

THE EVENT HORIZON



ST. LOUIS ASTRONOMICAL SOCIETY

Devoted to the Interest and Advancement of the Science of Astronomy

VOLUME 31, Issue 1
January, 2021

Why There Should Not Be Dark Matter In the Halos of Galaxies

by
Anne M. Hofmeister
Washington University

Research Professor Anne M. Hofmeister of Washington University will be featured at the January meeting of the Saint Louis Astronomical Society. The meeting will be held via Zoom online conference only, due to the COVID-19 outbreak. The meeting and lecture will begin at 7:30 p.m. on Friday, January 15. Zoom access information is posted below.

“Dark matter” is a theoretical, invisible substance thought to be necessary to explain the motions of galaxies and distortion in images of some distant galaxies. Its nature is unknown. Many researchers think it is a new type of subatomic particle, which does not emit light, heat, or other radiation. Dr. Hofmeister will talk about the search for dark matter, and reasons for doubting its existence in the halos of galaxies. Based upon principles of the physics of heat, she will explain why dark matter, if it exists, should

be located at the center of a galaxy and not in its halo of very low density gas.

Dr. Anne Hofmeister is a Research Professor of Earth and Planetary Sciences at Washington University. Her research interests include classical physics applied to astronomy, heat transfer, and dust in space. Her laboratory experiments utilize very high pressure and laser-flash devices to probe the physics of low temperature materials such as interstellar space dust and high temperature materials such as rock in the Earth’s mantle. Dr. Hofmeister is the recipient of the 2020 Professional Excellence Award in academia/research from the Association for Women Geoscientists

Upcoming Meetings 2021

February- Raymond E Arvidson, PhD Perseverance Rover Mission - Mars 2020 Washington University
March- K Michael Malolepszy Probing the Sub-Microwave Universe Part III SLAS
April Ian H. Redmount, PhD Cosmic Roller Coaster St. Louis University
August- Robert Criss, PhD Galactic Rotation & Dark Matter Washington University

Mid States Region



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READ ME !!!!!!!

**Beginning in March, SLAS will have it’s own Zoom account and the link for the meetings will CHANGE!
We’ll keep you posted for the new ID.**

Joining a Zoom Conference Meeting: Everyone can join! No Computer Required!

Joining us for a Zoom Conference is easy! All you need is any of the following: Computer, desktop or laptop, smartphone, **OR** any regular phone! The meeting will be open from 6:30-11pm. The extra time is to allow socializing before or after the meeting

Below is the invitation to join:
To join Zoom Meeting for SLAS Regular Meeting with computer or smartphone:
Just click the link below:
<https://zoom.us/j/8604505790>
Meeting ID: 860 450 5790
Dial by ANY phone using your location (any phone will work)
+1 312 626 6799 US (Chicago)

President's Corner

by
Jim Small

Sincere apologies for the tardiness of the newsletter for January (ok, we're way beyond tardy here...) No excuses, just a lot going on with me. BUT, it might be a little easier for February as I won't be dealing with any computer issues anymore in using publisher (or any other pc program for that matter) as I finally stopped using my mac to also run window as the programs are having issues talking to each other... Picked up a nice refurbished HP laptop instead. Thanks to Bill Neubert for the help with that! Now I can run all those pc astronomy programs easier as well. Nothing like a new clean install. But enough of that. Thanks to Grant Martin for the article this month about his efforts with the Jupiter-Saturn conjunction this month. Thanks also to Don Ficken for the photo of the madhouse that was at Broemmelsiek Park for the conjunction.

I spent the week before the meeting last month at the AAS convention, which was a huge meeting. If you aren't aware, amateurs are able to register for a conference like that for \$149 for the entire week, way cheaper than it is for AAS members. Some terrific talks and you will see some

of the people that presented at the meeting later this year. One of my favorites was a panel on Voyager and the record of the golden disc that was sent up with the spacecraft. Bradley is working as we speak on setting SLAS up for a couple of the panelists to speak to our group in the fall. I can't wait.

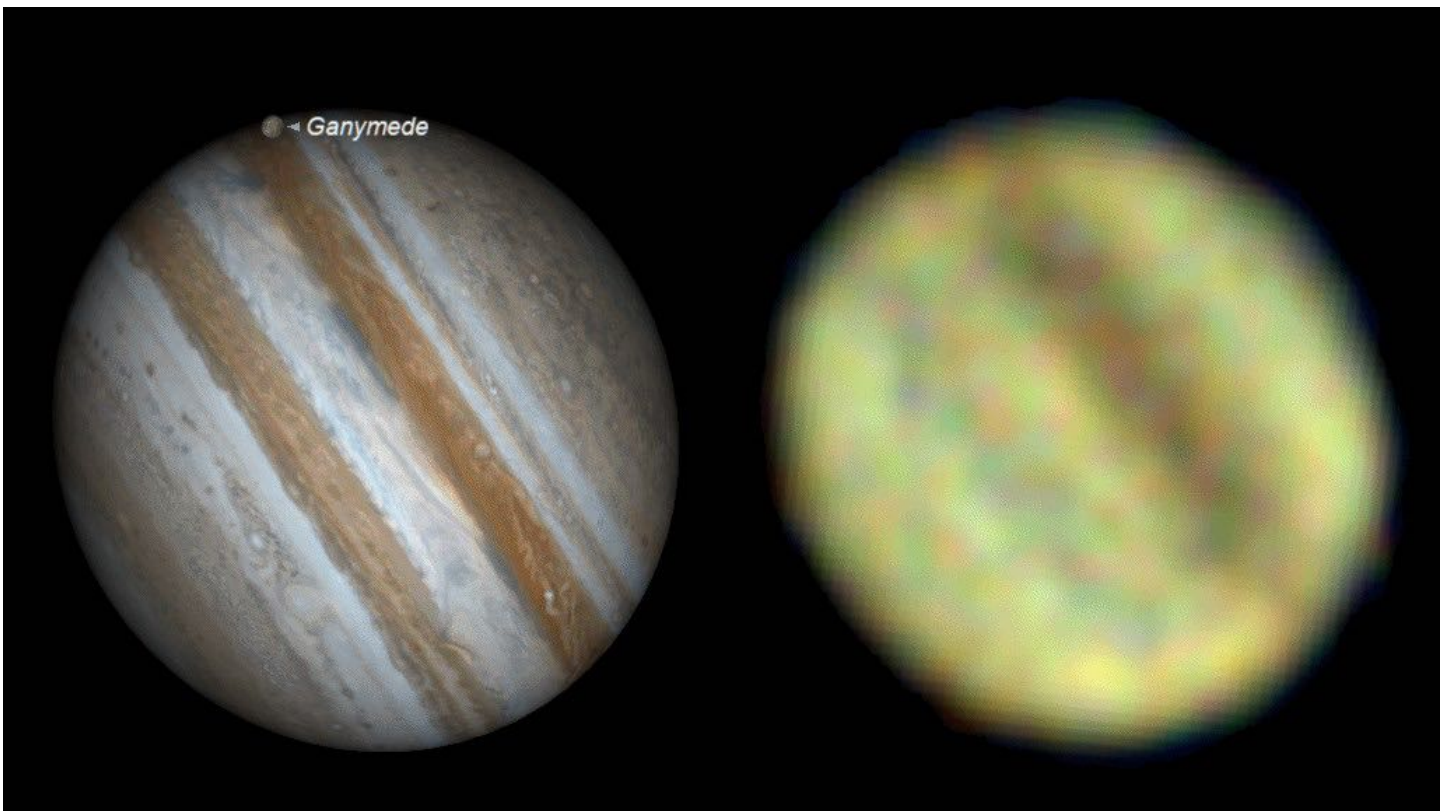
The loaner program has benefited once again from several donations that will likely be sold off to benefit the program again. Here is the short list of telescopes available for sale most likely (make an offer!!)

- Cave Astrola 6" (f8?) Newtonian with pier mount and many accessories
 - Meade 6" f5 Newtonian with pier mount and many accessories
 - Bauch and Lomb Criterion 4000 4" sct and tabletop mount with case and accessories
 - Monolux 4380 refractor with nice wood case and accessories
 - Galileo Telescope (4" Newtonian) and mount
- Pictures and more information in the next newsletter before the February meeting.

DON'T MISS next meeting: Ray Arvidson speaking to us the **DAY AFTER** the **PERSEVERANCE** landing on Mars!



Crowds at Broemmelsiek Park to see the Jupiter-Saturn conjunction December 21st. (photo by Don Ficken)



Transit of Jupiter by Ganymede by Grant Martin



For Sale

**Celestron Nexstar SE 6 inch
GOTO Telescope and Tripod**

Hard shell carrying case (\$250 retail)
25mm Plossl eyepiece
1.25 Star Diagonal
6 inch Bahtinov mask
T Adapter #93625, Piggy back mount, mounted laser pointer
Bought new June 2016
Excellent condition - limited use
Price \$850 (32% off retail)

**Revolution 2
Imager Bundle**

Revolution DVR
Other accessories
Retail price \$438
For sale at \$300



**Inquiries, please contact
Jim Morrison
401-486-9728**

Jupiter - Saturn Conjunction *by* Grant Martin

As we know now, December 21st had scheduled a conjunction of Jupiter and Saturn. As we also know, no decent astronomical event goes uncloudy. Or as Jim Twellman likes to observe “The chances of clouds are exponentially proportional to the rarity of the event” – and this one won’t be around for another 800 years or so. So yeah, rare. Knowing all this, I went a day early because it really did look like clouds were going to move in for the next few days. And even the 20th was looking iffy.

Ha! Not so fast Mr. Weatherman. It turned out to be an amazingly clear & stable atmosphere for photography. I arrived at Broemmelsiek park well before sunset and yet, there were already a few folks out getting ready as well. Please forgive me for not making this a COMPLETE observing report but I was kind of single mindedly focused on imaging so I didn’t “take names”.

The sunset was remarkable. On the right is the silhouette of my scope and the bright points just to the left of it are Jupiter & Saturn. The scope is a Celestron C6 (6” f10) with a ZWO ASI 385MC camera attached.

And the image of Jupiter and Saturn below right is the result of post-processing a video I took WITH that setup. Jupiter and Saturn are pretty much correct for the difference in brightness. I like this image because it shows the relative brightness difference between these two planets. It’s even more dramatic when you consider that Saturn is WAAAYY off in the distance. About as far from Jupiter as Jupiter is from us. Jupiter is 5AU from us and Saturn is about 5 AU from Jupiter. That’s kinda like being in Hazelwood Missouri and looking at Jupiter in Columbia Missouri with Saturn hanging out in Kansas City, Kansas (ok, Missouri, Kansas, it’s all the same at that distance). Unfortunately, Jupiter’s Moons on the other hand came out a bit too bright by the processing.

If you look closely, you can see the “Great Red Spot” just rotating into view (inset). As I was processing this image with AstroSurface, I was really surprised to see this kind of detail from such a small scope and camera combination. I had to fire up Starry Night Pro to verify this was NOT some kind of processing artifact. It wasn’t!

It was an impressive night for sure. There were about 30 people who showed up at the park to see this rare event and three other astrophotographers as well.

We had no idea what was in store for us less than 24 hours later!



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21 December 2020, "The Big day".

Boy was I shocked. No, not that the weatherman was wrong yet again (that's a given), I wanted to get to the park early and by early, I was targeting 3PM. You know, rush n stuff. I actually got there about 3:45 and this is where the shock came in: I could see cars parked in the lot from Schwede road BEFORE the turn in. Uh oh. I pulled into a nearly full lot. Yeesh. All the pads were taken. ??? Ok, now what? Maybe I can mooch an outlet with my extension cord. But ya know, it already was looking like a three ring circus and it undoubtedly was going to grow more rings as the day progressed. But I was on a mission so "fun be darned".

I got back in the van and started to look for points East that gave a better, less "congested" view. I didn't get far when I found the East lot just a few hundred yards away and a dozen feet higher in altitude. IT was already starting to jam up so I went to the far corner and hoped a ranger wouldn't run me off. Please note the line of cars on the Eastern horizon: That's the overflow lot for the Astronomy area itself. Yeesh, they're about to start lining them up on the side of Schwede. In fact, later that night, the Rangers were directing them into the grass at the entrance to the main part of the park. I've never seen the park like this before. But then again, it IS "The Christmas Star", and it IS the age of COVID, and peeples been cooped up at home, so yeah, any excuse to get out the house



Sunset in the park

Problem is, for the astrophotographers, we had gale force winds all day and it wasn't dissipating. I mean I like that song well enough but "Good vibrations" isn't what you want when you're taking high magnification astrophotographs. In fact, the relevant song would be called "BAD vibrations".

About the time I was starting to setup, this guy off in the distance calls my name. As he walked up he yelled "It's Paul. From last night." He was one of the astrophotographers that was in the park last night ... and he's no slouch...we don't know him... yet. He'll make a good addition to the group.

We commiserated about our bad fortune relatively speaking but setup anyway.

Everything was good but the wind sent the seeing into negative numbers. Between the wind generated vibrations and the hellatiously rapid air movement at altitude, the images were just fuzballs.

I learned a long time ago that the current software tools can work miracles with what would normally be considered bad data so I started capturing videos.

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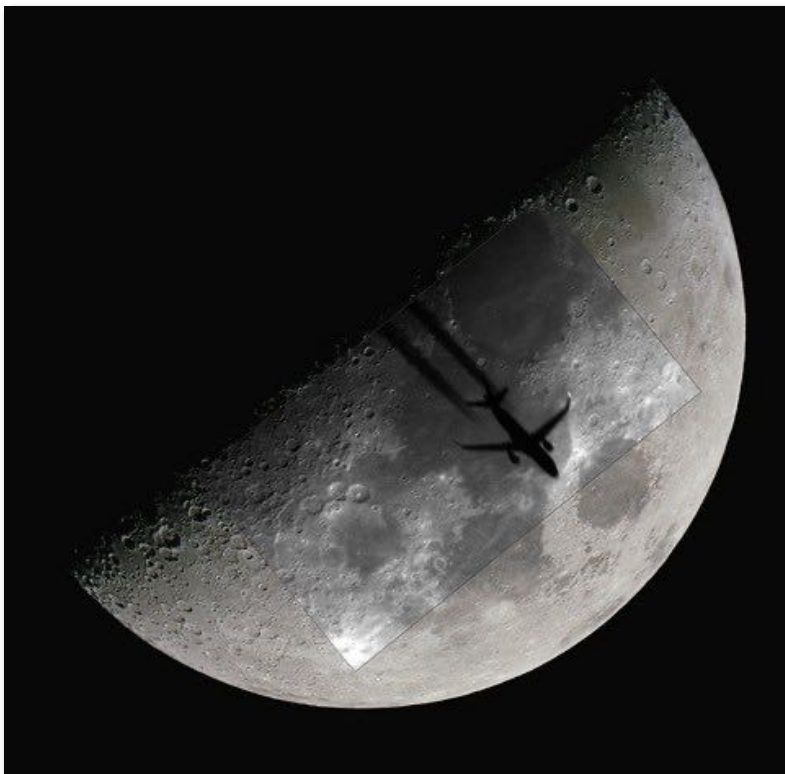
(Continued from page 5)

I'm glad I did. Little attention was paid to another astronomical event that would occur this evening. That event was Ganymede transiting the face of Jupiter. But bad seeing. No real chance of catching it(?) The on screen video hardly showed a detail on Jupiter. But perseverance.

By 6:30, Jupiter & Saturn had set and so we switched to the Moon. Yet another event was going to take place this evening and that would be the appearance of "The Lunar X". I had taken a few images and was watching a jet approach the Moon. "No way" we thought. YES WAY, RIGHT IN FRONT OF IT! I had started a 1000 frame sequence and it was getting close to the end of the "Film" so to speak. We watched it on the monitor and I captured it starting at frame 945. Image on right is full frame and the image below is as it appeared to us from the ground



Copyright 2020 Grant Martin



About 8PM we got the bums rush from the Rangers. Turns out this part of the park is NOT open 24/7. We forgot that.

Post processing the images didn't show anything at all as good as last night. They WERE closer together. Here's the best one I could get...



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And this is an image from a 39 plus inch telescope down in Chile. We should have been so lucky. But there is one little detail here: Saturn's brightness has been "boosted" a bit relative to Jupiter. The operator probably took an exposure for Jupiter, then one for Saturn, and then one for Jupiters' Moons and then composited them into this image. Why do I think this? Because Jupiter is magnitude -1.97 and Saturn is magnitude .63. That's a magnitude 2.60 difference. Using a ballpark equation of 2.51 raised to the power of the magnitude difference yields a value of about 11. Meaning Jupiter should appear 11 times brighter than Saturn in this image. And the Moons? They are about magnitude 5 ish resulting in a magnitude difference of 6.97 ish relative to Jupiter. Call it 7ish. Which means Jupiter should appear 627 ish times brighter than even Ganymede. That can't be caught by ANY camera in a single shot.

But hey, I'm not casting shade. Just identifying why I thought there was something odd about this image and why I made the caveat about the moons in mine. So like the old CBS catch phrase "The more you know"

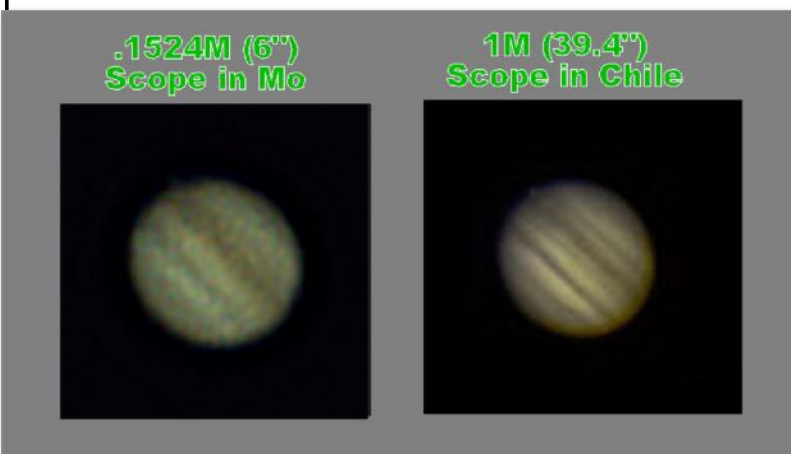
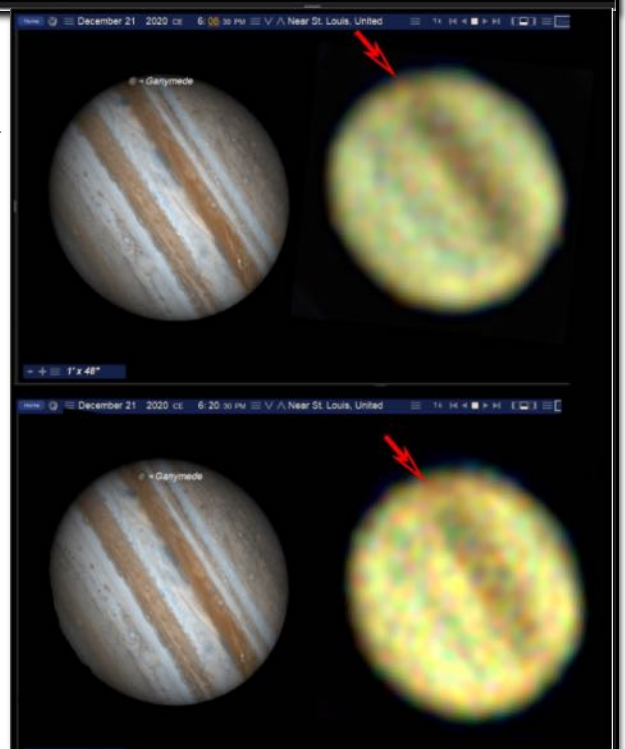
But wait, wait! There's more! After processing my data, I discovered I was able to capture the start of the transit of Ganymede.

It started just before 6.

The inset image shows Io, Ganymede, and Europa (from top left to bottom right) but blows out Jupiter. The next image shows the start of the transit and a few minutes into it. The data was quickly processed but I think an expert could really pull out better images from the data

Below: Just before ingress As seen in Missouri AND Chile **Right:** The composited image above from my data shows the Ingress of Ganymede and several minutes later (the arrows point to "orange-ish" blobs that when viewed as an animation, conform to the locations predicted by Starry Night Pro).

I continue to be amazed at what today's technology allows us to accomplish for so little cost. Even though we didn't catch the Lunar X, it was still a rare bit of fun and relaxation in the year 2020. :-) GM



**St. Louis Astronomical Society
Devoted to the Interest and Advancement
of the Science of Astronomy
Executive Board Meeting Minutes 12/3/2020**

1. Opening Activities

- a. Attendance: Jim Small, Bill W, John N, Brent B, Brad W. Mark J, Larry Campbell
- b. Open Meeting: 7:02pm
- c. Approval of last month's meeting minutes. Bill motion to approve second by John minutes approved
- d. Next Board meeting date: Dates for 2020: Meetings will be via Zoom until further notice: Dec 3, Jim will set up Board meetings for 2021 on the first Thursday in NSN

2. Upcoming General Membership meeting topics:

- a. Speaker: Maura McLaughlin, PhD, Pulsars: Timekeepers of the Cosmos
- b. Speaker Press Release: Brad sent bio to Rich H.
- c. Special Awards needed: Move Special recognition awards to January
- d. Special Business needed: Budget Presentation and vote
- e. A101: Mark Jones Jupiter/Saturn Conjunction
- f. Solstice prizes – Lookin up optics is donating a solstice prize, 2 or 3 Orion Neb T-shirts, Greenbank Observatory postcards. Mark to post photos on Facebook page

3. SLAS Financial Report YTD as of Nov 30

- a. Balance Sheet Total Equity \$82,881
- b. Profit/Loss report. Total Income \$7,363, Gross Profit \$5,150,
- c. Annual Budget meetings – any modifications to the budget documents?
- d. Corporate filings: none this month
- e. S&T raising their price \$11. SLAS absorbed the difference in subscription cost. The paypal and various renewal forms have been updated to reflect the new price.

4. Speaker Committee

- a. Budget - \$500, balance \$22
- b. Upcoming speakers:

SLAS Monthly Meetings

Presentations 2020

Month	Name	Topic	Sponsor
18-Dec-2020	Maura McLaughlin, PhD	Pulsars: Timekeepers of the Cosmos	University of West Virginia

Presentations 2021

Month	Name	Topic	Sponsor
15-Jan-2021	Robert Criss, PhD	Galactic Rotation & Dark Matter	Wash U
19-Feb-2021	Raymond E Arvidson, PhD	Perseverance Rover Mission Mars 2020	Wash U
19-Mar-2021	K Michael Malolepszy	Probing the Sub-Microwave Universe Part III	SLAS
16-Apr-2021	Ian H Redmount, PhD	Cosmic Roller Coaster	SLU
16-May-2021	Larry Bartoszek, PE	The Connection Between the Periodic Table & Astronomy	NSS
18-Jun-2021	Brad Jolliff, PhD	China's Exploration of the Moon: The Chang'e Missions	Wash U
16-Jul-2021	John Newcomer	Hiking on the Mountains of the Moon: The Voyage of Apollo 15	SLAS
15-Jan-2021	Anne Hofmeister, PhD	Thermodynamic Constraints on the Non-Baryonic Dark Matter Gas	Composing Galactic Halos Wash U
17-Sept-2021	Larry Bartoszek, PE	Digital Sky Survey Telescope	The Sloan NSS

5. Membership Initiatives

- a. Budget - \$400, balance \$45
- b. Welcome Aboard Meetings – none planned at this time
- c. Raffles – none planned at this time
- d. Attendance prizes this month Randy Harrison donating choice of binoculars or Explore Scientific 62deg eyepiece, package from Green Bank Observatory, Tee Shirts from Infini-tees, Star Date subscription

6. Membership Recognition

- a. Total Budget \$900, balance \$762
- b. NSN Outreach Awards: planned for Feb
- c. Membership Report: Report sent by Don Ficken before the meeting. As of 11/30/2020 SLAS has 198 members.
- d. Member anniversary awards - The membership pins and certificates were mailed on Monday.

We need to set a time to go pick out the Special Award plaques and make an appointment with Mueller's. I think we should open up the selection to the entire committee. Larry will send message to awards committee on when to visit

- e. New Award program - \$600 budget, \$762
- 1. New Award Committee report: Chairman – Larry Campbell, Jim Small, Mark Jones, Cook Feldman, Sharon Bertram, Fred Schovanez, Bill Neubert
- 2. New Award Policy and nomination process – No changes proposed at this time
- 3. Submittal deadlines – May 2021
- 4. Nomination reviews: July 2021
- 5. Award selection: done
- 6. Plaques purchased: in work by Larry and Jim
- 7. Awards presented: Planned for January

7. Outreach

- a. Budget - \$1100, balance \$802
- b. Member Training Program Status: on hold for the time being.
- c. Purchase of T-shirts for volunteers completed training – on hold for the time being.
- d. Purchase of lawn signs: completed
- e. Upcoming outreach events: None for December
- f. Awards/recognition – Mark will send email reminding members to get their volunteer hours. 2 events needed to qualify for a pin
- g. NSN Outreach hours - As of Dec 2nd we have 17 members with 2 or more events and members have logged 286 hrs for 2020. Special kudos to Bill Breeden and Don Ficken for coming up with virtual outreach ideas

8. Old Business: None

9. New Business: None

10. Other Committee Reports: If needed

A. SLSC Business:

- a. First Friday actions: No first Friday planned for early 2021
- b. Other immediate business - None

B. SLCL Business:

- a. Annual contract – On hold due to COVID
- b. Upcoming events next year - There are a few

C. Jefferson College Business:

- a. Committee Meeting report: Construction bids for phase1 have been received and reviewed. Approved bid will be reviewed with college board on Dec 6. Construction for phase 1 which includes the observatory slab and prier expected to begin early 2021.
- b. Upcoming Outreach Event: Virtual event Sunday, Dec 6

11. Closing Activities

Motion to adjourn by Brad, second by John. Meeting closed at 8:38pm

St. Louis Astronomical Society Profit & Loss Budget vs. Actual January through December 2020				St. Louis Astronomical Society Balance Sheet As of December 31, 2020		
	Jan - Dec 20	Budget	\$ Over Bud...		Dec 31, 19	Dec 31, 20
Ordinary Income/Expense				ASSETS		
Income				Current Assets		
Events Income	670.00	1,620.00	(950.00)	Checking/Savings		
Magazine Subscription	2,381.95	1,437.10	944.85	Checking - First Bank	7,187.45	7,587.88
Membership Dues	4,960.00	4,265.00	695.00	Deposit, Certificate of	15,841.67	15,925.53
Total Income	8,011.95	7,322.10	689.85	Library Telescope Escrow	1,053.86	1,206.41
Cost of Goods Sold				PayPal	77.94	747.44
Magazine Subscriptions	2,500.85	1,437.10	1,063.75	Savings - First Bank	41,122.69	41,145.74
Total COGS	2,500.85	1,437.10	1,063.75	YMCA Trout Lodge Escr...	14.21	0.00
Gross Profit	5,511.10	5,885.00	(373.90)	Total Checking/Savings	65,297.82	66,613.00
Expense				Other Current Assets		
1-Programs & Events	1,772.55	4,210.00	(2,437.45)	Inventory Asset	761.53	761.53
2-Newsletter	241.34	710.00	(468.66)	Undeposited Funds	20.00	0.00
3-Library expense	198.98	500.00	(301.02)	Total Other Current Assets	781.53	761.53
4-Astronomical League Dues	815.00	860.00	(45.00)	Total Current Assets	66,079.35	67,374.53
5-Loaner Scopes	67.95	100.00	(32.05)	Fixed Assets	15,000.00	15,336.00
6-Brochures		550.50	(550.50)	TOTAL ASSETS	81,079.35	82,710.53
7-Insurance	1,049.50	1,050.00	(0.50)	LIABILITIES & EQUITY		
8-Website	407.36	625.00	(217.64)	Equity		
9-Administrative Expenses	293.64	295.50	(1.86)	Opening Bal Equity	8,497.66	8,497.66
Total Expense	4,846.32	8,901.00	(4,054.68)	Retained Earnings	69,757.14	72,581.69
Net Ordinary Income	664.78	(3,016.00)	3,680.78	Net Income	2,824.55	1,631.18
Other Income/Expense				Total Equity	81,079.35	82,710.53
Other Income				TOTAL LIABILITIES & EQUITY	81,079.35	82,710.53
Donations	102.05		102.05			
Interest Income	106.91	200.00	(93.09)			
LTP Receipts	1,876.81		1,876.81			
Proceeds from Lens Sales	694.10		694.10			
Total Other Income	2,779.87	200.00	2,579.87			
Other Expense						
LTP Disbursements	1,799.26		1,799.26			
YMCA Trout Lodge ESCROW Expe...	14.21		14.21			
Total Other Expense	1,813.47		1,813.47			
Net Other Income	966.40	200.00	766.40			
Net Income	1,631.18	(2,816.00)	4,447.18			

We could use articles for the newsletter. The following topics are fine for submission.

- 1. Star party reports. Let us know how a star party you attended went! Photos would be most welcome in addition to the article.**
- 2. Observing reports. Actually made it out observing? Let us know how it went. Taken some astro photos? Please submit!**
- 3. Bought something or built something? How about a review or an article!**

Send to newsletter@slasonline.org

Upcoming Star Parties and Other Events

For details on these and other upcoming events, check out the Night Sky Network Calendar linked on the Home Page for SLAS at <http://www.slasonline.org>

SLAS Executive Board Meetings Location will be at *Nicoletti's Restaurant in Valley Park* All meetings are on First Thursdays unless noted. **Note: Board meetings will be via Zoom until further notice.** Feb 4, Mar 4, Apr 1, May 6, Jun 3, Jul 1, Aug 5, Sep 2, Oct 7, Nov 4, Dec 2

Dark Sky Observing Dates

Feb 6, Mar 13, Apr 10, May 8, Jun 5, Jul 10, Aug 7, Sep 4, Oct 2, Nov 6, Dec 4

Francis Park Events: These events are on Wednesdays of the week nearest the first quarter Moon
On hold until further notice due to Covid 19

Sky Orienteering Events For members who want to gather and do some relaxed observing at Babler State Park Feb 14, Mar 14, Apr 11

Please RSVP if you plan to come!

SLSC Public Telescope Viewing Events: These events are held the first Friday of the month
Planetarium shows start at 7pm
On hold until further notice due to Covid 19

Pattonville Observatory Public Viewing Dates
See you next year! Maybe!

Broemmelsiek Astronomy Park Public Viewing
Every Friday by appt

UMSL Observatory
For directions and map
<http://www.umsl.edu/~physics/About%20the%20Department/astro.html>

All sessions include viewing of 1st quarter Moon with additional objects

Skywatch Hotline: 314-516-5706

Saturdays:

LET US KNOW YOU ARE COMING!

To RSVP for any of these events log in to the Night Sky Network and submit your RSVP. If the event is canceled, you will be notified immediately according to the preferences you have selected.

SLAS Events

February

4 Thur SLAS Board Meeting
6 Sat SLAS Dark Sky Observing
7 Sun Aim for the Stars - JCO
8 Mon Constellation Tour 32
14 Sun SLAS Sky Orienteering
15 Mon Constellation Tour 33
19 Fri SLAS Regular Meeting - Perseverance Rover Mission!
Ray Arvidson

March

1 Mon Constellation Tour 34
4 Thur SLAS Board Meeting
7 Sun Aim for the Stars - JCO
8 Mon Constellation Tour 35
13 Sat SLAS Dark Sky Observing
14 Sun SLAS Sky Orienteering
15 Mon Constellation Tour 36
19 Fri SLAS Regular Meeting
22 Mon Constellation Tour 37

April

1 Thur SLAS Board Meeting
5 Mon Constellation Tour 38
10 Sat SLAS Dark Sky Viewing
11 Sun SLAS Sky Orienteering
12 Mon Constellation Tour 39
14 Wed Manchester Parks - Schroe
16 Fri SLAS Regular Meeting
19 Mon Constellation Tour 40
24 Sat Bridgeton Night Under the Stars

For other events, watch the calendar on the website. Virtual stargazing events and other online activities will be registered there. We hope you can join us for some of these activi-

SLAS Merchandise Available

SLAS merchandise is now set up for embroidery at **Headz n Threadz** at www.headznthreadz.com

There is now only one location:

1065 Regency Parkway, St. Charles MO 63303

Telephone: 314.528-8100

sales@headznthreadz.com

Simply take the garment, hat, etc you wish to have embroidered and they will take care of it. They have the SLAS logo on file. You may make modifications to the colors if you wish.

SLAS Logo is also available at www.Infini-tees.com



SLAS MEMBERSHIP APPLICATION



Name: Last _____
 First, Middle Initial _____
 Address _____
 City, State, Zip Code _____
 email address _____

Youth @ \$10.00 / 1 year (18 yrs or younger) \$ _____
 Individual @ \$25.00 / 1 year \$ _____
 Family @ \$40.00/1 year \$ _____
Publications with discount available with your SLAS membership:
 Sky and Telescope @ \$43.95 / 1 year \$ _____
 (S&T may also be renewed at their website:
<http://www.skyandtelescope.com>)
 Astronomy @ \$34.00 / 1 year \$ _____
TOTAL ENCLOSED \$ _____

Please send completed form with check (no cash please) made payable to
 St Louis Astronomical Society
 Don Ficken, Membership
 13024 Barrett Crossing CT
 St. Louis, MO 63122

Check all that apply:
 Renewal
 Address Change Only
 Please send my newsletter by regular mail
 New Member!

SLAS OFFICERS

President	Jim Small	314-307-0692
president at slasonline.org		
Vice President	Bradley R Waller	314-481-7250
vicepresident at slasonline.org		
Secretary	Mark Jones	636-394-2342
secretary at slasonline.org		
Treasurer	Bill Winningham, (Don Ficken - membership)	636-357-2763
treasurer at slasonline.org		
Hospitality	Larry Campbell	636-244-2867
hospitality at slasonline.org		
Board Members at Large:		
	Tom Nickelson	314-346-9565
board20 at slasonline.org		
	Brent Buch	314-239-0329
board21 at slasonline.org		
	John Newcomer	314-496-4636
board22 at slasonline.org		
ALCOR	Bill Winningham	636-357-2763
(Astronomical League Correspondent) treasurer at slasonline.org		
MSRAL Rep.	Jim Small	314-909-7211
msral_rep at astroleague.org		

COMMITTEE CHAIRS

Dark Site Coordinator	Mark Jones	636-394-2342
darksite at slasonline.org		
Librarian	Jim Small	314-909-7211
librarian at slasonline.org		
Library Telescope Program	Don Ficken	636-851-9630
librarytelescope at slasonline.org		
Loaner Equipment	Greg Gaines	314-277-3082
loaner at slasonline.org		
Merchandise	Vacant	
merchandise at slasonline.org		
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observing at slasonline.org		
Publicity	Rich Heuermann	314-962-9231
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Recognition	Larry Campbell	636-244-2867
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Social Media	Vacant	
'SLASdialogs' Moderator Mark Jones, Rhonda Whelan		
dialogsmoderator at yahoo.com		
Star Party Coordinator	Bill Breden	314-276-3613
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Telescope Making	Bill Davis, Jim Melka	314-469-3061
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Webmaster	Jim Small	314-909-7211
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Devoted to the Interest and Advancement of the Science of Astronomy

ST. LOUIS ASTRONOMICAL SOCIETY

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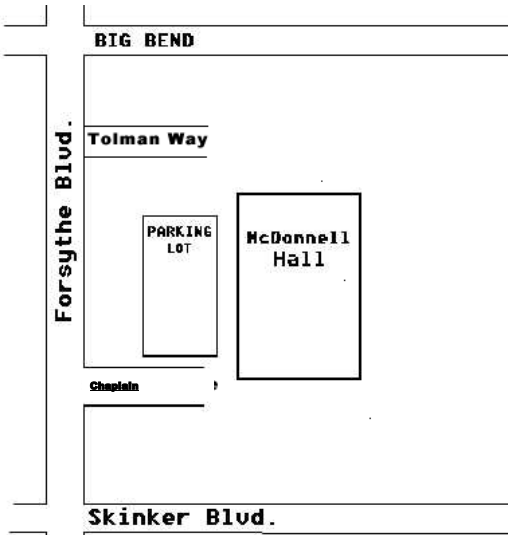


Who We Are and What We Do

St. Louis Astronomical Society is a not-for-profit organization established in 1936. SLAS is devoted to the interest and advancement of the science of astronomy. Our mission is to promote an understanding of the science of astronomy to our members and to the public. Membership is open to anyone with an interest in astronomy.

For more information contact any SLAS officer or visit our website listed above. SLAS is affiliated with the Astronomical League, Night Sky Network and the Mid-States Region of the Astronomical League.

Meetings are held the 3rd Friday of each month at McDonnell Hall at Washington University. See the map to the right for directions.



St. Louis Astronomical Society

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