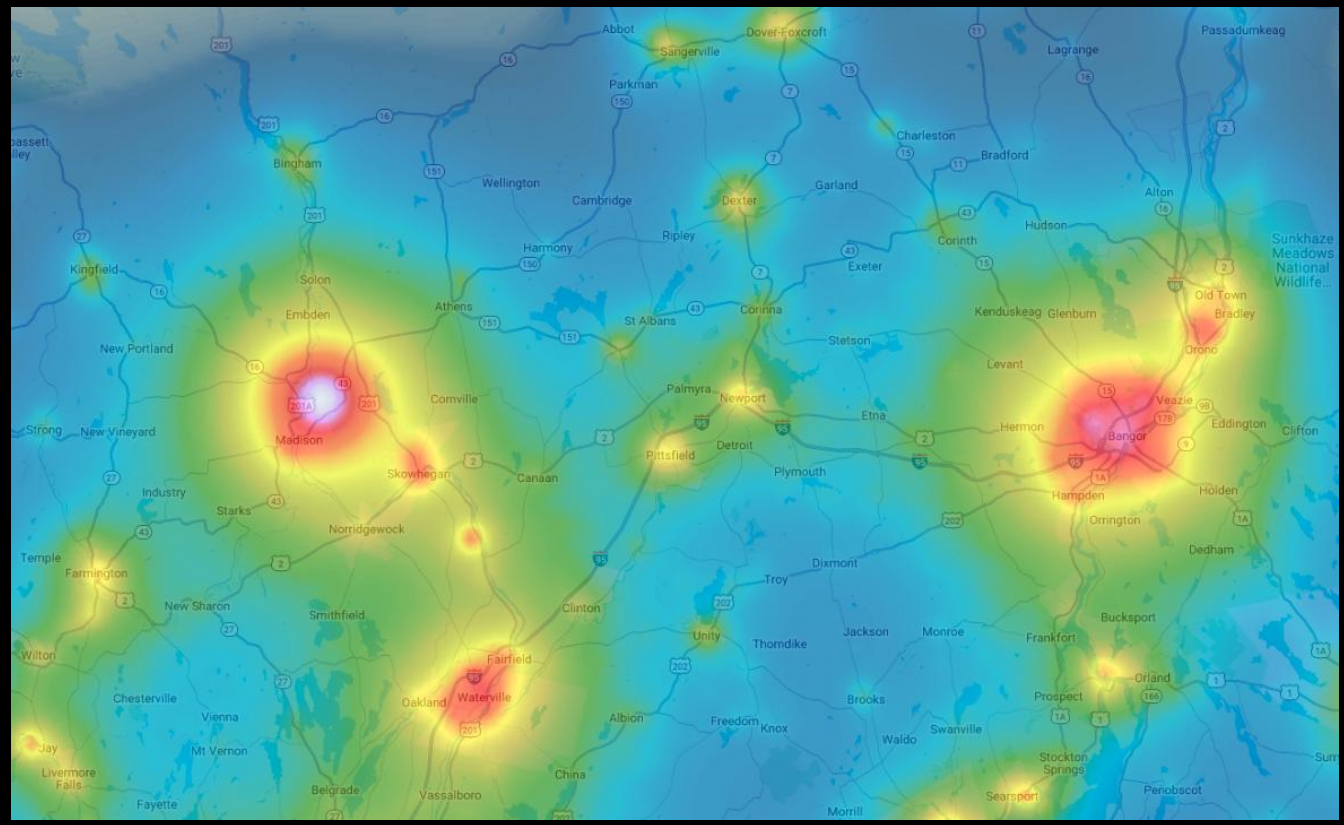
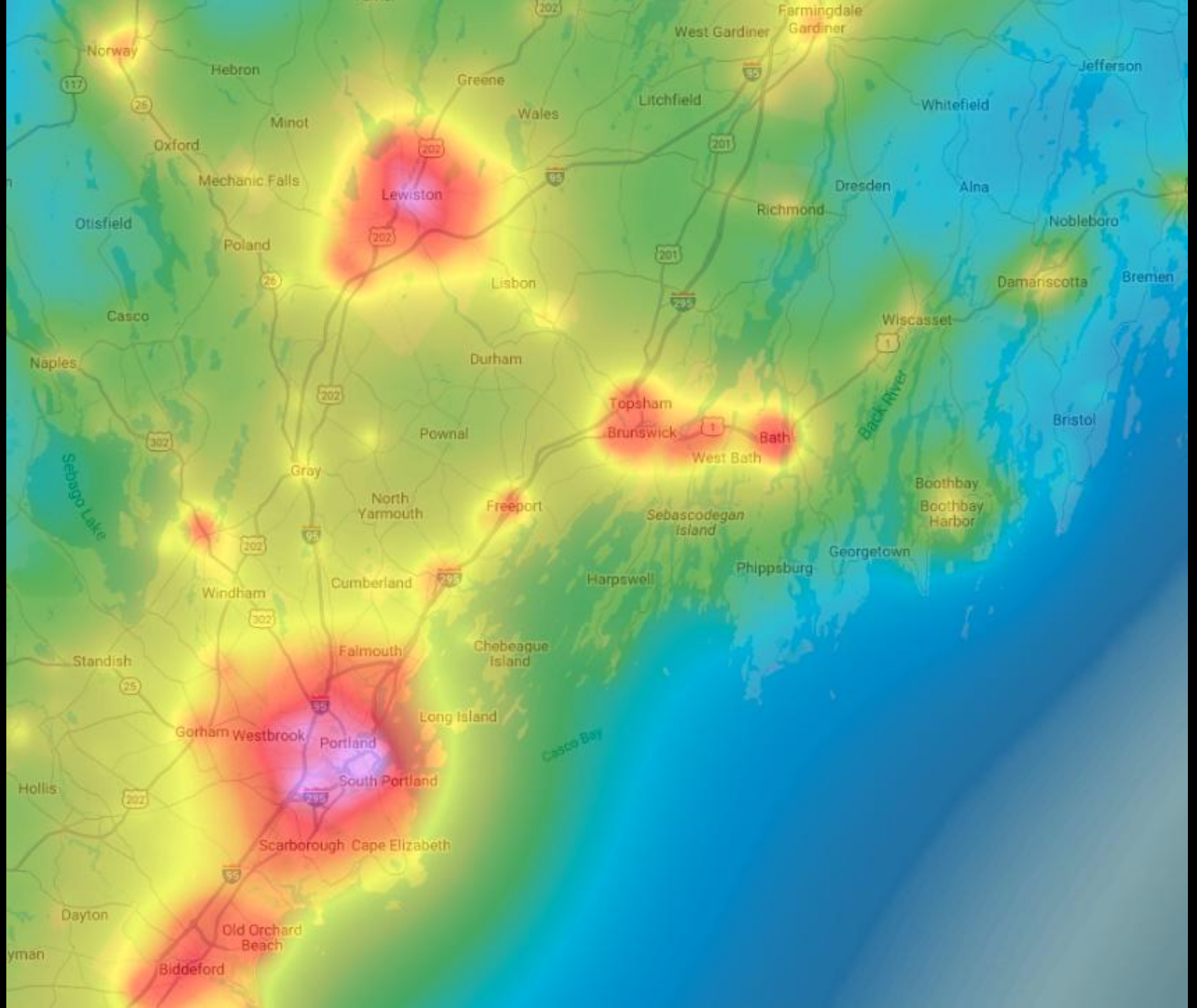

Quebec
Montreal
Bangor
Portland
Boston
New York
Pine Barrens


Edmundston
Saint-Nicolas
Montmagny
Beauport
Quebec
Caribou
Presque Isle
Thetford Mines
Saint-Georges
Houlton
Maine
Bangor
Skowhegan
Waterville
Belfast
Augusta
Rockland
Bridgton
Lewiston
Brunswick
Bath
Westbrook
Portland
Biddeford
Dover
Portsmouth
Quebec
Presque Isle
Fredericton
Madison
Bangor
Brunswick, Cooks Corner, Bath
Portland

https://www.lightpollutionmap.info




Norway
Hebron
Greene
Wales
Litchfield
West Gardiner
Farmingdale
Gardiner
Jefferson
Whitefield
Minot
Oxford
Mechanic Falls
Lewiston
Dresden
Alna
Richmond
Otisfield
Poland
Nobleboro
Lisbon
Damariscotta
Bremen
Casco
Wiscasset
Naples
Durham
Topsham
Brunswick
Bath
West Bath
Back River
Bristol
Pownal
Gray
Sebago Lake
North
Yarmouth
Freeport
Sebascodegan
Island
Boothbay
Boothbay
Harbor
Georgetown
Phippsburg
Harpswell
Windham
Cumberland
Standish
Falmouth
Chebeague
Island
Long Island
Gorham
Westbrook
Portland
Casco Bay
South Portland
Hollis
Scarborough
Cape Elizabeth
Dayton
Old Orchard
Beach
Biddeford

Hubble (color)

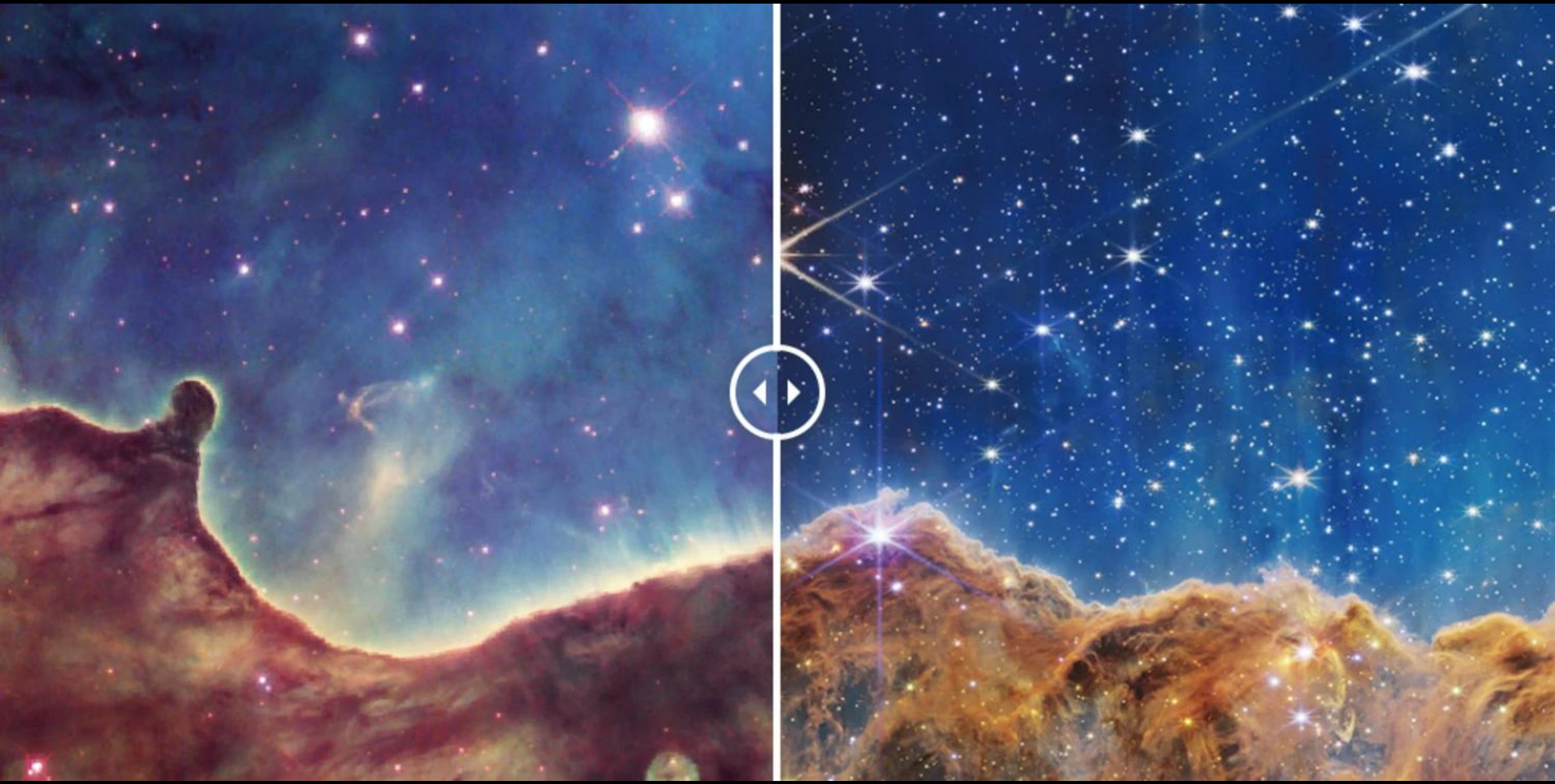
Credits : NASA, C.R. O'Dell and S.K. Wong (Rice University)

JWST (color)

Credits : NASA / ESA / CSA / PDRs4All team S. Fuenmayor

HST

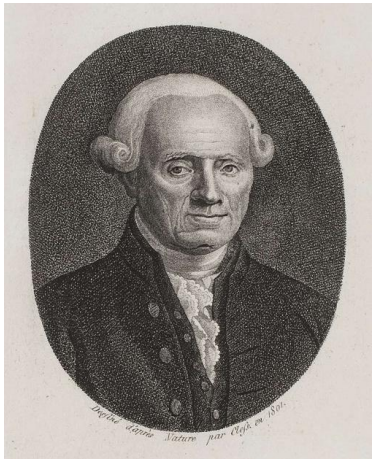
JWST



Exploring the Universe Using Binoculars

Midcoast Senior College

Russell F. Pinizzotto, Ph.D. (Russ)



Herschel 2 Observing Program Targets Remaining

NGC #	Right Ascension	Declination	Cons	Type	Mag	Notes
175	00h 37m 20.53s	-19° 56' 09.4"	Cet	SG	12.14	
217	00h 41m 32.99s	-10° 01' 23.5"	Cet	SG	13.28	
1209	03h 06m 02.14s	-15° 36' 58.0"	Eri	EG	11.34	
1325	03h 24m 24.76s	-21° 32' 46.0"	Eri	SG	11.48	
1332	03h 26m 16.35s	-21° 20' 15.0"	Eri	EG	10.18	
1353	03h 32m 02.17s	-20° 49' 18.0"	Eri	SG	11.42	
1400	03h 39m 29.97s	-18° 41' 24.9"	Eri	EG	10.91	
1421	03h 42m 28.46s	-13° 29' 24.9"	Eri	SG	11.32	
1507	04h 04m 26.35s	-02° 11' 24.7"	Eri	SG	12.23	
1587	04h 30m 39.04s	00° 39' 34.5"	Tau	EG	11.67	
1600	04h 31m 38.96s	-05° 05' 17.4"	Eri	EG	10.90	
1618	04h 36m 05.75s	-03° 09' 02.4"	Eri	SG	13.51	
1637	04h 41m 27.35s	-02° 51' 36.3"	Eri	SG	10.82	
1700	04h 56m 55.46s	-04° 52' 04.1"	Eri	EG	11.04	
2254	06h 35m 48.08s	07° 39' 55.2"	Mon	OC	9.10	
2259	06h 38m 20.06s	10° 52' 55.2"	Mon	OC	10.80	
3887	11h 47m 04.7s	-16° 51' 13"	Crt	SG	10.70	
3892	11h 48m 01.1s	-10° 57' 43"	Crt	SG	12.89	
4024	11h 58m 31.2s	-18° 20' 49"	Crv	EG	11.73	
4105	12h 06m 40.7s	-29° 45' 42"	Hya	EG	10.58	
5018	13h 13m 01.0s	-19° 31' 04"	Vir	EG	10.72	
5037	13h 14m 58.9s	-16° 35' 32"	Vir	SG	12.07	Same FOV
5044	13h 15m 24.0s	-16° 23' 09"	Vir	EG	10.56	Same FOV
5061	13h 18m 04.9s	-26° 50' 10"	Hya	EG	10.25	
5068	13h 18m 55.3s	-21° 02' 21"	Vir	SG	9.99	
5077	13h 19m 30.1s	-12° 39' 26"	Vir	EG	11.27	
5078	13h 19m 50.4s	-27° 24' 37"	Hya	SG	10.91	
5084	13h 20m 16.8s	-21° 49' 34"	Vir	SG	10.46	
5087	13h 20m 25.3s	-20° 36' 34"	Vir	EG	11.17	
5129	13h 24m 09.8s	13° 58' 35"	Vir	EG	12.03	
5134	13h 25m 19.0s	-21° 08' 05"	Vir	SG	11.55	

Unit 11

AstroLeague Observing Programs, Observing Catalogs, Observing Sessions

Astronomical League Observing Programs

An Astronomical League observing program is a structured, amateur astronomy project with specific observing goals, such as identifying celestial objects or completing a certain number of observations. Completing a program earns participants a certificate and pin, and the programs range from beginner-friendly activities with no equipment needed to advanced ones requiring specialized instruments like telescopes.

Astronomical League
Binocular Messier Observing Program

https://www.astroleague.org/

https://www.astroleague.org/alphabeticobserving/

https://www.astroleague.org/binocular-messier-observing-program/

Requirements and Rules

This certification is available to members of the Astronomical League, either through their local astronomical society or as members at large. If you are not a member and would like to become one, check with your local astronomical society, search for a local society on the Astronomical League Website, or join as a Member-at-Large.

SMA
SOUTHERNMAINEASTRONOMERS

https://www.southernmaineastronomers.org

To qualify for the Binocular Messier Certification:

Observe 50 or more Messier objects using only binoculars.
Any 50 of the 110 recognized Messier objects may be observed.
Any pair of binoculars may be used, but those with objectives between 20mm and 80mm in diameter are recommended.

To record your observations, you may use the log sheets found in the back of the Astronomical League's manual "Observe: A Guide to the Messier Objects", or any similar log sheet.

The required information for each observation is:

- the name of the object
- date and time
- latitude and longitude
- an estimate of the seeing and transparency
- the size and power of the binoculars used
- and **perhaps,** a brief description of what you saw

Astronomy Observation Log – (Your name here!)

Project: Binocular Messier Observing Program

Page: 01, Object Numbers: 1 to 5

Subject/Position:	Date:	Time:
Observing Location:	Instrument:	
Conditions:	Seeing:	Trans:
Notes:		

Subject/Position:	Date:	Time:
Observing Location:	Instrument:	
Conditions:	Seeing:	Trans:
Notes:		

AstroLeague Seeing and Transparency

https://www.astroleague.org/seeing-and-transparency-guide/

Seeing:

How stable is the sky?

- E (excellent) – The brighter stars are not twinkling at all.
- VG (very good) – The stars are twinkling slightly, but the brighter planets are not twinkling.
- G (good) – The brighter planets are twinkling slightly.
- F (fair) – The brighter planets are obviously twinkling.
- P (poor) – The atmosphere is turbulent. All objects are twinkling to the points where observation is not practical.

Transparency:

How clear is the sky?

1. None	Magnitude 1 skies	
2. Only Polaris	Magnitude 2 skies	α UMi
3. … plus Kochab or Pherkad	Magnitude 3 skies	β UMi, γ Umi
4. … plus any stars in the tail	Magnitude 4 skies	δ UMi (Yildun), ε UMi
5. … plus another bowl star	Magnitude 5 skies	ζ UMi
6. All 7 stars	Magnitude 6 skies	η UMi
7. More than 7 stars visible	Magnitude 7 skies	

Astronomy Observation Log – Russell F. Pinizzotto

Project: Herschel 2 Observing Program, Part 4, Objects 301 to 400

Page: 61, Object Numbers: 301 to 305

Subject/Position: NGC 5861	Date: 22 Jun 25 Time: 11:46 pm
Observing Location: The Garage	Instrument: eVscope 2
Ap: 114 mm FL: 450 mm	EP/Mag: Imager / 40 and 120
Conditions: 68.2 (62.4) 0G2 NNE. Clr.	Seeing: Good Trans: 4, B4, SQM 21.20
Notes: Somewhat dim, but lots of internal structure. Inner and outer halos.	
Irregular intensity distributions in both. N5858 to right, smaller, but	
brighter. IC1091 almost at right edge, even smaller. Used PixInsight for ID	
5 min exposure. VV. Lib. SG. 11.60.	

Subject/Position: NGC 5864	Date: 22 Jun 25 Time: 11:56 pm

Appendix A - 7x35, 7x50, and 10x50 Binoculars

I. Easy Messier Objects:

2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 15, 16, 17, 18, 22, 23, 24, 25, 27, 29, 31,

34, 35, 36, 37, 38, 39, 41, 42, 44, 45, 46, 47, 48, 50, 52, 55, 67, 92, 93, 103.

Total = 42.

II. Tougher Messier Objects:

14, 19, 28, 30, 33, 40, 49, 53, 62, 63, 64, 78, 79, 80, 81, 82, 83, 94.

Total = 18.

III. Challenge Messier Objects:

1, 9, 26, 32, 51, 54, 56, 65, 66, 68, 71, 75, 97, 101, 104, 106.

Total = 16.

Grand Total = 76.

All 76 objects (Easy, Tough, and Challenge) were observed with 7×35 Tasco binoculars purchased at Wal-Mart for $19.00!

Appendix A - 7x35, 7x50, and 10x50 Binoculars

I. Easy Messier Objects:

2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 15, 16, 17, 18, 22, 23, 24, 25, 27, 29, 31,

34, 35, 36, 37, 38, 39, 41, 42, 44, 45, 46, 47, 48, 50, 52, 55, 67, 92, 93, 103.

Total = 42.

GC	11
OC	24
BN	4
Star Cloud	1
PN	1
Galaxy	1

II. Tougher Messier Objects:

14, 19, 28, 30, 33, 40, 49, 53, 62, 63, 64, 78, 79, 80, 81, 82, 83, 94.

Total = 18.

GC	8
BN	1
Galaxy	8
Double Star	1

III. Challenge Messier Objects:

1, 9, 26, 32, 51, 54, 56, 65, 66, 68, 71, 75, 97, 101, 104, 106.

Total = 16.

SNR	1
GC	6
OC	1
PN	1
Galaxy	7

Grand Total = 76.

Astronomical League
Binocular Observing Programs

Advanced Binocular Double Star
Asterism
Binocular Double Star
Binocular Messier
Binocular Variable Star
Deep Sky Binocular
Earth Orbiting Satellite
Galileo – Binocular
Lunar – Binocular
Solar Neighborhood – Binocular
Solar System – Binocular
Southern Skies Binocular

Binocular Master Observer
Completion of at least 8

Catalogs of Astronomical Objects

Messier Catalogue	110 objects	catalogued by Charles Messier and Pierre Méchain
Caldwell Catalogue	109 objects	compiled by Patrick Moore
New General Catalogue	7,840 objects	compiled by John Louis Emil Dreyer
Index Catalogues	5,386 objects	supplements published by Dreyer

https://en.wikipedia.org/wiki/Messier_object

https://en.wikipedia.org/wiki/Caldwell_catalogue

https://en.wikipedia.org/wiki/New_General_Catalogue

Planning an observing session – Tsula's Big Adventures

https://www.youtube.com/watch?v=7RLyzQU9xkY

1. Check the weather and the phase of Moon
2. Prepare an observing list – maybe 10 objects
3. Organize everything you need – see next 2 slides
4. Don't forget your binoculars!!!
5. Record your observations
    1. Take your time with each object
    2. Detailed notes and sketches
6. Have fun!

Planning an Observing Session – Things to Take Along – Page 1

Winter Observing
Heated Socks, toe and/or feet warmers
Hand warmers
Heat wraps – Traditionally used as a treatment for sore muscles, these wraps provide heat for up to 12 hours.
Long Johns
Blankets

Summer Observing
Bug spray

Food and Drink
Amateur astronomers need to fuel their observations with the right snacks and beverages!
It seems everyone has a signature food or drink item they bring observing.
Bottled water, Coffee, Soda, Hot chocolate
Chips, Granola bars, Peanut M&Ms, Oreos, Cheez-Its

Handouts for beginners – If you're going to a star party or bringing someone who's new to observing, it's a good idea to have some printed materials covering the basics of astronomy. If you're observing in a crowded public place, people may stop and ask you about what you're doing, so these can come in handy.

Protection from wildlife – Many of our fans told us that they observe in dark-sky locations near bears, mountain lions, and other dangerous wildlife.

Power – Make sure you have enough power for your telescope and other electronic gadgets. A Celestron Power Tank 17 and a few spare batteries should do the trick.

Planning an Observing Session – Things to Take Along – Page 2

Creature Comforts
Observing chair or stool – Choose an observing chair you can sit in comfortably for extended periods. Scott M. likes using a beanbag chair!
Music
Hat
Lip balm
Sketch pad – Sketching what you see through the eyepiece is the oldest (and cheapest) form of astroimaging!

Lens cleaning tool – Bring a small tool to clean your optics, especially if it may be windy or dusty. Make sure your brush is specifically made for lenses and optical elements, like our LensPen.

Level – If your tripod doesn't have a built-in level, a simple bubble level is a real time-saver when you're setting up your tripod!

Toolbox – In case anything goes wrong, James F. keeps a toolbox handy for on-the-spot equipment adjustments.

Hair dryer – If moisture or humidity may pose a problem, Michael P. recommends bringing a small hair dryer along to zap water off of your optics!

Star maps/smartphone app – Star charts are a great way to navigate the night sky. Now, you have the option of using a paper star chart or a digital one. **Binoculars –** Binoculars are a great tool for observing the night sky.

Red flashlight – It takes your eyes a while to adapt to darkness, which helps you see finer details through your telescope. Use a red flashlight to provide visibility while your eyes are dark-adapted. You can also deck out your tripod legs with red lights so people don't trip on them in the dark. And don't forget red filters for anything that emits light, like your laptop or smartphone screen!

Laser pointer – If you're observing in a group, a green laser pointer can help you point out objects for everyone to see. Be careful to observe all laws regarding laser pointers where you live.

White headlamp for cleanup – When you're done observing, a regular white headlamp can help you clean up quickly while keeping your hands free.