# So, You have a New Telescope!

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# So You Have a Telescope ...

- Telescope Basics
- Observing
- Hints
- References

# **Telescope Basics**



#### Parts of the 'System'



# **Optical Tube Assemble (OTA)**

Lens

Compound

irror

Refractor

lirror





# Oculars (Eye Piece - EP)





12 21.5mm

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Z 15mm

8mm

12 ....

- Fits beam of light to your eye
- Higher mm is larger Field of View (FOV)
- Lower mm higher magnification, but dimmer object and less FOV!
- Look for 'eye relief'



#### Mounts



- EquatorialAlt/AZDubsonian
  - Fork Mount
- Sturdy TripodWeights and bracing



# Size and Magnification

The larger the size of the telescope, the brighter objects will be.





The higher the magnification (smaller ocular) the dimmer objects will be!



# Field of View (FOV)

- Objects will be larger with a smaller ocular but field of view will be smaller!
- Use larger oculars to find objects, then use higher power (smaller oculars) to view them
- Sometimes low power (larger oculars) are better to see nebulae (larger FOV)





# Alignment

- Needs to be pointed to True North
  - Use compass to get close
  - Sight Polaris and move tripod not mount
- Finder Scopes have a larger FOV
  - Use it to zero in on an object, then view it through main scope
- Finder scopes need to be aligned to main scope
  - Do this during day

 Center an 'obvious' object on the ground in main scope, then adjust finder scope

# Observing

60



# **Selecting Objects**

- Great objects to start with:
  - Moon
  - Jupiter and it's moons
  - Saturn (amazing!)
  - Brighter Messier objects
- Use Stellarium or other sky chart program to check things out
  - Zoom in the see what it looks like
  - Click on the object to gets it's RA/Dec, Magnitude, Separation, etc.
  - If you have a GoTo scope, Stellarium can even command it!

### **Common Disappointments**

- Our eyes will not register color for faint objects
  - You are not going to see wonderful color nebulae !!
  - You will be able to see the colors of brighter stars
    - (blues, yellows, golden, red and even green!)
- Stars are 'point' objects
  - Sort of boring .. (look for those with bold colors and dbl stars)
- Best time for astronomy is ... WINTER !!
  - Yup, longer nights, crisper, cleaner, clearer sky
  - Orion, Andromeda galaxy and other spectacular objects are out
  - But it's COLD !!

# HINTS & TIPS

# Hints

- Use Averted Vision and Movement
  - Sides of eye are more sensitive don't look directly at faint objects
  - Very slightly move telescope in one axis back and forth to pick up really faint objects
- Scope Vibrations
  - Allow to settle
  - Don't touch when viewing
- Be alert for changing conditions
  - Feel setup for dew
  - Watch street lights for halo
  - Watch for blank areas of sky

# Other Hints ...

- Seeing and Visibility
  - Visually look for how many stars you can see
    - Notice any 'spots' where there are no stars
  - Careful of dew
    - Watch/feel the telescope/mount for dew
    - Notice halos around lights
  - Dark adapt your eyes (use red flashlight to read, etc)
- Ideal Locations
  - High
  - Away from lights
  - Good southern view
  - Horizon down to 20° (horizon is always murky)



<u>eference</u>

### References

- Interactive Tools:
  - http://www.skyandtelescope.com/observing/interactive-sky-watching-tools/
- What's Up:
  - https://telescopius.com/
  - http://www.skyandtelescope.com/
  - http://www.astronomy.com/
- Sun and Comets
  - https://sohowww.nascom.nasa.gov/
- Charts
  - https://www.stellarium.org/

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#### The Start of the Kahale Observatory



# Mahalo!

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