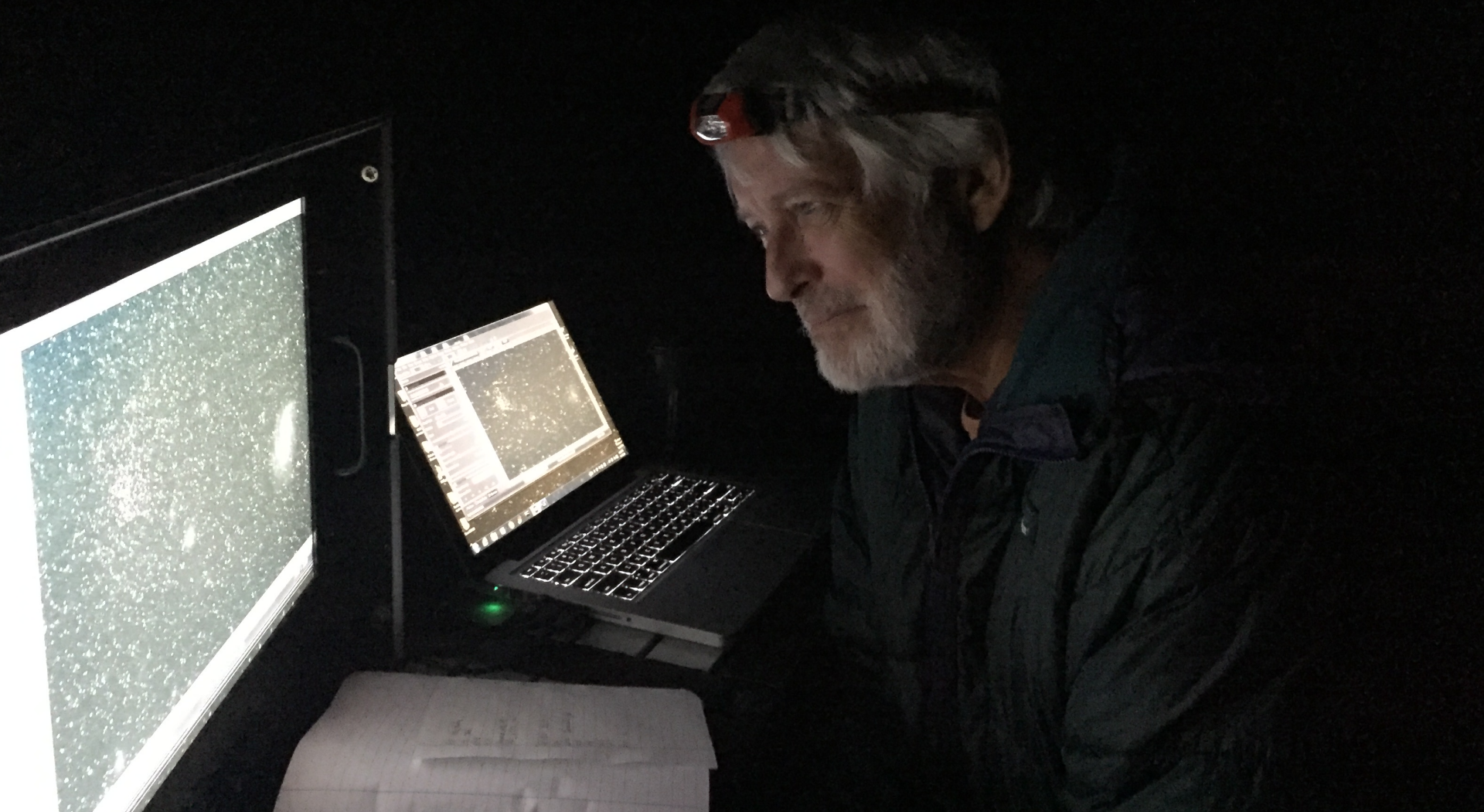


Video astronomy



3PLUS

Resolution

Snap

Record

1920 x 1200

RGB

25.00

Mode

Exposure

100

Target:

1929.141ms

Time:

Trigger Mode

Source:

Software

Exposure Time:

h

m

s

ms

µs

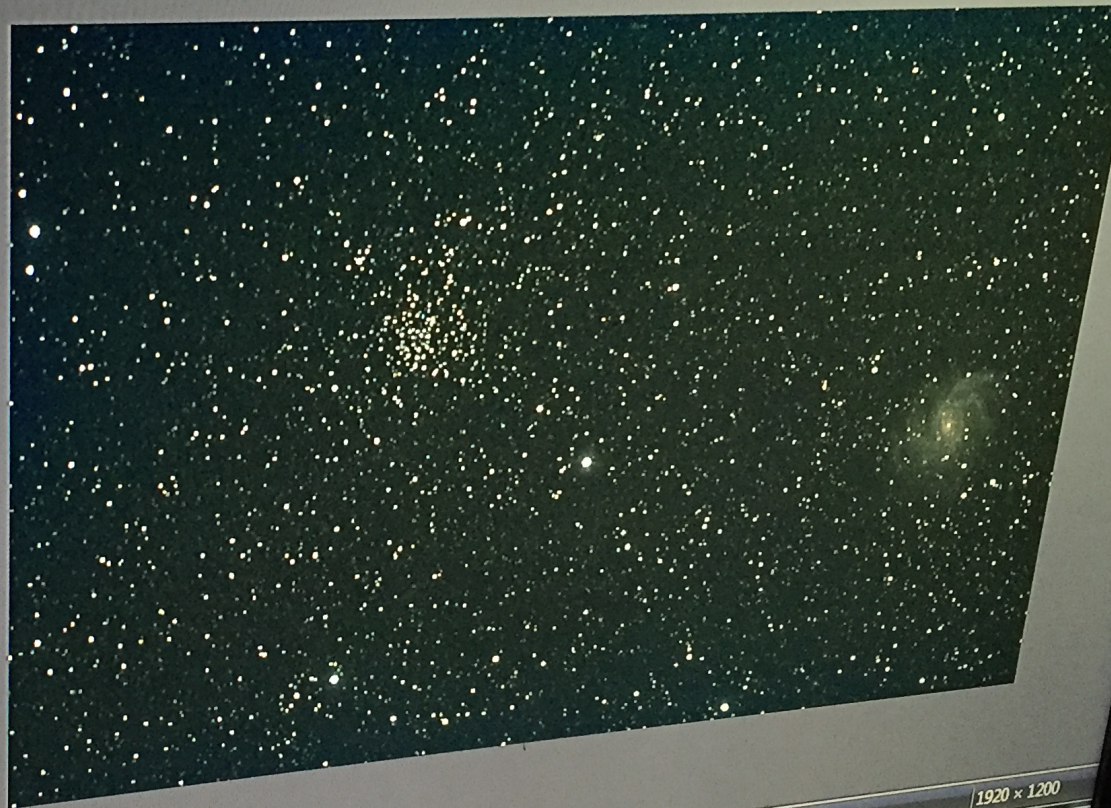
olders

Undo/Redo

Camera

RaiderDS2.3PLUS

0 200 400 600 800 1000 1200 1400 1600



1920 x 1200

Exposure: 10.3 / 150

Frame Rate: 0.1; Frame: 185

kyRaiderDS2.3PLUS

Capture & Resolution



Resolution: 1920 x 1200

Format: RGB

Gain: 25.00

Video Mode

Auto Exposure

Exposure Target: 100

Exposure Time: 1929.141ms

Trigger Mode

Trigger Source: Software

Exposure Time:

h m s ms μ s

0 15 0 0

Folders

Undo/Redo

7

Camera



1920 x 1200

Zoom: 50%

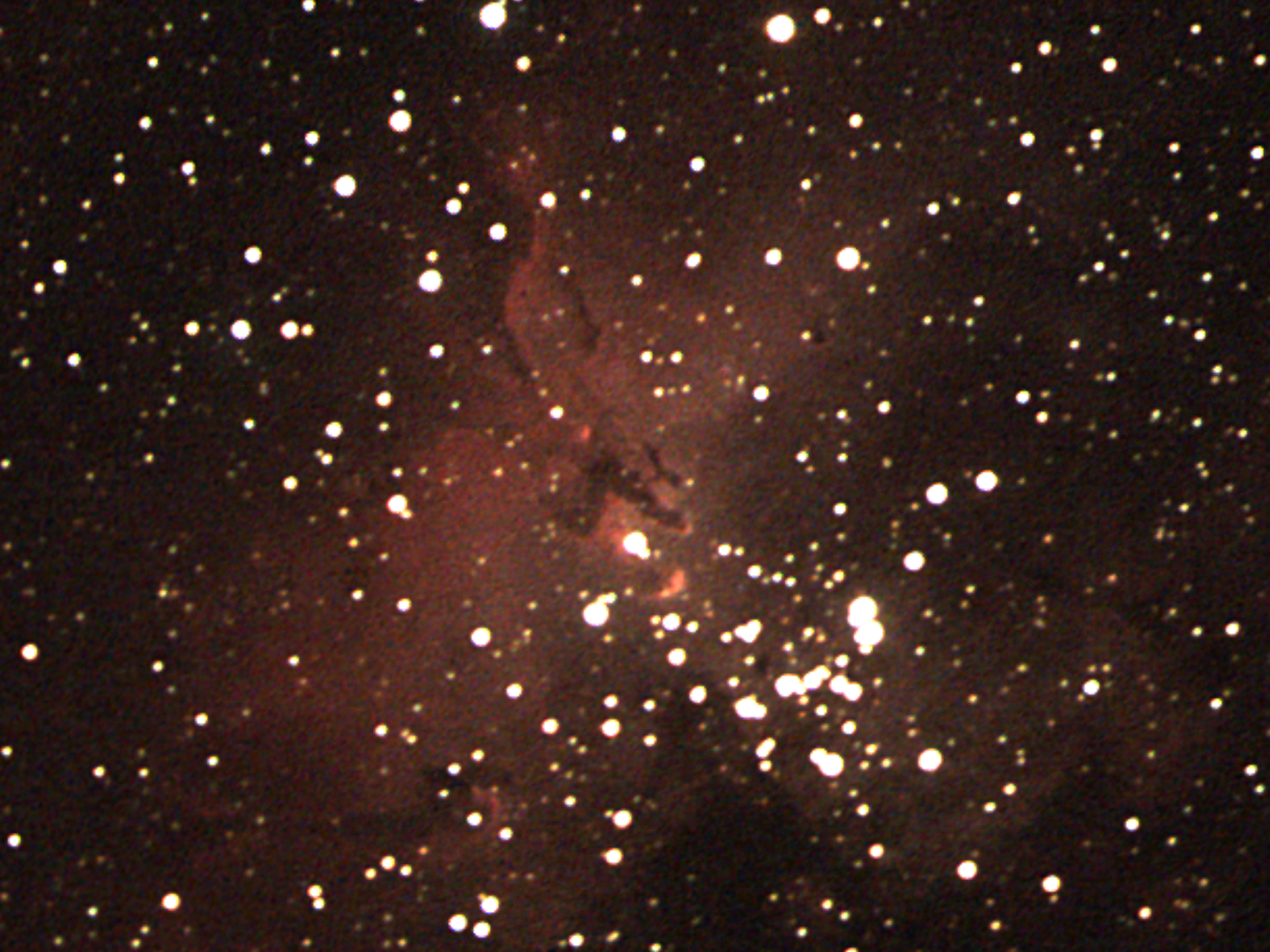


Video astronomy

“Video astronomy is not about pretty pictures. It is a step up from eyepiece observing where the goal is to observe objects live in color and in detail without the need for post image processing.”

—Jack Huerkamp







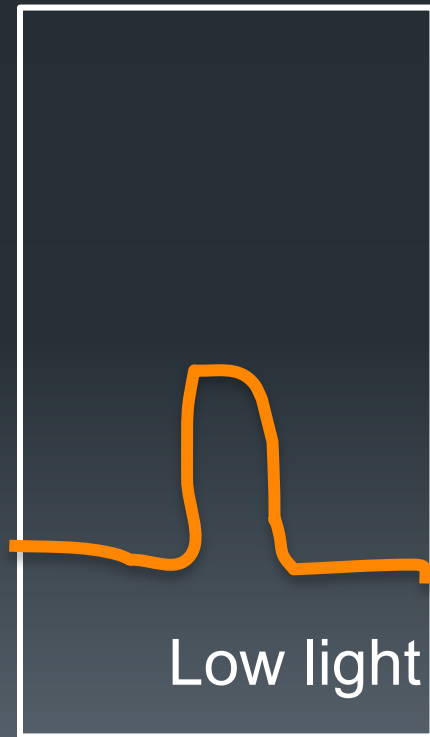
Video observing rocks!

- Images in great detail, and in color
- “Live, near-real-time observing”
- Great for light-polluted skies
- Poor eyesight is not a problem
- 30 sec views like looking in a 4-ft reflector

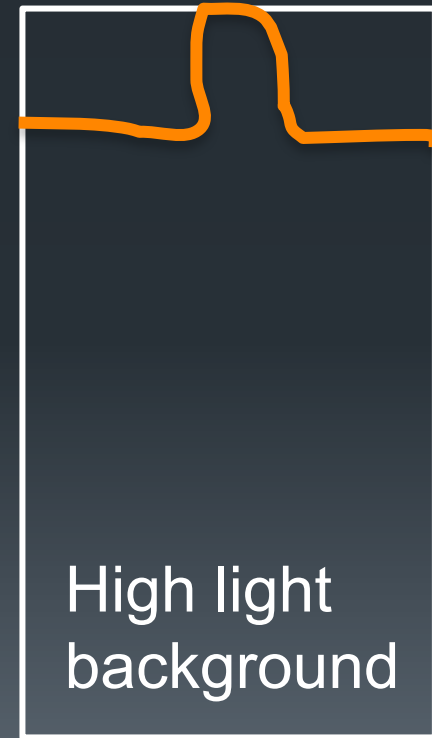
How video works



Signal



Low light background



High light background

Video's great in a bright sky,
(and even better in a dark one)

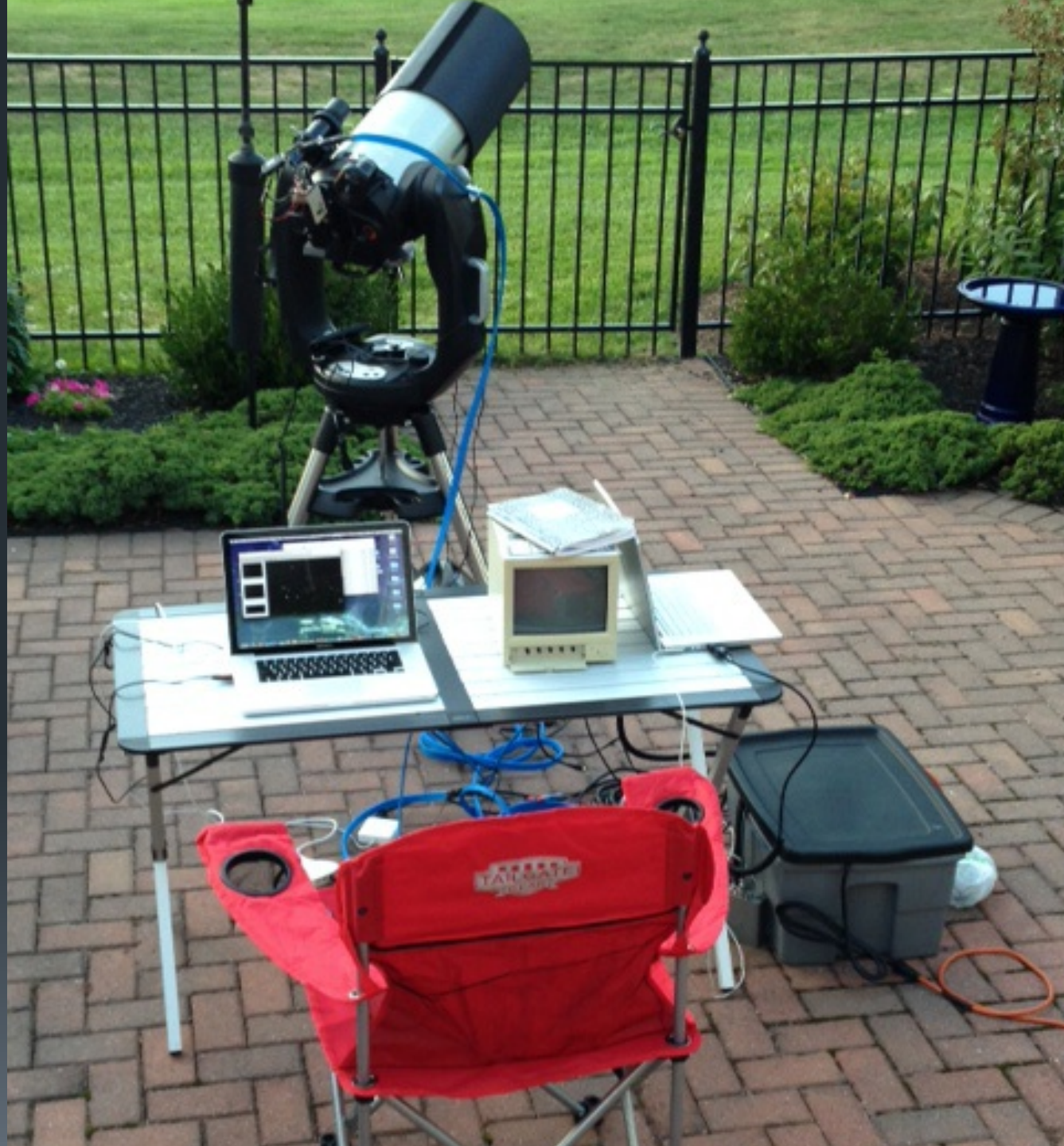




Equipment—basic setup

- Motorized telescope with good tracking
- Camera and focal reducer for f/4 optics
- Power cable to camera
- Video cable to analogue TV monitor

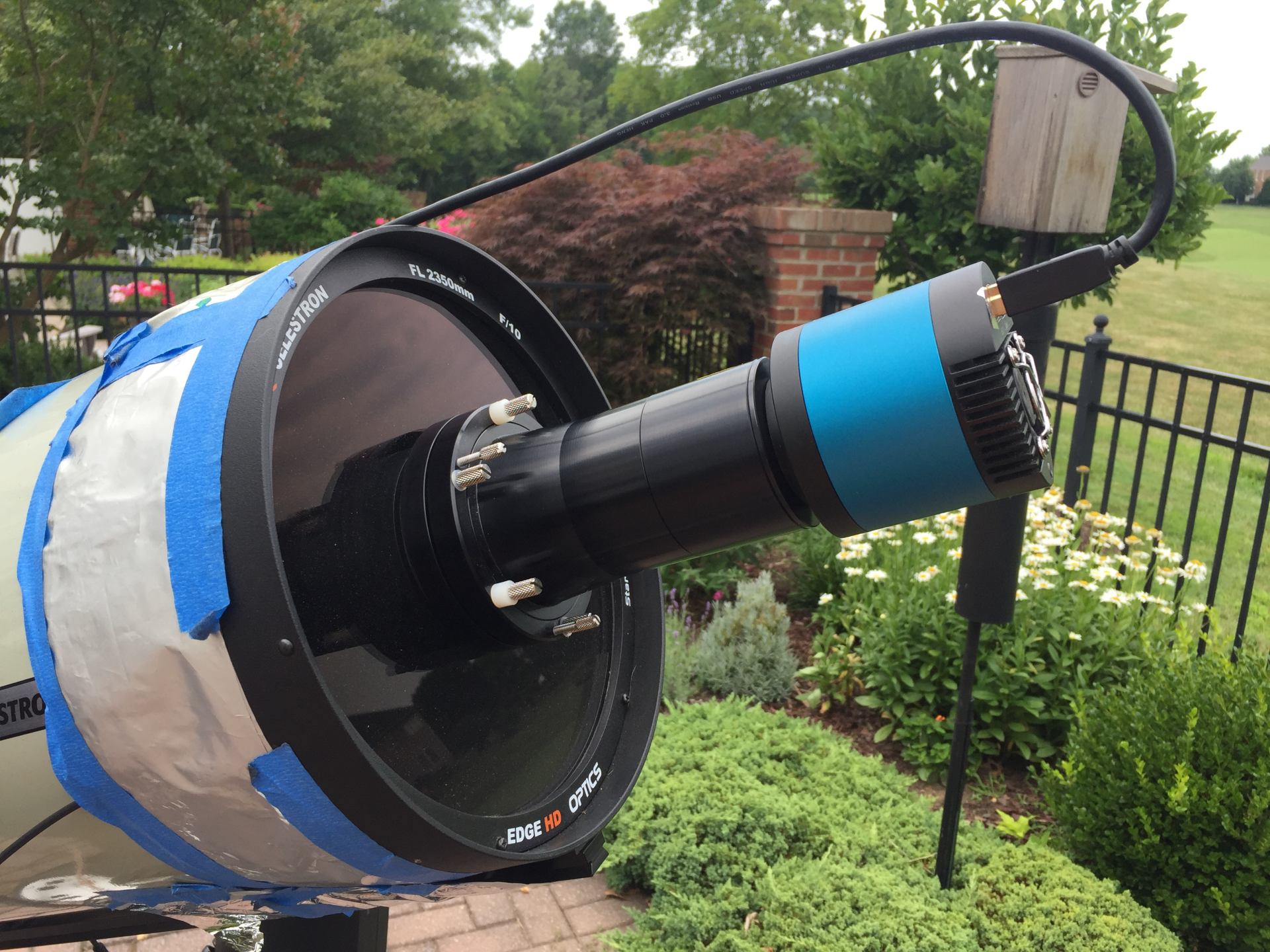
Basic setup





Equipment—advanced setup

- Telescope with tracking/guiding
- Camera with HyperStar lens for f/2 optics
- Video, power & serial cables to camera and scope
- Laptop and software
- Large display monitor



CELESTRON

FL 2350mm

F110

EDGE HD OPTICS



Advanced setup



Challenges-telescope alignment, tracking, focal reduction

- Celestron SCT for stable optical tube assembly
- Equatorial or Alt-Az mounting for fast, simple setup
- Precision alignment with Celestron StarSense
1 arcmin RMS go-to accuracy
- Focal reducer produces bright images (f/2-f/4) for camera
- Filters for light pollution, emission nebulae



Challenges—electrical equipment

- AC/DC power solutions
- Batteries and chargers
- Electronic filters to remove ground loops and electronic noise
- S-video, composite video, digital video technologies
- Cable management
- CRT, LCD-LED monitors

AC power




DC power



Challenges—Software

- Camera control
 - Telescope control
 - Focusing on iPad
 - Video mask
 - Broadcasting
 - MPG4 videos
 - Image touchup
- MallincamSky
SkyTools 3
SplashTop
KVYCam
Nightskiesnetwork.CA
Snagit
Photoshop, ImageJ



Using image alignment and
stacking on an alt-az scope



Outreach



Webcasting and forums

www.nightskiesnetwork.ca



The screenshot shows the top section of the Nightskies Network website. The background is a vibrant image of a nebula. On the left, there is a silhouette of a telescope on a tripod. The text 'The Original' is written in a white, cursive font. Below it, 'WELCOME TO' is in a small, white, sans-serif font, followed by 'NIGHT SKIES NETWORK' in a large, blue, serif font. Below this header is a grid of logos for various astronomical companies. The logos are arranged in two rows. The first row includes Meade Instruments, MallinCam, TeleVue Visionary, Celestron, and MiloSlick Scientific. The second row includes Equatorial Platforms, Lunt solar systems, Astro Physics, and SkyShed Observatories. Below the grid, there is a paragraph of text explaining that the listed companies are not sponsors but are listed to support the site's mission. At the bottom, there is another paragraph announcing a new section for schools, colleges, universities, and astronomy societies.

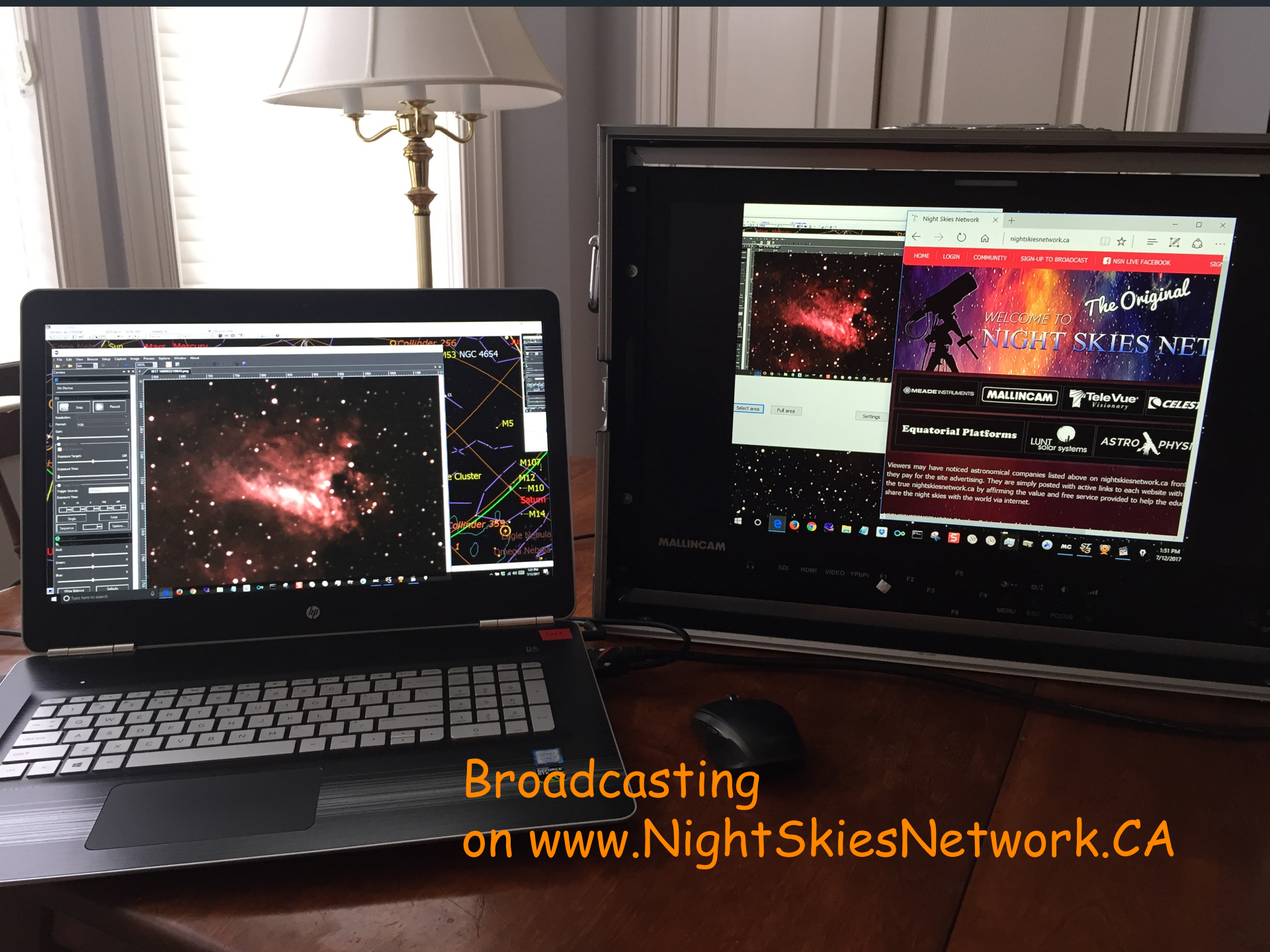
The Original
WELCOME TO
NIGHT SKIES NETWORK

MEADE INSTRUMENTS MALLINCAM TeleVue Visionary CELESTRON MiloSlick Scientific

Equatorial Platforms LUNT solar systems ASTRO PHYSICS SkyShed Observatories

Viewers may have noticed astronomical companies listed above on nightskiesnetwork.ca front page. They are not sponsors nor do they pay for the site advertising. They are simply posted with active links to each website with permission to indicate their support of the true nightskiesnetwork.ca by affirming the value and free service provided to help the education of astronomy live on line and to share the night skies with the world via internet.

NIGHTSKIESNETWORK.CA, the Original worldwide astronomy broadcast site, is proud to announce the addition of a new section for Schools, Colleges, Universities and Astronomy Societies. This new section will allow these institutions to privately broadcast their own live webcasts of astronomical events to their students. The broadcast will be available to all who wish to watch.



Broadcasting
on www.NightSkiesNetwork.CA



Broadcasting websites

- Nightskiesnetwork.ca (Mallin)
- Nightskiesnetwork.com (Sardina)
- Astronomy Live
- Facebook Live Video
- Periscope broadcasting

Forums for video astronomy

- CloudyNights.com—Electronic assisted astronomy EAA
- NightSkiesNetwork.com
- Yahoo groups: Nightskiesnetwork
- AstroVideoForum



More Examples



























Video astronomy

- Remote video astronomy Jim Meadows
- Electronic assisted astronomy (EAA) Cloudy Nights
- Digitally enhanced observing Simon Hamner
- Video astronomy Rock Mallin
- Astro-video observing Rock Mallin
- Live video astronomy Jack Huerkamp
- Video-assisted observing Vincent Maccioni

—live video astronomy is not about pretty pictures; it is a step up from eyepiece observing where the goal is to detect objects and detail in them without the need for stacking and post processing—Jack Huerkamp

NSN.CA Broadcasting Setup

