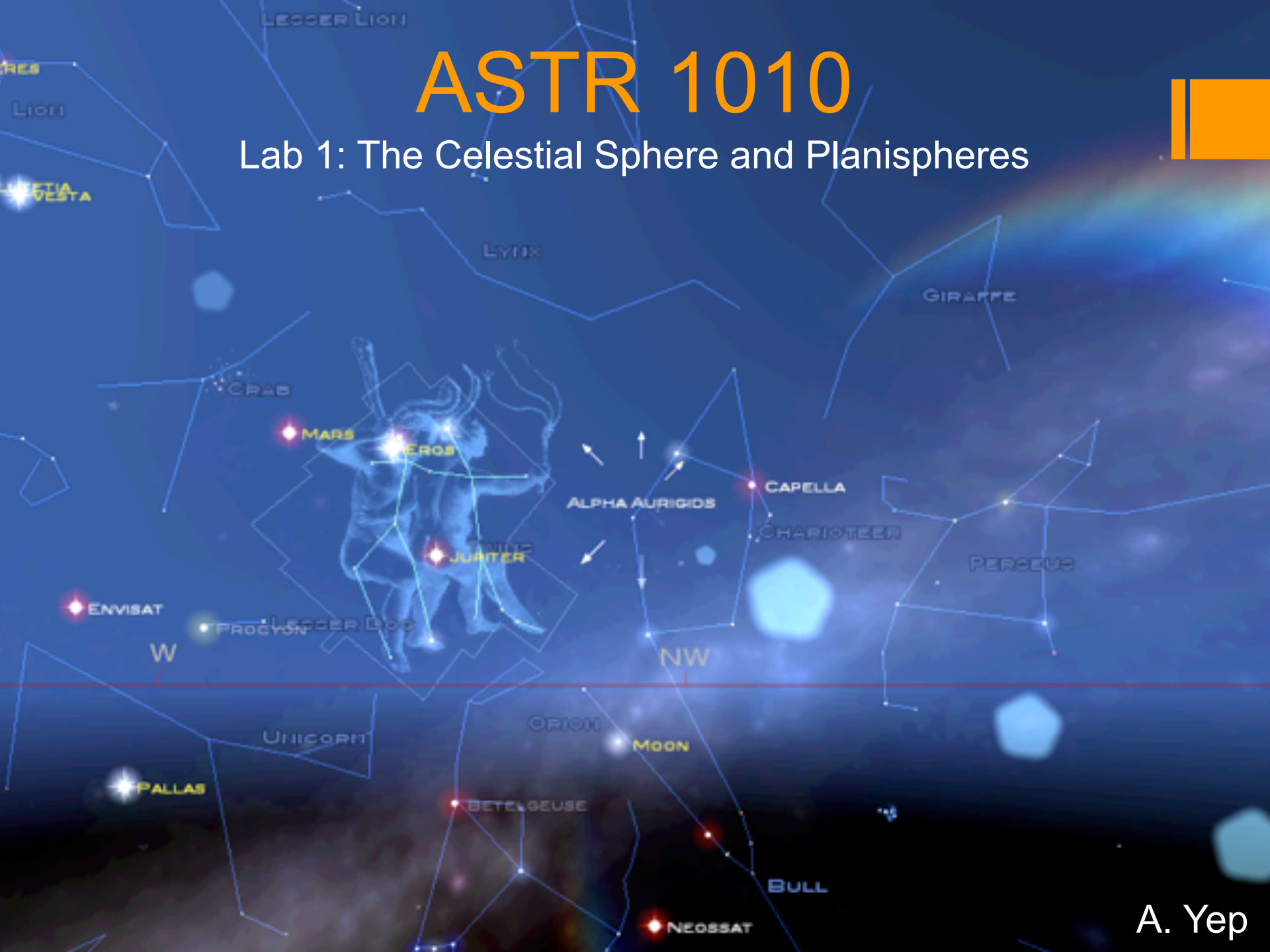
ASTR 1010

Lab 1: The Celestial Sphere and Planispheres



A. Yep

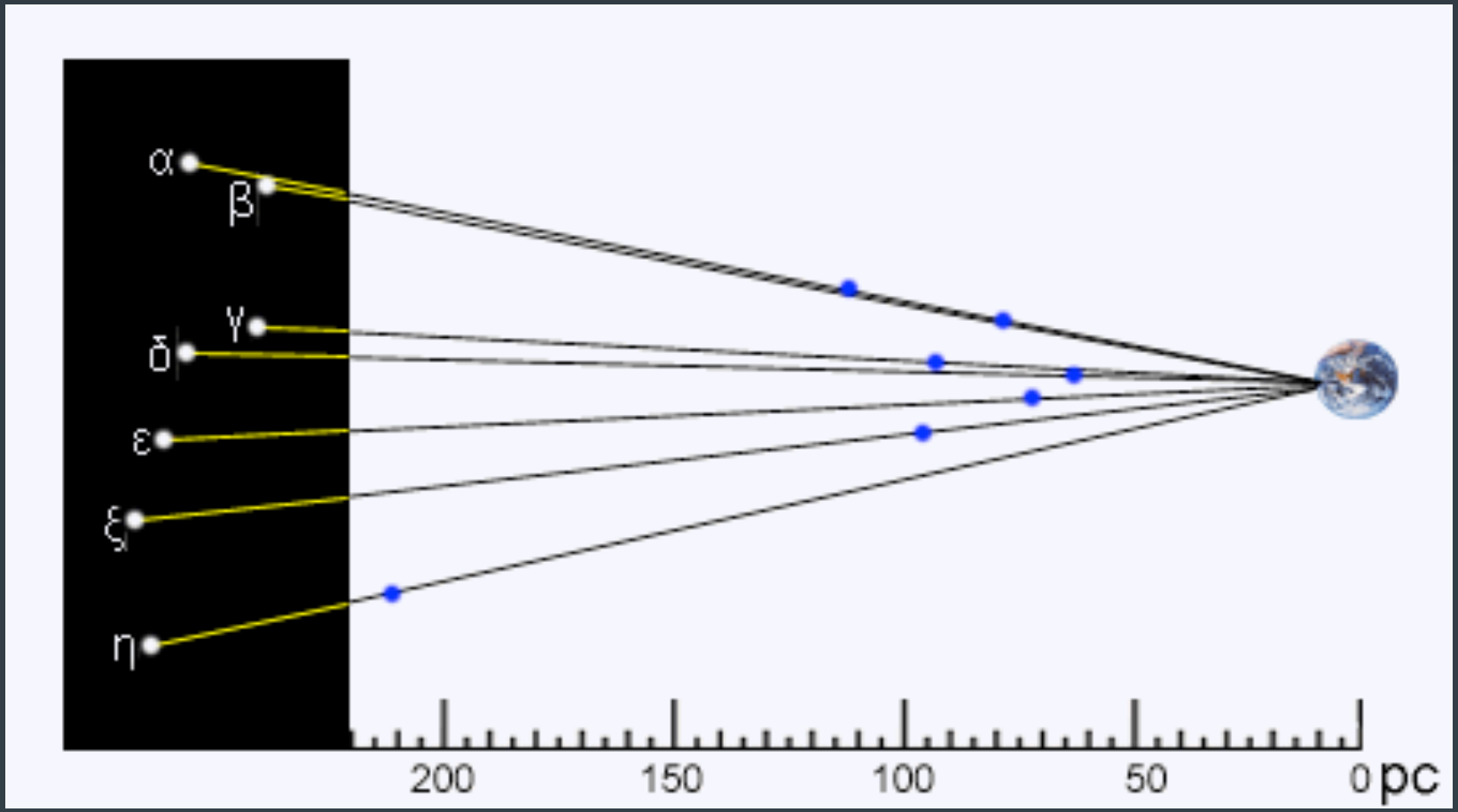
Sky Maps

When we need to find a place, we use a map. Stars each have a place in the sky, so we can use maps to find stars too.

Celestial Sphere

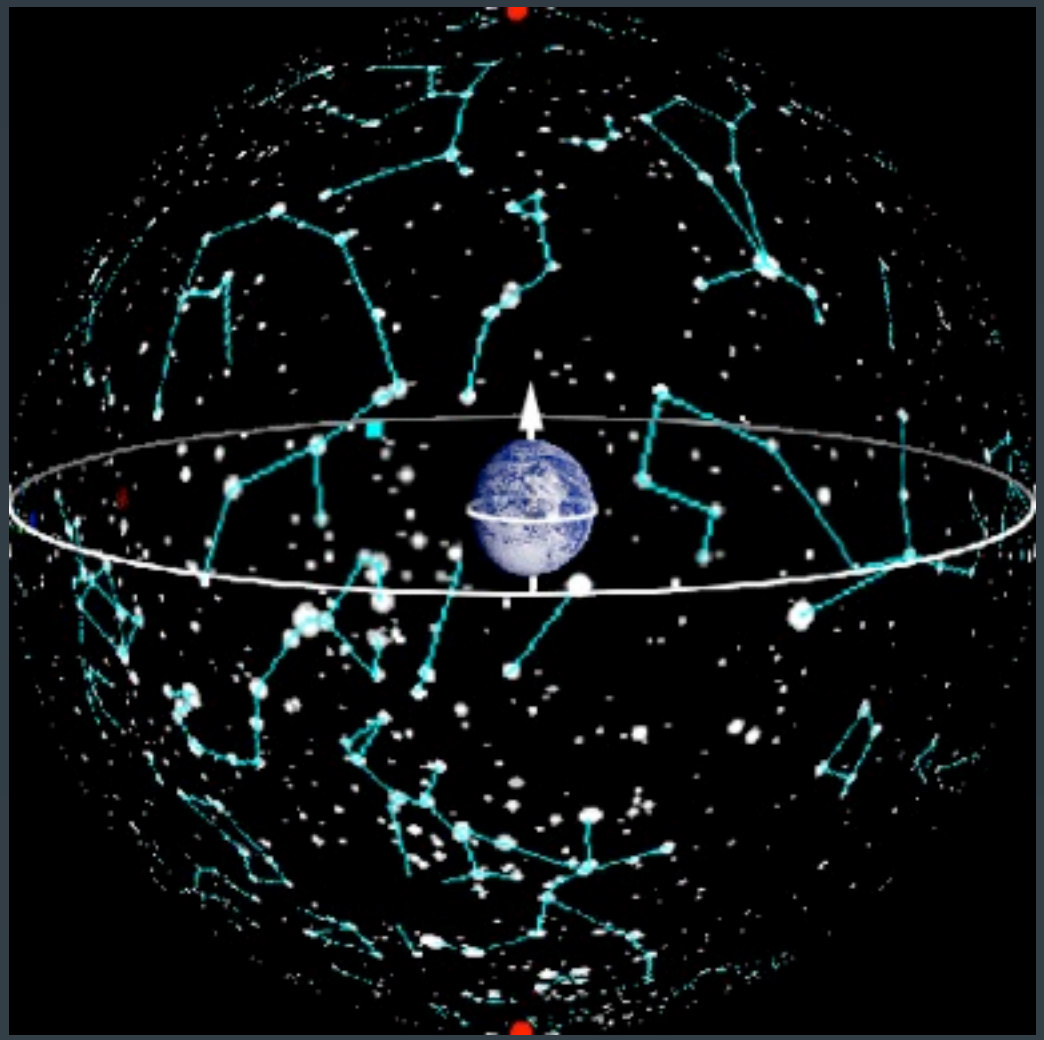
In reality, all the stars we see are far away from us and generally far away from each other. To us, however, because they are so far away, they look like points of light on the inside of a sphere. This is the celestial sphere.

What we see: Stars' real locations:



Celestial Sphere

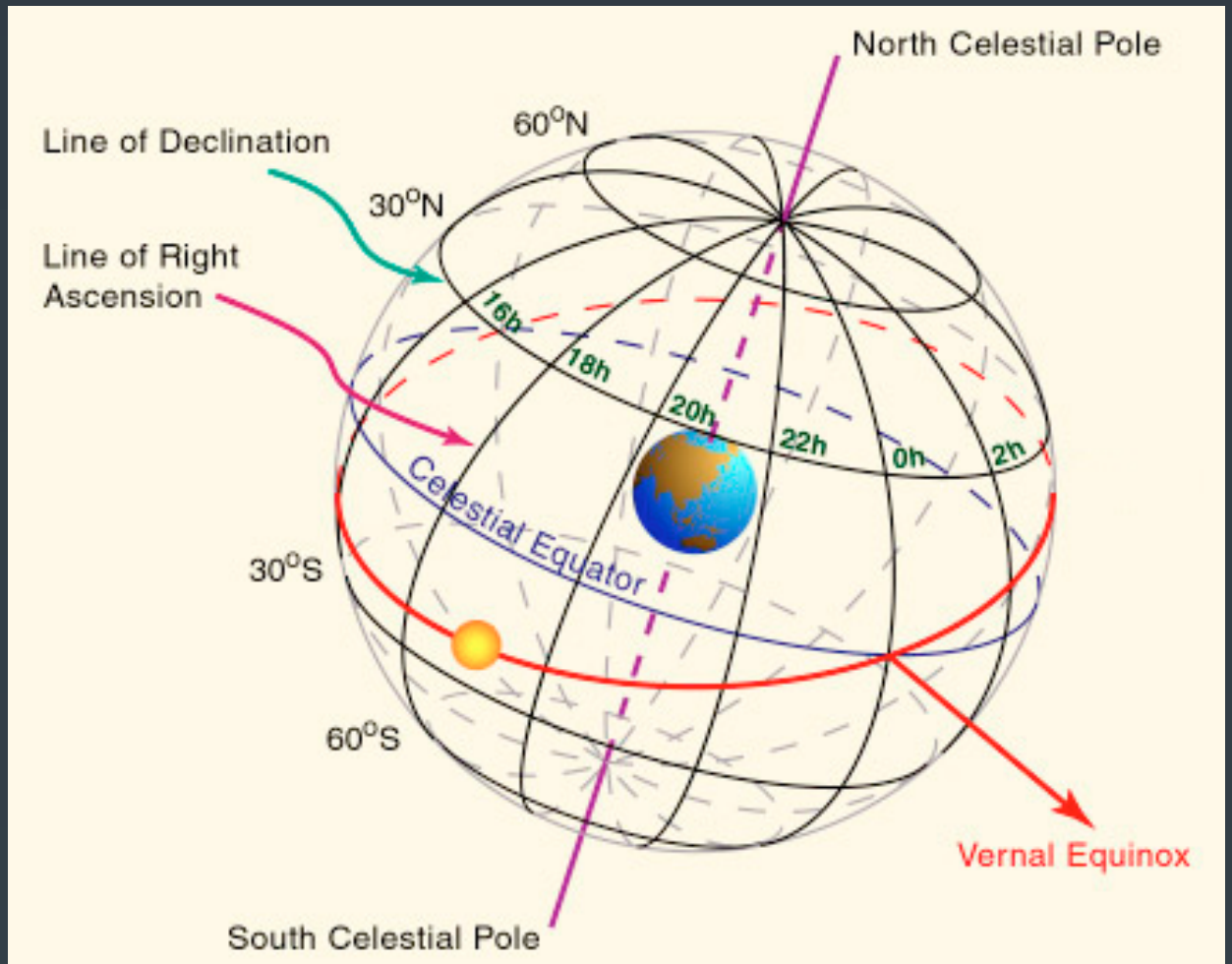
Just as we compress hills and mountains into a flat piece of paper, we compress stars all lightyears apart into the surface of an imaginary sphere. Our celestial sphere looks like this:



Equatorial Coordinates

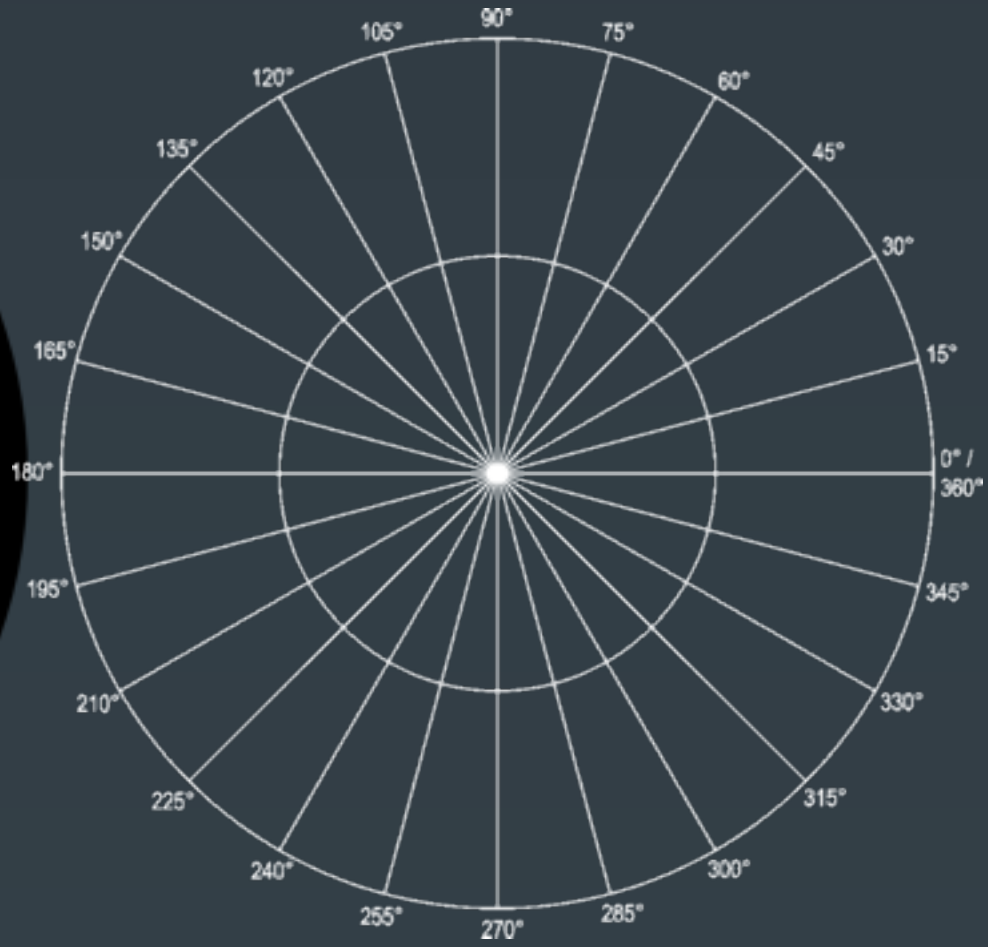
Maps have lines of latitude and longitude. We extend this system to the sky, forming the equatorial coordinate system.

Right Ascension: Longitude (vertical circles, measure East-West location)
Declination: Latitude (horizontal circles, measure North-South location)



Hours vs. Degrees

Right Ascension is measured in hours, a very convenient measure because it tracks the sky as the earth rotates and local time changes. Geometrically, using hours works fine because circles are measured in degrees, and clocks, it so happens, are also circles. There are 24 h in a clock and 360° in a circle. Therefore, **1 h = 15°.**

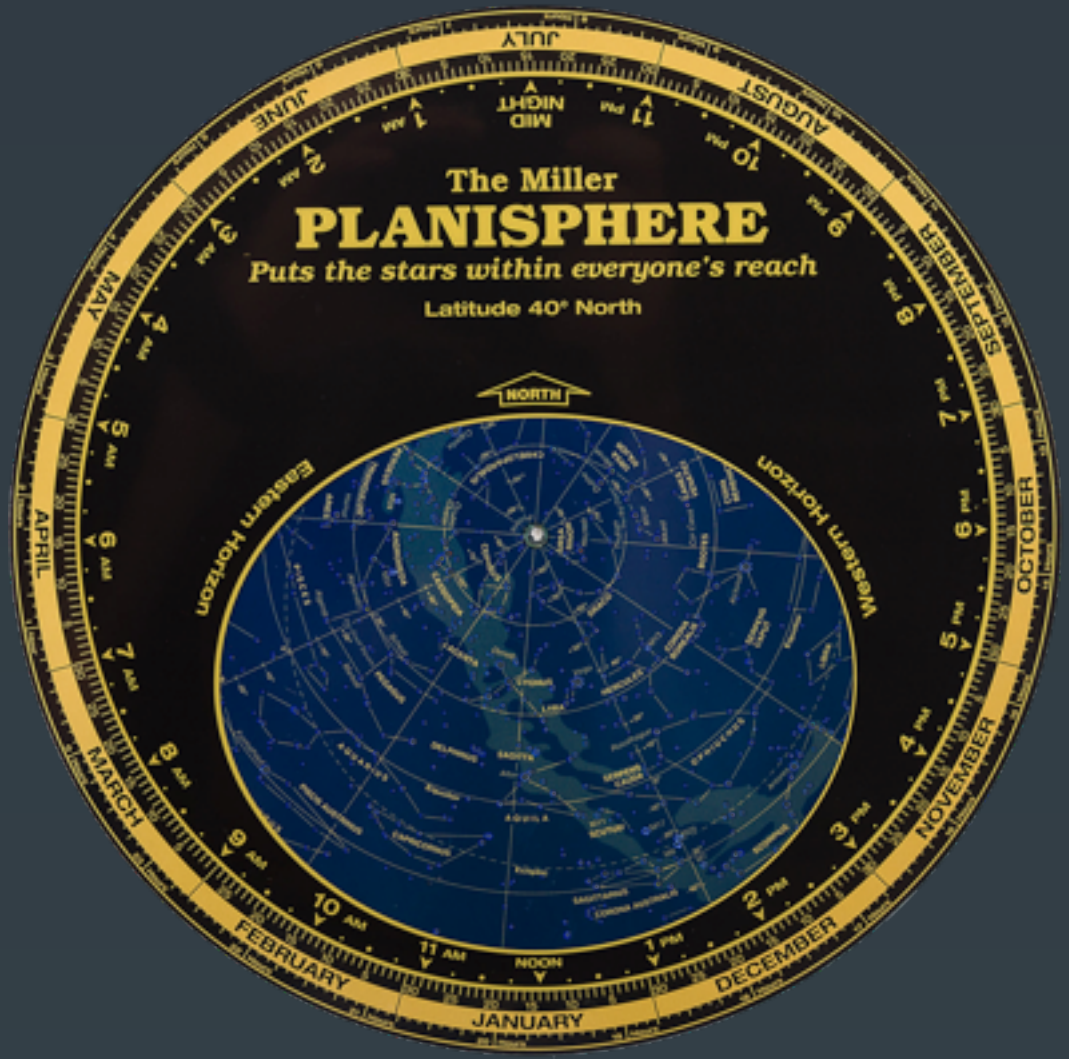


Celestial Globe

When we look up at the sky, we see the inner surface of celestial sphere. If you turn that inside out, you get a globe! That's what we're using for today's lab. Using it is a lot like using a regular globe of Earth.

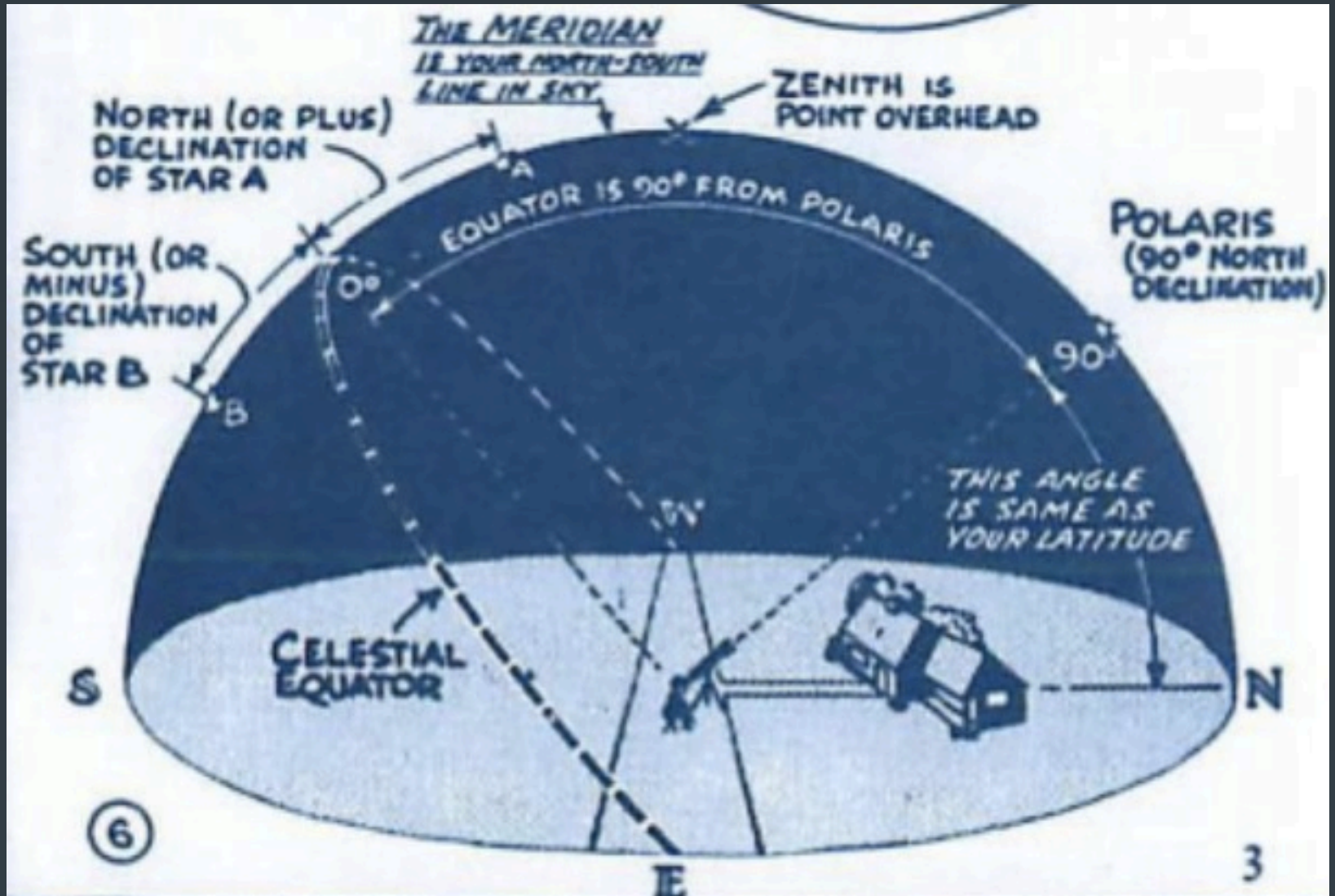
Global to Local

Globes are great for learning where places are in context of the whole world, but they're not always great for getting where you need to go. For that we have city maps, and state maps. For the local sky, we have planispheres.



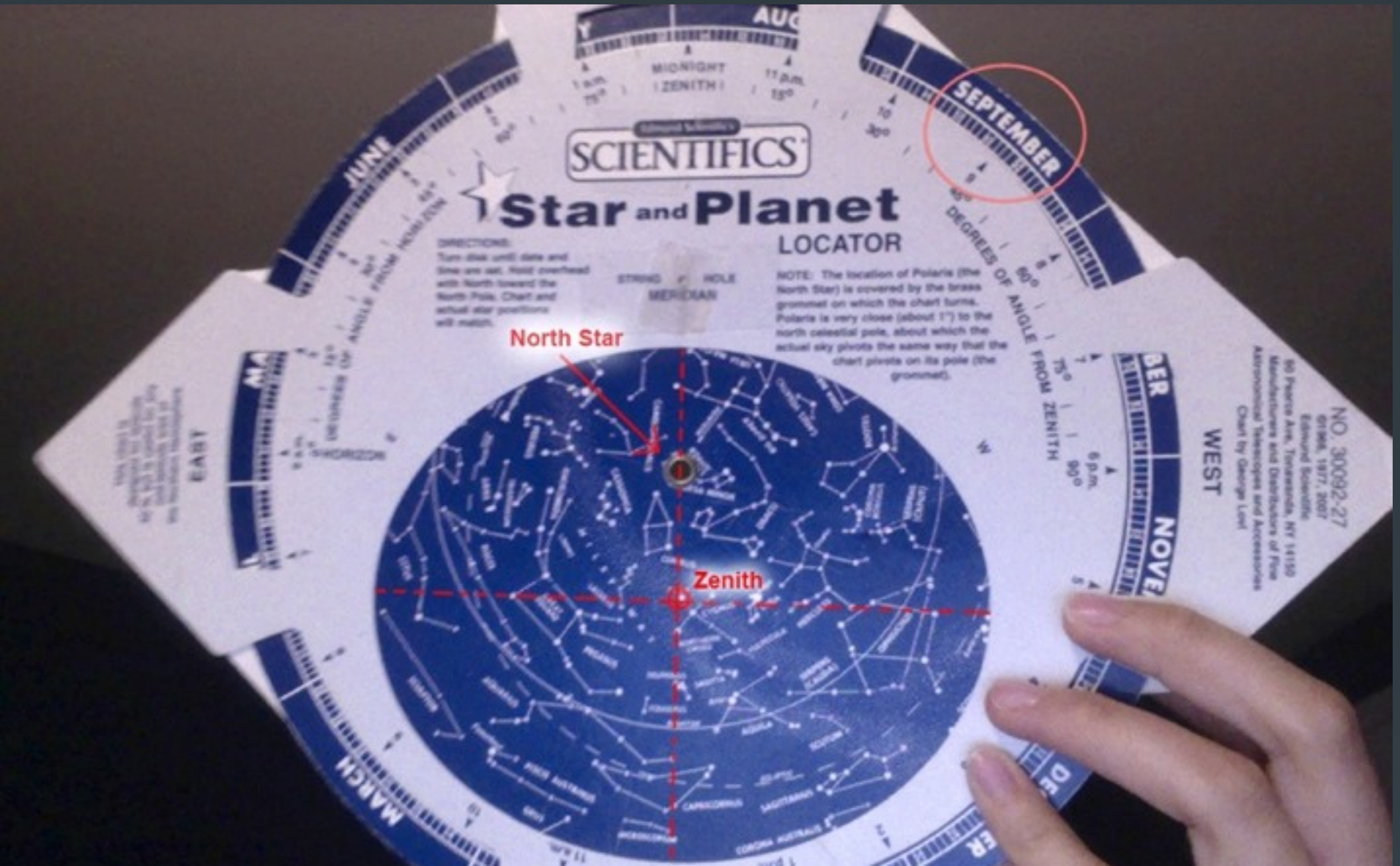
Horizon System

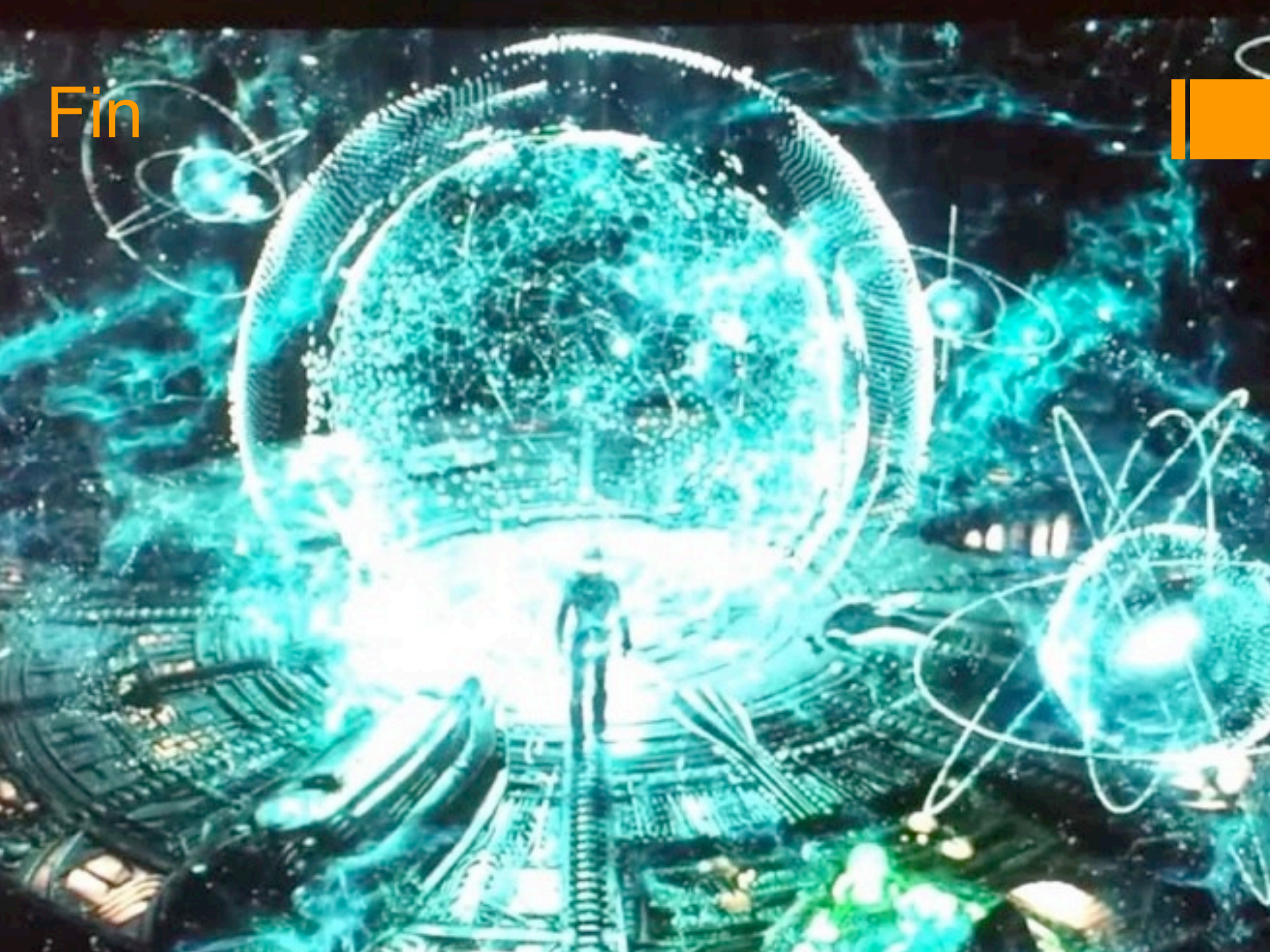
The **horizon** is at 0° altitude. The **zenith** is directly over your head (90° altitude). The **meridian** arches over your head from north to south. The **North Star** is 34° above L.A.'s horizon. The **celestial equator** is 90° from the North Star.



The Star Wheel

Here is everything you can see on this day, at this time.




Fin