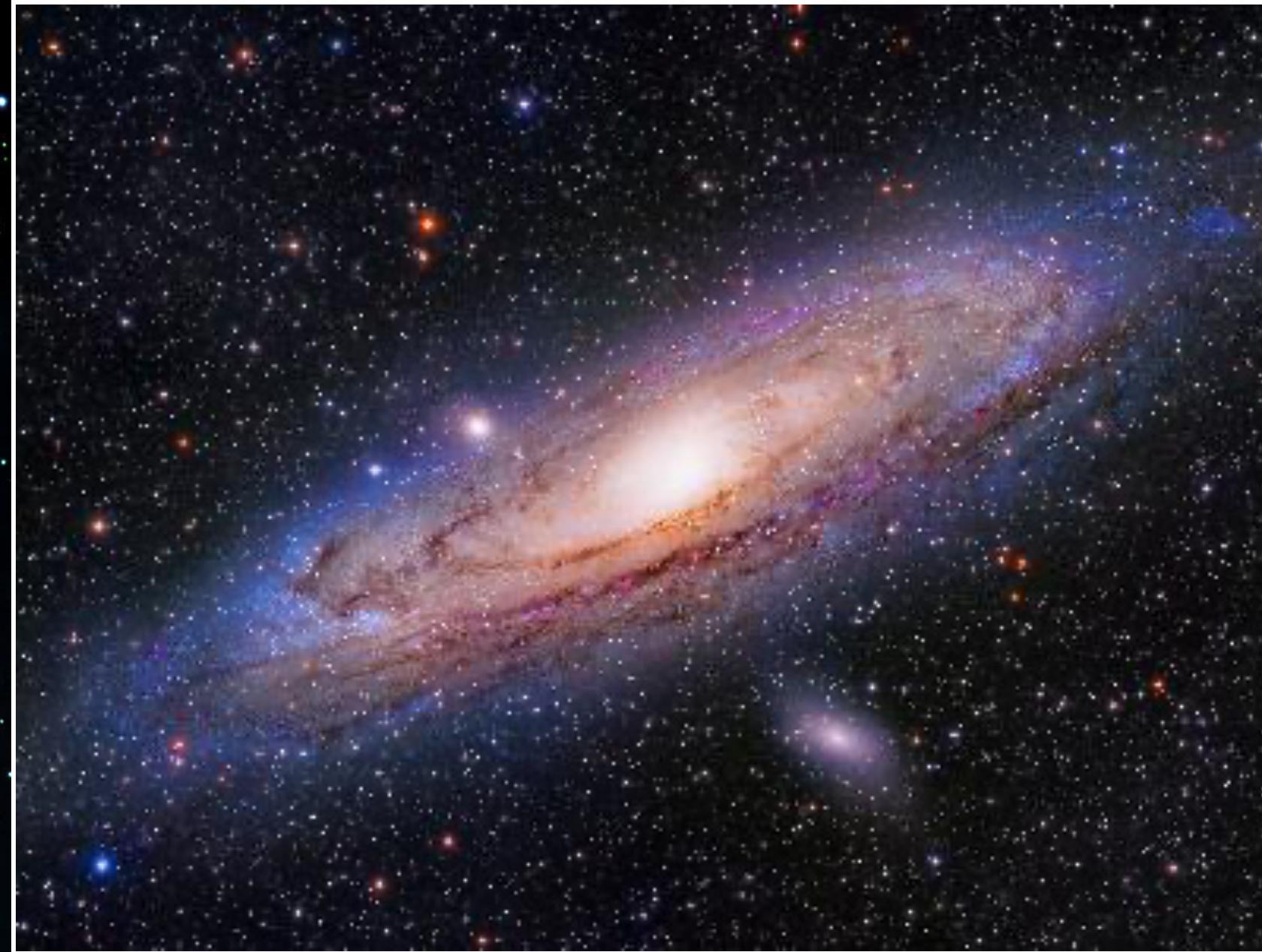
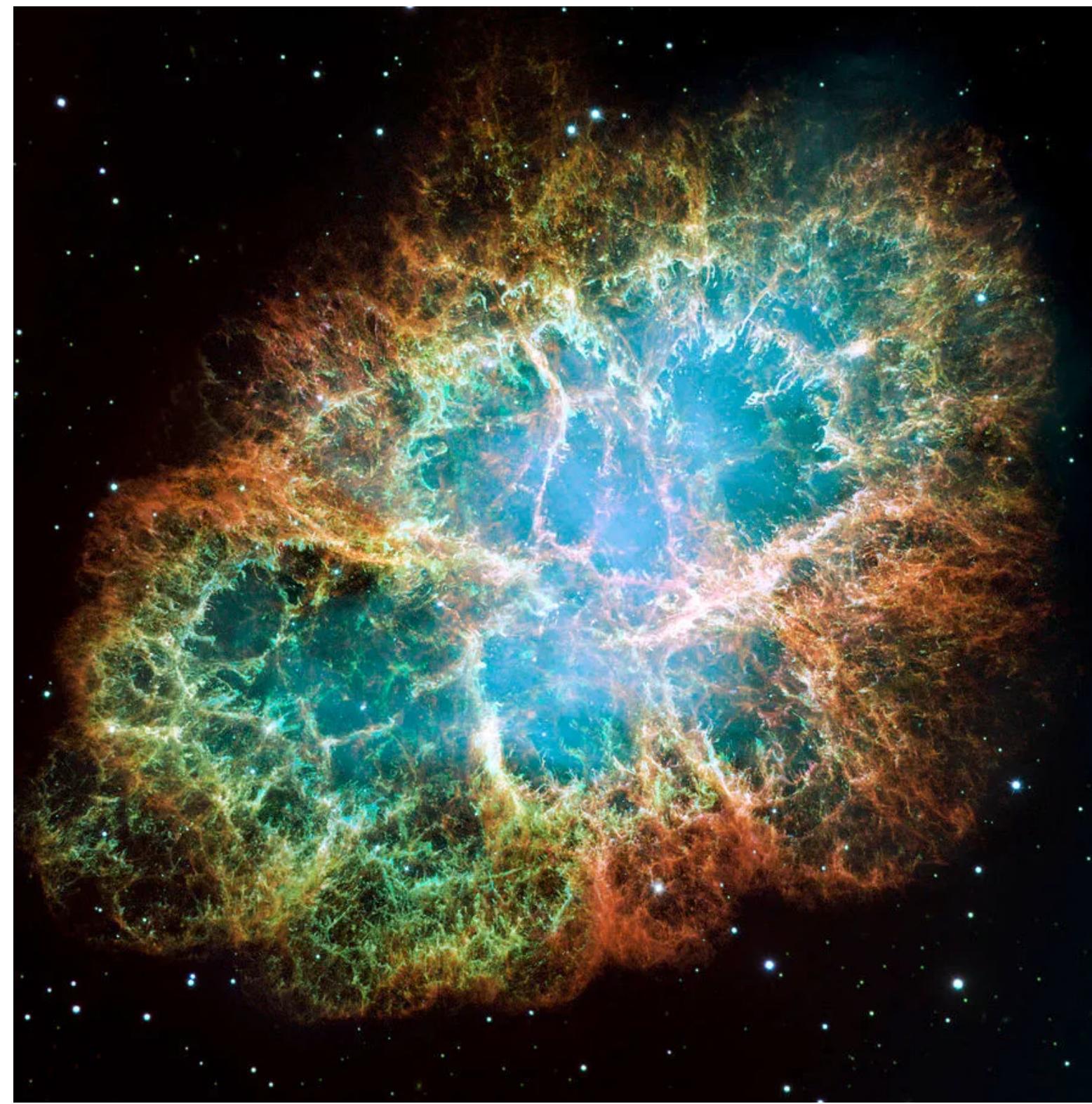
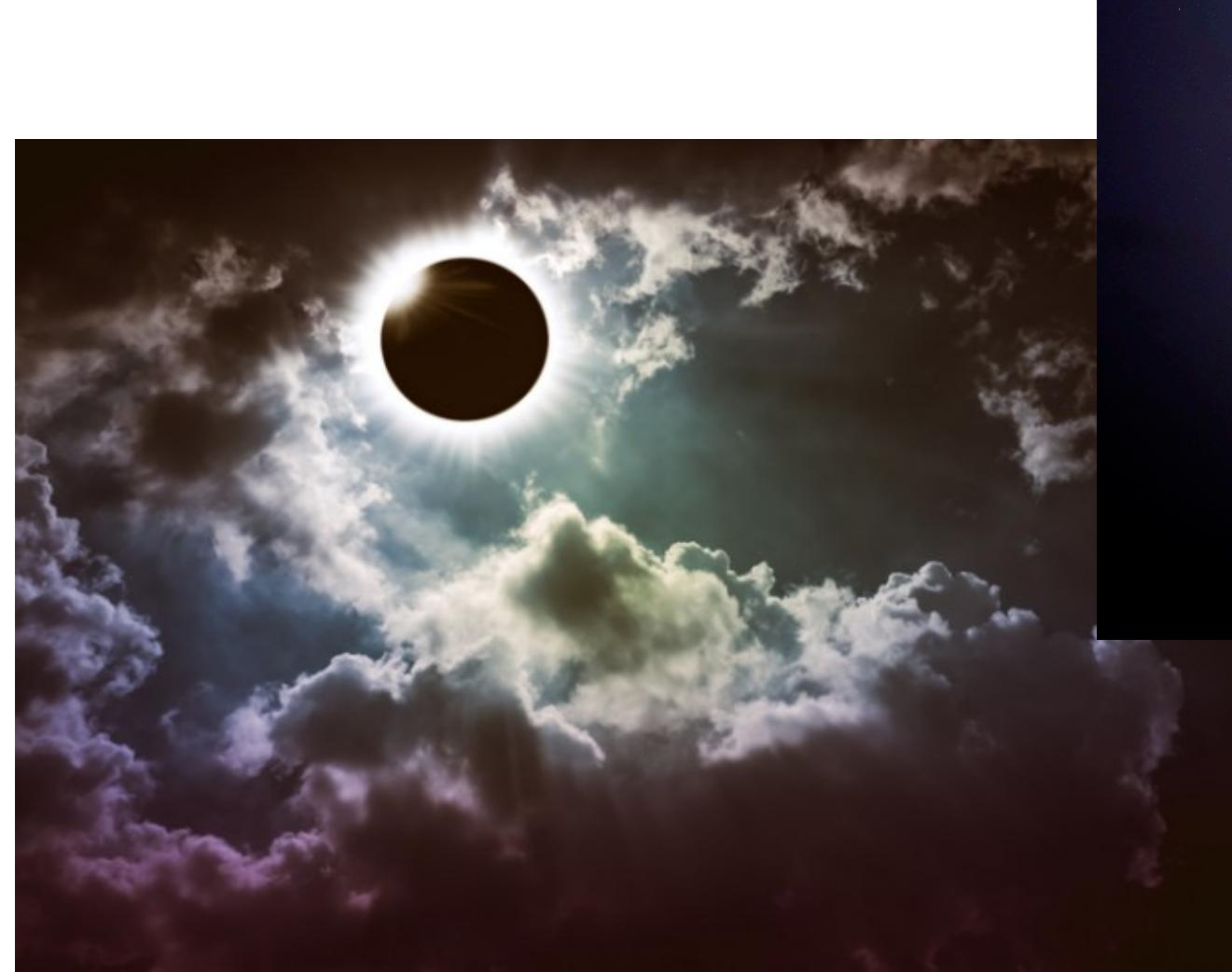

Astrophotography

25.04.15/16

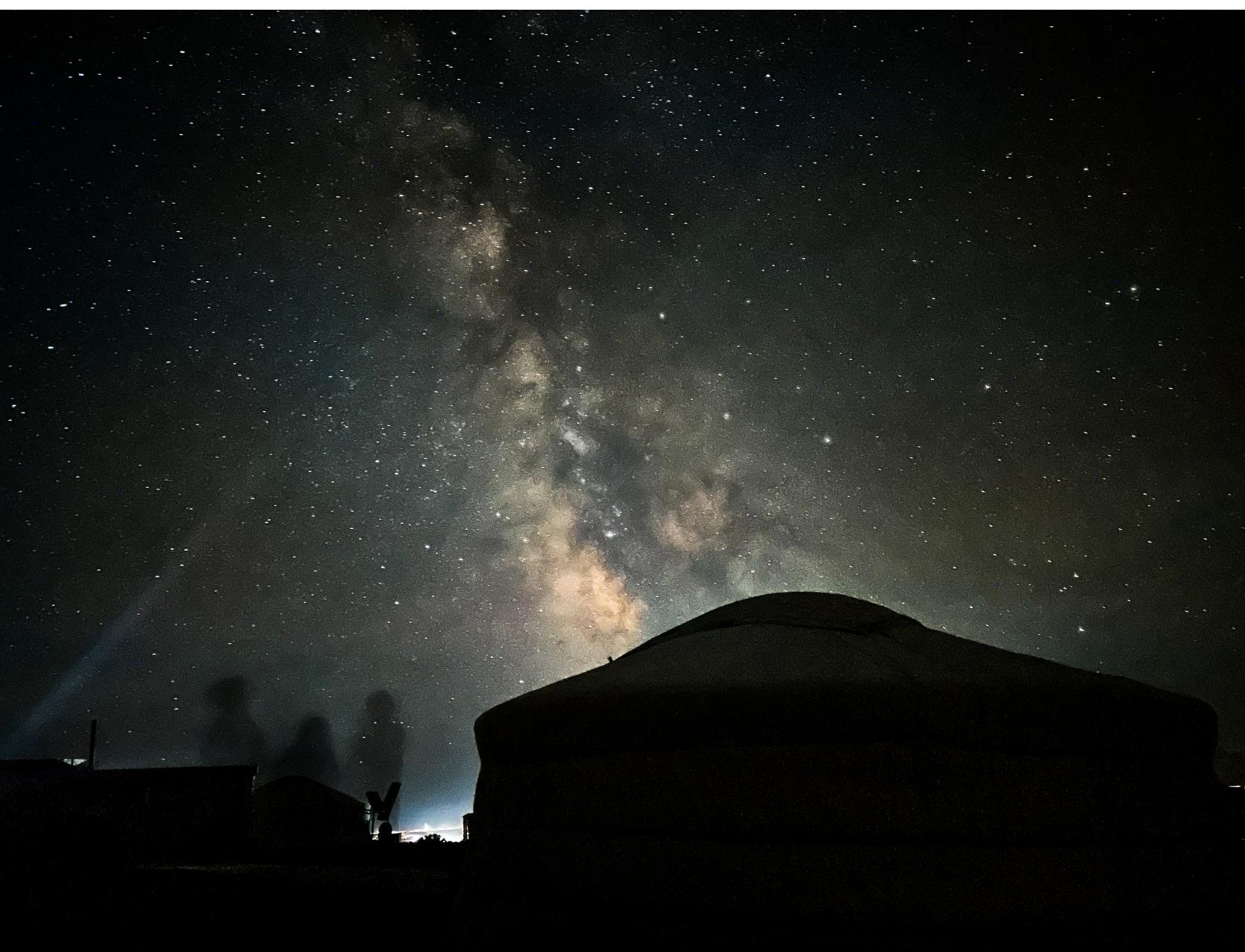
The astrophotography



The astrophotography on the ground



The astrophotography with cellphone

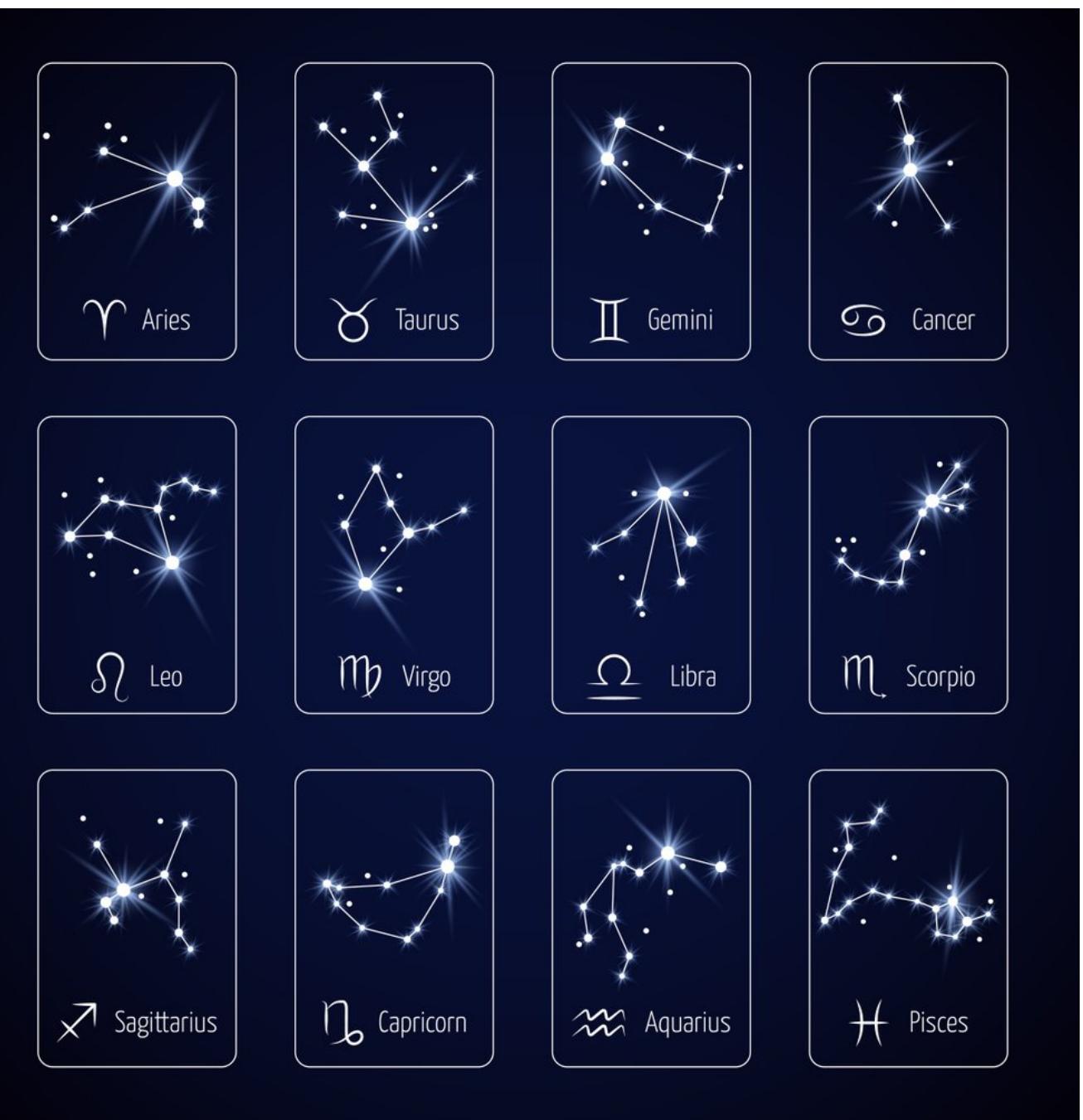


What should we consider?

- Nice target
- Nice date
- Nice place
- Camera setting

Nice target - Catalog

- Solar system planets + the Moon
- The constellations
- Messier Catalog



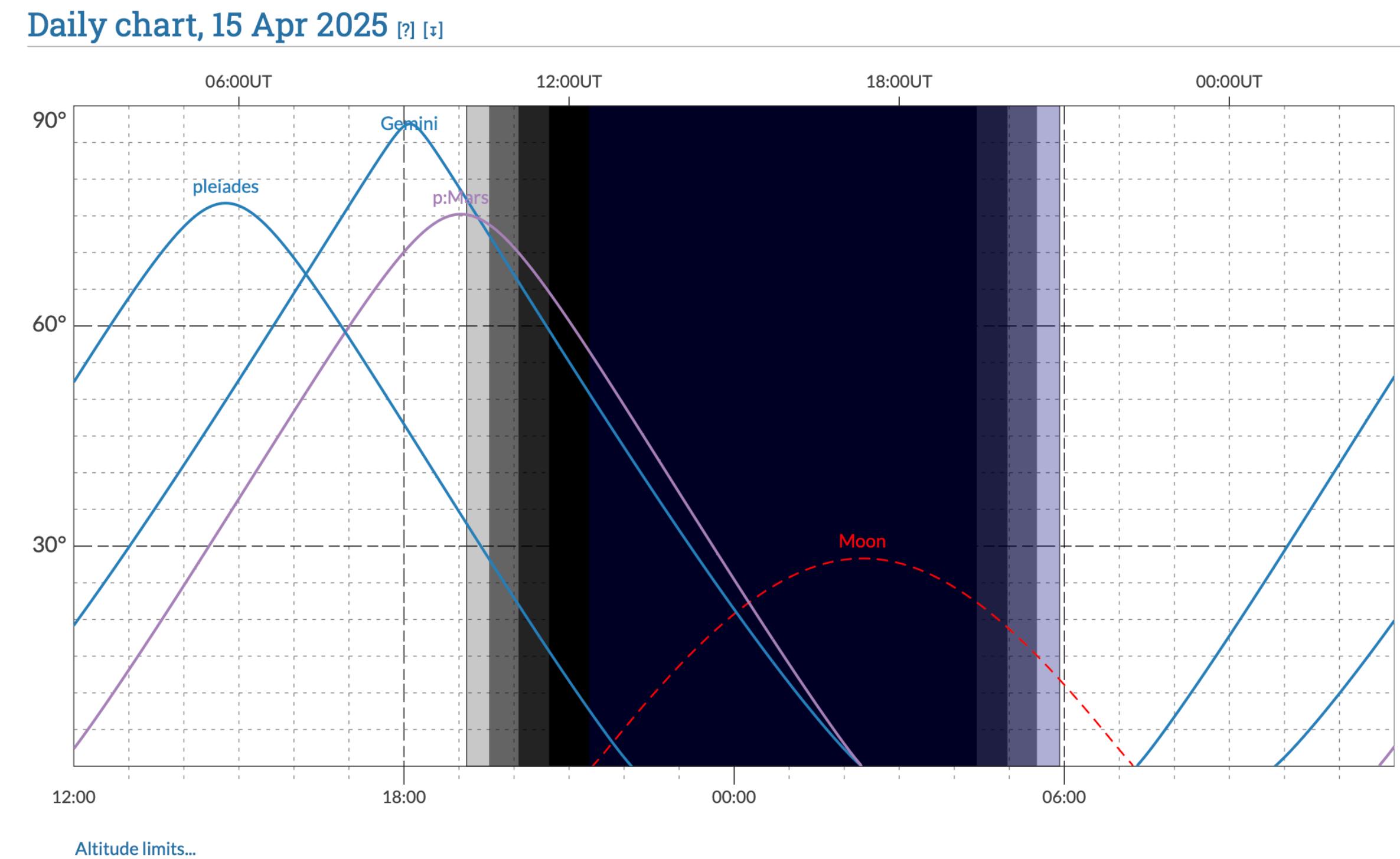
Nice target - SkyMap

- Application: Stellarium



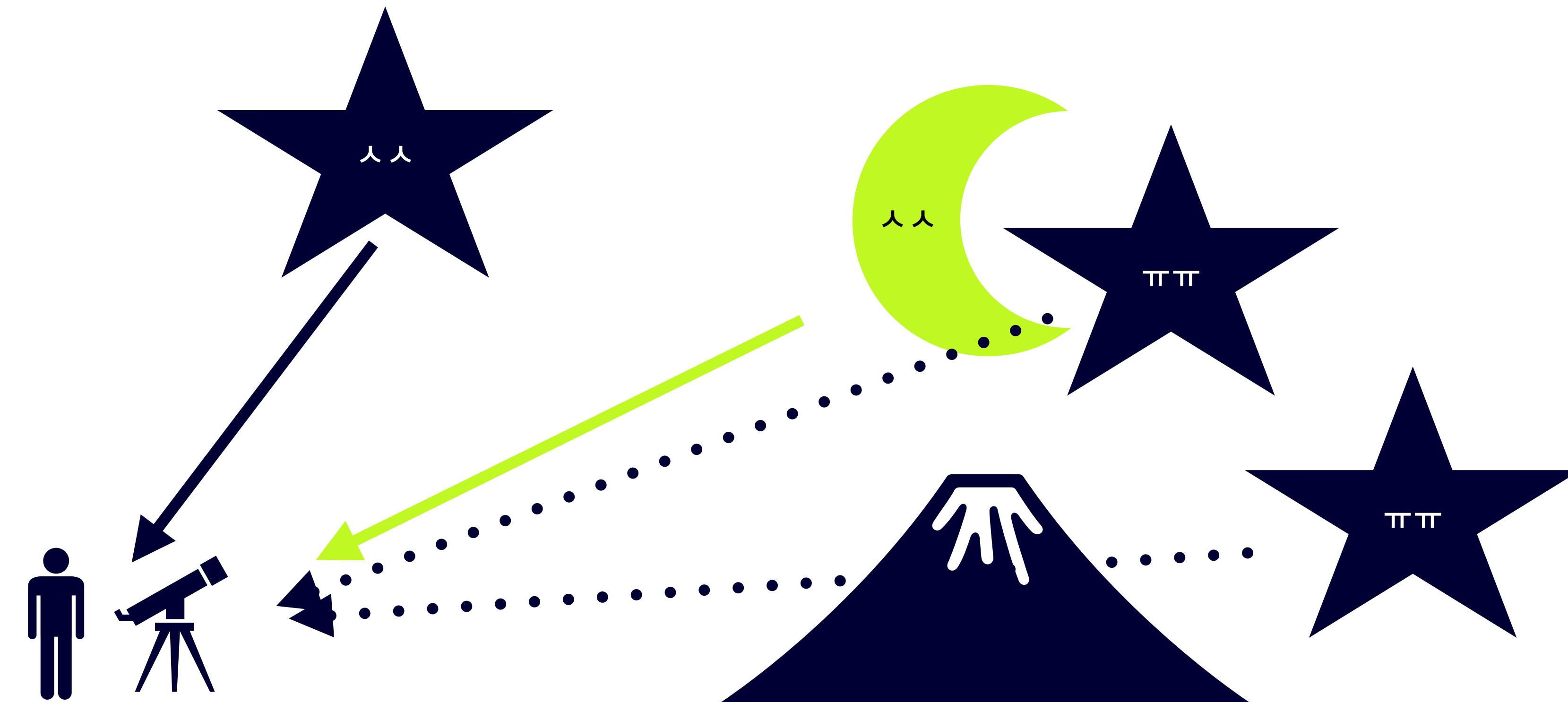
Nice target - Altitude

- [https://airmass.org/chart/obsid:sao/date:2025-04-11/object:Centaurus A/ra:201.365063/dec:-43.019113](https://airmass.org/chart/obsid:sao/date:2025-04-11/object:Centaurus%20A/ra:201.365063/dec:-43.019113)
- Set the observing location, date, targets



Nice target - Altitude

- You should consider the landscape and position of the moon

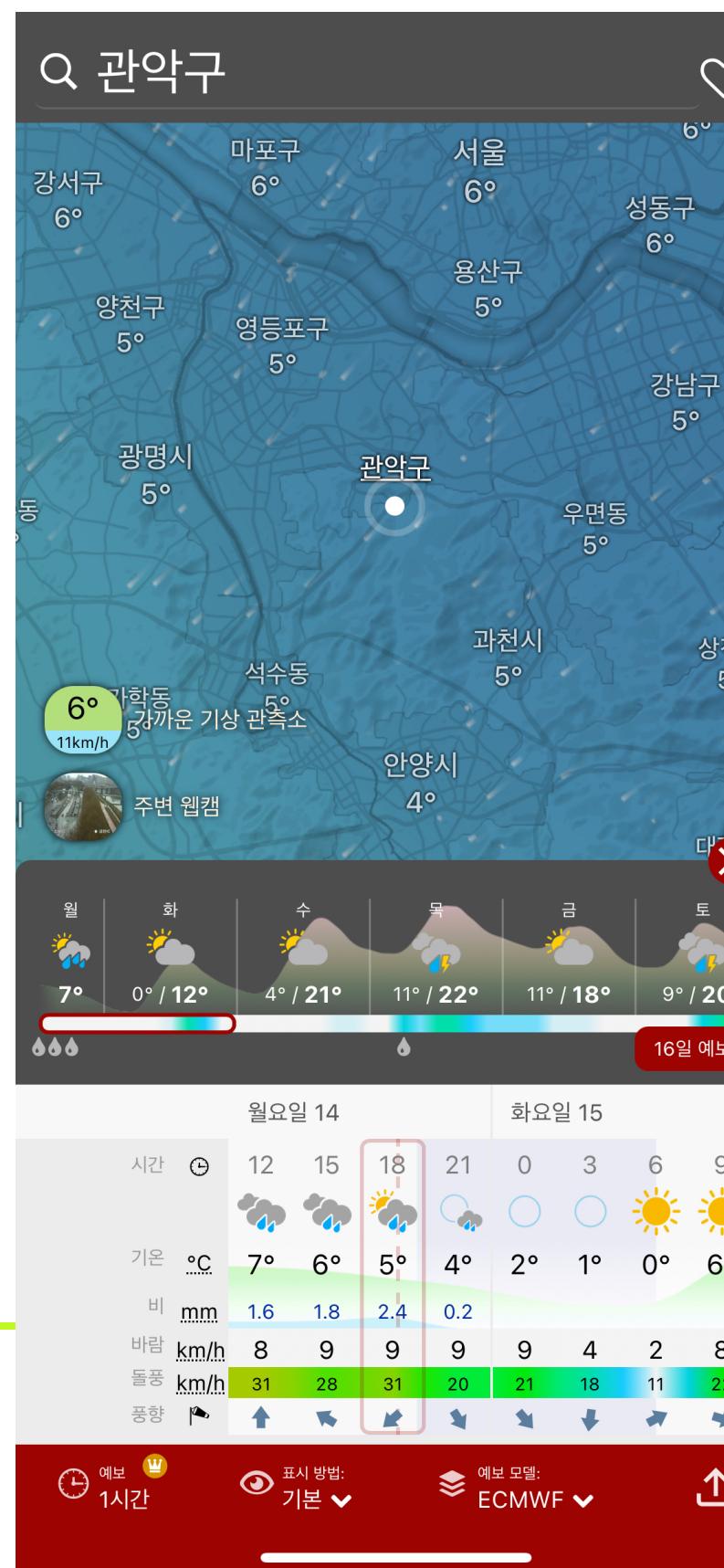


Nice date - Weather Forecast

- We should consider humidity and cloud, dust
- We need the dry, clear sky

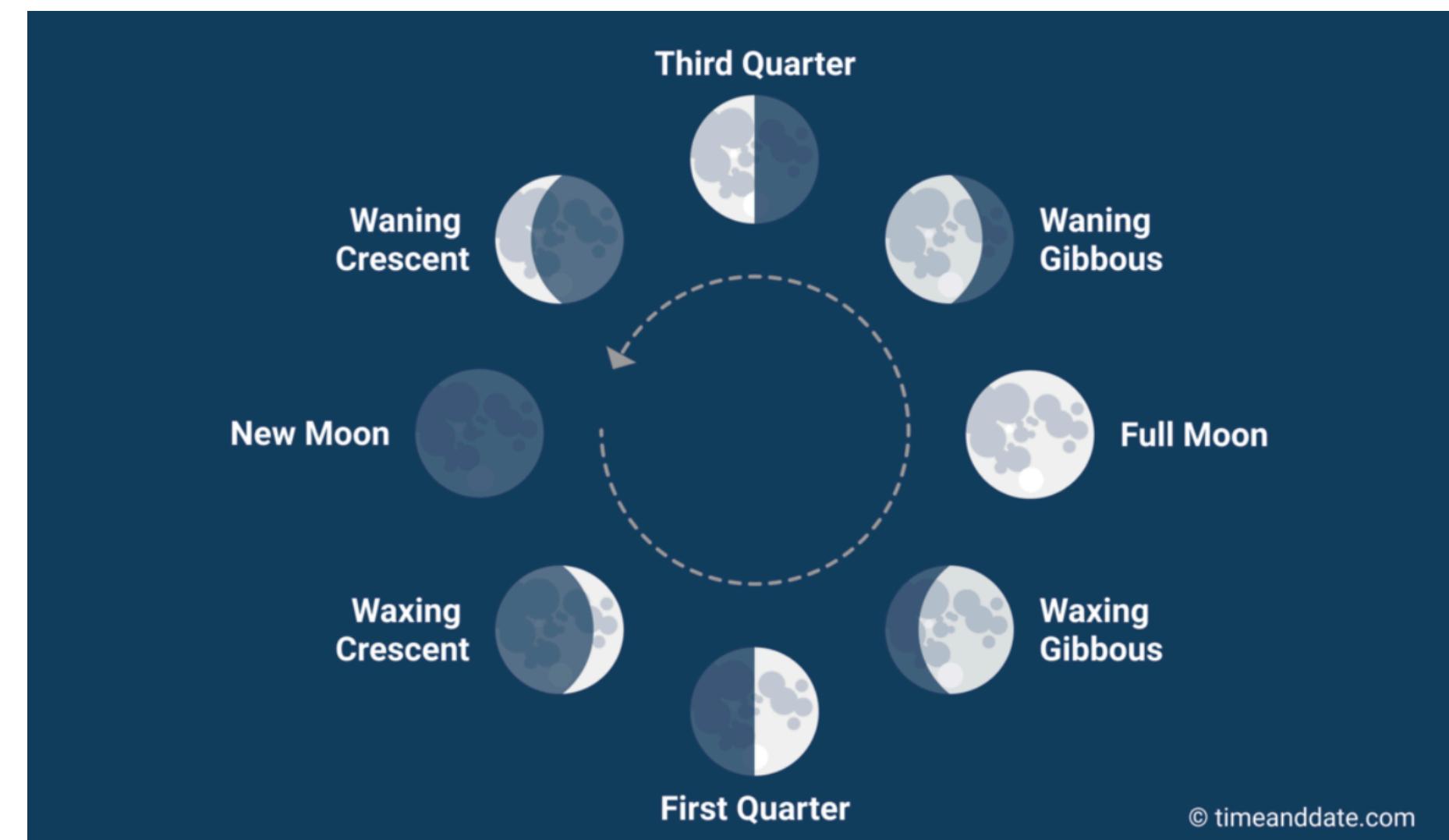


Application: Windy



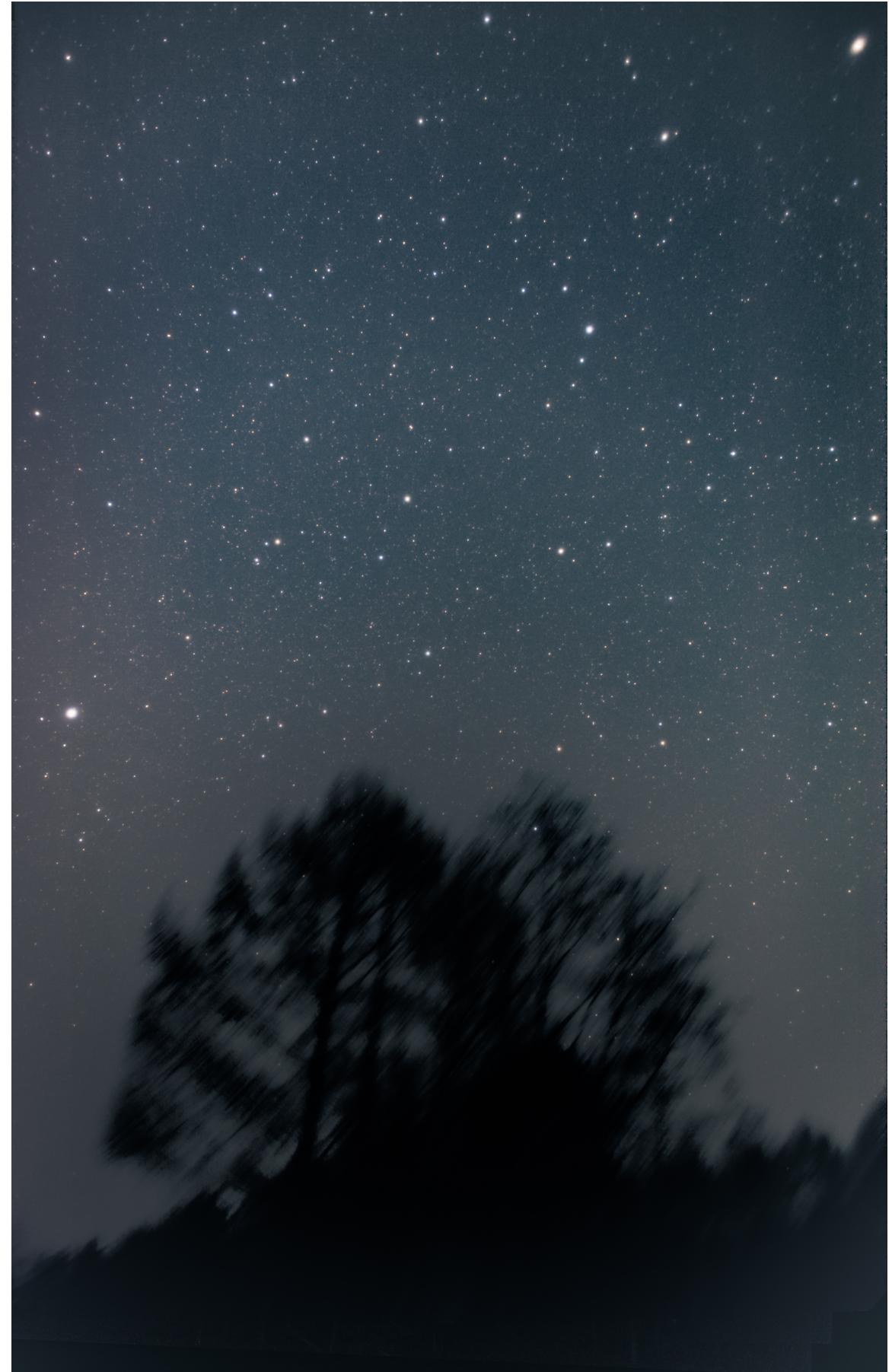
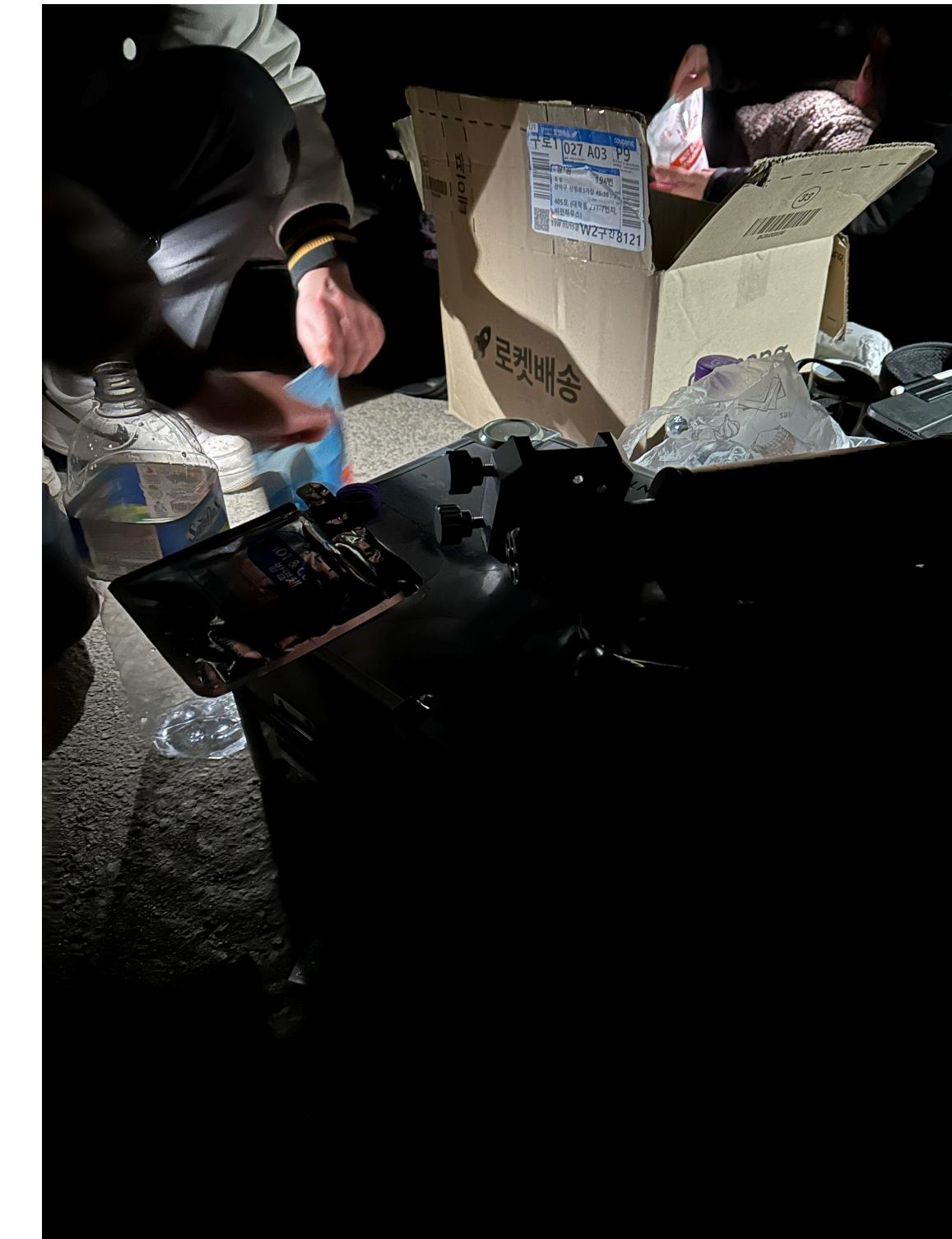
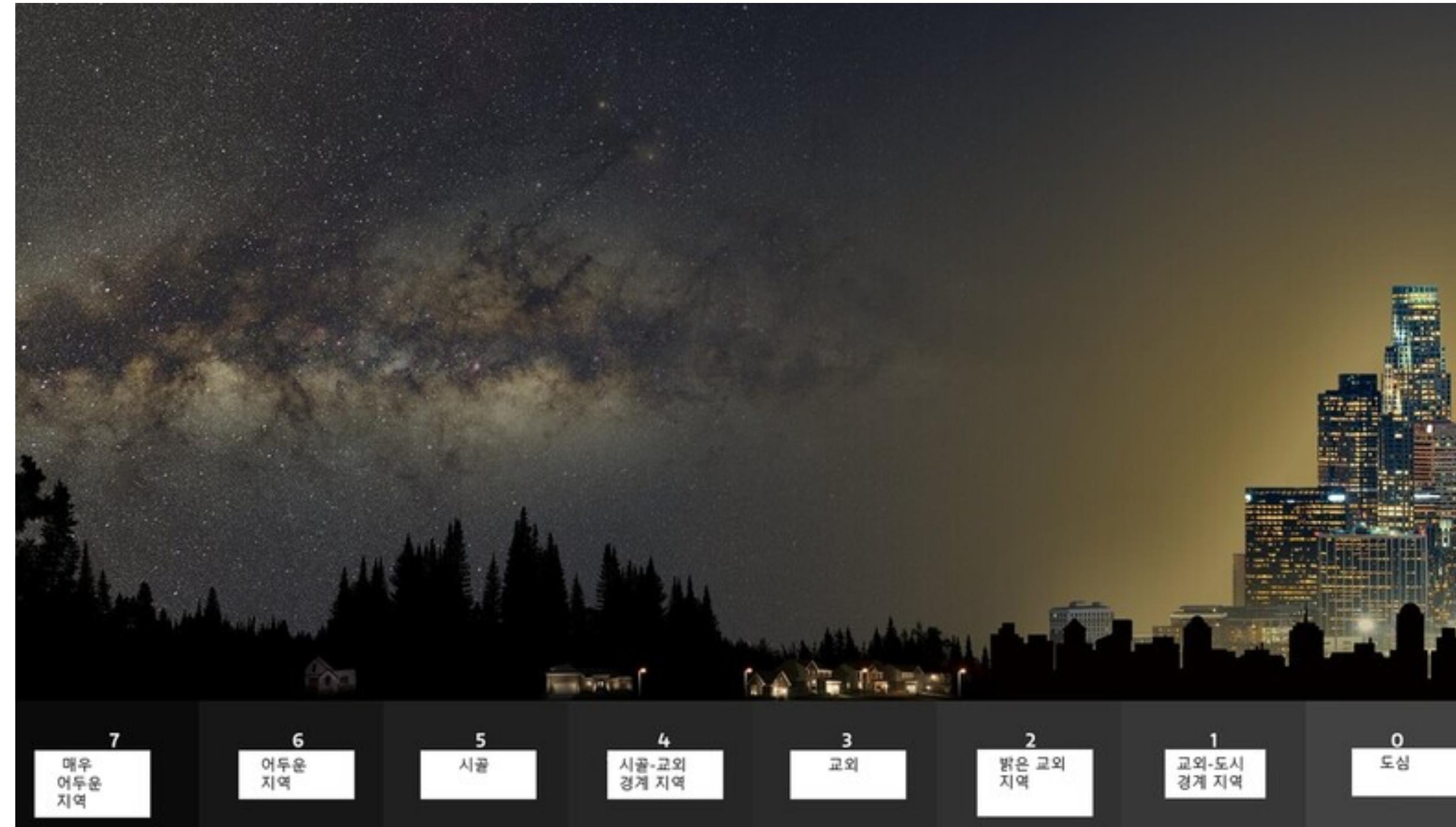
Nice date - Lunar Phase

- The full moon will **erase** the nearby astronomical targets
- The new moon is the best to observe the deep sky targets
 - Or you just try to take a photo of moon



Nice place - Light pollution

- We should avoid the light pollution



Left: have been street without street lamp in 인제 to take a astrophotography

Right: Photo by Jiwon Jang in 인제 (DSLR)

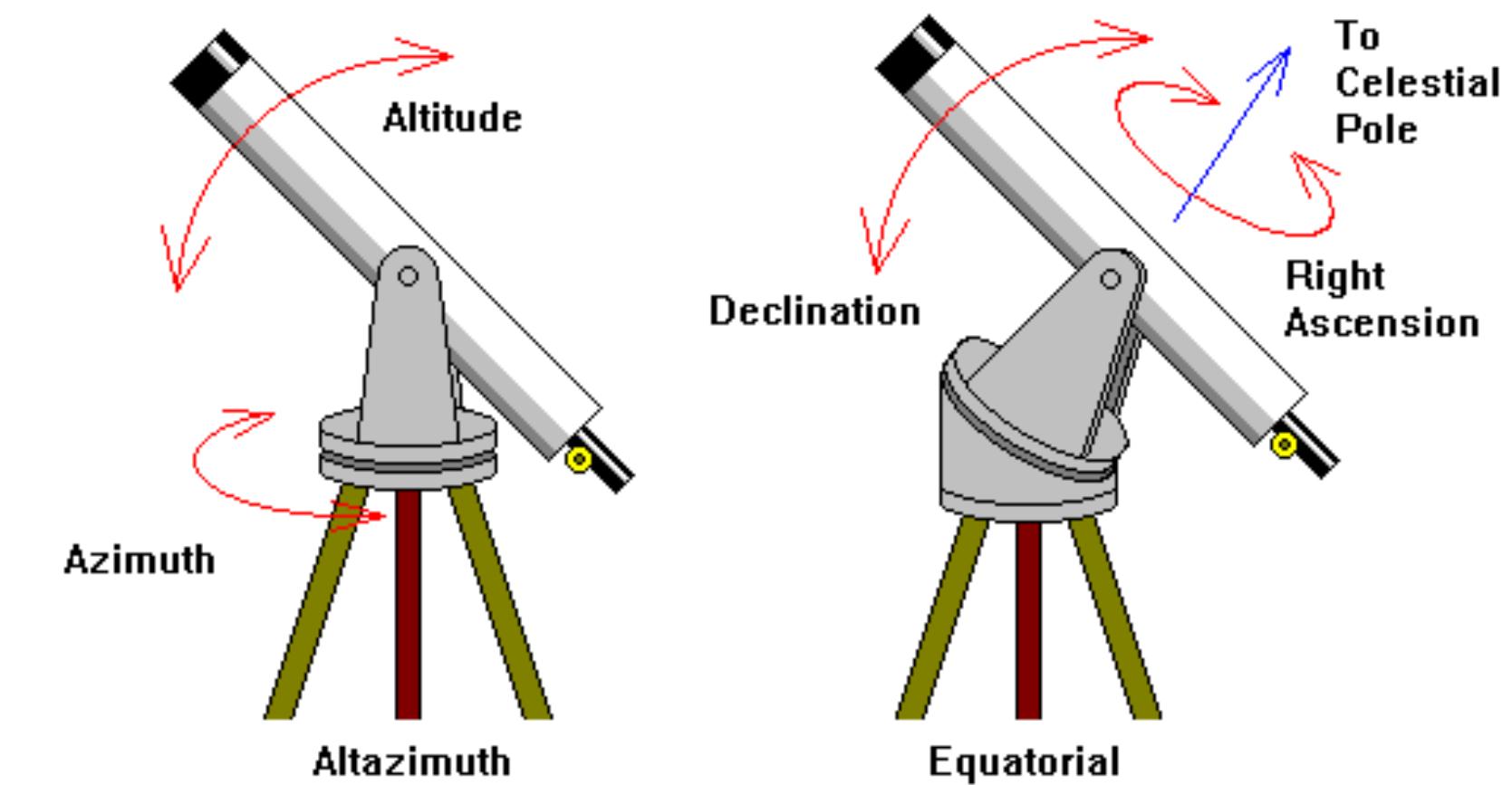
Camera setting - Avoid Oscillation

- We use tripod to keep the camera steady.
- We set the timer to prevent the camera from moving by our hand touch.



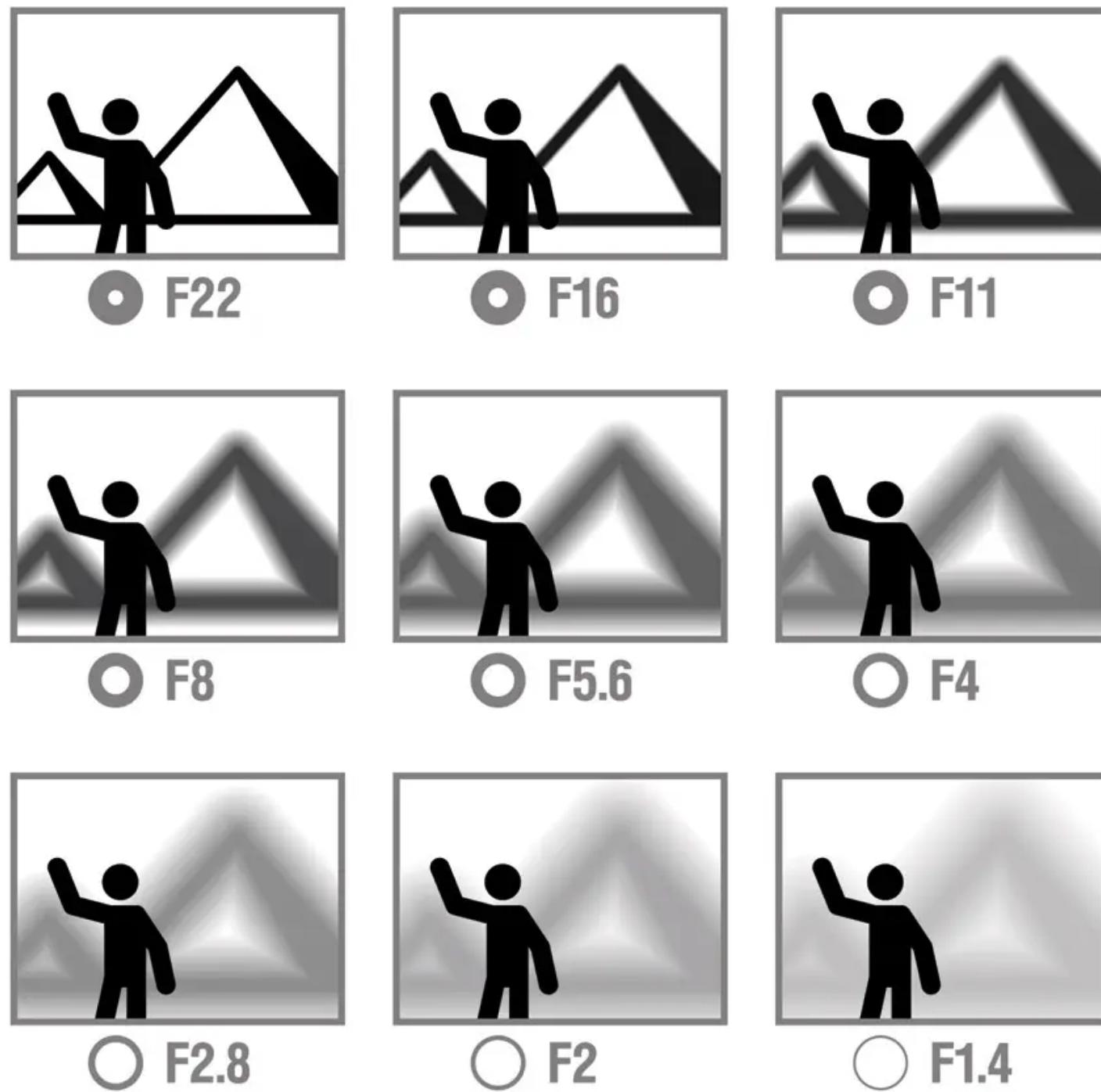
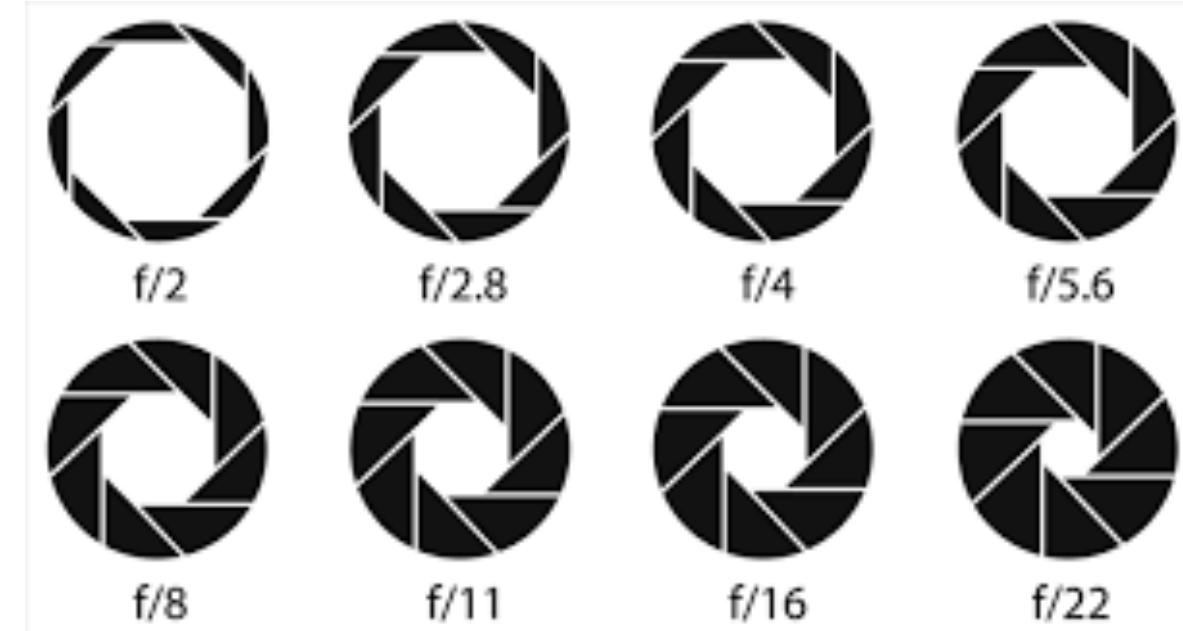
Camera setting - Mount

- Altazimuth mount vs Equatorial mount
- For us now, we are going to use altazimuth mount
- But if you want to be expert in astrophotography, we recommend you to use equatorial mount
- ~~(Equatorial mount is expensive)~~



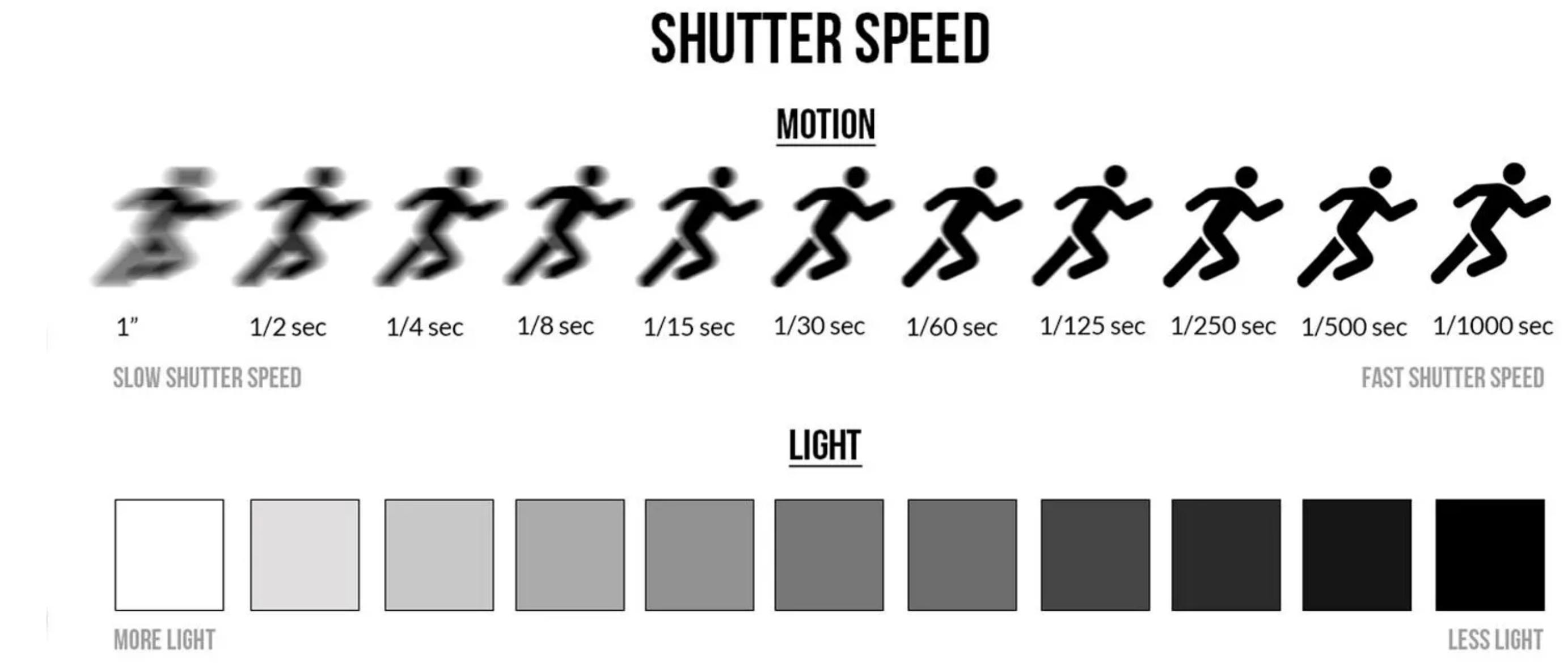
Camera setting - f-stop

- Exposure $\propto 1/f^2$
- Open the aperture wide (low f) makes the background and foreground become blurred.
- Close the aperture wide (high f) makes a larger portion of the scene is in focus
- For astrophotography, f-stop has less meaning



Camera setting - Shutter speed

- Shutter speed \propto exposure



- More exposure receive more light

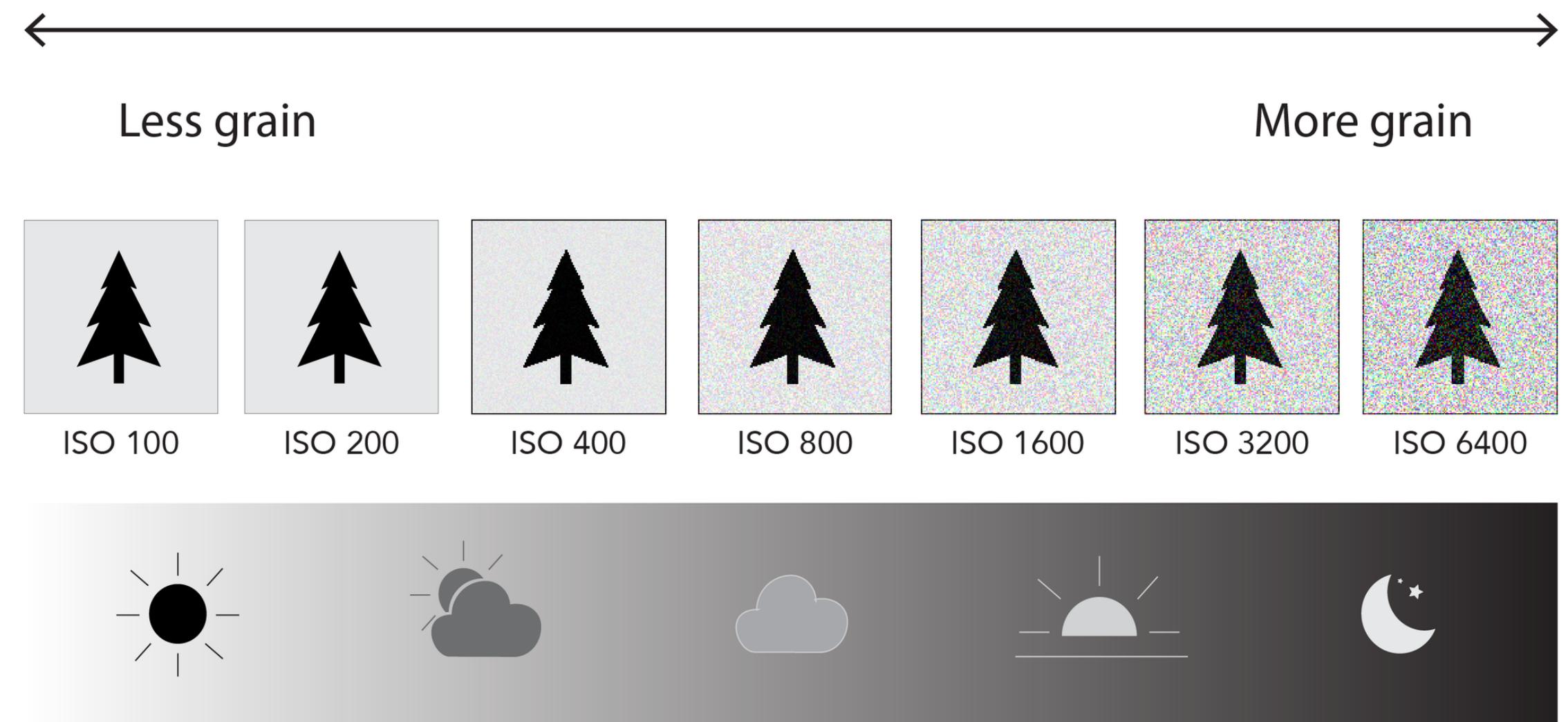
- A moving target during a long exposure results in motion blur. (잔상)
 - We can take star trail image with this method (15 degrees in 1 hour!)
 - Typical smartphone allows the shutter speed up to 30 sec.

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Camera setting - ISO

- ISO \propto exposure
 - Sensitivity for light (threshold of noise)
 - Low ISO makes less noise
 - High ISO detects dimmer objects

Which ISO should I use?



For Galaxy(Android) users



Expert Raw



Adobe Lightroom

For IPhone(iOS) users



NightCap



Adobe Lightroom

HW

- **Take a photo of astronomical targets whatever** due to the 6/3 with ‘smartphone’ device.
 - The place is free, but we **limit the spec of instruments to the smartphone.**
 - We will lend out some tripods we will use today.
- Write your story about the photo (Experience you get, created Myth whatever)
 - Hence you will submit **the astronomical photo and commentary.**
- We will have **astrophotography contests** in 6/10.

Reference

- <https://www.slrlounge.com/glossary/shutter-speed-definition/>
- <https://www.samsungsvc.co.kr/solution/1324316>
- <https://nightcapcamera.com/>
- <https://helpx.adobe.com/lightroom-cc/user-guide.html>