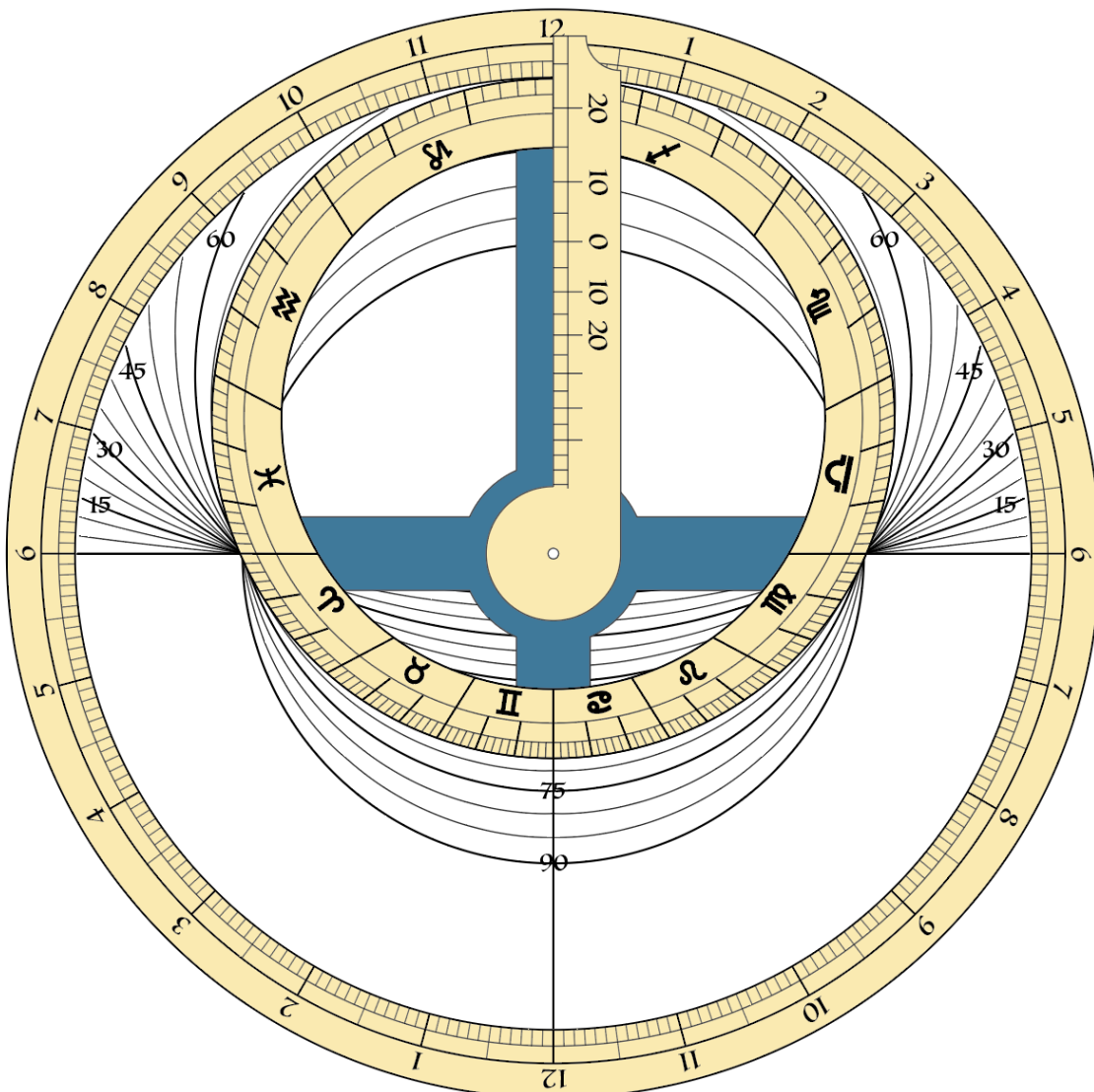


Universal Horizon Astrolabe

The typical planispheric astrolabe features a stereographic projection of the local sky. This projection allows many problems to be solved, but it is specific to a single latitude. *This* astrolabe projects horizons from a range of latitudes, removing the astrolabe's latitude-specific functionality at the cost of reduced utility. Historically, these overlaid horizons were often engraved on a dedicated plate that could be swapped out for those containing full local sky projections.

Assembling the volvelle:

The image below shows the completed volvelle and can act as a guide for your assembly. Once each component has been cut out with a hole punched through its center, they can be secured together in this configuration using a brass fastener. In order of assembly, from back to front, the components proceed as follows: limb, ecliptic, rule.

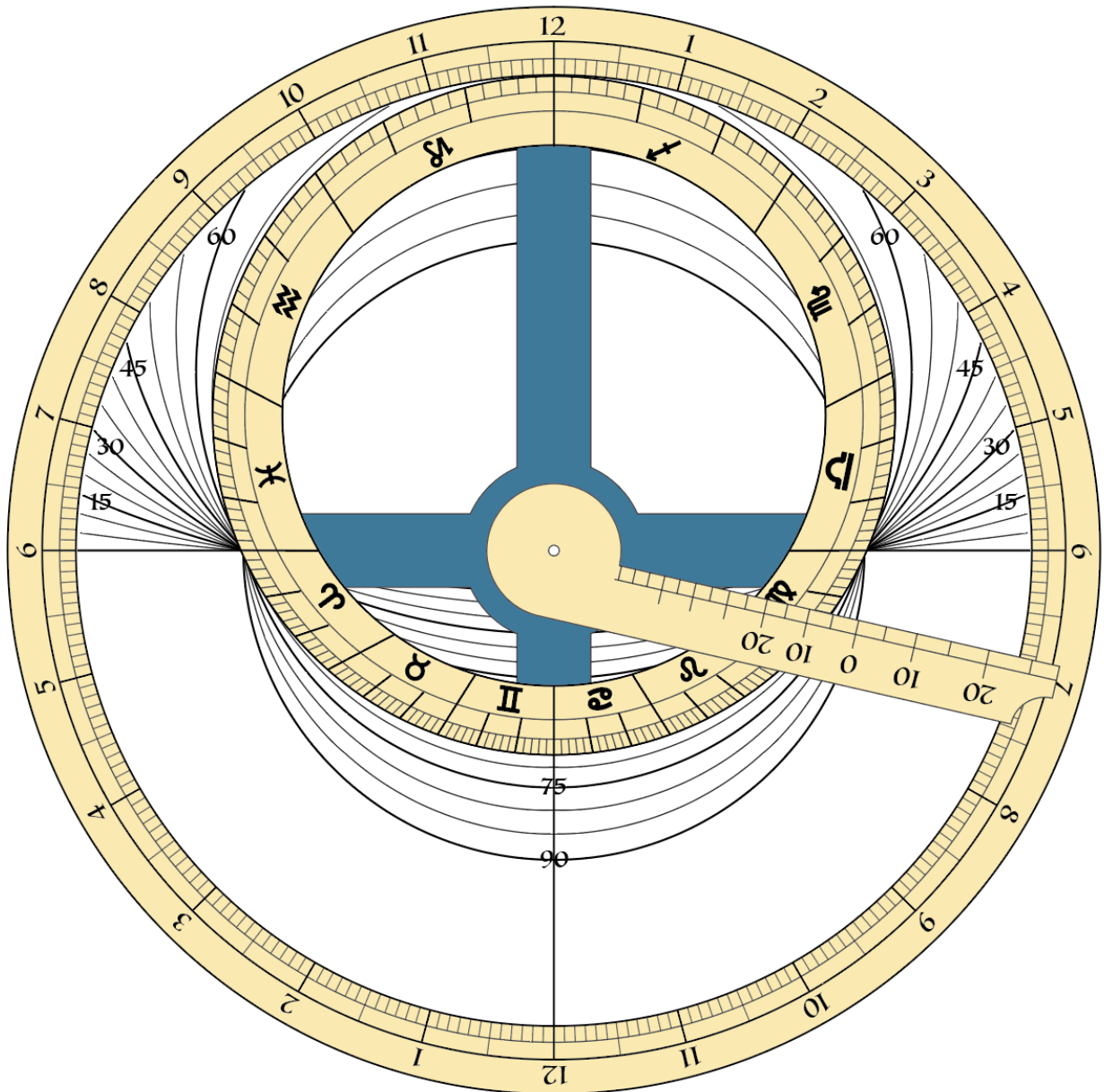


Using the volvelle: calculating the time of sunrise

Step 1: set the inner edge of the rule to the sun's position along the ecliptic.

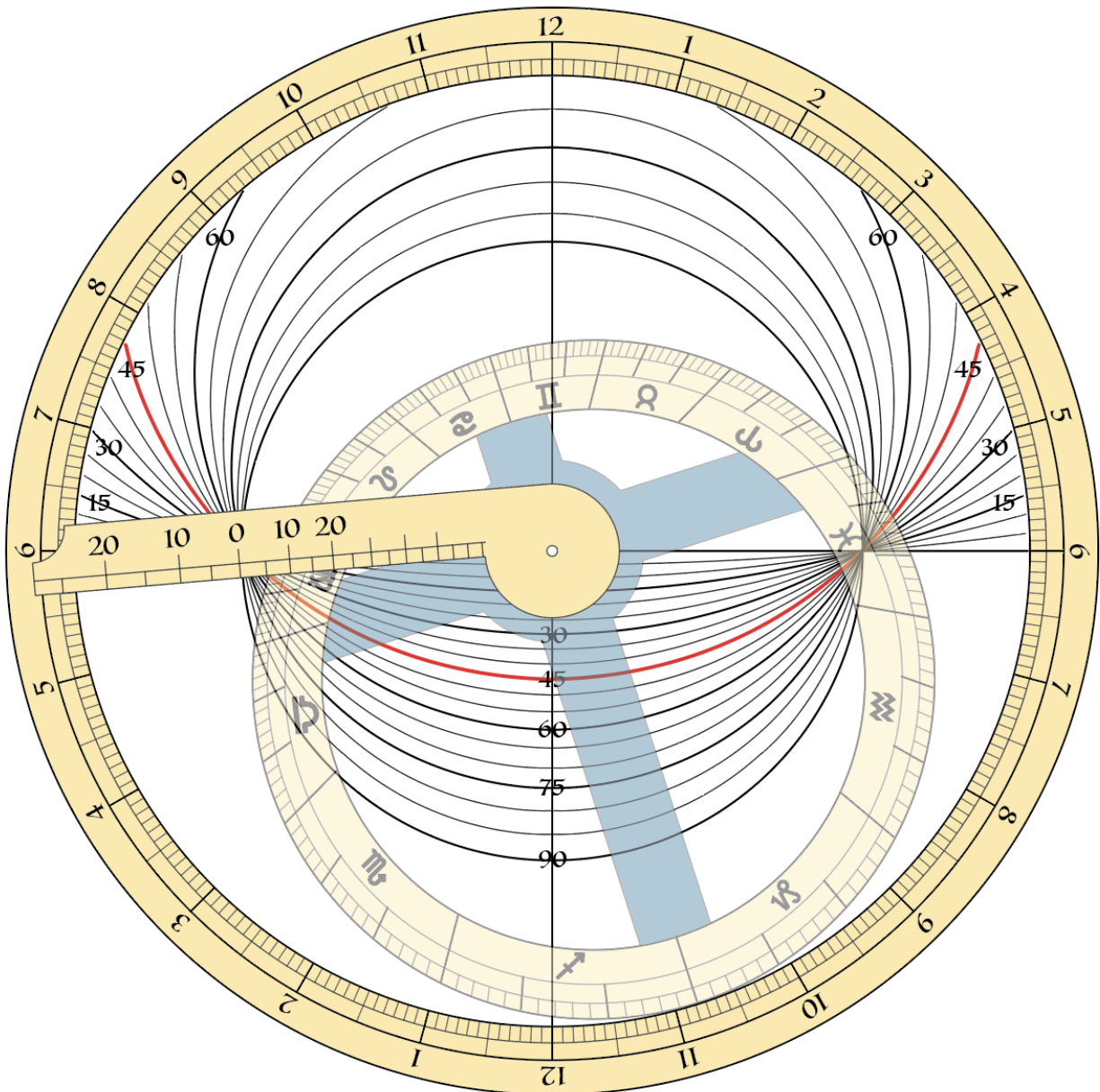
If you don't know the current ecliptic position of the sun, it can be found here under "sky right now" <https://www.bcgnomonics.com/planesphericastralabe>.

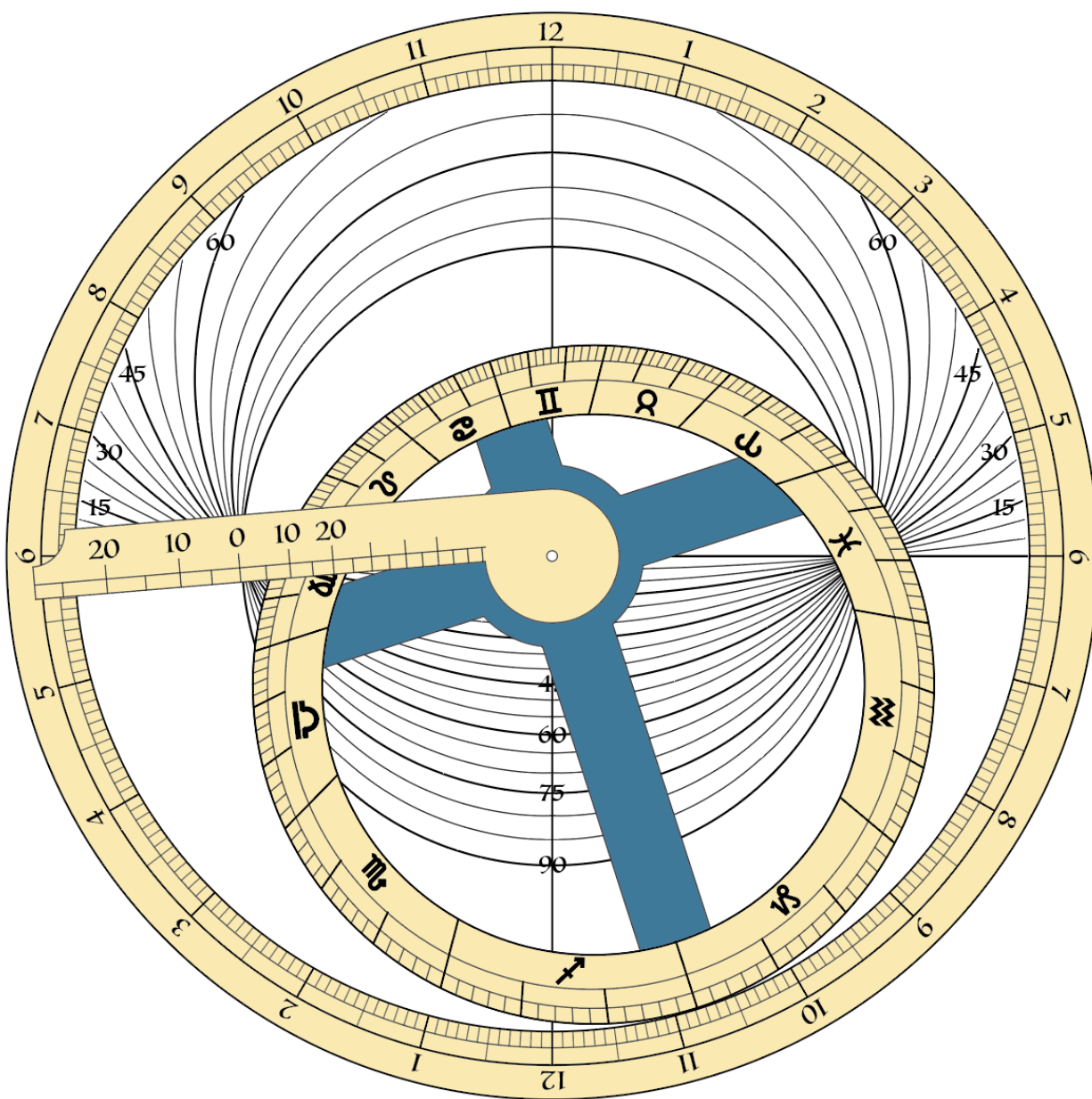
In the example shown below, the rule is set to 16° of Virgo.



Step 2: Find the horizon that is the closest match to your latitude.
In the example shown below, the horizon for 45° N is highlighted.

Step 3: rotating the ecliptic and rule together, place their intersection (the sun's ecliptic position) on your horizon.
In the example below, the intersection point of the rule and ecliptic sits on the 45° N horizon.





Reading the volvelle:

In this orientation, the rule indicates the time of sunrise against the hour scale (noon is at the top of the instrument).

In the example above, sunrise occurs at 5:40 am local solar time.

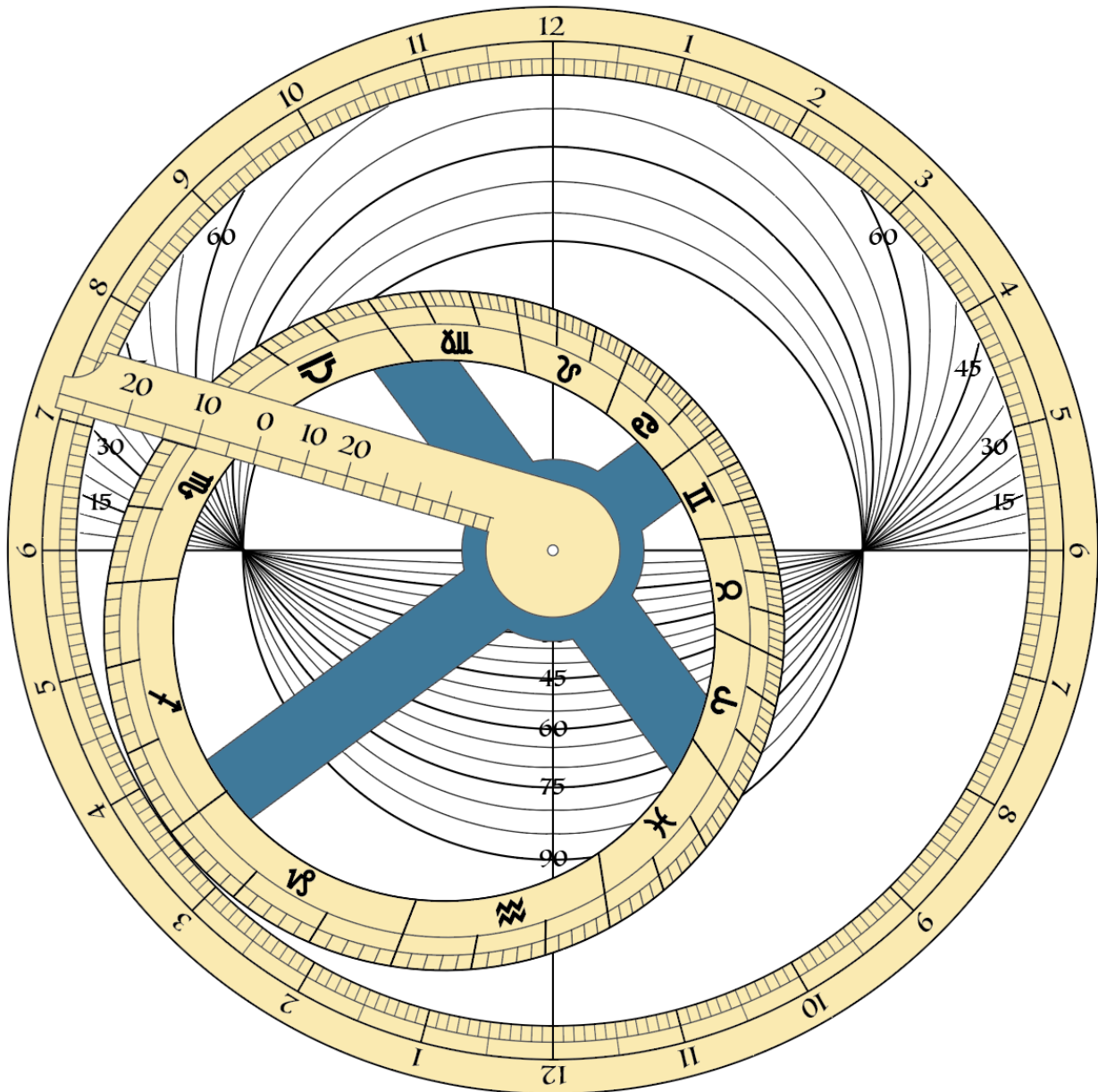
(Note that any time output will be local solar time. For precise results, refer to the conversion guide found here <https://www.bcgmnemonics.com/localapparenttime>.)

The volvelle can just as easily calculate the time of sunset; simply set the sun's ecliptic point to the other side of the astrolabe on the western horizon.

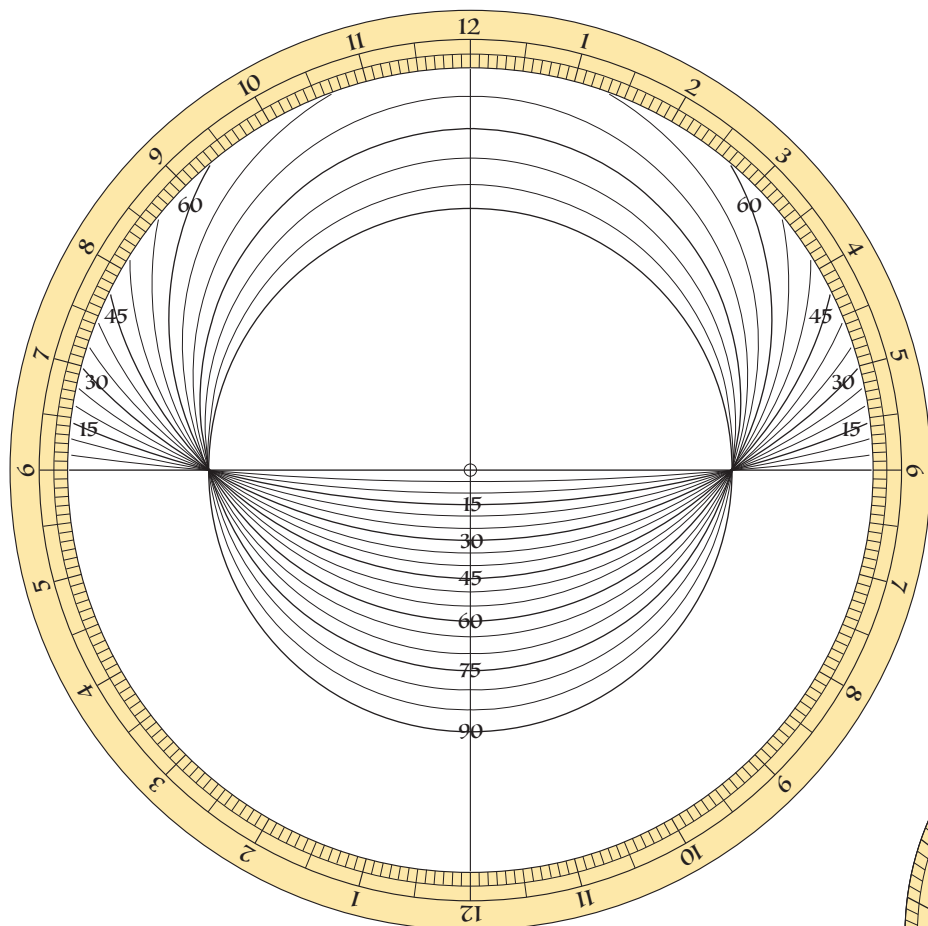
Solar declination can also be read from the rule.

To demonstrate the annual variation of the sun's diurnal arc, here's a second example. Here, the rule has been set to 10° of Scorpio, which corresponds to November 2nd.

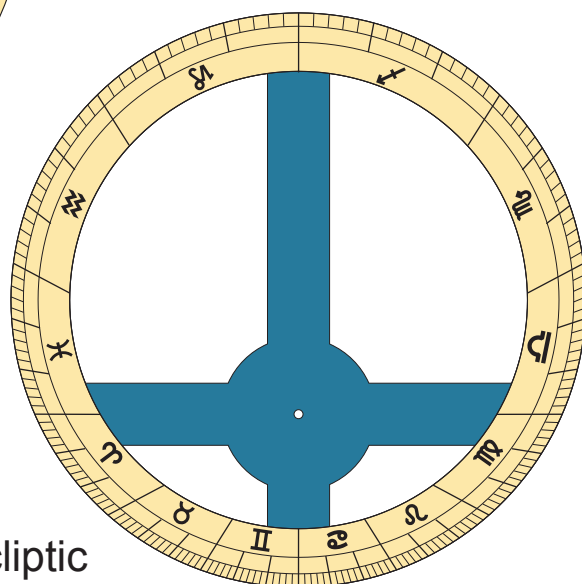
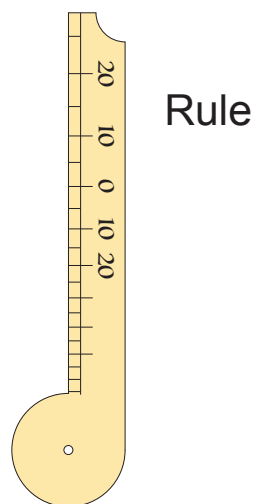
Reading the limb, we can see that sunrise occurs on this date (at latitudes of 45°) at 7:05 am solar time.



The inputs used to set this orientation do not need to be your actual local values. Additional problems may be solved by choosing a different latitude and/or setting the volvelle to a date and time of your choosing in the past or future.



Horizon plate and limb



Ecliptic

Universal Horizon Astrolabe