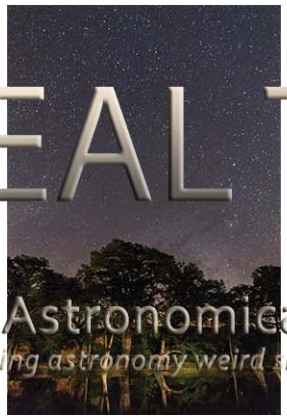
SIDEREAL TIMES



Austin Astronomical Society

keeping astronomy weird since 1969

www.austinastro.org

July 2016

MONTHLY MEETING

July 8, 2016
7:30 PM (PA@6:30 PM)
Texas Museum of Science & Technology
1220 Toro Grande Drive
Cedar Park

Rachael Livermore
Jeffrey Silverman
Astronomy on Tap ATX
Distant Galaxies and Supernova Explosions

PRACTICAL ASTRONOMY

Introduction to AAS Junior Astronomers Program

See Page 3 for details of both.

Sidereal Times
Vol. 48 No. 7
http://www.austinastro.org/

Sidereal Times is the official monthly publication of the Austin Astronomical Society.

President's Corner

By David Mathias, 2016-17 President

I Need a Vacation!

Welcome to July, AAS members! We're into the thick of the heat and humidity now, as this summer looks like a replay of last year. Though occasionally gusty, I hope you and your bottle of DEET received a workout during our drier June weather, and that you have enjoyed some good viewing. I've seen some great astro pictures and some great vacation pictures on Facebook over this last month. To those of you who are combining both astronomy and your family vacations, you are my heroes!

At the AAS Executive Committee retreat on June 25th, a small group of us met at the Mitte Foundation's Carriage House building close to downtown. At the retreat, I presented a first draft of a vision statement for AAS. We walked through sections of the Bylaws that we believe could use some editing and updating, and came away with one change we'd like to present for a vote in August. Much of the afternoon was spent discussing plans for EEO repairs and enhancements, and in sketching out preliminary budget items for next fiscal year. My many thanks to the EC members who were able to get away for the afternoon, and my apologies for scheduling conflicts others encountered.

On June 28th, I represented AAS at The Greater Austin STEM Networking Forum held at Eastside Memorial High School. AAS has recently joined this organization, and I was looking forward to learning more about the organization and its mission. I was very surprised to see the large number of attendees and to learn more about organizations in the area who are focused on making Central Texas a hub of science, technology, engineering and math learning – both in the classroom and through informal learning opportunities (like amateur astronomy!). I also took an opportunity to tell all the attendees about our upcoming AUTS event (more below). Learn more about the STEM group and its goals here: https://greateraustinstemecosystem.files.wordpress.com/2016/05/2016-06-28-forum.pdf.

On July 9th, we will be holding our first Out of the Box scope clinic at EEO. Joi Chevalier, Dawn Davies and I came up with this idea to serve as a segue and

Banner: July 2015 Image of the Month: Michael Schaffer, Stars & Fireflies Over Frio River

Inside This Issue

(President's Corner continued from page 1)

warmup to our annual Austin Under the Stars event. Scope clinics are a good way to welcome newer or less-experienced members to the Society. I'm thrilled to see it come to life now. Several of your board members and volunteers will be offering assistance on Saturday to members who may not be very experienced setting up and using their scopes. We're hoping for a good turnout. Please spread the word to your friends who are AAS members.

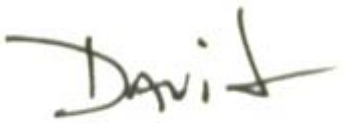
Austin Under the Stars is coming up very soon! I hope you've cleared your calendars and have started burning incense (or whatever) to the ancients to encourage them to keep the skies clear for the event. Expect additional communications from Dawn Davies as we get closer to the event date. We'll need volunteers in a number of roles. Please plan to help out with your hands or your scopes for our biggest citywide annual event.

As I mentioned at the top of this note, our Bylaws could use some updating. (For example, the version of Robert's Rules of Order mentioned in the Bylaws was published in 1989! Roberts is now on the 11th edition!) I'm looking for a few members who would like to meet with Joyce Lynch and me to review our observations and then drive the edits and revisions to bring back to the General Assembly for approval. If you are interested in helping, please drop a note to president@austinastro.org.

Lastly, I'd like to offer an open apology to current or new members experiencing any delays with processing of their membership dues. We try to make board transitions seamless, but there's often some gaps to close during the first month. The Treasurer's role is the most difficult to transition due to the need to transition bank signatories, PayPal account information, have a new debit card issued, and a whole host of other details too numerous to mention. Thank you for your patience. I think we just about have things under control now.

As always, I appreciate your notes, comments and feedback. See you at TXMOST on Friday for the General Assembly meeting and Practical Astronomy!

My best always,



Come to the July Meetings

When: Friday, July 8, 7:30 PM (PA 6:30 PM)
Where: Texas Museum of Science & Technology
1220 Toro Grande Dr. Cedar Park, TX, 78613
Off FM 1431 between Ronald Reagan Boulevard and Sam Bass Road

General Assembly
Drs. Rachael Livermore and Jeffrey Silverman from Astronomy on Tap ATX will be our speakers and will each give a talk about the latest happenings in their respective specialties. Rachael will fill us in on the search for the most distant and thus earliest galaxies in the universe going backward in time ever closer to the big bang. Jeff will wow us with findings about the most titanic of supernova explosions.

Practical Astronomy
PA this month we will introduce the Junior Astronomers program and get feedback from members, and especially member families, about what might be great for the program this year. The entire family is welcome! See Page 4 for more.

Out of the Box

Have you bought a telescope, but not yet taken it out for a spin? Or had even more questions once you did open it?

Never fear - on July 9th, your fellow AAS members will host Out of the Box, a clinic specifically for you! Bring your new or unused telescope out to our AAS dark sky site, Eagle Eye Observatory at Canyon of the Eagles on Members' Night, and get your new telescope questions answered. In the late afternoon, we'll open the boxes and identify what's inside, how to set up your telescope, explain the eyepieces, and give you some field basics. With an experienced AAS member, you'll look at a few objects in the evening sky, just to get started.

If you are new to your own observing but do not own a telescope, come on out anyway! You'll get to experience EEO and share a scope with a new friend.

Then, at our AAS Austin Under the Stars evening on July 23rd, you'll come out, and with your experienced partner, do a bit more: test your newfound skills by tracking the same objects as your partner, and talk a bit about what you have been learning with the public.

Out of The Box
July 9 - EEO at Canyon of the Eagles, 5-10pm
July 23 - Field, St. Stephens Episcopal School, 6pm-10pm
Bring: you, your telescope, and a device with SkySafari Pro, or the sky software of your choice!

Please contact Joi Chevalier (kitjer@snikte.net) and Dawn Davies (dawnmunroedavies@gmail.com) to let them know you're coming, so that we have enough partners to help out.

Clear Skies!

ARE YOU AN AMATEUR ASTRONOMER OR AN ASPIRING ONE? DO YOU HAVE A PASSION FOR STARGAZING AND A DESIRE TO LEARN MORE ABOUT THE UNIVERSE? WOULD YOU LIKE TO LEARN HOW TO USE A TELESCOPE OR LEARN HOW BETTER TO USE THE ONE YOU HAVE?

Are you between the ages of 4 and 17 years?

If so, the AAS's Jr. Astronomy Program is right for you. In the coming weeks we will be sending out notices and dates for upcoming meet-ups, classes and workshops for all members looking to take part.

Join us for an intro presentation and panel on the new program at our July Practical Astronomy Session on July 8 from 6:30p – 7:15p. For more information email us at contactaas@austinastro.org.

PLANETARIUM SHOWS ASTRONOMY TALKS
ASK AN ASTRONOMER YOUTH ACTIVITIES
SOLAR VIEWING NIGHT SKY OBSERVING
ASK AN ASTRONOMER WORKSHOPS
PLANETS GALAXIES CLUSTERS
SUNSPOTS NEBULAE
AND MUCH MORE

SATURDAY
JULY 23RD 2016
6 P.M. – 11:59 P.M.

WWW.AUSTINASTRO.ORG

ST. STEPHEN'S EPISCOPAL SCHOOL
6500 ST. STEPHEN'S DRIVE AUSTIN, TX 78746

Astronomical League Report

By Lauren Gonzalez, ALCor

Congratulations to Katie Raney who completed her binocular Messier program! The binocular Messier program requires observers to locate 50 of the 110 objects on the full Messier list. She started her list back in 2013. It just goes to show you don't have to observe and record data often to receive an award; take your time, don't rush, and you can be recognized for all your hard work too. Congrats, Katie!

I am currently one Pluto spotting observation and a little Mars tracking away from the Solar System program and 80 Herschel's away from the Herschel 400, so with any weather-related luck, I may finish both before the end of the summer. Please keep me updated at LSROGERS16@GMAIL.COM to let me know what you're working on.

EC Positions Still Available

There are still openings on the Executive Committee: Outreach Chair and Parliamentarian.

Also, Lou Scaruffi has decided that he cannot serve as our International Dark-Sky Association representative, so another one is needed.

If you are interested in any of these positions, contact President David Mathias at president@austinastro.org

There is a candidate for Communications Chair, and an election for that position will take place at the July 8 GA meeting.

Correction to last month's issue

The article in last month's issue about the 2016-17 Executive Committee mentioned all of the elected officers but failed to include the appointed EC members. Apologies for the omission.

Historians	Brian Cuthbertson and Kelley Knight
Astronomical League Correspondent	Lauren Gonzalez
Webmaster	Maurice Nelson

Executive Committee Minutes

By Andrea Tole, Secretary

May 9, 2016

Call to Order – 7:15PM

Present: David, Jim S, Tim B, Joyce L, Alan C, Tara K, Phil S, Ron C, Andrea T, Lou S, Amy J, Domingo R, Dawn D, Brian L, Terry P, Joi C.

Correction to April minutes – Ron will change from March to April

Approve Minutes from April EC Meeting

Terry – Vice President
Tara – Treasurer
Joi/Maurice – Communications/Webmaster
Dawn – Outreach
Domingo – Equipment
Jim S. – Member Services
Tim B. – Texas IDA
Lauren Gonzales – AL
Brian, Alan, Carl – At-Large

TP: Meeting venue at St Stephens, recital room or observatory (gets crowded), should hear back within next couple of days. Collimation workshop will probably take place.

JS: suggested having members BYOD. DOB collimation would be ok for pre-sunset. Planning astronomy 102 presentation for June general meeting.

TP: Presenters planned for Friday backed out, Jeff Silverman, possibility for July 8. TP said he might be available.

DD: ATM award winning inventor offered to present, lives in Austin.

DM: Lou completed astronomy class and offered to present.

TK: Will have treasury report before next meeting, funds came in from Amplify Austin, Nathan needs receipt. Insurance payment $360, NASA Spaceplace certificate to AAS for contributions (using articles for newsletter). No money spent.

DM mentioned donations coming in, both $ and equipment.

TK recommended giving prizes at TSP, name recognition is great.

JC: Communications exhibit at TXMOST, a lot of exhibits approx. half photos are up. Trying to get rest of events up on the website. Error 44, Maurice needs to fix, observing targets. Workday planning and event planning. Demonstrated the new brochure . Signup widget associated to the workday in Wordpress. Transition website to Maurice. Joi wants to train EC on posting content. Lost Maples: TPWD is developing a dark sky park but it is a ways from Austin. They are developing an application and 5013c, ecologically maintained, horizon problem only downfall. The park will host different AS for help with their dark sky application and feedback.

DD: No current star party requests. Creating updates to outreach primer. Wants to develop astronomy programs at State Parks. Working on developing hub schools. Documentation for .pdf on the educational portal if astronomers can't be there. Pricing package ideas for membership or student. Working with Cindy from IDA dates for second night sky festival, hiring planner. Collaborating with different AS outreach chairs.

DR: June 4, in the books only 7 responded to workday. Tools needed wheelbarrows, shovels, etc. JC said that she would publish on website. 6 work tables need to be replaced. DD, recommended looking at what we are using to finish and seal them. DR, this time we just want to replace the tables and the path to the observatory which is part of the parking lot. New ADA restroom going in but we need a path to the sidewalk. Need more crushed granite (have 4 yards), one parking place for ADA compliance going in also and granite needs to be used for that. JL we used deck paint last time on work tables. DD the seal on the sides is the problem, ADA may fall on LCRA, not AAS. DM the path belongs to AAS, the ADA compliance issues came from COE not being in compliance. DM we are not responsible for the parking lot or restroom. DM we are responsible for signage, path…be careful of "scopecreep".

DR The roof got worse with the wind this weekend, that is not ours, still belongs to LCRA. We trained 4 new people this past weekend. Added shelves to the storage shed but still need more. 25" scope does not seem secure. Loaner scope, the mirror is bad, triple image. Waiting list for telescopes. Wants to start a loaner scope for the smaller scopes without requiring a deposit.

DD: 7 state parks want us,

JC: Become mobile around the parks that want us. DR: suggested a meeting only on the topic of becoming mobile. DM: tabled the discussion for later, suggested thinking about the mission.

DR: Bought phone to try at COE. Who is ISP? TK: Not sure. DR: Phone number assigned to the observatory, no one is sure. TK: we will have to see if we can continue old contract. DM: Please let EC know before we go ahead.

DR: Donated scopes, taking photos, documenting inventory, eyepieces, Dawn's idea would work,

Calendar of Events

8 July 2016
General Assembly Meeting
7:30 PM (PA 6:30 PM)
Texas Museum of Science & Technology

9 July 2016
Members Only Star Party
Canyon of the Eagles
Out of the Box telescope clinic

21 July
Outreach Opportunity
Bee Cave Public Library
Star Party
8:00 - 10:00 PM

23 July 2016
Austin Under the Stars
St. Stephen's Episcopal School

30 July 2016
Outreach Opportunity
Public Star Party
Canyon of the Eagles

1 August 2016
Executive Committee Meeting
7:00 PM
The Frisco

6 August 2016
Members Only Star Party
Canyon of the Eagles
Members' Fast Track 101:
Pushing Astronomy

12 August 2016
General Assembly Meeting
7:30 PM
ETC 2.136 - UT Campus
Engineering Teaching Center

24-29 October
Eldorado Star Party
X Bar Ranch
Near Sonora, TX

what actually belongs to AAS is small, the rest is COE's, we could move out in a day.

TK: What is the consequence if we break the agreement with COE. DM, DD: None, just 90 day notice.

JS: updated JC on presenters for upcoming GA meetings.

TB: Updating Lou on IDA packet.

BL: Owns a machine shop, offered his services. Said he wants to be equipment chair someday.

Alan: Nothing to add.

TB: recommended working with Steve B. for help with IDA.

DM: recommended new board members read back issues of *Sidereal Times.*

JC: State parks are changing to separate parks and interpretive work from law enforcement. Seeking legislation on dark skies in state parks for preservation of dark, even within individual campsites.

DD: Resurrecting Jr. astronomer program with JC.

Old Business

Elections/Next Board - Missing candidates for key roles. New "member" Bianca Esquivel interested. Former member of SAAS.

EEO repairs – Roof leaks. COTE May repairs fuzzy. AAS work day in June. Beware unilateral repairs outside bounds of contract.

Appropriateness of accepting new memberships only for the purpose of one-time attendance at members-only star parties - Joyce informed Cindy/COTE of our preference not for members-only parties.

Personal safety at EEO – Investigate restoring telephone service. Get emergency contacts from COTE and post within EEO. LCRA is responsible for maintaining those structures.

AT: Is there data on memberships gained by star parties hosted at COE? DM: No, however, 1000 visitors to 1,700 visitors at COE.

DR: COE is stalling on repairs, not one requested by AAS has been addressed.

TB: We need to include the GA on decisions about moving or not. PS: Some members scouted potential sites, a few years ago. DM: "Perfect site" was not identified. PS: Make moving a fact based discussion. Relocation proposal. When he travels, other AS say how wonderful AAS dark sky site is. These are not easy to come by, believes we should have a home base. JC: requirements, criteria, grade the sites. We need to draw up a document before we propose it to the members. JS: Document was drafted (2013 – 2014??) PS: he will be back in town in September and he would be willing to help with the document.

DD: State parks have everything going for them to host us. They are not corporations and they have
camping.

AJ: Every month, be old school and call people to remind them about the GA meetings.

DM: There will be trade-offs. Let's try to figure out who wants/needs to be part of that and start.

Reminder that some EC members wanted to track proposed Bylaw amendments. David created folder and file in Google Drive for capturing recommendations. – Joyce and I met. Please add yours.

DM: JC would like COE to stop recommending to sign up for AAS. Members only nights are for member s only.

Conservation Day @ Austin Zoo, September 27 – AAS participation requested by Girl Scout. TK: has made contact.

Could we get a thank you note sent to Susan Franzen on behalf of the entire EC? Not discussed

New Business

Equipment Donations from members – Dented LX200 from Mike Slack mount and fork field tripod, Used 2.3 Meter Observatory, Pier.

PS: working with ANSC this summer and they want to start an astronomy program.

DM: Vic Ellisor has been working on another 8 out there that may be a better match. PS: wants to gather info about availability for donations. DD: has an 8 in. she wants to donate and DM will pick up. BL: will help out with 10". JC: has an 8" to donate. DR: wants to make good scopes out of old scopes. DD: has equipment that needs to be auctioned. DM: member wants to donate pier and fiberglass observatory, retail value approx. $9,000. DD: Recommends Google doc for inventory of auctionable stuff.

Conversations – David spoke with AL President, AWB President, Greater Austin STEM Ecosystem members, NASA's Texas Space Grant Consortium, UBarU Board member SAAS is looking at this for their home base, Mission Capital, starting conversation with Chuck Baker, San Antonio President.

DM: Bylaws, if outgoing members have access to Google drive, leave info and recommendations on bylaws.

Votes Taken

Meeting adjourned at 9:05.

General Assembly Minutes

By Andrea Tole, Secretary

May 13, 2016
Call to Order – 7:45PM

David Mathias: Welcome and New Member Introductions. Returning member recommended having meetings at St. Stephen's or somewhere other than UT because of parking. Hill Country Astronomers member present who invited AAS members to their meetings on the first Monday of the month. Collaboration of central Texas astronomical societies desired. Request made to engage and involve younger members.

Quorum reached

Reading and approval of the minutes – approved 7:57PM

Nominations for open officer positions. Communications chair, Secretary, Member-at-Large, Outreach Chair are still vacant. Motion to nominate Andrea Tole for Secretary. Andrea Tole – MAL to Secretary by acclamation. Gregory Rohde – self-nomination to Member At Large, voted and approved. Parliamentarian – presidential nomination.

Officer Reports

Terry Phillips: Vice president – duties include meeting venues, speakers

Joi Chevalier: Update on website and TXMOST exhibit – 23 AAS images are up, eleven more will be put up. Demonstrated new brochure design.

Joyce Lynch: Newsletter will publish soon.

Domingo Rochin: bTraining at COE every month; he is also willing to do some training at public star parties. June 4 work day help needed. Building up materials and tools, Greg will help manage. Worktables will not be available that night because of fresh paint. Loaner scope program is busy, suggested using the small donor scopes for new members or beginners to learn basics.

Dawn Davies: Outreach chair nominations. Solar scope training will be available if you arrive early at the next public star party. Austin Under the Stars at St. Stephen's soccer field – July 23, 6:00 – midnight, everyone needs to come out if they can. David recommended a sing-a-long.

Jim Spigelmire: Absent. Member services update from Joi C. Early committee formed to build robust members services program. Looking for ways of engaging younger members. July 9, at EEO – "Out of the Box" event. Planning for more practicum oriented activities and events.

Tim Brown: Absent

Lauren Gonzalez: Absent

Brian Lippincott: "What's Happening in Astronomy" – Mars solar transit, Kepler, rough terrain on Mars and rover heading toward Mt. Sharp, looking for other Earths using starshade spacecraft and coronagraph instruments, volcanoes under ice on Mars, media event for July 3 – 4 observing and documenting Juno's arrival at Jupiter, Kepler verified around 1,200 planets.

David: Generous donations received: LX200 10" telescope, fiberglass observatory and pier (approx. $8,000 value) we need to figure out how to transport these items. Thank you for the donations. Contacts being made to astronomy groups and organizations. Open forum. Discussion about equipment.

8:48 – break

8:59 – reconvene

Welcome New Members

Dan Anderson
Read Barbee
James Berault
Michael Bulat
Gary Carpenter
Carri Crowe
Jason Crowe
Darrin Everitt
Emily Flores
Daniel Lowell
Hanan Lowell
Tony Mathews
Patrick Moore
Taylor Popp
Susan Silberman
Caleb Urban
David Urban
Tracy Urban
John West

Presentation

David: Introduced Amy Jackson. Amy Jackson presented about her business, Starry Sky Austin's Guatemalan Outreach Project. Shipping telescopes discussion.

David thanked Frank and St. Stephens for allowing AAS to meet here.

Meeting adjourned at 9:37PM to the observatory and classroom.

April 2016 Treasury Report

By Tara Krzywonski, 2015-16 Treasurer

Deposits

Dues payments	
Checks	$ 0
PayPal	$37.51
Dues payments totals	**$37.51**
Interest earned-checking	$0.80
Interest earned-CD	$0.24
Interest earned-CD	$0.25
Total interest earned	**$1.29**
Amplify Austin	$ 987.27
Other donation	$ 366.15
Total other income	**$1353.42**

Deposit Totals April 1 - 30, 2016 $1392.22

Expenses

COE internet	$ 65.43
Outreach expense	$161.45
EC expense	$150.00
COE repair expense	$ 85.45

Expense Totals April 1 - 30, 2016 $462.33

Bank Balances

University Federal Credit Union Checking	$19,809.99
University Federal Credit Union Donations Savings	$ 30.00
University Federal Credit Union C.D.	$ 5,808.86
University Federal Credit Union C.D.	$ 5,789.67
University Federal Credit Union Scholarship	$ 463.25

Total Cash $31,901.77

Total of 629 AAS members as of June 10, 2016

Total of 490 AAS memberships as of June 10, 2016

July 2016 Observing Targets

By Brian Cuthbertson

As hot as it may seem in Texas in July, understand that we have a very benign environment here on Earth's surface. All it takes is a pair of eyes and a dark night to see what temperature extremes the Cosmos is capable of. The velvety blackness between the stars, "outer space" if you like, has a temperature of about 3 degrees Kelvin. Since 0 degrees Kelvin is absolute zero, we're talking really cold up there. On the other hand, temperatures inside stars can range from millions to billions of degrees Kelvin. So when you chase your favorite summertime targets up there, keep in mind you've got a really nice planetary platform to do it from, even in Texas in July. The rest of the universe should be so lucky. As always, enjoy!

NGC 6866 rating EASY
open cluster in Cygnus
RA 20h 03.7m Dec +43d 59.5' (2000)
Magnitude 7.6

Open cluster NGC 6866 lies just above (north of) the western arm of the Northern Cross in Cygnus. The arm extends from Sadr (Gamma Cygni) at the center of the Cross, WNW to Delta Cygni at the arm's western end. You'll find the cluster roughly 2/3 of the way out along this line, and about a degree north of it. Caroline Herschel was the first to find the cluster, on July 23rd, 1783.

NGC 6866 is bright enough to be easily visible in an 11x80 finder scope, with stars of magnitude 10 and fainter. In a 2.4-inch refractor the cluster appears elongated SE-NW, with about 10 visible stars, including an obvious string of 3 or 4 running across the center, and sitting on a bright background haze.

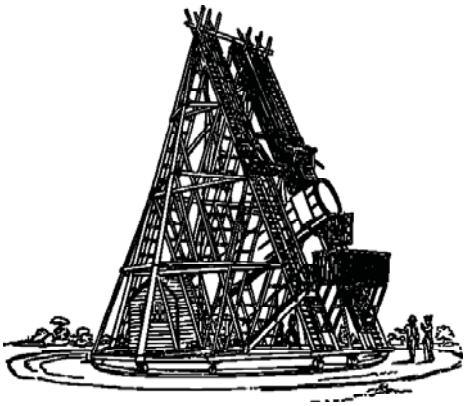
Larger scopes show more of course: a 6-inch picks up about 20 stars in a 5' area, and a 10-inch can detect about 40 in an 8' area. Larger scopes will show various stellar concentrations and arcs, plus several nice triple stars.

NGC 6866 is about 700 million years old, and lies about 4,000 light years away. By comparison, the nearby naked-eye Hyades cluster is just 46 light years away, and the most distant known open cluster in the galaxy, Berkeley 29, is nearly 49,000 light years away.

NGC 6539 rating MEDIUM
globular cluster in Serpens
RA 18h 04.8m Dec -07d 34.8' (2000)
Magnitude 9.8

Globular cluster NGC 6539 spans two constellations, Serpens (more properly, Serpens Cauda - the Serpent's Tail) and Ophiuchus (the Serpent Bearer): the border actually runs through the globular. However, the center of the globular sits marginally on the Serpens side, so the cluster is assigned to Serpens.

NGC 6539 was discovered in 1856 by Danish astronomer Theodor Brorsen. Brorsen is best known for his discovery of 5 comets. So as a comet hunter finding a globular cluster, this makes him more or less a Danish equivalent of Charles Messier.



William Herschel's telescope From a drawing in 'The Imperial History of England, comprising the entire work of D. Hume,' David Hume, 1891.
openclipart.org

In small scopes, like a 2.4-inch refractor, NGC 6539 is a small, broadly concentrated spot. In larger scopes like a 10-inch reflector, it appears as a diffuse unconcentrated glow about 3.5' in diameter, with a mag 12.5 star on its NW edge. In larger amateur scopes, like an 18-inch at 225x, the cluster diameter is about 3.5'. And a few of the cluster's brightest stars, around 15th magnitude, can be seen around the cluster's edge, which appears somewhat ragged.

At a distance of more than 25,000 light years, NGC 6539 is marginally closer to us than better known neighboring globular M14 in central Ophiuchus. But its distance still places it in the vicinity of the Milky Way's galactic bulge.

NGC 6886 rating HARD
planetary nebula in Sagitta
RA 20h 12.7m Dec +19d 59.0' (2000)
Magnitude 11.4

Not to be confused, number-wise, with NGC 6866, NGC 6886 is a small planetary in the eastern end of the concise little constellation of Sagitta,the Arrow. Sagitta is the 3rd-smallest constellation, larger only than Equuleus, the "little horse," and Crux, the Southern Cross. Sagitta covers just 0.19% of the total area of the sky. Looked at another way, if the entire sky were divided into constellations about the same size as Sagitta, we'd have over 520 constellations instead of our current 88. That could present an interesting naming challenge!

NGC 6886 was discovered by Ralph Copeland on September 17, 1884. He also discovered planetary NGC 6891, about 7 degrees due south in Delphinus, the same year. Copeland was an English astronomer who eventually discovered 35 NGC objects, most of them with Lord Rosse's 72-inch reflector, and became Astronomer Royal for Scotland in 1889.

NGC 6886 is a tiny planetary, about 9"x9", that lies at the NW apex of a thin triangle of stars pointing ENE. At 250x in a 10-inch it appears starlike. In a 12-inch at 225x it has a greenish hue, in contrast to other nearby stars, but remains stellar in appearance until about 450x. At that point it begins to show a SE-NW elongation, with a brighter but nonstellar center.

Image of the Month

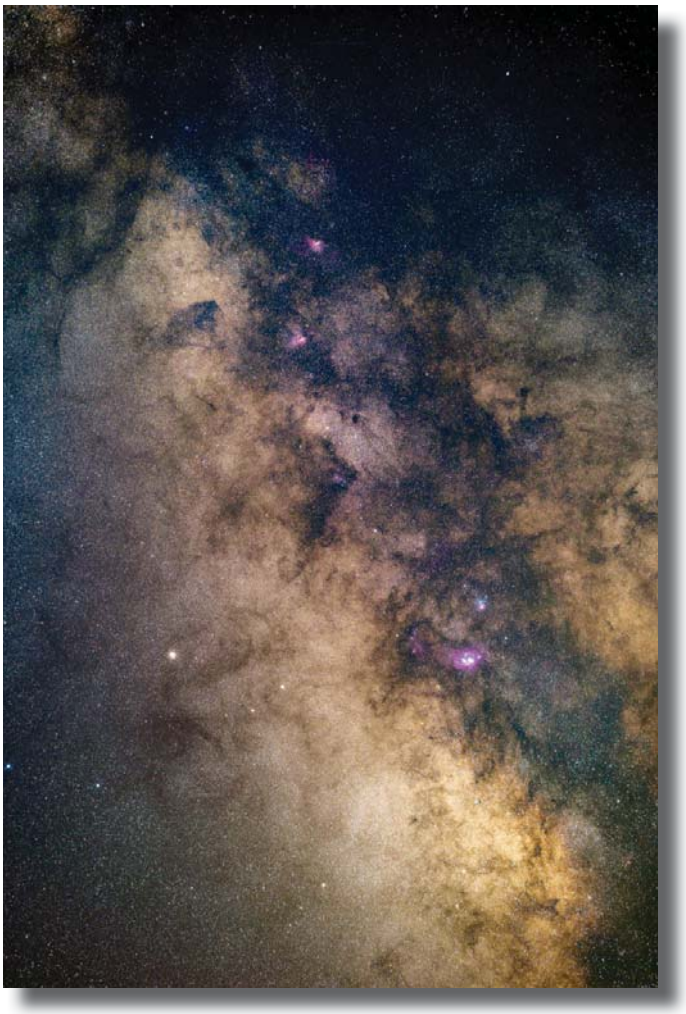
Congratulations!

Todd Hargis

Rho Ophiucus

Nikon D810, Carl Zeiss 135mm f/2 Apo Sonar @ f/2. ISO 250, 5 minute exposure
Taken at Canyon of the Eagles, July 2, 2016

Members' Gallery



Milky Way From Pedernales Falls

Nikon D810
Carl Zeiss 85mm f/1.4
Milvus lens at f/2.8
ISO200
5 minute exposure
June 28, 2016

Images by Todd Hargis

Lagoon and Triffid

Nikon D810 W/ Nikon 300mm
f/2.8 G VRII lens @ f/2.8
5 minutes
ISO 200
Pedernales Fall State Park
June 28, 2016

Saturn
By Marc Crisantes

Meade 11-inch
Lewis Ranch
Burnet, TX

IN YOUR OWN BACKYARD: IMAGES FROM THE AUSTIN ASTRONOMICAL SOCIETY

Texas Museum of Science & Technology
1220 Toro Grande Dr.
Cedar Park, TX, 78613

Through March 2017

http://txmost.org

Hubble's bubble lights up the interstellar rubble

By Ethan Siegel

When isolated stars like our Sun reach the end of their lives, they're expected to blow off their outer layers in a roughly spherical configuration: a planetary nebula. But the most spectacular bubbles don't come from gas-and-plasma getting expelled into otherwise empty space, but from young, hot stars whose radiation pushes against the gaseous nebulae in which they were born. While most of our Sun's energy is found in the visible part of the spectrum, more massive stars burn at hotter temperatures, producing more ionizing, ultraviolet light, and also at higher luminosities. A star some 40-45 times the mass of the Sun, for example, might emits energy at a rate hundreds of thousands of times as great as our own star.

The Bubble Nebula, discovered in 1787 by William Herschel, is perhaps the classic example of this phenomenon. At a distance of 7,100 light years away in the constellation of Cassiopeia, a molecular gas cloud is actively forming stars, including the massive O-class star BD+60 2522, which itself is a magnitude +8.7 star despite its great distance and its presence in a dusty region of space. Shining with a temperature of 37,500 K and a luminosity nearly 400,000 times that of our Sun, it ionizes and evaporates off all the molecular material within a sphere 7 light years in diameter. The bubble structure itself, when viewed from a dark sky location, can be seen through an amateur telescope with an aperture as small as 8" (20 cm).

As viewed by Hubble, the thickness of the bubble wall is both apparent and spectacular. A star as massive as the one creating this bubble emits stellar winds at approximately 1700 km/s, or 0.6% the speed of light. As those winds slam into the material in the interstellar medium, they push it outwards. The bubble itself appears off-center from the star due to the asymmetry of the surrounding interstellar medium with a greater density of cold gas on the "short" side than on the longer one. The blue color is due to the emission from partially ionized oxygen atoms, while the cooler yellow color highlights the dual presence of hydrogen (red) and nitrogen (green).

The star itself at the core of the nebula is currently fusing helium at its center. It is expected to live only another 10 million years or so before dying in a spectacular Type II supernova explosion.

Image credit: NASA, ESA, and the Hubble Heritage Team (STScI/AURA), of the Bubble Nebula as imaged 229 years after its discovery by William Herschel.

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Reaching out with Dawn Davies

By Mike Marotta

"I would like to see our membership overrun with families and kids." For past President and current Outreach Chair Dawn Davies, astronomy is about bringing science to people. "I would like to see us work more closely with the state parks at Pedernales, Blanco, and Reimers Ranch." That drive for active participation aligns with her experience growing up in San Francisco.

Her father's interest in science led to hers. They would go with the local stargazers club to the farm country west of the city, or up into the mountains. At the Mt. Tamalpais theater she heard a lecture by SETI astronomer Jill Tarter. But even on the sidewalks of San Francisco, she once met John Dobson.

Away from the city lights, the seeing was good, especially when the fog rolled in and covered them. But, she says, "it was not until I went to a Texas Star Party that I had that experience: there are so many stars!" That sense of wonder motivates her work with all of our outreach programs. Astronomy on Tap has become a huge success. A worldwide organization (www.astronomyontap.org), the Austin parties are among the largest, drawing up to 400 people to the family-friendly North Door at 501 Brushy, just east of I-35.

Davies grew up during the space shuttle era. "I was four or five watching the television at school in the multimedia room when the Challenger exploded." Despite the tragedy, the headline news of that time, and of the earlier Mercury and Apollo programs, made outer space a significant feature of popular culture. Now, we have Elon Musk's SpaceX, Richard Branson's Virgin Galactic, among others. And we continue space probes such as the recent Juno satellite to Jupiter. But she notes that the excitement is not in the headlines, the way it was. So, for her, the mission of science education is highly personal, one-on-one. She is willing to sit with one youngster for a couple of hours and answer all of their questions. Not surprisingly, when she was president of her high school astronomy club, they did outreach similar to ours, going to elementary schools to talk to kids about stars, outer space, the planets, and the night sky.

She still has the remnants of her first telescope, a 60-mm Celestron refractor. "It fit in a lawn chair bag along with the accoutrements," she says. It finally wore out going to AAS star parties. She next owned an 8-inch Zhumell reflector, which she received from AAS member Tim Brown, who had inherited it from Bill Tschumy, who was a co-developer of the SkySafari software, which she uses on her iPad. Davies now owns a 10-inch Orion Dobsonian.

Dawn at the Texas Star Party in 2014.

Photos courtesy of Dawn Davies

Davies (continued)

Dawn joined the club at the September 2008 star party at Canyon of Eagles. The following June, she was elected club secretary. She served for two years. Then she was chosen Outreach Chair, a post she held for two years before serving two years as President. She again moved into the Outreach Chair slot, where she serves in an interim status until someone else can step up to fill the role.

Dawn working on reconstruction of her scope base.

In addition to continuing Austin Under the Stars, she wants to resurrect the junior astronomers program of the AAS. The intention was to serve our student members from five to 18 years of age who may not have adult mentors. Of course, we work with them and their mentors together when possible. But the program is to be built around what the juniors want. "You might be talking about the chemical compositions of stars," Dawn says, "and they find that 'wow' in the chemistry." She also points to our "Out of the Box" program for people with new or unused or just under-used telescopes. Those are held at the Canyon of Eagles members-only parties.

Helping people to get involved in astronomy nurtures the field, assuring its future success. "Astronomy is the only arena where you can say 'I am an astronomer' and not have to present a Ph.D.," Dawn says. Amateurs discover asteroids and comets; and with crowd sourcing via the Internet they discover things that professionals do not. "You can make a worthwhile, needed contribution." It can begin with someone showing someone else how to use a planisphere.

Dawn talking about one of her favorite subjects, astronomy for everyone, at Astronomy on Tap ATX in September, 2015.

Report: A Few of the Holmberg Galaxies

By Akarsh Simha

I have a tendency to prefer small observing programs with few objects. Part of the reason is a search for variety. Part of it, one may say, is a certain lack of systematic pursuit that the larger programs like the Herschel 400 demand. This is why I love the Springer book "Galaxies and How to Observe Them" by Wolfgang Steinicke and Rich Jakiel. The last section of the book is full of wonderful short observing programs going beyond the Milky Way, including several obscure targets. It is here that I found out about the Holmberg galaxies.

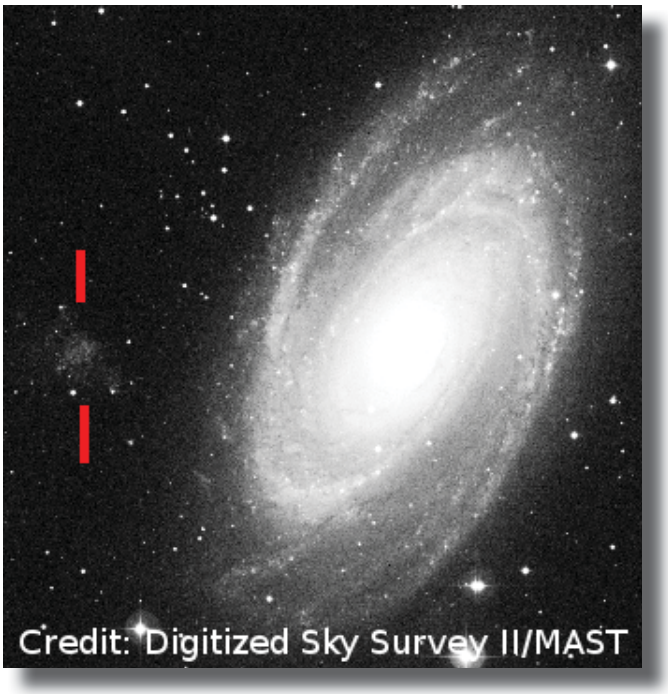
For those that like faint challenges (visual or photographic), have access to dark skies, and like short lists, this is a great program. There are only 9 of these galaxies. They were detected by Erik Holmberg while at the Lund Observatory in Sweden. Of the 9, some are very faint, and some are accessible in even 5" telescopes. Some of them are dwarf galaxies.

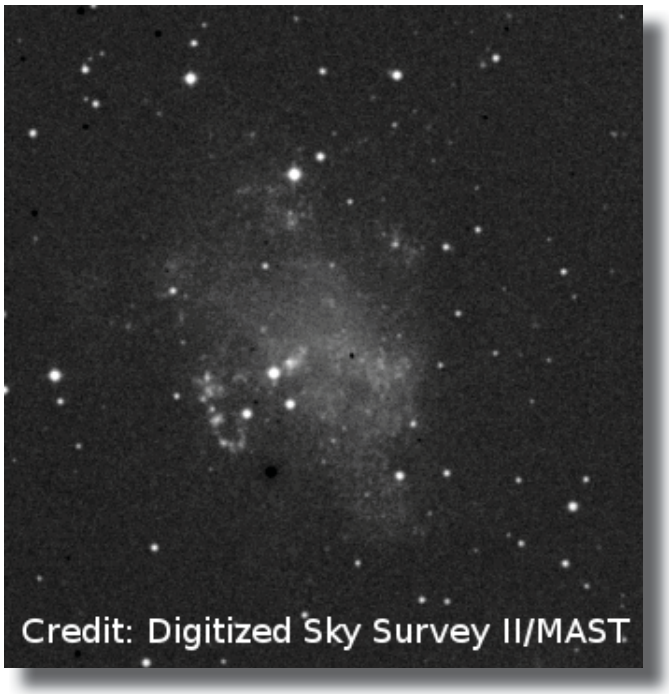
German visual observer Uwe Glahn has observed all 9 with a 16" telescope. According to him, Holmberg published these galaxies in three publications in 1950 and 1969. Holmberg I, II and IX belong to the M 81 group, and Holmberg IV to the M 101 group.

Visual observation reports of all 9 Holmbergs in varying apertures (6" to 20"!) are listed in the aforementioned book. Uwe's observations are available at his website **http://www.deepsky-visuell.de/Projekte/Holmberg.htm** in German. My observations of the list with an 18" (mostly from Texas Hill Country and Texas Star Party) are listed on the deep-sky forum along with attempts at translating Uwe's reports. **http://www.deepskyforum.com/showthread.php?780-Observations-of-the-9-Holmberg-dwarfs** For brevity, in this submission, I shall only pick a few of the nine to describe.

Holmberg IX (= UGC 05336):
Of the nine, Holmberg IX is probably the faintest and most difficult to visually observe. However, it might be the most photographed of the lot. Reason? It's right next to M 81!

Here is an image of the region around Bode's galaxy from the Digitized Sky Survey, contrast-enhanced and annotated to show Holmberg IX.





Holmberg (continued)

I first came across this object in an amateur image of M 81. The thought of observing a dwarf of M81 is exciting, isn't it? Unable to observe it in my 18" despite the excellent conditions at Texas Star Party 2012, I went up to the largest telescope on the middle field, and requested the owner if I could see it. Being a galaxy aficionado, he obliged and we looked at it. It was still somewhat difficult to see in that large aperture! But we felt brightnenings at 3 different locations on the galaxy at different times. The entire blob could be held in averted vision only occasionally.

Last year, at TSP 2015, I managed to detect this in my 18". Better eyepieces with more contrast, better observing skill, better collimation and tracking probably contributed to this success. This is a tough nut.

Holmberg II (= Arp 268, UGC 04305):
Holmberg II is an irregular galaxy not far from M 81, listed in Holmberg's 1950 paper. The picture reminds me of Eagle nebula, but this object is nowhere as easy! However, my friend and I managed to pick it out in a 5" Takahashi refractor, and while it was certainly not easy to see, it was not as indistinct as I'd imagined it would be! But we were in some very good skies too – it was a clear night last December near Crowell, TX at the Commanche Springs Astronomy Campus.

It's a short star-hop from M 81 to Holmberg II. With my 18", the object was rather easy. I was able to pick out the central bright region of the object and also hold two brightenings within that region. The HII regions could not be seen.

Holmberg VI (= NGC 1325A)
Here is something on the opposite hemisphere, and in the NGC catalog! This is a galaxy in Eridanus. I observed this at Okie-Tex star party 2015 (where it rises lower than it gets in Texas) without difficulty. A 14mm Pentax eyepiece shows hints of mottling. Some reports from Germany seem to indicate that this is a difficult object, likely because of its very low altitude at those latitudes.

Holmberg VIII (= UGC 08303)
14" telescope. I haven't tried it in any smaller aperture than my 18", but it wasn't too difficult. Could be held steadily with averted vision. The irregular shape of the galaxy could be sensed as well. The object was found without difficulty just south of NGC 5033.

Some biographic notes on Prof. Holmberg:
I found the following in the "Biographical Encyclopedia of Astronomers"1 article on Holmberg by Gary Wegner:

***"Holmberg was one of the first to consider determining galaxy masses from rotation curves."

***He discovered the Holmberg effect – significantly more number of satellite galaxies lie in projection above the poles of spiral galaxies than in the equatorial planes.

***He constructed an analog computer with light bulbs and photocells to simulate the collisions of galaxies in 1941!

***"His waltz with Russian astronomer Anna Massevitch was one of the highlights of the closing banquet of the IAU General Assembly in Brighton in 1970"!

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