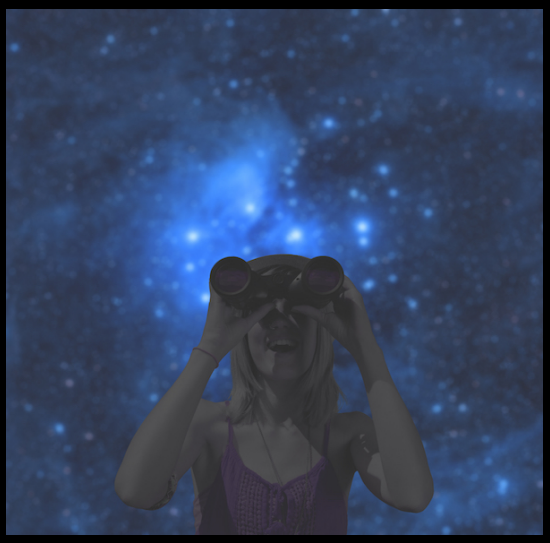
Binoculars

- Ideal starter instrument
- Use what you already have
- Eyes ~ 120°
- Binoculars ~ 6° and less

Benefits of Binoculars

- Simple to use
- Images are right side up
- Large field of view
- Inexpensive first instrument
- Two eyes are better than one
- Highly portable
- Short duration viewing
- Develop observing & chart reading skills
- Multi-purpose



AstroStar/Shutterstock

Anatomy of Binoculars

- Objective lenses
- Prisms
- Focus wheel
- Eyepieces
- Rubber eyepiece cups
- Diopter adjustment
- Hinge
- Protective caps
- Tripod adaptor

Kawai

Types of Binoculars

Porro Prism
- Most common
- Least expensive

Roof Prism
- More compact
- More expensive

Image Stabilized
- Gyroscope or liquid filled prisms
- Very expensive

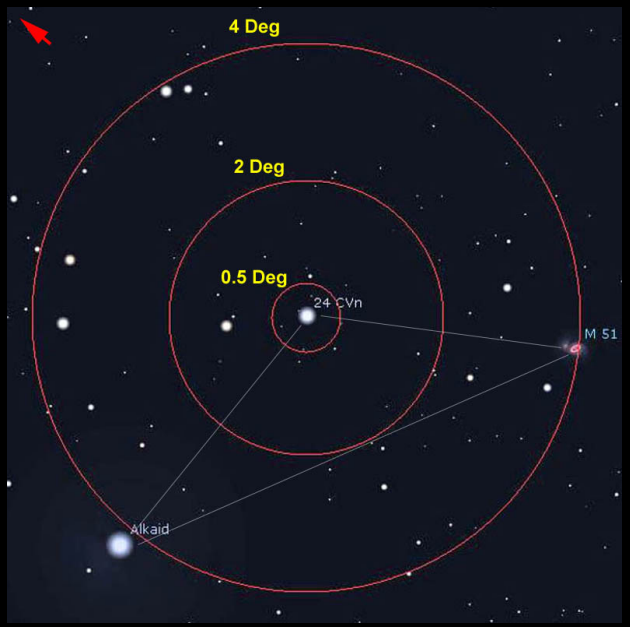
Choosing Binoculars

Magnification
- Power
- 7x to 10x (handheld)

Aperture
- Objective lens
- 50mm minimum

Age Considerations
- Pupil dilation
- Aperture ÷ magnification
- 50 ÷ 7 = 7.1 mm exit pupil
- 50 ÷ 10 = 5 mm

Field of View
- Wider the better
- 7° for 7 x 50
- 5° for 10 x 50
- Extra wide
- Ultra wide



Stellarium

Choosing Binoculars

Optical coatings

- Anti-reflection optical coatings
- Magnesium Fluoride (MgF)
- Purple, green or amber colour
- Avoid ruby coloured coatings
- Fully multicoated VS multicoated

Glass Types

- Borosilicate Crown Glass (Bk7)
- Barium Light Crown Glass (Bak4)
  - More expensive

Focusing

- Centre focus most common
- Diopter adjustment

Weight

- 7 x 50 or 10 x 50 largest easily handheld

Tripod adapter

- Mounting option

Rick Stankiewicz

Choosing Binoculars

Cost

- Wide range
- Quality binoculars ~ $250
- Compare prices

Workmanship

- Try before you buy
- Overall fit & finish
- Inspect optics & coatings
- Inspect eyepieces
- Check exit pupil

Manufacturers

- Vixen
- Orion
- Celestron
- Pentax
- Oberwerk
- Nikon
- Fujinon
- Canon
- Swarovski $$$
- Zeiss $$$

Choosing Binoculars

Vendors

- Astrobuysell.com
- KW Telescope
- Focus Scientific
- Astronomy Plus
- Maison de l'Astronomie
- Henry's
- Canadian Tire

Gary Seronik

Observing Tips

- Achieve critical focus
- Averted vision

Tripod mount

- Up to 15 x 70
- Manfrotto

Get comfortable

- Inflatable raft
- Lawn chair
- Recliner
  - Zero Gravity Chair
  - Manfrotto Magic Arm

Parallelogram mount

- Purchase
  - Oberwerk
  - 10 Micron $$$
- DIY
  - EZ Binocular Mount Kit (Peterson Engineering)
  - petersonengineering.com/binocular-mount/
  - $163.95 USD

Care & Maintenance

Respect your investment

- *Always* install lens caps
- *Always* use the strap
- *Always* carry binoculars in the case
- *Never* leave in direct sunlight
- Dew shield/straps
- ***Only*** remove lens caps to observe

Cleaning

- Less is better
- If you must clean:
  1. Blub blower
  2. Canned air *Caution*
  3. Camel hair brush
  4. 99% isopropyl alcohol
  5. 100% cotton pads/cotton balls

Stubborn Stain Cleaning Solution

- 1 part 99% isopropyl alcohol
- 2 parts distilled water
- 1 drop Dawn dishwashing liquid/ 473 mL (1 pint)

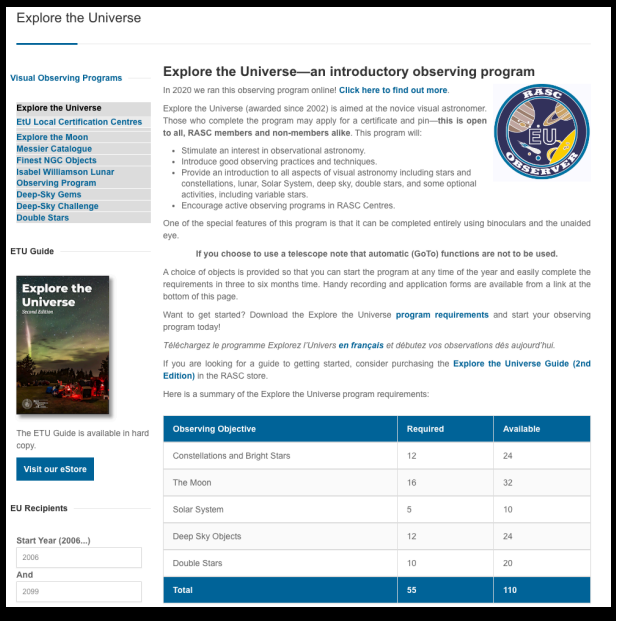
LensPen

Binocular Observing Programs

- PAA Binocular Observing Program
- Royal Astronomical Society of Canada
  - Explore the Universe
  - Explore the Moon

Astronomical League Programs

- Sky Puppy (young observer)
- Lunar
- Solar System
- Binocular Double Star
- Advanced Binocular Double Star
- Binocular Master Award
- Binocular Messier
- Binocular Variable Star
- Deep Sky Binocular


Explore the Universe

Visual Observing Programs

Explore the Universe
EtU Local Certification Centres
Explore the Moon
Messier Catalogue
Finest NGC Objects
Isabel Williamson Lunar Observing Program
Deep-Sky Gems
Deep-Sky Challenge
Double Stars

ETU Guide

The ETU Guide is available in hard copy.

Visit our eStore

EU Recipients

Start Year (2006...)
2006
And
2099

Explore the Universe—an introductory observing program

In 2020 we ran this observing program online! **Click here to find out more**.

Explore the Universe (awarded since 2002) is aimed at the novice visual astronomer. Those who complete the program may apply for a certificate and pin—**this is open to all, RASC members and non-members alike**. This program will:

- Stimulate an interest in observational astronomy.
- Introduce good observing practices and techniques.
- Provide an introduction to all aspects of visual astronomy including stars and constellations, lunar, Solar System, deep sky, double stars, and some optional activities, including variable stars.
- Encourage active observing programs in RASC Centres.

One of the special features of this program is that it can be completed entirely using binoculars and the unaided eye.

If you choose to use a telescope note that automatic (GoTo) functions are not to be used.

A choice of objects is provided so that you can start the program at any time of the year and easily complete the requirements in three to six months time. Handy recording and application forms are available from a link at the bottom of this page.

Want to get started? Download the Explore the Universe **program requirements** and start your observing program today!

*Téléchargez le programme Explorez l'Univers **en français** et débutez vos observations dès aujourd'hui.*

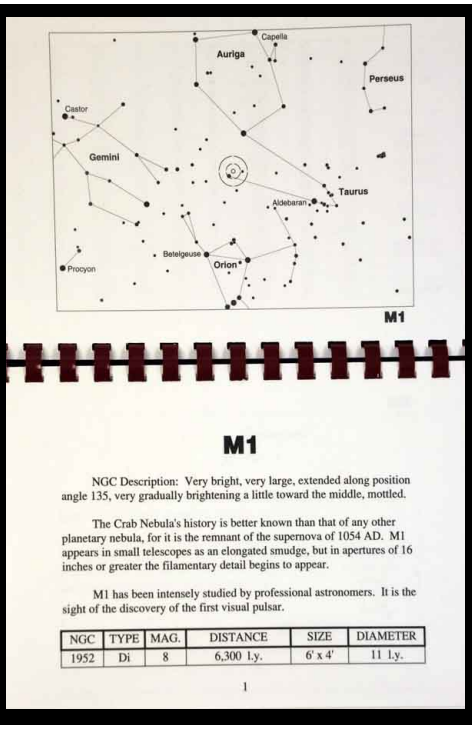
If you are looking for a guide to getting started, consider purchasing the **Explore the Universe Guide (2nd Edition)** in the RASC store.

Here is a summary of the Explore the Universe program requirements:

Observing Objective	Required	Available
Constellations and Bright Stars	12	24
The Moon	16	32
Solar System	5	10
Deep Sky Objects	12	24
Double Stars	10	20
Total	**55**	**110**

Resources

- Messier object finder charts
- Two volume set
- Spiral bound & laminated
- sky-spot.com
- $35.99 USD



M1

NGC Description: Very bright, very large, extended along position angle 135, very gradually brightening a little toward the middle, mottled.

The Crab Nebula's history is better known than that of any other planetary nebula, for it is the remnant of the supernova of 1054 AD. M1 appears in small telescopes as an elongated smudge, but in apertures of 16 inches or greater the filamentary detail begins to appear.

M1 has been intensely studied by professional astronomers. It is the sight of the discovery of the first visual pulsar.

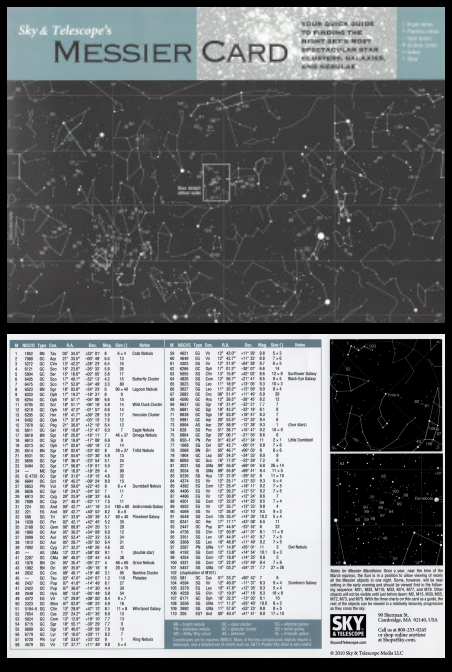
NGC	TYPE	MAG.	DISTANCE	SIZE	DIAMETER
1952	Di	8	6,300 l.y.	6' x 4'	11 l.y.

1

Resources

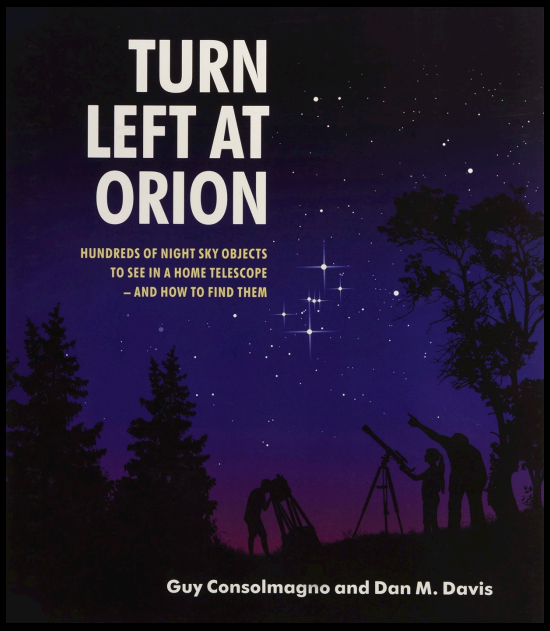
Sky & Telescope's Messier Card

- Laminated
- Double sided
- $6.95 USD
- https://www.astronomics.com/dew-resistant-messier-card.html



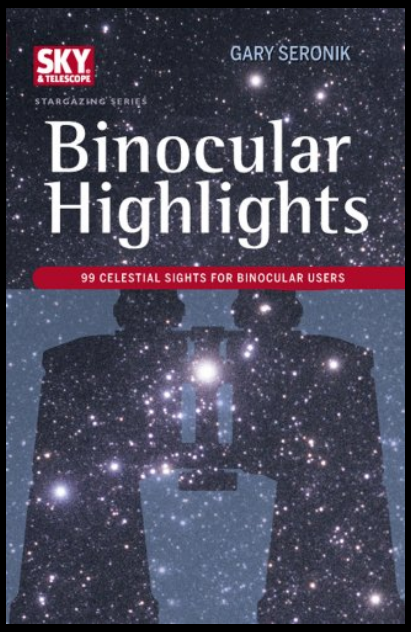
Resources

- Turn Left At Orion
- Guy Consolmagno & Dan M. Davis
- Hard cover or spiral bound
- Cambridge University Press
- $35.55



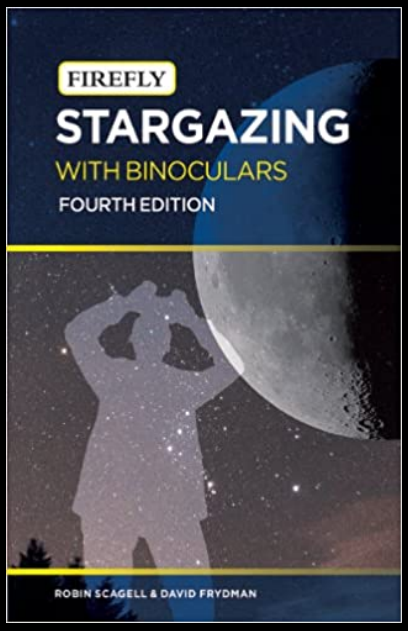
Resources

- Binocular Highlights
- Gary Seronik
- Sky Publishing
- $??.??



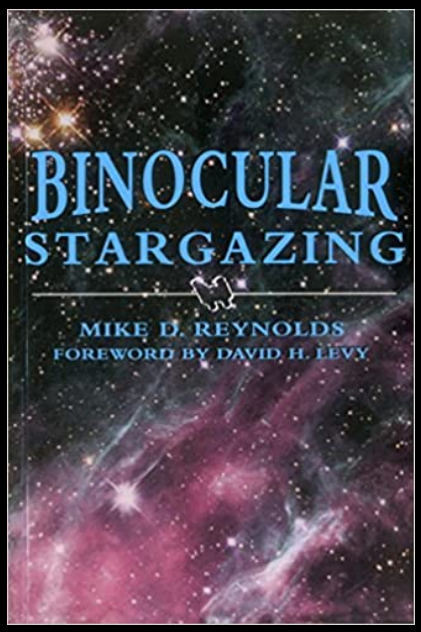
Resources

- Stargazing With Binoculars
- Robin Scagell & David Frydman
- Firefly Books Publishing
- Paperback
- $19.95



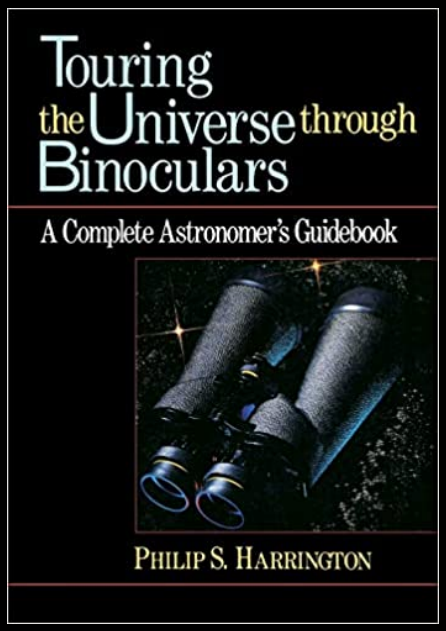
Resources

- Binocular Stargazing
- Mike D. Reynolds
- Stockpole Books Publishing
- Paperback
- $18.95



Resources

- Touring the Universe Through Binoculars
- Philip S. Harrington
- Wiley Publishing
- Hardcover or paperback
- $58.60/$45.73



Binocular Targets

Moon

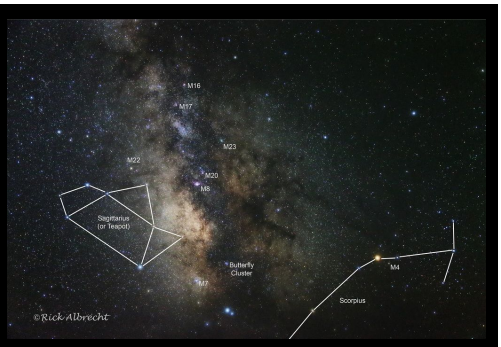
- Maria
- Craters
- Mountains
- Special features
  - Rills
  - Lunar X
  - Lunar V
- Lunar eclipse

Binocular Targets

Extended objects
- Constellations
- Scanning Milky Way
- Large open clusters
  - Perseus Double Cluster NGC869 & NGC884
  - Pleiades M45
  - Hyades

Double stars

Comets



Solar Viewing

WARNING!!

Events
- Sunspots
- Transits
- Solar eclipses

Filters
- Visual use

Manufactured
- Telescopes Canada
- O'Telescope
- Astronomy Plus
- Kendrick
- Focus Scientific
- Lunt (Sunoculars)

DIY
- All-Star Telescope
- Astronomy Plus
- Kendrick

Brett Hardy

Binocular Targets

Planets

- Mercury **
- Venus *
- Mars
- Jupiter
- Saturn
- Uranus
- Neptune

Peter Zay/Anadolu Agency via Getty Images

Binocular Targets

Astronomy Catalogues

- Messier
- New General Catalogue (NGC)
- Caldwell Objects Catalogue
- Index Catalogue (IC)

Shutterstock

Novice Astronomy Class # 8

Constellations

November 4, 2022