



# A Guide to Salem's Night Skies

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# Squad Goals

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- To give you a short list of fun, easy things to look at when you find yourself under a night sky
- To make sure you know how to find said objects in the sky
  - Don't be afraid to use technology to help you either! There are some great apps out there these days.
- Everything is visible with the naked eye and looks great with just binoculars
- A small telescope will really make everything pop but is largely unnecessary
- Slides available at  
<https://github.com/jrembold/Presentations> under the SPL Skies of Salem folder for future reference



# Overview

- The Moon
  - Tycho
  - Copernicus
  - Sea of Tranquility
- Planets
  - Jupiter and moons
  - Saturn
  - Venus and Mars
- Deep Sky
  - Pleiades
  - Orion Nebula
  - Andromeda Galaxy
  - Hercules Cluster
- Other
  - Perseid Meteor Shower
  - ISS and Iridium Flares



Upcoming:

## The Moon





# The Moon

- Where to find:
  - Full: highest in sky around midnight
  - New: highest in sky at noon
  - Waxing: up in early evening
  - Waning: up in early morning
- Always see basically the same side of the Moon
  - Rotates on axis at same rate it rotates around Earth
- Near-side has lots of contrast with darker lowlands and brighter highlands
- Looking along the **terminator** where light meets dark, will give the greatest sense of depth and contrast from shadows.



# Tycho

- Named after Tycho Brahe
- Bright crater in Southern hemisphere
- Characterized by many long rays emanating outwards
- Fairly young by crater standards





# Tycho

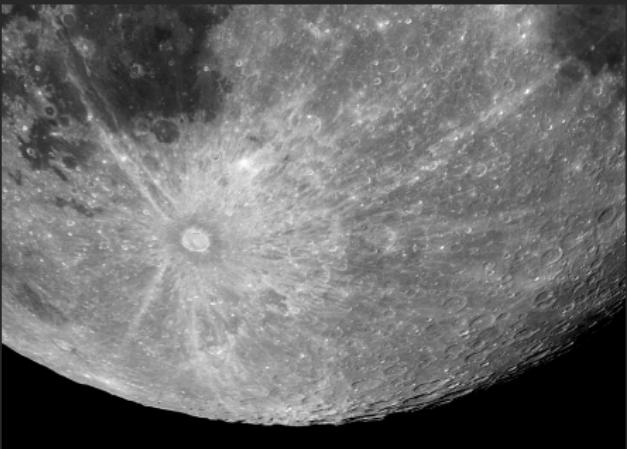
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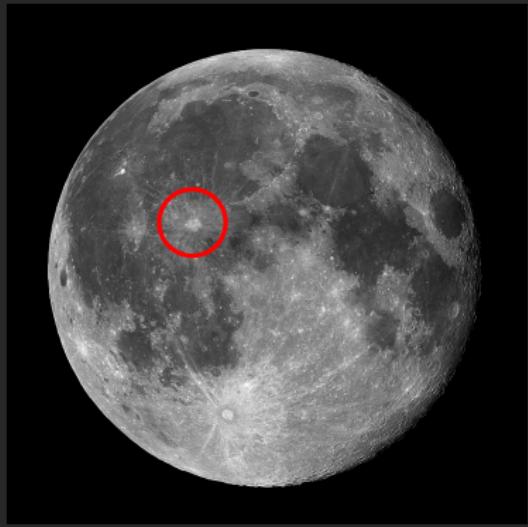


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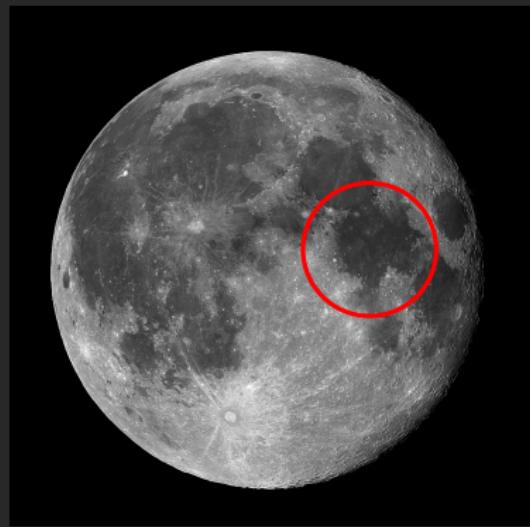
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- Lowlands expose darker rock, giving the distinct shade
- Apollo 11 landing was near the Southwest edge



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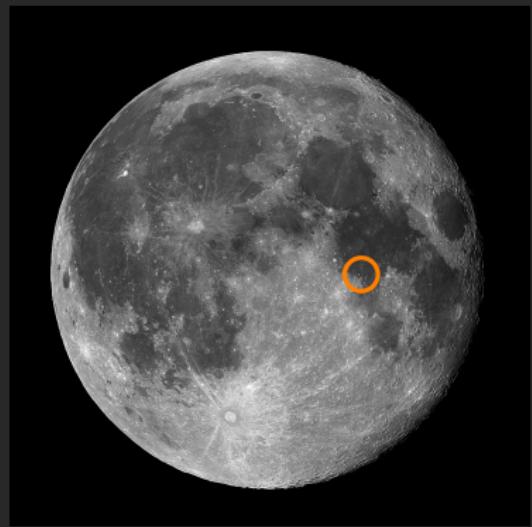
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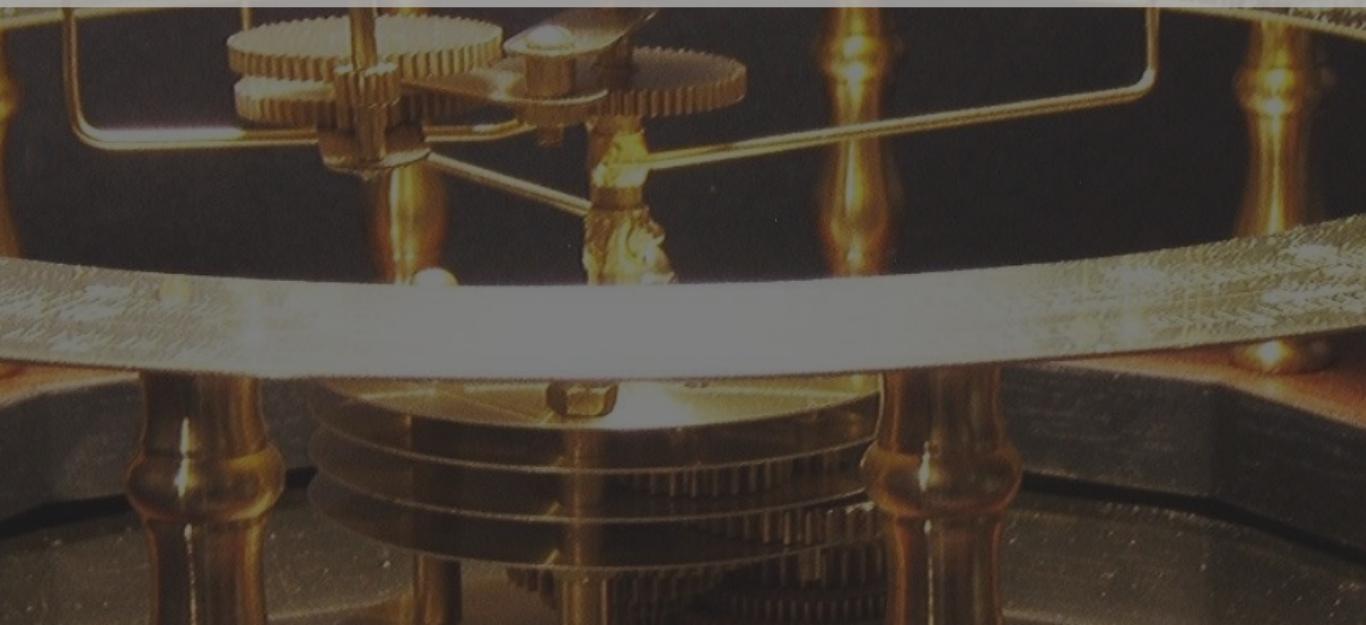
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Upcoming:

## Planets



# Jupiter



- Largest of the planets. Will appear as a very large bright star in the sky.
- Look towards the South between 15 and 30 degrees above the horizon.
- If you see two really bright stars, Jupiter is the brighter and is the rightmost one at the moment.
- 4 moons easily visible with just binoculars
  - Io, Europa, Ganymede and Callisto
  - Sometimes 1 or 2 may be in front or behind the planet



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# Venus and Mars



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  - Currently so close to the Sun as to be invisible
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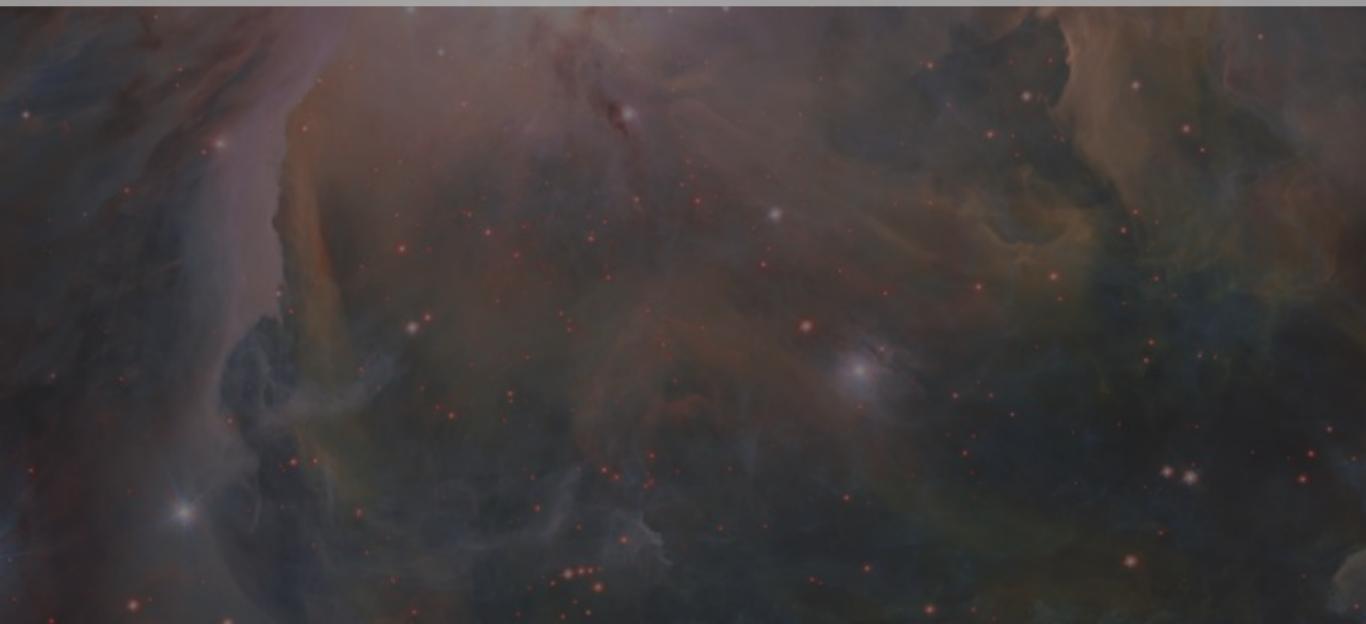
## • Mars

- Exhibits a reddish tinge
- Lies on the same ecliptic, so visible mainly looking South
- With telescope can sometimes make out polar caps



Upcoming:

## Deep Sky





# Deep Sky Basics

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- I will relate everything to 3 bright, easy, constellations. So you just need to be able to find them.
  - Cassiopeia
  - Orion
  - The Big Dipper
- Peripheral vision is more sensitive to light
  - Don't stare directly at the dim object you are trying to see!
- These all can be seen in light-polluted areas, but it may be easier to find them the first time from a good dark location.

# The Pleiades: An Open Star Cluster



- Located in the constellation Taurus
  - Can find by following the line of Orion's belt
  - Or rapidly scan the sky looking for a blurry spot
- Tightly packed bunch of young, bright blue stars
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# Andromeda Galaxy

- Our nearest galactic neighbor!
- Definitely easier to spot away from light pollution
- Follow a trail of constellations to help find it:
  - Cassiopeia (the “W”)
  - Pegasus (a big square)
  - Andromeda (two “legs” attached to the square)
- Will appear an oblong fuzzy blob with naked eyes, much more detail visible with binoculars





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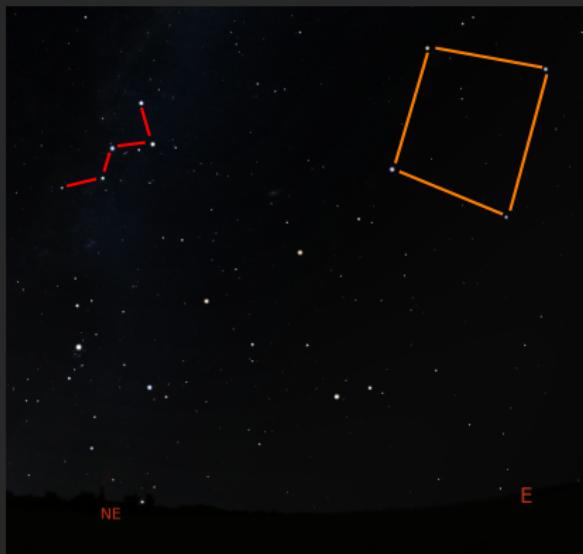
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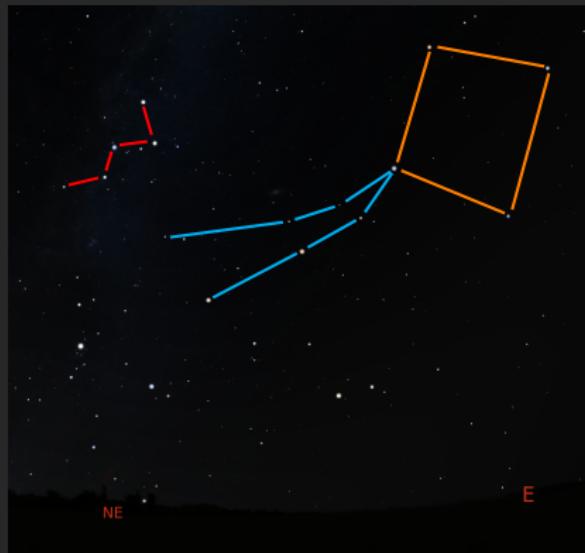
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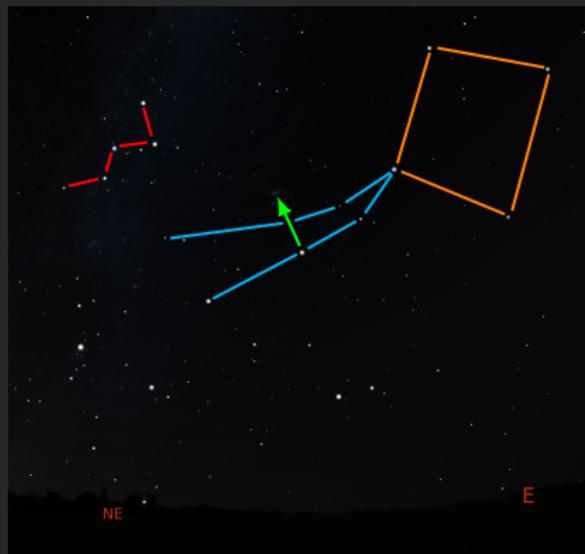
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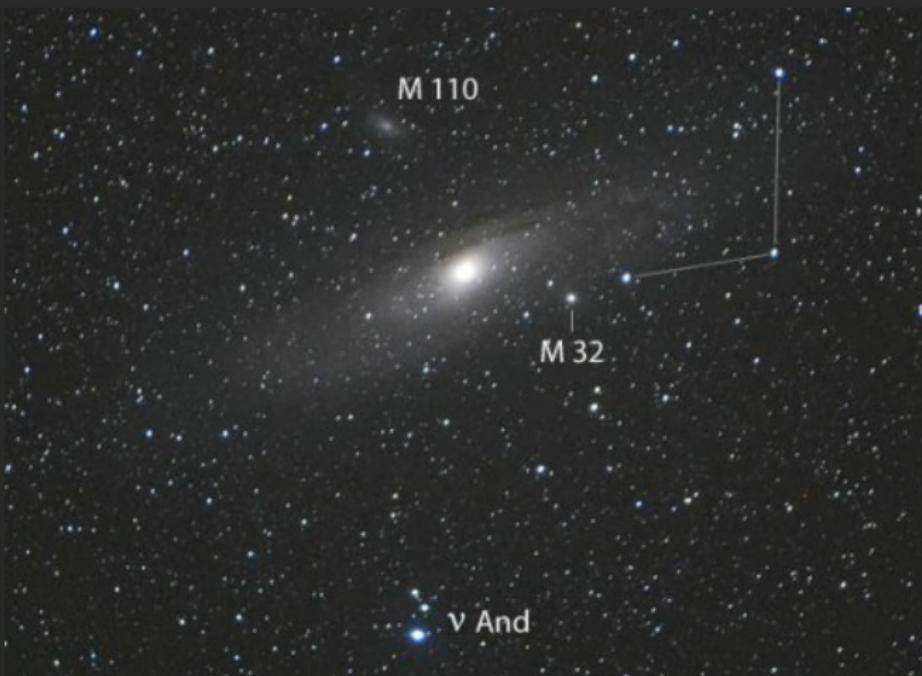
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# Andromeda thru Binoculars





# Hercules Cluster: A Globular Cluster

- Located in constellation Hercules
  - Rests between the bright stars Vega and Arcturus
  - The handle of the big dipper points towards Arcturus (roughly)
- Incredibly dense regions of old, yellow/golden stars
- Generally live above or below the disk of the Milky Way





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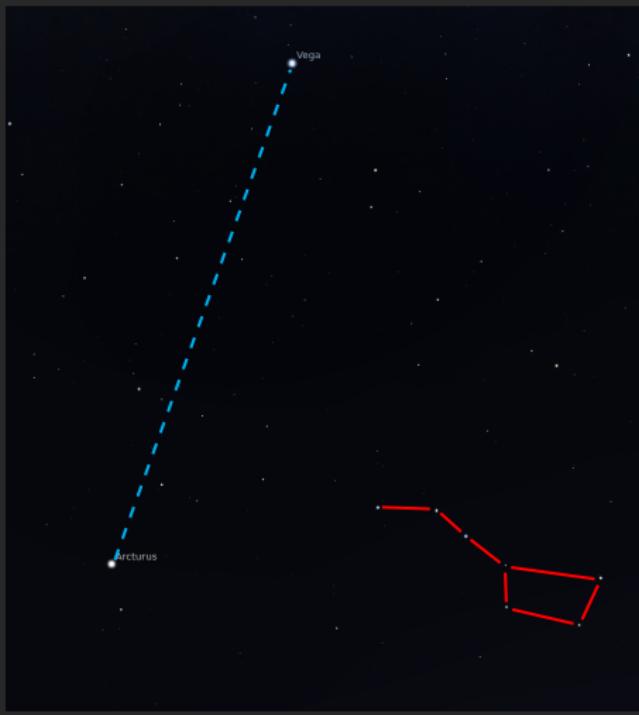
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# Perseid Meteor Shower



- Caused by debris from Comet Swift-Tuttle burning up in the atmosphere
- Radiant will appear to be in the constellation Perseus, just below Cassiopeia
  - In truth though, just look up. You'll see them everywhere!
- Peak mornings are August 11,12,13
  - But watch starting now! A large moon will obscure viewing on those days



# Notable Satellites

- The International Space Station (ISS)
  - Semi-reliable in when it passes overhead
  - Appears as a quickly moving, very bright star
- Iridium Flares
  - From Iridium communication satellites
  - Appear as a really slow, really bright shooting star
- Can get info or alerts about upcoming passes from Heavens-Above website or app





# Wrap Up

- Even in cloudy and light-polluted Salem there are fun things to check out in the sky!
  - Lunar details
  - Nearby planets
  - Bright deep sky objects
  - Debris in or just above our atmosphere
- Finding said objects is not rocket science
- Even simple binoculars can take your observing night to the next level!



# Some Resources

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- Stellarium: Free planetarium software
- [www.heavens-above.com](http://www.heavens-above.com): Satellite predictions
- Sky Map: Android app showing location of objects in sky
  
- Photo credits:
  - Frank Barrett for images of the Moon
  - [www.bestbinocularreviews.com](http://www.bestbinocularreviews.com) for image of Saturn
  - Max Mallon for phases of Venus
  - Malcolm Park for image of Mars
  - Bob King for image of Andromeda