Backyard Stargazing Using Binoculars

Presented By Dave Covey
Getting Started

• Advantages over telescopes
  • Less costly
  • More portable
  • Wider view of the sky
  • Multiple uses (sports, wildlife, night, etc.)

• Suggestions to begin
  • Start with 7X or 10X power
  • Start with an aperture of about 50 mm
  • Start with a light weight
  • Start with a good quality
  • Cost $ 75 to $ 400 for standard binocular (suggested)
  • Cost $ 800 to $ 1800 for astronomical binocular
Mounting Options for Binoculars

Hand Holding

- Standard Binoculars
- Mount cost - none
- Limited viewing/tracking
- Not able to share
- Simple setup procedure
- Very light weight equipment
Mounting Options for Binoculars

Camera
Tripod/Parallelogram

- Standard Binoculars
- Mount cost new $ 200 to $ 500
- Can manually track object
- Can share view w/ others
- Simple setup procedure
- Fairly light weight equipment
Mounting Options for Binoculars

**Heavy Tripod W/ Alt-Az**

- Astronomical Binoculars
- Mount cost new $ 500 to $ 700
- Can manually track object
- Can share view w/ others
- Simple setup procedure
- Heavier equipment weight
Mounting Options for Binoculars

Heavy Tripod W/ Go-To

- Standard Binoculars
- Mount cost new $ 500 to $ 700
- Can automatically track object
- Can share view w/ others
- More complex setup procedure
- Heavier equipment weight
Reference Materials - Planetarium Software

Computers

• Advantages
  • Large screen
  • Planning the stargazing session
  • Helpful information

• Disadvantages
  • Not Portable
  • No real time viewing
  • Navigate around the sky

Software Available

• The SkyX by Software Bisque
• Starry Night
• Stellaris
• Stellarium
• Many others
Reference Materials - Planetarium Software

Smartphones

- Advantages
  - Portable
  - Real time views
  - Helpful information
  - Navigate around the sky
- Disadvantages
  - Small screen
  - May require WIFI connection
  - Needs GPS and North sensing

Apps Available

- SkySafari
- Redshift
- Mobile Observatory
- Stellarium Mobile
- Many others
Reference Materials - Books

- Books
  - Binocular specific reference
  - Helpful general reference and hints
  - Some focus on deep sky objects
  - Some have sky atlas or charts
  - Shows how to find various objects
  - Usually has image of the objects
  - Has information about the objects
Reference Materials - Planisphere

• Planisphere
  • Shows major constellations and brighter stars
  • Specific to Northern Hemisphere sky and general latitude
  • Can be used all year
    • Dial in Month-Day-Time
  • Helpful to locate constellations
  • Good tool for starting your stargazing session
  • It doesn’t need batteries
Where to Start

• Bright Objects in the Solar System – Easy to find
  • Moon
  • Planets

• Bright Objects (Deep Sky Objects) outside the Solar System – Harder to find
  • Galaxies
  • Star Clusters
  • Gas Nebulas

• We’ll explore how to find a few Deep Sky Objects
Exploring the Eastern Sky

- Date: 10/07/2020
- Time: 9:15 PM
Finding the 1st Deep Sky Object

• Locating Deep Sky Objects outside the Solar System
• Best to know the Constellations and major bright stars
• One method is known as “star hopping”
Andromeda Galaxy

• Definitely outside our home the Milky Way Galaxy
• Is visible to the naked eye under dark sky conditions
• Binocular view will be an ellipse shape that is fairly large (top image)
• Telescope view will be brighter with greater detail (bottom image)
Comparison of Size Between the Moon and Andromeda Galaxy
Finding 2nd Deep Sky Object

- Using 2 Constellations to find another deep sky object
Double Cluster

• Double Cluster or NGC 884 & 869/C14 is a pair of open cluster with 300 or so stars in each cluster

• Is visible to the naked eye under dark sky conditions

• Binocular view will show two clumping of stars (top image)

• Telescope view will expand the stars within each cluster to provide greater detail but normally can’t fit both in the same view (bottom image)
Exploring the Eastern Sky (continued)

• Date: 10/07/2020
• Time: 9:15 PM
Finding 3rd Deep Sky Object

- Star hopping down “The Segment” from Mirfak
M45 The Pleiades

• Also known as The 7 Sisters
• Pleiades is an open cluster containing about 100 stars of which 10 are brighter than magnitude 6
• Is visible to the naked eye under dark sky conditions
Exploring the Southern Sky

- Date: 10/07/2020
- Time: 8:15 PM
Finding 4th Deep Sky Object

- Date: 10/07/2020
- Time: 8:15 PM
Hercules Constellation

• The Keystone within the Hercules Constellation
• Locate the leading Western edge of the Keystone
• 1/3 of the way from the “top” star
• The Great Hercules Cluster is a globular cluster of 300,000 to 500,000 stars

• The stars within the globular cluster are very tightly spaced and gravity bound
Exploring the Southern Sky (continued)

• Date: 10/07/2020
• Time: 7:40 PM
Finding 5th and 6th Deep Sky Objects

• Using the “Tea Pot” as the starting point
• Locate the top 2 stars in the lid as pointer
The Lagoon and Trifid Nebulas

- M8 The Lagoon Nebula
- M20 The Trifid Nebula
- Both are emission nebulae where the gas cloud is illuminated by the stars within the nebula
Summary

• Learn the nighttime sky by exploring a section of the sky and then work your way around to other sections of the sky

• With binoculars you can view the Moon and major planets and also view some of the brighter deep sky objects – if you know where to look

• Have fun sharing the views with family and friends

• Keep cost of equipment within reason

• **Allows for portability and simplicity**

• **Caution** – do not use binoculars to view the Sun without special filters
PAC Binocular

• Available as a loan-out