



## GENERAL MEETING

Visitors Welcome

Tuesday Evening, March 21, 7:30 PM

Aboite Township Community Room,  
11321 Aboite Center Rd. Fort Wayne, IN 46814

### Star Hopping to a Dozen Targets, Why Bother?

By Dick Evans

Learn about this basic and effective way to find objects  
of interest in the night sky.

General Meetings are held the third Tuesday of each month,  
7:30pm. Check our web site for location.

## Star Hopping Workshop

Dick Evans has devoted much of his lifetime to astronomical pursuits, as an active stargazer, an astronomy instructor for countless school children, a docent for the public at our Saturday night stargazing sessions, and as a donor-supporter for MacDonald Observatory and our own Star\*Quest Observatory (to name a few activities).

In 2012 Dick published a pictorial catalog of 582 selected NGC objects, which is available to our members from our library. He is well qualified to be our guide to the night sky.

The sky is full of interesting things to look at. However, it's easy to forget to go after some of them and even forget why you might want to if we aren't using a go-to telescope. Even if we try, sometimes they can be quite hard to find. Dick's Program is intended to help correct those problems. Enjoy

After the meeting you are invited to join the group that meets for continuing discussions at a restaurant to be selected at the meeting.

## Calendar Events Mar-Apr

Scheduled events for the next two months:

**Saturday Public star gazing at Jefferson Township Park begins in April.** (Observatory is available for members to use, except for scheduled observing events)

### March

General Meeting Tuesday, Mar 21

Board Meeting Tuesday, Mar 28

### April – Saturday public viewing begins at JTP

General Meeting Tuesday, Apr 18

Board Meeting Tuesday, Apr 25

## Renew Your Membership

Good News: your current membership is good through March of 2017. The new membership dues are due by 1 April at a rate of \$36 for individuals and families and \$25 for students. The new membership card will expire on March 31 of 2018.

**This year we are continuing an added bonus.** Your new membership will include membership in the *Astronomical League*, with all of the many benefits they offer (check them out on Google or their web page, [astroleague.org](http://astroleague.org)).

**We urge that you renew before 1 April so that you won't miss an issue of their quarterly magazine, *The Reflector*.**

Don't miss out on the benefits of membership:

- Membership in the Astronomical League.
- The *Reflector* on line and by mail delivered quarterly.
- Access to the Star\*Quest Observatory and library.
- Lots of star parties.
- Discounts on Astronomy and Sky & Telescope magazines.
- The *Eyepiece* on line or delivered to your door every month.
- Interesting astronomical topics presented at monthly meetings.
- The chance to meet and talk with astronomy lovers, and to participate in our primary mission: *to promote Astronomy and related space sciences to members and the public.*
- Occasional field trips to planetariums, museums or observatories.

To get your ticket to 2017 send your check to the FWAS P.O. box listed above, or see treasurer Dave Wilkins at the program meeting.

Take advantage of club membership savings for subscriptions to magazines: ASTRONOMY \$34/yr or \$60/2yr; SKY & TELESCOPE \$32.95/yr or \$65.90/2yr. Also, limited quantities of the CANADIAN OBSERVER'S HANDBOOK may be ordered at the general meeting for \$25 (if available).

## Star Parties Start Early

The observing season starts in April, and already we have several star party requests at Jefferson Township Park (JTP). We will need trained volunteers to run the Richard Johnston (RJ) Telescope. **If you wish to participate,**

*Continued on page 2*

## Board Meeting Highlights

- Board met on Tues, 28 Feb. in Phil Hudson's office.
- The Star\*Quest observatory is under preparation for a grand opening in April.
- Our new observing season will begin in April 2017 at Jefferson Township Park.
- The next board meeting will be on Tuesday, 23 Mar., at 7:30 p.m. in Phil Hudson's office.

### FWAS OFFICERS

President: Larry Clifford 824-2655  
Vice-President: Phil Hudson 484-7000  
Secretary: Gene Stringer 489-8135  
Treasurer: Dave Wilkins 444-3070

### APPOINTED POSITIONS

Observatory Director: Open  
Star\*Quest Project Manager: Gene Stringer 489-8135  
Star\*Quest Treasurer: Dave Wilkins 444-3070

### EDITORIAL STAFF

Eyepiece editor, Gene Stringer, 489-8135  
Distribution, Gene Stringer 489-8135 & Phil Hudson 484-7000

Submissions to the Eyepiece are cheerfully accepted by E-mail (preferred) or on CD or other media, or on paper. Submissions may be edited

with the RJ scope, with your own telescope or without a scope, contact Gene Stringer at 489-8135 to get on this volunteer list. This is a great way to contribute to the community service of the FWAS. Current events are:

Apr dates anticipated at JTP include adult astronomy students from IPFW and Indiana Tech plus their friends and family members. Several scopes will be needed, but you don't need a scope to participate. You can help by coaching students and welcoming the crowd. We advise that all groups may start arriving at 8:30 p.m. while it is still light enough to read road signs, so figure your equipment setup time accordingly.

## How May We Serve You?

Your Board is now looking ahead to the coming season to determine how best to serve your desires and needs. If you have some ideas of things you would like to see or do, or for programs for our general meetings now is a good time to voice them. Contact Phil Hudson at (260)484-7000 for discussing topics for monthly meetings.

Also, we invite your participation in the activities we perform for the public – star parties or one of the Star\*Quest teams. Call Gene Stringer at 485-8135, to get on his volunteer list, and for Star\*Quest service.

## Messier Marathon

**Messier Marathon** from Wikipedia, the free encyclopedia: "A Messier marathon is an attempt, to find as many Messier objects as possible during one night. The Messier catalogue was compiled by French astronomer Charles Messier during the late 18th century and consists of 110 relatively bright deep sky objects (galaxies, nebulae, and star clusters)."

Amateur astronomers have long appreciated the 110 Messier objects that dot the night skies throughout the year. However, there is a certain time of the year in March and

April when an observer starting at dusk and continuing until dawn can theoretically view all of the Messier objects in one night. This has been discussed extensively in the Sky & Telescope issue of March 2000. If you would like to try this venture we are publishing a chart from that issue which lists the objects in the order of which they may be most efficiently observed.

The 2017 calendar shows the New Moon on 27 March and 26 April. The most favorable nights for attempting your marathon should be from 23-27 March and 21-28 April. The Society hopes the Friday nights of March 24 and April 21 & 28 will be clear at Jefferson Township Park. How long can you go and how many M objects can you log? We'll ask for a count at the April & May monthly meetings.

## Star\*Quest Update

by Gene Stringer

Preparation is underway to prepare the Star\*Quest Observatory for a grand opening on 20 May. The Construction Support Team is hard at work to accomplish the following tasks:

1. Fix the leak in the RJ Pier well ( Leader: Gene Stringer)
2. Refurbish the HC telescope (Leader: Jon Thomas)
3. Install Red Lighting (Leader Alan Paries)
4. Plan and install signs (Leader: Phil Hudson)
5. Landscaping (Leader Laura Ainslie)
6. Recognition of donors & past members (Leader: Dave Wilkins)
7. Procure and install observatory furniture (Done)
8. Plan, procure and install observatory equipment (Leader: Gene Stringer)
9. Clean the 16" Richard Johnston Telescope (Done)
10. Plan and conduct the grand opening on 20 May (Leader: Gene Stringer)

If you have not already volunteered and/or wish to support any of the above tasks please contact the task leader or Gene Stringer at (260)489-8135 to volunteer.

## MOO Group Challenge

For you MOO Group denizens looking for a lesser known target in the late winter sky we submit the following from Steve O'Meara's Herschel 400 Observing Guide (page 88, Cambridge University Press 2007):

**NGC 2903, a mixed spiral galaxy, Constellation Leo, RA 9h 32.2m, Dec +21° 31', Mag 9.0, Dim 11.6' x 5.7'**

O'Meara describes this as "...a fairly bright and extensive galaxy 1 1/2° south of Lambda Leonis...displays a sharp nucleus inside a bright central lens, which is surrounded by a diffuse, elliptical glow...Larger telescopes will show several of its 70 H II regions and the galaxy's more extensive outer arms."

Your challenge is to show the detail in the brighter regions as well as the fainter wisps of the outer arms, *and the colors of the foreground stars in the field*. Submit your image to the on-line MOO Group. We hope to publish several entries. Good luck.

## Sky & Telescope Messier Marathon Checklist

*Objects are listed in the order they are most efficiently observed. Based on a sequence devised by Don Machholz.*

Seen? <input type="checkbox"/>	Messier Number	Constellation	Type	Rating	Seen? <input type="checkbox"/>	Messier Number	Constellation	Type	Rating
<b>Early Evening</b>									
<input type="checkbox"/>	77	Cetus	Galaxy	Difficult	<input type="checkbox"/>	87	Virgo	Galaxy	Moderate
<input type="checkbox"/>	74	Pisces	Galaxy	Difficult	<input type="checkbox"/>	89	Virgo	Galaxy	Difficult
<input type="checkbox"/>	33	Triangulum	Galaxy	Difficult	<input type="checkbox"/>	90	Virgo	Galaxy	Difficult
<input type="checkbox"/>	31	Andromeda	Galaxy	Easy	<input type="checkbox"/>	88	Coma Berenices	Galaxy	Difficult
<input type="checkbox"/>	32	Andromeda	Galaxy	Difficult	<input type="checkbox"/>	91	Coma Berenices	Galaxy	Difficult
<input type="checkbox"/>	110	Andromeda	Galaxy	Difficult	<input type="checkbox"/>	58	Virgo	Galaxy	Moderate
<input type="checkbox"/>	52	Cassiopeia	Open Cluster	Moderate	<input type="checkbox"/>	59	Virgo	Galaxy	Moderate
<input type="checkbox"/>	103	Cassiopeia	Open Cluster	Moderate	<input type="checkbox"/>	60	Virgo	Galaxy	Moderate
<input type="checkbox"/>	76	Perseus	Planetary Nebula	Moderate	<input type="checkbox"/>	49	Virgo	Galaxy	Moderate
<input type="checkbox"/>	34	Perseus	Open Cluster	Easy	<input type="checkbox"/>	61	Virgo	Galaxy	Moderate
<input type="checkbox"/>	45	Taurus	Open Cluster	Easy	<input type="checkbox"/>	104	Virgo	Galaxy	Moderate
<input type="checkbox"/>	79	Lepus	Globular Cluster	Moderate	<b>After Midnight</b>				
<input type="checkbox"/>	42	Orion	Diffuse Nebula	Easy	<input type="checkbox"/>	5	Serpens	Globular Cluster	Moderate
<input type="checkbox"/>	43	Orion	Diffuse Nebula	Easy	<input type="checkbox"/>	13	Hercules	Globular Cluster	Easy
<input type="checkbox"/>	78	Orion	Diffuse Nebula	Moderate	<input type="checkbox"/>	92	Hercules	Globular Cluster	Moderate
<input type="checkbox"/>	1	Taurus	Supernova Remnant	Difficult	<input type="checkbox"/>	57	Lyra	Planetary Nebula	Moderate
<input type="checkbox"/>	35	Gemini	Open Cluster	Easy	<input type="checkbox"/>	56	Lyra	Globular Cluster	Difficult
<input type="checkbox"/>	37	Auriga	Open Cluster	Moderate	<input type="checkbox"/>	29	Cygnus	Open Cluster	Moderate
<input type="checkbox"/>	36	Auriga	Open Cluster	Moderate	<input type="checkbox"/>	39	Cygnus	Open Cluster	Moderate
<input type="checkbox"/>	38	Auriga	Open Cluster	Moderate	<input type="checkbox"/>	27	Vulpecula	Planetary Nebula	Easy
<input type="checkbox"/>	41	Canis Major	Open Cluster	Easy	<input type="checkbox"/>	71	Sagitta	Globular Cluster	Moderate
<input type="checkbox"/>	93	Puppis	Open Cluster	Moderate	<input type="checkbox"/>	107	Ophiuchus	Globular Cluster	Moderate
<input type="checkbox"/>	47	Puppis	Open Cluster	Moderate	<input type="checkbox"/>	12	Ophiuchus	Globular Cluster	Moderate
<input type="checkbox"/>	46	Puppis	Open Cluster	Moderate	<input type="checkbox"/>	10	Ophiuchus	Globular Cluster	Moderate
<input type="checkbox"/>	50	Monoceros	Open Cluster	Moderate	<input type="checkbox"/>	14	Ophiuchus	Globular Cluster	Moderate
<input type="checkbox"/>	48	Hydra	Open Cluster	Moderate	<input type="checkbox"/>	9	Ophiuchus	Globular Cluster	Moderate
<input type="checkbox"/>	44	Cancer	Open Cluster	Easy	<b>Leo and the Big Dipper Region</b>				
<input type="checkbox"/>	67	Cancer	Open Cluster	Moderate	<b>Scorpius and Sagittarius Region</b>				
<input type="checkbox"/>	95	Leo	Galaxy	Difficult	<input type="checkbox"/>	4	Scorpius	Globular Cluster	Easy
<input type="checkbox"/>	96	Leo	Galaxy	Difficult	<input type="checkbox"/>	80	Scorpius	Globular Cluster	Moderate
<input type="checkbox"/>	105	Leo	Galaxy	Difficult	<input type="checkbox"/>	19	Ophiuchus	Globular Cluster	Moderate
<input type="checkbox"/>	65	Leo	Galaxy	Difficult	<input type="checkbox"/>	62	Ophiuchus	Globular Cluster	Moderate
<input type="checkbox"/>	66	Leo	Galaxy	Difficult	<input type="checkbox"/>	6	Scorpius	Open Cluster	Moderate
<input type="checkbox"/>	81	Ursa Major	Galaxy	Moderate	<input type="checkbox"/>	7	Scorpius	Open Cluster	Easy
<input type="checkbox"/>	82	Ursa Major	Galaxy	Moderate	<input type="checkbox"/>	11	Scutum	Open Cluster	Easy
<input type="checkbox"/>	97	Ursa Major	Planetary Nebula	Difficult	<input type="checkbox"/>	26	Scutum	Open Cluster	Difficult
<input type="checkbox"/>	108	Ursa Major	Galaxy	Difficult	<input type="checkbox"/>	16	Serpens	Diffuse Nebula + Open Cluster	Easy
<input type="checkbox"/>	109	Ursa Major	Galaxy	Difficult	<input type="checkbox"/>	17	Sagittarius	Diffuse Nebula	Easy
<input type="checkbox"/>	40	Ursa Major	Double Star	Difficult	<input type="checkbox"/>	18	Sagittarius	Open Cluster	Easy
<input type="checkbox"/>	106	Canes Venatici	Galaxy	Moderate	<input type="checkbox"/>	24	Sagittarius	Star Cloud	Easy
<input type="checkbox"/>	94	Canes Venatici	Galaxy	Moderate	<input type="checkbox"/>	25	Sagittarius	Open Cluster	Easy
<input type="checkbox"/>	63	Canes Venatici	Galaxy	Moderate	<input type="checkbox"/>	23	Sagittarius	Open Cluster	Easy
<input type="checkbox"/>	51	Canes Venatici	Galaxy	Moderate	<input type="checkbox"/>	21	Sagittarius	Open Cluster	Easy
<input type="checkbox"/>	101	Ursa Major	Galaxy	Moderate	<input type="checkbox"/>	20	Sagittarius	Diffuse Nebula	Easy
<input type="checkbox"/>	102	Draco	Galaxy	Difficult	<input type="checkbox"/>	8	Sagittarius	Diffuse Nebula	Easy
<input type="checkbox"/>	53	Coma Berenices	Globular Cluster	Moderate	<input type="checkbox"/>	28	Sagittarius	Globular Cluster	Easy
<input type="checkbox"/>	64	Coma Berenices	Galaxy	Moderate	<input type="checkbox"/>	22	Sagittarius	Globular Cluster	Easy
<input type="checkbox"/>	3	Canes Venatici	Globular Cluster	Moderate	<input type="checkbox"/>	69	Sagittarius	Globular Cluster	Difficult
<input type="checkbox"/>	68	Hydra	Globular Cluster	Difficult	<input type="checkbox"/>	70	Sagittarius	Globular Cluster	Difficult
<input type="checkbox"/>	83	Hydra	Galaxy	Difficult	<input type="checkbox"/>	54	Sagittarius	Globular Cluster	Difficult
<b>Virgo Cluster Region</b>					<input type="checkbox"/>	55	Sagittarius	Globular Cluster	Difficult
<input type="checkbox"/>	98	Coma Berenices	Galaxy	Moderate	<input type="checkbox"/>	75	Sagittarius	Globular Cluster	Difficult
<input type="checkbox"/>	99	Coma Berenices	Galaxy	Moderate	<b>Early Dawn</b>				
<input type="checkbox"/>	100	Coma Berenices	Galaxy	Moderate	<input type="checkbox"/>	15	Pegasus	Globular Cluster	Difficult
<input type="checkbox"/>	85	Coma Berenices	Galaxy	Moderate	<input type="checkbox"/>	2	Aquarius	Globular Cluster	Difficult
<input type="checkbox"/>	84	Virgo	Galaxy	Moderate	<input type="checkbox"/>	72	Aquarius	Globular Cluster	Difficult
<input type="checkbox"/>	86	Virgo	Galaxy	Moderate	<input type="checkbox"/>	73	Aquarius	Open Cluster	Difficult
					<input type="checkbox"/>	30	Capricornus	Globular Cluster	Difficult

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## Solar Eclipse Provides Coronal Glimpse

By Marcus Woo

On August 21, 2017, North Americans will enjoy a rare treat: The first total solar eclipse visible from the continent since 1979. The sky will darken and the temperature will drop, in one of the most dramatic cosmic events on Earth. It could be a once-in-a-lifetime show indeed. But it will also be an opportunity to do some science.

Only during an eclipse, when the moon blocks the light from the sun's surface, does the sun's corona fully reveal itself. The corona is the hot and wispy atmosphere of the sun, extending far beyond the solar disk. But it's relatively dim, merely as bright as the full moon at night. The glaring sun, about a million times brighter, renders the corona invisible.

"The beauty of eclipse observations is that they are, at present, the only opportunity where one can observe the corona [in visible light] starting from the solar surface out to several solar radii," says Shadia Habbal, an astronomer at the University of Hawaii. To study the corona, she's traveled the world having experienced 14 total eclipses (she missed only five due to weather). This summer, she and her team will set up identical imaging systems and spectrometers at five locations along the path of totality, collecting data that's normally impossible to get.

Ground-based coronagraphs, instruments designed to study the corona by blocking the sun, can't view the full extent of the corona. Solar space-based telescopes don't have the spectrographs needed to measure how the temperatures vary throughout the corona. These temperature variations show how the sun's chemical composition is distributed—cru

cial information for solving one of long-standing mysteries about the corona: how it gets so hot.

While the sun's surface is ~9980 Farenheit (~5800 Kelvin), the corona can reach several millions of degrees Farenheit. Researchers have proposed many explanations involving magneto-acoustic waves and the dissipation of magnetic fields, but none can account for the wide-ranging temperature distribution in the corona, Habbal says.

You too can contribute to science through one of several citizen science projects. For example, you can also help study the corona through the Citizen CATE experiment; help produce a high definition, time-expanded video of the eclipse; use your ham radio to probe how an eclipse affects the propagation of radio waves in the ionosphere; or even observe how wildlife responds to such a unique event.

Otherwise, Habbal still encourages everyone to experience the eclipse. Never look directly at the sun, of course (find more safety guidelines here: <https://eclipse2017.nasa.gov/safety>). But during the approximately 2.5 minutes of totality, you may remove your safety glasses and watch the eclipse directly—only then can you see the glorious corona. So enjoy the show. The next one visible from North America won't be until 2024.

For more information about the upcoming eclipse, see: NASA Eclipse citizen science page <https://eclipse2017.nasa.gov/citizen-science> NASA Eclipse safety guidelines <https://eclipse2017.nasa.gov/safety> Want to teach kids about eclipses? Go to the NASA Space Place and see our article on solar and lunar eclipses! <http://spaceplace.nasa.gov/eclipses/>

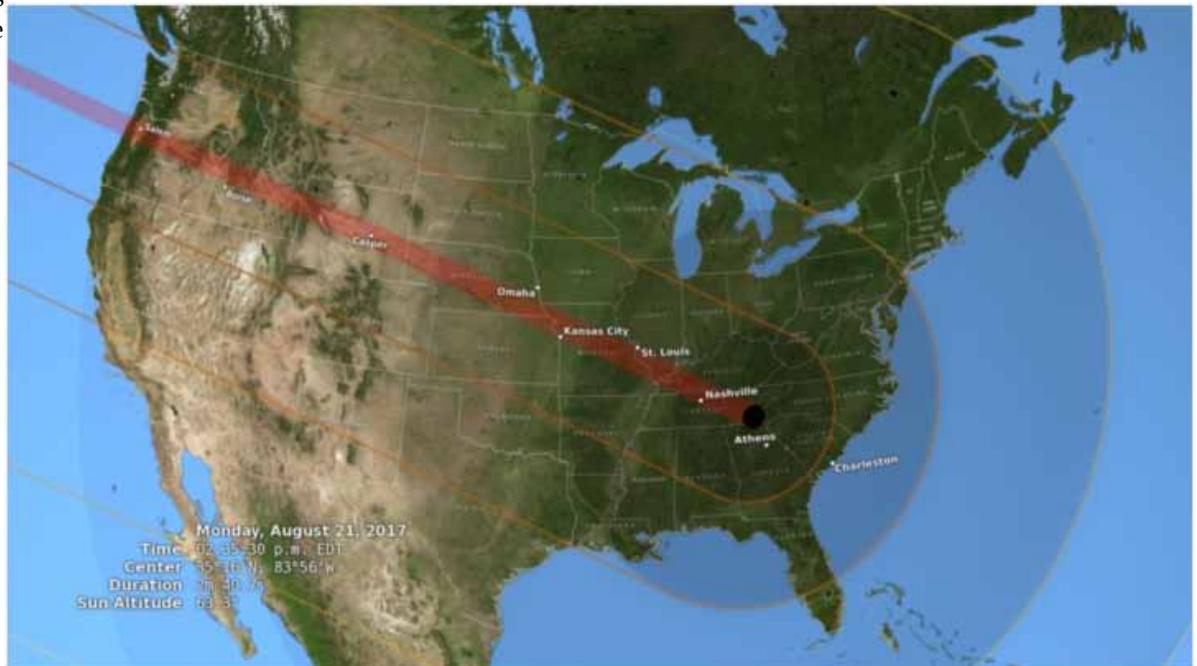


Illustration showing the United States during the total solar eclipse of August 21, 2017, with the umbra (black oval), penumbra (concentric shaded ovals), and path of totality (red) through or very near several major cities. Credit: Goddard Science Visualization Studio, NASA



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*\*Program:\**  
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**March Night Sky:** For the first half of the month, Mars and Venus are low in the west after sunset. During the final week of March, Mercury takes the place of sinking Venus. In the late evening, watch for Jupiter rising in the East. Saturn appears in the Southeast in the predawn hours. Saturday the 25th is the time for the [Messier Marathon](#), always a day near the vernal equinox and new moon when most if not all of the 110 deep sky fuzzies can be seen in one night. Members are invited to bring your telescope to the Observatory and run the marathon the 25th. Full Moon is the 12th, New Moon the 27th.