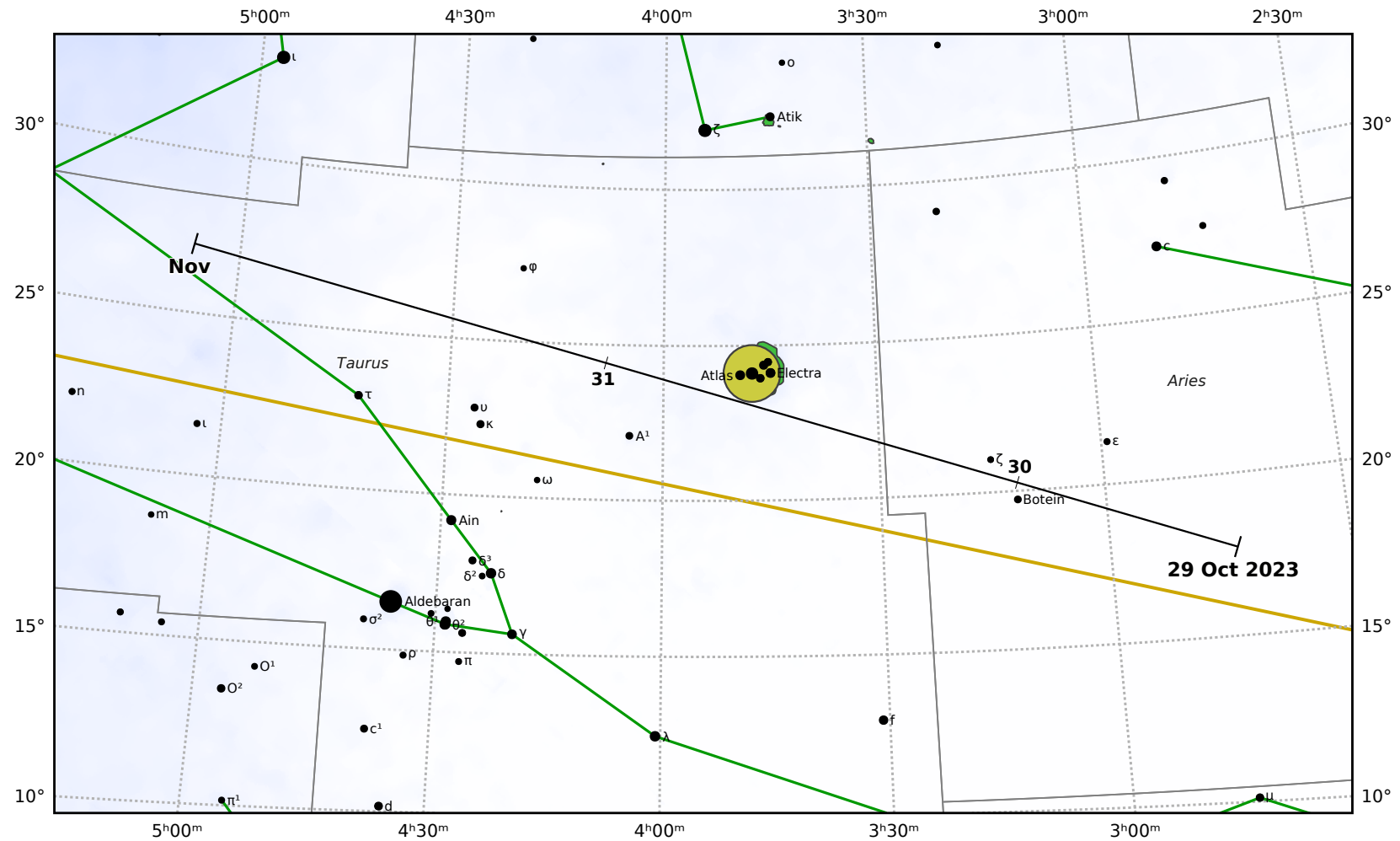


Magnitude scale: ● 5.0 ● 4.5 ● 4.0 ● 3.5 ● 3.0

— The Equator — Ecliptic Plane — Galactic Plane

● Galaxy ■ Bright nebula ● Open cluster ● Globular cluster

CloseApproach_2023-10-30_16:38:12.6_(UTC+1)_ moon star

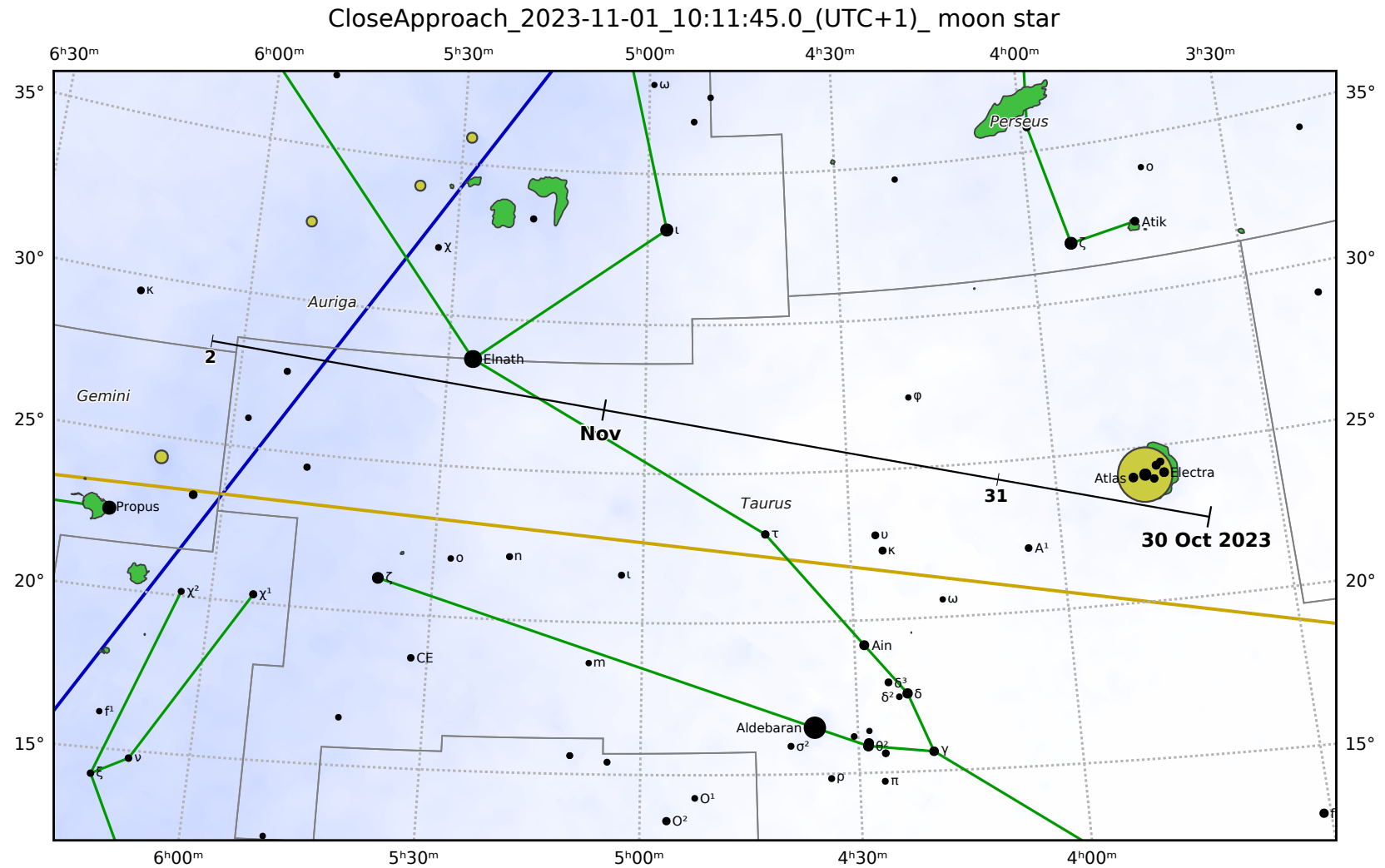


Generated with <https://github.com/dcf21/star-charter>

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

— The Equator — Ecliptic Plane — Galactic Plane

Galaxy Bright nebula Open cluster Globular cluster

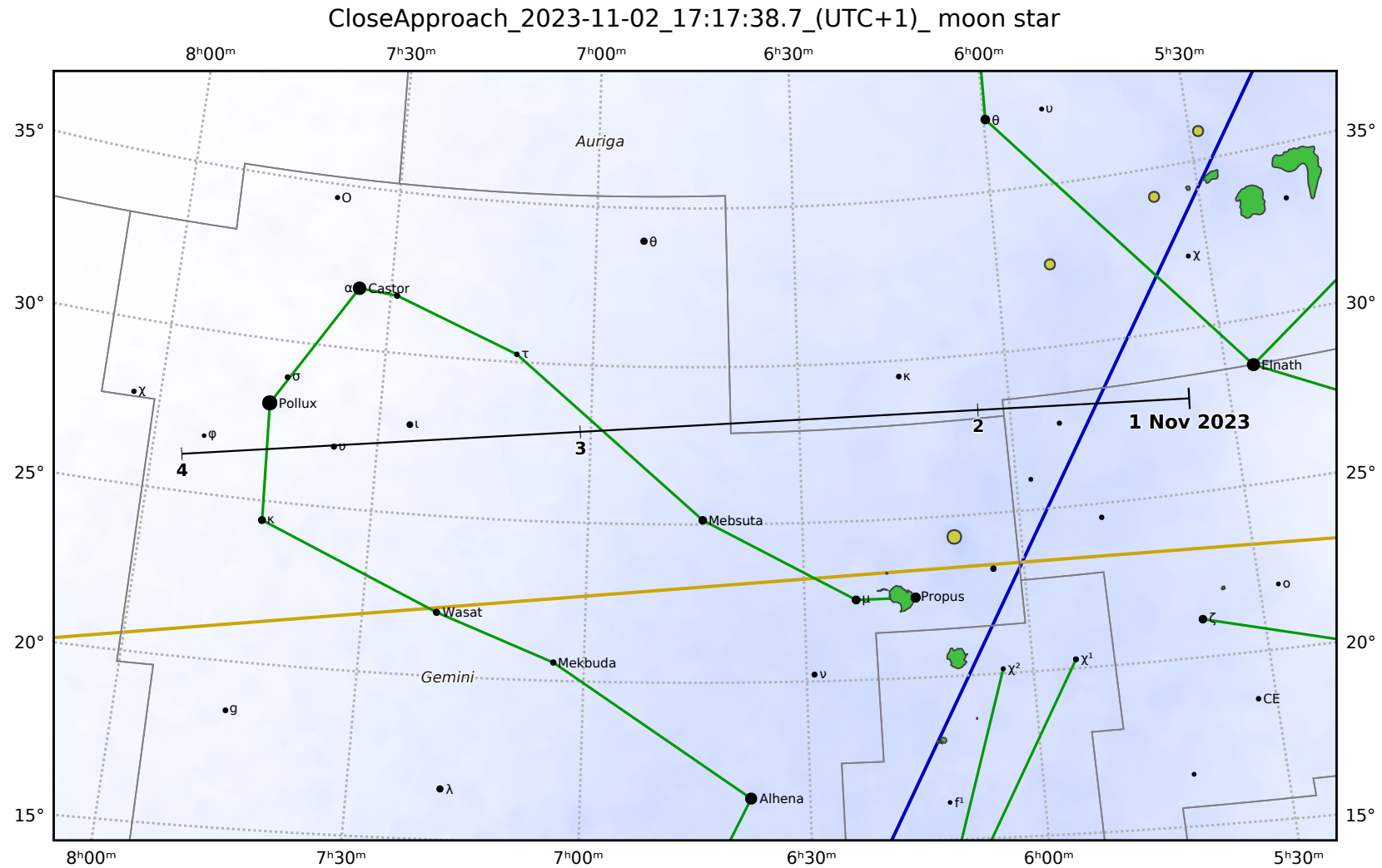


Generated with <https://github.com/dcf21/star-charter>

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

— The Equator — Ecliptic Plane — Galactic Plane

Galaxy Bright nebula Open cluster Globular cluster

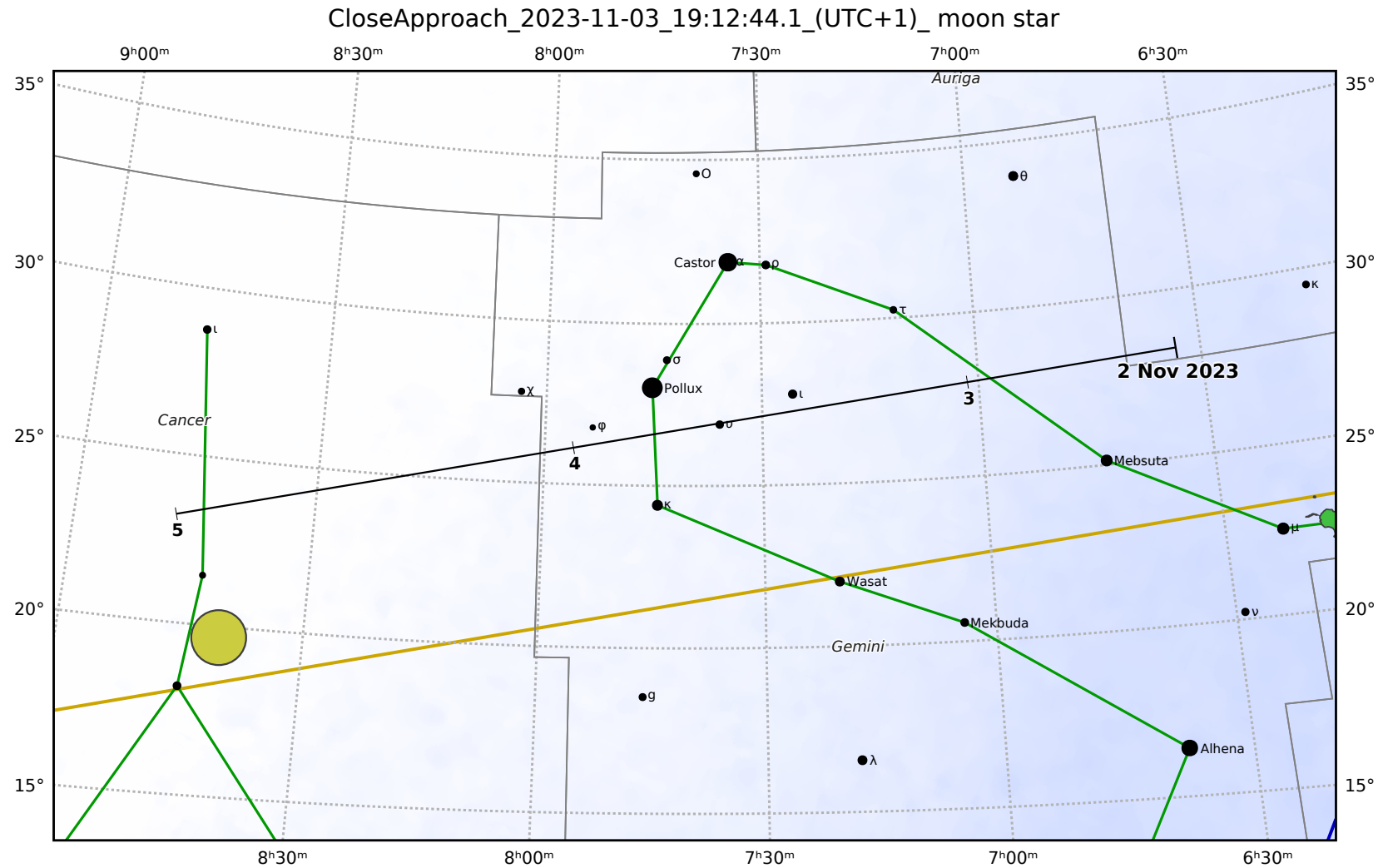


Generated with <https://github.com/dcf21/star-charter>

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

— The Equator — Ecliptic Plane — Galactic Plane

Galaxy Bright nebula Open cluster Globular cluster

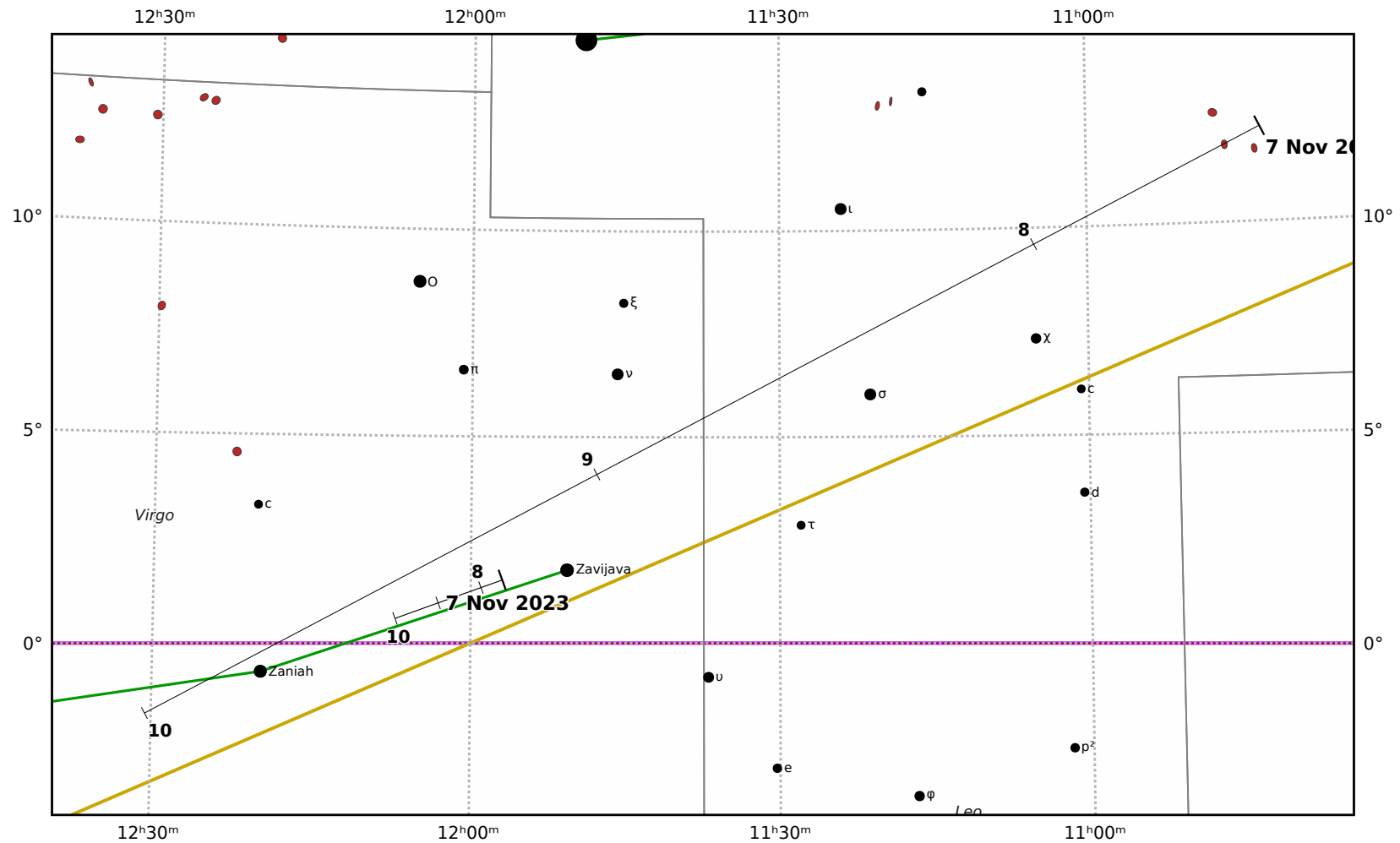


Magnitude scale: • 5.0 • 4.5 • 4.0 • 3.5 • 3.0 • 2.5 • 2.0 • 1.5 • 1.0

— The Equator — Ecliptic Plane — Galactic Plane

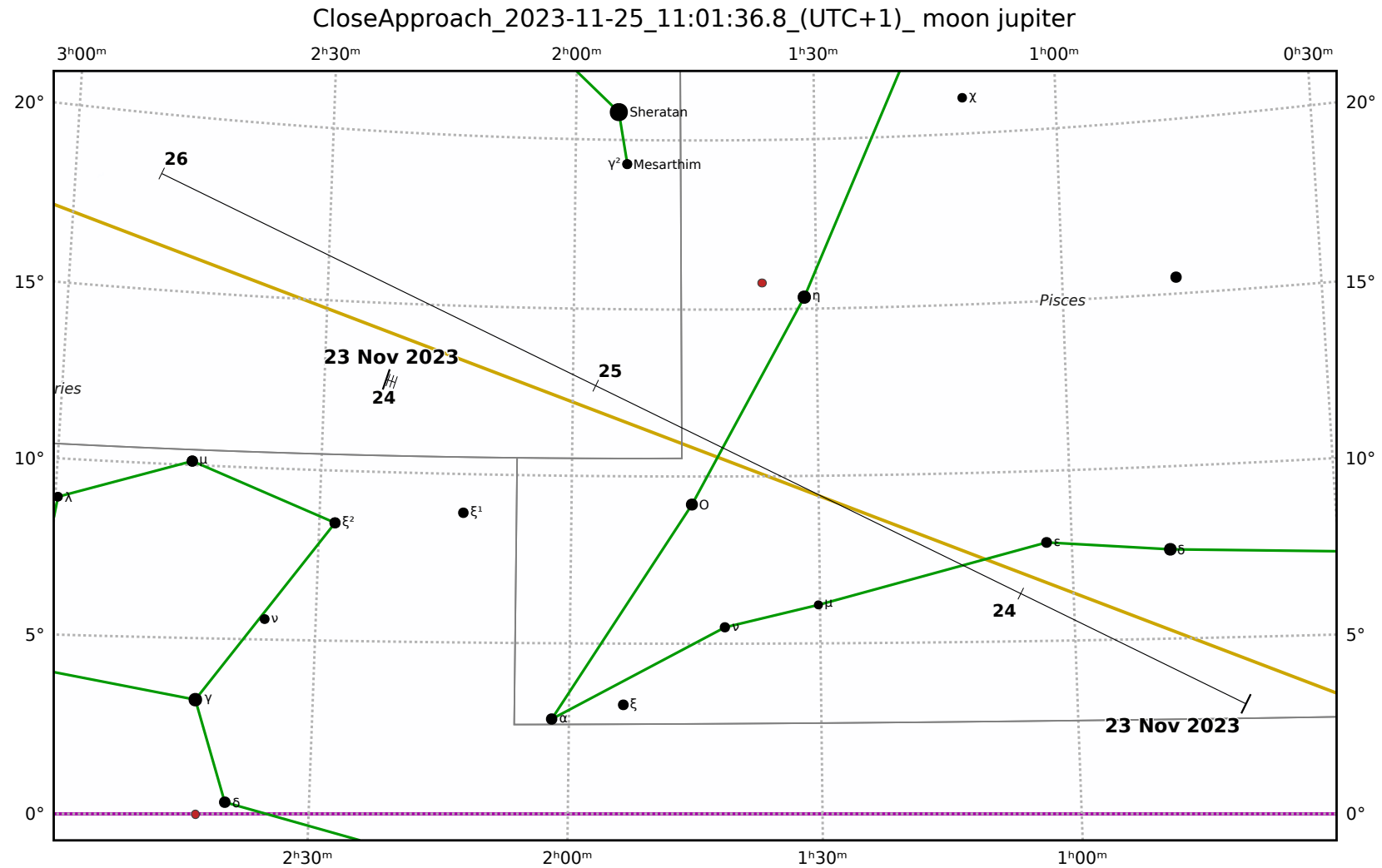
● Galaxy ■ Bright nebula ● Open cluster ● Globular cluster

CloseApproach_2023-11-09_11:23:09.0_(UTC+1)_venus moon

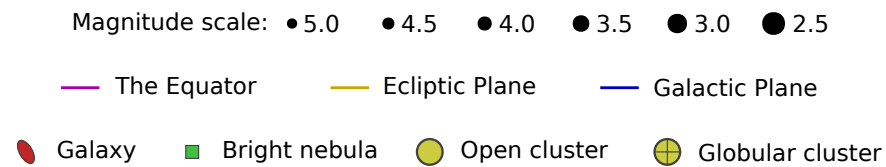


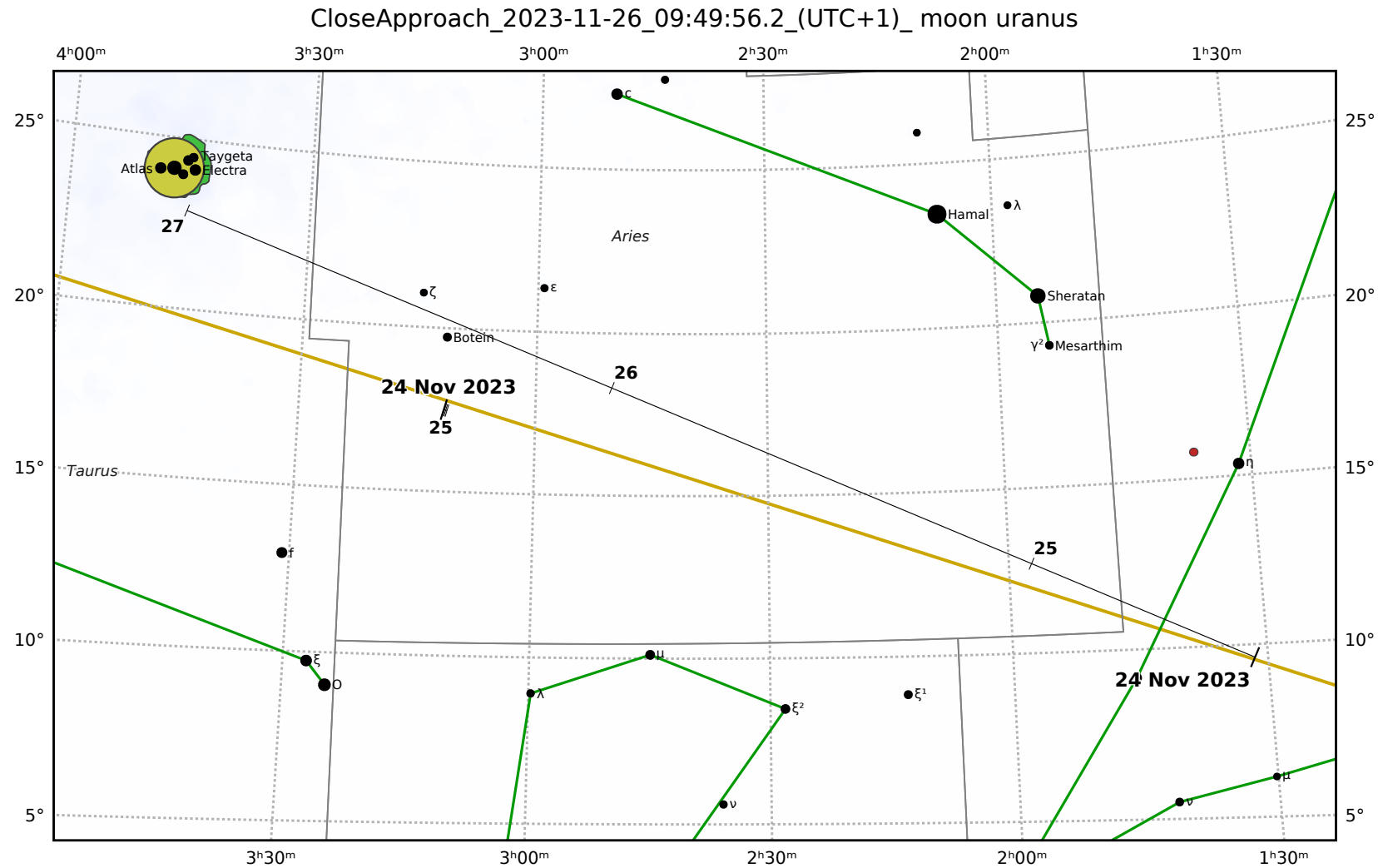
Generated with <https://github.com/dcf21/star-charter>

- Magnitude scale: ● 5.0 ● 4.5 ● 4.0 ● 3.5 ● 3.0 ● 2.5 ● 2.0
- The Equator — Ecliptic Plane — Galactic Plane
- Galaxy ■ Bright nebula ● Open cluster ⊕ Globular cluster



Generated with <https://github.com/dcf21/star-charter>



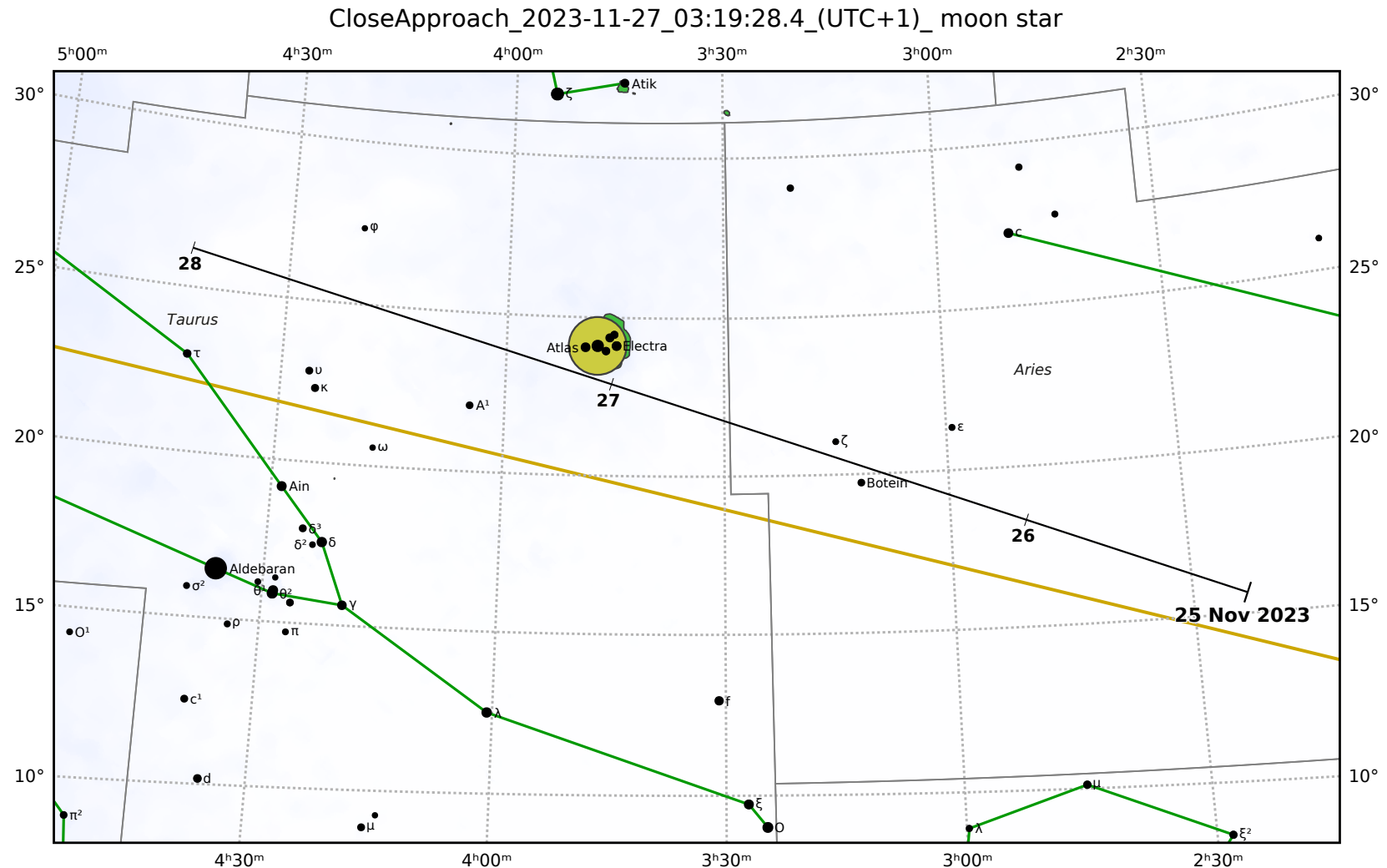


Generated with <https://github.com/dcf21/star-charter>

Magnitude scale: ● 5.0 ● 4.5 ● 4.0 ● 3.5 ● 3.0 ● 2.5 ● 2.0

— The Equator — Ecliptic Plane — Galactic Plane

● Galaxy ■ Bright nebula ● Open cluster ● Globular cluster

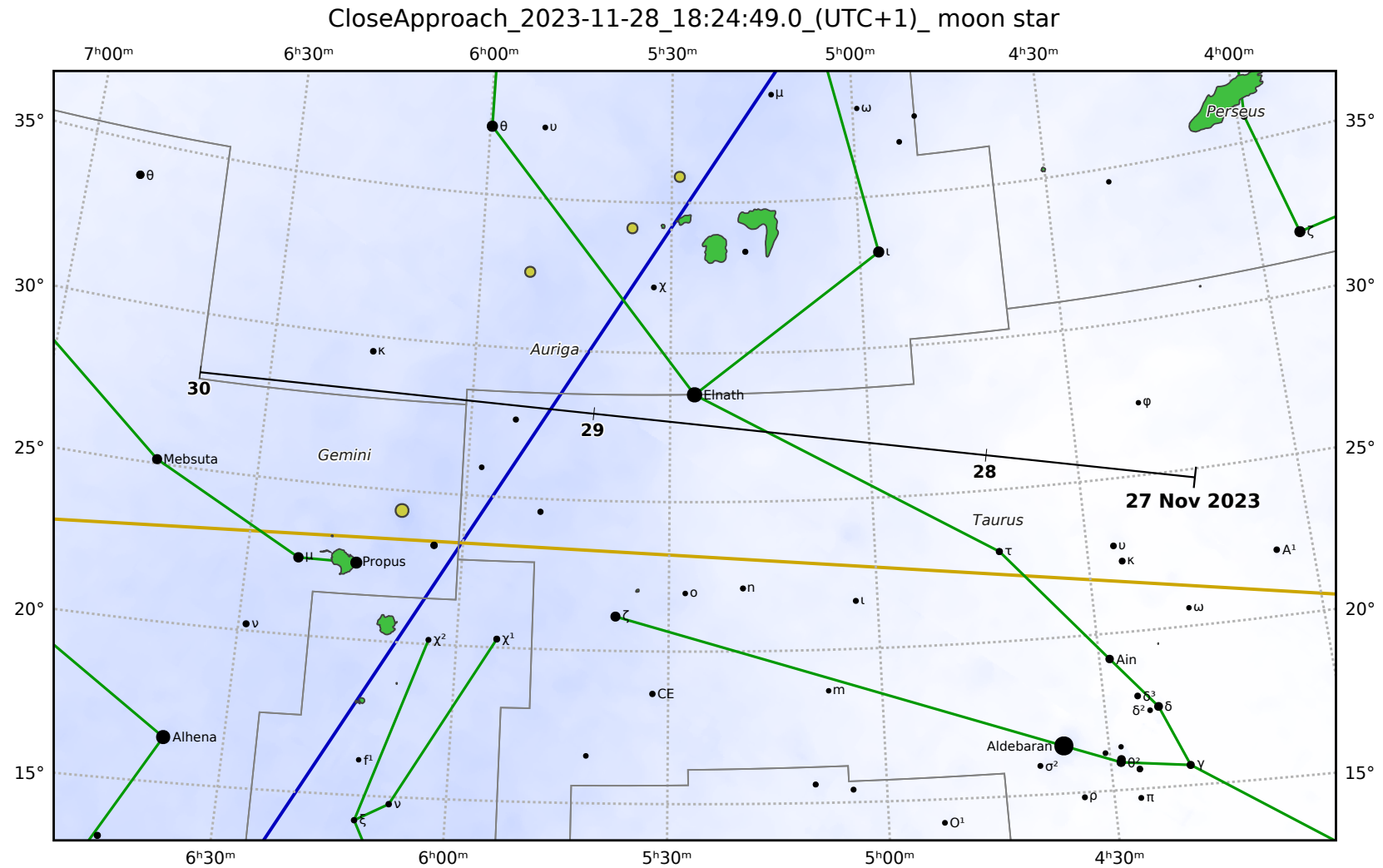


Generated with <https://github.com/dcf21/star-charter>

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

— The Equator — Ecliptic Plane — Galactic Plane

👉 Galaxy 🟩 Bright nebula 🟡 Open cluster 🟡⊕ Globular cluster

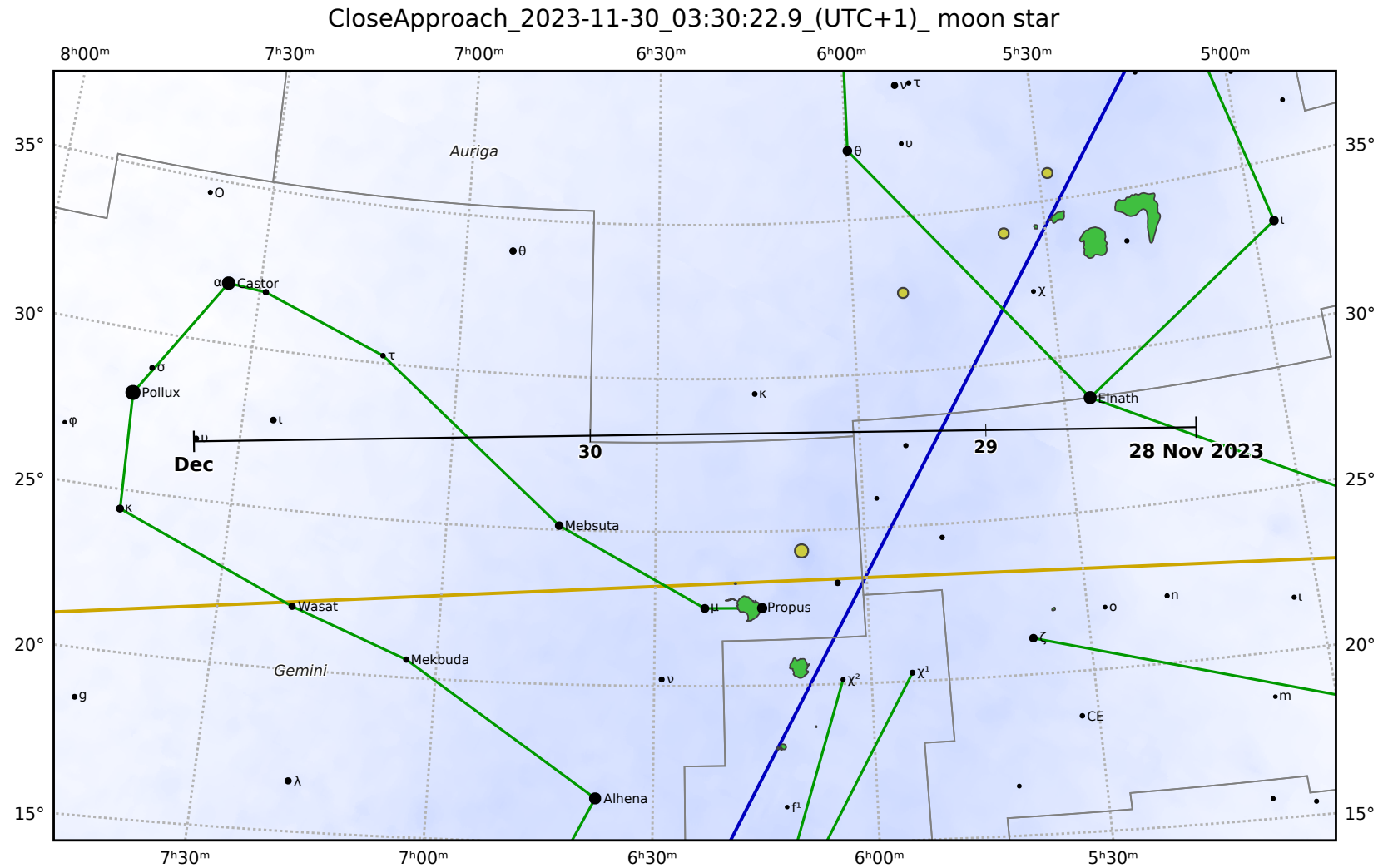


Generated with <https://github.com/dcf21/star-charter>

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

— The Equator — Ecliptic Plane — Galactic Plane

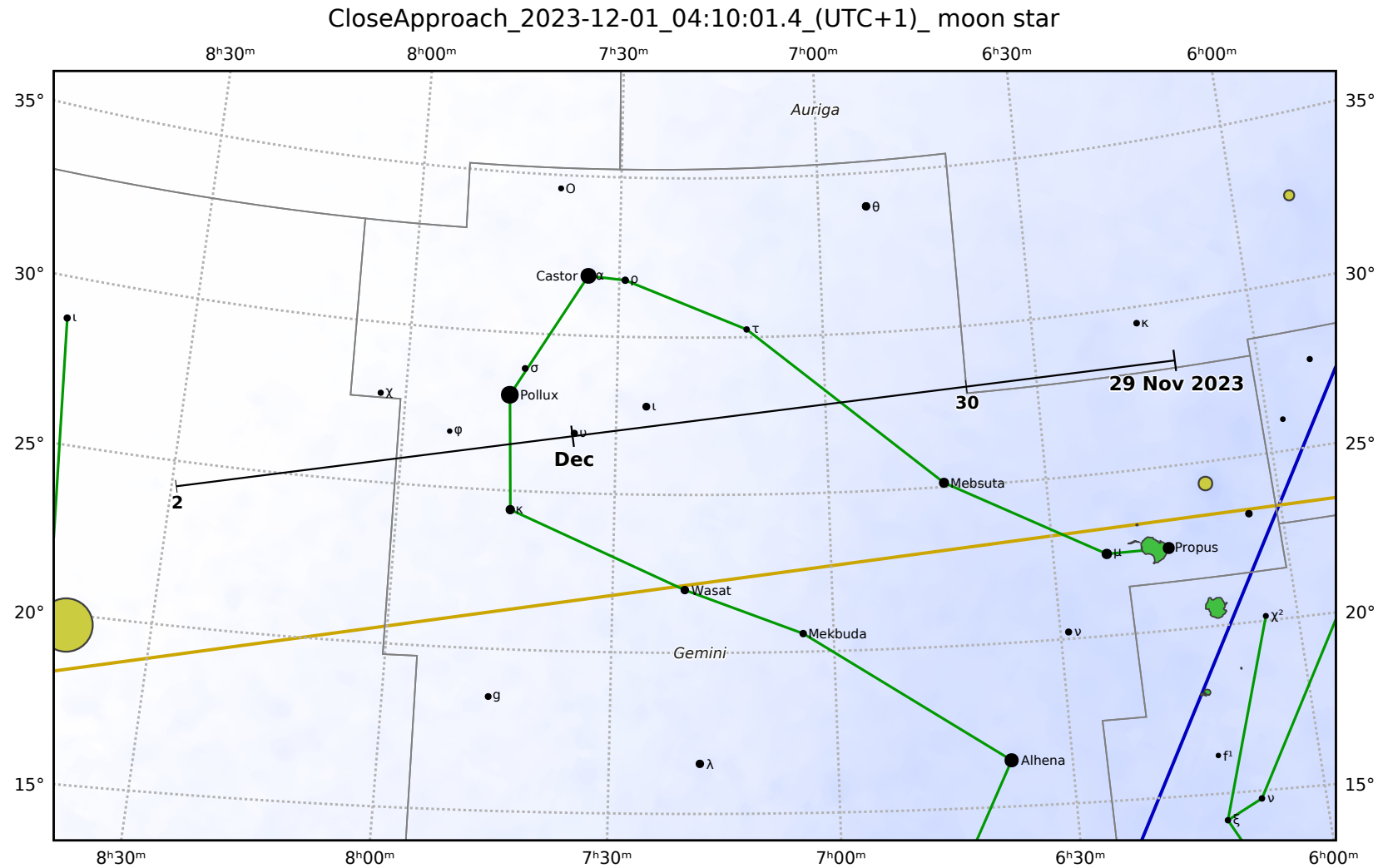
Galaxy Bright nebula Open cluster Globular cluster



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

— The Equator — Ecliptic Plane — Galactic Plane

🌌 Galaxy 🌌 Bright nebula 🌌 Open cluster 🌌 Globular cluster



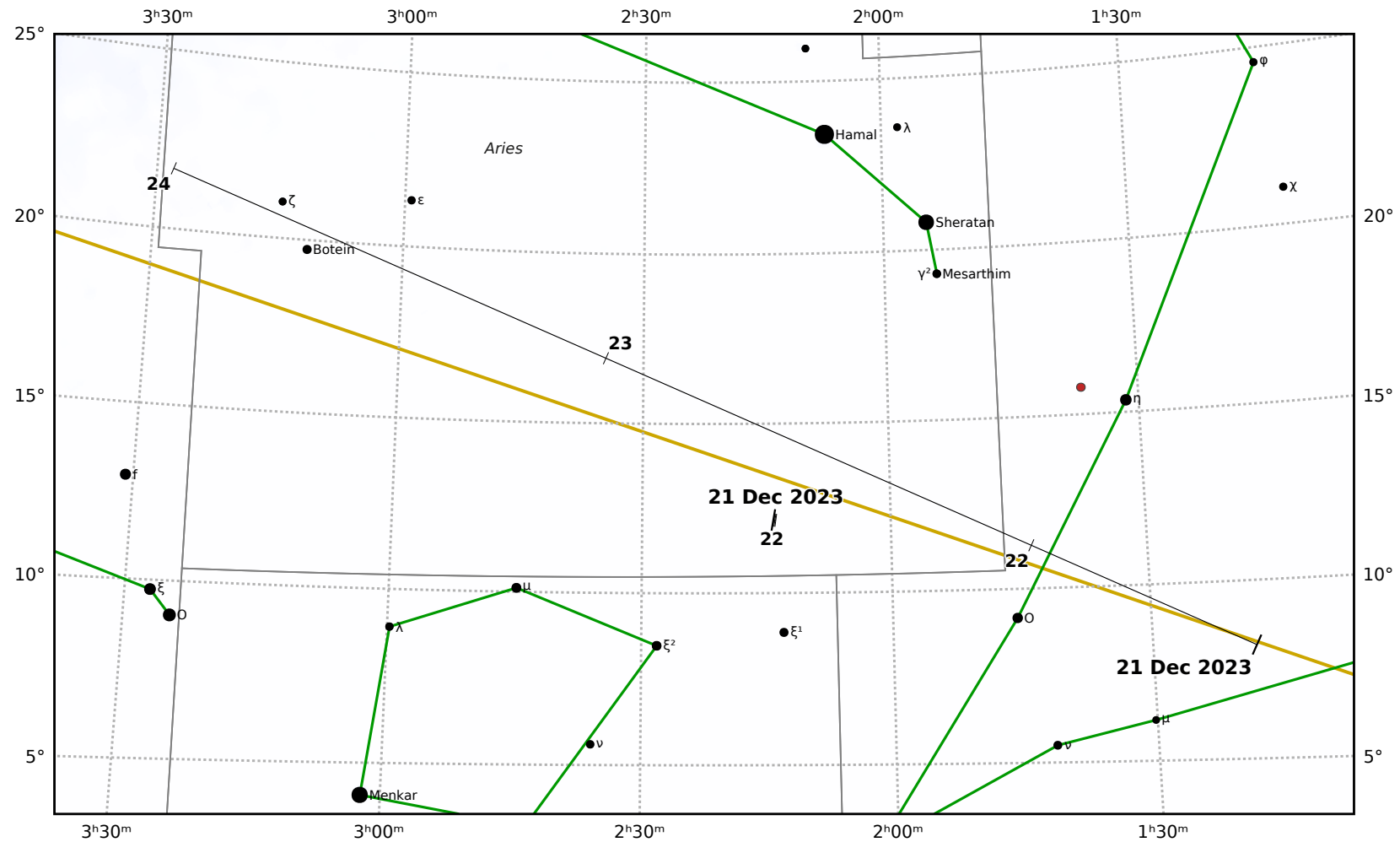
Generated with <https://github.com/dcf21/star-charter>

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

— The Equator — Ecliptic Plane — Galactic Plane

Galaxy Bright nebula Open cluster Globular cluster

CloseApproach_2023-12-22_13:13:03.5_(UTC+1)_moon jupiter



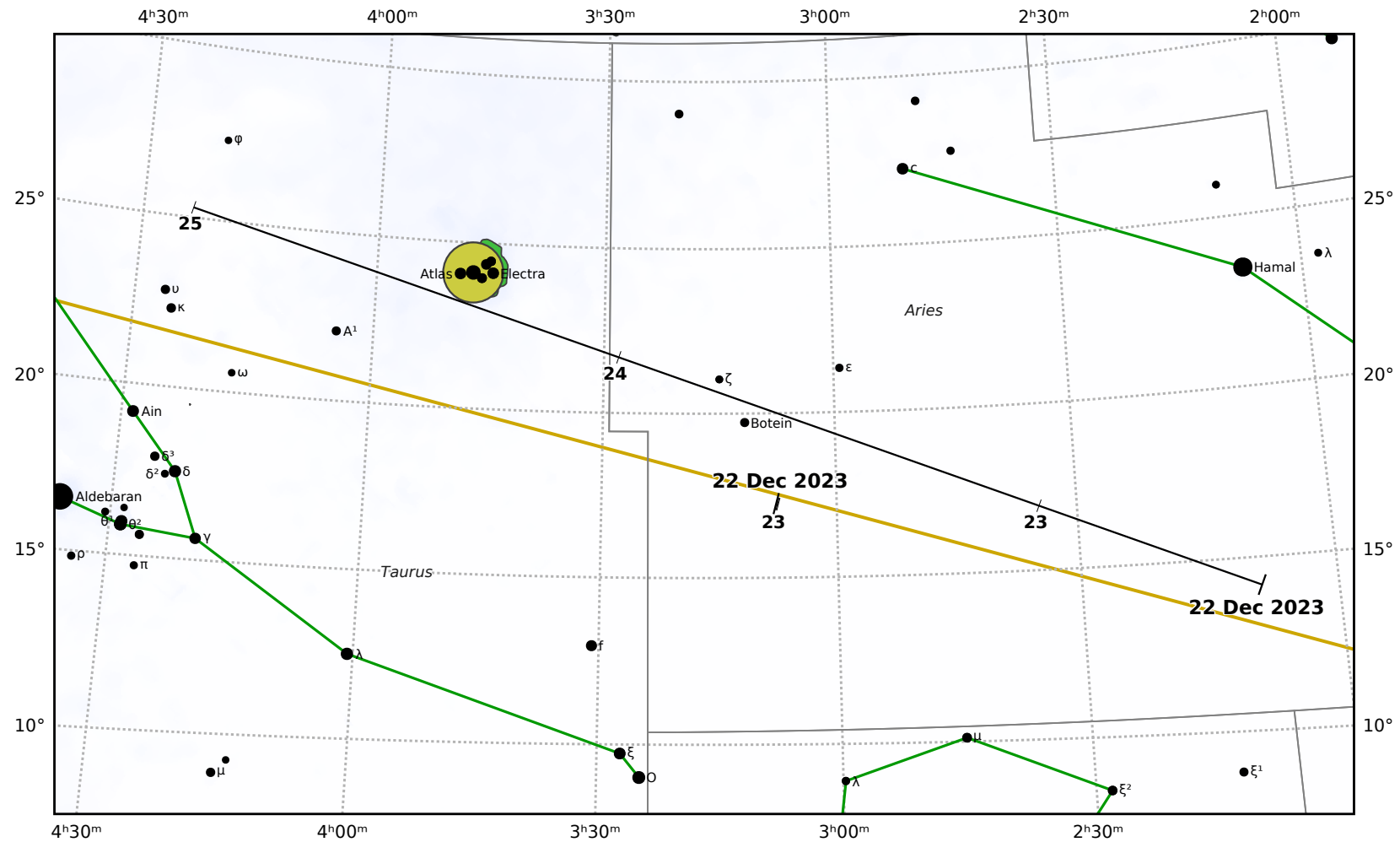
Generated with <https://github.com/dcf21/star-charter>

Magnitude scale: ● 5.0 ● 4.5 ● 4.0 ● 3.5 ● 3.0 ● 2.5 ● 2.0

— The Equator — Ecliptic Plane — Galactic Plane

● Galaxy ■ Bright nebula ● Open cluster ⊕ Globular cluster

CloseApproach_2023-12-23_13:44:15.6_(UTC+1)_ moon uranus

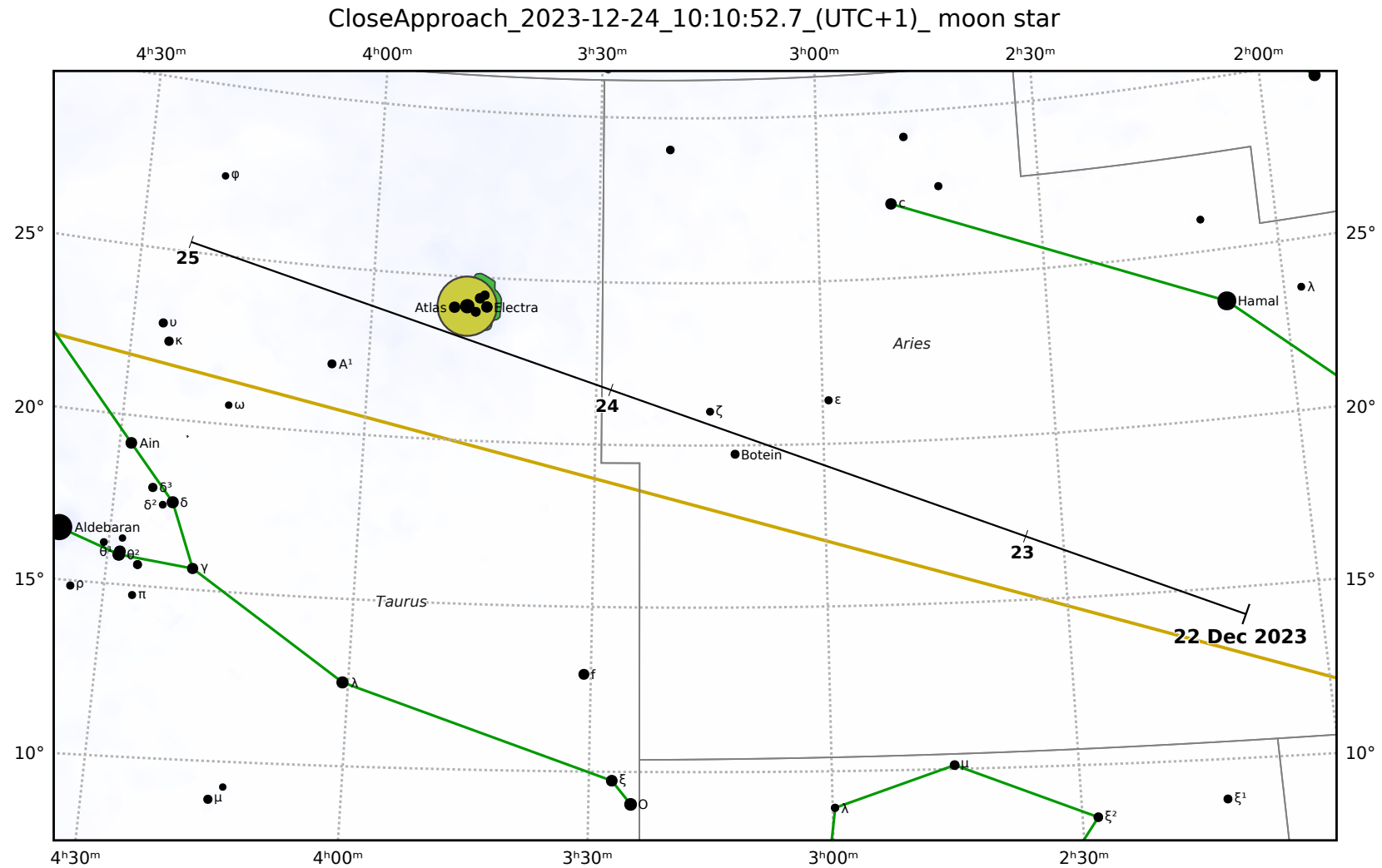


Generated with <https://github.com/dcf21/star-charter>

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

— The Equator — Ecliptic Plane — Galactic Plane

● Galaxy ■ Bright nebula ● Open cluster ● Globular cluster

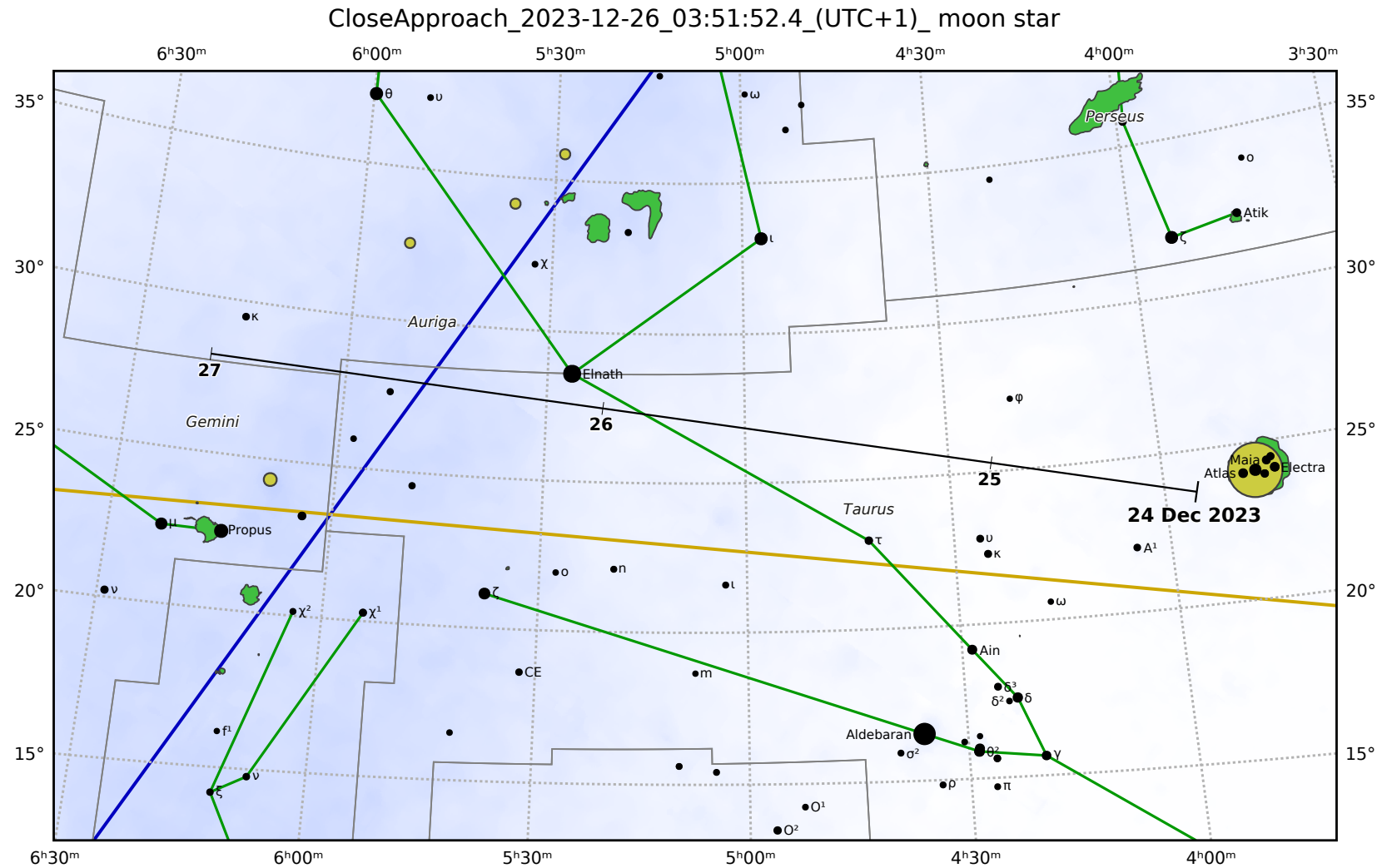


Generated with <https://github.com/dcf21/star-charter>

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

— The Equator — Ecliptic Plane — Galactic Plane

● Galaxy ■ Bright nebula ● Open cluster ● Globular cluster



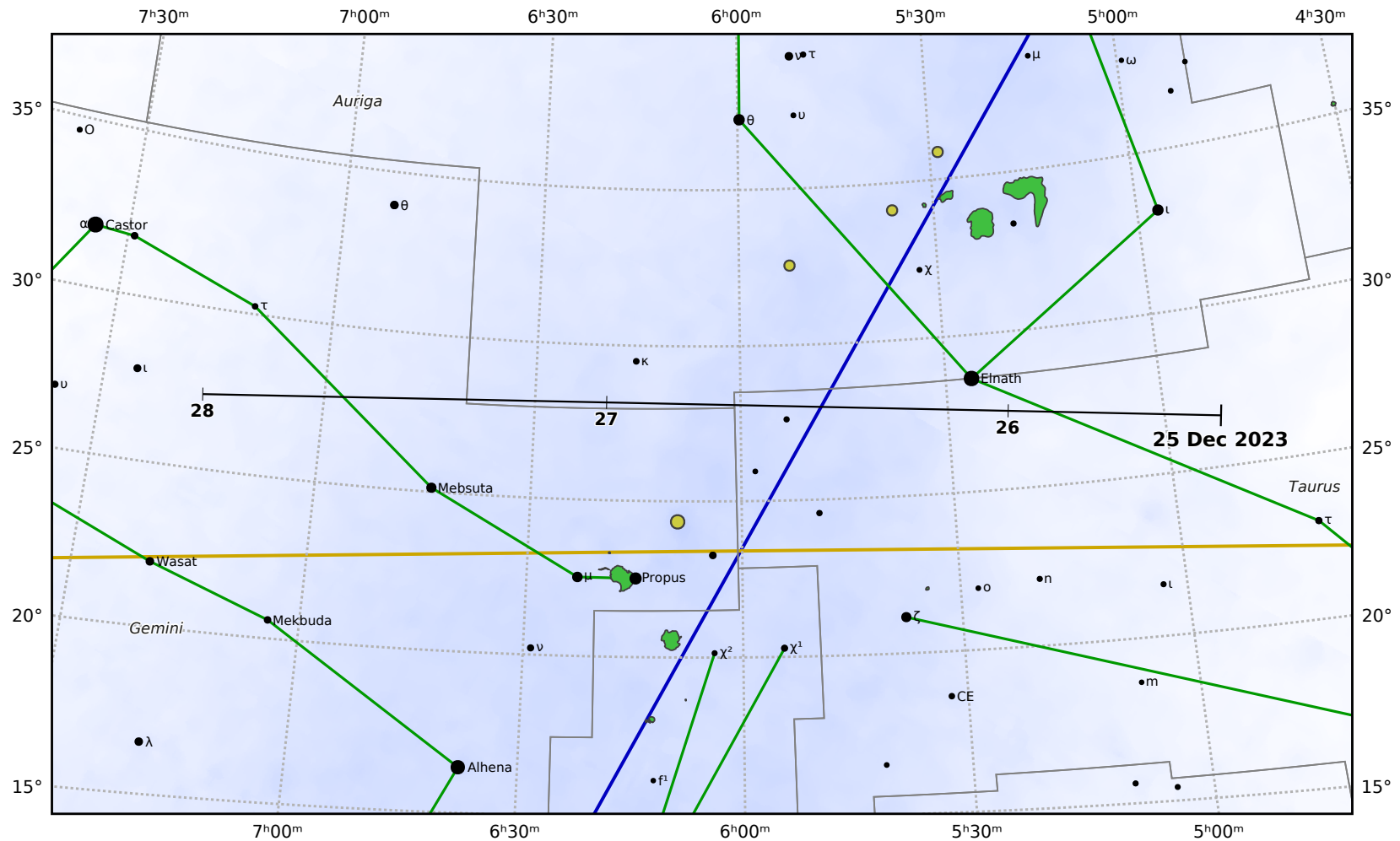
Generated with <https://github.com/dcf21/star-charter>

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

— The Equator — Ecliptic Plane — Galactic Plane

Galaxy Bright nebula Open cluster Globular cluster

CloseApproach_2023-12-27_11:40:17.9_(UTC+1)_ moon star

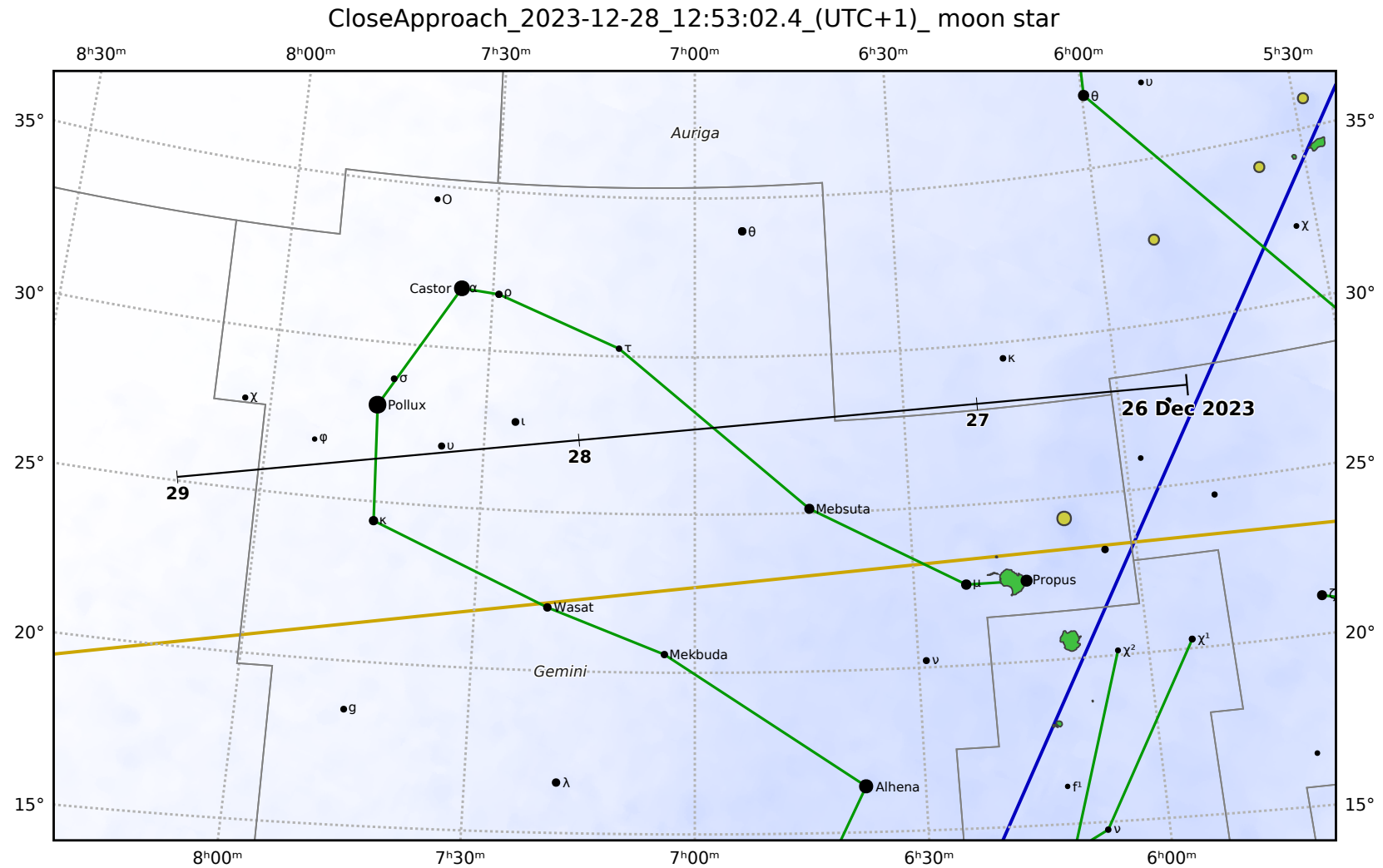


Generated with <https://github.com/dcf21/star-charter>

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

— The Equator — Ecliptic Plane — Galactic Plane

👉 Galaxy 🟩 Bright nebula 🟡 Open cluster 🟡⊕ Globular cluster



Generated with <https://github.com/dcf21/star-charter>

Magnitude scale: • 5.0 • 4.5 • 4.0 • 3.5 • 3.0 • 2.5 • 2.0 • 1.5 • 1.0

— The Equator — Ecliptic Plane — Galactic Plane

● Galaxy ■ Bright nebula ● Open cluster ⊕ Globular cluster

3 Fragen und Hinweise

Wenn Sie Fragen oder Hinweise haben, können Sie sich gern an thomas.rinder@fh-kiel.de wenden.

Die notwendigen Berechnungen wurden mit dem Datensatz <https://ssd.jpl.nasa.gov/doc/Park.2021.AJ.DE440.pdf> durchgeführt und beziehen sich auf den Standort der Sternwarte der FH Kiel. (Acton [1996])

Die Sternkarten sind mit StarCharter <https://github.com/dcf21/star-charter> erzeugt worden. (Ford)

Literatur

Charles H. Acton. Ancillary data services of nasa's navigation and ancillary information facility. *Planetary and Space Science*, 44(1): 65–70, 1996. ISSN 0032-0633. doi: [https://doi.org/10.1016/0032-0633\(95\)00107-7](https://doi.org/10.1016/0032-0633(95)00107-7). URL <https://www.sciencedirect.com/science/article/pii/0032063395001077>. Planetary data system.

Dominic Ford. Starcharter. URL <https://github.com/dcf21/star-charter>.