

The ECLIPSE

November
2015

The Newsletter of the Barnard-Seyfert Astronomical Society

Next Membership Meeting:
November 18, 2015, 7:30 pm
Cumberland Valley
Girl Scout Council Building
4522 Granny White Pike

Guest Speaker: *Rob Mahurin, Middle
Tennessee State University*
Details on page 6

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From the President:

Hopefully everyone got a glimpse of the morning planets in that nice run of clear days we had before all that rain. Turning the clocks back will not help. At 6am, many of us have to be up... at 5am, not so much. Still, if you are awake (dog walk, baby feeding), look east to watch the continuing dance of the planets.

I'll make another pitch to put your name in for a calendar/handbook if you wish to order. Come to the November meeting with a \$5 deposit for your Deep Space Mysteries calendar, RAS Observer's Handbook, or Ottewell's Astronomical Calendar. See last month's newsletter for more details. We want to order early to have them here by the December potluck. New members: our December meeting features a potluck dinner! BSAS provides meat and drinks, members bring side dishes and desserts. We also have a silent auction to benefit the equipment fund. Bring your unwanted astronomically themed items, and look to pick up some bargains. Books, gear... lots of fun stuff! We are still looking for a few members to serve on the board. We've had a few volunteers, we need more! In particular we need someone to balance the checkbook... otherwise known as a treasurer. Please let us know if you could do this for the club.

Mark your calendar for our next star party on November 14th at Shelby Bottoms, 6:30 - 8:30pm. If you would like to set up that telescope that has been in the closet for years, bring it out and set up next to someone... chances are good that they can answer your questions and get you going. Hopefully it will not be too cold. We will have the Moon as well as some of our favorite deep-sky objects, from the Andromeda Galaxy to the Pleiades, the lovely open cluster in Taurus. Bring binoculars, bring yourself and enjoy a night under the stars.

Clear skies,
Theo Wellington



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Observing Highlights October and November

Globular Clusters

M56, M71, M15, M2,
M72, M75, M30

Open Clusters

M73, M29, M39, M52,
NGC457 (ET), M103,
NGC654, NGC663,
NGC884/869 (Double Cluster),
M34, M45 (Pleiades)

Nebulae

M57 (Ring),
NGC 6543 (Cat's Eye),
NGC6826 (Blinking),
M27 (Dumbbell),
NGC7000 (North America),
IC5146 (Cocoon),
NGC7293 (Helix),
NGC1499 (California)

Galaxies

M31 (Andromeda),
M32, M110,
M33 (Triangulum),
M74

Asterisms

Cr399 (Coat Hanger)

Multiple Star Systems

Double-Double (Epsilon Lyrae)
Albireo (Beta Cygni)
Gamma Delphini

Variable Stars

Mu Cephei
(Herschel's Garnet Star),
Beta Persei (Algol),
Omicron Ceti (Mira)

Upcoming Star Parties

Saturday 11/7	Private Star Party Natchez Trace Parkway mile marker 412 (Water Valley Overlook)
Saturday 11/14 6:30 - 8:30 pm	Public Star Party Shelby Bottoms Nature Center
Friday 12/11 6:30 - 9:00 pm	Public Star Party Bowie Nature Park (Fairview)
Saturday 12/12	Private Star Party Natchez Trace Parkway mile marker 433.5



Nov 11
Dec 11



Nov 19
Dec 18



Nov 25
Dec 25



Nov 5
Dec 3

Happy Birthday Charles T. Kowal by Robin Byrne

This month, we celebrate the life of a man whose name may not be well known, but whose career spans many important events in astronomy. Charles Thomas Kowal was born in upstate New York on November 8, 1940. As a child, his mother often took him to the planetarium at the Museum of Science in Buffalo, NY, and also indulged his love of building telescopes. After graduating from high school at the age of 16, Kowal went to the University of Southern California in Los Angeles, where he received his bachelors degree in astronomy.

Upon graduation, Kowal was offered a job by the California Institute of Technology to be a staff astronomer at both the Mount Wilson and Palomar Observatories. He remained in this position for the next 23 years. One of his first projects was working with Fritz Zwicky, providing photographs for his "Catalog of Galaxies and of Clusters of Galaxies." Next they began searching galaxies for Type Ia supernovae using the 48" telescope at Palomar. With Kowal's help, Zwicky was able to determine the absolute magnitude of these exploding stars, thus being able to use them for measuring distances to the most distant galaxies observable. During this project, Kowal found 81 supernovae.



At the same time as the supernova survey, Eleanor Helin and Gene Shoemaker were using the 18" telescope at Palomar for their Planet-Crossing Asteroid Survey (PCAS), which was hunting for near-Earth asteroids. They were able to use the same images Kowal used to find supernovae, which led to the discovery of many fainter near-Earth asteroids that couldn't be found using the smaller telescope.

In the 1970's, Kowal was responsible for the discovery of two moons of Jupiter. In 1974, he found Leda, and in 1975 Themisto was found. These were the 13th and 14th moons of Jupiter to be discovered. For many years, Themisto was considered to be "lost" because no one was able to find it again, due to limited knowledge of its orbit. It wasn't until the year 2000 that it was finally recovered.

From 1976 to 1985, Kowal conducted a search for distant objects in the solar system, in the hopes of discovering a planet. During that nine-year period, he scanned an area of 6400 square degrees of sky centered around the ecliptic. In all that time, he only found

Charles T. Kowal, continued

one object that matched his search criteria. In 1977, 2060 Chiron was found to be in an orbit beyond Jupiter. Chiron is unusual because it exhibits characteristics of both asteroids and comets, and is now considered to be both. At the time of its discovery, some in the press dubbed it the “10th planet,” but that quickly faded when it was realized how small Chiron really is. More recent observations have found that it has a small ring system. Because no images have resolved its disk, it is not certain whether it is gravitationally round or not. If it is, it will be considered a dwarf planet, because its orbit is highly elliptical, taking it from just inside the orbit of Jupiter, out to beyond Uranus. Since the discovery of Chiron, more objects have been found in this region and have been named Centaurs. These are likely Kuiper Belt Objects whose orbits have been disturbed by interactions with the giant planets. During Kowal’s long search, it wasn’t entirely in vain, because he also found five comets that now bear his name.

In 1980, Kowal began a study of astronomical history, and investigated some of the drawings made by Galileo. One such drawing, made in 1613, included an object Galileo mistakenly labeled as a star near Jupiter. Kowal determined that it was, in fact, Neptune, proving that Neptune had been observed by Galileo. For this surprising discovery, Kowal was awarded the R. R. Newton Award for Scientific History.

In 1985, Kowal began working at the brand new Space Telescope Science Institute (STSI). His job, as an operations astronomer, was to monitor the instruments on the Hubble Space Telescope. Because this involved looking at the quality of the images being sent back to Earth, Kowal was one of the first people to see many of Hubble’s historic images.

In 1988, Kowal wrote a book about the objects he spent the bulk of his career studying. “Asteroids: Their Nature and Utilization” became very popular, and was reprinted in 1996.

In 1996, Kowal left STSI to work at the Johns Hopkins University Applied Physics Laboratory on the NEAR (Near Earth Asteroid Rendezvous) Shoemaker spacecraft. This spacecraft travelled to the asteroid Eros and landed on it after a successful orbital mission. Kowal was one of the software engineers for this project. He also worked on the TIMED spacecraft, which studied Earth’s upper atmosphere. Kowal retired in 2006, and he lived another 5 years, until his death on November 28, 2011 at the age of 71.

With innumerable discoveries of asteroids, comets, moons and supernovae, that alone

continued on next page

Charles T. Kowal, continued

would be an outstanding legacy for Kowal. But he also repeatedly managed to be in the right place at the right time to be associated with major advances in astronomy. Our astronomical knowledge wouldn't be the same without the contributions of Charles Kowal.

References:

[Charles T. Kowal - Wikipedia](#)

[Charles Kowal's Comets, Moons and Centaurs by Martin S. Nowak](#)

[Chiron - Wikipedia](#)

Upcoming lecture opportunity at Dyer Observatory

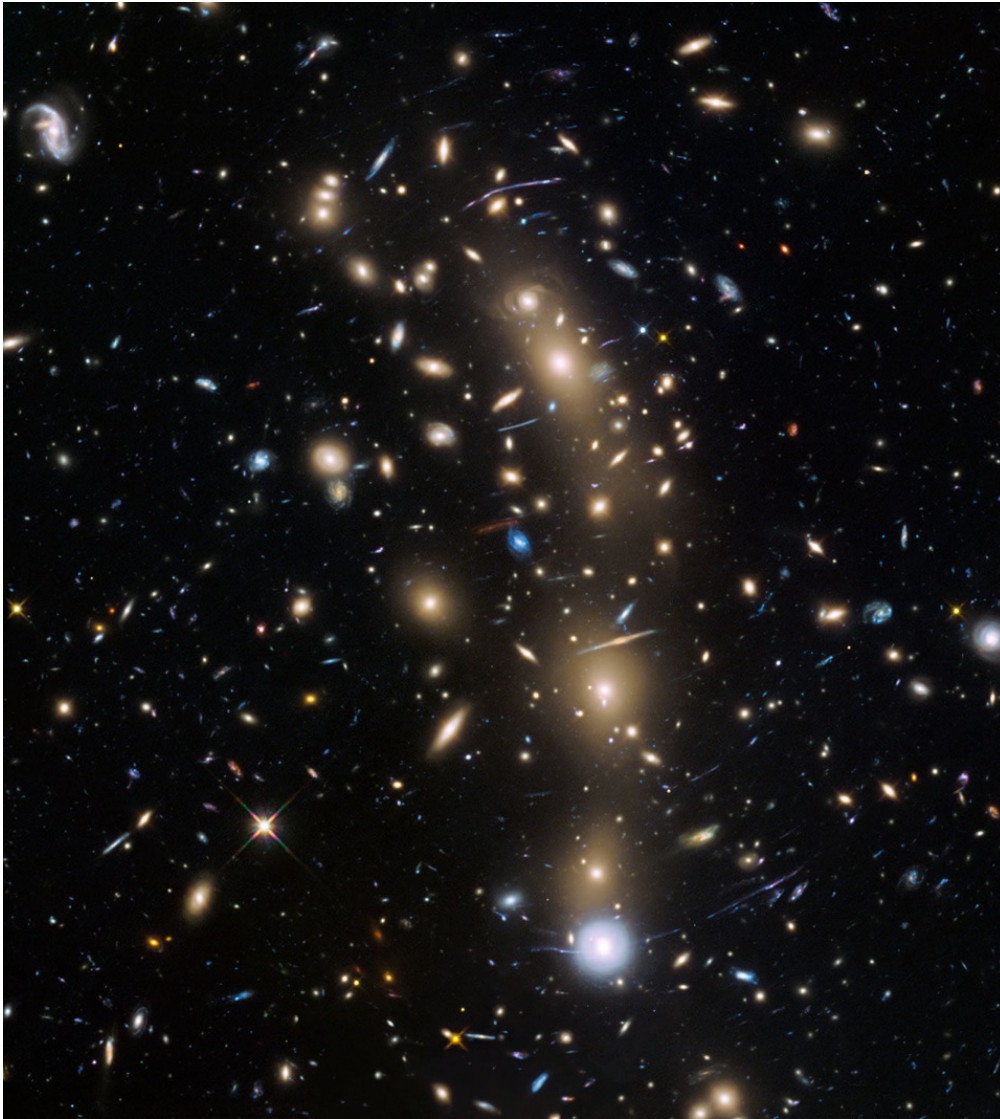
Dr. Warren Skidmore will present "The Thirty Meter Telescope. The Next Generation of Ground Based Telescope. What, Why and How" at 7:00pm on Friday, November 20th

Dr. Skidmore will talk about the Thirty Meter Telescope (TMT) observatory construction activities in Hawaii, including the exciting scientific questions that drive the building of a giant telescope, how the observatory is designed to support a range of scientific studies and about the engineering solutions that have been developed to overcome the problems of constructing and operating a giant diffraction-limited observatory.

Following the talk, the Seyfert Telescope will be open for viewing, weather-permitting.

Cost: \$6.27 per person (\$5.00 admission plus \$1.27 online handling fee). No tickets sold at the door and no refunds or exchanges. Tickets may be purchased from the website dyer.vanderbilt.edu

Note: Dr. Skidmore works at the Thirty Meter Telescope Corporation. Interestingly, this telescope is still the focus of litigation and protests in Hawaii, occasionally delaying the construction that is slated for completion in 2024. Three telescopes are being decommissioned as part of a compromise allowing this to be built.



This image from the NASA/ESA Hubble Space Telescope shows the galaxy cluster MACS J0416.1-2403. This is one of six being studied by the Hubble Frontier Fields programme, which together have produced the deepest images of gravitational lensing ever made. Due to the huge mass of the cluster it is bending the light of background objects, acting as a magnifying lens. Astronomers used this and two other clusters to find galaxies which existed only 600 to 900 million years after the Big Bang.

Credit:

[NASA, ESA and the HST Frontier Fields team \(STScI\)](#)

Next BSAS meeting
 October 21, 2015, 7:30 pm
 Cumberland Valley Girl Scout Council Building
 4522 Granny White Pike

Guest Speaker: Rob Mahurin, Middle Tennessee State University: Symmetry, the Big Bang, and You

“Cosmology has come full circle: in order to understand the largest features of the universe, we must understand the smallest. I’ll be talking about what we can learn about astronomy from some very terrestrial physics experiments.”

Also, mark your calendars for two events coming up at Pickett State Park:

The annual New Year’s Eve hike and star gaze.

Contact Monique at the park and she will find you accommodations if you come!

The first Pickett-Pogue Dark Sky Park Astronomy Weekend April 1-3.

Bunkhouse and meals on Saturday, breakfast on Sunday for \$50.

Astronomy presentations and hiking and outdoor opportunities in this scenic park.

**Barnard-Seyfert Astronomical Society
Minutes of the Monthly Membership Meeting
Held On Wednesday, October 21, 2015.**

The Barnard-Seyfert Astronomical Society held its monthly membership meeting for October at the Girl Scouts of Middle Tennessee, 4522 Granny White Pike, Nashville, Tennessee, on Wednesday, October 21, 2015. 22 members and 2 guests signed in. President Theo Wellington called the meeting to order at 7:39 PM, following the ISS pass viewed from the parking lot. Theo asked for a motion to approve the minutes of the September 2015, meeting as printed in the October 2015, edition of the *Eclipse*. Curt Porter so moved, Chuck Schlemm seconded, and the minutes were approved with a unanimous voice vote. Theo Wellington reported there was \$1,573.31 in the regular account and \$1,619.54 in the equipment account.

Theo Wellington recognized at new member, Ms Andrea Lane. Theo announced that there is a private star party at the Water Valley Overlook, MM 412, (11/7) and a public star party at Shelby Bottoms Nature Center (11/14). She reported that there were 200 visitors to the public star party at Edwin Warner Park on 10/17. She called for a volunteer to tweet for the BSAS on Twitter. She reported that a 16 inch Meade Schmidt-Cassegrainian telescope was donated to the BSAS by member Loren Ball.

Dr Terry Reeves presented "What's Up", descriptions and finding instructions for about 17 objects for binoculars and telescopes, and gave advice on dressing for cold weather observing.

Ms Sam Keenay, Girls Scouts of Middle Tennessee, said that the Girl Scouts want to do more with astronomy, and that they have telescopes that no-one knew how to use. She asked for assistance. Please contact the club or the Girl Scout office if you can help.

Chuck Schlemm remarked that the Bays Mountain StarFest was being held the weekend of October 23. There is also a Doctor Who Family Night at Adventure Science Center, January 30, and a Geek Media Expo at the Sheraton Music City, October 30 - November 1.

Dr Rob Mahurin will be speaking at the November membership meeting, and the pot luck dinner and silent auction will be at the December membership meeting.

The meeting was adjourned at 8:53 PM.

Respectfully submitted,

Bud Hamblen

Secretary

Barnard-Seyfert Astronomical Society
Minutes of a Regular Meeting of the Board of Directors
Held On Wednesday, October 7, 2015.

The regular meeting of the Board of Directors of the Barnard-Seyfert Astronomical Society was held October 7, 2015, at the Girl Scouts of Middle Tennessee, 4522 Granny White Pike, Nashville, TN 37204. Present were Joe Boyd, Bud Hamblen, Rob Mahurin, Kris McCall (by telephone), Poppy Simmons and Theo Wellington. A quorum being present, Theo Wellington called the meeting to order at 8:05 PM. Theo Wellington asked for a motion to approve the minutes of the September meeting as printed in the October issue of the *Eclipse*. Rob Mahurin so moved, Joe Boyd seconded, and the minutes were approved by a unanimous voice vote. Theo Wellington reported that Bob Norling said there was \$1,517.41 in the regular account and \$1,619.54 in the equipment account.

Theo reported that Loren C. Bell has donated his 16" Meade telescope to the Society. There was discussion about how best to use the telescope and how to publicize this in the *Eclipse* and in the Astronomical League *Reflector*.

Theo reported that membership information has been completely migrated to the Night Sky Network.

Because of increased fees involved with paying for meeting space, Astronomical League membership, on-line dues payments and other costs, changes in membership dues were discussed. Joe Boyd recalled that the last change in membership dues was in 2001 or 2002.

Resolution 2015-10-07:

Because of the increased costs of hiring meeting space, Astronomical League membership and other benefits, it is resolved to change the membership dues as follows:

- Individual members: \$25 (includes membership in the Astronomical League).
- Family members: \$35 (includes membership in the Astronomical League for the primary member and persons in the same household).
- Senior members: \$20 (includes membership in the Astronomical League).
- Senior Family members: \$20 (includes membership in the Astronomical League for the primary member and persons in the same household).
- Students: \$12.

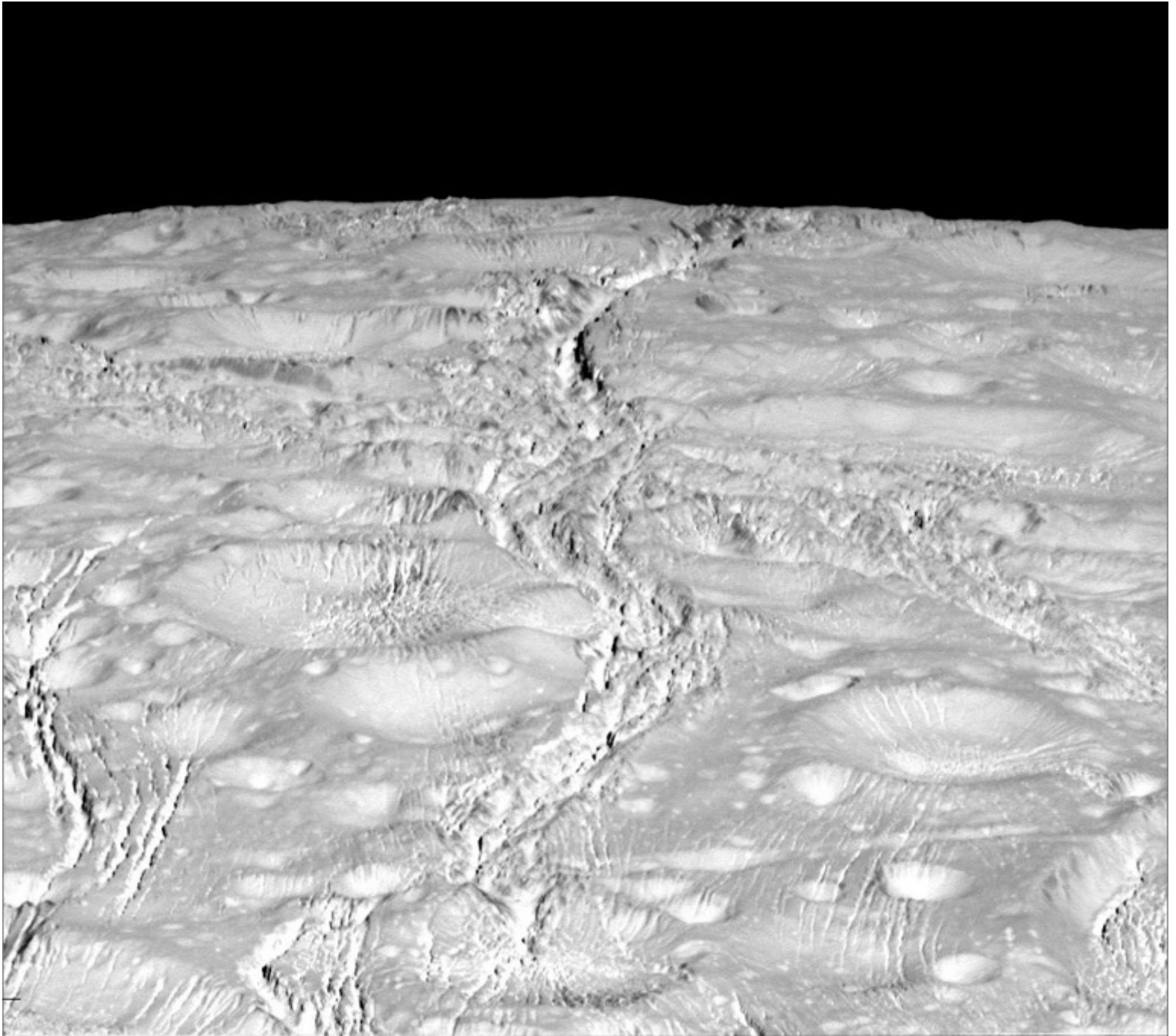
The effective date is January 1, 2016. Memberships may be extended before that date at the old dues.

Kris McCall moved that the resolution be adopted, Rob Mahurin seconded, and the resolution was adopted by unanimous voice vote.

There being no further business, the meeting was adjourned at 8:40 PM.

Respectfully submitted,

Bud Hamblen
Secretary



NASA's Cassini spacecraft zoomed by Saturn's icy moon Enceladus on Oct. 14, 2015, capturing this stunning image of the moon's north pole.

Scientists expected the north polar region of Enceladus to be heavily cratered, based on low-resolution images from the Voyager mission, but high-resolution Cassini images show a landscape of stark contrasts. Thin cracks cross over the pole -- the northernmost extent of a global system of such fractures. Before this Cassini flyby, scientists did not know if the fractures extended so far north on Enceladus.

North on Enceladus is up. The image was taken in visible green light with the Cassini spacecraft narrow-angle camera. The view was acquired at a distance of approximately 4,000 miles (6,000 kilometers) from Enceladus and at a Sun-Enceladus-spacecraft, or phase, angle of 9 degrees.

Credit: [NASA/JPL-Caltech/Space Science Institute](https://www.nasa.gov/jpl-caltech-space-science-institute)



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Nashville, TN 37215-0713

Annual dues:

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

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

You can check the status
of your membership at
bsasnashville.com.

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

About BSAS

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 bsasnashville.com. If you need more information, write to us at info@bsasnashville.com or call Theo Wellington at (615) 300-3044.

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 info@bsasnashville.com.