

THE EVENT HORIZON



ST. LOUIS ASTRONOMICAL SOCIETY

Devoted to the Interest and Advancement of the Science of Astronomy

**VOLUME 30, Issue 8
August, 2020**

Standing on the Shoulders of Apollo 15: Past and Future Lunar Exploration

**by
Dr. Jeffrey Gillis-Davis
Washington University**

Dr. Jeffrey Gillis-Davis of Washington University, will be featured at the August meeting of the Saint Louis Astronomical Society. The meeting will be held via Zoom (see below) The meeting and lecture will begin at 7:30 p.m. on Friday, August 21.

Only 27 people (24 individuals, 3 went twice) have traveled to the Moon, and only twelve have walked upon its surface. Apollo 15, the fourth successful lunar landing mission, launched on July 26, 1971. Dr. Gillis-Davis will talk about the science and exploration of the Moon, from Apollo 15 to the upcoming NASA Artemis mission to return astronauts to the Moon in 2024. Forty-nine years ago, Apollo 15 was the first of what were called the Apollo "J" missions. Apollo 15 was capable of a longer stay time, greater surface mobility, and more significant science than previous missions. The return to the Moon with Artemis will be building upon Apollo, advancements in human spaceflight, and commercial and international partnerships. Apollo

and Artemis are benchmarks for current and future lunar exploration. As Isaac Newton wrote in the 17th century, "If I have seen further, it is by standing on the shoulders of giants."

Dr. Gillis-Davis has been a Research Associate Professor of Physics at Washington University since 2018. For the prior fifteen years, he worked at the University of Hawaii. His research there involved data from NASA's MESSENGER mission, which orbited Mercury, and radar data from the Lunar Reconnaissance Orbiter Mission. At Washington University, he is the principal investigator of NASA's Interdisciplinary Consortium for Exploring Volatile Origins. This team of international researchers studies the origin, evolution, and interactions of volatiles on the Moon and asteroids.

Upcoming Meetings!

September Ann Hofmeister, PhD New Mechanisms for Plate Tectonics, Lunar Drift and Differential Rotation of the Lithosphere.

October Marco Cavaglia, PhD Gravitational Waves Part II University of Missouri: S & T

November-Brett McGuire, PhD Mirror Asymmetry in Life and in Space NRAO-WVa

December- Maura McLaughlin, PhD Still Thinking About a Topic! University of West Virginia

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Joining a Zoom Conference Meeting: Everyone can join!

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 7:00-10:30pm. 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 phone using your location (any phone will work)

+1 312 626 6799 US (Chicago)

Meeting ID: 860 450 5790

If you need help joining the meeting, don't hesitate to call Jim Small at 314-307-0692!!

(ps: the link for the meeting is the same each month so far. If there continue to be no problems)



President's Corner

by
Jim Small

The SLAS Regular meeting for July will be via Zoom conference only. This month features Jeffrey Gillis-Davis talking about Moon exploration. There should be a good crowd for this meeting as it got some good publicity in a WU alumni newsletter! Looking forward to the presentation.

We will also continue holding SLAS Board meetings via Zoom conference. The link for the board meetings on the First Thursday of the month is the same as the link for the regular meetings.

The nomination forms for the Special Awards program is available on the website. The period for nominations has been extended until September 1st. Please read through the nomination forms and fill one out for someone you feel is deserving!

More people are getting involved in virtual outreach programs as we continue to cope with the coronavirus. If you would be interested in doing some of the presentations, speak with Don Ficken about participating. We would love to have as many members as possible participating! We are doing virtual events for Jefferson College, Gateway Arch, and Francis Park events. In addition, Bill Breeden is doing constellation tours every Monday.

The sessions I normally present at the Pattonville Observatory are on hold for the time being and may not resume until after the first of the year. I am still working on doing virtual programs at some point. One of the fun events coming up is the ALPO conference on October 2-3. Free to watch via YouTube. See the article elsewhere in the NL. There are still events held at [McDonald Observatory via virtual streaming](#) for Moon observing, Deep Sky observing and Solar observing. Follow the link to see them archived. Keep an eye out for more virtual events worth looking into, post them in dialogs and/or send them to me for posting in the newsletter.

It's planetary season! Be sure to take in Jupiter and Saturn this fall and MAKE SURE you put Mars on your list as well. Grant Martin has a nice article on viewing... opposition is coming up!

We still don't have much to report on the Jefferson College Observatory at this point as COVID has slowed things down for now. The money is still there, so it's just a matter of time.

Keep looking up! If you have some photos or cool links about upcoming events, be sure to forward them to me for the newsletter!

Hope to see you at the meeting Friday night!

Until then, clear skies!

Jim Small

Danville Observing Report Saturday, July 18, 2020 by Bill Breeden

DANVILLE, MO - The forecast for this night in the summer was mostly favorable, with temperatures in the high 80s at sunset, dropping to the high 70s by midnight. Cloud cover was predicted to be about 20%, but that forecast kept bouncing around all day between zero and 20%, and it seemed to land at the high end of that scale. Oh, well - it would have to suffice!

In addition to the usual line-up of deep-sky objects in the sky tonight, we were treated to an amazing comet: C/2020 F3 (NEOWISE). Tonight, it would shine at magnitude 3, and appear in the northwestern sky below the Big Dipper, about 20 degrees above the horizon.

We had a decent crowd at our dark site tonight. My wife Rita and me, Cook Feldman, Don Ficken, Jeff Carpenter, Rich Heuermann, Ramesh Babu Nagarajan, and John Strebeck were there for a night under the stars. Please forgive me if I have left anyone out, as I am using Night Sky Network RSVPs and my own memory to write this report. We also had more than the usual one or two "drive-through visitors" - those mysterious vehicles that drive into the site after dark, with dust flying and headlights blazing; they always seem to drive all the way to the end of the lot, linger for a minute (with lights on), and then slowly leave the site. Who are these mysterious visitors in the night? We may never know. As much as I like Danville, we really need a private

dark site. Sigh.

Back to the comet - it was SPECTACULAR! I am not an astro-photographer, but this was one of the rare times that I wish I had the talent. In binoculars, the comet appeared above two stars about 1 degree apart. A check of a star chart showed these two stars as Kappa and Iota Ursa Majoris, the front paw of the Great Bear. The comet appeared about 1 degree above the pair, forming a striking triangle. Interestingly, the comet was about the same brightness as the pair of stars, with its tail pointing away from the stars. When placing the trio in the center of my binoculars, the comet's tail extended all the way to the field stop. A fifth-magnitude star was also positioned inside the comet's tail. This scene looked exactly the way you would expect a comet to appear in a block-buster science fiction movie. It was nothing less than awesome - one of those astronomy sights that I will never forget!

Once I was finished admiring the comet, it was time to get down to the business of observing the list of deep-sky objects I had prepared for this evening. My list was shorter than usual, as I wanted to have time for the comet, and also to just buzz around the Messiers of Sagittarius and Scorpius for a while. Like last month, I had pulled a list of objects from Stephen James O'Meara's book *Hidden Treasures*. They did not disappoint!

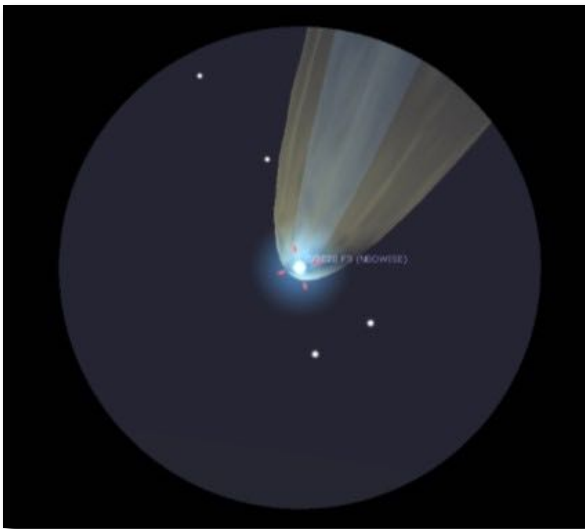
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Simulated view of Comet C/2020 F3 (NEOWISE) through binoculars. Courtesy Stellarium.

In my 24mm Panoptic eyepiece, the nucleus of the comet was big and bright, and the coma was very obvious. The tail extended beyond the field stop, filling my entire field of view with comet awesomeness.



Simulated view of Comet C/2020 F3 (NEOWISE) through 24mm Panoptic eyepiece. Courtesy Stellarium.

I began with NGC6242, a really pretty open cluster in Scorpius. This cluster was amazingly bright and sparkly in my 24mm Panoptic eyepiece. It is 3,600 light-years away, and shines at magnitude 6.4. O'Meara indicates that if this object was in another part of the sky, it would be a celestial showpiece. I completely agree. It is located in southern Scorpius, so it is best seen on July evenings. Don't miss this one!

Next up was NGC6281, another open cluster in Scorpius. This one shines even brighter than NGC6242, at magnitude 5.4. It's small size on the sky (8 arcminutes) encouraged me to bump up the power a little, so I inserted my 19mm Panoptic eyepiece. What a view! O'Meara calls it the Moth Wing Cluster, but to me it looked sort of like an airplane

propeller. Take a look and decide!

Way down in southern Scorpius, near the stinger of the Scorpion, lies NGC6400, another spectacular open cluster. I am sort of an open-cluster nut, as some of you may know. This one sort of blends into the background stars of the Milky Way, but it is such a gorgeous view that it does not matter! NGC6400 shines at 8th magnitude and is 12 arcminutes across. Low to medium power provides a wonderful view of it.

Occasionally, an Index Catalog object makes its way onto my observing list. Tonight it would be IC4665, an open cluster in Ophiuchus. This is the 83rd object listed in *Hidden Treasures*, which O'Meara calls the Southern Beehive. Wow, what a treat! Located just 3 degrees from Beta Ophiuchi, a 3rd magnitude star in northern Ophiuchus, this wide, bright open cluster has a combined magnitude of 4, and is over a degree wide. It makes an amazing target in the finderscope or a pair of binoculars. When viewing through your telescope, use your lowest power eyepiece. This beautiful, large, bright open cluster shows that one in a while, an amazing object pops up on the IC list.

Here are the other objects I enjoyed finding and viewing from *Hidden Treasures*:

- NGC6210, open cluster in Hercules
- NGC6369, planetary nebula in Ophiuchus
- NGC6503, galaxy in Draco
- NGC6441, globular cluster in Scorpius
- Barnard's Star, the highest proper-motion star in the sky, located in Ophiuchus

After completing my list, I simply sat down for a while and observed the sky with my wife for a while, pointing out constellations with her. It's always nice to enjoy the sky without optical aid and review the constellations. Clouds came and went in all areas of the sky, but that did not stop us from observing!

Sagittarius, Scorpius, and Scutum emerged from behind a few clouds, so I enjoyed hopping around some of the Messier objects in that part of the sky. Here are the objects that I viewed using my LX90 telescope and 19mm Panoptic eyepiece:

- M4, globular cluster (Sco)
- M8, the Lagoon Nebula (Sgr)
- M11, the Wild Duck Cluster (Sct)
- M16, the Eagle Nebula (Ser)
- M17, the Swan Nebula (Sgr)
- M20, the Trifid Nebula (Sgr)
- M22, globular cluster (Sgr)

I also took a few moments to view Jupiter and Saturn, which appeared near each other in the south, in the constellation Sagittarius. All four of Jupiter's moons were visible tonight, and Saturn's rings do not disappoint!

Despite the 20% cloud cover that at times seemed to cover half the sky, we managed to get in a really pleasant night of stargazing. My wife was getting sleepy, so we packed up about 11:15PM.

Clear Skies,
Bill Breden



Project for the times! Free to a good home!

So you have some spare time and need a good project? Here's your chance. Tom Rogers would like to donate this telescope, mount and eyepieces to anyone who would like it. It's an old Edmund Scientific 4.25" Newtonian reflector, with an equatorial pedestal mount and an assortment of eyepieces. It definitely needs some work to get it back into working order. The mirror would need re-silvering, and the tube would need some TLC. It's free for someone who is looking for a project. I would rather it go to someone who would use it rather than the trash. Again, it's free to a good home ;^);

Thanks, Tom Rogers

Contact: email address: tomr_fp@yahoo.com

A Probable Comet Impact on Mars in 1973 by Jim Melka, Assistant Mars Coordinator of the Association of Lunar and Planetary Observers

Evidence is presented by the author that a comet consisting of large amounts of ice probably impacted Mars on September 2, 1973. Four amateur astronomers observed and imaged the aftermath of the proposed comet impact. Descriptions of visual telescopic observations are given beginning with two very large side-by-side circular white clouds with one having a diameter of 692km and the other 608km. Three black-and-white images of the clouds are shown that were recorded over a period of 2 hours and 52 minutes. During this period, the clouds began to merge and finally did merge into one large cloud. A Mariner 9 map of

the Corprates quadrangle made before the event was compared with a Viking map made after the event providing before-and-after impact data. Six new craters were found in a cluster with diameters ranging in size from 4.2 km to 10.0 km. The September 2nd clouds are compared against the seven known categories of Martian clouds - limb/terminator hazes, equatorial cloud bands, discrete clouds, orographic clouds, polar clouds and hazes, frosts and fogs, and dust clouds - and are explained as being inconsistent with any of these cloud types. Read the entire report in this month's Journal of the Lunar and Planetary Observers The Strolling Astronomer Volume 62, Number 3, Summer 2020, Page 65-70. If you haven't been on the ALPO website, here is a link. It is a terrific website for all things Lunar and Planetary! <http://alpo-astronomy.org> The Strolling Astronomer is under the publications tab. For a direct link to Jim Melka's article, follow the link: <http://www.alpo-astronomy.org/marsblog/wp-content/uploads/2020/06/Comet-Impact-on-Mars2.pdf> While you are visiting the site, you might check on the virtual conference for ALPO to be held October 2-3. It is free to view on their YouTube channel at the following link: <https://www.youtube.com/channel/UCEmixiL-d5k2Fx27Ijfk41A> To join ALPO online the cost is \$18/year.

Virtual Constellation Tours by Bill Breeden

Join Bill Breeden most Monday evenings at 7:00PM for an online tour of a different constellation each week.

Each short tour (10 to 30 minutes) is conducted using Stellarium and released on YouTube.

This is an 88 part series of virtual sky tours that will take

you around the entire sky, one constellation at a time. Join Bill as we go through the constellation's location in the sky, its brighter stars, double stars, and a few deep-sky objects. SLAS members receive an invitation by email prior to each tour.

Previously aired tours will remain on YouTube for a limited time at www.youtube.com/williambreeden4. These tours are also available to the public.

All presentations go whether clear or cloudy!

Mars! by Grant Martin

Once again, Mars approaches opposition with Earth. This year's opposition occurs on Oct 3rd. And it will be as big as ... 22 arc seconds (Thought I was gonna say a Full Moon didn't ya?). It won't be as large as it was at the last opposition in 2018 and certainly not the 25+ arc seconds back in 2003. But it WILL be larger than any opposition for the next 13 years.

What this means is if you ever had a desire to do some Mars observing, now is the time to get cracking. It's an amazing little planet that truly does show ever-changing detail if you look close enough.

The information and links below will take you on a journey that will only increase your observing skills and knowledge of the little planet that so many people hold hopes of visiting someday.

So, aside from the intellectual pursuit, why am I pushing this subject so much? Because Mars is rapidly diminishing in size. By 2027, it will be almost HALF the size it is now – and we all know the smaller an object is, the harder it is to observe.

If you want to wait till it returns to the size it will be this year, you'll have to wait 13 years – we aint getting' any younger and unless you're a young whippersnapper or a mutant, your eyes aint getting any better either. As I get older, I become more appreciative of that old saying "Strike NOW! While the iron's hot" – I've missed way too many observing opportunities because I dilly-dallied around.

Here are the oppositions for the next 15 years (then the cycle pretty much repeats forevermore):

Year	Date	Size Arc"	Magnitude
2020	Oct 13	22	-2.6
2022	Dec 7	17	-1.9
2025	Jan 15	15	-1.4
2027	Feb 19	14	-1.2
2029	Mar 25	14	-1.3
2031	May 4	17	-1.8
2033	Jun 27	22	-2.5
2035	Sep 15	25	-2.8

Now, having beat the "Observe Mars now" horse to death, let me ask you this: You do know that the Astronomical League has an observing program designed just for observing Mars right? It's a doozy for sure. I know because I completed it in 2018.

I went into it thinking it was maybe an intermediate level program and came out of it dazed and amazed because it's very close to, if not an advanced level program. I say Dazed because it demands that you drink from a firehose of knowledge so to speak. This knowledge pertains to various Albedo features, weather features, orbital & rotational characteristics and their effects on when you'll be able to observe said features and when you can't. Other demands of the program include estimating Polar cap size and location, as well as observing every longitude of the face of Mars ... twice.



Changing size of Mars over a 1 year span centered on the Oct 3rd opposition.

When you get done analyzing the requirements, you realize that to accomplish the program, you'll have to make weekly observations for at least four months straight (That's the part that wore me out). These observations can occur in a 4 hour window once a week, or several smaller doses throughout a week. Determining when this window starts is the key to success. I won't go into detail here, I've done that in a webpage at a link below (you'll know it when you see it).

I tell ya, once you've accomplished this program, you've really accomplished something – Kind of like completing the Herschel 400 and the Lunar Observing programs for sure!

I don't want this to be taken in anyway as pushing anyone from attempting the program. To the contrary, while it is extremely challenging, educational, and fulfilling when completed, it is enlightening and satisfying no matter how much you put into it. I urge folks to take a look at it in detail. Any kind of travel down that path will only be of benefit to your observing skillset in general, and your knowledge of Mars specifically.

Here are a few links to some Mars observing resources that may help (OK, just one, but it's a BIG doorway to the really good ones): <https://tinyurl.com/almopr>

I created this page with the Astronomical League program in mind but it and the links inside really are very useful to anyone wanting to know anything about Mars and how to observe it. I also included a link to my program submission to Mike Simonson, the chair of the Mars observing program. It shows you exactly what is needed to succeed and how to do it.

Happy viewing! Grant

**St. Louis Astronomical Society
Devoted to the Interest and Advancement
of the Science of Astronomy
Executive Board Meeting Minutes July 7, 2020**

1. Opening Activities

- a. Attendance: Jim Small, Brent Buch, Mark Jones, Bill Winningham, Brad Waller, Larry Campbell
- Visitors: John Beaury, Jeff Carpenter, Barbara Shrauner, Rick Rodgers
- b. Open Meeting; Meeting opened at 7:05pm
- c. Approval of last month's meeting minutes. Minutes approved.
- d. Next Board meeting date: Meetings will be via Zoom until further notice: Aug 6, Sep 3, Oct 1, Nov 5, Dec 3.

2. Upcoming General Membership meeting topics:

- a. **July Speaker:** Amy E Kimball, PhD, \$100 honorarium was budgeted for this speaker
- b. Special Awards needed: none planned for July
- c. Speaker Press Release: Brad will send to Rich Heuermann on Monday
- d. Special Business needed: None planned for July
- e. A101 ideas: Astrospheric by Jim; Oct Mars Opposition
- f. All meetings will be Zoom until further notice. Link to Zoom is same every month and can be found in newsletter

3. SLAS Financial Report: Bill W reported he doesn't have reports from bank yet. Bank reports usually come out about the 4th of each month

- a. Balance Sheet. Unofficial data \$1000 in LTP escrow, total equity \$82,085. Fixed assets \$15,224
- b. Profit/Loss report. Membership income over budget by \$35, \$100 received in donations, net income \$1000, YTD \$2500
- c. Annual Budget
- d. Corporate filings: next due August 2020

4. Speaker Committee

- a. Budget - \$500
- b. Upcoming speakers: August: Jeffrey Gillis-Davis, PhD, September: Ann Hoffmeister – Washington University, October: Marco Cavaglia, PhD, November: Brett McGuire, PhD, December: Maura McLaughlin, PhD
- c. Open dates: None for 2020
- d. Topics of interest should be sent to Brad Waller
- e. Stipends per approved 2020 budget
- f. Travel per approved 2020 budget

5. Membership Initiatives

- a. Budget - \$400
- b. Welcome Aboard Meetings
- c. Raffles None planned for 2020 unless there is a great opportunity like a ticketed event
- d. Attendance prizes June attendance prizes have been mailed

6. Membership Recognition

- a. Total Budget \$900
- b. NSN Outreach Awards:
- c. Membership Report: Don Ficken sent June report prior to July meeting. June 2020 membership report showing 186 members (vs 189 last year at this same time). Thanks to great work by Bill Winningham, we are holding our own with renewals.
- d. Member anniversary awards. 17 certificates and pins from 2019 need to be mailed
- e. New Award program - \$600 budget
- 1. New Award Committee report: Need to set up next meeting to discuss plaque design. Extend deadline to Sep 1st with announcement at September meeting. Send out email with extended deadline. Brad to get quotes for plaques.

7. Outreach

- a. Budget - \$1100
- b. Member Training Program Status: on hold for the time being.
- c. Upcoming outreach events: Outreach in the current and near future situation. Discussion of techniques to be used.
- d. Virtual programs through Gateway Arch were held in May and June another planned for July

8. Old Business:

- a. Training Program start a committee, on hold for the time being.

9. New Business: None

10. Other Committee Reports: As needed

A. SLSC Business:

- a. First Friday actions: First Fridays are reopening tomorrow all visitors must have tickets, no plans to start telescope viewing yet. Need to check with SLSC to see if virtual First Friday stargazing would be welcomed
- b. Other immediate business

B. SLCL Business:

- a. Annual contract. On hold
- b. Upcoming events. Events- cancelled until further notice

C. Jefferson College Business:

- a. Committee Meeting report. No committee meetings in past 2 months
- b. Upcoming Outreach Event: No in-person events planned, looking at sponsoring a virtual event similar to Gateway Arch

D. Library Telescope Committee

- a. Budget – \$650
- b. Upcoming builds or maintenance events. One stolen telescope has been recovered but needs to be repaired.
- c. Maintenance budget - \$200
- d. Mileage re-imbusement - \$250
- e. Promotional materials - \$200

E. SLAS Social Events

- a. Budget - \$300
- b. Homemade Fest - \$100 budget
- c. Star-B-Q - \$200 budget, date and venue on hold

Other

F. SLAS Brochures

- a. Budget \$325
- b. Quarter cards design of cards continues, but purchase of more cards is on hold for the time being.

G. Loaner scope Program

- a. Budget - \$100
- b. New donations No new telescope donations for June
- c. Replacement Parts for the LPTs - contacted Telescope Warehouse
- d. Items for sale

H. SLAS Library

- a. Budget - \$400
- b. Other No purchases this month

11. Closing Activities

- Motion to adjourn meeting by Brad Waller seconded by Brent Buch, meeting adjourned at 9:41pm

**St. Louis Astronomical Society
Profit & Loss Budget vs. Actual
January through July 2020**

	Jan - Jul 20	Budget	\$ Over Bud...
Ordinary Income/Expense			
Income			
Events Income		810.00	(810.00)
Magazine Subscription	1,203.00	1,070.45	132.55
Membership Dues	2,985.00	3,040.00	(55.00)
Total Income	4,188.00	4,920.45	(732.45)
Cost of Goods Sold			
Magazine Subscriptions	1,203.00	1,037.50	165.50
Total COGS	1,203.00	1,037.50	165.50
Gross Profit	2,985.00	3,882.95	(897.95)
Expense			
1-Programs & Events	980.16	2,715.00	(1,734.84)
2-Newsletter	79.20	410.00	(330.80)
3-Library expense	81.53	291.66	(210.13)
5-Loaner Scopes		58.00	(58.00)
6-Brochures		350.00	(350.00)
7-Insurance	1,049.50	1,050.00	(0.50)
8-Website	239.39	475.00	(235.61)
9-Administrative Expenses	130.73	173.00	(42.27)
Total Expense	2,560.51	5,522.66	(2,962.15)
Net Ordinary Income	424.49	(1,639.71)	2,064.20
Other Income/Expense			
Other Income			
Donations	102.05		102.05
Interest Income	92.56	116.00	(23.44)
LTP Receipts	1,669.01		1,669.01
Proceeds from Lens Sales	694.10		694.10
Total Other Income	2,557.72	116.00	2,441.72
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	744.25	116.00	628.25
Net Income	1,168.74	(1,523.71)	2,692.45

**St. Louis Astronomical Society
Balance Sheet
As of July 31, 2020**

	Dec 31, 19	Jul 31, 20
ASSETS		
Current Assets		
Checking/Savings		
Checking - First Bank	7,187.45	8,080.39
Deposit, Certificate of	15,841.67	15,914.30
Library Telescope Escrow	1,053.86	998.61
PayPal	77.94	59.69
Savings - First Bank	41,122.69	41,142.62
YMCA Trout Lodge Escr...	14.21	0.00
Total Checking/Savings	65,297.82	66,195.61
Other Current Assets		
Inventory Asset	761.53	761.53
Undeposited Funds	20.00	0.00
Total Other Current Assets	781.53	761.53
Total Current Assets	66,079.35	66,957.14
Fixed Assets	15,000.00	15,224.00
TOTAL ASSETS	81,079.35	82,181.14
LIABILITIES & EQUITY		
Equity		
Opening Bal Equity	8,497.66	8,497.66
Retained Earnings	69,757.14	72,581.69
Net Income	2,824.55	1,101.79
Total Equity	81,079.35	82,181.14
TOTAL LIABILITIES & EQUITY	81,079.35	82,181.14

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

SLAS EVENTS

August

21 Fri
22 Sat
24 Mon
26 Wed
31 Mon

SLAS Regular Meeting
Virtual Stargazing at the Arch
Constellation Tour 9
Virtual Francis Park Stargazing
Constellation Tour 10

September

Deadline for Special Award Nomi-

1 Tue
nations
3 Thur
6 Sun
7 Mon
8 Mon
18 Fri
19 Sat
20 Sun
21 Mon
23 Wed
26 Sat

SLAS Board Meeting
Virtual Viewing at Jefferson College
Constellation Tour 11
Constellation Tour 12
SLAS Regular Meeting
SLAS Dark Sky Observing
SLAS Sky Orienteering
Constellation Tour 13
Virtual Francis Park Stargazing
Virtual Stargazing at the Arch

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-

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.**
Sept 3, Oct 1, Nov 5, Dec 3

Dark Sky Observing Dates

Francis Park Events: These events are on Wednesdays of the week nearest the first quarter Moon
Aug 26, Sept 23, Oct 21

Sky Orienteering Events For members who want to gather and do some relaxed observing at Babler State Park

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 Sept 4, Oct 2, Nov 6, Dec 4

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

Broemmelsiek Astronomy Park Public Viewing
Every Friday night.

UMSL Observatory
For directions and map
<http://www.umsu.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 Merchandise Available

SLAS merchandise is now set up for embroidery at **Headz n Threadz** at <https://hnt.threadthis.com/>

There are two locations:

Galleria: 2495 St. Louis Galleria, St. Louis, MO 63117 Telephone: 314.862.2695
galleria@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 Infini-tees



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 @ \$32.95 / 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

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Librarian	Jim Small	314-909-7211
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Library Telescope Program	Don Ficken	636-851-9630
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Loaner Equipment	Greg Gaines	314-277-3082
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merchandise at slasonline.org		
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membership at slasonline.org		
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'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
webmaster at slasonline.org		

Devoted to the Interest and Advancement of the Science of Astronomy

ST. LOUIS ASTRONOMICAL SOCIETY

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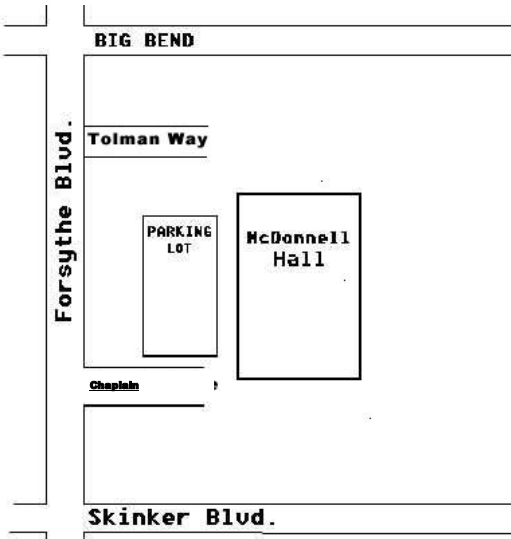


Who We Are and What We Do

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
Jim Small
13128 Cozyhill Drive
St. Louis, MO 63122

