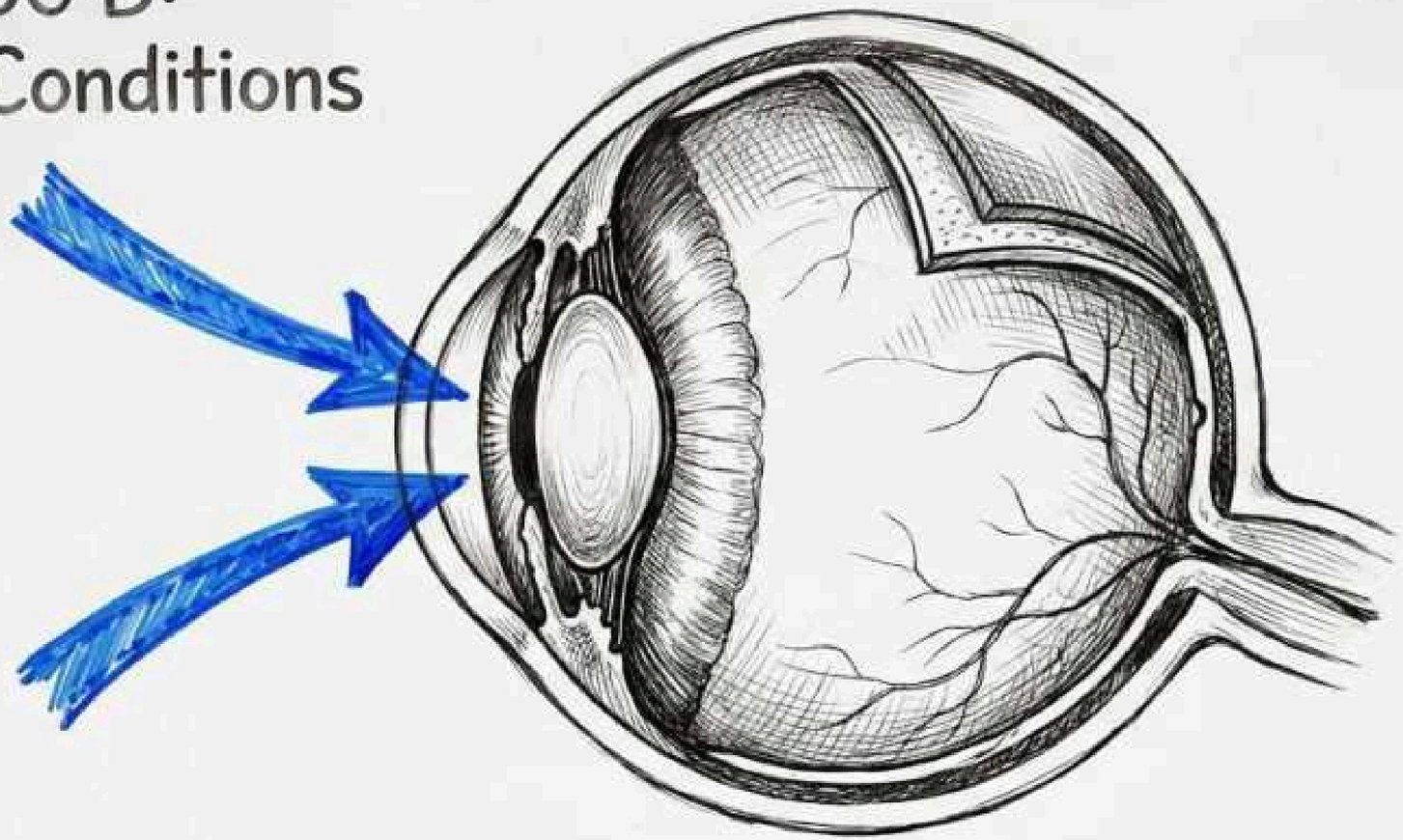
ASTR 150 B:
Tools & Conditions

¶ 2.1



Your eyes are your main instrument. A single glance at a bright screen or headlight undoes chemical adaptation. Give yourself time; expect to see more stars the longer you stay out.



T = ~1 min:
Pupil widening
(mechanical adjustment)

T = 20–30 mins:
Chemical retinal adaptation
(full night vision achieved)

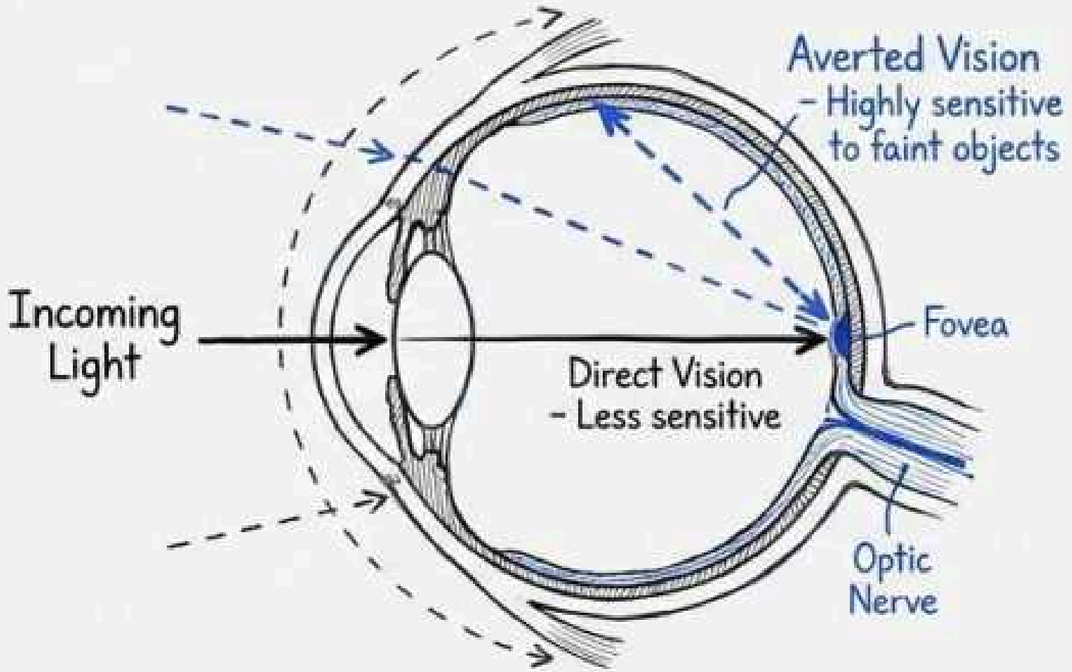


[¶ 2.2]

$\lambda \approx 650\,nm$

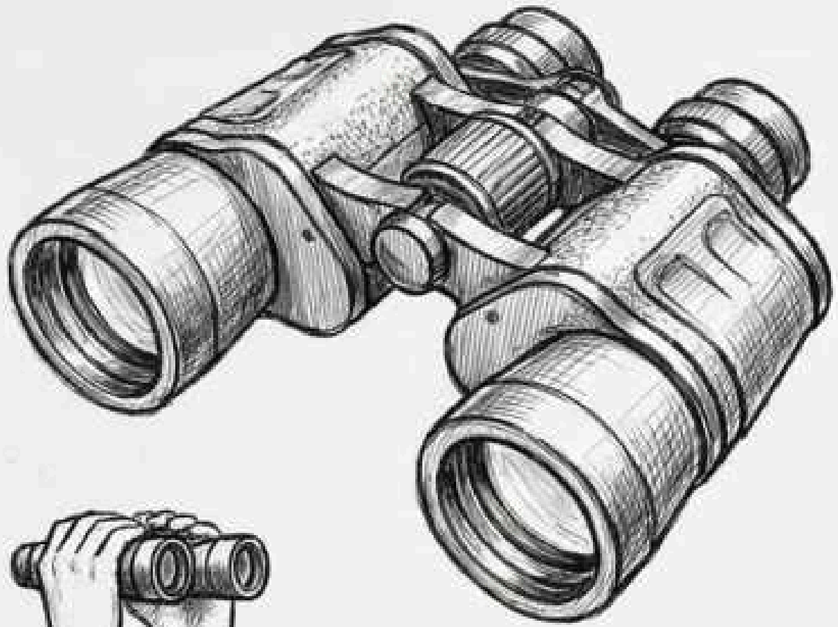


Red light sources



Red light preserves dark adaptation. For faint objects, utilize Averted Vision: look slightly to the side of your target so the light falls on the more sensitive outer retina.

[¶ 2.3]





Specs: 7x50 or 10x50

Magnification (M) = 7x or 10x

Objective Lens (D) = 50mm

Light Gathering Power (LGP) $\propto D^2$



Jupiter



The Moon



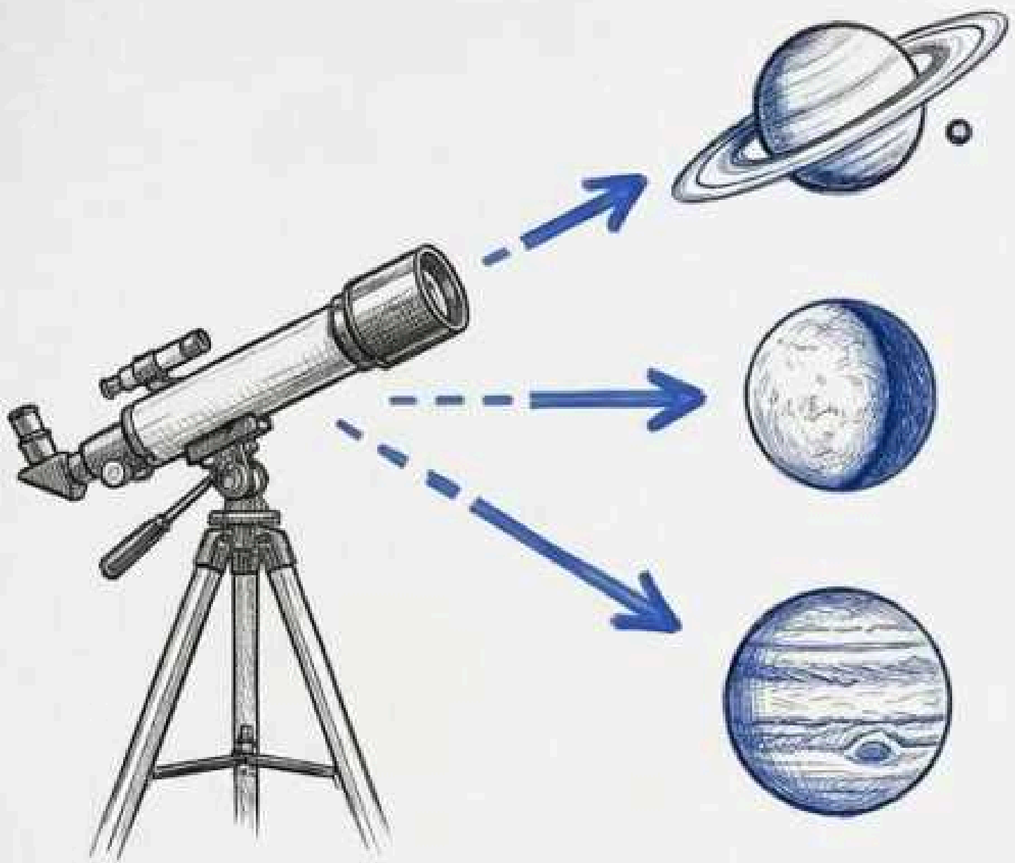
The Pleiades



Andromeda Galaxy

Binoculars are the best first instrument. They gather far more light than the eye. Keep the view steady by resting elbows on a car roof or fence.

[¶ 2.4]



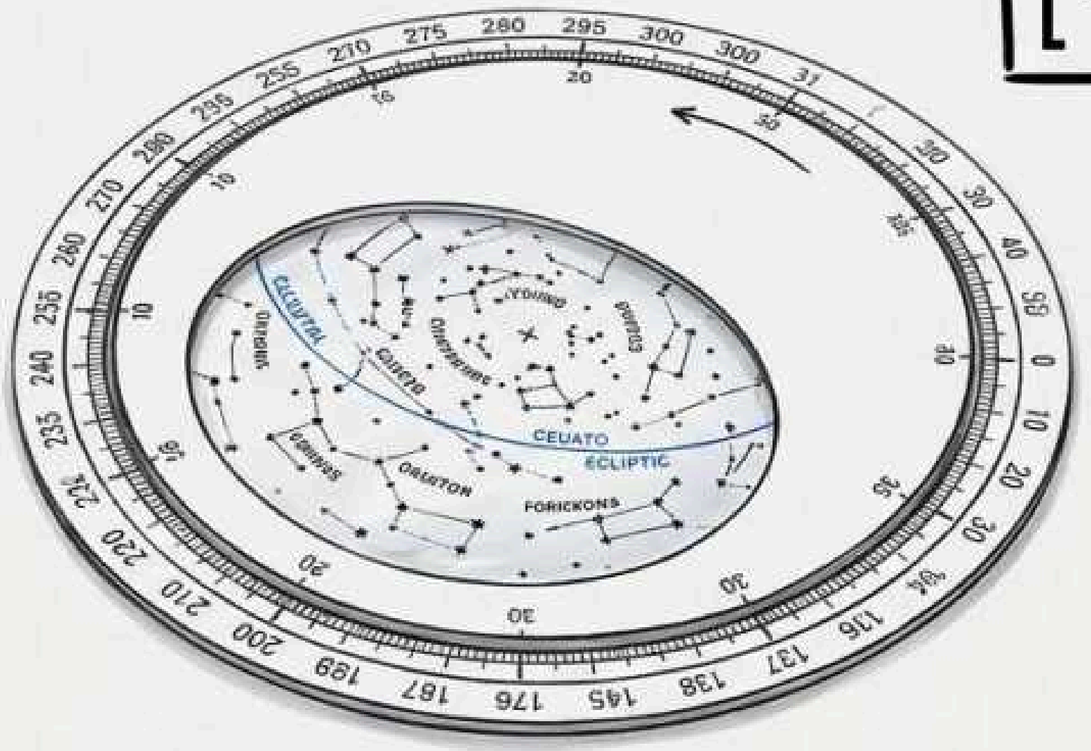
Good Binoculars > Cheap Telescope

A small telescope reveals planetary details but is NOT needed for this course.

Pro-Tip: Leverage astronomy clubs for free public viewing nights to look through larger telescopes and get expert advice.

[¶ 2.5]

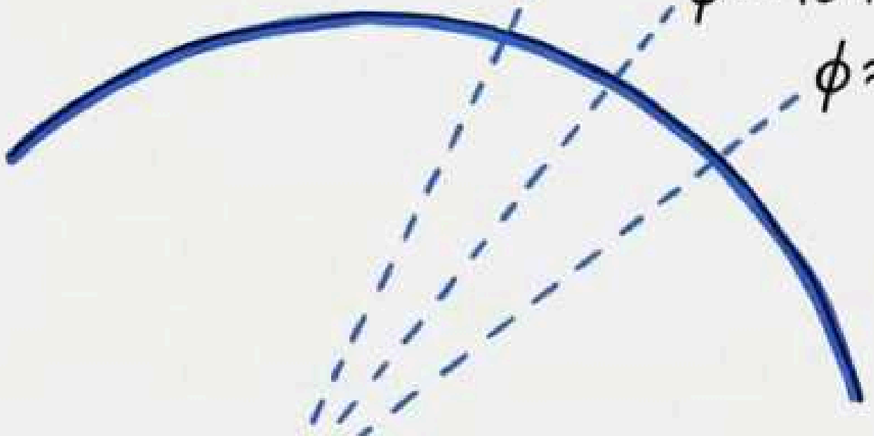




$\phi \approx 30°N \rightarrow$ Florida

$\phi \approx 40°N \rightarrow$ Mid-Country

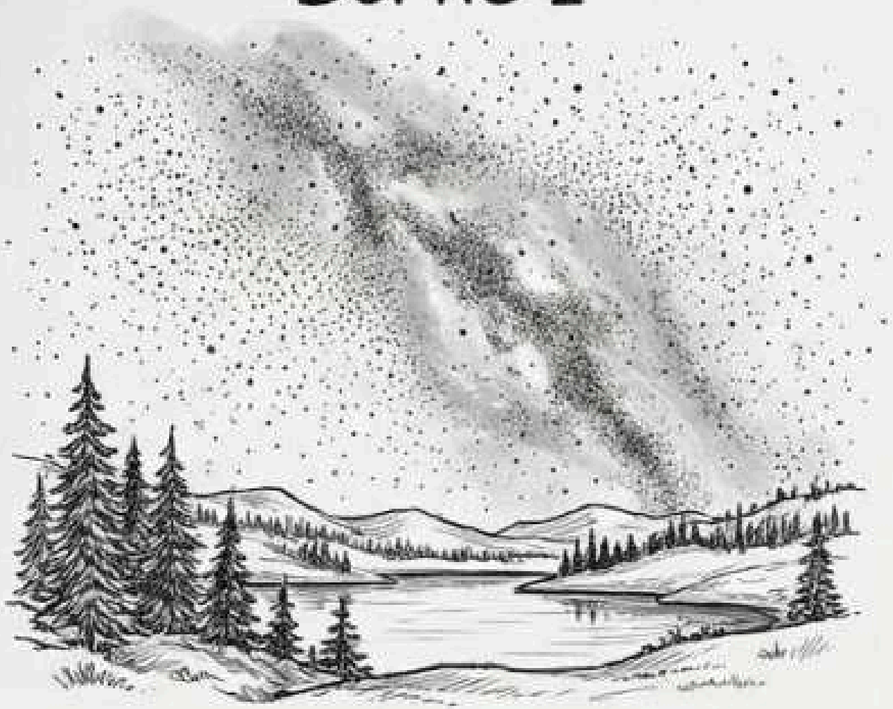
$\phi \approx 50°N \rightarrow$ Seattle



Digital planetarium apps (like Stellarium) map the sky via GPS. Analog planispheres are a reliable alternative with infinite battery life, but must be matched to your latitude.

[¶ 2.6]

Bortle 1



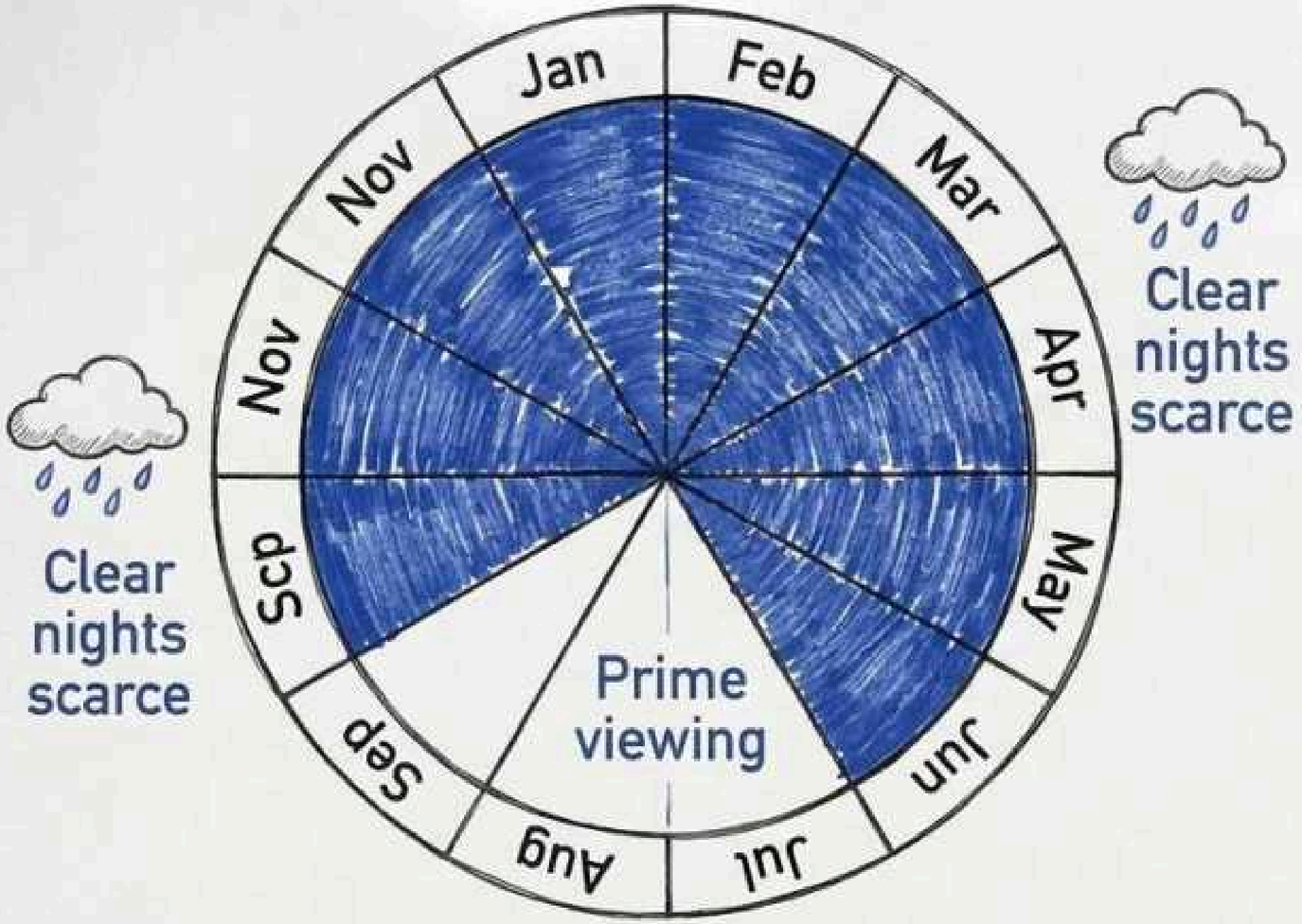
Bortle 9

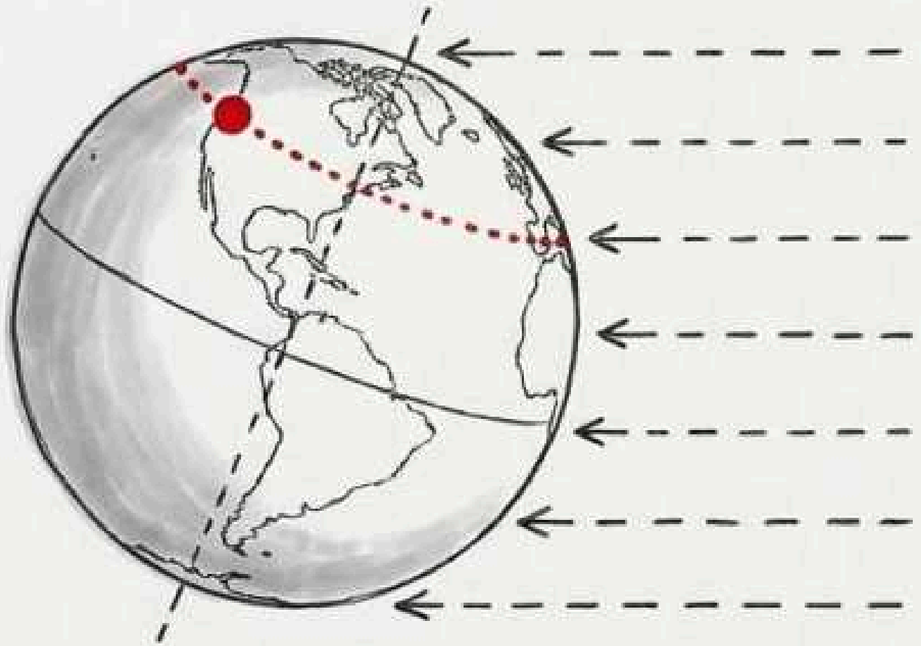


1 2 3 4 5 6 7 8 9

The greatest enemy: Light Pollution (scattered artificial light). In a big city, expect a few dozen stars. Even a short drive away yields exponential increases, revealing several thousand stars at a truly dark site.

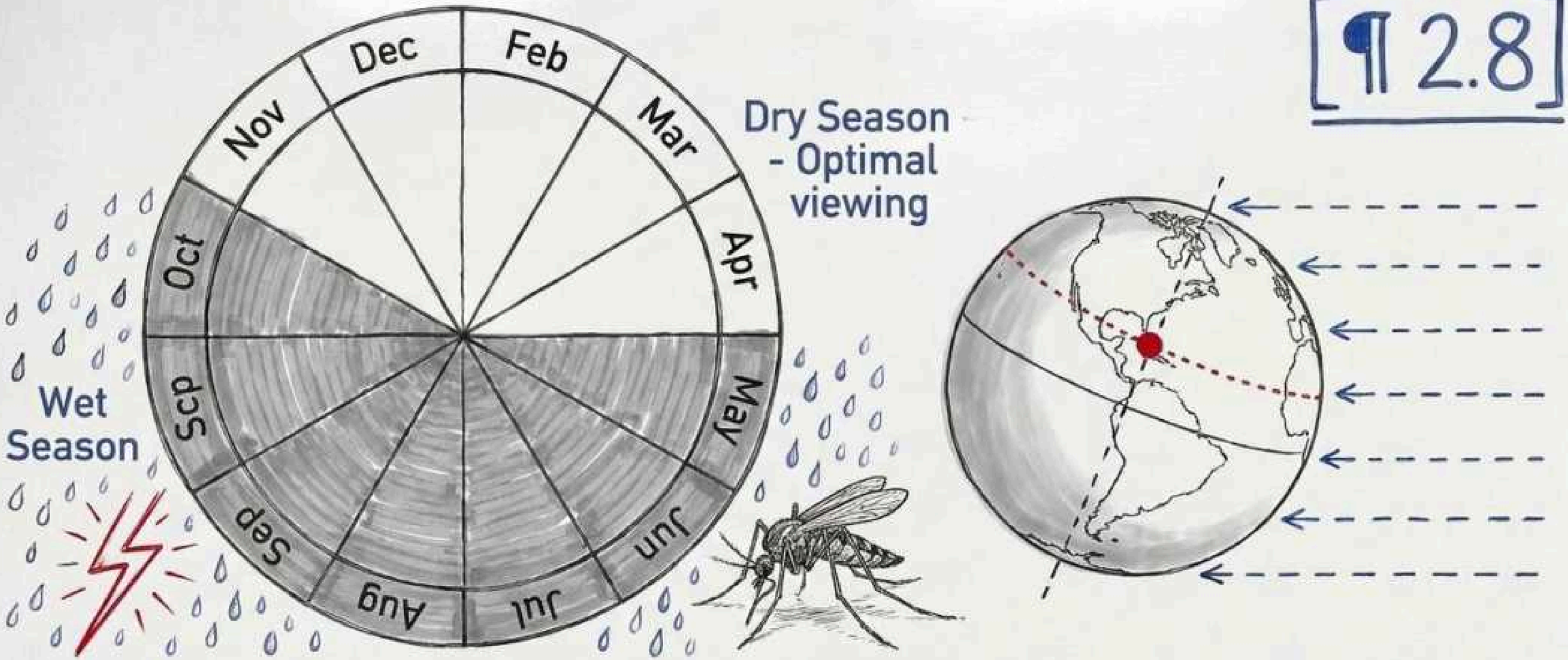
[¶ 2.7]





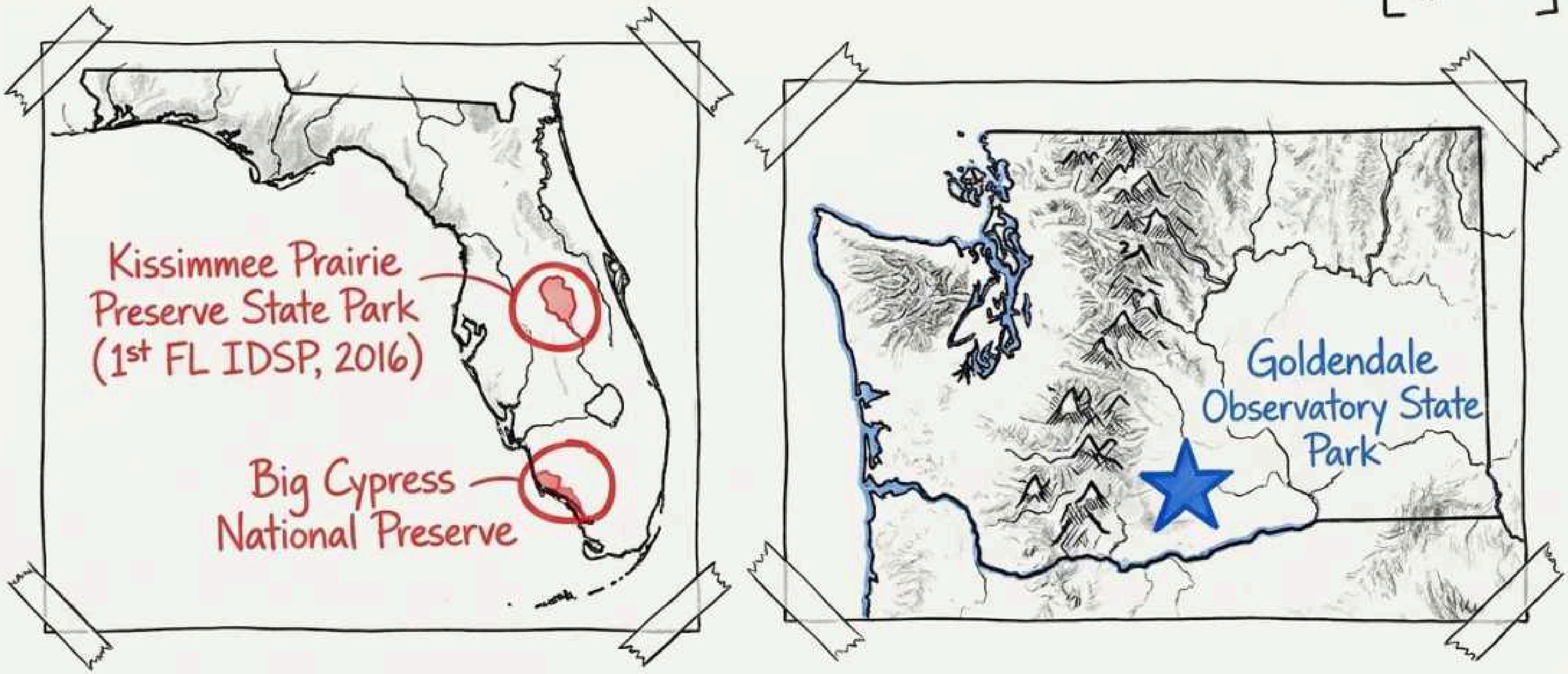
Seattle constraint: Summer brings clear skies, but short nights.
In late June, true darkness is brief and occurs around midnight.
Winter nights are long, but heavily clouded.

[¶ 2.8]



Florida is nearly the reverse: Winter brings the clearest skies. Due to its southern latitude, night lengths remain relatively even throughout the entire year.

[¶ 2.9]



Designated Dark Sky Places. Note for WA: The region east of the Cascades provides both drier and darker skies than the Seattle area.

¶ 2.10

- Dress warmly (even in Florida). Sitting still during sedentary observation drops body temperature rapidly.

- Bring a reclining chair.

Looking straight up at the zenith is only comfortable with ergonomic support.





Next Step: Learning the Constellations.