

# THE EVENT HORIZON



## ST. LOUIS ASTRONOMICAL SOCIETY

*Devoted to the Interest and Advancement of the Science of Astronomy*

**VOLUME 30, Issue 9  
September, 2020**

### **Water, Water, Everywhere: From the Study of Meteorites to the Origin of Earth's Water**

*by*

**Dr. Lionel Vacher  
Washington University**

Dr. Lionel Vacher of Washington University will be featured at the September 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, September 18. Zoom access information is posted below.

Over 70% of the Earth's surface is covered with water, to an average ocean depth of almost 2.5 miles. Where did all that water come from? The origin of Earth's oceans is a major topic of modern planetary science research. Most theories about the formation of the Earth propose that our planet formed too close to the Sun to retain large quantities

of water. Dr. Vacher will explain the leading theories for the original source of Earth's water, and indicate how his own studies of certain types of meteorites may provide some answers to water questions.

Dr. Lionel Vacher is a Postdoctoral Research Associate in the Department of Physics at Washington University. His primary research interests include "primitive" meteorites, the origin of water in the solar system, the effects of water on meteorite chemistry, and hydrothermal experiments.

#### **Upcoming Meetings!**

**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

**January**- Robert Criss, PhD Galactic Rotation & Dark Matter Washington University

**February**- Raymond E Arvidson, PhD MARS!!! Washington University

**March**- K Michael Malolepszy Probing the Sub-Microwave Universe Part III SLAS

### Mid States Region



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**Watch SLASdialogs and the newsletter between now and October for sales of telescopes nicely suited either for projects or ready-to-go mint telescopes. Great bargains will be for sale!**

### **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 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 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 September will be via Zoom conference only.** This month features Lionel Vacher to speak to us about the origin of water in the solar system! To join the meeting, see the article on the front page for instructions and a link. We have been having good attendance at the meetings. We certainly hope to see you then!

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.

Nominations for the Special Awards program have been completed and we will hold the presentation ceremony at either the October or November meeting. Thanks to all who submitted a nomination form. Look for the process to be continued next year. Thanks to Larry Campbell and his committee for getting the work completed for this great recognition program. Thanks to Mark Jones for all the hard work developing the awards. If you have ideas for the plaques to be awarded for these programs, that would be terrific to pass on to Larry Campbell.

We will have an update at this month's meeting for the Jefferson College Observatory and the progress being made on that front.

On the loaner scope front, Mark Jones and I unboxed both the Meade 10" LX200 GPS ACF that was donated to us and cataloged the scope and the equipment that came with it. We also unboxed the Meade LX55 10" SCT that was donated and cataloged that as well.

We have been getting a number of donated telescopes and currently have a surplus. As a result, we will be selling the following telescopes:

-The Meade LX55 10" SCT

-a mint Orion 6" Newtonian with equatorial mount with original box

-a Tasco 4.5" Newtonian f8 with equatorial mount with original box. It was actually purchased in Japan!

-a Meade Jupiter 4.5" Newtonian f8 with digital electronic goto alt az mount with the original box

I will also be selling telescopes donated by East Central College which includes a wide range of telescopes including a Criterion 6" long focal length with mount, and two other telescopes. We also have misc telescope boxes both large and small, two of them Unitron parts. There are other parts for sale as well including finderscopes and other Unitron parts. Proceeds for those materials will go to purchase equipment for the astronomy program at ECC.

More info and photos soon!

Hope to see you at the meeting Friday night! Until then, clear skies!

JimSmall

## The Moon and Planets!

The Moon has been hanging out with the planets lately and we've been blessed with some nice views. On the left is the Moon with Mars in the upper left. On the right is the Moon with Venus and if you look closely above Venus, you can find the Beehive cluster! The Beehive would show up better, but it's hard so close to sunrise. Both shots were tough to expose for the Moon and the planet. Both were shot with a Nikon D750 and Tamron 150-600 zoom lens. The Moon and Mars was shot at 1/250s at f10 at 800 ISO. The Moon and Venus was shot at 1 sec at f6.3 at 1600 ISO.



Two images of the fabulous comet Neowise shot by Jim Melka last July. Jim determined that the comet faded 5 magnitudes, from 1st mag to 6th mag in 12 days. The July 13th image was obtained at a parking lot at Maryville University. The July 25th image was obtained at Brommelsiek Park in St. Charles County.

### **Do You Dabble in Astrophotography?**

Even better, do you do more than dabble? The EH would certainly love to have your images for our gallery pages. Fancy, highly processed deep sky images or simple phone snapshots, we would love to see what you're up to! Did you venture out even with the pandemic to get some shots? Take a selfie of you and your equipment in action and send it in! Of course, it's nice to have some specs on both the subject of the photo and the equipment used to take it, especially exposure times ect.! You can label the photo as Jim Melka did here or



C/2020 F3 (NEOWISE); 2020-07-13, 09:31:38UT  
Nineteen 6 second raw frames Canon 20D at ISO 200  
EFL 270mm on fixed tripod, Tail length 3"  
Jim Melka Maryville University- Chesterfield, MO



C/2020 F3 (NEOWISE); 2020-07-25, 02:56UT  
Thirty one 4 second raw frames Canon 20D at ISO 400  
EFL 160mm on fixed tripod, Tail length ? Mag ~5.8  
Jim Melka Brommelsiek Park, St. Charles County, MO.

simply send the info in with the picture when you submit it! There are lots of great planet shots available right now, both in the morning and the evening! Maybe even grab Pluto as it's sandwiched between Saturn and Jupiter right now! Submit your photos to [newsletter@slasonline.org](mailto:newsletter@slasonline.org) and we'll make sure they get published!

### **Have You Been Out Observing Lately?**

Have you dragged your telescope out for a run lately? Are you taking advantage of these times to work on an observing program from the AL? Did you do like apparently everyone else has done and bought some new equipment? We would certainly like to hear about THAT! What have you been looking at in the sky? Let us know what you've been up to! Just a short piece would work fine. Simply send it to [newsletter@slasonline.org](mailto:newsletter@slasonline.org) and we'll get it in the newsletter. We would love it!

**St. Louis Astronomical Society  
Devoted to the Interest and Advancement  
of the Science of Astronomy  
Executive Board Meeting Minutes August 6, 2020**

**1. Opening Activities**

- a. Attendance: Jim Small, Bradley Waller, Bill Winningham, Larry Campbell, Brent Buch, John Newcomer Visitors: John Beaury, Rick Rodgers, Bill Poletti
- b. Open Meeting: called to order at 7:01pm
- c. Approval of last month's meeting minutes. Minutes approved by 4 -1 vote.
- d. Next Board meeting date: Dates for 2020: Meetings will be via Zoom until further notice: Sep 3, Oct 1, Nov 5, Dec 3

**2. Upcoming General Membership meeting topics:**

- a. **Speaker:** Jeffery Gillis-Davis
- b. Special Awards needed: none
- c. Speaker Press Release: is out
- d. Special Business needed: none
- e. A101: update on the observatory process.

**3. SLAS Financial Report**

- a. Balance Sheet Total assets \$83,000
- b. Profit/Loss report Current ahead by \$1,168.74
- c. Annual Budget meetings – Need to begin the budget process for 2021 next month, send out budget commentary to be updated. : Budget meeting Sunday, September 20<sup>th</sup> at 4 pm
- d. Corporate filings: Coming up in August, AL fees.

**4. Speaker Committee**

- a. Budget - \$500
- b. Upcoming speakers: September: Ann Hoffmeister – Washington University, October: Marco Cavaglia, PhD, November: Brett McGuire, PhD, December: Maura McLaughlin, PhD Speakers for 2021: send updated spreadsheet for speakers for next year.
- c. Open dates for 2021 Send suggestions for speakers with contact info
- d. Topics of interest
- e. Stipends
- f. Travel

**5. Membership Initiatives**

- a. Budget - \$400
- b. Welcome Aboard Meetings
- c. Raffles
- d. Attendance prizes

**6. Membership Recognition**

- a. Total Budget \$900
- b. NSN Outreach Awards:
- c. Membership Report:
- d. Member anniversary awards – awards not picked up were mailed with cover letter, certificate and pin. 13 in all.
- e. New Award program - \$600 budget
  1. New Award Committee report: Committee formed, Nomination forms finalized. Chairman – Larry Campbell, Jim Small, Mark Jones, Cook Feldman, Sharon Bertram, Fred Schovanez, Bill Neubert,
  2. New Award Policy and nomination process – Article for newsletter to encourage nominations for awards.
  3. Submittal deadlines
  4. Nomination reviews
  5. Award selection
  6. Plaques purchased
  7. Awards presented

**7. Outreach**

- a. Budget - \$1100
- b. Member Training Program Status: on hold for the time being.
- c. Purchase of T-shirts for volunteers completed training
- d. Purchase of lawn signs **See photos from Bradley** I like the type-face we used on the quarter cards (Upper East Side) Can/Should we

use that on larger signs? Should we standardize where on a sign we put our logo? A QR code? Maybe there are other ideas? Maybe this is overthinking the signs?

- e. Upcoming outreach events: Virtual outreach for this fall
- f. Awards/recognitions
- g. NSN Outreach hours YTD

**8. Old Business:** a. Training Program start a committee

**9. New Business:** None

**10. Other Committee Reports: If needed**

**A. SLSC Business:**

- a. First Friday actions: First Friday is in play, but no word on telescope viewing at this time.
- b. Other immediate business

**B. SLCL Business:**

- a. Annual contract
- b. Upcoming events

**C. Jefferson College Business:**

- a. Committee Meeting report Update for Astro 101?
- b. Upcoming Outreach Event: Sunday August 9 Virtual event

**D. Library Telescope Committee**

- a. Budget – \$650
- b. Upcoming builds or maintenance events
- c. Maintenance budget - \$200 Adapter ring replacement update has been fabricated and installed.
- d. Mileage re-imbursement - \$250
- e. Promotional materials - \$200

**E. SLAS Social Events**

- a. Budget - \$300
- b. Homemade Fest - \$100 budget
- c. Star-B-Q - \$200 budget – no word on any possibility yet

**Other**

**F. SLAS Brochures**

- a. Budget \$325
- b. Quarter cards

**G. Loaner scope Program**

- a. Budget - \$100
- b. New donations 4.25" reflector might be donated."
- c. Replacement Parts for the LPTs – Library Telescopes with Brad's loaner program have been updated except for one.
- d. Items for sale

**H. SLAS Library**

- a. Budget - \$400
- b. Other

**I. Merchandise**

**J. Telescope Making**

**K. Newsletter - Send articles!!!!**

**L. Website**

**M. Social Networking**

**N. Night Sky Network**

**O. SLASdialogs }**

**P. Dark Site**

**Q. Observing Programs**

**R. Star Parties Donation:**

**11. Closing Activities** Bradley Waller motioned to adjourn, second by John Newcomer. Meeting adjourned at 8:18 pm

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

	Jan - Aug 20	Budget	\$ Over Bud...
<b>Ordinary Income/Expense</b>			
<b>Income</b>			
Events Income		810.00	(810.00)
Magazine Subscription	1,335.85	1,136.35	199.50
Membership Dues	3,250.00	3,205.00	45.00
<b>Total Income</b>	<b>4,585.85</b>	<b>5,151.35</b>	<b>(565.50)</b>
<b>Cost of Goods Sold</b>			
Magazine Subscriptions	1,368.80	1,103.40	265.40
<b>Total COGS</b>	<b>1,368.80</b>	<b>1,103.40</b>	<b>265.40</b>
<b>Gross Profit</b>	<b>3,217.05</b>	<b>4,047.95</b>	<b>(830.90)</b>
<b>Expense</b>			
1-Programs & Events	980.16	2,873.00	(1,892.84)
2-Newsletter	79.20	465.00	(385.80)
3-Library expense	81.53	333.33	(251.80)
4-Astronomical League Dues	815.00		815.00
5-Loaner Scopes		66.00	(66.00)
6-Brochures		400.00	(400.00)
7-Insurance	1,049.50	1,050.00	(0.50)
8-Website	239.39	505.00	(265.61)
9-Administrative Expenses	139.55	212.50	(72.95)
<b>Total Expense</b>	<b>3,384.33</b>	<b>5,904.83</b>	<b>(2,520.50)</b>
<b>Net Ordinary Income</b>	<b>(167.28)</b>	<b>(1,856.88)</b>	<b>1,689.60</b>
<b>Other Income/Expense</b>			
<b>Other Income</b>			
Donations	102.05		102.05
Interest Income	94.36	133.00	(38.64)
LTP Receipts	1,709.32		1,709.32
Proceeds from Lens Sales	694.10		694.10
<b>Total Other Income</b>	<b>2,599.83</b>	<b>133.00</b>	<b>2,466.83</b>
<b>Other Expense</b>			
LTP Disbursements	1,799.26		1,799.26
YMCA Trout Lodge ESCROW Expe...	14.21		14.21
<b>Total Other Expense</b>	<b>1,813.47</b>		<b>1,813.47</b>
<b>Net Other Income</b>	<b>786.36</b>	<b>133.00</b>	<b>653.36</b>
<b>Net Income</b>	<b>619.08</b>	<b>(1,723.88)</b>	<b>2,342.96</b>

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

	Dec 31, 19	Aug 31, 20
<b>ASSETS</b>		
<b>Current Assets</b>		
<b>Checking/Savings</b>		
Checking - First Bank	7,187.45	7,522.12
Deposit, Certificate of	15,841.67	15,915.06
Library Telescope Escrow	1,053.86	1,038.92
PayPal	77.94	93.14
Savings - First Bank	41,122.69	41,143.66
YMCA Trout Lodge Escr...	14.21	0.00
<b>Total Checking/Savings</b>	<b>65,297.82</b>	<b>65,712.90</b>
<b>Other Current Assets</b>		
Inventory Asset	761.53	761.53
Undeposited Funds	20.00	0.00
<b>Total Other Current Assets</b>	<b>781.53</b>	<b>761.53</b>
<b>Total Current Assets</b>	<b>66,079.35</b>	<b>66,474.43</b>
<b>Fixed Assets</b>	<b>15,000.00</b>	<b>15,224.00</b>
<b>TOTAL ASSETS</b>	<b>81,079.35</b>	<b>81,698.43</b>
<b>LIABILITIES &amp; EQUITY</b>		
<b>Equity</b>		
Opening Bal Equity	8,497.66	8,497.66
Retained Earnings	69,757.14	72,581.69
Net Income	2,824.55	619.08
<b>Total Equity</b>	<b>81,079.35</b>	<b>81,698.43</b>
<b>TOTAL LIABILITIES &amp; EQUITY</b>	<b>81,079.35</b>	<b>81,698.43</b>

**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](mailto: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.**  
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  
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 Oct 2, Nov 6, Dec 4

**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

### September

18 Fri SLAS Regular Meeting  
19 Sat SLAS Dark Sky Observing  
20 Sun SLAS Sky Orienteering  
21 Mon Constellation Tour 13  
23 Wed Virtual Francis Park Stargazing  
26 Sat Gateway to the Stars  
28 Mon Constellation Tour 14

### October

1 Thur SLAS Board Meeting  
4 Sun Aim for the Stars - Jeffco  
5 Mon Constellation Tour 15  
12 Mon Constellation Tour 16  
16 Fri SLAS Regular Meeting  
17 Sat SLAS Dark Sky Observing  
18 Sun SLAS Sky Orienteering  
19 Mon Constellation Tour 17  
21 Wed Francis Park  
24 Sat Stargazing at the Arch  
26 Mon Constellation Tour 18  
29 Thur Carbon Library Star Party  
2 Mon Constellation Tour 19  
5 Thur SLAS Board Meeting  
6 Fri SLSC First Friday  
8 Sun Aim for the Stars - Jeffco  
9 Mon Constellation Tour 20  
14 Sat SLAS Dark Sky Observing  
16 Mon Constellation Tour 21  
30 Mon Constellation Tour 22

### December

3 Thur SLAS Board Meeting  
4 Fri First Friday  
6 Sun Aim for the Stars - Jeffco  
7 Mon Constellation Tour 23  
12 Sat SLAS Dark Sky Observing  
14 Mon Constellation Tour 24  
18 Fri SLAS Regular Meeting

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 <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

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

## COMMITTEE CHAIRS

<b>Dark Site Coordinator</b>	<b>Mark Jones</b>	636-394-2342
darksite at slasonline.org		
<b>Librarian</b>	<b>Jim Small</b>	314-909-7211
librarian at slasonline.org		
<b>Library Telescope Program</b>	<b>Don Ficken</b>	636-851-9630
librarytelescope at slasonline.org		
<b>Loaner Equipment</b>	<b>Greg Gaines</b>	314-277-3082
loaner at slasonline.org		
<b>Merchandise</b>	<b>Vacant</b>	
merchandise at slasonline.org		
<b>Membership</b>	<b>Don Ficken</b>	636-225-0269
membership at slasonline.org		
<b>Newsletter Editor</b>	<b>Jim Small</b>	314-909-7211
newsletter at slasonline.org		
<b>Observing Programs</b>	<b>Mark Jones</b>	636-394-2342
observing at slasonline.org		
<b>Publicity</b>	<b>Rich Heuermann</b>	314-962-9231
publicity at slasonline.org		
<b>Recognition</b>	<b>Larry Campbell</b>	636-244-2867
recognition at slasonline.org		
<b>Social Media</b>	<b>Vacant</b>	
'SLASdialogs' Moderator <b>Mark Jones, Rhonda Whelan</b>		
dialogsmoderator at yahoo.com		
<b>Star Party Coordinator</b>	<b>Bill Breeden</b>	314-276-3613
starparty at slasonline.org		
<b>Telescope Making</b>	<b>Bill Davis, Jim Melka</b>	314-469-3061
telescope at slasonline.org		
<b>Webmaster</b>	<b>Jim Small</b>	314-909-7211
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

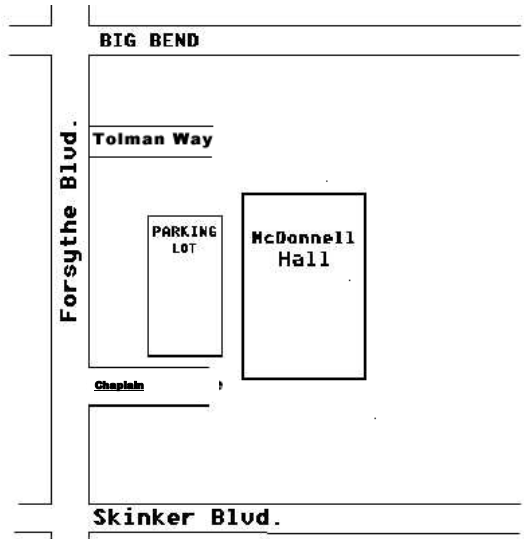


**Who We Are and What We Do**

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**

Jim Small  
13128 Cozyhill Drive  
St. Louis, MO 63122

