

THE EVENT HORIZON



ST. LOUIS ASTRONOMICAL SOCIETY

Devoted to the Interest and Advancement of the Science of Astronomy

VOLUME 31, Issue 2
February, 2021

Mid States Region



The Perseverance Rover Mission and the Search for Early Life on Mars

by

Professor Raymond E. Arvidson
Washington University

Professor Raymond E. Arvidson of Washington University will be featured at the February 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, February 19. Zoom access information is posted below and on the Society's website, www.slasonline.org

Mars is a very cold and dry world today, but it was much different in its distant past. NASA's latest robotic surface explorer, the Perseverance Rover, is scheduled to land on Mars on February 18. The NASA Exploration Program focuses on characterizing the early warm, wet conditions on Mars, and searching for evidence for early life. This includes the Perseverance Rover Mission, designed to collect rock cores from an ancient river delta deposited in a lake that once filled Jezero Crater. Cores would be re-

turned to Earth by a subsequent mission, allowing records of ancient life to be explored in great detail in various laboratory settings.

Dr. Raymond Arvidson is a Distinguished University Professor of Earth and Planetary Sciences and a Fellow of the McDonnell Center for the Space Sciences at Washington University. In addition to teaching and research focused on surface processes of planetary bodies, he has been a team member of NASA spacecraft orbiter, lander, and rover missions to Mars and Venus. He has published his research efforts in over 250 scientific papers. Dr. Arvidson is also the Director of the NASA Planetary Data System Geosciences Node. This facility archives and makes available images and data of solid surfaces gathered by all NASA missions to the global community of researchers and to the general public.

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

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.

Inside This Issue

President's Corner **2**
Perseverance Launch

Night Sky Network **3**
Outreach Awards
Lunar X

Perseverance **4-5**
Landing!

Board minutes **6**

Financials **7**

Events **8**

Contacts **9**

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)

Don't miss this month's meeting!

Perseverance is landing Thursday and Ray Arvidson will tell us all about it the next day at the meeting!

President's Corner

by
Jim Small

DON'T MISS Friday's meeting: Ray Arvidson speaking to us the **DAY AFTER** the **PERSEVERANCE** landing on Mars! Links to follow the landing on Thursday afternoon are in the articles elsewhere in this newsletter. What a great month for Mars missions with three encountering Mars all the week of the meeting! Here's hoping the Perseverance landing is successful !!

We will recognize members of SLAS who are receiving the Night sky Network Outreach Awards at this month's meeting. Obviously, we aren't meeting in person, so we will get the pins and certificates to members through the mail. See the article on the next page to see who contributed this year!

I will present some of the telescopes we have had donated that we will offer for sale to anyone interested. Below is the list. I won't do an auction for this meeting because there are a good number of telescopes and we will not have that much time to devote to the sale. If you are interested in any of the materials presented here, simply call me at 314-307-0692 or let me know at the meeting that you have

an interest.

Below is a list of the telescopes we will offer for sale:

-Cave Astrola 6" (f8?) Newtonian with tracking pier mount and many accessories including a solar filter. In great condition and the mirror was resilvered.

-Meade 6" f5 Newtonian with tracking pier mount and many accessories

-Bauch and Lomb Criterion 4000 4" SCT and tabletop mount with case and accessories

-Monolux 4380 refractor with beautiful wood case and accessories. Beautiful collectors item in mint condition.

-Galileo Telescope (4" Newtonian) and mount

-Meade ETX 90 and tripod

You don't have to wait for the meeting if you have an interest in any of these telescopes.

Sincerely,

Jim Small

Mars's Latest Visitor: NASA's Perseverance Rover

by
David Prosper



(editor's note: This article from Night Sky Network was written in July, before the successful launch of Perseverance.)

NASA's latest Mars rover, Perseverance, is launching later this month! This amazing robot explorer will scout the surface of Mars for possible signs of ancient life and collect soil samples for return to Earth by future missions. It will even carry the first off-planet helicopter: Ingenuity. Not coincidentally, Perseverance will be on its way to the red planet just as Mars dramatically increases in brightness and visibility to eager stargazers as our planets race towards their closest approach in October of this year.

Perseverance's engineers built upon the success of its engineering cousin, Curiosity, and its design features many unique upgrades for a new science mission! In February of 2021, Perseverance will land at the site of an ancient river delta inside of Jezero Crater and ready its suite of seven primary scientific instruments. The rover will search for traces of past life, including possible Martian fossils, with WATSON and SHERLOC, two advanced cameras capable of seeing tiny details. The rover also carries an amazing instrument, SuperCam, to blast rocks and soil outside of the rover's reach with lasers to determine their chemical makeup with its onboard suite of cameras and spectrometers. Perseverance will also take core samples of some of the most promising rocks and soil, storing them for later study with its unique caching system. Future missions will retrieve these samples from the rover and return them for detailed study by scientists on Earth. Perseverance also carries two microphones so we can hear the sounds of Mars and the noises of its instruments at work. It will even launch a small helicopter - Ingenuity - into the Martian atmosphere as a trial for future aerial exploration!

Would you like to contribute to Mars mission science? You can help NASA's rover drivers safely navigate the Martian surface by contributing to the AI4Mars project! Use this tool to label terrain features on photos taken of the Martian surface by NASA missions to help train an artificial intelligence algorithm to better read their surrounding landscape: bit.ly/AI4Mars

The launch of Mars Perseverance is, as of this writing, scheduled for July 20, 2020 at 9:15am EDT. More details, updates, and livestreams of the event are available on NASA's official launch page: bit.ly/Mars2020Launch. Dig deep into the science of the Mars 2020 mission and the Perseverance rover at: mars.nasa.gov/mars2020/. Find out even more about past, present, and future Mars missions at nasa.gov.

**SLAS 2020 Outreach
Volunteer Recognition
by
Mark Jones**

Night Sky Network Offers Award Certificates and Pins to recognize individuals who have volunteered and performed public outreach. This year, due to COVID-19, NSN updated their requirements to reflect some of the more challenging outreach conditions. Member clubs whose members performed and reported on just (2) or more outreach events in 2020 using the NSN event management system are qualified to receive pins.

2020 we had 18 members (2 or more events)

2019 we had 22 members

2018 we had 21 members

2017 we had 20 members

2016 we had 26 members

2015 we had 26 members

2014 we had 14 members

In 2020, SLAS members volunteered for more than 75 events and logged 305 hrs for NSN events

163 events and logged 1477 hours in 2019

138 events and logged 1350 hours in 2018

214 events and logged 1658 hours in 2017

159 events and logged 1620 hours in 2016

102 events and 1430 hours in 2015

72 events and 736 hours in 2014

59 events and 716 hours in 2013

Since June 2007 SLAS members have logged 11,518 hrs for NSN events

Thank you to the following members. They will be recognized at this month's meeting

Bill Breeden	40	events; 48	hours
Donald Ficken	20	events; 42.1	hours
Mark Jones	15	events; 33.5	hours
Bradley Waller	8	events; 18	hours
William Neubert	7	events; 23	hours
John Strebeck	7	events; 13.5	hours
John Beaury	6	events; 18.8	hours
Richard Jennings	6	events; 10.8	hours
Richard Fefferman	6	events; 10.5	hours
Cook Feldman	5	events; 16	hours
Maryanne Angliongto	5	events; 12.5	hours
Raymond Mueller	4	events; 17	hours
Larry Campbell	3	events; 7	hours
Randy Harrison	3	events; 4.8	hours
James Small	2	events; 5	hours
Rita Breeden	2	events; 6	hours
Frank Mack	2	events; 2.8	hours
Kathryn Czeschin	2	events; 4	hours
Timothy Hulla	1	events; 3	hours
Robert Goddard	1	events; 2	hours
Kathryn Taggart	1	events; 3	hours
Larry Meyer	1	events; 2	hours
Elaine Siboda	1	events; 2	hours

2020 Volunteers, Special Mention

Bill Breeden, Outreach Coordinator, Francis Park, Virtual Coordinator
 Don Ficken, Library Coordinator, Virtual Coordinator
 Brad Waller, SLSC Coordinator
 Richard Fefferman, Gateway Arch Coordinator

**Dates and Times for Lunar X for the Year
by
Grant Martin**

<u>UT Date</u>	<u>UT time</u>	<u>Local date</u>	<u>Local Time</u>
3/20/2021	9:42:04PM	3/20/2021	4:42PM CDST
5/18/2021	11:14:01PM	5/18/2021	6:14PM CDST
7/16/2021	10:37:44PM	7/16/2021	5:37PM CDST
9/13/2021	9:46:28PM	9/13/2021	4:46PM CDST
11/11/2021	10:41:35PM	11/11/2021	4:41PM CST



Landing On Mars: A Tricky Feat! *by David Prosper*



The Perseverance rover and Ingenuity helicopter will land in Mars's Jezero crater on February 18, 2021, NASA's latest mission to explore the red planet. Landing on Mars is an incredibly difficult feat that has challenged engineers for decades: while missions like Curiosity have succeeded, its surface is littered with the wreckage of many failures as well. Why is landing on Mars so difficult?

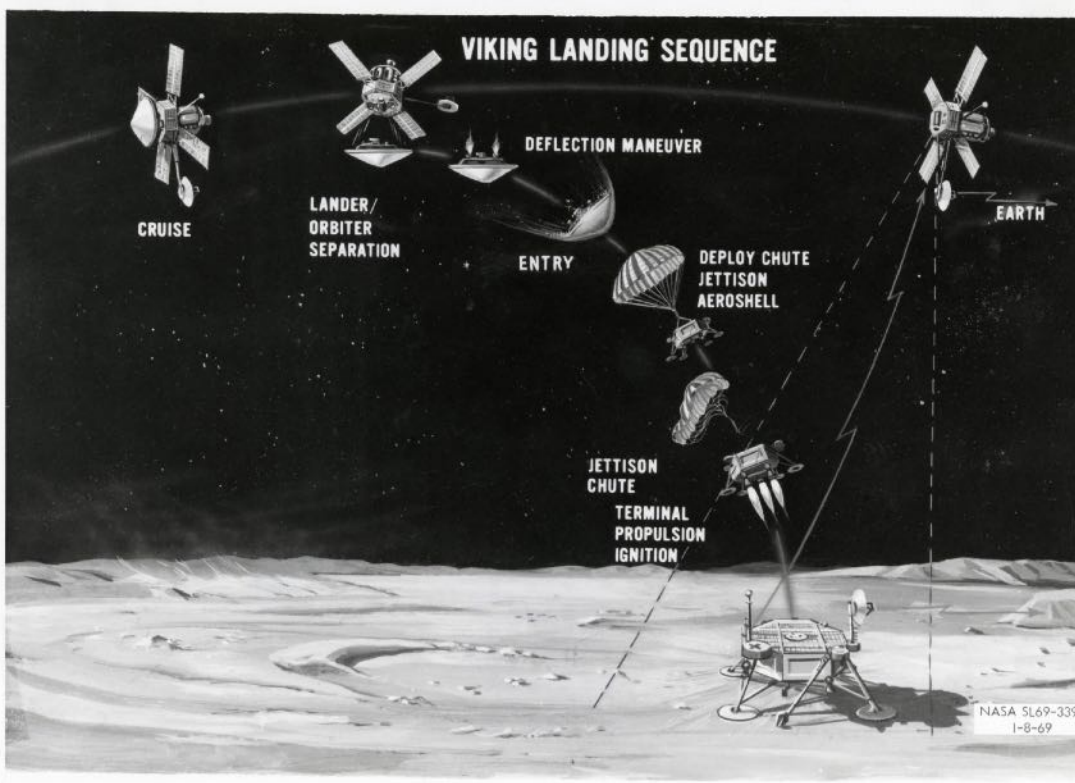
Mars presents a unique problem to potential landers as it possesses a relatively large mass and a thin, but not insubstantial, atmosphere. The atmosphere is thick enough that spacecraft are stuffed inside a streamlined aeroshell sporting a protective heat shield to prevent burning up upon entry - but that same atmosphere is not thick enough to rely on parachutes alone for a safe landing, since they can't catch sufficient air to slow down quickly enough. This is even worse for larger explorers like Perseverance, weighing in at 2,260 lbs (1,025 kg). Fortunately, engineers have crafted some ingenious landing methods over the decades to allow their spacecraft to survive what is called *Entry, Descent, and Landing (EDL)*.

The Viking landers touched down on Mars in 1976 using heat shields, parachutes, and retrorockets. Despite using large parachutes, the large Viking landers fired retrorockets at the end to land at a safe speed. This complex combination has been followed by almost every mission since, but subsequent missions have innovated in the landing segment. The 1997 Mars Pathfinder mission added airbags in conjunction with parachutes and retrorockets to safely bounce its way to a landing on the Martian surface. Then three sturdy "petals" ensured the lander was pushed into an upright position after landing on an ancient floodplain. The Opportunity and Spirit missions used a very similar method to place their rovers on the Martian surface in 2004. Phoenix (2008) and Insight (2018) actually utilized Viking-style landings. The large and heavy Curiosity rover required extra power at the end to safely land the car-sized rover, and so the daring "Sky Crane" deployment system was successfully used in 2012. After an initial descent using a massive heat shield and parachute, powerful retrorockets finished slowing down the spacecraft to about 2 miles per hour. The Sky Crane then safely lowered the rover down to the Martian surface using a strong cable. Its job done, the Sky Crane then flew off and crash-landed a safe distance away. Having proved the efficacy of the Sky Crane system, NASA will use this same method to attempt a safe landing for Perseverance this month!

You can watch coverage of the Mars Perseverance landing starting at 11:00 AM PST (2:00 PM EST) on February 18 at nasa.gov/nasalive. Touchdown is expected around 12:55 PM PST (3:55 PM EST). NASA has great resources about the Perseverance Rover and accompanying Ingenuity helicopter on mars.nasa.gov/mars2020. And of course, find out how we plan to land on many different worlds at nasa.gov.

NASA National Aeronautics and Space Administration

Headquarters
Washington, D.C.

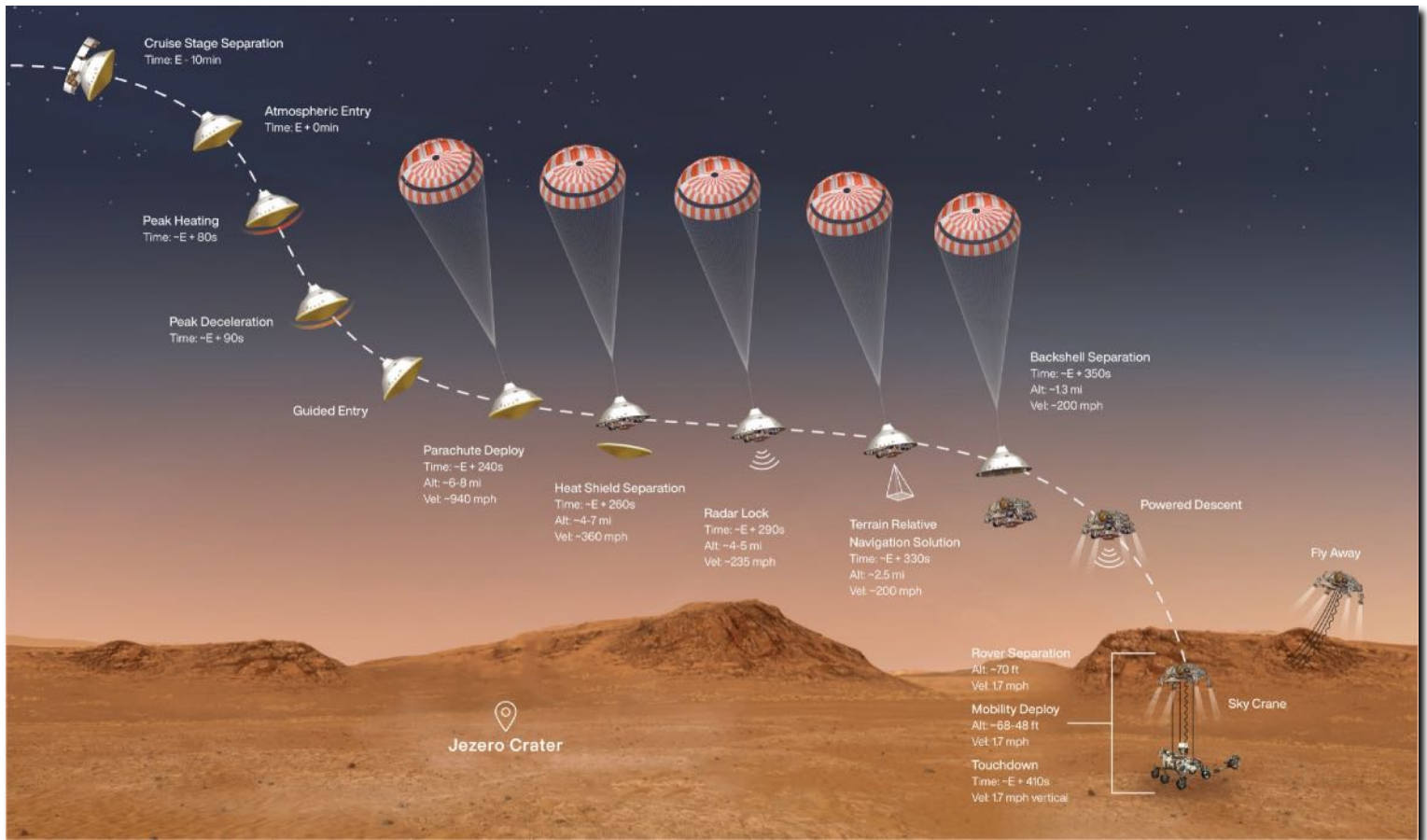


Thanks to Night Sky Network for this article!

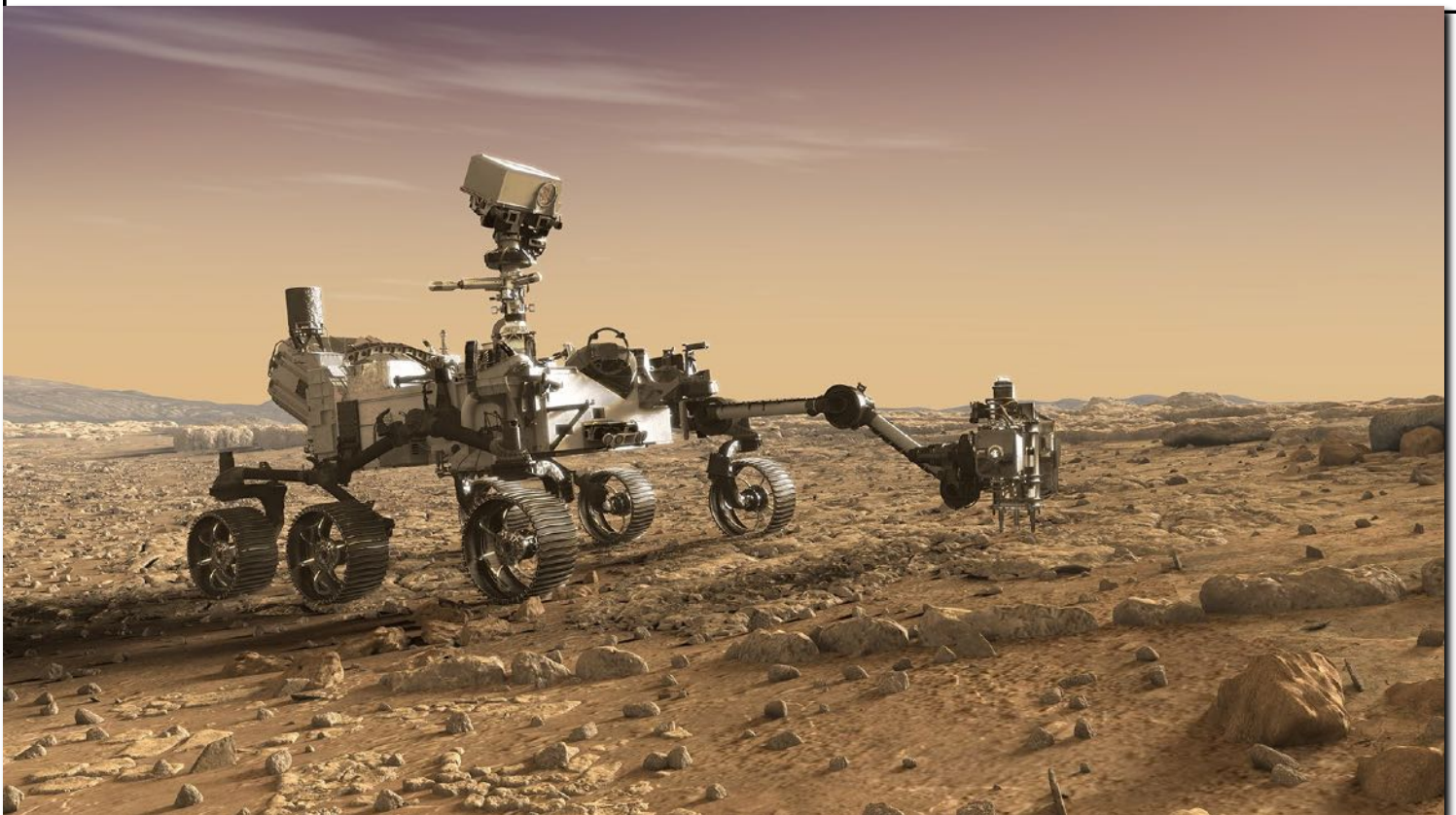
The Viking Lander Sequence.

Dr. Ray Arvidson (this month's speaker) was involved with this mission!

Perseverance sequence on the next page!



Perseverance Landing Sequence. Sometimes called the Seven Minutes of Terror!
Below: Artist conception of Perseverance on Mars!



**St. Louis Astronomical Society
Devoted to the Interest and Advancement
of the Science of Astronomy
Executive Board Meeting Minutes 1/7/2021**

1. Opening Activities

- a. Attendance: Jim Small, Brent Buch, Larry Campbell, Bill Winningham, Brad Waller, Mark Jones
- b. Meeting Opened at 7:19pm
- c. Approval of last month's meeting minutes. Motion to approve by Brad second by Larry. Minutes were approved with changes
- d. Next Board meeting date: Dates for 2021 remain the first Thursday of the month: Meetings will be via Zoom until further notice. Jan 7, Feb 4, Mar 4, Apr 1, May 6, Jun 3, Jul 1, Aug 5, Sep 2, Oct 7, Nov 4, Dec 2.

2. Upcoming General Membership meeting topics:

- a. **Speaker:** Anne Hofmeister, PhD Thermodynamic Constraints on the Non-Baryonic Dark Matter Gas Composing Galactic Halos
- b. Discussion of limiting Q&A after speaker. Jim will check with speaker prior to meeting if they have an expected time for Q&A
- c. Speaker Press Release: release by Rich Heuermann
- d. A101: Mark Jones will present 2021 Astro Events

3. SLAS Financial Report

Should be able to close the 2020 books by Jan 9.
Preliminary year end results: Equity \$82,764, Income \$3735 above budget, \$4960 income from dues for 2020. Over 200 members, Net income about \$1685,

4. Speaker Committee a. Budget - \$400

SLAS Monthly Meetings

Presentations 2021

Note that Drs Hofmeister and Criss have switched months

Month	Name	Topic	Sponsor
15-Jan-2021	Anne Hofmeister, PhD	Thermodynamic Constraints on the Non-Baryonic Dark Matter Gas Composing Galactic Halos	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
21-May-2021	Larry Bartoszek, PE	The Connection Between the Periodic Table and 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
20-Aug-2021	Robert Criss, PhD	Galactic Rotation & Dark Matter	Wash U
17-Sep-2021	Larry Bartoszek, PE	The Sloan Digital Sky Survey Telescope	NSS

b. Open dates for 2021 are Oct - Dec, Brad has booked 2 speakers for 2022

c. Topics of interest. AAS meeting is next week, Jim will check for potential speakers

5. Membership Initiatives

- a. Budget - \$450
- b. Attendance prizes this month Winners for December, Hand-warmer - Mark Jones; Star Date - Charlie Jefferies; Sky Safari - Sal-lie Taylor donate money to observatory; Green Bank Stuff - Brad Waller; T-shirt - Jim Small; T-shirt - Randy Harrison; T-shirt Orion - Craig Walters; T-shirt Dobsonian Brent Buch; T-shirt Wayne Clark; 40mm eyepiece - Brad Waller

6. Membership Recognition

- a. Total Budget \$420
- b. NSN Outreach Awards: 18 people had 2 or more events, Jim to buy 20 pins

- c. Membership Report: 211 members through Dec 2020
 - d. Member anniversary awards – all have been mailed out
 - e. New Award program - \$600 budget New Award Committee report: Chairman – Larry Campbell, Jim Small, Mark Jones, Cook Feldman, Sharon Bertram, Fred Schovanez, Bill Neubert
- Next meeting Jan 10, 4pm, Larry will send out meeting announcement

7. Outreach

- a. Budget - \$700
- 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 complete and received by Brad
- e. Upcoming outreach events:
Jan 10, 2021 Aim for the Stars
January 12, 2021 at 6:00 pm - "The Search for Life in the Solar System"
January 27, 2021 at 10:00 am – "The Search for Life in the Solar System"
March 3, 2021 at 6:00 pm – "A Warp-10 Tour of the Milky Way"
March 24, 2021 at 10:00 am - "A Warp-10 Tour of the Milky Way"
- f. Awards/recognitions – 18 SLAS member had 2 or more outreach events for 2020. Jim will order pins

8. Old Business:

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

9. New Business: None

10. Other Committee Reports: If needed

A. Jefferson College Business:|

- a. Committee Meeting report: Observatory update. Construction contract issued in December, work should start in January
- b. Upcoming Outreach Event: Virtual event Sunday, Jan 10

D. Library Telescope Committee

- a. Budget – \$300
- b. Maintenance budget - \$100
- c. Mileage re-imbusement – see above
- d. Promotional materials - \$200

E. SLAS Social Events a. Budget - \$300

- b. Homemade Fest - \$100 budget. Board recommends post-pone event until warmer weather maybe host outdoors.
- c. Star-B-Q - \$200 budget

F. SLAS Brochures a. Budget \$200

G. Loaner scope Program

- a. Budget - \$100
- b. New donations – 6" Cave reflector, Monolux refractor
- c. Replacement Parts for the LPTs -

H. SLAS Library

- a. Budget - \$500

I. Newsletter

- a. Budget \$600

J. Website

- a. Budget \$690

11. Closing Activities

Motion to adjourn made by Brad, second by Bill. Meeting adjourned 9:16pm

**St. Louis Astronomical Society
Profit & Loss Budget vs. Actual
January 2021**

	Jan 21	Budget	\$ Over Bud...
Ordinary Income/Expense			
Income			
Magazine Subscription			
Astronomy Magazine Sal...	170.00	102.00	68.00
Sky & Telescope Sales	175.80	164.75	11.05
Total Magazine Subscription	345.80	266.75	79.05
Membership Dues	480.00	520.00	(40.00)
Total Income	825.80	786.75	39.05
Cost of Goods Sold			
Magazine Subscriptions			
Astronomy Magazine Cost	170.00	102.00	68.00
Sky & Telescope Cost	131.80	164.75	(32.95)
Total Magazine Subscripti...	301.80	266.75	35.05
Total COGS	301.80	266.75	35.05
Gross Profit	524.00	520.00	4.00
Expense			
1-Programs & Events		178.00	(178.00)
2-Newsletter		35.00	(35.00)
3-Library expense		100.00	(100.00)
5-Loaner Scopes		25.00	(25.00)
6-Brochures		25.00	(25.00)
8-Website		200.00	(200.00)
9-Administrative Expenses	8.24	80.00	(71.76)
Total Expense	8.24	643.00	(634.76)
Net Ordinary Income	515.76	(123.00)	638.76
Other Income/Expense			
Other Income			
Interest Income	5.13	4.00	1.13
Total Other Income	5.13	4.00	1.13
Net Other Income	5.13	4.00	1.13
Net Income	520.89	(119.00)	639.89

**St. Louis Astronomical Society
Balance Sheet
As of January 31, 2021**

	Dec 31, 20	Jan 31, 21
ASSETS		
Current Assets		
Checking/Savings		
Checking - First Bank	7,587.88	8,603.05
Deposit, Certificate of	15,925.53	15,930.33
Library Telescope Escrow	1,206.41	1,206.41
PayPal	747.44	248.03
Savings - First Bank	41,145.74	41,146.07
Total Checking/Savings	66,613.00	67,133.89
Other Current Assets		
Inventory Asset	761.53	761.53
Total Other Current Assets	761.53	761.53
Total Current Assets	67,374.53	67,895.42
Fixed Assets	15,336.00	15,336.00
TOTAL ASSETS	82,710.53	83,231.42
LIABILITIES & EQUITY		
Equity		
Opening Bal Equity	8,497.66	8,497.66
Retained Earnings	72,581.69	74,212.87
Net Income	1,631.18	520.89
Total Equity	82,710.53	83,231.42
TOTAL LIABILITIES & EQUITY	82,710.53	83,231.42

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.** Mar 4, Apr 1, May 6, Jun 3, Jul 1, Aug 5, Sep 2, Oct 7, Nov 4, Dec 2

Dark Sky Observing Dates

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 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

19 Fri
SLAS Regular Meeting -
Perseverance Rover Mission!
Ray Arvidson

March

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

April

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

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		
Membership	Don Ficken	636-225-0269
membership at slasonline.org		
Newsletter Editor	Jim Small	314-909-7211
newsletter at slasonline.org		
Observing Programs	Mark Jones	636-394-2342
observing at slasonline.org		
Publicity	Rich Heuermann	314-962-9231
publicity at slasonline.org		
Recognition	Larry Campbell	636-244-2867
recognition at slasonline.org		
Social Media	Vacant	
'SLASdialogs' Moderator Mark Jones, Rhonda Whelan		
dialogsmoderator at yahoo.com		
Star Party Coordinator	Bill Breden	314-276-3613
starparty at slasonline.org		
Telescope Making	Bill Davis, Jim Melka	314-469-3061
telescope at slasonline.org		
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

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

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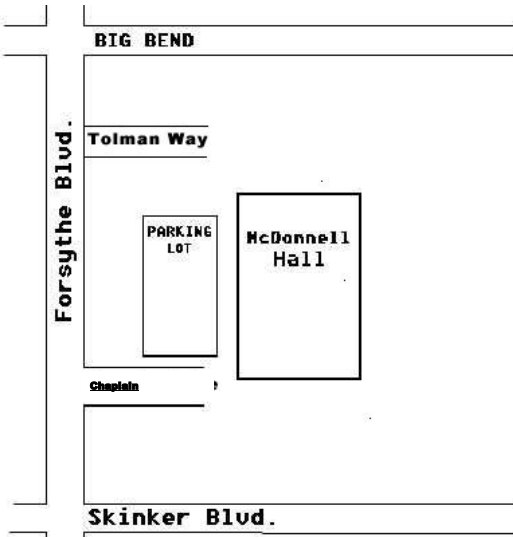


Who We Are and What We Do

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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