THE EVENT HORIZON

ST. LOUIS ASTRONOMICAL SOCIETY

Devoted to the Interest and Advancement of the Science of Astronomy

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Producing Tours of the Night Sky

by

Bill Breeden and Chris Hanson SLAS

Bill Breeden and Chris Hanson of the Saint Louis Astronomical Society will be featured at the July meeting of the Saint Louis Astronomical Society. The meeting will begin at 7:30 PM Friday, July 15 in McDonnell Hall, Room 162, on the Washington University campus, Saint Louis, MO 63105. McDonnell Hall is accessible from Forsyth Boulevard via Tolman Way. Free yellow zone and garage parking spaces are available. The event will also be available via Zoom online conference. Zoom access information is posted on the Society's website, www.slasonline.org . The event, cosponsored by NASA's Missouri Space Grant Consortium, is open to the public free of charge.

Astronomy software is a very useful tool for exploring the night sky, for both novice and advanced amateur astronomers, as well as for the general public. For the past two years, Mr. Breeden has produced a YouTube tour each month of one of the eighty-eight constellations that cover the entire night sky. He traces out the brighter stars and shows viewers how to locate the constellation. He also indicates some of the interesting astronomical objects – double stars, star clusters interstellar nebulae, and galaxies – that lie within the constellation's boundary. He will review his production process and a few basics of the Stellarium software. He will also talk about recording videos and creating a YouTube channel. Stellarium is a free open source planetarium program for computers, tablets, and smart phones. It shows a realistic sky in 3D, just like what can be seen with the naked eye, binoculars or a telescope. More information on Stellarium can be at http://stellarium.org . Mr. Hanson will provide an explanation about how to modify Stellarium to add personalized landscapes and custom Oculars Add-in tabs.

Upcoming Meetings
August: JWST Panel Discussion at SLSC
September: Laurie Sibbald, Topic TBA
October: JWST Nathalie Ouellette
November: Brett McGuire, MIT
December: Alan Dyer, Astrophotography

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SLAS Returns to In-Person Meetings! Zoom Conference Meetings will Continue

The meetings for June and July have been scheduled for McDonnell Hall, room 162. It's been too long! The room will be open by 6 pm to allow setup and will remain open till 11.
You still ***cannot park in any red spaces***. There are 18 yellow slots on Forsyth which are ok after 5 pm Friday. There are also many yellow slots by the greenhouses west of McDonnell that are eligible after 5 pm. There is also an underground parking garage east of McDonnell at Wrighton Way. Park in any yellow slot. There are also two car chargers near McDonnell and several in the garage.
Can't wait to see everyone in a meeting again! Friday night, 7:30 pm!

We will still run the meeting via Zoom Conference in addition to live and in person. The Zoom room will be open from 7-10 pm.
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

President's Corner
by
Jim Small

The summer is off to a great start. A successful MSRAL, AND our first live and in person meeting for two years! Although the June meeting was sparsely attended, we all enjoyed the cake and coffee and especially the social interaction. It was great to catch up with people again. We only had a minor glitch with some spammers that invaded the meeting. That will be handled the next time by making sure we have a second computer from which to run the meeting without interrupting the speaker. Apologies also for errors regarding the parking. There are no handicap spaces right in front of McDonnell Hall, they are all red. There are plenty of yellow spaces close however, and those are all fine after 5 on Fridays. The July meeting will also be in person so we hope to see you there!

After MSRAL, I got to attend the AAS meeting virtually THEN I attended the best deal of the month, the RASC GA virtual meeting. Tons of talks, all recorded so we can go back and watch, and all for $25! Might be the best deal ever. It resulted in me recruiting three speakers for us for the fall. Looking forward to that!

The August meeting will be a panel discussion of the JWST images released this week. It will be held at the Planerarium. Parking at the regular lot will be available.

This Fall, we will host a Dobson-Fest on September 17, the day after the September meeting. This is very close to John Dobson's birthday! There will be a contest for the best dob. For details, see: https://www.slasonline.org/events/dobson-fest

It's been a great summer so far with only a few glitches. We were having trouble with the 16" at the observatory, so a group of us got together at the dome, unmounted the scope, opened the bottom, and cleaned and reorganized all the contacts so there was no longer any strain on key wires, such as the ribbon wire that led to the RA motor, which had been stalling. Hopefully we got it working now. More testing on that soon!

Hope to see you at the meeting!! jrs

19th Annual SLAS Star-B-Q
Saturday, August 20, 2022
Jefferson College Observatory

Come join fellow members of the SLAS at the **Jefferson College Observatory** for our annual Star-B-Q. ***This area has a large Patio, porta-potties and observatory.***

SLAS will once again provide the hamburgers and hotdogs. We ask for you to bring your favorite drinks and side dish or dessert. Don't forget to bring your telescope or binoculars, chairs and bug spray! Shade is limited so bring your umbrellas or canopies for extra shade.

Activities will include: ***Astronomy Trivia Quiz and prizes, solar viewing and plenty of socializing***! Don't have a telescope? Don't worry this is a great chance to see other member's telescopes.

You can get directions and RSVP at https://nightsky.jpl.nasa.gov/club/eventview.cfm?Event_ID=124154

3pm – Picnic begins
4pm-6pm Food line open
5pm-7pm Trivia Contest (with prizes)
6pm-7pm- cleanup
7:50pm Sunset
8pm-midnight- Observing

Special Note: There will be solar viewing during the day.

Jefferson College Observatory Training Materials Now Available

by

Mark Jones

In addition to the Public Outreach Training program mentioned in the March 2022 Event Horizon, we now have a Jefferson College Observatory Operator training program.

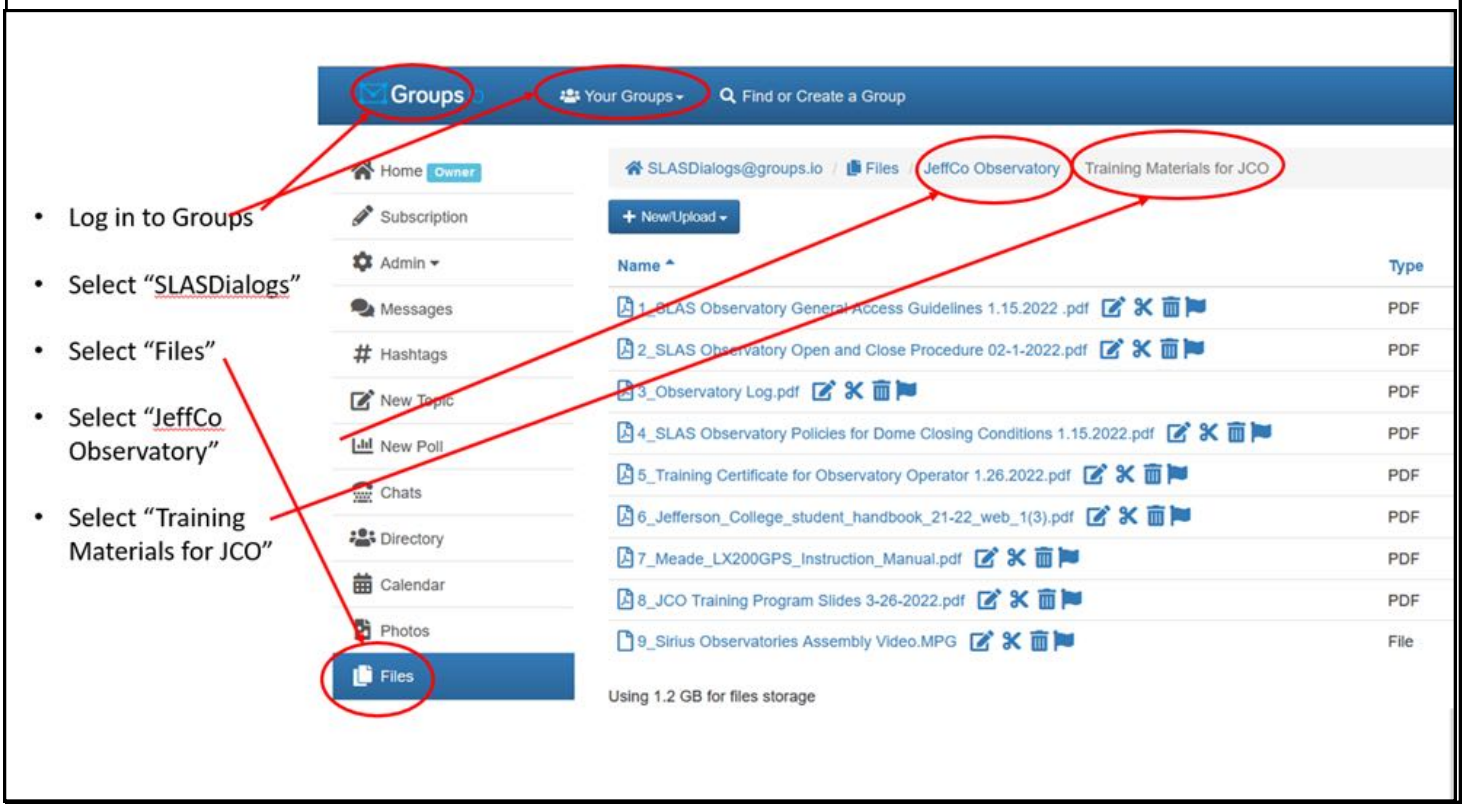
SLAS does NOT require training for any member wishing to volunteer for Observatory programs. However, if you wish to become an Observatory Operator you will need to complete the training program. Only trained and listed, SLAS members may open, operate or close the SLAS observatory equipment.

The training materials can be found on the SLASDialogs.groups.io website. The training can be done at your own speed, just download and read the training materials. The final step will include at least 2 hours of hands-on training. For those who decide to complete the training you can receive a SLAS Trained Observatory Operator badge and a Training Certificate. You will also be eligible to have keys to access the observatory for your own use as well as for SLAS events.

To access the materials go to:

https://groups.io/g/SLASDialogs/files/JeffCo%20Observatory/Training%20Materials%20for%20JCO
or follow the figure below

If you do not have access SLASDialogs.groups.io, or you want the materials send directly to you just send a message to contactus@slasonline.org.



Using Stefan-Boltzmann Law to Compute on the Cosmic Scale.

by

Mark Jones

One of the laws derived from thermodynamics is Stefan-Boltzmann. Stefan-Boltzmann law, statement that the total radiant heat power emitted from a surface is proportional to the fourth power of its absolute temperature. Astronomers use this law for black body surfaces and for stars. Knowing the temperature and radius of a star, astronomers can compute the amount of light radiating from its surface. This equates to the Absolute Magnitude of a star. Conversely, if a star's absolute magnitude and temperature are known, it radius can be determined. This is how White Dwarf stars were first identified in the early 1900's. See Epsilon Eridani b.

$L = 4 \pi R^2 \sigma_{SB} T^4$

However, this law can be used to make predictions on a cosmic scale as well. About the Universe itself. We know the 2.73°K cosmic background radiation is the remnant of the Big Bang which happened 13.7 billion years ago. Using the SB Law does not require knowing the mass of a star, galaxy or Universe as used in many other published amounts.

Let's plug these values into the SB law. Assume the radius of the universe is the cosmic time, i.e. universe has expanded at the speed of light (c) for 13.73 billion years.

$L = 4 \pi (13.7e6 \text{ X } c)^2 \sigma_{SB} (2.73)^4 = 9.39996E+53 \text{ x } (4\pi\sigma_{SB})$. L is the total radiant energy of the universe.

How many stars are in the universe? Using the total radiant energy of the universe value you can calculate how many "Sun-type" stars are there in the entire universe.

Let's use the SB law to calculate the total radiant energy of our Sun.

1 Sun = $L = 4 \pi (6.93e+8)^2 \sigma_{SB} (5800)^4 = 5.477E+32 \text{ x } (4\pi\sigma_{SB})$.

Take ratio of total radiant energy of the universe / total radiant energy of the Sun=

$9.39996E+53 \text{ x } (4\pi\sigma_{SB}) / 5.477E+32 \text{ x } (4\pi\sigma_{SB}) = 1.716e+21$

The SB law predict there are 1.71e+21 "Suns" in the universe. This value is very close to numbers predicted by other means. You can check others sources such as (https://www.esa.int/Science_Exploration/Space_Science/Herschel/How_many_stars_are_there_in_the_Universe)

How many galaxies are in the universe? Once again let's not use mass in our calculation but use luminosity or Absolute Magnitudes. The absolute magnitude of the Sun is +4.83, the Absolute magnitude of the Milky way is -20.5. This is a magnitude difference of -20.5-4.83 = -25.33. Converting this to luminosity ratio 10^(-25.33/2.5) = 1.36e+10. Taking the value from question 1 (1.716e+21 Suns) and dividing by 1.36e+10 = 1.27e+11 galaxies of Milky Way energy output. This value is very close to numbers predicted by other means.

What was the temperature of the Universe which the Epoch of Reionization ended 370,000 years after the Big Bang? Assuming the universe had a radius of 370,000 light-years, the temperature can be computed.

$L = 4 \pi R^2 \sigma_{SB} T^4 = [9.39996E+53 \text{ x } (4\pi\sigma_{SB}) / (3.7e5 \text{ x } c)^2]^{1/4} = 526°K$

Using Wein's Law, we can compute the peak wavelength for a 526°K black body is 5.5 micrometers. This should be within the infrared range of the JWST. Will it be detected?

Weinn's Law $\lambda_{max} = b / T = b / 526 = 5.5e\text{-}3mm$ or 5.5 micrometers. Where b=2.899 mmK

The Sangamon Astronomical Society is Proud to Announce the

21ST ANNUAL ILLINOIS DARK SKY STAR PARTY

When: September 22-25, 2022

Where: Jim Edgar Panther Creek State Fish and Wildlife Area (31 mi. NW of Springfield, IL)

Accommodations: Two large group campsites with plenty of room for RV, trailer and tent camping. Water and toilets available on site; bring your own electric power

Food: Provided by Lions Club and Boy Scouts

Events: Presentation by Professors Gautham Narayan, Paul Ricker and Joaquin Vieira, University of Illinois Champaign-Urbana

Presentation by Professor John Martin, University of Illinois Springfield.

Astronomy Bowl

Raffle

Further information, fees and Registration Form:
www.sas-sky.org

Back to Live and In-Person meetings! Sparsely attended, and the meeting was simultaneously on Zoom. June speaker Mark Leach was introduced by President Jim Small then "mugged" by VP Bradley Waller with the traditional gift of a SLAS coffee mug.

Below: Jefferson College Observatory with the Milky Way. Photo by Mark Jones.

Jefferson College Observing Report, June 18, 2022

by

Bill Breeden

HILLSBORO, MO – Saturday night's weather forecast was looking good! I was not up to making the long drive out to Danville, our usual dark-sky observing site, so I took this opportunity to do some deep-sky observing from our observatory location at Jefferson College. I packed up my LX-90 SCT and made the much shorter drive to Hillsboro. I met Ken Levy and Mark Jones out there, and Mark opened up the observatory dome. Ken brought his 10-inch Dobsonian go-to reflector. A small group, sure, but it is always more fun to observe with other astronomers. The Moon phase was a 19-day old waning gibbous, rising just after midnight. And this time of year, it is not really dark until after 9PM, so we would have about 3 hours of dark sky. Good enough for me!

With decent transparency and seeing, this would be a good night to try out some springtime galaxies and summer globular clusters. I had a long list of Messier objects to try out here, something I had not yet really tried from Jefferson College. This would be interesting!

My first target was M10 in Ophiuchus. This magnitude 6.7 globular cluster was rising in the southeast, and I was quite impressed with how nice it appeared in my 24mm Panoptic eyepiece. There is a tree line along the eastern horizon extending up about 20 degrees, but M10 had cleared this altitude. Hillsboro is dark, but not as dark as Danville. I also observed M12, another globular cluster in Ophiuchus. M10 and M12 looked about 75-80% as well as they do from Danville. Not bad at all!

Rita Breeden is all ready to join Bill for a night of deep-sky observing at Jefferson College. Note the Moody Observatory dome. Photo by Bill Breeden.

Now it was onward to Hercules, just above Ophiuchus in the sky. M13 and M92 were outstanding! Changing from a 24mm eyepiece to a 19mm brought these globular clusters a just a tad closer and brighter to my eye. Sustained viewing of M13 and M92 allowed me to resolve many stars into the heart of these clusters. It also helped that there were only three astronomers here tonight, and there were no cars coming and going. We had no issues with headlights or flash-

lights, and we were able to dark-adapt very well.

By 10PM, it was really dark, so it was time to try to see some galaxies! M90 in Virgo and M91in Coma Berenices, two 10th magnitude galaxies in the Virgo Cluster, were my targets. Using my 19mm Panaoptic eyepiece, these galaxies were surprisingly easy to spot and observe. M90 is just next to an 8th magnitude star, and is a tilted spiral galaxy. I could easily observe it with direct vision. It was mostly a thin oval smudge, but I could coax just a little detail out of it. M91 is a face-on spiral galaxy with much lower surface brightness. I have observed it from Danville, but from Hillsboro tonight, it really did not appear much different – a very, very faint circular smudge. This galaxy is 61 million light-years away, and it is mind-blowing to observe it from Jefferson College. Very cool!

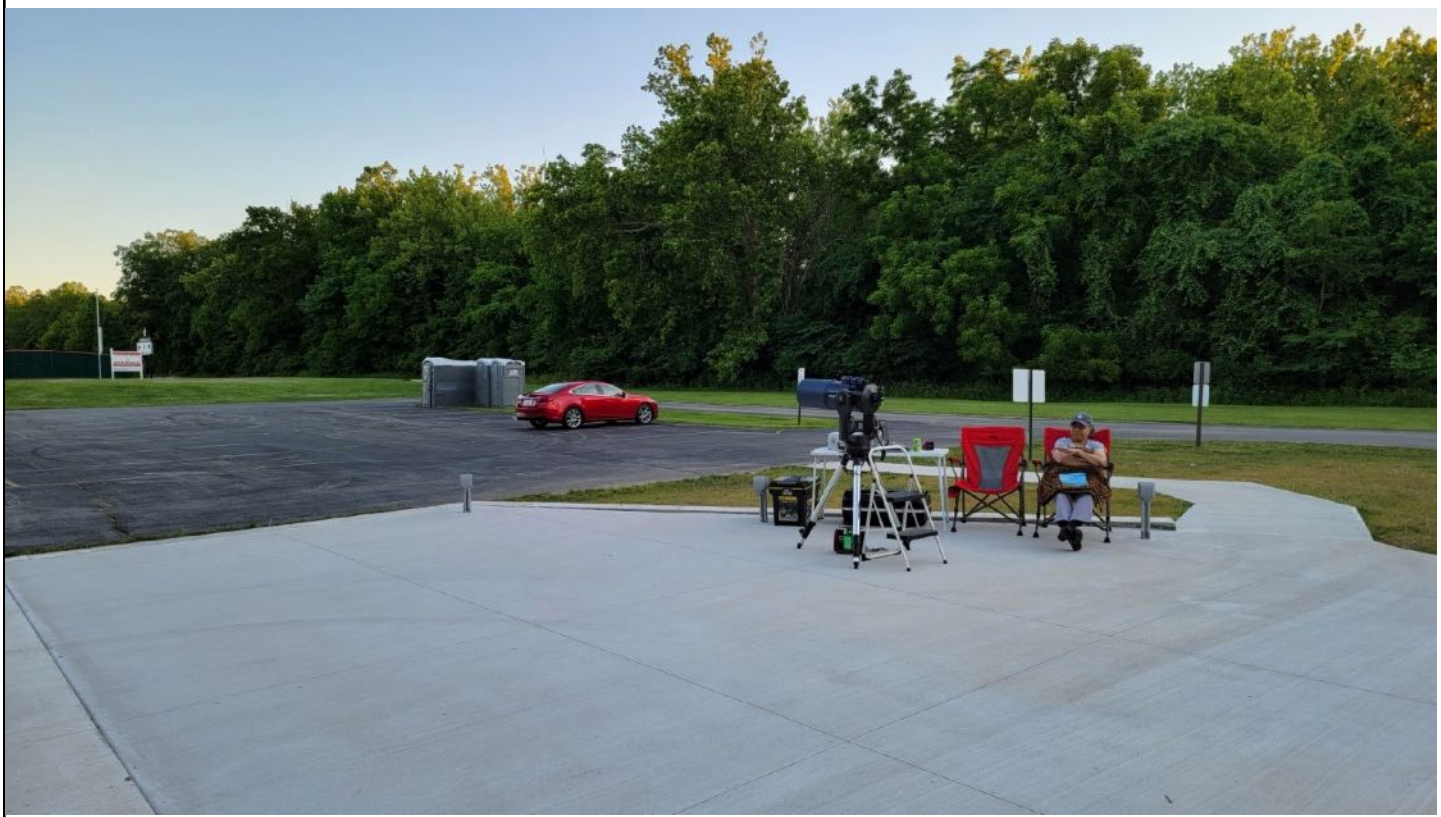
There were no planets up tonight, and the sky seemed to be filled with stars. The Big Dipper hung high in the north with its handle pointing upward. It was very easy to make out the star patterns of Leo, Ophiuchus, Serpens, Scorpius, and even Sagittarius, which was rising very low in the southeast. The sky was a sight to see!

I continued to tour the sky and observe many more Messier objects, including M84, M86, and M51. M51 (The Whirlpool Galaxy) displayed both cores clearly, and I could see the spiral arms. They were faint, but I could see them easily with direct vision. M51 makes a good target for judging seeing conditions and light pollution, and I was really impressed with how good M51 appeared in my 8-inch telescope from Jefferson College. I also observed M5, M57, M81, M82, and Porrima (Gamma Virginis), a magnitude 3.4 double star. Splitting that very close double (separation 2.3") required my 9mm Delite eyepiece!

This location makes a fine alternative to Danville if you would like a closer alternative. Danville is about a Bortle 3 sky, whereas Jefferson College may be Bortle 4. There is the tree line in the eastern and western sky that encroaches up to about 20 degrees up at the Jefferson College location. The small sacrifice in darkness and horizons are offset by the closer distance and the availability of power outlets and restrooms.

Just as the best telescope is the one you will use the most, the same is true about an observing location: The best one is the one you are more likely to go to. Come on out to Jefferson College and give it a try! SLAS has waited a long time to have an observatory and telescope patio. Now that the dream has come true, won't you join us?

Clear Skies, Bill Breeden



The telescope patio at Jefferson College, looking southwest. Photo by Bill Breeden.

St. Louis Astronomical Society
Devoted to the Interest and Advancement of the Science of Astronomy
Executive Board Meeting Minutes 6/2/2022

1. Opening Activities a. Attendance: Jim Small, Larry Campbell, Bill Winningham, Brad Waller, Mark Jones, Brent Buch, Randy Harrison b. Open Meeting: meeting opened at 7:05pm
c. Approval of last month's meeting minutes Brad made motion to approve minutes, Brent seconded, minutes were approved by Board. d. Next Board meeting date: Dates for 2022: Jul 7, Aug 4, Sep 1, Oct 6, Nov 3, Dec 1 Meetings will be via Zoom until further notice:

2. Upcoming General Membership meeting topics:
a. **Speaker**: b. Special Awards needed: perpetual coming
c. Speaker Press Release: Info sent to Rich H and Brad W.
d. Special Business – Solstice Prizes
e. A101 – Report on MSRAL

3. SLAS Financial Report a. Balance Sheet b. Profit/Loss report c. Annual Budget meetings d. Corporate filings: Insurance was renewed in May. 990N was filed in May. Did receive a check from GSEM for $50, check from Launch Code Event $250 Action Bill W will address this. Current interest is for Sales of Telescopes and sales of eclipse glasses. Question from Cook F - Will SLAS be applying for a Missouri Sales and User Tax identification number? Even with our exemption certificate, the diligence needs to be conducted to determine if we will need to collect sales tax or not and what municipal rate would apply. Action: Bill W. will check into this Question from Brad W - Sounds like SLAS may have some money coming from when Jerry Loethen was SLAS Treasurer, see https://treasurer.mo.gov/UnclaimedProperty/en/Property/SearchIndex?lastName=st.%20Louis%20Astronomical%20Society&page=1&propertyId=0&searchType=Person #6758173

4. Speaker Committee a. Budget - $400 b. Upcoming speakers:
Action: Brad to send mugs to previous 2021 and 2022 speakers. Need 11 mugs from Wash U storage. |Action: Jim to check with Wash U about in person meetings. Jan Smith??
SLAS Monthly Meetings Presentations 2021-2022

Month	Name	Topic	Sponsor
17-Jun-2022	Mark Leach	The Cahokia in Chesterfield. The Sun, Moon and Milky Way	
15-July-2022	Open		
19-Aug-2022	Panel Discussion	JWST First Images	SLASSLSC
16-Sep-2022	Open		
21-Oct-2022	Open		
18-Nov-2022	Brett McGuire	TBD	MIT
16-Dec-2022	Open		

d. Topics of interest: James Webb Space Telescope, Katie Bouman
e. Stipends f. Travel

5. Membership Initiatives a. Budget - $450 b. Welcome Aboard Meetings c. Raffles d. Attendance prizes this month - Solstice for June

6. Membership Recognition a. Total Budget $420
b. NSN Outreach Awards: Action: Brad and Jim Small to distribute the certificates and pins. c. Membership Report: From Don Ficken - SLAS membership report showing 245 members. We have matched our highest count of last year and show notable gains in family memberships. Action: Bill to create form letter with links and text form for members to renewal. Include links to magazines and renewal. No need to create distribution lists for each month. d. Member anniversary Action: Larry will submit expenses for 35yr pins, about $32
e. New Award program - $600 budget
1. Special 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 **–** 3. Submittal deadlines 4. Nomination reviews: Nominations due May 1st. 5. Award selection:
6. Plaques purchased: 7. Awards presented: Action: Jim working perpetual plaques Action: Larry C. to set up Committee Meeting to review the nominations before early August

7. Outreach - a. Budget - $700, balance $620 b. Member Training Program Status: c. Purchase of Badges and T-shirts for volunteers completed training Action: Bill to reimburse Mark for Badges, 2 separate receipts approx. $39each d. Purchase of lawn signs: e. Upcoming outreach events: Solar Sunday every weekend, JCO June 5, Airshow June 11-12 f. Awards/recognitions g. NSN Outreach hours YTD 2022: 175.5 hours}

8. Old Business: a. Action: Bill to ask Don to purchase 10,000 eclipse glasses before Oct 1st.

9. New Business: None

10. Other Committee Reports: If needed
MSRAL 2022: Dates will be June 3-5 at Washington University. Action: Brad to drop off certificate paper and A-frame sign and NSN pins, Quarter cards to Jim at Knight Center

A. SLSC Business: First Friday actions There will be first Friday (June 3rd), Stranger Things. Will and Eric are manning telescopes. No first in July b. Other immediate business **May Notes from Meeting with Will Synder at Board meeting.** SLSC open Sun-M, Th-Sat. Best evening would probably Thursday. No rental fees for SLAS. For banquets there would be catering. Indoor sky orienteering in StarBay. Annual new member meeting. Try to have JWST panel at Planetarium, August 19th **June Notes SLSC has reserved date for Aug 19th JWST in StarBay. Virtual and live event. People can park on Planetarium side. We can bring our own refreshments. Photocake. Before end of June meet Will at Planetarium, June 16, 6pm. Note: Mark to send JWST slide to Will** Action: Invite Will Snyder to monthly SLAS Board Meeting Action: start email thread on ideas for SLSC hosting events

B. SLCL Business a. Annual contract – b. Upcoming events -

C. Jefferson College Business: a. Committee Meeting report: Bill sent proof of insurance for SLAS liability coverage.
b. Upcoming Outreach Event: Sunday at the Observatory: 2022 will be 1st Sunday of the month. Add some special events.

D. Library Telescope Committee a. Budget – $300 b. Upcoming builds or maintenance events c. Maintenance budget - $100 d. Mileage re-imbursement – see above e. Promotional materials - $200

E. SLAS Social Events a. Budget - $300 b. Homemade Fest - $100 budget **Action: Bill need receipts for Homemade Fest.** c. Star-B-Q - $200 budget d. Promoting Dobson-Fest event on Sep 17th at JCO **Action: Mark will send Dobson-Fest Flier to Board and Jim will create a webpage for Dobson-Fest, QR code Motion to Board: SLAS will provide 3 free Individual memberships to SLAS as prizes for the telescope competition. Fund will be paid for by Outreach budget of $75. Motion by Mark, second by Randy. Motion passed**
Other

F. SLAS Brochures a. Budget $200 b. Quarter cards - New quarter cards with Arch events have been printed and received on May 27th. Cost $56.35

G. Loaner scope Program a. Budget - $100 b. New donations c. Replacement Parts for the LPTs d. Items for sale several: 7 telescopes ready to sell, 2 items sold
H. SLAS Library a. Budget - $500 b. Other –
I. Merchandise
J. Telescope Making
K. Newsletter a. Budget $600
L. Website - a. Budget $690
M. Social Networking
N. Night Sky Network
O. SLASdialogs
P. Dark Site
Q. Observing Programs
R. Star Parties Donation:
11. Closing Activities: Motion to adjourn by Brad second by Larry meeting adjourned at 9:14pm

St. Louis Astronomical Society
Profit & Loss Budget vs. Actual
January through June 2022

	Jan - Jun 22	Budget	$ Over Bud...
Ordinary Income/Expense			
Income			
Events Income	1,070.00		1,070.00
Magazine Subscription	1,639.90	2,169.80	(529.90)
Membership Dues	2,570.00	2,715.00	(145.00)
Merchandise Sales			
General Merchandise		390.00	(390.00)
Total Merchandise Sales		390.00	(390.00)
Total Income	5,279.90	5,274.80	5.10
Cost of Goods Sold			
Magazine Subscriptions	1,622.90	2,169.80	(546.90)
Total COGS	1,622.90	2,169.80	(546.90)
Gross Profit	3,657.00	3,105.00	552.00
Expense			
1-Programs & Events	604.03	1,860.00	(1,255.97)
2-Newsletter	261.93	350.00	(88.07)
3-Library expense	65.00	375.00	(310.00)
6-Brochures	56.35	300.00	(243.65)
7-Insurance	1,049.50	1,050.00	(0.50)
8-Website	215.28	500.00	(284.72)
9-Administrative Expen...	394.17	1,931.40	(1,537.23)
Total Expense	2,646.26	6,366.40	(3,720.14)
Net Ordinary Income	1,010.74	(3,261.40)	4,272.14
Other Income/Expense			
Other Income			
Donations	477.45		477.45
Interest Income	2.04	24.00	(21.96)
LTP Receipts	106.20		106.20
Proceeds from Lens Sales	2,151.96		
Total Other Income	2,737.65	24.00	2,713.65
Net Other Income	2,737.65	24.00	2,713.65
Net Income	**3,748.39**	**(3,237.40)**	**6,985.79**

St. Louis Astronomical Society
Balance Sheet
As of June 30, 2022

	Dec 31, 21	Jun 30, 22
ASSETS		
Current Assets		
Checking/Savings		
Checking - First Bank	7,447.09	10,778.71
Deposit, Certificate of	15,952.97	15,952.97
Library Telescope Escrow	797.00	797.00
PayPal	705.80	627.43
Savings - First Bank	41,149.86	41,151.90
Total Checking/Savings	66,052.72	69,308.01
Other Current Assets		
Inventory Asset	675.61	675.61
Investment in Mid-States 2...	2,000.00	2,000.00
Total Other Current Assets	2,675.61	2,675.61
Total Current Assets	68,728.33	71,983.62
Fixed Assets		
Accum Depr - Office Equp	(216.65)	(216.65)
JC Scope and Observatory	15,783.04	15,506.14
Office Equipment	216.65	216.65
Total Fixed Assets	15,783.04	15,506.14
TOTAL ASSETS	**84,511.37**	**87,489.76**
LIABILITIES & EQUITY		
Liabilities		
Current Liabilities		
Accounts Payable		
Accounts Payable	770.00	0.00
Total Accounts Payable	770.00	0.00
Total Current Liabilities	770.00	0.00
Total Liabilities	770.00	0.00
Equity		
Opening Bal Equity	8,497.66	8,497.66
Retained Earnings	74,279.95	75,243.71
Net Income	963.76	3,748.39
Total Equity	83,741.37	87,489.76
TOTAL LIABILITIES & EQUITY	**84,511.37**	**87,489.76**

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 astrophotos? 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 All meetings are on First Thursdays unless noted. ***Note: Board meetings will be via Zoom until further notice.*** Dates for 2022: Aug 4, Sep 1, Oct 6, Nov 3, Dec 1

SLAS Dark Sky Observing Dates July 23, July 30, Aug 27, Sept 24, Oct 22, Nov 26, Dec 17

Francis Park Events: These events are on Wednesdays of the week nearest the first quarter Moon
August 3, August 31, Sept 28, Oct 5,

Aim for the Stars Public events held on 1st Sundays at the Jefferson College Observatory and Patio.
Aug 7, Sept 4, Oct 2, Nov 6, Dec 4

Stargazing at the Arch Events for the public held at the Gateway Arch
Aug 14, Sept 3, Oct 8

Sky Orienteering Events For members who want to gather and do some relaxed observing at Babler State Park (BSP) or at the Jefferson College Observatory (JCO) Please RSVP if you plan to come!
Sept 4 (JCO), Nov 6 (JC)),

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

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:

SLAS Events

	July
15 Fri	SLAS Regular Meeting
20 Wed	Mt. Zion Summer Camp
	August
3 Wed	Francis Park
4 Thur	SLAS Board Meeting
6 Sat	Warson Park
7 Sun	Aim for the Stars (JCO)
13 Sat	Night Skies Over Babler
14 Sun	Stargazing at the Arch
19 Fri	SLAS Regular Meeting NOTE: special meeting at McDonnell Planetarium
20 Sat	Annual Star-B-Q
31 Wed	Francis Park
	September
1 Thur	SLAS Board Meeting
3 Sat	Crestwood Park
3 Sat	Stargazing at the Arch
4 Sun	Aim for the Stars (JCO)
10 Sat	Astronomy Festival at Tower Grove
10 Sat	Stargazing at Tower Grove
10 Sat	Girl Scout Astronomy Overnight
16 Fri	SLAS Regular Meeting
17 Sat	First Annual Dobson-Fest
20 Tues	Missouri Master Naturalists
24 Sat	Scouts at Babler
28 Wed	Francis Park
28 Wed	Cedar Hill Homeschoolers
	October
1 Sat	Girl Scout Round Up Camp Cedarledge

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 activities!

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 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 _____

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

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 **$**_____

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)***
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Hospitality ***Larry Campbell*** 636-244-2867
hospitality at slasonline.org

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board23 at slasonline.org

Brent Buch 314-239-0329
board24 at slasonline.org

Randy Harrison 618-267-1659
board25 at slasonline.org

ALCOR ***Bill Winningham*** 636-357-2763
(Astronomical League Correspondent)
treasurer at slasonline.org

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webmaster at slasonline.org

Devoted to the Interest and Advancement of the Science of Astronomy

ST. LOUIS ASTRONOMICAL SOCIETY

We're on the Web!
http://www.slasonline.org

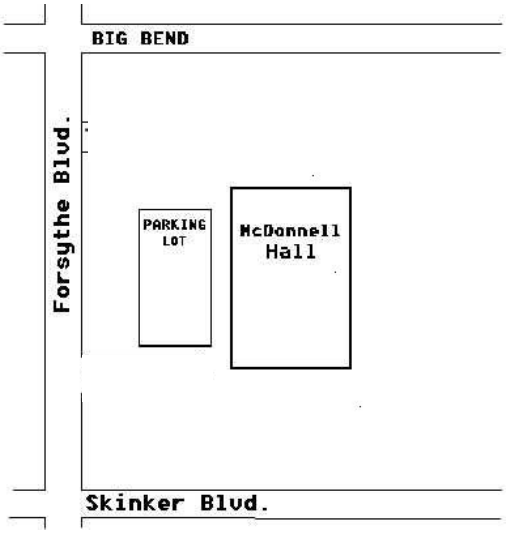
Follow us on
Twitter: @stlastro
Facebook: @stlastro

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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