

Electronically Assisted Astronomy

The image shows a vast field of stars in a dark sky. A prominent feature is a large, diffuse nebula with a complex, filamentary structure. The nebula is primarily green, with some red and blue filaments interspersed. It appears to be a large-scale structure, possibly a remnant of a star-forming region or a supernova remnant. The stars are scattered throughout the field, with some brighter stars visible.

Peterborough Astronomical Association

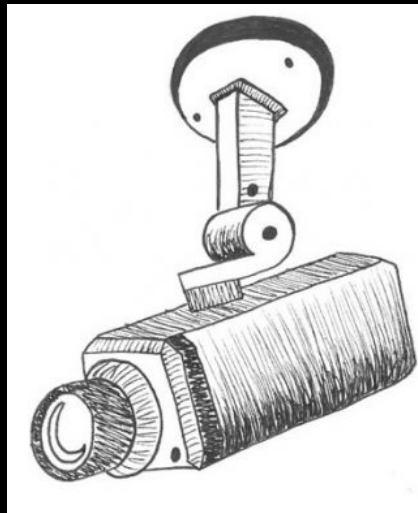
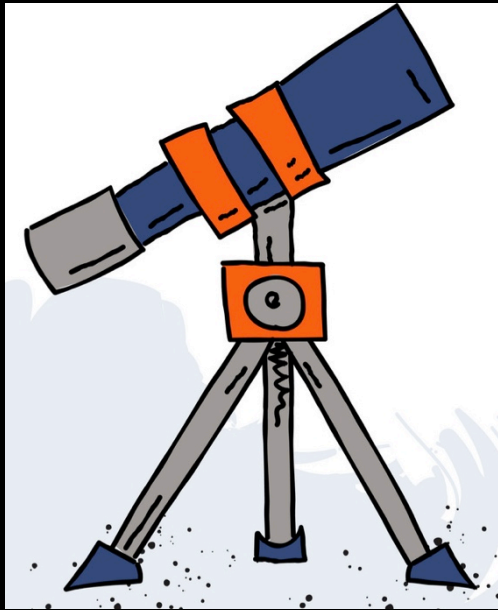
Novice Astronomy Class # 26

November 1, 2024

Brett Hardy

NGC 6960 – Brett Hardy

What is EAA?



EAA

Benefits of EAA

- See more
- See fainter
- Colour!
- Immediate gratification
- Eliminate travel
- Increase observing opportunities
- Overcome vision limitations
- Outreach
- Comfort
- Image capture
- Ease of use
- Reinvigorate your hobby



National Parks Service

Drawbacks

- Non-traditional
- Increased hardware/software
- More technical



Minimum Equipment

Telescope & Mount

- Any telescope or camera lens
- Alt Az
- Equatorial
- Tracking

Video camera

- Digital USB camera
- Adapter for telescope or lens

Display & Control

- Table & chair
- Laptop
- Software

Power Supply

- Camera
- Monitor
- mount

Cables

- USB cable



Glenn Norman

Optional Equipment

- Focal reducer
- Barlow
- Filters *
- Bahtinov mask *
- Dew shield/heaters *
- Wired or wireless controller
- Computer *
- Software *
- Video capture device *
- Guide scope and camera



Camera Manufacturers

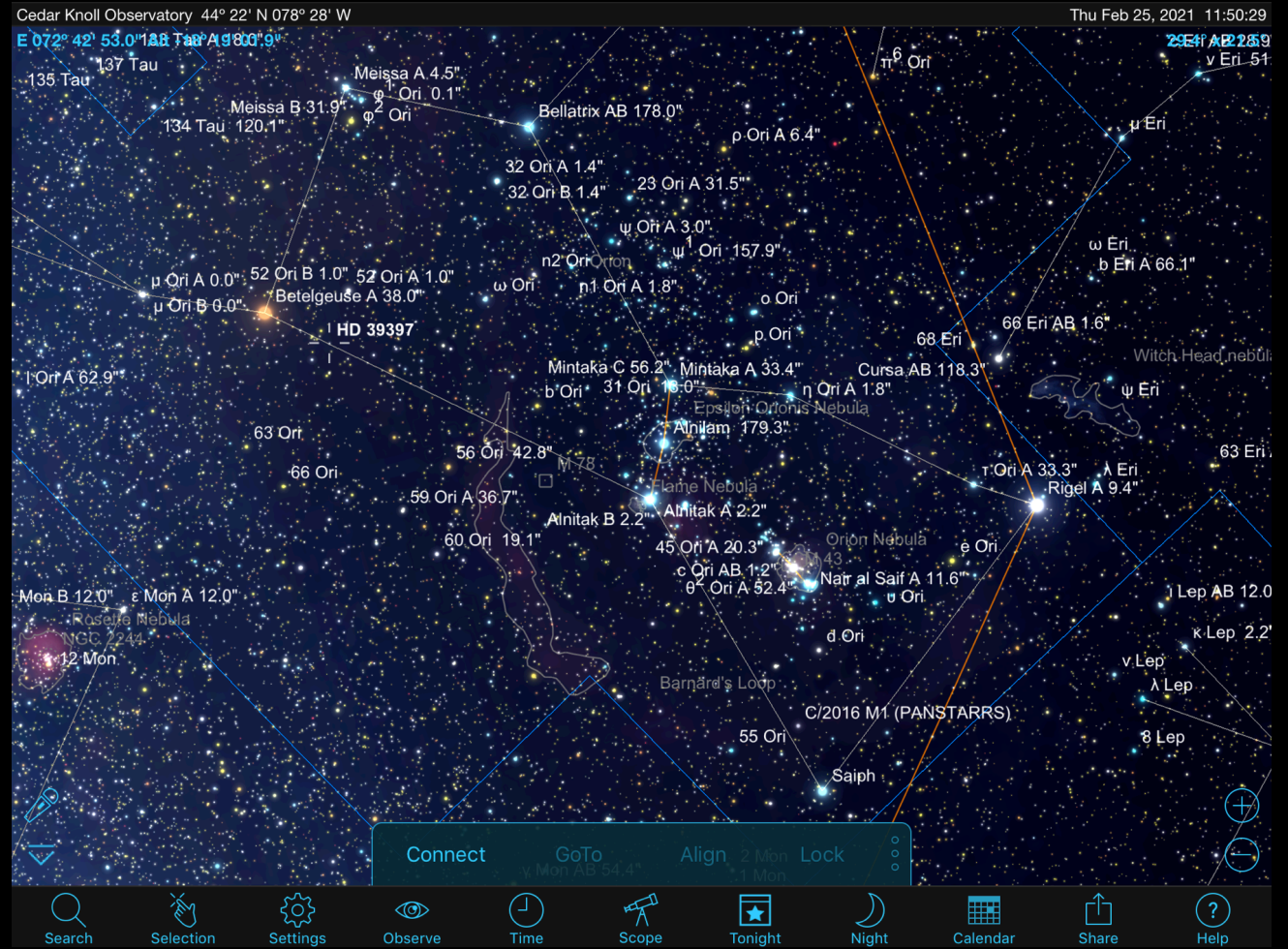
- MallinCam
- QHY
- ZWO
- Meade
- Orion
- Celestron
- Starlight Xpress
- Atik



Software

- MallinCam Sky
- Sky Safari Pro
- Team Viewer
- APCC Pro
- SkyTools 4 Visual Pro
- Starry Night Pro

- SharpCap
- Miloslick
- FireCapture
- Stellarium
- Windows Remote Desktop
- RegiStax6
- Deep Sky Stacker



SkySafari Pro Screen Capture

Field of View

Telescope

- Focal length
- Focal ratio

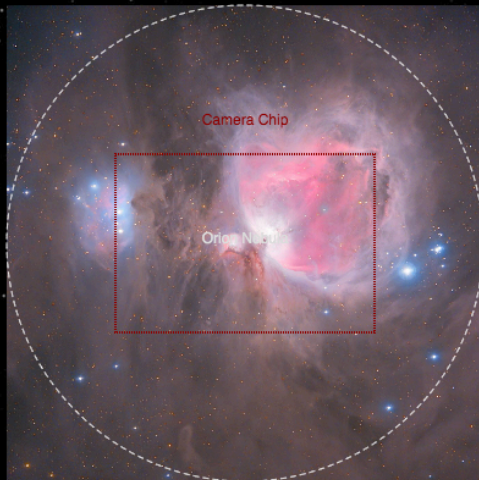
Camera

- Camera chip dimensions
- Pixel size

Adjusting Field of View


- Focal reducers
- Barlows


Aperture 175mm / 6.89 inches
Maximum Magnification :350x
Resolving Limit (Dawes) :0.66" arcseconds
Native Focal Length / F: 1400mm / F8
Ideal Resolution : 0.67" - 2" arcseconds
Resolution 1.33" arcseconds per pixel
Sampling Good ✓✓✓✓
Camera Chip FOV 0.59° x 0.41°



Bintel Astronomy Calculator & Simulator

Developed by Dylan O'Donnell

 Choose Telescope

 Choose Camera

Select Telescope ...

Select Camera ...

TELESCOPE

Focal Length (mm)

1400

F Ratio / F Number

8

CAMERA

Pixel Size (µm)

4.63

Pixels Wide

3704

Pixels High

2778

EYEPIECE

Focal Length (mm)

Field of View / FOV (°)

ACCESSORIES & SETTINGS

Binning

1x1

Magnifier or Reducer

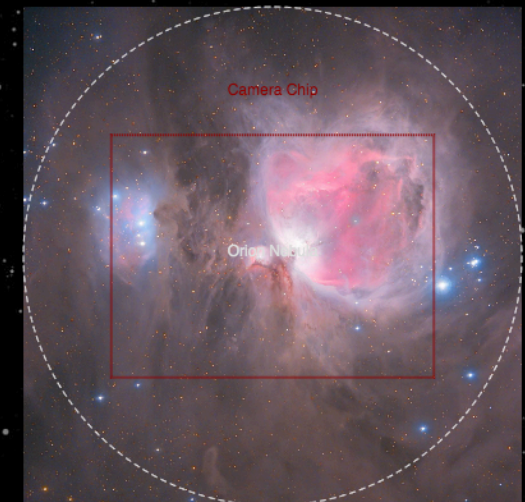
None

PREVIEW TARGET

Orion Nebula

Calculate

Aperture 175mm / 6.89 inches
Maximum Magnification :350x
Resolving Limit (Dawes) :0.66" arcseconds
Native Focal Length / F: 1400mm / F8
Ideal Resolution : 0.67" - 2" arcseconds
Resolution 0.68" arcseconds per pixel
Sampling Good ✓✓✓✓
Camera Chip FOV 0.70° x 0.53°



bintel.com.au

Cedar Knoll Observatory

In the dome

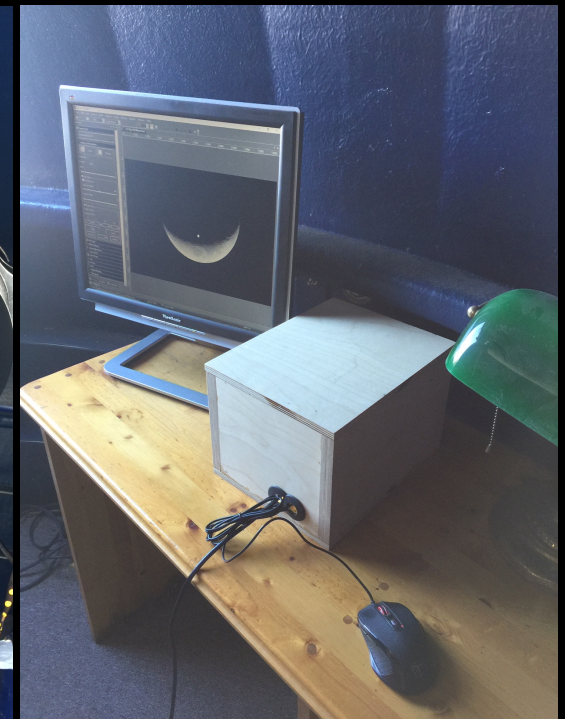
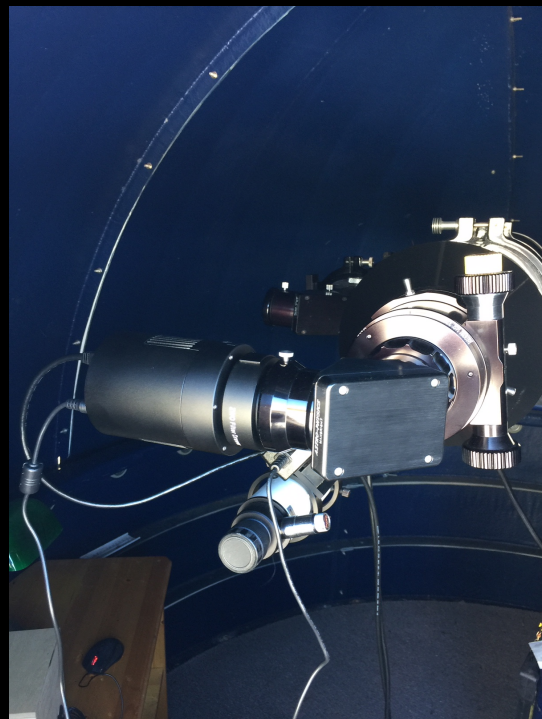
- 3 meter Technical Innovations Dome
- Minix Neo N42C mini computer
- 175mm TMB APO refractor
- 101mm TeleVue Genesis APO refractor
- Astro-Physics 1200 GTO German equatorial mount
- Simulation Curriculum SkyFi III

Cameras

- MallinCam SkyRaider DS432mTEC
- MallinCam SkyRaider DS10cTEC
- MallinCam SkyRaider DS26cTEC
- Mallincam Hyper Plus

In the warm room

- Dual 32" monitor display
- Asus laptop
- iPad



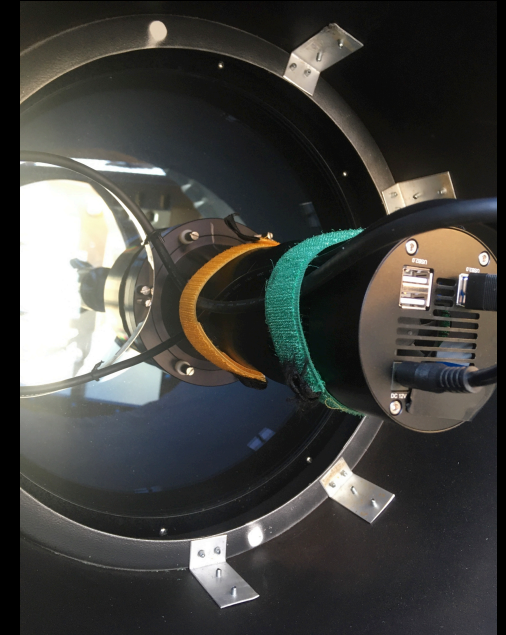
Hevans Drive Observatory

In the observatory

- Modified poly shed roll off roof observatory
- Celestron C14 SCT telescope
- CG 11 mount
- Dell computer
- 17" monitor
- Starizona HyperStar

Cameras

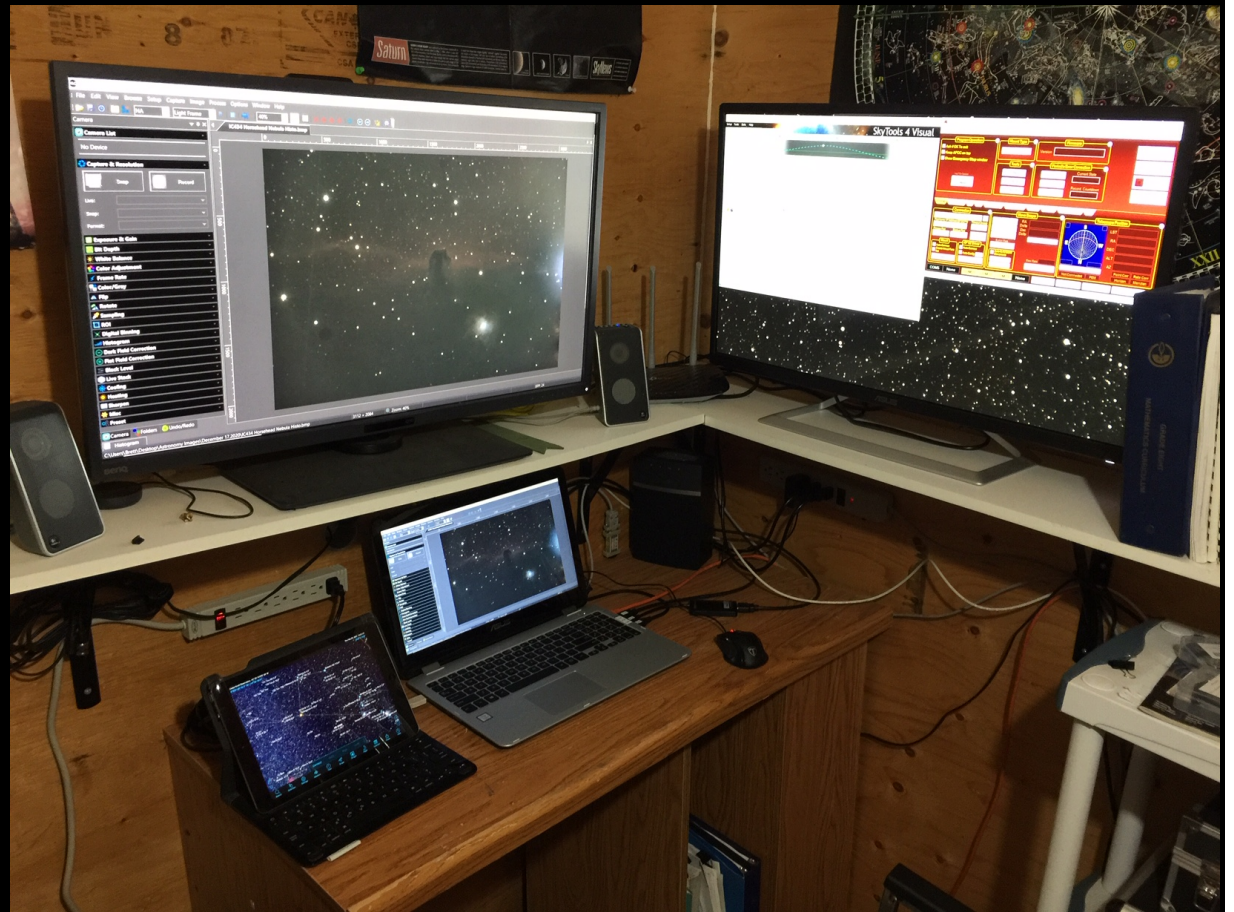
- MallinCam Xterminator
- MallinCam SkyRaider DS10cTEC



Mike McCarthy

Remote Observing

- Significantly increases observing opportunities and comfort
- Eliminate biting insects
- Eliminate cold
- Small \$ investment
 - Requires WiFi or ethernet cable



Cedar Knoll Observatory Warm Room

Smart Telescopes

- DwarfLab Dwarf 3
- ZWO SeeStar S50
- Vaonis Vespera II
- Unistellar Odessey & Equinox 2
- Celestron Origin

Benefits

- Extremely easy to use
- Very portable
- Quick and easy setup
- Colour images in near real time
- Built-in image processing
- Easily share images

Drawbacks

- Field rotation
- inflexible configuration
- Mediocre for planets
- Failure of a single component shuts down operation



DWARF 3 Smart Telescope



Carrying Bag



Magnetic Solar Filters



Pouch for Solar Filters



USB-C Cable



Wipe Cloth



Images



M16 The Eagle Nebula: MallinCam DS10cTEC, TMB175, LHDR 10-20 seconds, 50 frames, L-eNhance – Brett Hardy

Images



Fish Head Nebula IC1795: MallinCam DS10cTEC,Celestron 14", Exp:20 seconds, stack of 20 frames – Mike McCarthy

Images



M8 The Lagoon Nebula: MallinCam DS10cTEC, TMB175, LHDR 5-15 seconds, 52 frames, L-eNhance – Brett Hardy

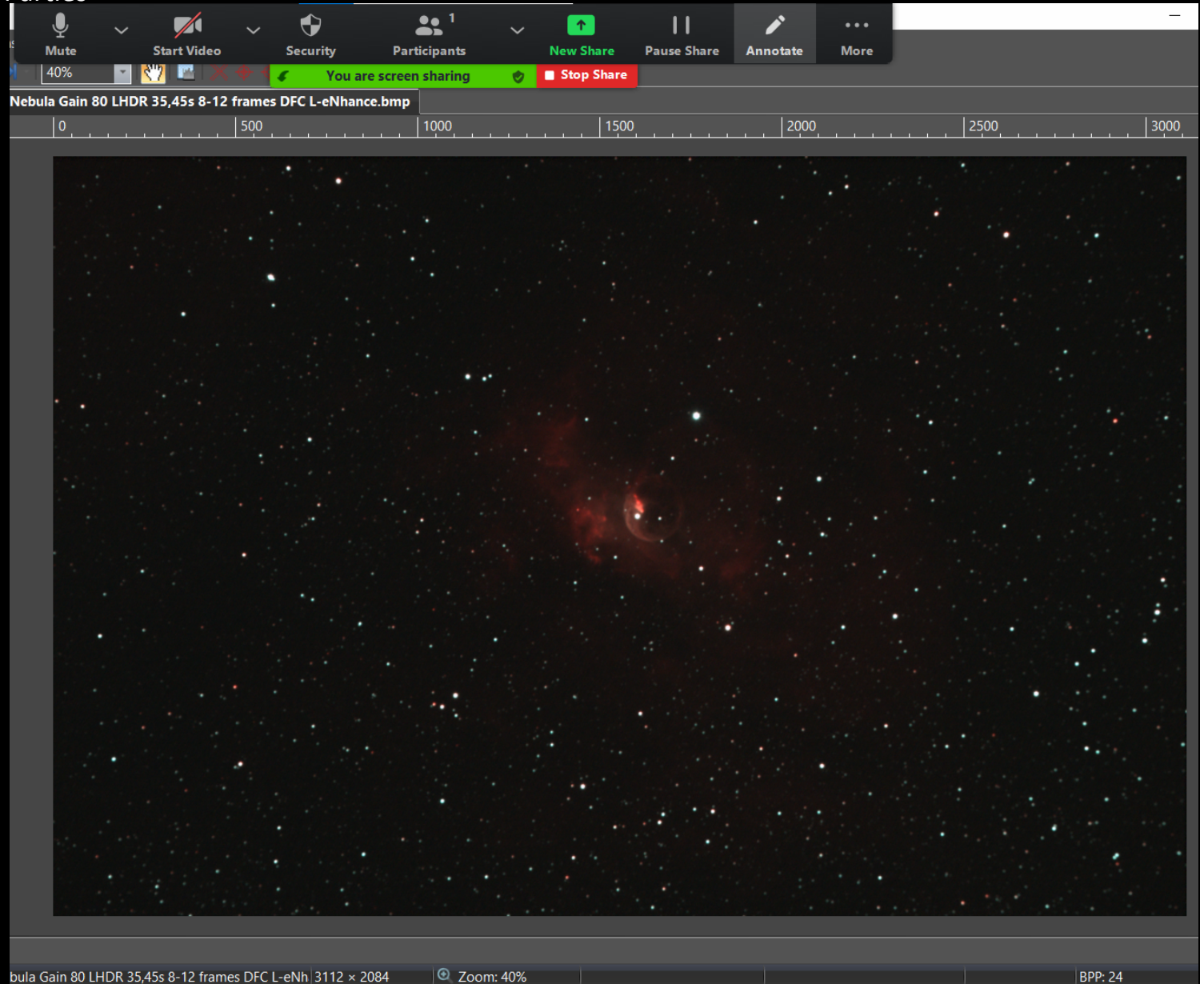
Images



M42/43 Orion Nebula: MallinCam DS26cTEC, TMB175, LHDR 0.3-17 seconds, 46 frames – Brett Hardy

Viewing Opportunities

- PAA Virtual Star Parties



Zoom Screen Capture

Next Month's Novice Astronomy Class # 27
Making Sense of Astronomy Terminology
December 6, 2024

