

MONTHLY MEETING

February 13, 2015

7:30 PM (PA @ 6:30 PM) ETC 2.136 - UT Campus Engineering Teaching Center

"365 Days of the Moon" Robert Reeves This program was scheduled for last month but was postponed due to bad weather. See Page 2 for details.

PRACTICAL ASTRONOMY

"Outreach to Small Humans (Kids)" Katie Raney See Page 2 for details

Join us at Double Dave's afterward!



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PRESIDENT'S CORNER

I love the beginning of a new year for so many reasons. Personally it is tremendously close to my birthday so a new year for me is the same as a new calendar year. That feeling makes life feel brand new and full of abundance and possibilities. As an astronomer it means chilly but ultimately clearer nights than the rest of the



AAS President, Dawn Davies

year. The last few weeks have been proof of that as I step out my door in the evening, look up, and see the sky crisp and full of stars.

We've already kicked 2015 off with a bang! January was a tremendously full month with regards to outreach events, and we've had great presence out at the Eagle Eye Observatory (EEO). At the end of January we launched our first Astronomy Off the Field Event. Attendance was high and new faces plentiful, both member and non-member. We are looking forward to our next function at the end of February and will continue to report back on how future AOtFs develop.

For those of you who have put in for the Texas Star Party in May, you should have received your confirmation e-mail, and I look forward to seeing you all in West Texas in three months. However, before we reach May, there are a great many other events ahead.

March will see another annual go at the Messier Marathon taking place on the Members Only night out at Canyon of the Eagles (COE). Additionally, we hope to have our second annual Austin Astronomical Society (AAS) online auction. April will play host to the Central Texas Star Party, a two day/two night member only event out at EEO along with clinics and some phenomenal barbeque. Prior to summer we hope to have a special event for members of the public looking to learn more about telescopes and getting into astronomy. And as usual, summer will yield our annual Austin Under the Stars.

Banner: Rosette Nebula, by Ken Pendlebury. 2014 Image of the Year.

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http://www.darksky.org/

(President's Corner continued from page 1)

Keep your ear to the ground as we announce our call to the general assembly for Nominating Committee members for this year's election of Executive Committee members.

Our general meetings continue to educate and entertain as we continue to introduce new segments to our monthly gatherings. February's meeting plays host to some very special guests including renowned speaker Robert Reeves. In March we will be introducing a new segment focused on book/film reviews. Have you read a particularly fascinating book or seen a recent movie related to science, particularly astronomy? We want to hear about it. Contact me if you are interested for more details.

There is so much to do as a member of AAS both on the field and off, indoors and out, and we are always interested to hear new ideas and suggestions on how to make your membership and experience better. (dawnmunroedavies@gmail.com or 512.663.2249)

Here's to dark and starry skies!



JOIN US FOR FEBRUARY'S MEETINGS

When	February 13
	Practical Astronomy at 6:30 PM
	GA meeting at 7:30 PM
Where	ETC 2.136 - UT Campus
	Engineering Teaching Center

Rescheduled from last month, Robert Reeves will talk about his ongoing Facebook project "365 Days of the Moon". Robert, a long-time friend of the AAS, is a true pioneer of the art and science of digital astrophotography and is the author of several books on the subject. In his latest project he has acquired hundreds of high-resolution images detailing and describing all manner of lunar features. Come and marvel at the images and listen to Robert explain how they reveal the processes of the lunar surface's evolution, and you may also pick up some great tips for taking your own lunar images.

In the Practical Astronomy session, fine tune your outreach skills during this interactive presentation. Learn how to talk about big ideas with small humans, demonstrate astronomical concepts, and get kids and their parents interested in the dynamic nature of astronomy. Plus, you'll be able to share what works for you with the group as we discuss the best ways to get the general public excited about the night sky.

THE AUSTIN ASTRONOMICAL SOCIETY WANTS YOU!



WE'RE LOOKING FOR A FEW (3) MEMBERS TO BE PART OF THE 2015 EXECUTIVE COMMITTEE ELECTION NOMINATING COMMITTEE

FOR MORE INFORMATION, OR TO VOLUNTEER PLEASE CONTACT DAWN (dawnmunroedavies@gmail.com), ATTEND THIS MONTH'S GENERAL ASSEMBLY MEETING FEBRUARY 13, OR SEE THE WEBSITE FOR MORE INFORMATION.



ASTRONOMY OFF THE FIELD – THURSDAY, FEBRUARY 26

7:00 p.m. – 9:00 p.m. PINTHOUSE PIZZA – 4729 Burnet Road Austin, Texas 78756

Put down the telescope and come Off the Field.

Are you looking for a bit of mid-week astronomical socializing? Are you tired of trying to discern one astronomer's voice from another on the observing field in the pitch dark? Want to get to know your fellow AAS members and other Austin astronomers?

Join us for Astronomy Off the Field on the last Thursday of the month. Meet up with fellow astronomers to talk shop and then some. Get to know their other interests, alternative hobbies, relax with a drink and food and have a little fun, if not a lot.

EXECUTIVE COMMITTEE MINUTES By David Lynch, Secretary

January 5, 2015

The meeting was called to order at 7:58 PM. Present were President Dawn Davies, Vice-President Terry Philips, Secretary David Lynch, Treasurer Mark Lyon, Outreach Chair Larry Martin, Equipment Chair James Hall, Member Services Chair Tim Brown, Members-at-Large Alan Carruth, David Mathias, and Jim Spiglemire, and Newsletter Editor Joyce Lynch.

OFFICER REPORTS

Vice-President The May meeting will be held at UT-Austin. Usually this meeting conflicts with final exams so another location is required, but it occurs before the beginning of exams this year. Vice-President Terry Philips is scheduled to present in February on the birth of the Sun. Don Olson from Texas State University will present in June.

Equipment New red lights have been placed at the entrance/exit to the parking area and the porta-potty at the Eagle Eye Observatory. New eyepieces have been purchased. The Harlan Smith telescope needs new covers for the ends of its tubes.

OLD BUSINESS

A final draft of the agreement with Calibre, operator of the Canyon of the Eagles Resort, was presented to the Executive Committee. If there are no objections or changes requested, the draft will be sent to Calibre for signatures.

Reimers Ranch Travis County Parks staff would like help with public viewings. Current difficulties for providing that assistance include the 10:00 PM park curfew, entry fee, and need for parks staff to be on site to operate the observatory.

NEW BUSINESS

Eagle Eye Observatory schedules There were disagreements between the list of 2015 events on the observatory page and the main website calendar. The EC came to a consensus that Jim Chandler will continue to produce the first draft of the schedules for public and members-only star parties, which Canyon of the Eagles management may request to be moved to accommodate holidays or other busy weekends.

Astronomy Off the Field A test event for Astronomy off the Field will take place on January 29. It will be open to non-members as well as members.

The meeting was adjourned at 9:22 PM.

Calendar of Events

13 February 2015 General Assembly Meeting 7:30 PM (Practical Astronomy 6:30) ETC 2.136 - UT Campus

14 February 2015 Outreach Opportunity Public Star Party 6:00 PM - 11:00 PM Canyon of the Eagles

20 February 2015 Outreach Opportunity Cub Scout Pack 174 8:00 PM - 9:00 PM Hill Country Bible Church 12124 RR 620

21 February 2015 Enchanted Rock Star Festival Noon - 10:00 PM Enchanted Rock State Natural Area Fredericksburg, TX

21 February 2015 Members Only Star Party Canyon of the Eagles

26 February 2015 Astronomy Off the Field 7:00 PM Pinthouse Pizza 4729 Burnet Road

02 March 2015 Executive Committee Meeting

13 March 2015 General Assembly Meeting 7:30 PM ETC 2.136 - UT Campus

Please see the AAS Calendar of Events webpage for more details: http://www.austinastro.org/events

MARK YOUR CALENDAR! Central Texas Star Party Canyon of the Eagles April 17 and 18

General Assembly Minutes

By David Lynch, Secretary

January 9,2015

The meeting was called to order at 7:32.

OFFICER REPORTS

Vice-President Donald Olson from Texas State University will present in June. Plans for modifications to Ruof Observatory to hold the 25" Dobsonian telescope have been submitted to management at Canyon of the Eagles.

Outreach There are star parties upcoming at several schools. The next public star party at Canyon of the Eagles will be January 17.

BUSINESS

New gate procedure at Canyon of the Eagles Except for membersonly nights and public star parties, visitors must check in at the Resort office and pick up a key to the gate and/or observatory. On membersonly nights, the combination lock is still in place, but the combination has changed. Astronomy Off the Field The first Astronomy Off the Field event will be January 29 from 7-9 PM at Red's Porch on South Lamar.

PRESENTATIONS

What's Happening in Astronomy? Cassini has been paired with the Very Long Base Array and has located Saturn and several moons to a precision of 4 km; revived Kepler spacecraft (K2) has discovered an additional exoplanet; the original Kepler mission has found more than 1,000 exoplanets; the Curiosity rover has found methane on Mars.

AL Awards Katie Raney, Outreach award.

Robert Reeves canceled his presentation due to the potential for icy weather and will present at the February meeting. Vice-President Terry Philips spoke about constellations in his place.

The meeting was adjourned at 8:52.

Welcome New Members

Randy Brasher Julianna Bridgewater Larry Brown David Copeland Maryl Dye **Steve Ferris** Danielle Hamlin Dianna Hodges Curt Lewis Nathan Morgan Charles O'Donnell Zach Patrick **Randy Peoples** Holly Prosser Brenda Roye David Roye Carlos Sallaberry Linda Simpson **Christopher Stevens**

The Twenty-Third Annual Great Lecture in Astronomy, "Alien Worlds"

Presented by Dr. William Cochran on Saturday, February 21, at 1 p.m. at the Peter O'Donnell, Jr. Building, at UT-Austin, in the AVAYA Auditorium, (Rm. 2.302). The public is invited to attend this lecture, which is sponsored by The University of Texas at Austin McDonald Observatory and Department of Astronomy Board of Visitors.

OUTREACH REPORT

By Larry Martin, Outreach Chair

AS is an Outreach organization, and 2015 Opens with a Bang! January Outreach events in North Austin provided a wide range of interests in varying sky conditions. Mother Nature, as usual, gave us some star party challenges. AAS members and unexpected guests

enabled us to host six (6) events during the month. Credits must first go to those individuals who made these events possible: Dawn Davies, Michelle Harvey, Joyce and Jim Lynch, Murali Kanagala, Domingo Rochin, Dave Ault, Alan Carruth, Katie Raney, David Mathias, Rob and Mary Pettengill, Tony Estevis, Phil Schmidt, Jeff Phillips, Bob Kieras plus many others that I'm failing to name, members of the Georgetown Astronomers, and youth volunteers who stepped up to manage activity tables with games, stickers and always popular tattoos.

Outreach events included Deer Park Middle School's Science Night, Elsa England Elementary School's Science Night, Running Brush Middle School's 8th Grade Astronomy Night, Laurel Mountain Elementary School's Science Night, Barrington Elementary School Science Night, and the Wild Basin Preserve Winter Event. A few highlights - Deer Park Middle School on January 16 was a premium event for all participants. Amateurs from both AAS and Georgetown provided views of the eastern skies as the stars emerged. The real eye candy included Orion, the Pleiades, and comet C/2014 Q2 Lovejoy, which was peaking in brightness.

Elsa England on the 22nd was an inside job! Overcast skies forced



everyone inside, but thanks to a long hallway, we posted a small image of the Moon on the distant end. Using an 8-inch SCT for a close-up view of the simulated lunar surface, we were also treated to mischievous but familiar faces that appeared in the eyepiece.

Laurel Mountain Elementary School Science Fair on the 30th was short but sweet. We began with short talks and a video about why Pluto is no longer a planet and how telescopes work. We moved outside with three telescopes to have a look at the Moon as it darted in and out of the clouds. Great idea! If the Moon can play "Find Me" in the dark, then it didn't take long for students to get the hint and join in the fun.

So, that is a glimpse of what happened in January. February is up and may prove to be just as fascinating with a public event developing at Enchanted Rock on the 21st. Although it conflicts with our private star party at EEO, most of the activities are held during the daytime. Easy enough to pack it out early and head for Eagle Eye to finish up the day OR just hang around for a Star Party lasting until 10PM. Visit the AAS home page for emerging details or look on Page 13.

HINT #1: If you are pursuing the Astronomy League's Outreach Certi-

fication, January events would qualify you for the basic award or compile hours toward Stellar and Master certs. The Enchanted Rock event can add a ton of qualified hours toward advanced certification requirements.

HINT#2: Quite a few AAS members participate in Outreach events and do not log hours toward Outreach certification. This is possibly one of the easiest certs to achieve. Many of you are already making the effort to help with Outreach events. Why not top it off with a pin and certificate? Contact me! I'd be happy to help with events, dates, hours and form submittal info. Don't want to do it for yourself? Why not do it for someone else! "If Joe can do it, I can do it!"

Photos by Larry Martin



UPCOMING EVENTS

February 14 COE Public Star Party February 20 Cub Scout Pack 174 February 21 Enchanted Rock Festival

December 2014 Treasury Report By Mark Lyon, Treasurer

Deposits

Dues payments	
Checks	\$145.00
Paypal	\$315.00
Dues payments totals	\$460.00
Interest earned-checking	\$0.17
Interest earned-CD	\$0.21
Interest earned-CD	\$0.23
Total interest earned	\$0.61
Donations	\$150.00
RASC Handbook sales	\$185.00
Total Other Income	\$335.00
Deposit Totals December 1 - 31, 2014	\$795.61
Expenses	
COE Internet	\$52.05
COE operating expense	\$514.47
Outreach expense	\$95.85
Webhosting expense	\$53.40
RASC Handbook purchase	\$26.60
Annual Club insurance	\$548.00
Meeting expense	\$341.30
Holiday party expense	\$69.59
Internation Dark-Sky Association annual contribution	\$100.00
Expense Totals December 1 - 31, 2014	\$1802.26
Bank Balances	
University Federal Credit Union Checking	\$19,066.09
University Federal Credit Union C.D.	\$5,804.94
University Federal Credit Union C.D.	\$5,785.96
University Federal Credit Union Scholarship	\$461.48
Total Cash	\$31,118.47
Total of 319 AAS members as of January 29, 2015	

Member Services Committee Report

By Tim Brown

Last month's practical astronomy session was a lively, free-for-all, discussion of the Member Services Committee's role in the society. What, we asked, should the committee focus on providing our members? The answers, in brief:

> For New Members - mentoring, loaner scope program, in the field workshops Practical Astronomy Sessions - emphasis on "hands-on" and basic topics Social and observing events - Dam Star Party, CTSP, workshops

Bring your ideas and enthusiasm to a planning meeting (goal: action) on February 19th. Details of time, place and agenda will follow. Check your e-mail and the website.

Practical Astronomy Session – Friday February 13th 6:30 - Katie Raney will speak on "Outreach to Small Humans (Kids)"

Upcoming Events

Second Annual AAS Messier Marathon – March 21st at Eagle Eye Observatory

Come join your fellow members for a night of challenging fun. Like all Olympic competitions, Gold, Silver and Bronze certificates will be awarded. Unlike the Olympics, only the color will match the name. No precious metal statues.

Central Texas Star Party and Barbecue – April 17th and 18th at EEO

Our annual stargazing and partying extravaganza. Stargazing Friday and Saturday night, barbecue and workshops Saturday afternoon.

A lot of fun coming soon. Join us in making it happen.

Astronomy Off the Field - January 29, PoK-e-Jo's

Photos by Jim Lynch



FEBRUARY 2015 OBSERVING TARGETS

By Brian Cuthbertson

M eather doesn't generally make **V** February the most pleasant month for observing. Maybe the Finns have it right. In Finnish, the month is called "helmikuu", meaning "month of the pearl": when snow melts on branches, it forms droplets, and as these freeze again, they are like pearls of ice. Well, maybe not so much in Texas, but you get the idea. In any case, far above February's often cloudy nights, the winter Milky Way is settling to the west in February, slowly making way for spring's galaxy-filled evenings. So if you can find a clear night this month, go out and watch the vista change. It's always an amazing show. **Enjoy!**

14 CMi rating EASY

multiple star in Canis Minor RA 07h 58.4m Dec +02d 12.8' (2000) Magnitude 5.3

You'll find 14 CMi about 5.5 degrees SE of Procyon in the constellation of Canis Minor, the Little Dog. Also known as SAO 116182, 14 CMi is a multiple-star system of 4 components, about 265 lightyears away (plus or minus 20). The primary, component A, is an orange giant star (spectral type KIII). Of the other 3 components, two (B and C) are 9th magnitude, and 1 (D) is 11th. All are, roughly, 100" from A in various position angles; see the list below for specifics.

14 CMi was discovered to be multiple by William Herschel on February 9th, 1782, which incidentally makes it an appropriate February target. Herschel missed the 11th magnitude member, and noted the star as a triple. He measured the separation of the AB pair as 65.47" with a position angle of 63 deg. 26'.

40 years later, almost to the day, the duo of John Herschel and James South again observed 14 CMi and again measured the separation of the AB pair. This time the separation was 76.021" at a position angle of 65 deg. 42. The large increase in the separation of A and B caught their attention, which one of them described as "very remarkable".

As we now know, the primary of 14 CMi, component A, is the star responsible for this change, with a significant proper motion of -162 +099 (.163"/year west, .099"/year north). The list below shows the most recent measurements of the components of 14 CMi from the WDS (Washington Double Star catalog):

Pair AB: mag 5.41, 9.36; sep 100.00"; PA 84 deg (2011) Pair AC: mag 5.41, 9.89; sep 136.90"; PA 149 deg (2011) Pair AD: mag. 5.41, 11.00; sep 114.20"; PA 281 deg (1999)

As a whole, the 14 CMi system is moving through the Milky Way at a speed of 78.4 km/sec relative to the Sun. Its projected galactic orbit takes it between 21,900 and 55,700 light years from the galactic center.

NGC 2539 rating MEDIUM

open cluster in Puppis RA 08h 10.6m Dec -12d 49.0' (2000) Magnitude 6.5



Discovered by William Herschel on January 31, 1785, NGC 2539 is a moderately condensed open cluster located in the NE corner of Puppis, where the eastern edge of the winter Milky Way yields to springtime's galaxy-filled abyss.

Consisting of mostly 9th to 13th magnitude stars, the cluster teeters on the edge of naked-eye visibility. But it is often overlooked due to more popular Messier objects in the general area: 7 degrees NNE in Hydra is open cluster M48; and 8 degrees WSW, in the thick of the Puppis winter Milky Way, are open clusters M46 and M47.

NGC 2539 is relatively easy to spot because it sits behind the lemony light of magnitude 4.7 star 19 Puppis, a type G sun similar to our own. But the star and cluster have absolutely no physical relation: 19 Puppis is a foreground star just 185 lightyears away, while the cluster itself is roughly 4000 light-years distant truly a background object!

In addition to its distance from us, NGC 2539 also lies 760 lightyears from the galactic plane. As a consequence, it is relatively unaffected by interstellar dust, making it a preferred object for professional studies. Such studies show that NGC 2539 is about 650 million years old, similar in age to the Hyades and the Praesepe cluster (M44). The cluster is also about 24 light-years across, making it slightly larger than the Hyades cluster, but 760 times farther away.

In 7x50 binoculars, NGC 2539 appears as a 6th-magnitude mottled glow whose SE edge just touches 19 Puppis. Very low power telescopic views of the cluster suggest an oval pattern in the cluster's brightest stars, leading to its "Dish Cluster" nickname. A 4-inch scope will show about 75 stars from 9th to 13th magnitude in a 15' area, and a 10-inch can pick up more than 100. Professional studies detect about 170 members brighter than magnitude 15 out to about 21'.

NGC 2768 rating HARD

galaxy in Ursa Major RA 09h 11.7m Dec +60d 02.8' (2000) Magnitude 10.0

Elliptical galaxy NGC 2768 lies in Ursa Major roughly 5 degrees east of 3rd magnitude Omicron UMa, or Muscida, the "Muzzle", which represents the nose of the Great Bear. The galaxy sits in a field of bright stars. In a 6-inch you'll see a bright concentrated glow elongated E-W in a 2x1' halo, containing a conspicuous stellar nucleus. Large scopes will can extend the size to $3x1^{2}$

Professional scopes like Hubble can pull out additional interesting detail. For example, a dusty structure forming a knotted ring circles the galaxy, but oddly enough it is perpendicular to the galaxy's plane. And two tiny S-shaped symmetric jets can be seen traveling out from the galactic center. Indeed NGC 2768 is an example of a Seyfert galaxy with a supermassive black hole at its center. The jets are a sign of a very active center, thrown off from an accretion disk around the central black hole.



Canon 6D, 24mm lens at f2.0, ISO 3200. 20 second exposure taken January 14, 2015 at Haleakala National Park, Mauii. Processed in Adobe Lightroom.

Members' Gallery



Orion Nebula By Dan Pollock 7DMkII camera 55 120 sec. shots

Triple Transit of Jupiter By Rob Pettengill

4 moons and 3 shadows, spectacular event but mediocre seeing. Ganymede (distance scaled 40%), Europa, Jupiter, Europa's shadow, Callisto, Callisto's shadow, Io (faint), Io's shadow.

Jan 24, 2014 06:46 UT. Questar 3.5" with 2x2x Dakin Barlows and Sony NEX-5N exposed 0.6 sec ISO 400. 101 images stacked in Nebulosity and sharpened in Lynkeos. with post processing in Photoshop. Ganymede moved 60% closer to Jupiter to allow inclusion in detailed image.



MINOR MERGERS HAVE MASSIVE CONSEQUENCES FOR BLACK HOLES By Dr. Ethan Siegel

A Then you think of our sun, the nearest star to our world, you think of an isolated entity, with more than four light years separating it from its next nearest neighbor. But it wasn't always so: billions of years ago, when our sun was first created, it very likely formed in concert with thousands of other stars, when a giant molecular cloud containing perhaps a million times the mass of our solar system collapsed. While the vast majority of stars that the universe forms—some ninetyfive percent—are the mass of our sun or smaller, a rare but significant fraction are ultra-massive, containing tens or even hundreds of times the mass our star contains. When these stars run out of fuel in their cores, they explode in a fantastic Type II supernova, where the star's core collapses. In the most massive cases, this forms a black hole.

Over time, many generations of stars—and hence, many black holes—form, with the majority eventually migrating towards the centers of their host galaxies and merging together. Our own galaxy, the Milky Way, houses a supermassive black hole that weighs in at about four million solar masses, while our big sister, Andromeda, has one nearly twenty times as massive. But even relatively isolated galaxies didn't simply form from the monolithic collapse of an isolated clump of matter, but by hierarchical mergers of smaller galaxies over tremendous timescales. If galaxies with large

amounts of stars all have black holes at their centers, then we should be able to see some fraction of Milky Way-sized galaxies with not just one, but multiple supermassive black holes at their center!

It was only in the early 2000s that NASA's Chandra X-ray Observatory was able to find the first binary supermassive black hole in a galaxy, and that was in an ultra-luminous galaxy with a double core. Many other examples were discovered since, but for a decade they were all in ultramassive, active galaxies. That all changed in 2011, with the discovery of two active, massive black holes at the center of the regular spiral galaxy NGC 3393, a galaxy that must have undergone only minor mergers no less than a billion years ago, where the black hole pair is separated by only 490 light years! It's only in the cores of active, X-ray emitting galaxies that we can detect binary black holes like this. Examples like NGC 3393 and IC 4970 are not only confirming our picture of galaxy growth and formation, but are teaching us that supermassive relics from ancient, minor mergers might persist as standalone entities for longer than we ever thought!



Check out some cool images and artist reconstructions of black holes from Chandra: http://chandra.harvard.edu/photo/ category/blackholes.html Kids can learn all about Black Holes from this cool animation at NASA's Space Place: http://spaceplace.nasa.gov/blackholes.



Images credit: NGC 3393 in the optical (L) by M. Malkan (UCLA), HST, NASA (L); NGC 3393 in the X-ray and optical (R), composite by NASA / CXC / SAO / G. Fabbiano et al. (X-ray) and NASA/STScI (optical).

ENCHANTED "ROCK STAR" FESTIVAL VOLUNTEERS NEEDED

AS will be hosting solar observing Saturday Feb 21 1-5PM near the Summit Trail Gazebo at Enchanted Rock State Park. You can attend that afternoon and still make the members star party at Eagle Eye Observatory that evening. AAS volunteers will be able to attend for free. If you can help with the AAS booth or bring a solar telescope contact Rob Pettengill aascomm@robpettengill.org or Larry Martin dlar-rymartin@gmail.com. Preliminary event details follow:

Enchanted Rock State Natural Area has been designated by the International Dark Sky Association as a Gold Tier International Dark Sky Park. To celebrate the efforts made by staff and volunteers to earn that special status, we will be holding an all-day event for the public.

This will be a full day event that begins as the darkness turns to morning light with a sunrise program and ends with a Star Party chock full of telescopes and a constellation tour by McDonald Observatory's own Bill Wren. Throughout the day there will be activities for children and the young at heart. Check out this incredible schedule:

7:00-7:30am- Sunrise Summit Celebration w/Rev. Jeff Hammond. Join us on the summit of Enchanted Rock, where we kick off the day with a moment of reflection and gratitude. Noon-6:00pm- Booths open for public browsing

IN THE BIG TENT:

12:00pm Dark Sky Photography "How To" with Rob Greebon Photography

1:00pm Kids Bat Presentation & Puppet Show w/ Texas Parks and Wildlife's own Nyta Brown from the Old Bat Tunnel & Craig Hensley from Guadalupe River State Park

2:00 pm Kids Owl Presentation w/ TPWD's Craig Hensley

- 3:00 pm International Dark Sky Park Dedication Ceremony followed by "Better Lights for Starry Nights" w/ Bill Wren, McDonald Observa tory's "Ambassador of Dark Skies"
- 4:30 pm Astrophotography w/Ken Kattner, Putman Mountain Observatory
- 5:30 pm Winter Constellations and Star Charts Chris Keating, Mason Astronomy Group Professor of Physics & Astronomy

OUTSIDE OF THE TENT:

5:30 pm "Sundown Yoga at the Summit" w/Patty Williamson, Lizard Dreaming Yoga

6:00 pm Storytelling around the campfire w/ Ira Kennedy. Campfire tunes with Marshall Adams

7:00 pm Constellation Tour w/Bill Wren and Ken Kattner.

8:00 pm-10:00 pm STAR PARTY!!!!. Telescope viewing with area astronomy groups.

8:30 pm "Moon-less" Walk to the summit w/Ranger Scott Whitener

AROUND THE GROUNDS THROUGHOUT THE DAY:

Star Stations hands-on astronomy activities for kids of all ages Kent Rylander "What's In The Puddle" vernal pool residents under microscope exhibit.

Delmar Cain "Moths in the Light" moth exhibit.

Peter Van Bavel, "Galaxies of the Winter Sky" at Star Party

Biedermann's Fredericksburg Ace Hardware Dark Sky Lighting display

International Dark Sky Association Dark Sky display

Silent Auction w/ Whole Earth Provision Co Celestron Cosmos 90GT telescope and more!

Kids Blacklight Face Painting & Juggling with Moonshine the Magician

Food: Sweet Marleys sandwiches and frozen yogurt, Bakery JoJu wood fired pizzas and more...

Entertainment: Terry Theis accordian and Marshall "Mo" Adams harmonica - music for all ages!

What to Bring: Folding Chairs and/or blankets. Red LED lights for night time. (Use these to avoid any lighting disturbances during astronomical viewing), BYOT (Bring your own Telescope). The more telescopes, the merrier!

**Do NOT bring: Large Lanterns or spotlights for the nightime viewing. There will be plenty of volunteers and others to help guide the way.

***Red lights, red headlamps, or red coverings on your flashlights are suggested.

Large sections of the parking lot by the viewing area will be closed after 4:00 pm to keep headlights from disturbing the night programming.

MASON STAR GAZERS By Jack Estes

A s a past ALCOR, I was asked to present a Messier Binocular certificate to Jarret Lingle on Tuesday evening January 27th in Mason, TX. There is a small but very active astronomy club called the Mason Star Gazers. Bridget Langdale, of the Mason astronomy club, contacted me Monday morning and asked if I would drive up Tuesday night. That's a two hour drive north from Boerne. However Jarret is one of the contractors who built part of our observatories at Stellar Skies so I know him pretty well. He actually lives out at Pontotoc just a few miles from Stellar Skies. He has the first two AL certificates in their less-than one year-old club. I believe Jarret's other certificate is the regular Messier. For a small club, they have great attendance and looks like they really have a blast. They're very active observers. Most are relatively new astronomers, though one couple from Junction helps conduct the star parties out at Fort. McKavettand have a 22-inch DOB. They don't have Robert's Rules, minutes, treasurer reports, or conduct meetings anything like larger clubs. The person who would be president in a regular club, Bridget Langdale, is their "Star Captain".



OBSERVING REPORT-THE FIVE GLOBULAR CLUSTERS IN THE FORNAX DWARF GALAXY By Akarsh Simha

I was lucky to catch some photons during this January's new Moon period! Fortunately for me, I had no obligations on the 19th and 20th of January, so I decided to go observing on the 19th despite it being a Monday, after ensuring that multiple weather sources predicted a very clear night.

And a clear night it was! The sunset was at 6 PM, but it was about 6:40 by the time I pulled in under slowly darkening Bortle 2 skies near Pontotoc, TX. It was only by 8:30 PM that I had my Obsession 18" f/4.5 fully set up and ready to observe. The sky conditions were excellent. The Milky Way in Cassiopeia was shining surprisingly bright. Zodiacal light was extremely bright after sunset, and it was still lingering at 8:30 PM! I didn't look very carefully for the Gegenschein, but I noticed that the Milky Way near Orion had an unusual bulge, which was probably due to the Gegenschein. Sky conditions stayed great all night, so I got a lot of observing done.

There were a few personal highlights to the session, and very many interesting objects, but I shall not belabor on the details and shall instead focus on an interesting set of targets that I pursued, which seem less popular than I feel they ought to be – and these are the five globular clusters in the Fornax dwarf galaxy.

Wait a minute, globulars in another galaxy? Yes. If you've finished the Messier catalog, you have already seen a globular cluster in another galaxy – and that is M54. It's visible even with binoculars! This globular cluster is believed to belong to the Sagittarius Dwarf Elliptical Galaxy (SagDEG), a satellite galaxy of the Milky Way. With the large apertures available these days, objects in our more distant galactic neighbors are not uncommon targets for amateurs either. For example, the nebula NGC 604 in M33 and globular cluster Mayall II in M 31 are quite popular.

The Fornax dwarf galaxy is a satellite of the Milky Way, lying in the direction of the constellation of Fornax. Although the galaxy itself was first discovered by Harlow Shapley in 1938¹, the brightest of the five globular clusters in it, NGC 1049, was discovered much earlier in 1835 by Sir John Herschel². Shortly after the discovery of the dwarf, in 1939, Shapley identified two globular clusters superposed on it³. Thereafter, Paul Hodge⁴ identified two more globulars in the dwarf (1961).

Here in central Texas, the galaxy rises no more than a mere 25 degrees above the southern horizon. This makes the galaxy itself a difficult target, owing to its low surface brightness. The low southern declination might in fact be the cause of the low popularity of these targets – it is even more difficult for most of the USA and Canada. However, the tiny globulars are indeed quite tractable from Texas. While I may have detected hints of the galaxy's glow, I definitely cannot be certain about having seen the galaxy; the globulars, I did see, and I shall focus on them.

Paul Hodge's An Atlas of Local Group Galaxies, which I checked out from the UT Library, is a great reference for anyone hunting extragalactic objects. It lists the 5 globulars and also a planetary nebula in the Fornax dwarf. However, the book by itself is not readily usable on the field, so I prepared in advance by feeding the coordinates into the astronomy software KStars⁵, and subsequently downloading the imagery from the Digitized Sky Survey. This preparation helped me immensely on the field; as for the fainter globulars, precise positioning was essential.

NGC 1049 (GC 3 in Hodge's 1961 paper):

Although the Fornax system transited meridian at around 7:50 PM that night, owing to my late start, it was not until an hour later that I managed to grab NGC 1049. I had seen NGC 1049 earlier with a 17.5" from a dark sky site in the hills of southwestern India, so this wasn't a daunting target. At 66x, the object appeared virtually like a star. At 103x, it started appearing non-stellar, but still, it wasn't distinctly non-stellar. I could tell it looked different from other stars because it had a bit more of a halo around it. Putting on a 10mm eyepiece (205x), it finally was distinctly non-stellar. This was the easiest and brightest of the 5 globulars.

Hodge's GC 4:

This was the second easiest of the five. It was quite clearly detected in my field of view when I moved towards the bright star near the globular. It felt just a tad more condensed than NGC 1049, if at all, but was otherwise similar. It appeared distinctly non-stellar at 205x.

Hodge's GC 2:

GC 2 was more diffuse than GC4 and NGC 1049. It appeared as a uniform glow at 205x. Was not at all as obvious as GC4 or NGC 1049. It took me about 10 seconds of staring to realize that it was present in the field of view. I would rate this as the 4th easiest globular, after GC 5.

Hodge's GC 5:

GC 5 is quite reminiscent of GC 4, condensed and of nearly equal brightness. Detected with a 10mm eyepiece (205x). I would rank it 3rd in ease of observing, after GC 2 and before GC4.

Hodge's GC 1:

This was the most difficult of the 5 globulars. Also, by this time, it was already 9:30 PM, so a bit more than an hour and a half after transit. The object was at the very edge of visibility! I sensed it a multiple number of times, with the object popping in and out of the sky background. A trick that I learned from Jimi Lowrey, of rocking the focus in and out to detect faint objects, really helped. I knew almost exactly where to look, but the even-more-precise position was noted by observation and then verified against images. The size of the very, very, faint glow was comparable, if not larger than GC 2. I had the best view using a Pentax 14mm XS (147x). A 16mm Orthoscopic (128x) costing \$50 was also able to give a very good view.

For the reference of anyone who might be interested in trying these objects, I provide here the coordinates of these five globulars as obtained from the SIM-BAD⁶ database:

Name	RA (J2000)	Dec (J2000)
GC1	02:37:02.1	-34:11:00
GC2	02:38:40.1	-34:48:05
NGC 1049 (GC3)	02:39:48.3	-34:15:28
GC4	02:40:07.7	-34:32:11
GC5	02:42:21.1	-34:06:06
Fornax Dwarf Galaxy	02:39:59.3	-34:26:57

Overall, I had a very productive and enjoyable observing session. I'd like to use this opportunity to thank Greg for permitting me to observe from his grounds, and also my family for supporting my astronomy interests – something that my student stipend cannot afford.

1 "The Fornax dwarf galaxy. I. The globular clusters.", Paul W. Hodge, Astronomical Journal, Vol 66, p. 83-84 (1961)

2 The NGC/IC project: http://www.ngcicproject.org

- 3 "Galactic and Extragalactic Studies, II. Notes on the peculiar stellar systems in Sculptor and Fornax", Shapley, H., Proc. Nat. Acad. Sci. USA, 1939 Nov; 25(11) 565-569
- 4 "The Fornax dwarf galaxy. I. The globular clusters.", Paul W. Hodge, Astronomical Journal, Vol 66, p. 83-84 (1961

5 Users of Kstars trying this project should be warned that there seems to be some bug in the star catalogs in the Fornax region, so Kstars does not list some bright stars. Check against DSS images to be sure.

6 http://simbad.u-strasbg.fr/simbad/sim-ref?bibcode=1961AJ.....66...83H&simbo=on&submit=submit%20bibcode

ASTRONOMICAL LEAGUE NEWS By Lauren Gonzalez, ALCor

Congrats to our Astronomical League Observing Program awardees for this month. Robert Pettengill has received his second Stellar Level of the outreach award. The Stellar Level requires 50 hours of outreach work beyond the initial Outreach Level. Remember, Outreach Level only takes five events at two hours each, so get your ten hours documented and receive your award!

Also receiving an award this month is our Master Observer, Mark Johnston. Mark has completed the Stellar Evolution Program, requiring 100 observations of stars at different points in their lives. Stellar nurseries, carbon stars, planetary nebulae, supergiants, supernova remnants, and variable stars are among the types of objects required for this list.





Katie Raney received her Outreach Award from Lauren Gonzalez at the January GA meeting.

Photo by Dawn Davies

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Monthly deadline for Sidereal Times submissions is the 25th. Please send submissions to joycedelynch@gmail.com