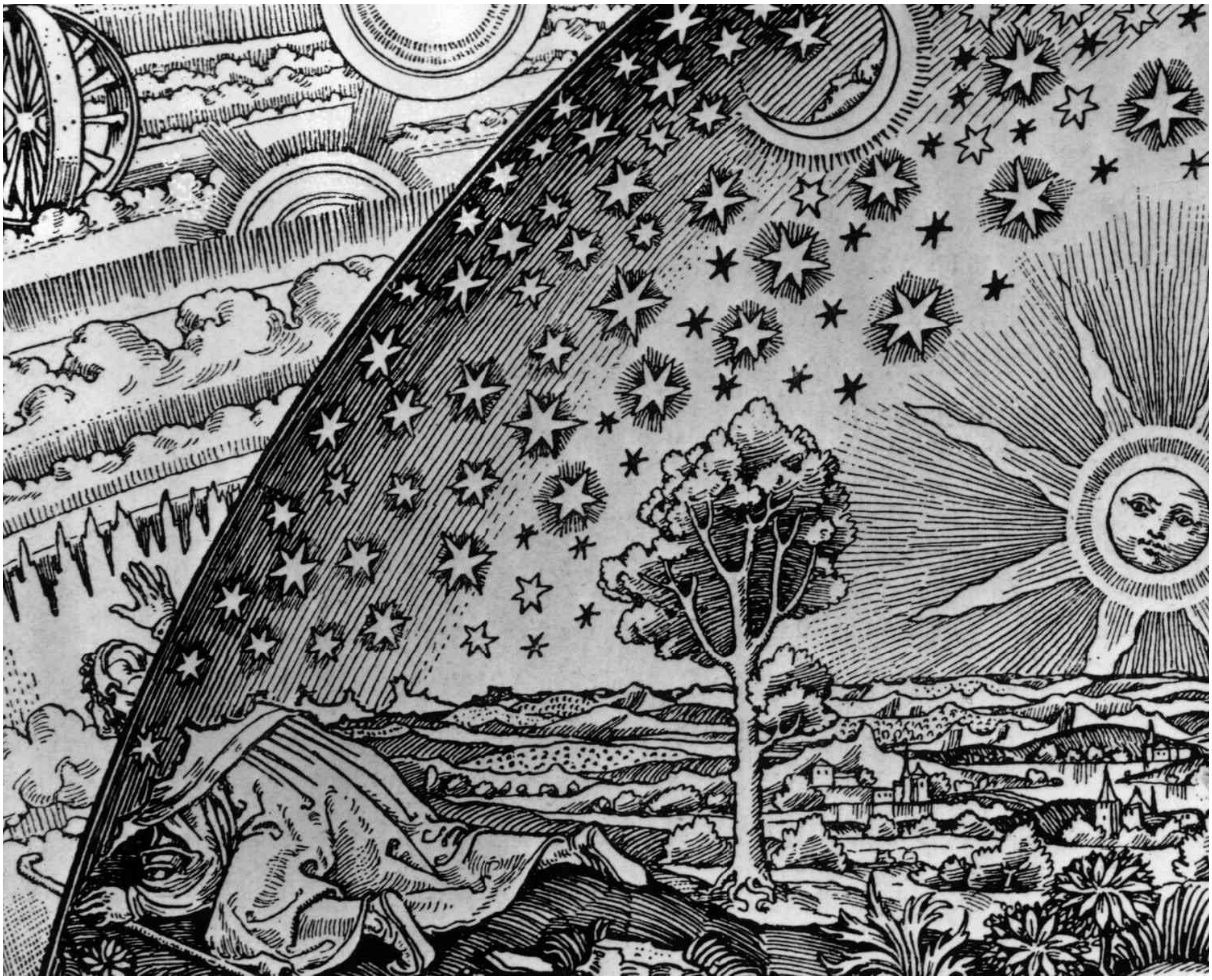
Mars

2025
Planet Visibility Charts



TheNauticalAlmanac.com

The charts contained herein were generated using a program created by Mr. Andrew Bauer.
Verify the accuracy of the data prior to use.
You use them at your own risk or peril.

Mars

Acknowledgment and Credit

Andrew Bauer

Mr. Bauer has created a python based program that generates the clear arrangement of data you'll find in the Planet Visibility Charts. He has also created the separate *Declination of the Sun and Planets* and *Local Mean Time of Meridian Passage* located at the end of this document.

His work was determined, tireless and efficient. In our mutual writing across many lines of longitude he has always been pleasant, friendly and most affable.

As he has said, *"The art of celestial navigation should be promoted, not discouraged, even in the modern day"*.

Disclaimer and Warning

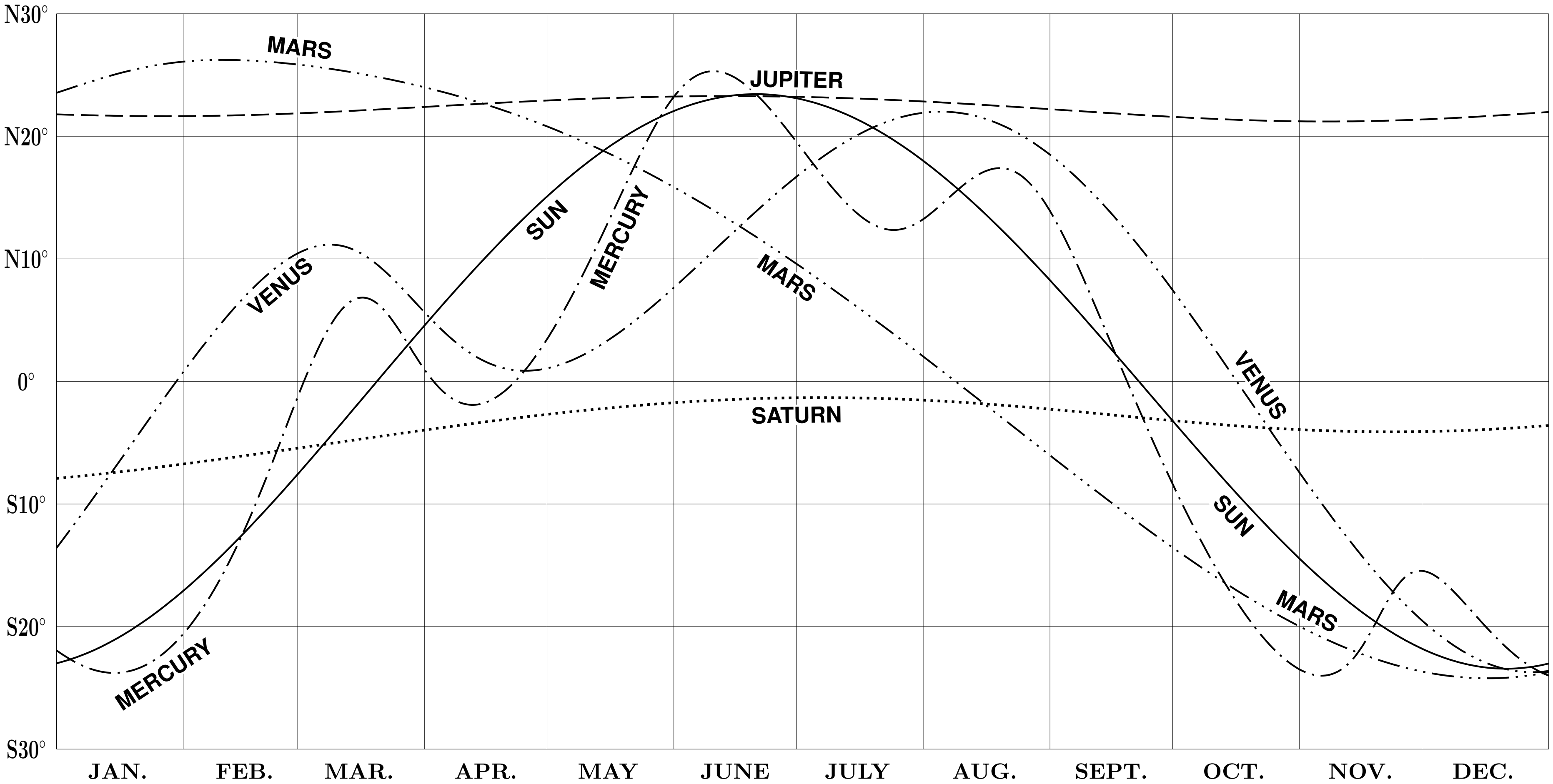
Prior to use verify the accuracy of the data you download from our site. It SHOULD NOT and MUST NOT be relied upon for celestial navigation work of any sorts or any purpose whatsoever. You use them at your own risk or peril.

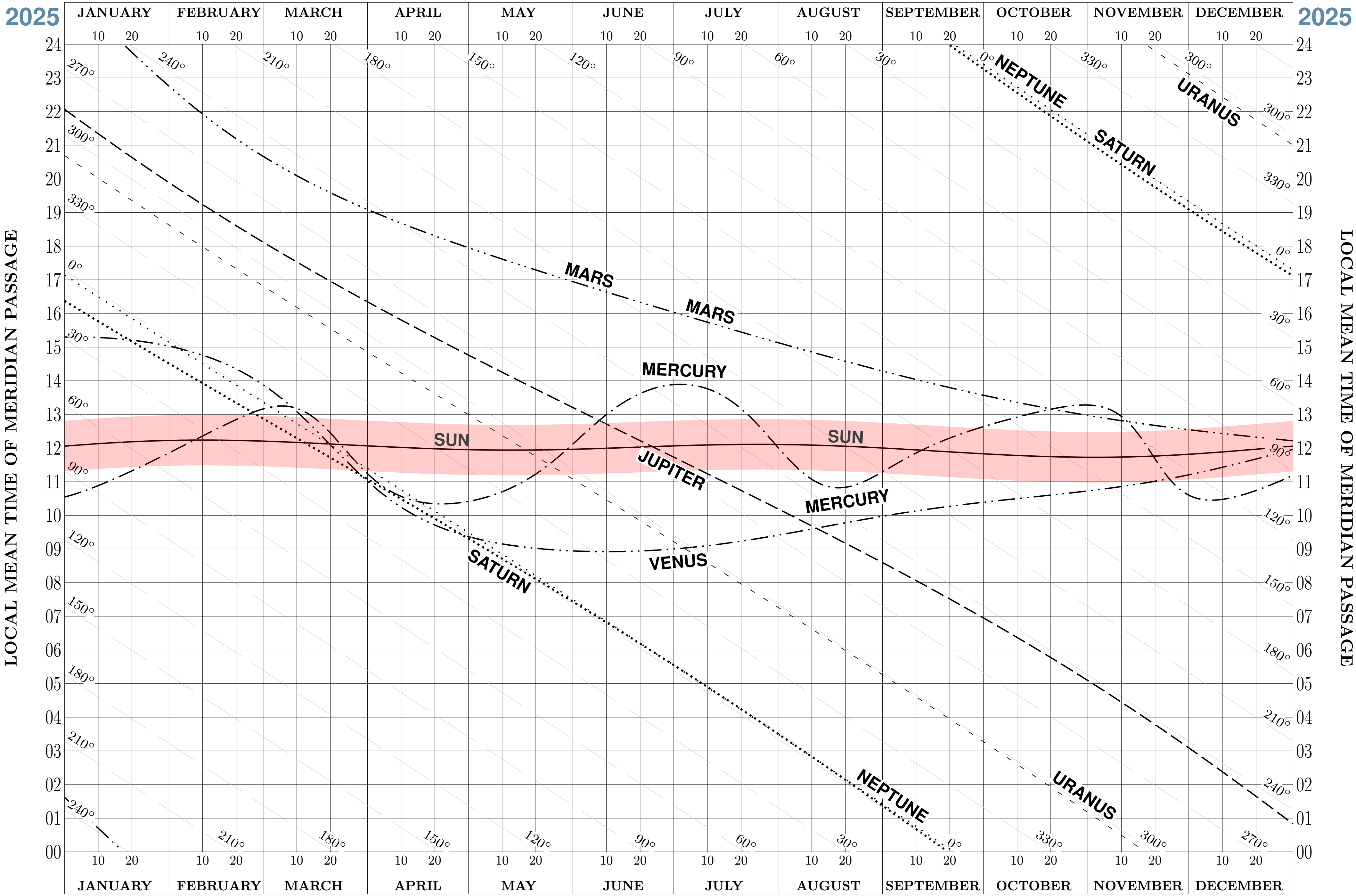
Errors & Corrections

Contact us if you find any significant errors and describe the correction that should be made.

Disclaimer_and_Credits_Planets.odt
December 11, 2024

DECLINATION OF SUN AND PLANETS, 2025




2025
JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER
DECEMBER
LOCAL MEAN TIME OF MERIDIAN PASSAGE
MARS
MERCURY
SUN
JUPITER
VENUS
SATURN
NEPTUNE
URANUS

INTRODUCTION TO THE PLANET VISIBILITY CHARTS

The classic Planet Diagram[1] shows the Local Mean Time of Meridian Passage of the Sun and five planets (two inferior and three superior). It does not provide useful information as to the actual visibility of the planets. Unlike stars, which have an inherent brightness, our planets only reflect the Sun's light and thus their magnitude (or brightness) is constantly changing, particularly with their distance from the Sun as they orbit the Sun in a near eliptical path (while we're doing the same on Earth). Planet visibility varies not only with a planet's current magnitude but also with the observer's location, specifically with the observer's latitude. Clearly a planet is not visible whenever it is below the horizon and neither when it is overpowered by the Sun's brightness, i.e. during daytime. Other miscellaneous factors (such as Skyglow - Light Pollution from large cities) also affect planet visibility. A planet's pattern of visibility is not repetitive: it changes year by year.

All these factors (and a few others) complicate the assessment of a planet's visibility. Generally one can assume that a planet will become visible soon after Civil Dusk and up to Civil Dawn when the Sun is again six degrees below the horizon. But a brighter planet is visible longer and dimmer planets possibly require the Sun to be around 12 degrees below the horizon, i.e. at Nautical Dawn and Dusk. The following diagrams illustrate when a planet is both above the horizon and when the Sun is at least six degrees below the horizon ... based on a chosen latitude.

The classic Planet Diagram is printed in portrait orientation, however landscape orientation has been chosen for these charts. A day proceeds vertically upwards from midnight (at 00h) to midnight (at 24h). The days span a year horizontally from left to right. So any typical "planet rise to Meridian Passage to planet set" is a vertical line going upwards and often crosses midnight into the next day.

The term "Local Mean Time" to describe the vertical chart axis needs a little explanation. Local Mean Time originated before Time Zones were introduced when each town kept its own meridian such that locations one degree of longitude apart had times four minutes apart. Time Zones, normally one hour apart, were introduced so that a whole region could share the same time. Thus Time Zones ideally jump by one hour every 15° of longitude and Greenwich in south-east London defines 0° longitude, also known as the prime meridian. So an appropriate correction must be applied when converting civil time to Local Mean Time, which obviously depends on the observer's longitude. In practise this means that civil time is equivalent to Local Mean Time only when at the central Time Zone reference longitudes that are 15° offset from the prime meridian, i.e. at 24 specific longitudes.

Consider an observer in Cork, Ireland at longitude 8.5° West. A planet's Meridian Passing over Greenwich occurs earlier ... it will reach the upper meridian about 34 minutes later in Cork. This correction can be applied simply in the charts by reading 34 minutes higher than Local Mean Time. No correction is required if you are on a longitude that is precisely a multiple of 15° using the time allotted to the Time Zone (with 15° longitude width), i.e. in the center of the Time Zone band. In practise no one will be at that "ideal" longitude, so a correction of up to ±30 minutes is to be applied depending on your actual location West (positive) or East (negative) of the Time Zone's central reference longitude.

For example, although Time Zone +1 in Europe stretches from Western Spain (9° 18' West) to Eastern Sweden (30° 55' East), the Local Mean Time on the chart will only match Civil Time at locations that are 15° East, e.g. the town Gmund in Austria. A location in Time Zone +1 that is 7.5° East, i.e. on the Western edge of the ideal Time Zone boundary, e.g. Dortmund in Germany, will have to add 30 minutes to the Local Mean Times on the chart.

Time Zones which violate the 15° standard Time Zone boundary are special cases. Consider Reykjavik in Iceland (21° 57' West) ... officially in Time Zone Zero: here they need to add around 90 minutes to the Local Mean Times on the chart. Time Zones not on the hour (Marquesas Islands, Newfoundland, Cocos Islands, Myanmar, Lord Howe Island, Chatham Islands, ...) need further appropriate correction.

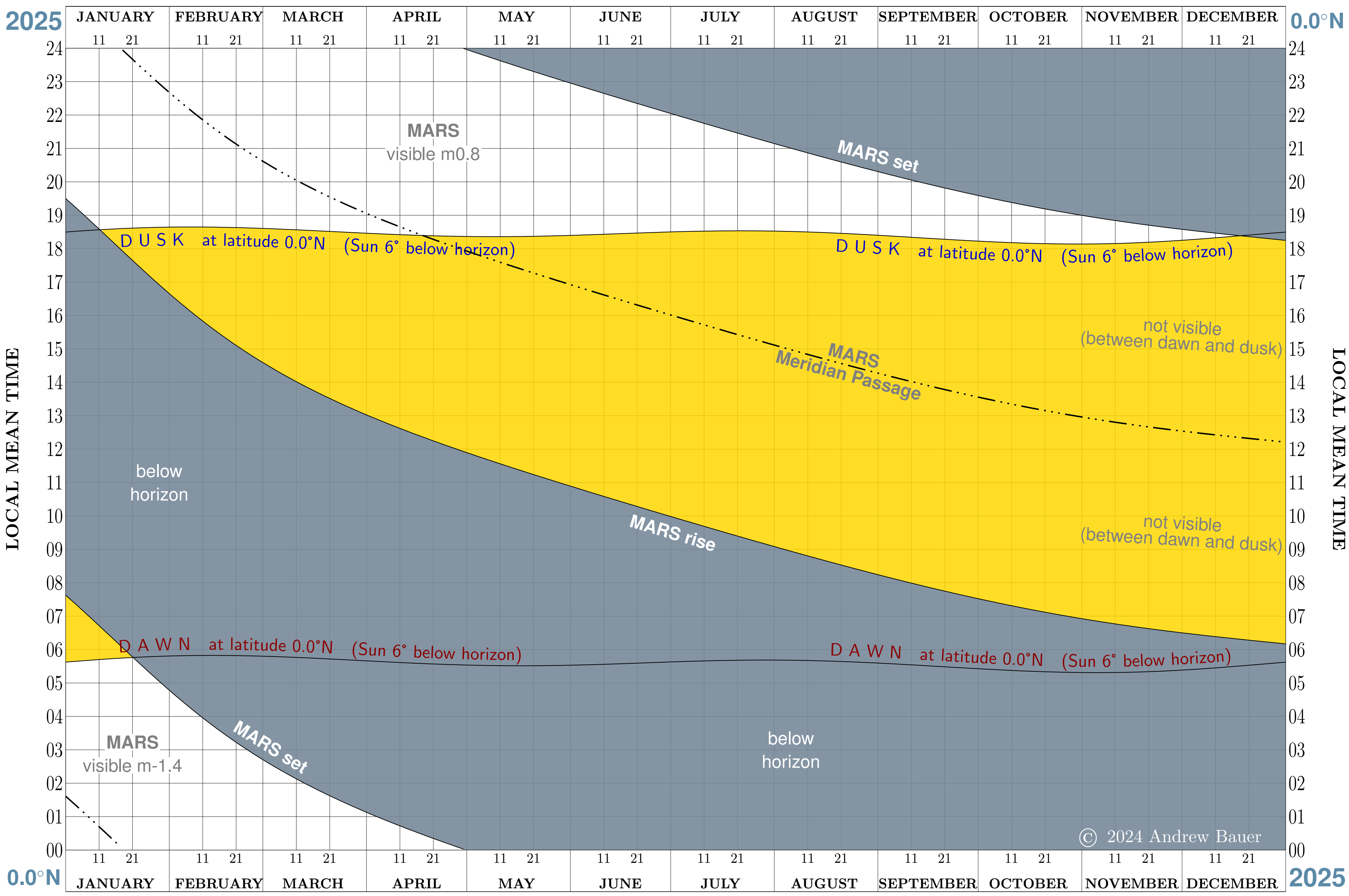
In the following charts the planet's RISE and SET are drawn as lines. A solitary RISE or SET is depicted as a small red (RISE) or blue (SET) cross. Grey shading shows when the planet is below the horizon, i.e. between planet SET and planet RISE. Of the remaining time, yellow shading indicates that the Sun is too high (= too bright) for any planet to be seen. Unshaded areas show when the planet is likely to be visible. There is an element of guesswork in assessing the minimum angle the Sun needs to be below the horizon per planet, but only 6° below the horizon is plotted. The unshaded areas representing planet visibility are always between planet RISE and SET as well as between Civil Dusk and Civil Dawn. Just one representative planet magnitude value is printed given sufficient space, though this may vary within the visible zone.

Despite the drawbacks, the Visibility Charts still provide helpful information when the navigational planets are chosen for navigational purposes, e.g. they clearly indicate the days or weeks when a planet is not visible at all (at that latitude) or for such a short time as to be impractical for taking sextant readings. More detailed information regarding Visibiliy Phenomena can be found on Rainer Lange's web pages[2]. Acknowledgements[3]

[1] American Practical Navigator, Vol. 1 by Nathaniel Bowditch, 2017 Edition, page 256

[2] Visibility Phenomena - Rainer Lange: `http://www.alcyone.de/planetary_lunar_and_stellar_visibility.html`

[3] The charts are produced using Skyfield, an astronomical library from Brandon Rhodes: `https://rhodesmill.org/skyfield/`



2025
0.0°N
JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER
DECEMBER
LOCAL MEAN TIME
MARS
visible m0.8
MARS set
D U S K at latitude 0.0°N (Sun 6° below horizon)
not visible
(between dawn and dusk)
MARS
Meridian Passage
below
horizon
MARS rise
D A W N at latitude 0.0°N (Sun 6° below horizon)
MARS
visible m-1.4
MARS set
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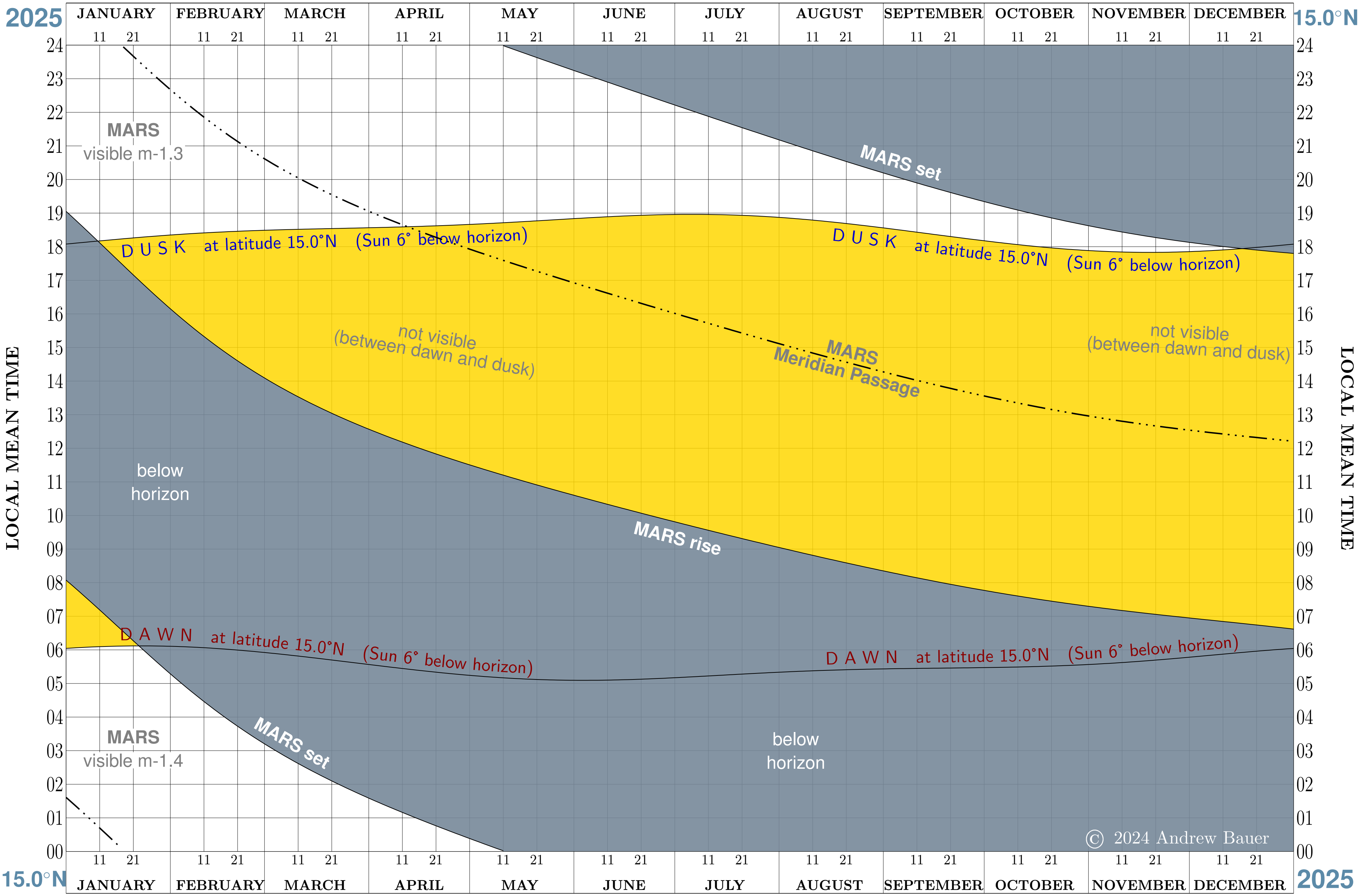
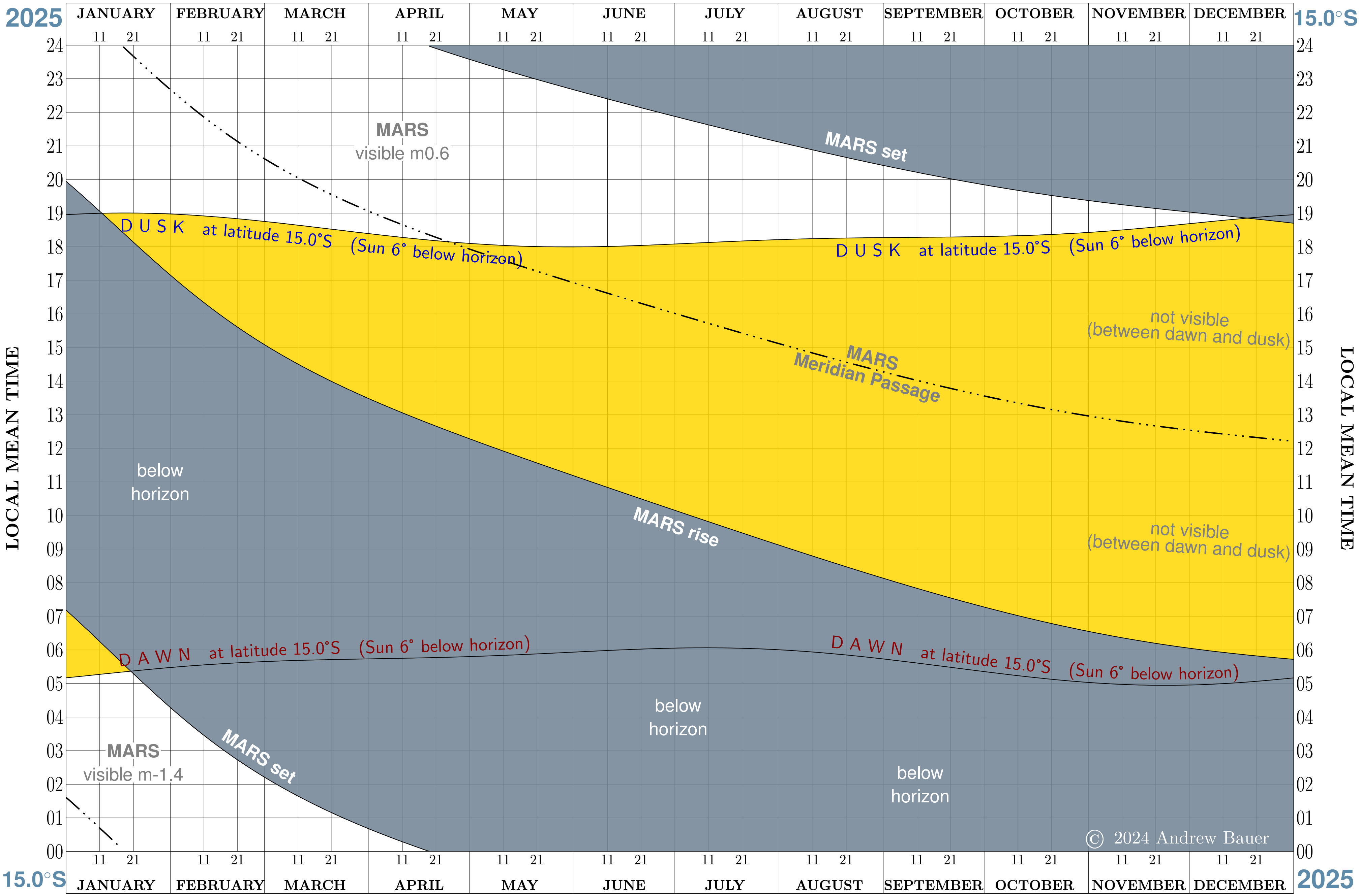
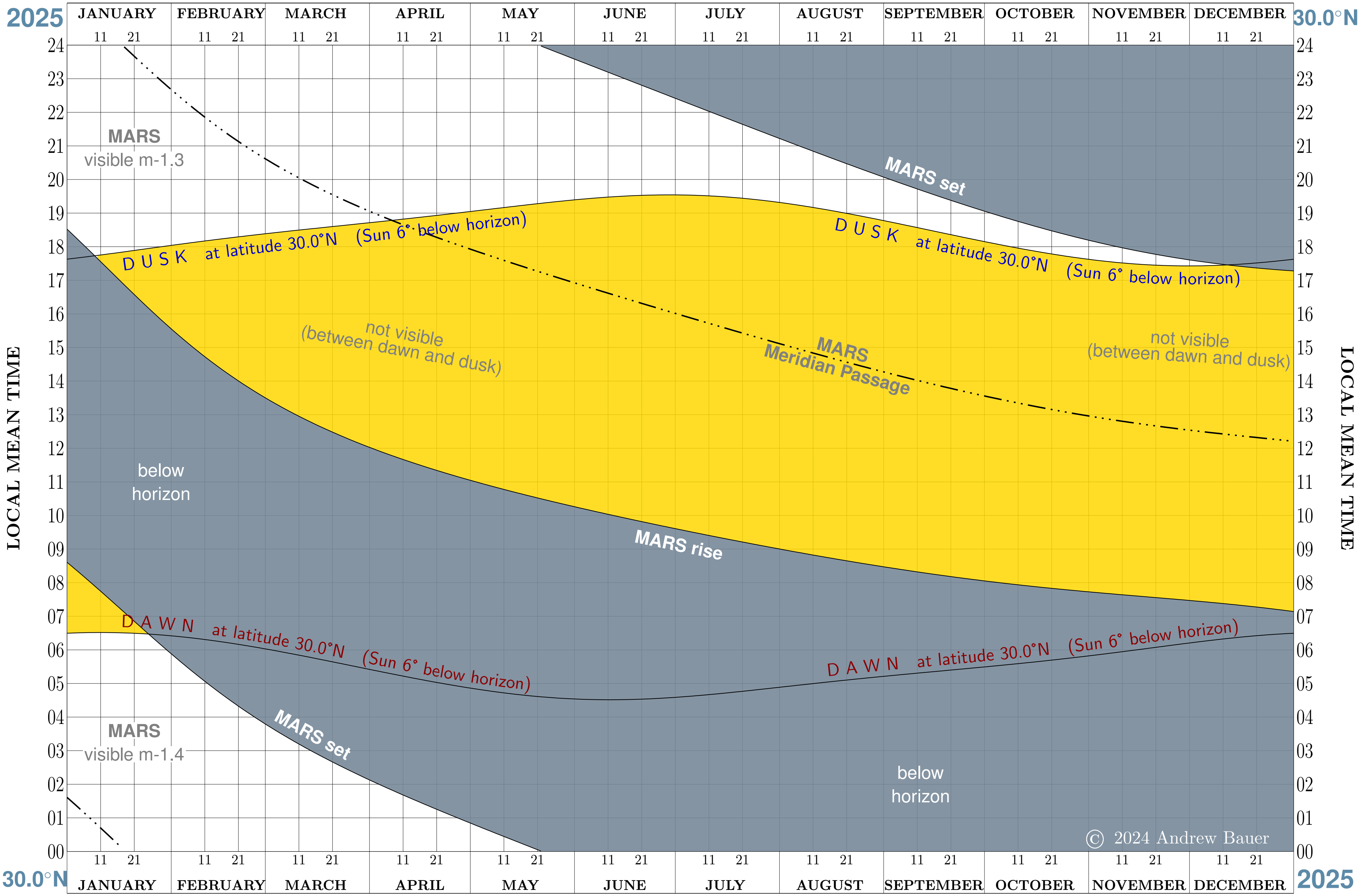


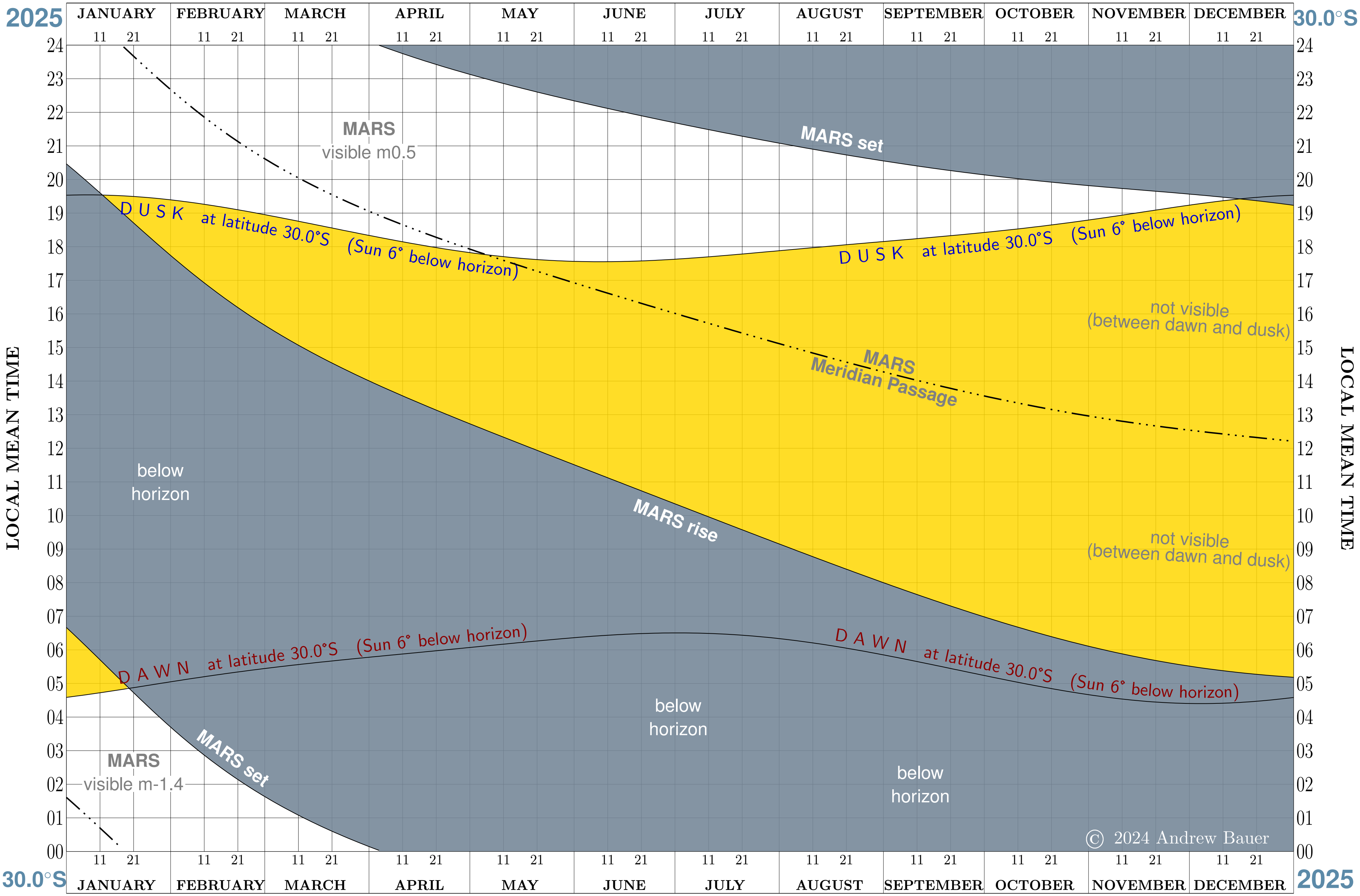
2025
15.0°N
JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER
DECEMBER
LOCAL MEAN TIME
MARS
visible m-1.3
MARS set
D U S K at latitude 15.0°N (Sun 6° below horizon)
not visible
(between dawn and dusk)
MARS
Meridian Passage
below
horizon
MARS rise
D A W N at latitude 15.0°N (Sun 6° below horizon)
MARS
visible m-1.4
MARS set
© 2024 Andrew Bauer

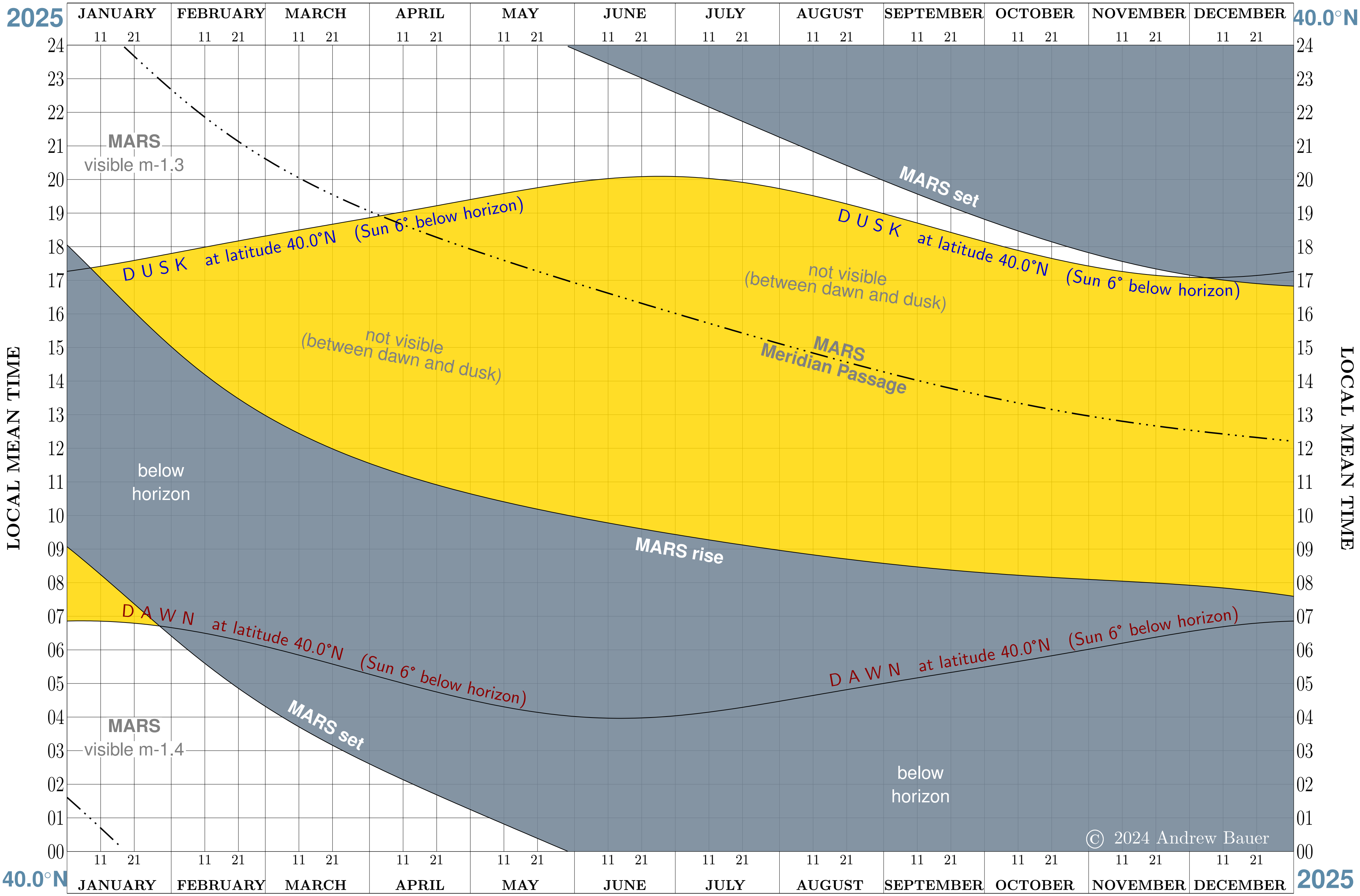


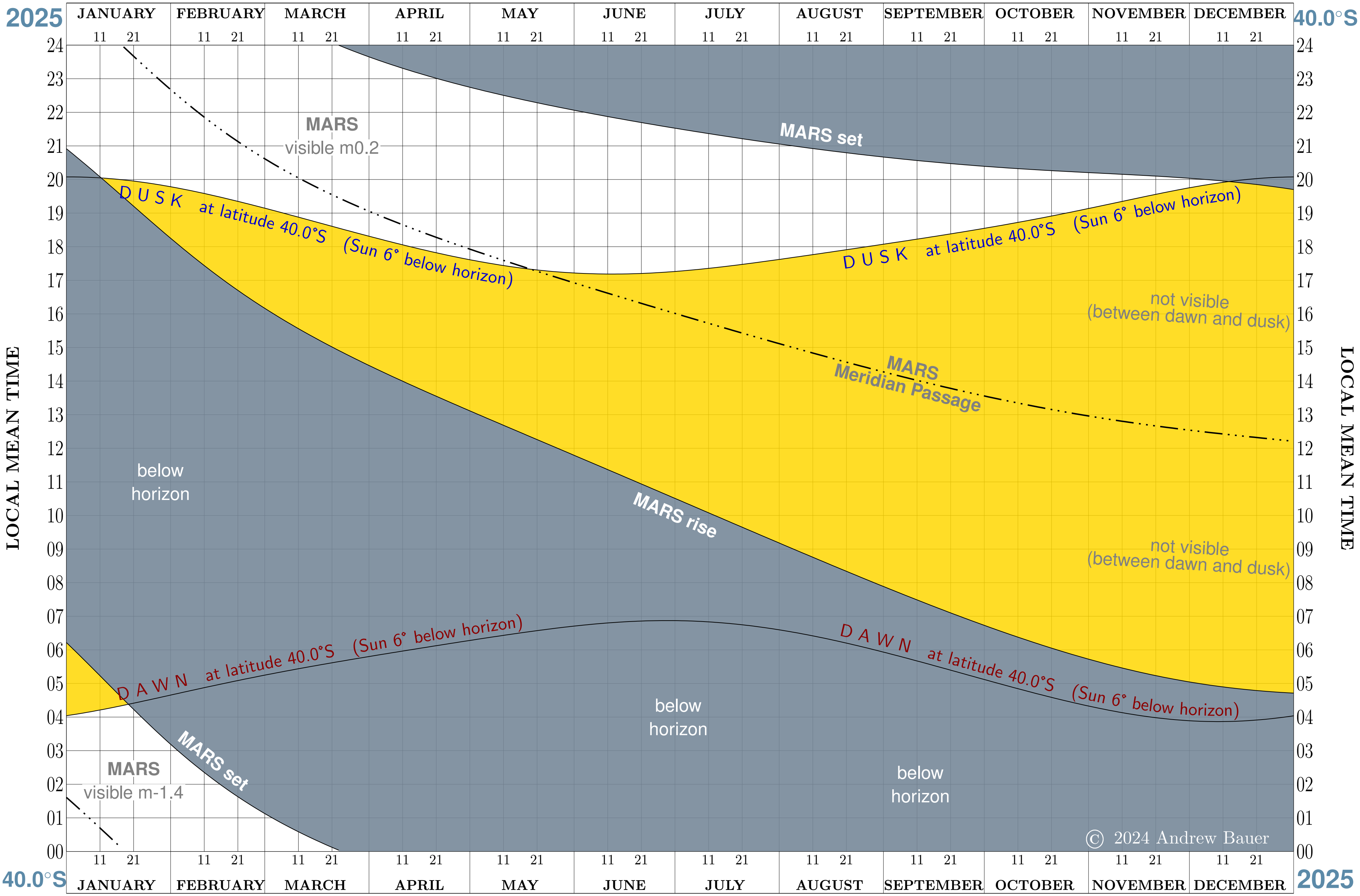
2025
15.0°S
JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER
DECEMBER
LOCAL MEAN TIME
MARS
visible m0.6
MARS set
D U S K at latitude 15.0°S (Sun 6° below horizon)
not visible
(between dawn and dusk)
MARS
Meridian Passage
below
horizon
MARS rise
D A W N at latitude 15.0°S (Sun 6° below horizon)
MARS
visible m-1.4
© 2024 Andrew Bauer

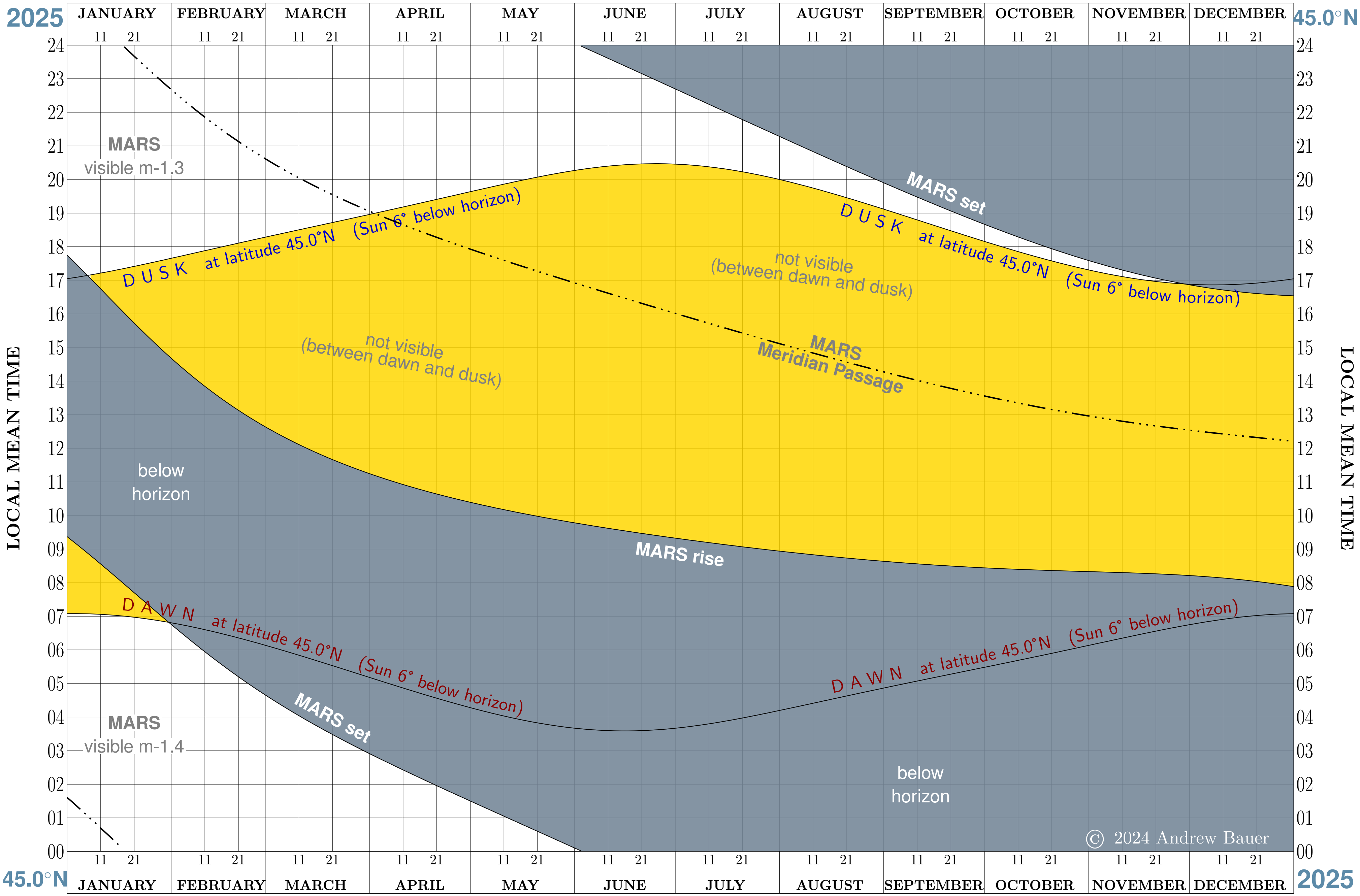


2025
30.0°N
JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER
DECEMBER
LOCAL MEAN TIME
MARS
visible m-1.3
MARS set
D U S K at latitude 30.0°N (Sun 6° below horizon)
not visible
(between dawn and dusk)
MARS
Meridian Passage
below
horizon
MARS rise
D A W N at latitude 30.0°N (Sun 6° below horizon)
MARS
visible m-1.4
© 2024 Andrew Bauer


2025
30.0°S
JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER
DECEMBER
LOCAL MEAN TIME
MARS
visible m0.5
MARS set
D U S K at latitude 30.0°S (Sun 6° below horizon)
not visible
(between dawn and dusk)
MARS
Meridian Passage
below
horizon
MARS rise
D A W N at latitude 30.0°S (Sun 6° below horizon)
MARS
visible m-1.4
© 2024 Andrew Bauer


2025
40.0°N
JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER
DECEMBER
LOCAL MEAN TIME
MARS
visible m-1.3
MARS set
D U S K at latitude 40.0°N (Sun 6° below horizon)
not visible
(between dawn and dusk)
MARS
Meridian Passage
below
horizon
MARS rise
D A W N at latitude 40.0°N (Sun 6° below horizon)
MARS
visible m-1.4
MARS set
below
horizon
© 2024 Andrew Bauer


2025
40.0°S
JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER
DECEMBER
LOCAL MEAN TIME
MARS
visible m0.2
MARS set
D U S K at latitude 40.0°S (Sun 6° below horizon)
not visible
(between dawn and dusk)
MARS
Meridian Passage
below
horizon
MARS rise
D A W N at latitude 40.0°S (Sun 6° below horizon)
MARS
visible m-1.4
© 2024 Andrew Bauer



2025
45.0°N
JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER
DECEMBER
LOCAL MEAN TIME
MARS
visible m-1.3
MARS set
D U S K at latitude 45.0°N (Sun 6° below horizon)
not visible
(between dawn and dusk)
MARS
Meridian Passage
below
horizon
MARS rise
D A W N at latitude 45.0°N (Sun 6° below horizon)
MARS
visible m-1.4
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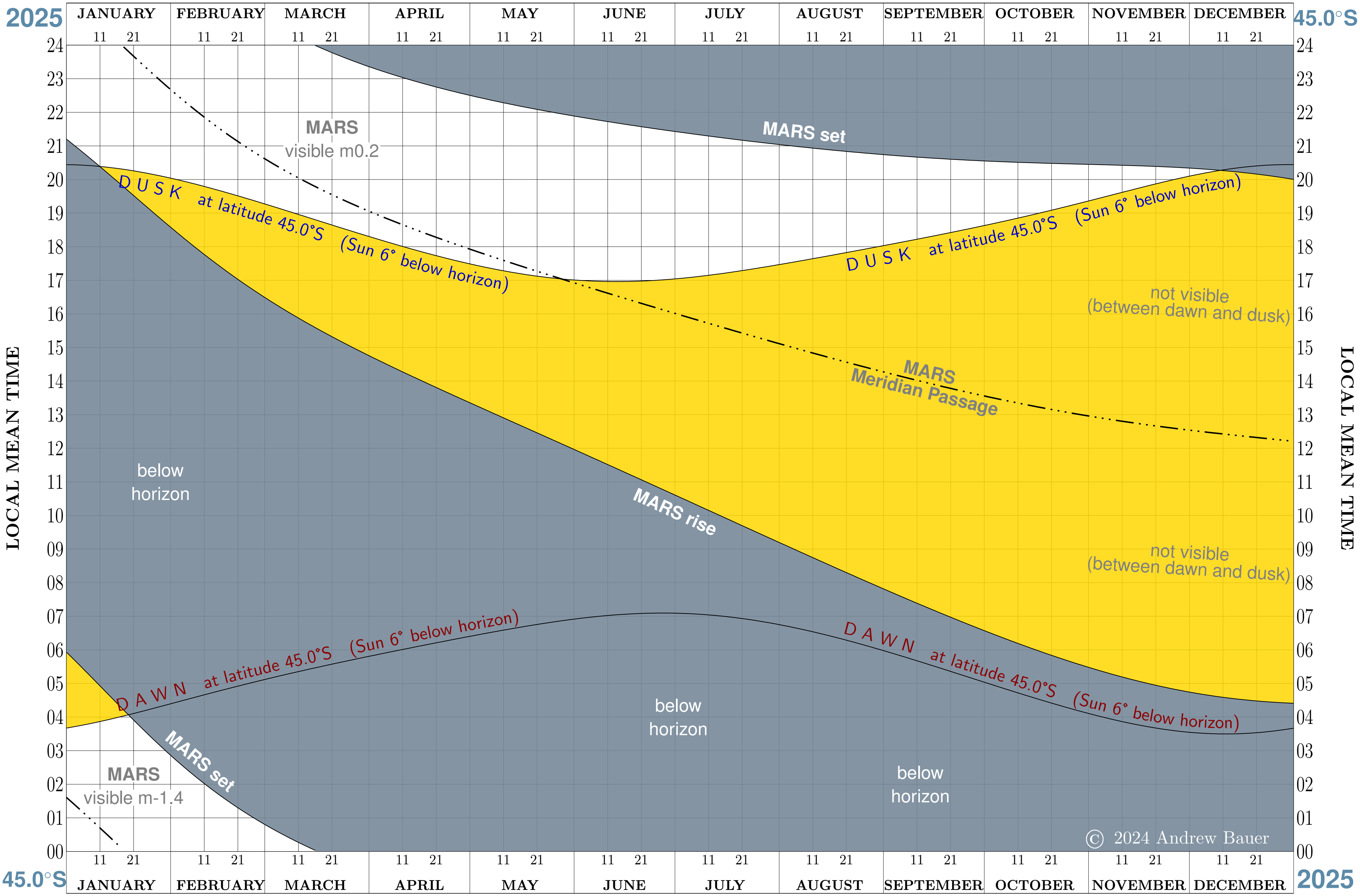
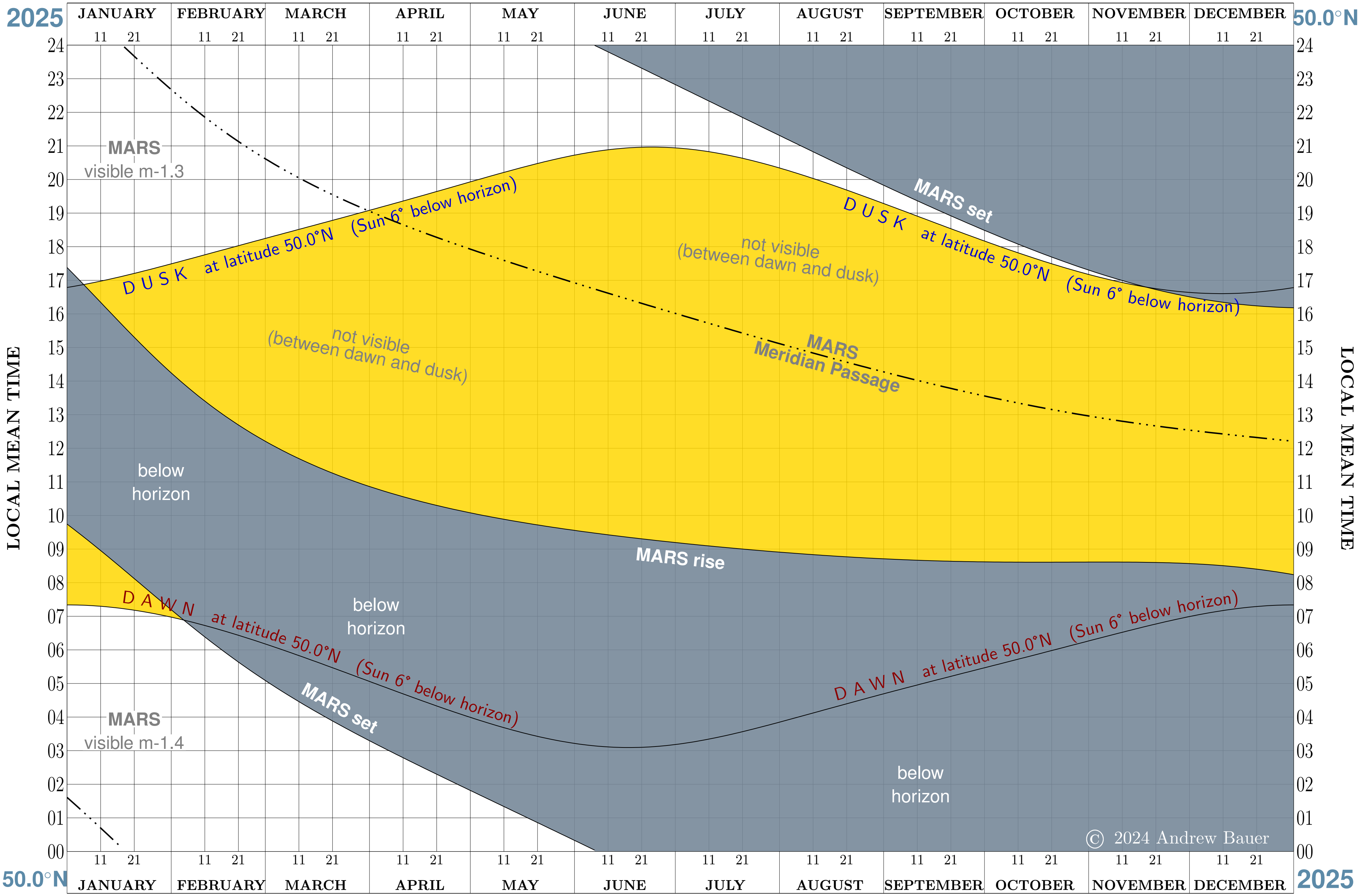


2025
45.0°S
JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER
DECEMBER
LOCAL MEAN TIME
MARS
visible m0.2
MARS set
D U S K at latitude 45.0°S (Sun 6° below horizon)
not visible
(between dawn and dusk)
MARS
Meridian Passage
below
horizon
MARS rise
D A W N at latitude 45.0°S (Sun 6° below horizon)
MARS
visible m-1.4
MARS set
© 2024 Andrew Bauer


2025
50.0°N
JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER
DECEMBER
LOCAL MEAN TIME
MARS
visible m-1.3
D U S K at latitude 50.0°N (Sun 6° below horizon)
not visible
(between dawn and dusk)
MARS set
MARS
Meridian Passage
below
horizon
MARS rise
D A W N at latitude 50.0°N (Sun 6° below horizon)
MARS
visible m-1.4
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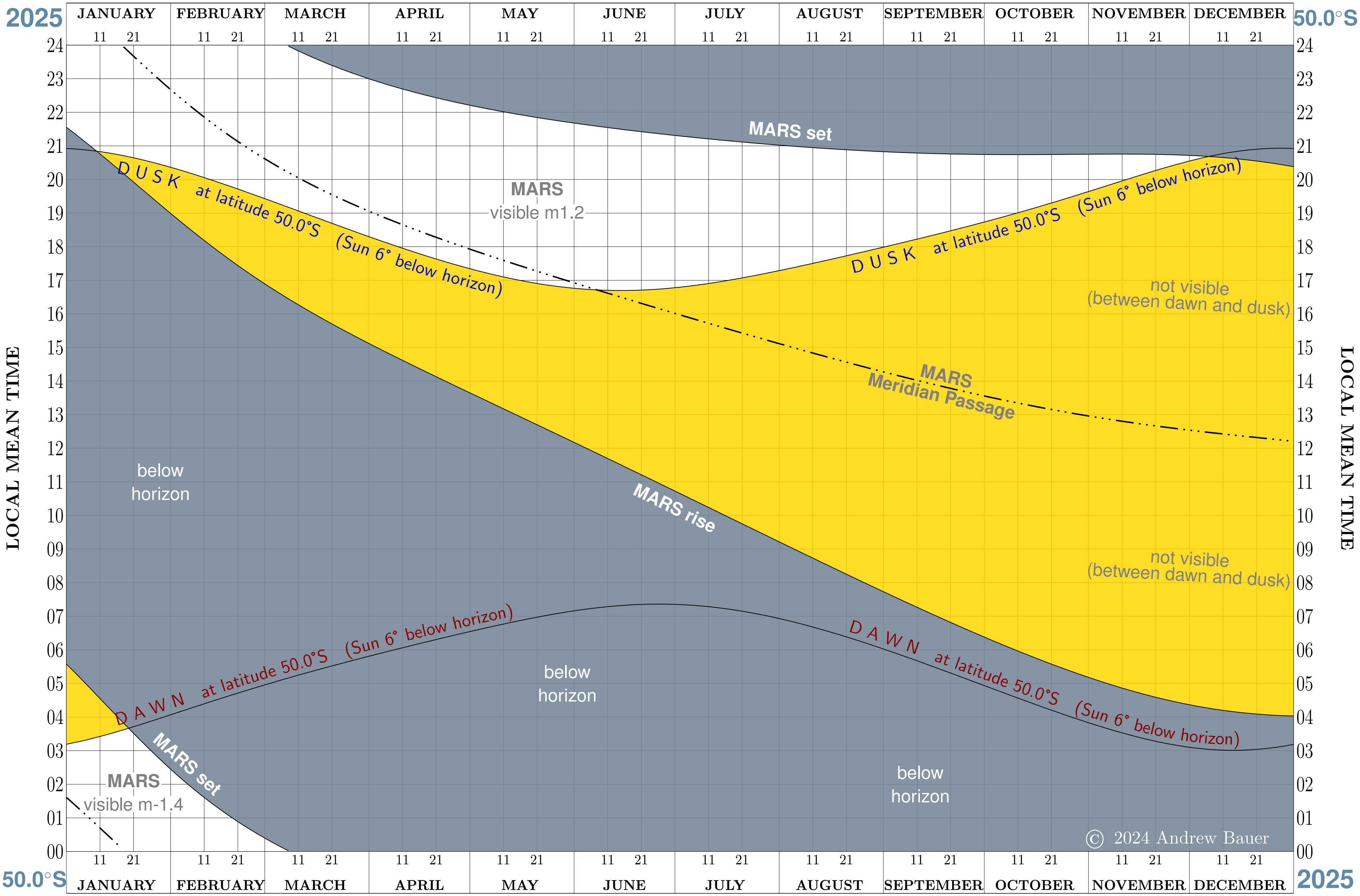
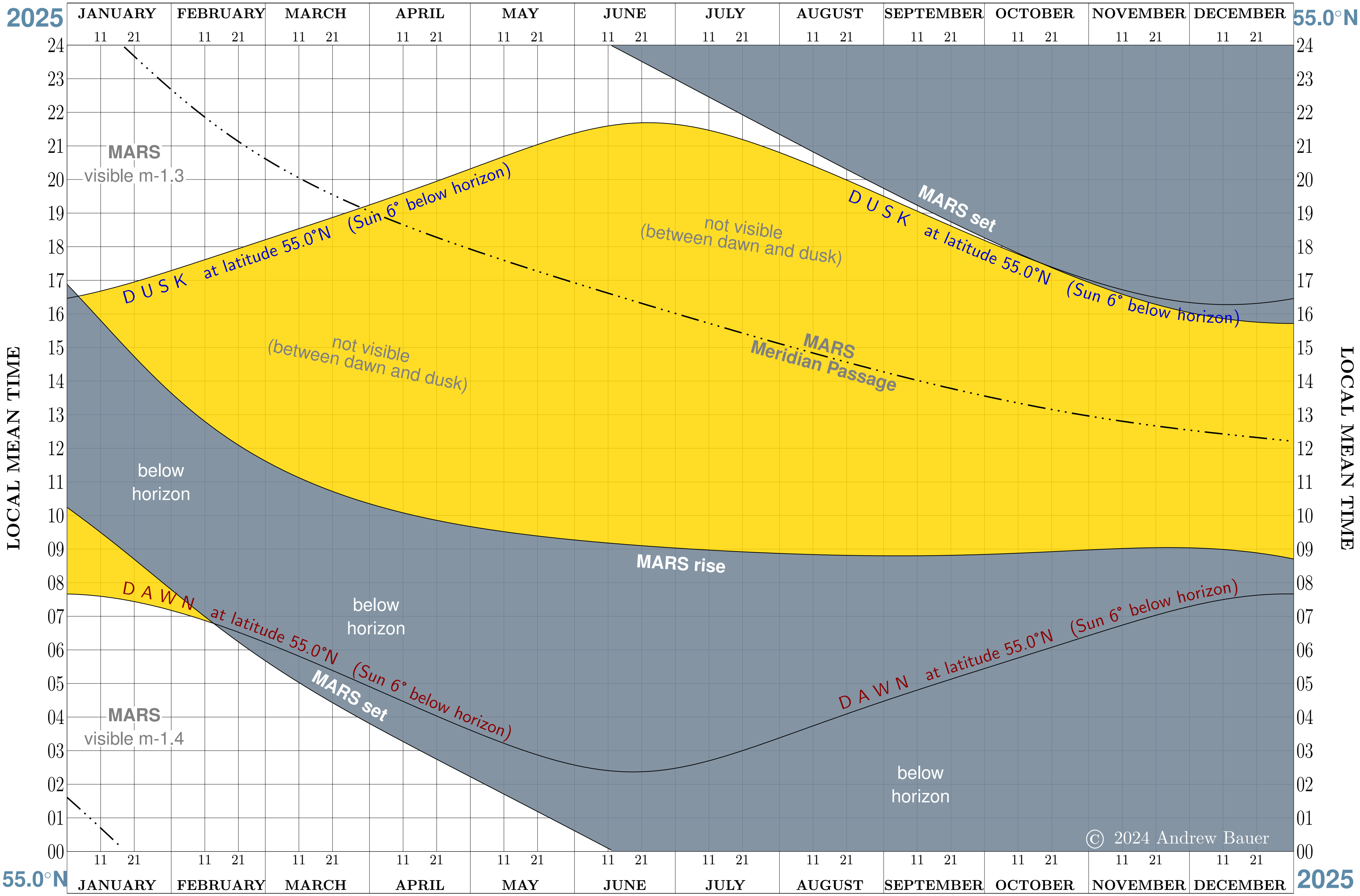
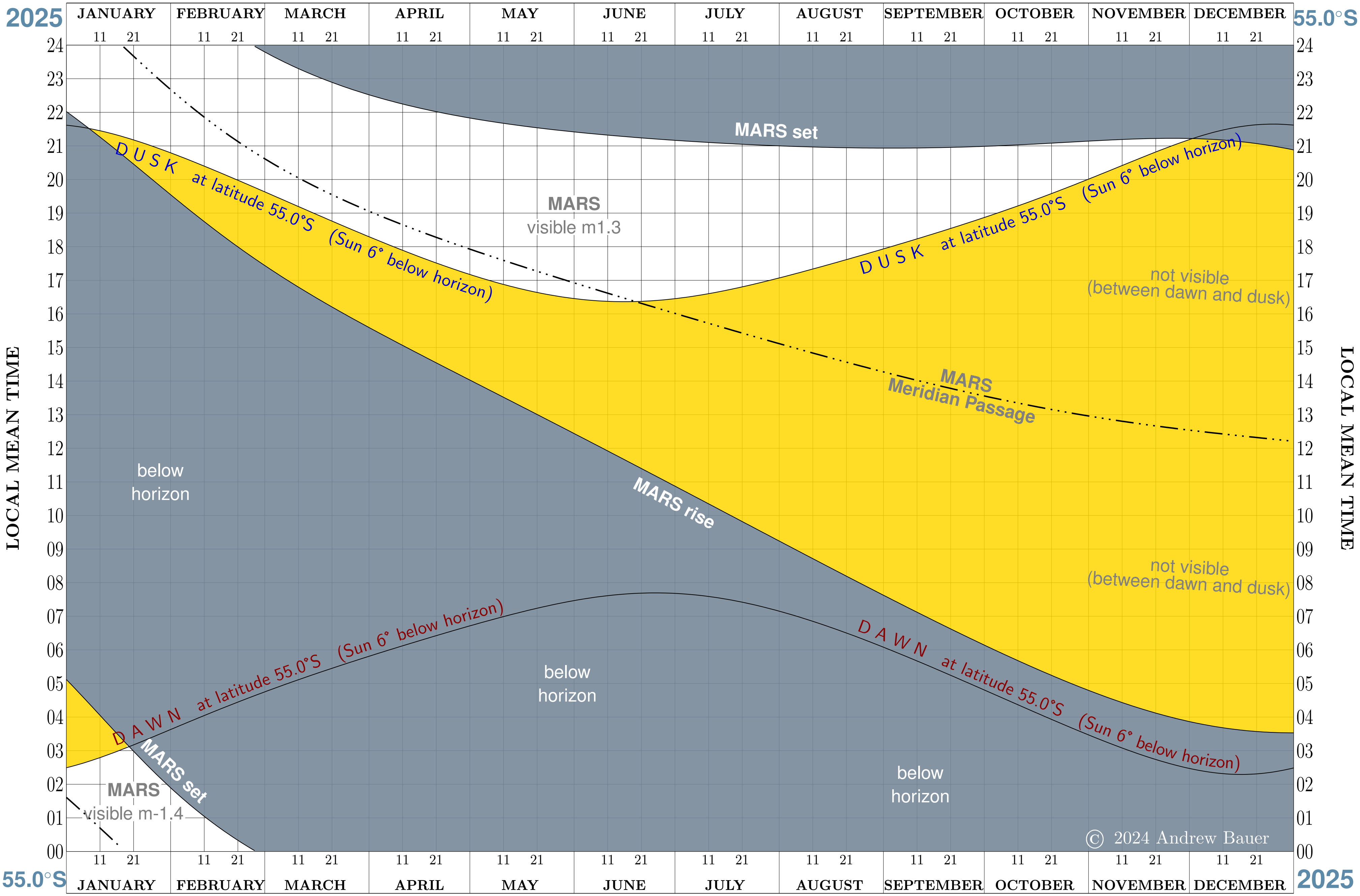
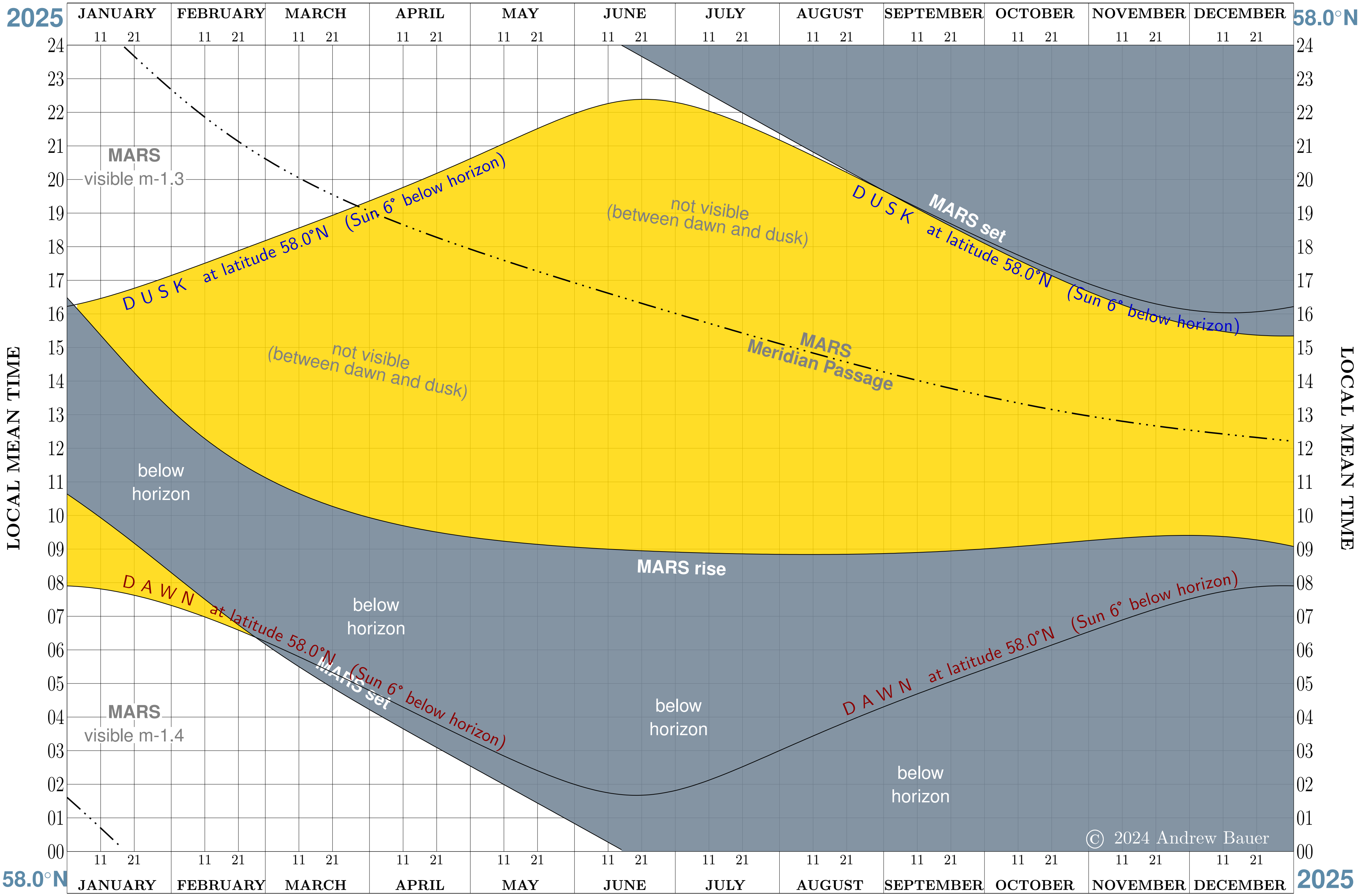
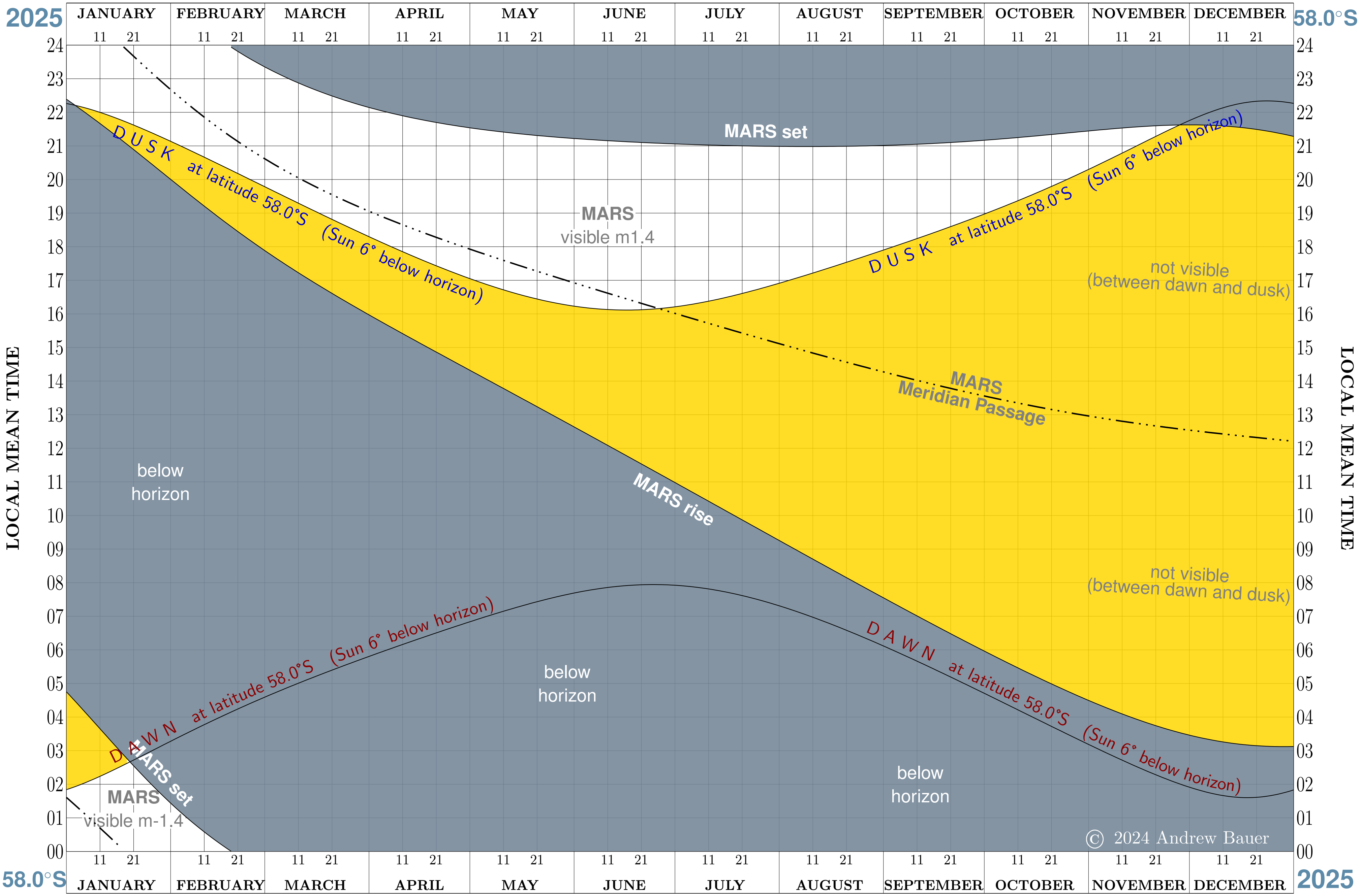

2025
50.0°S
JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER
DECEMBER
LOCAL MEAN TIME
MARS set
MARS
visible m1.2
D U S K at latitude 50.0°S (Sun 6° below horizon)
not visible
(between dawn and dusk)
MARS
Meridian Passage
below
horizon
MARS rise
D A W N at latitude 50.0°S (Sun 6° below horizon)
MARS set
MARS
visible m-1.4
© 2024 Andrew Bauer


2025
55.0°N
JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER
DECEMBER
LOCAL MEAN TIME
MARS
visible m-1.3
MARS
visible m-1.4
D U S K at latitude 55.0°N (Sun 6° below horizon)
D A W N at latitude 55.0°N (Sun 6° below horizon)
not visible
(between dawn and dusk)
MARS set
MARS rise
MARS
Meridian Passage
below
horizon
© 2024 Andrew Bauer

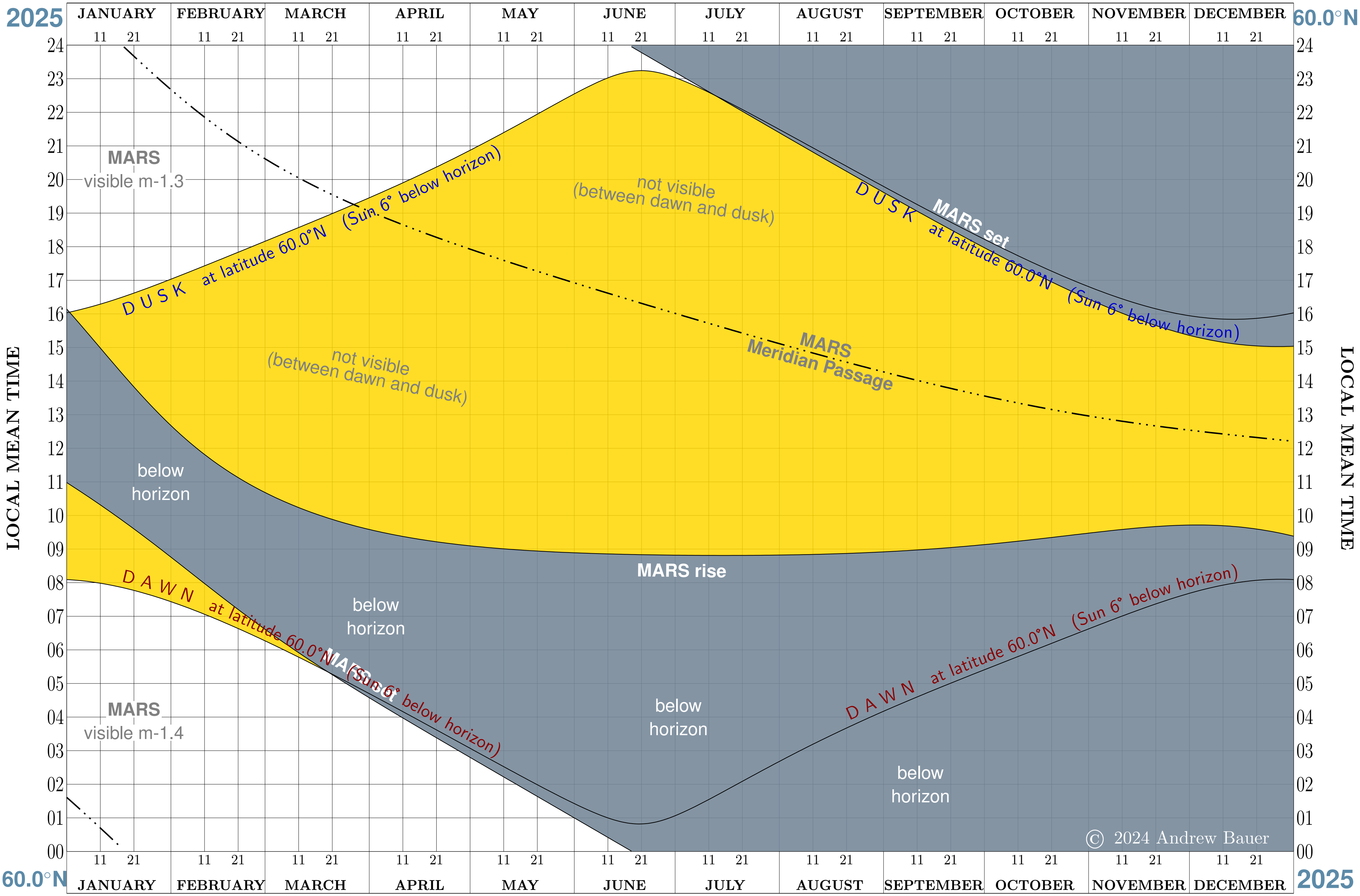


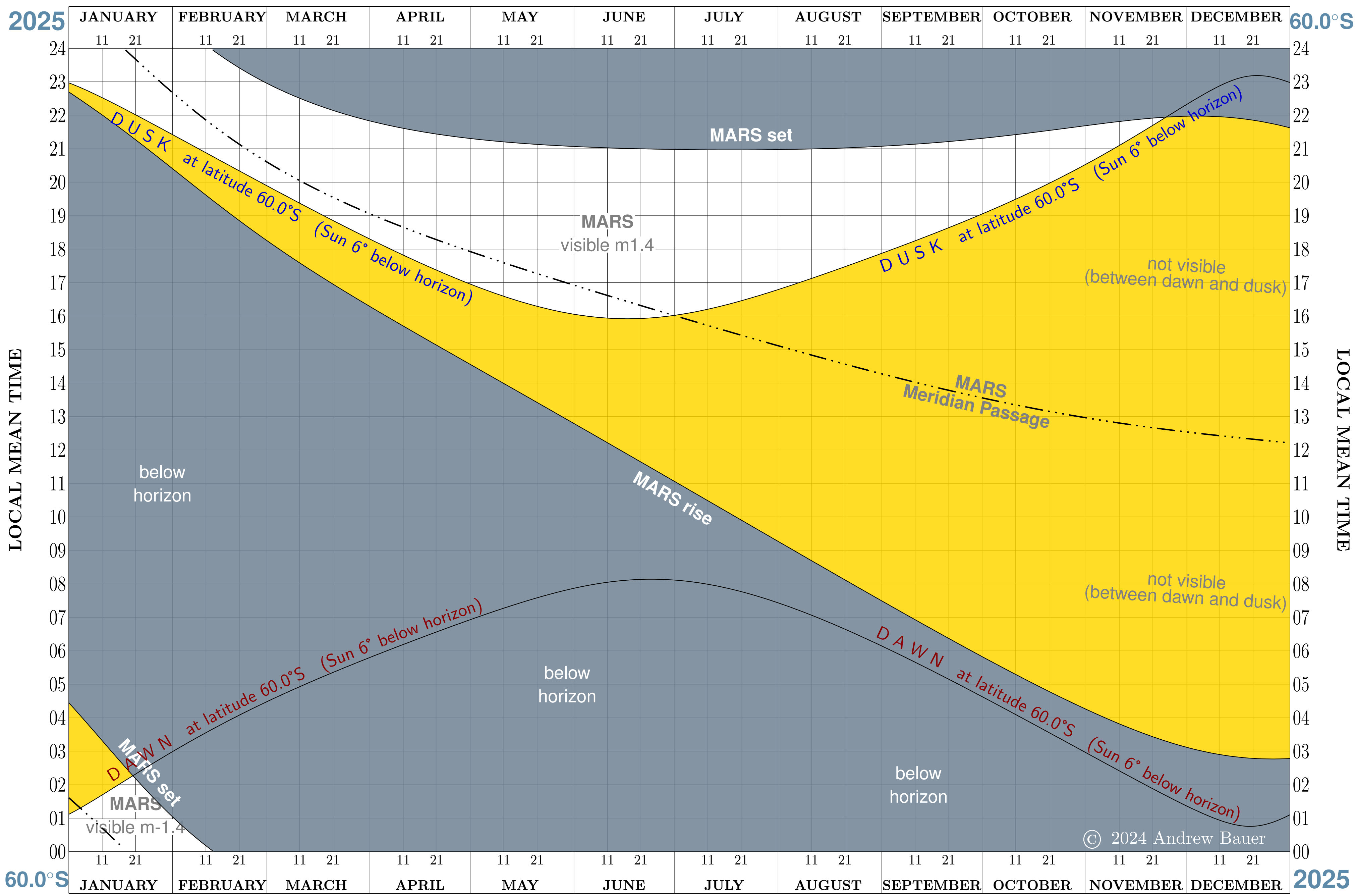
2025
55.0°S
JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER
DECEMBER
LOCAL MEAN TIME
MARS set
MARS
visible m1.3
D U S K at latitude 55.0°S (Sun 6° below horizon)
not visible
(between dawn and dusk)
MARS
Meridian Passage
MARS rise
below
horizon
D A W N at latitude 55.0°S (Sun 6° below horizon)
MARS
visible m-1.4
© 2024 Andrew Bauer

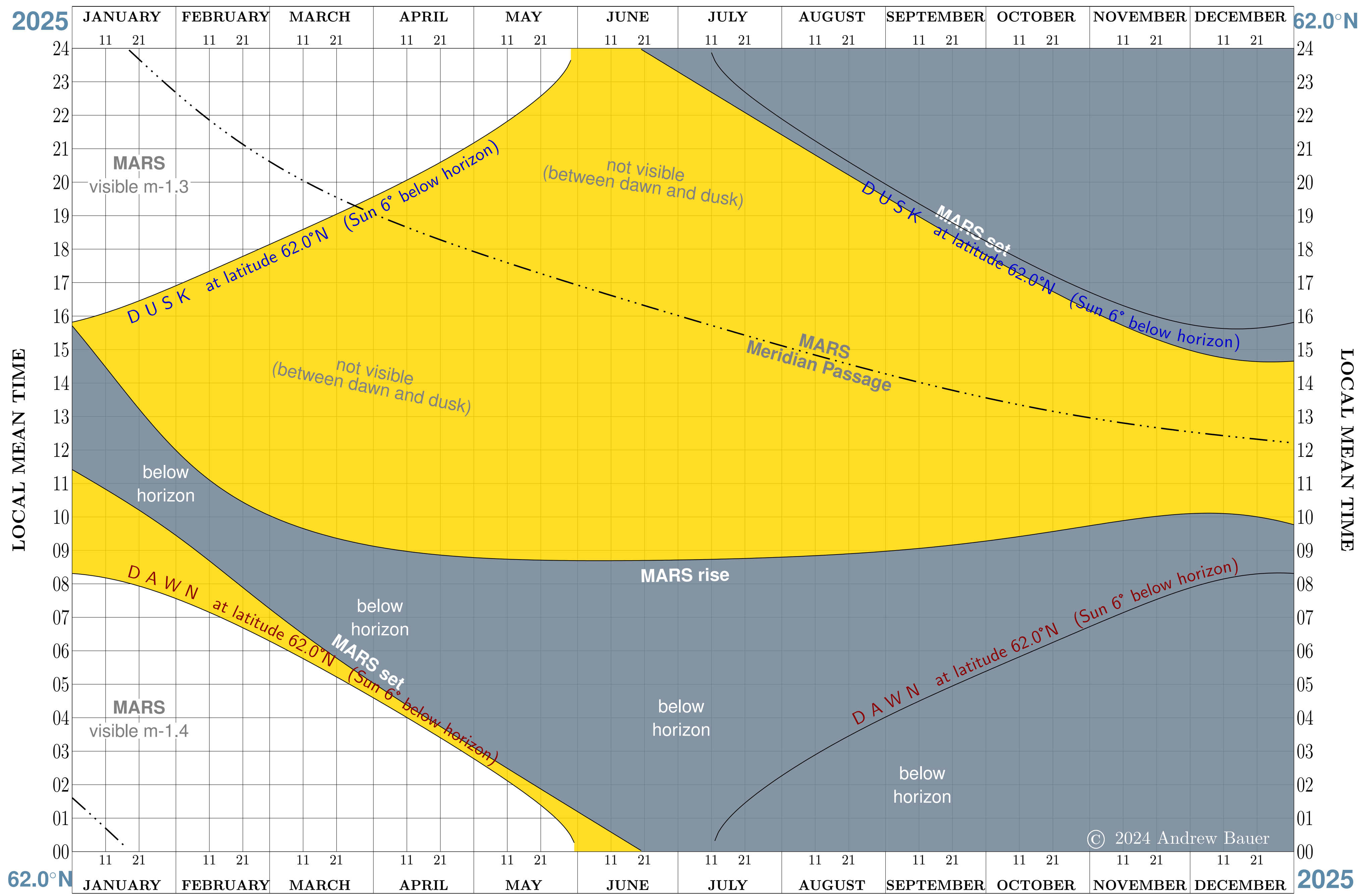

2025
58.0°N
JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER
DECEMBER
LOCAL MEAN TIME
MARS
visible m-1.3
MARS
visible m-1.4
D U S K at latitude 58.0°N (Sun 6° below horizon)
D A W N at latitude 58.0°N (Sun 6° below horizon)
not visible
(between dawn and dusk)
MARS set
MARS rise
MARS
Meridian Passage
below
horizon
© 2024 Andrew Bauer



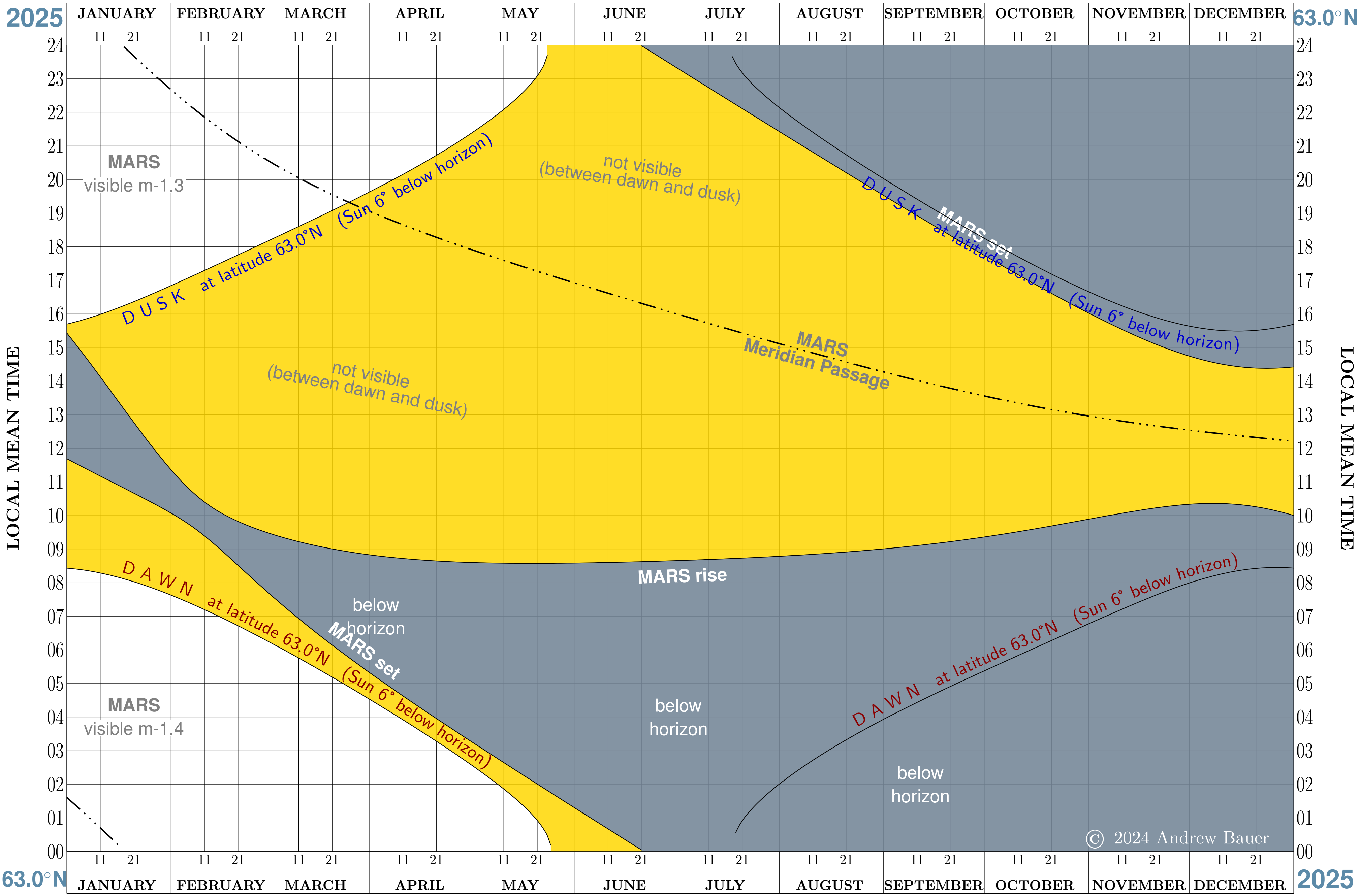
2025
58.0°S
JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER
DECEMBER
LOCAL MEAN TIME
MARS set
MARS
visible m1.4
D U S K at latitude 58.0°S (Sun 6° below horizon)
not visible
(between dawn and dusk)
MARS
Meridian Passage
below
horizon
MARS rise
D A W N at latitude 58.0°S (Sun 6° below horizon)
MARS set
MARS
visible m-1.4
© 2024 Andrew Bauer
58.0°S
2025


2025
60.0°N
JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER
DECEMBER
LOCAL MEAN TIME
MARS
visible m-1.3
MARS
visible m-1.4
D U S K at latitude 60.0°N (Sun 6° below horizon)
D A W N at latitude 60.0°N (Sun 6° below horizon)
not visible
(between dawn and dusk)
MARS
Meridian Passage
MARS set
MARS rise
below
horizon
© 2024 Andrew Bauer

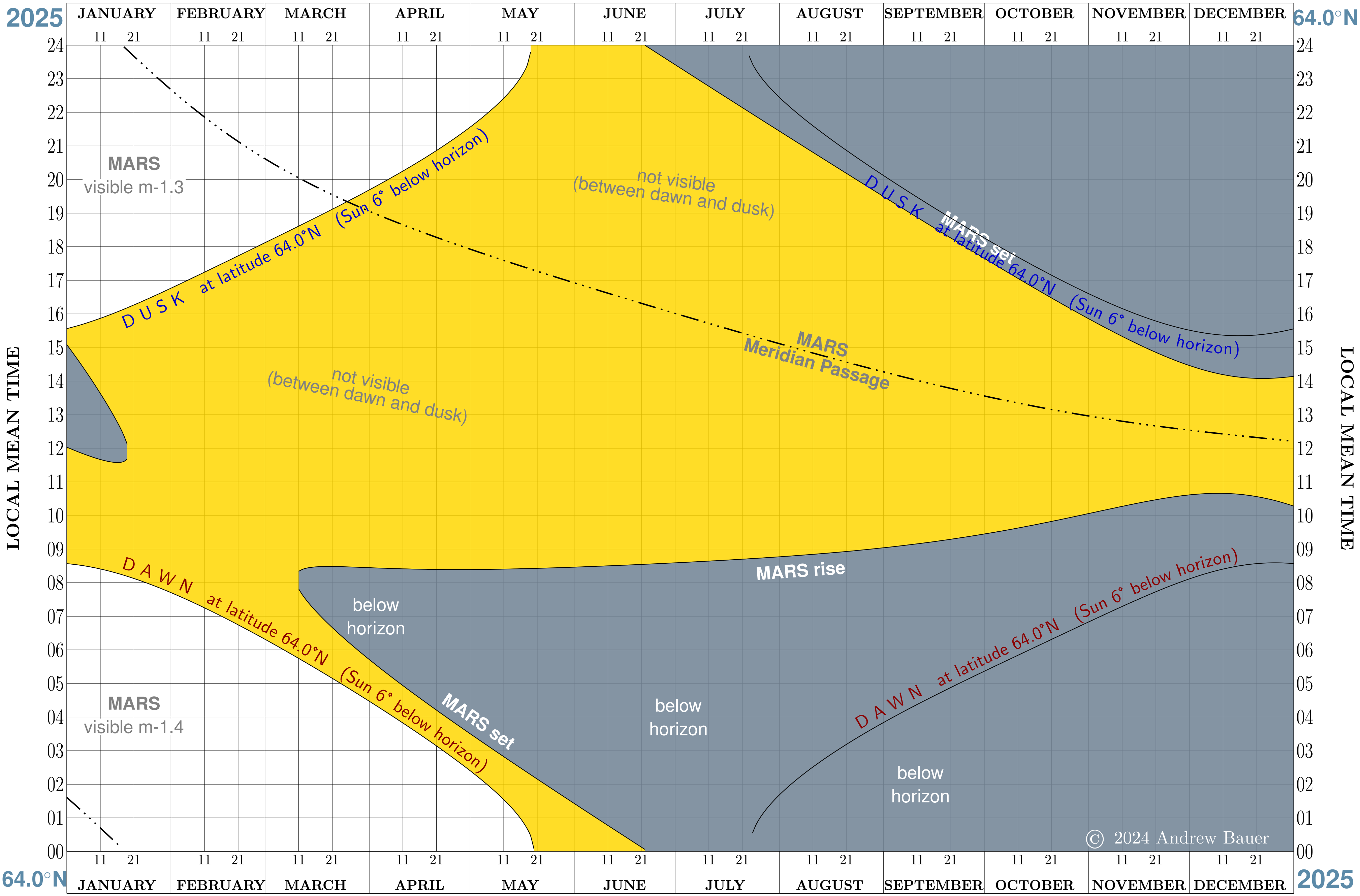

2025
60.0°S
JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER
DECEMBER
LOCAL MEAN TIME
MARS set
MARS
visible m1.4
D U S K at latitude 60.0°S (Sun 6° below horizon)
not visible
(between dawn and dusk)
MARS
Meridian Passage
below
horizon
MARS rise
D A W N at latitude 60.0°S (Sun 6° below horizon)
MARS
visible m-1.4

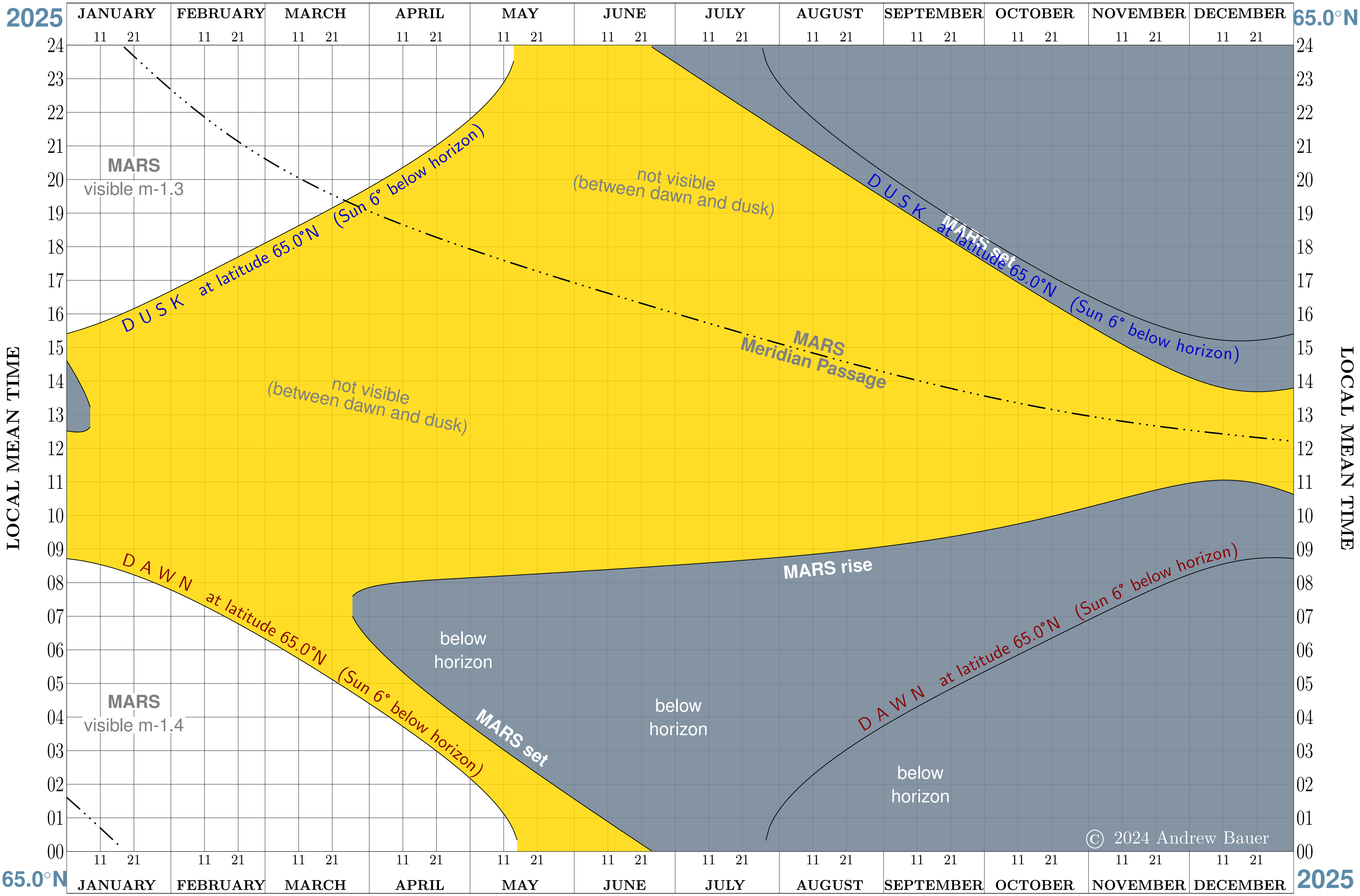


2025
62.0°N
JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER
DECEMBER
LOCAL MEAN TIME
MARS
visible m-1.3
MARS
visible m-1.4
DUSK at latitude 62.0°N (Sun 6° below horizon)
DAWN at latitude 62.0°N (Sun 6° below horizon)
not visible
(between dawn and dusk)
below
horizon
MARS set
MARS rise
MARS
Meridian Passage
© 2024 Andrew Bauer

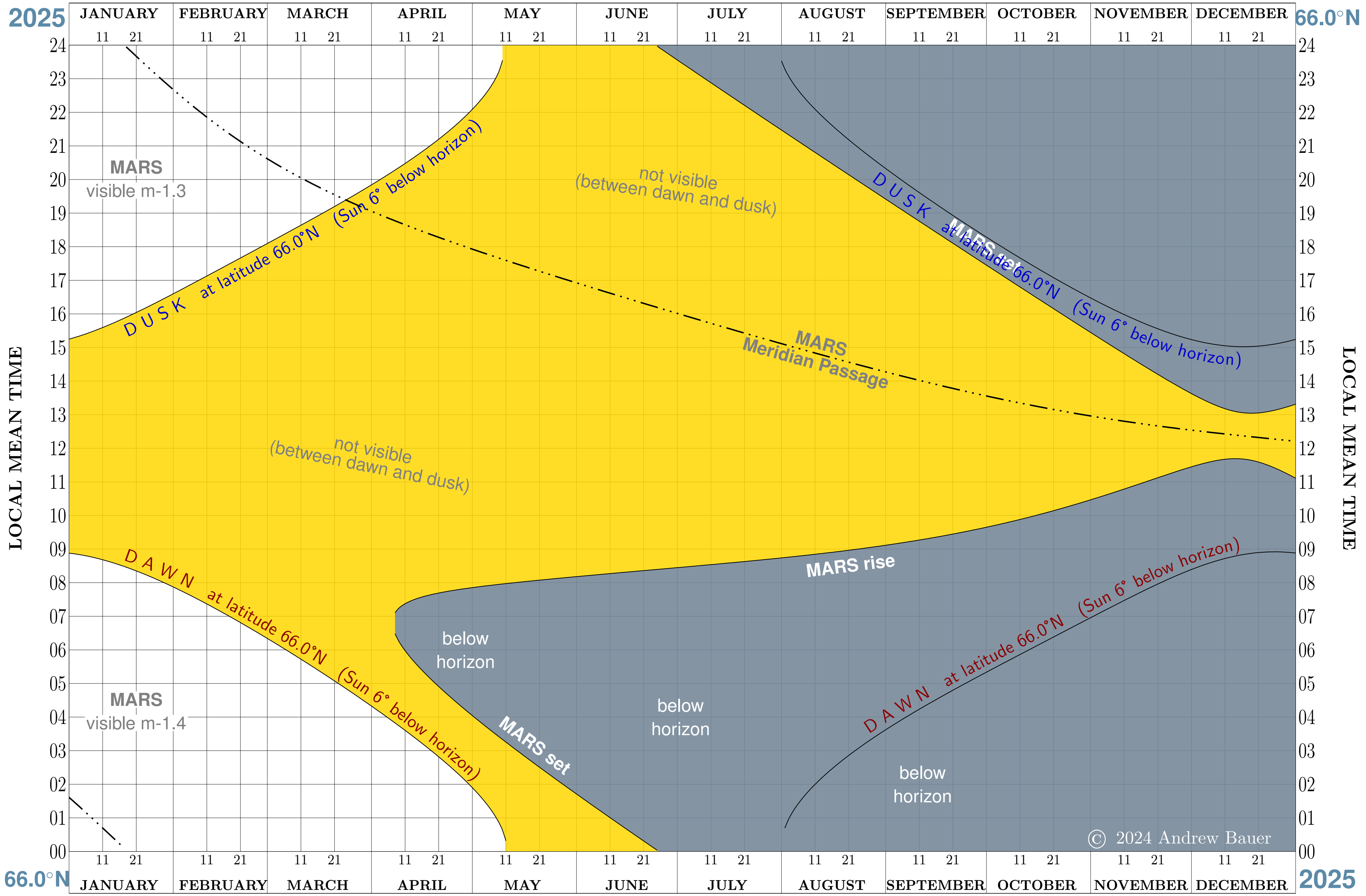


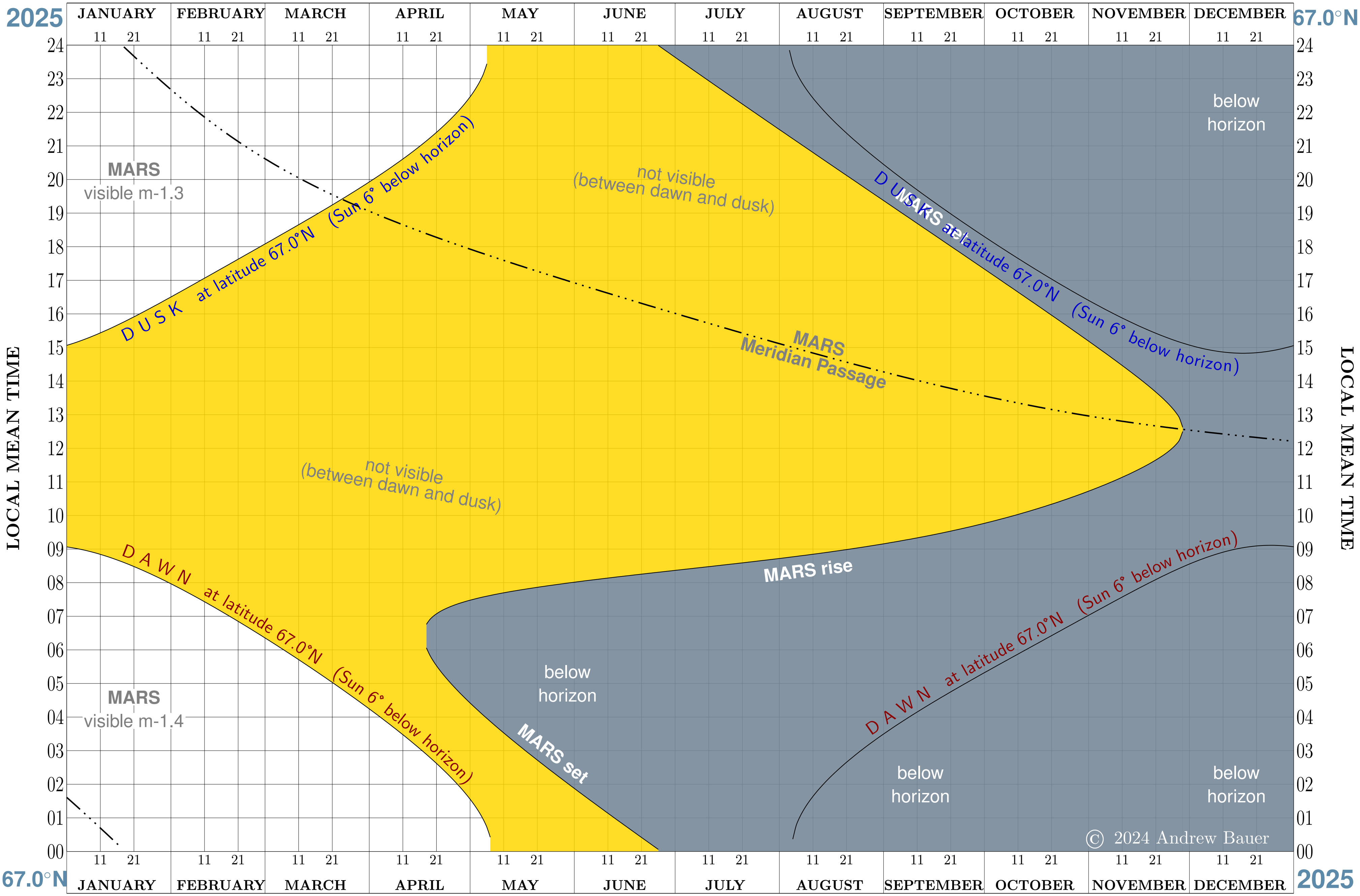
2025
63.0°N
JANUARY FEBRUARY MARCH APRIL MAY JUNE JULY AUGUST SEPTEMBER OCTOBER NOVEMBER DECEMBER
LOCAL MEAN TIME
MARS
visible m-1.3
MARS
visible m-1.4
DUSK at latitude 63.0°N (Sun 6° below horizon)
DAWN at latitude 63.0°N (Sun 6° below horizon)
not visible
(between dawn and dusk)
MARS
Meridian Passage
MARS set
MARS rise
below
horizon
© 2024 Andrew Bauer

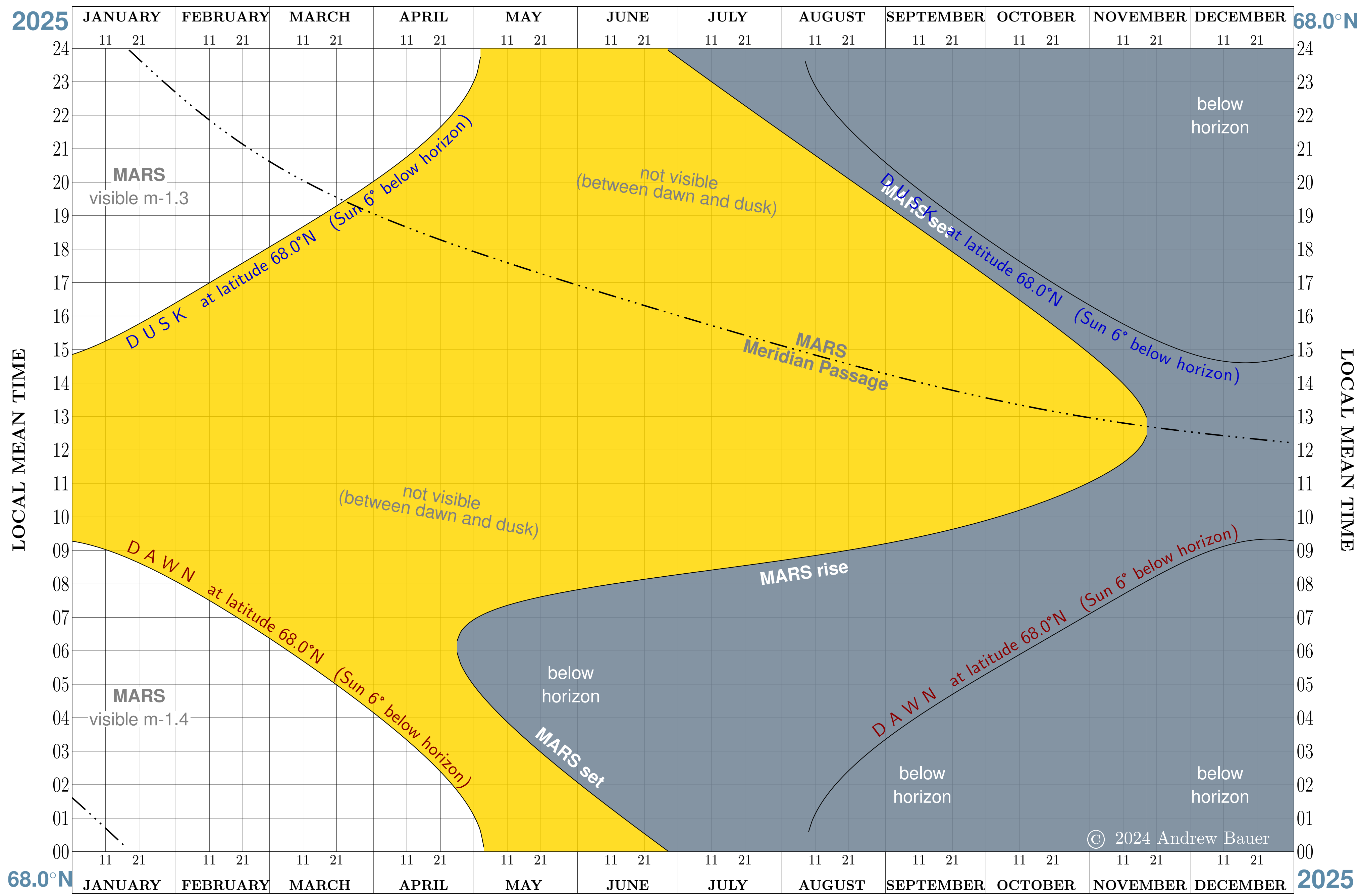

2025
64.0°N
JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER
DECEMBER
LOCAL MEAN TIME
MARS
visible m-1.3
MARS
visible m-1.4
D U S K at latitude 64.0°N (Sun 6° below horizon)
D A W N at latitude 64.0°N (Sun 6° below horizon)
not visible
(between dawn and dusk)
MARS
Meridian Passage
MARS set
MARS rise
below
horizon
© 2024 Andrew Bauer



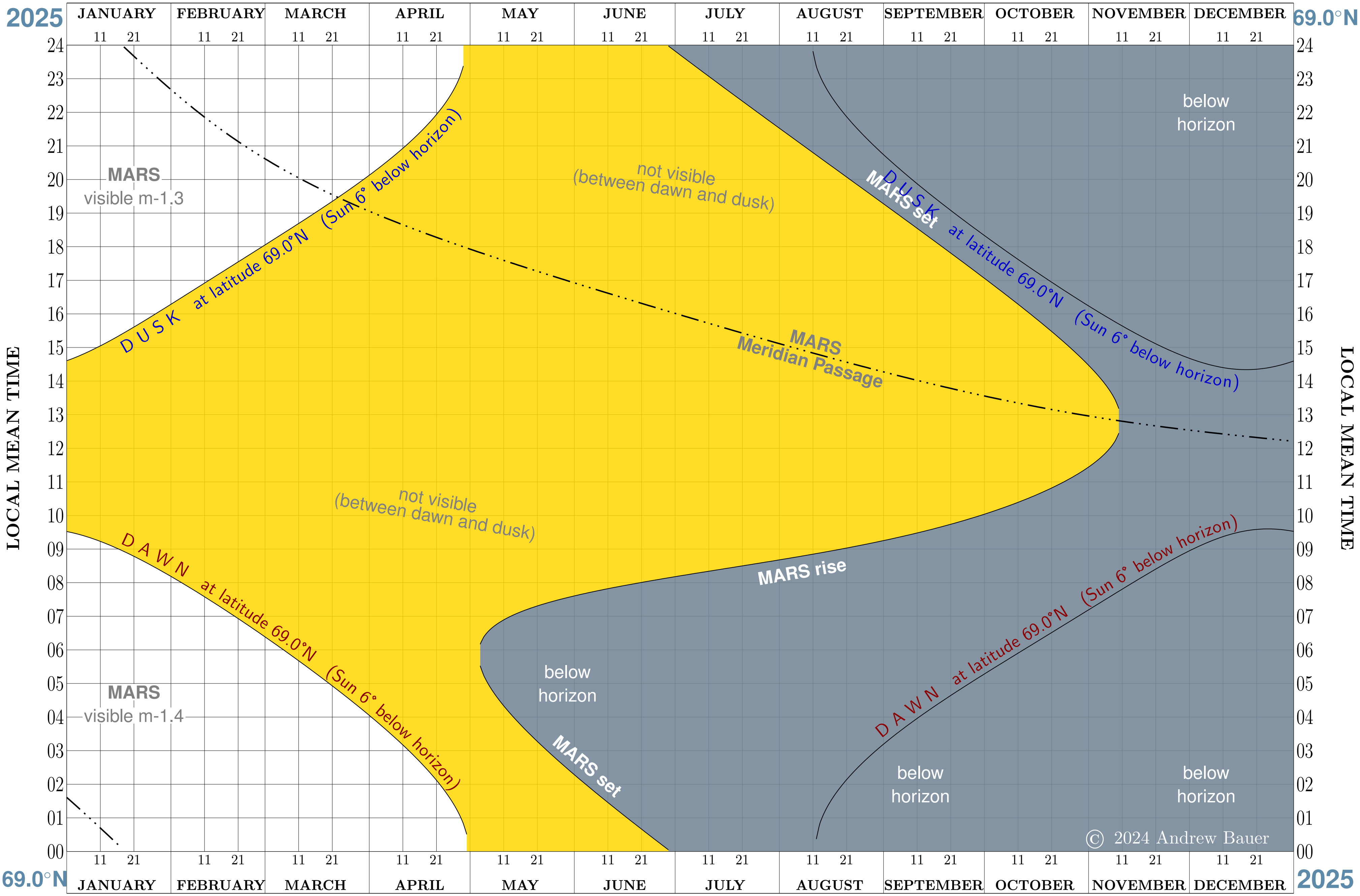
2025
65.0°N
JANUARY FEBRUARY MARCH APRIL MAY JUNE JULY AUGUST SEPTEMBER OCTOBER NOVEMBER DECEMBER
LOCAL MEAN TIME
MARS
visible m-1.3
MARS
visible m-1.4
D U S K at latitude 65.0°N (Sun 6° below horizon)
D A W N at latitude 65.0°N (Sun 6° below horizon)
not visible
(between dawn and dusk)
MARS
Meridian Passage
MARS set
MARS rise
below
horizon
© 2024 Andrew Bauer


2025
66.0°N
JANUARY FEBRUARY MARCH APRIL MAY JUNE JULY AUGUST SEPTEMBER OCTOBER NOVEMBER DECEMBER
LOCAL MEAN TIME
MARS
visible m-1.3
MARS
visible m-1.4
D U S K at latitude 66.0°N (Sun 6° below horizon)
D A W N at latitude 66.0°N (Sun 6° below horizon)
not visible
(between dawn and dusk)
MARS
Meridian Passage
MARS set
MARS rise
below
horizon
© 2024 Andrew Bauer

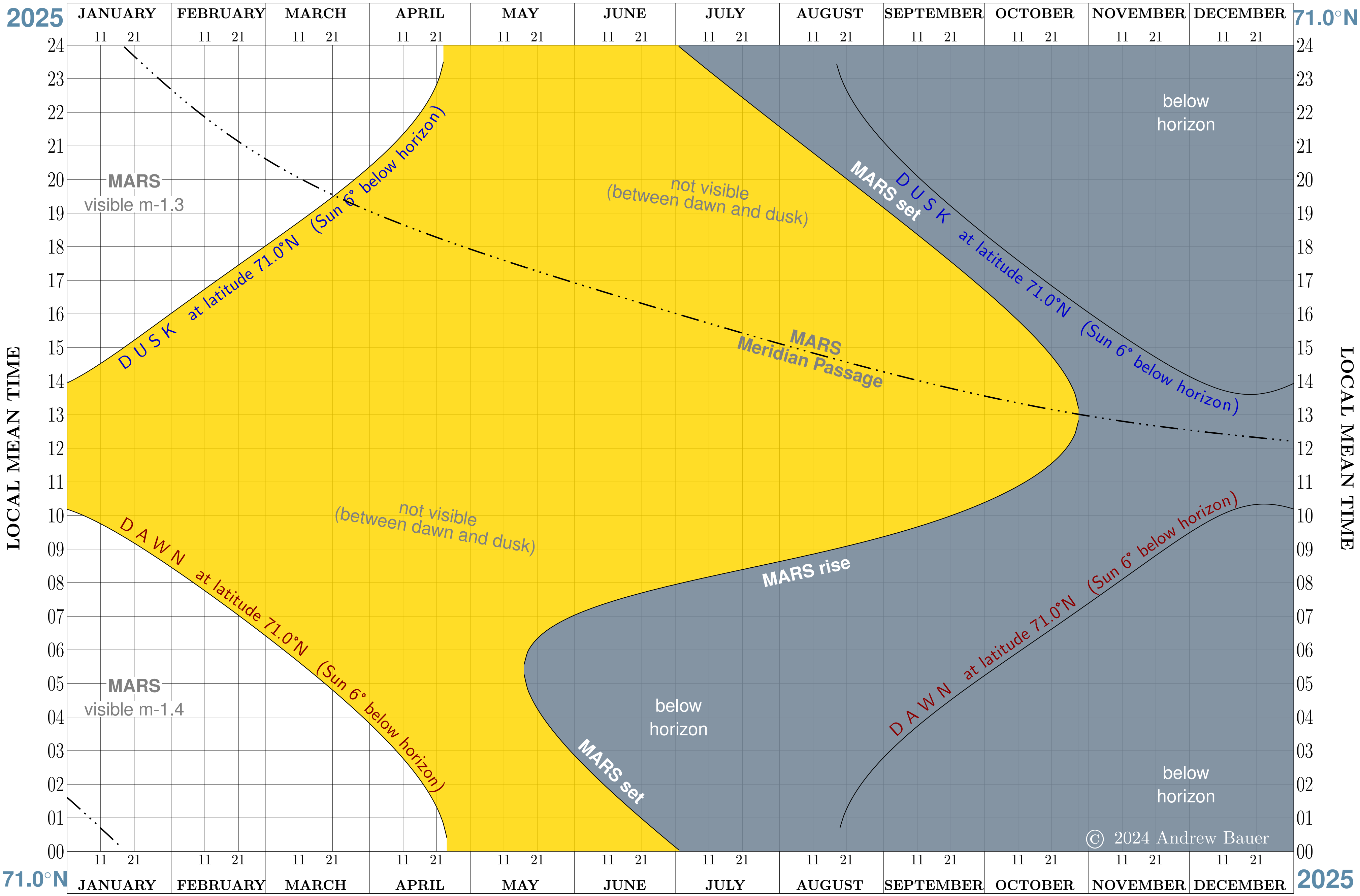

2025
67.0°N
JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER
DECEMBER
LOCAL MEAN TIME
MARS
visible m-1.3
MARS
visible m-1.4
D U S K at latitude 67.0°N (Sun 6° below horizon)
D A W N at latitude 67.0°N (Sun 6° below horizon)
not visible
(between dawn and dusk)
MARS
Meridian Passage
MARS set
MARS rise
below
horizon
© 2024 Andrew Bauer



2025
68.0°N
JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER
DECEMBER
LOCAL MEAN TIME
MARS
visible m-1.3
MARS
visible m-1.4
D U S K at latitude 68.0°N (Sun 6° below horizon)
D A W N at latitude 68.0°N (Sun 6° below horizon)
not visible
(between dawn and dusk)
not visible
(between dawn and dusk)
MARS
Meridian Passage
MARS set
MARS rise
MARS set
below
horizon
below
horizon
below
horizon
below
horizon
© 2024 Andrew Bauer



2025
69.0°N
JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER
DECEMBER
LOCAL MEAN TIME
MARS
visible m-1.3
MARS
visible m-1.4
D U S K at latitude 69.0°N (Sun 6° below horizon)
D A W N at latitude 69.0°N (Sun 6° below horizon)
not visible
(between dawn and dusk)
not visible
(between dawn and dusk)
MARS
Meridian Passage
MARS set
MARS rise
MARS set
below
horizon
below
horizon
below
horizon
below
horizon
© 2024 Andrew Bauer


2025
71.0°N
JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER
DECEMBER
LOCAL MEAN TIME
MARS
visible m-1.3
MARS
visible m-1.4
D U S K at latitude 71.0°N (Sun 6° below horizon)
D A W N at latitude 71.0°N (Sun 6° below horizon)
not visible
(between dawn and dusk)
not visible
(between dawn and dusk)
MARS
Meridian Passage
MARS set
MARS rise
MARS set
below
horizon
below
horizon
below
horizon
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