



# The ECLIPSE



The Newsletter of the Barnard-Seyfert Astronomical Society

Organized in 1928

August 2013

**The Membership meeting will be held on August 21, 2013 at the Cumberland Valley Girl Scout Council Building located at the intersection of Harding Place and Granny White Pike at 7:30 pm.**

The program will be the NOVA show, "Secrets of the Sun," featuring recent images and video from the Solar Dynamics Observatory. *You know it as the sun. Scientists know it as one of the most amazing physics laboratories in the universe.*

## Upcoming Events

Board of Directors Meeting, August 7 at the Cumberland Valley Girl Scout Building – 7:30 pm

## In this issue

Membership meeting	1
President's Message 1&7	
Observing Highlights	2
Star Parties	5
Book review: Moonrush –Robin Byrne	3
Inventing Astrophotography Dr. Ethan Siegel	4 & 5
Board Meeting Minutes July 10, 2013	6 & 7
Membership Meeting Minutes, July 17, 2013	8
BSAS Membership information	9
Eclipse photograph by Francisco Diego	

## From the President

A frequent question at star parties is, "How do you find your way around the night sky?" The next question is "Where is Orion?" (In the summer, that constellation is in the daytime sky!) Interestingly, the questions are increasingly asked by those with telescopes. Once upon a time, using a telescope required getting familiar with the sky, but the ability of the new generation of user-friendly electronics makes observing just a click away. Still, if you are looking for Orion in June at night, you'll be looking for a long time. Soooo....what about finding your way around the sky?

First, you don't need to be able to imagine fantastic animals and mythological heroes. Most of us began by learning to recognize a few simple patterns of stars, and then you star hop from those. For each season, there are a set of patterns that you can learn in just minutes, and from there you can find almost anything else. In the summer sky, the [Summer Triangle](#) and the [Big Dipper](#) combine to let you find almost everything else in the night sky. Still, I'm not one to learn by just reading a manual. I need a goal, and then I learn what I need to reach that goal. Fortunately, there is a fun set of goals for astronomy buffs that have already been set up....

These are the Astronomical League's "Observing Clubs." These are lists of things to find in the sky. YOU are a member of the Astronomical League...a portion of your member dues goes for that. The cool thing about finishing up one of the lists is that (1) you get a nifty certificate and pin and you are (2) recognized in the *Reflector* magazine. AND you learned a lot, which you get to keep forever! There are programs for every level from super beginner to expert faint fuzzy finders.

For example, start with the *Constellation Hunter Program*. Over the course of the year you will find 39 northern hemisphere constellations. See this page for the observations you need to make. You'd be a constellation whiz by the end of the year!  
<https://www.astroleague.org/al/obsclubs/consthunt/const.html>

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## Observing Highlights for August & September

### Moon phases

August 2013

08/06 NEW Moon  
08/14 FIRST Quarter  
08/20 FULL Moon  
08/28 LAST Quarter

September 2013

09/05 NEW Moon  
09/12 FIRST Quarter  
09/19 FULL Moon  
09/26 Last Quarter

### Objects:

#### Globular Clusters

M68, M53, M3, M5, M80, M4,  
M107, M13, M12, M10, M62,  
M19, M92, M9, M14,  
M28, M69, M22, M70, M54,  
M56, M55, M71,  
M75, M72, M15, M2, M30

#### Open Clusters

Mel111 (Coma Star Cluster),  
M6 (Butterfly), M7, M23, M21,  
M18, M25, M26, M11 (Wild  
Duck), M29, M73, M39

#### Nebula

NGC6302 (Bug),  
NGC6309 (Box), NGC6543  
(Cat's Eye),  
M20 (Trifid), M8 (Lagoon),  
M16 (Eagle), M17 (Swan),  
M57 (Ring), NGC6818 (Little  
Gem),  
NGC6826 (Blinking Planetary),  
M27 (Dumbbell),  
NGC6888 (Crescent),  
NGC6905 (Blue Flash),  
NGC6960/6974/6979/6992/6  
995 (Veil),  
NGC7000 (North America),  
NGC7009 (Saturn),  
IC 5146 (Cocoon)

#### Galaxies

M98, M99, M106, M61, M100,  
M84, M85, M86, M49, M87,  
M88, M91, M89, M90, M58,  
M104 (Sombrero Galaxy),  
M59, M60, M94, M64 (Black-  
Eye Galaxy),  
M63 (Sunflower Galaxy), M51  
(Whirlpool Galaxy), M83,  
M101/M102,  
NGC 6822 (Barnard's)

#### Other

Barnard's Star (star with  
fastest proper motion)  
M24 (Small Sagittarius Star  
Cloud)  
Cr 399 (Coat Hanger)

Multiple Star Systems  
M40, Gamma Virginis  
(Porrina),

Alpha Canum Venaticorum  
(CorCaroli),  
Zeta Ursae Majoris (Mizar),  
Epsilon Bootis (Izar or  
Pulcherrima)  
Mu Bootis (Alkalurops),  
Beta Scorpii (Acraab),  
Alpha Herculis (Rasalgethi),  
Epsilon Lyrae (Double Double),  
Beta Cygni (Albireo)

#### Variable Stars

Mu Cephei (Herschel's Garnet  
Star)

#### Planets

Venus  
Saturn  
Pluto

## Book Review: Moonrush

reviewed by Robin Byrne

I'm not sure how I came to have a copy of "Moonrush: Improving Life on Earth with the Moon's Resources" by Dennis Wingo, except that I know I didn't buy it, which is a good thing. Not that it is a horrible book, but it certainly has its flaws.

Wingo begins by describing how Earth's resources are in short supply, specially for energy production. While dismissing efforts to reduce energy consumption, and completely ignoring some alternative energy supplies such as solar and wind power, Wingo bases his entire argument for returning to the Moon on the need for hydrogen fuel cells. Why do we need to go to the Moon for hydrogen fuel cells? Platinum. Platinum is used in fuel cell production and is scarce on Earth, making fuel cells expensive to mass market. Instead of suggesting research to find a way to make efficient fuel cells with materials that are more abundant, or pursuing advances in solar and wind power, Wingo is convinced that vast stores of platinum are on the Moon just waiting to be mined, and that this, and this alone, is what will save our planet. It is interesting that while Wingo criticizes environmentalists for their single-minded approach to solving Earth's problems, he is equally single-minded in his approach. Although, he does have one other energy source in mind: fusion of Helium 3. But where to get Helium 3? While the Moon has some from interactions with the solar wind, the logical choice would be to mine the atmosphere of Uranus, of course! Never mind the small problem of not having the technology to create a fusion reaction.

Next Wingo takes us on a history of the U.S. space program, in particular, the politics of it. Wingo's assessment of how NASA is at the mercy of the whims of each administration and congress is correct. Funding comes and goes without any true vision. Once we beat Russia to the Moon, there were no big goals to keep the program on track. While manned spaceflight has floundered, unmanned exploration has flourished. However, Wingo is not impressed. All those space probes were only pursuing science, when they could have been assessing where resources were that could be exploited.

Lastly, Wingo lays out a variety of ways we can set up permanent travel to and from the Moon and how to establish a Moon base. It is interesting to note that, while he criticized government involvement in the space program, and praised private industry, one of the key components of his plan includes using the International Space Station as a location to manufacture the various spacecraft needed to go to and stay on the Moon. I wonder who would be doing the actual assembly? Continuing in the realm of Wingo's reality, setting up the Moon base would include Segway driving robots, obviously. Once established, let the mining begin! Without any actual data concerning the resources on the Moon, Wingo extrapolates that huge amounts of platinum and other resources are just waiting for easy extraction from the lunar soil. Granted, several tons of lunar soil will be needed to produce relatively small amounts of materials, but there's the entire Moon to make use of. Plus, Wingo is certain that impact sites will have even higher concentrations, so don't you worry.

Most of the information in this book, Wingo readily admits, came from other books and sources, with very few original ideas. So as I read "Moonrush," I kept thinking, "This sounds like some guy with a blog who decided to write a book." I waited until I had finished to find out more, and, behold, he's a guy with a blog! Wingo has written a few books, all of them geared toward returning to the Moon. His profession is software engineer, and his scientific knowledge is sketchy at best (he wrote that fusion involves overcoming the electrical repulsion of the electrons, rather than the protons). I seriously doubt the book had an editor, because there were several typos, and some word choices that made this grammar Nazi cringe. As you might have already deduced, I was not impressed by "Moonrush." However, if you're interested in this topic and want to learn more, save your money and read his blog.

Moonrush: Improving Life on Earth with the Moon's Resources by Dennis Wingo, Apogee Books, 2004

## Inventing Astrophotography: Capturing Light Over Time

By Dr. Ethan Siegel

We know that it's a vast Universe out there, with our Milky Way representing just one drop in a cosmic ocean filled with hundreds of billions of galaxies. Yet if you've ever looked through a telescope with your own eyes, unless that telescope was many feet in diameter, you've probably never seen a galaxy's spiral structure for yourself. In fact, the very closest large galaxy to us—Andromeda, M31—wasn't discovered to be a spiral until 1888, despite being clearly visible to the naked eye! This crucial discovery wasn't made at one of the world's great observatories, with a world-class telescope, or even by a professional astronomer; it was made by a humble amateur to whom we all owe a great scientific debt.

Beginning in 1845, with the unveiling of Lord Rosse's 6-foot (1.8 m) aperture telescope, several of the nebulae catalogued by Messier, Herschel and others were discovered to contain an internal spiral structure. The extreme light-gathering power afforded by this new telescope allowed us, for the first time, to see these hitherto undiscovered cosmic constructions. But there was another possible path to such a discovery: rather than collecting vast amounts of light through a giant aperture, you could collect it *over time*, through the newly developed technology of photography. During the latter half of the 19<sup>th</sup> Century, the application of photography to astronomy allowed us to better understand the Sun's corona, the spectra of stars, and to discover stellar and nebulous features too faint to be seen with the human eye.

Working initially with a 7-inch refractor that was later upgraded to a 20-inch reflector, amateur astronomer Isaac Roberts pioneered a number of astrophotography techniques in the early 1880s, including "piggybacking," where his camera/lens system was attached to a larger, equatorially-mounted guide scope, allowing for longer exposure times than ever before. By mounting photographic plates directly at the reflector's prime focus, he was able to completely avoid the light-loss inherent with secondary mirrors. His first photographs were displayed in 1886, showing vast extensions to the known reaches of nebulosity in the Pleiades star cluster and the Orion Nebula.

But his greatest achievement was this 1888 photograph of the Great Nebula in Andromeda, which we now know to be the first-ever photograph of another galaxy, and the first spiral ever discovered that was oriented closer to edge-on (as opposed to face-on) with respect to us. Over a century later, Andromeda looks practically identical, a testament to the tremendous scales involved when considering galaxies. If you can photograph it, you'll see for yourself!

Astrophotography has come a long way, as apparent in the Space Place collection of NASA stars and galaxies posters at <http://spaceplace.nasa.gov/posters/#stars>.

See the picture on the next page



Great Nebula in Andromeda, the first-ever photograph of another galaxy. Image credit: Isaac Roberts, taken December 29, 1888, published in *A Selection of Photographs of Stars, Star-clusters and Nebulae*, Volume II, The Universal Press, London, 1899.

## Star Parties for the months of August and September

Sat	8/3	BSAS trace	NM is 8/6	mile marker 412	water valley overlook
Fri	8/9	Bells Bend	830 to 1030	FQ is 8/14	Saturn, star clusters, nebulae, double stars, etc
Sat	9/7	BSAS trace	NM is 9/5	mile marker 435.5	
Sat	9/14	Long Hunter	800 to 1000	FQ is 9/12	Saturn & Venus early, Moon, Andromeda Galaxy, etc

**Barnard-Seyfert Astronomical Society**  
**Minutes of the Regular Meeting of the Board of Directors**  
**Held On Wednesday, July 10, 2013**

The board of directors of the Barnard-Seyfert Astronomical Society (BSAS) met in regular session at the Cumberland Valley Girl Scout Council Building in Nashville, Tennessee on Wednesday, July 10, 2013. A sign-in sheet was passed around in lieu of a roll call. Board members Joe Boyd, Dr. Spencer Buckner, Steve Cobb, Bill Griswold, Melissa Lanz, Kris McCall, Bob Norling, and Theo Wellington were present. Board members, John Harrington, Bob Rice, and Poppy Simmons were absent. A quorum being present, President Theo Wellington called the meeting to order at 7:40 P.M.

Theo Wellington asked for corrections to the minutes of the previous board meeting held on June 5, 2013 and, there being none, asked for a motion declaring them to be approved as published in the June 2013 edition of the Society's *Eclipse* newsletter. Spencer Buckner so moved and Joe Boyd seconded his motion, which was subsequently passed by a unanimous voice vote. Theo noted that the Bells' Bend star party on June 28<sup>th</sup> had appeared in the minutes with an incorrect date.

Treasurer Bob Norling reported that the BSAS had \$1,804.81 in its regular checking account and \$1,251.28 in its equipment account. Bob noted that the regular checking account is down because he paid Astroleague for the members' subscriptions to the Reflector. The Reflector is paid for once a year. Mike Benson gets the list of members from Bob Griswold and sends to Astroleague once a year.

Theo Wellington announced these upcoming star parties:

- Jul 13 – Public star party @ Adventure Science Center from 8:30 P.M. to 10:30 P.M.,
- Jul 19 – Public star party @ Bowie Nature Park from 8:30 P.M. to 10:30 P.M. / Full Moon Pickin' Party at Warner Park 7-11 pm (email Chuck Schlemm if interested)
- Aug 03 – Private star party @ Natchez Trace Parkway mm 412 (Water Valley Overlook),
- Aug 09 – Public star party @ Bells Bend Park from 8:30 P.M. to 10:30 P.M.

Kris McCall noted she is concerned about parking for the July 13<sup>th</sup> star party at the Adventure Science Center (ASC), since there is a Sounds game that night, and there are also laser light shows at the ASC. Kris plans to block off the West end of the parking lot. People may still park in the East end.

Bill Griswold noted that he would like to hitch a ride to some of the star parties, particularly those where the sky is dark.

The board then discussed upcoming meetings. For July, Gary Eaton is willing to speak about double stars, and Terry Reeves can speak about what's up in the night sky. The August and October meetings are still open. The program committee (Joe Boyd, Spencer Buckner, Bob Rice, Terry Reeves) will meet soon to finalize plans for this year and make plans for the 2014 programs. Possible program ideas: Steve Cobb will check with his brother in law, a professional astronomer living and working in Germany; Spencer Buckner will check with Allen Smith, who might speak to us about his dark energy survey; and there is a new astronomer at Western Kentucky University, following Charles MacGruder's retirement; Theo will ping Jana Ruth for ideas. Kris suggested a six-minute DVD "Losing the Dark" for combining with another program. The November program is Spencer's "All I Want for Christmas" followed by the potluck in December, and the January, "New Christmas Toys – How Does this Work?"

Spencer would like publicity for the January meeting, and hopes lots of children with new telescopes will show up. The board discussed publicizing through the Scouts, the parks, the home-school association, teachers, and also Ms. Cheap.

Don Horne is a new member who is working with Web-Master Drew Gilmore on the BSAS web-site, to make it easier to get notice out about cancelled star parties, and to optimize the web-site to get BSAS to show up on the most web searches.

We still need an active inventory of our equipment. Theo and Joe will email Lonnie. Theo has garage space that we could

use to store our equipment. When members request to borrow it, the equipment could be transferred at star parties, where we could also help the borrower understand how to use and care for the equipment. We have a form for borrowers to sign that says what they are legally obligated to.

Kris McCall noted that the Astronomy Day activities next year will be held on the Saturday before Mother's Day. Attendance may be down because of Mother's Day and graduations; however, all of the other weekends also had potential conflicts – Easter Sunday on April 20<sup>th</sup>, Music City Marathon on April 26<sup>th</sup>, SEC Women's Basketball the first weekend in May. It is difficult to find a weekend in the spring when the media are willing to put us first in publicity.

The BSAS needs a new brochure, and now would be a great time to produce one. Pictures from star parties would be welcomed; one caveat is that if children are recognizable, we must have written permission from their parents to use the pictures in publicity.

Theo noted that our annual picnic, normally held in August, has not been scheduled this year.

Theo Wellington reported that Webmaster Drew Gilmore was investigating the possibility of using credit cards for online membership dues payments. The trail of renewals would have to go to both Treasurer Bob Norling and Bill Griswold, who maintains the membership directory.

Since there was no further business to discuss, Bob Norling moved that the meeting be adjourned. Bill Griswold seconded his motion that passed by a unanimous voice vote of the board at 8:43 P.M. without additional discussion.

Respectfully submitted,  
Melissa Lanz, substituting for Bob Rice, Secretary

President's Message, continued from page 1

You can observe binocular double stars, binocular Messier objects, the Moon, meteors....there are lots of ways to make learning the night sky fun and easy!

<http://www.astroleague.org/al/obsclubs/LevelObservingClubs.html>

Star parties are a great place to ask some of our veteran observers, "How do you find (this thing I can't find)?" For example, I've never been good at finding M27, the Dumbbell Nebula. It's in the constellation Vulpecula, which I also can't point to exactly, somewhere in the Summer Triangle. I've spent a lot of time hunting and pecking around trying to find it. So I was all ears when Terry Reeves featured this object at our last program, What's up in the Summer Sky. He wanted me to start with Sagitta (which I *can* find), then showed where M27 was in relation to these stars. Surely it couldn't be that simple? So the next clear night (many days later) I took out the telescope and hopped to the appropriate stars....and there it was. In maybe 30 seconds, without bothering to polar align, I found it. Hooray! It was just a faint smudge in my Goodlettsville sky, but it was there. Thanks, Terry! Now I can add that to the list of Things I Can Find. It just took the right set of star hop directions.

It's easy and fun to find your way around the night sky, and you can learn at your own pace. I'd love to be able to recognize some club members for going through an Astronomical League list....start one ~~today tonight~~ next clear night!

Clear, dark skies,  
Theo Wellington, President

**Barnard-Seyfert Astronomical Society**  
**Minutes of the Monthly Membership Meeting**  
**Held On Wednesday, July 17, 2013**

President Theo Wellington called the meeting to order at 7:40 P.M. on Wednesday, July 17, 2013 at the Cumberland Valley Girl Scout Council Building in Nashville, Tennessee and welcomed members and visitors. There were 24 members and guests present. Ms. Wellington asked for corrections to the minutes of the previous membership meeting held on June 19, 2013 and, there being none, asked for a motion to approve these minutes as published in the June 2013 edition of the Society's *Eclipse* newsletter. Bill Griswold so moved, and Joe Boyd seconded this motion, and the minutes were approved by a unanimous voice vote. Treasurer Bob Norling reported that the BSAS had \$1,804.81 in its regular account and \$1,251.28 in its equipment account.

Theo announced that she had regretfully accepted Bob Rice's resignation as secretary.

Theo Wellington announced these upcoming star parties:

- July 19 – Public star party at Bowie Nature Park from 8:30 PM to 10:30 PM.
- August 3 – Private star party at MM 412 on the Natchez Trace Parkway
- August 9 - Public star party at Bell's Bend Park from 8:30 PM to 10:30 PM.
- September 7 - Private star party at MM 435 on the Natchez Trace Parkway

Chuck Schlemm announced that he would be bringing a telescope to the Bell's Bend star party, and would like to know who else would be participating.

Ms. Wellington then introduced our speakers for the evening, Gary Eaton on Double Stars, and Terry Reeves, on What's Up in the Night Sky?

Gary's talk covered these points about Double Stars:

- Astronomers estimate up to half of all stars may have one or more companions.
- Many Double Stars can be observed from one's backyard, without a large telescope.
- Look for brightness, separation, configurations, color.
- The challenge is in splitting a close pair.
- Temperature gives stars their color.
- Two are better than one!
- Suggestions for logging: date/time, weather, magnitude, angle, separation, color, and a sketch of what you see.
- Additional resources: Astronomical League's Double Star club, Sky and Telescope's sky atlas

Gary also passed out a handout of 21 Summer Double Star Targets.

Terry touched on the following deep sky objects, some of which can be seen with binoculars:

- M24 - Star Cloud (binoculars, if you have dark skies)
- M8 – Lagoon Nebula (cannot see the nebula with binoculars, but can see the individual stars) – cloud of ionized hydrogen gas
- M11 – Wild Duck cluster (telescope and binoculars) – fuzzy, wedge-shaped patch of about 1000 stars, 6000 light years away toward the center of the galaxy
- M39 – Open Cluster (binoculars)
- M13 – Hercules Cluster (binoculars) – faint fuzzy patch 25,000 light years away, 100 light years in diameter, 10 billion years old
- M27 - Dumbbell Nebula
- M56 - Globular Cluster - estimated age 13.7 billion years.
- M17 – Swan Nebula

Since there was no further business to discuss, the meeting was adjourned at 8:45 P.M.

Respectfully submitted,  
Melissa Lanz, substituting for Bob Rice, Secretary



## Become a Member of the BSAS!

Download and print the Application for membership from [www.bsasnashville.com](http://www.bsasnashville.com) (Adobe® Acrobat Reader® required).

Then fill it out and bring it to the next monthly meeting or mail it along with your first year's membership dues to:

BSAS  
P.O. Box 150713  
Nashville, TN 37215-0713

Annual dues, which include membership in the BSAS and Astronomical League, and subscriptions to their newsletters, are:

**\$20** Individual  
**\$30** Family  
**\$15** Senior (+65)  
**\$25** Senior Family (+65)  
**\$12** Student\*

\* To qualify, you must be enrolled full time in an accredited institution or home schooled.

All memberships have a vote in BSAS elections and other membership votes.

Also included are subscriptions to the BSAS and Astronomical League newsletters.

### IMPORTANT DUES INFORMATION

To find the expiration date for your current membership, visit our web site at <http://www.bsasnashville.com> and click the Renewals link.

There will be a two month grace period before any member's name is removed from the current distribution list.

## About Our Organization

Organized in 1928, the Barnard-Seyfert Astronomical Society is an association of amateur and professional astronomers who have joined to share our knowledge and our love of the sky.

The BSAS meets on the third Wednesday of each month at the Cumberland Valley Girl Scout Building at the intersection of Granny White Pike and Harding Place in Nashville. Experienced members or guest speakers talk about some aspect of astronomy or observing. Subjects range from how the universe first formed to how to build your own telescope. The meetings are informal and time is allotted for fellowship. You do not have to be a member to attend the meetings.

Membership entitles you to subscriptions to *Astronomy and Sky & Telescope* at reduced rates; the club's newsletter, the *Eclipse*, is sent to members monthly.

BSAS members also receive membership in the Astronomical League, receiving their quarterly newsletter, the *Reflector*, discounts on all astronomical books, and many other benefits.

In addition to the meetings, BSAS also sponsors many public events, such as star parties and Astronomy Day; we go into the schools on occasion to hold star parties for the children and their parents. Often the public star parties are centered on a special astronomical event, such as a lunar eclipse or a planetary opposition.

Most information about BSAS and our activities may be found at [www.bsasnashville.com](http://www.bsasnashville.com). If you need more information, write to us at [info@bsasnashville.com](mailto:info@bsasnashville.com) or call John Harrington at (615) 739-4500.

[BSAS on Facebook](#)

## Free Telescope Offer!

Did someone say free telescope? Yes, you did read that correctly. The BSAS Equipment & Facilities Committee has free telescopes ranging in size from 2.6" to 8" that current members can actually have to use for up to 60 days at a time. We also have some other items in the loaner program such as a photometer, H-alpha solar telescope, educational CDs, tapes, DVDs, and books. Some restrictions apply. A waiting list is applicable in some cases. The BSAS Equipment Committee will not be held responsible for lost sleep or other problems arising from use of this excellent astronomy gear. For information on what equipment is currently available, contact Lonnie Puterbaugh at 615-661-9540.