

# NOVA



Official Newsletter of the Salt Lake Astronomical Society  
Volume 50 Number 9 September 2020

**SLAS 's Newsletter's 50th year of publication.**

**Please Welcome The Newest SLAS Members!**

Brissey, Rick

Chacon, Lydia-anna

Kelsi, Rugo

Menasco, Rob



**Terrence Cook's** shot of a Perseid meteor and Milky Way over Arches National Park the night of 12 August 2020. The bright object near top center is Jupiter with Saturn to Jupiter's left.

# SALT LAKE ASTRONOMICAL SOCIETY BOARD MEETING

12 August 2020

**Special Note:** Due to the COVID-19 outbreak the meeting was held virtually.

**Board Members in Attendance:** Luke Moses, Rodger Fry, Daland Speirs, Tom Sevcik, John Drabik

**Other Members in Attendance:** Joan Carman, Patrick Wiggins, Ken Warner

**Location:** Online virtual meeting using Zoom

President Luke Moses called the meeting to order: 7:06 PM

Luke asked Rodger to update the Board on SPOC. Rodger reported there isn't much going on, except the bushes are getting unsightly and he would like to get them trimmed. Discussion of when that might be done, set for Tuesday 8/18/2020 at 3:00 PM. Rodger will bring equipment and a wheelbarrow, and will send out a reminder email to a small group of people.

Further discussion of whether we should extend SPOC fees to next year since nobody has been able to use the facility and take advantage of the fees they paid for this year. Motion by Rodger to extend SPOC fee expiration by one year, to the same date but in 2021. Second by Luke. Passed unanimously.

Regarding the use of SPOC during the remainder of this season, Patrick will put a note in the newsletter tomorrow that those people certified in 2019 can contact Rodger for consideration of limited use of SPOC. The public will not be allowed in (doors should be kept closed). If there is more than one person then masks etc will be required.

Rodger reported that the General Meeting speaker will be Joseph Moony, speaking about supernovae. For September, the guest speaker will be Mike Joner, topic TBD. There are no speakers set up for October or November yet. This was followed by discussion of whether the annual Solstice Party should be canceled. Consensus that we should wait and see how the pandemic status looks. Motion by Rodger to forego December guest speaker. No second. Will table this until September or October board meeting.

Patrick put up a notice on the website about selling the Paramount that was donated earlier this year. He is asking people to make an offer. If sold, the money may be used for the Jachmann telescope fund. Patrick noted we are seeking offers but the value is not stated on the site – due to the excellent condition it is probably worth about \$2000. Bids will be due October 1st. A call for bids will be given at the General Meeting next week. There will be an unstated Reserve amount and the Paramount will not be sold if the Reserve is not met (a reserve amount was discussed but will not be advertised and is not in these minutes in order to provide a level bid field for those interested).

Luke received an email about the 2.3 meter dome that was also donated. There is interest, but no bid was made. Patrick would like to advertise the dome availability on other sites and it was noted that the dome is in excellent condition. No action taken yet on this point.

Luke and Rodger received an email from another person who would like to donate a 14" telescope and 10' Prodome dome. The condition is unknown, but Luke seemed to recall it being about 10 years old. A quick check of prices showed that an equivalent dome currently costs about \$8,000. There was discussion about use at SPOC, but as with the prior dome, it is probably too small and might attract vandals. The general feeling is that Luke should contact the owner, and let him know we are interested but only to sell it and use the proceeds, he can take the tax writeoff. The 14" Celestron telescope value will also be determined at that time, and he can also take the writeoff for it. Luke noted that it is in good condition. The dome, telescope and mount will require disassembly and transport to SPOC, similar to what was done for the 2.3 m dome. He will contact the owner with this information.

Luke also received an email from somebody who would like to donate several telescopes. He does not have the exact descriptions at this time but it includes a 6" refractor, 8" Celestron GOTO, and others. There was discussion about what to do with the telescopes since storage at SPOC might otherwise be an issue. A sale was discussed, no action on that point. John suggested that perhaps one or two of them could be prizes in a raffle or as a door prize at an upcoming meeting with public attendance (not currently being considered due to the virus). Daland suggested an in-person auction, held at SPOC, as another option.

John delivered the Secretary/Treasurer report. The Society is still out \$40 due to the Paypal-caused error noted last month. Paypal still has no help available as of 2 days ago, and the case cannot be reopened without intervention (and possibly not even then). Luke recommended that we write it off. Motion by Luke to do that. Second by Rodger. Passed unanimously. John will create an offset adjustment and note in the Books spreadsheet for this. Since the amount is less than \$200, Luke noted that it does not have to be brought to the general membership.

Nominations are now open for Board positions for 2021. Discussion of this, and Rodger noted that he is not available or eligible in 2021. Luke is also not eligible, per the Society Constitution. John noted that two nominations have been received, one for any available position (by a third party; the indicated person has not been contacted to see if they will accept). The other is for the Secretary / Treasurer position. Patrick will continue to note on the website that nominations close August 31, to allow time to contact interested parties and prepare the ballot for the election.

Daland mentioned that he has been contacted about Star Parties again, both corporate and possibly for non-profits. This has come up before and there was discussion about insurance implications and availability of operators (at SPOC, or operators plus equipment for parties at other locations). Luke noted that the insurance does not cover such events. Daland noted that some companies have offered to make donations to SLAS, however, Luke is concerned that insurance would still be an issue. The framing question was then asked: "Is the Board open to star parties with donations?" SLAS does not provide private parties due to the insurance and operator availability points made earlier. John suggested adding a short notice to the SLAS site, that we do not support such events, in order to provide consistency and clarity for those who visit the web site. Patrick said he will look into that. John will formulate some proposed text and send it to Luke [Update: an email with possible content for private parties of various types was sent to Luke, Patrick and Rodger after the meeting was adjourned.]

Joan Carman reported on the library loaners program. Some SL County telescopes have been out on loan for months (borrowed before virus closures at the library. There are 17 such telescopes. They will be returned soon and Joan would like to hold a re-collimation event at a suitable library site. There were 185 holds requested for telescopes before the virus, and the library's list has now grown to 228 requests. SL County has only 47 telescopes actually available. Joan also reported that Provo City recently purchased two telescopes (which were assembled and delivered at the March event). They would like three more telescopes. The funds have been budgeted. John noted that some telescope makers are experiencing long lead-times. Joan will check on availability while we await SL County funds.

Ken logged into the meeting late. John updated him about the pre-meeting conversation concerning web site problems, and that issues are still being encountered as late as earlier this evening. New members are being announced to the Secretary (for bookkeeping updates) but their records are not being filled in. Renewals are not being announced, but the expiration field is being updated (only one such update has been received so far this month, and it did not include SPOC or other special fees, so it is unknown whether the site problem affects other types of renewals.) Ken is working a payment update code rewrite and should have it done in a few days.

There being no further business, the meeting was adjourned by Luke.

Meeting adjourned: 8:10 PM

# SALT LAKE ASTRONOMICAL SOCIETY GENERAL MEMBERSHIP MEETING

19 August 2020

**Special Note:** Due to the COVID-19 outbreak the meeting was held virtually.

**Board Members in Attendance:** Luke Moses, Rodger Fry, Daland Speirs, Tom Sevcik, John Drabik

**Attendance:** 34

**President Luke Moses called the meeting to order:** 7:32 PM

Luke immediately introduced the guest speaker, BYU's Dr. Joseph Moody.

Dr Moody provided background on himself. He has been teaching astronomy at BYU for 31 years, and at Utah State before joining BYU. He received his PhD in Michigan where he studied under Dr Robert Kishner (an early expert on supernovae). Dr Kishner was his thesis advisor.

Before the 1980's there were no supernovae observed scientifically before their peak and start of their decline stage. Dr Kishner determined how to prepare for catching a supernova on the rising part of the light curve, and with the help of amateur astronomers he started to see them around the time of supernova peak and before.

Dr Moody presented a series of slides, starting with a discussion of the range of star masses that result in various types of life sequences for those stars. Low mass stars (0.4 up to about 8 solar masses (0.4- 8M)) do not get hot enough in their core to fuse carbon and oxygen into heavier elements. M is the factor that determines the end-of-life mechanism. High mass stars have rapid declines.

He showed how some star shells can collapse within months, weeks, hours, or minutes depending on the type of material involved (e.g., silicon shells have very rapid collapse). Energy from the core fuses hydrogen to produce helium, then carbon, then carbon plus helium to form oxygen, but oxygen is hard to fuse so low M stars do not form much oxygen. Low mass eventually leads to planetary nebula formation, in layers and cycles (he showed a number of different planetary nebula (which is a misnomer - they just appeared as planet-sized to early astronomers, but the name stuck).

Planetary nebula (PN) form in layers and cycles, and he pointed out some of them using photos of the Cat's Eye and others. He noted that there are about 30,000 planetary nebula in the Milky Way. Smaller ones can dissipate rather quickly, in just 50,000 years or possibly faster.

Next he showed how larger companion stars affect PN shape, and result in a "corkscrew" like structure as material is pulled to the disk of the companion and then shot out as twirling jets in opposite directions, with high polarity asymmetry. White dwarfs, about the size of Earth, can have up to 1.4 M (a sharp cutoff point in end-of-life effects described by the Chandrasekhar mass/radius curve). He noted that the Dumbbell nebula is an example of that, and will eventually become a black dwarf, but the universe isn't old enough to have formed many of them (they can take millions or billions of years to form).

The mass/radius curve was an important factor in the validation of neutron star formation, and the concept of a "standard candle" for measuring astronomical distances. He also described how there were only two recognized supernova types (I and II). But more detailed captured spectra caught around the time of a supernova light peak showed that there were substantial differences, leading to current Ia, Ib, Ic, and II designations). He noted that the discovery that some supernovae had no hydrogen was "mind boggling" at the time, and very unexpected.

After the 1980's it was realized that a third type was needed to describe supernovae, and that type Ia is very different from Ib, Ic, and II, which are quite similar.

Stars with 8-25 M get hot enough in their core to fuse carbon and oxygen into heavier elements include neon, sodium, magnesium, sulphur, silicon, and up to iron but no further. Dr Moody explained how stars are in a state of equilibrium with gravity pushing inward, and heat energy pushing out. In stars of this size, balance is maintained but only for these lighter elements. He next described the end-of-life stage of stars greater than 25 M as a "waterfall" (i.e., if you're in a canoe and paddling near the waterfall, you suddenly realize you can't get away).

Iron is building up but it is removing energy from the core, leading to runaway and crushing as gravity overtakes the outward pressure energy due to the dissipation by iron in the core, with a shell of material above that. He noted how, depending on the shell type, the collapse can occur very quickly (e.g., silicon shell stars can collapse in just a few seconds or less). The collapse causes the outer material to fall in and "bounce off itself" resulting in blowing outward – a supernova. He described this (rushing in and bouncing back out) as a perfect rebound – so the outward energy is massive, and the resulting glow can be as bright as or brighter than all the other stars in the associated galaxy, combined.

This can last for several weeks. This discovery about supernovae also led to the discovery that the universe is expanding and doing so faster as time (age of the universe) increases. This runaway will eventually result in an open universe, perhaps within 20-30 billion years (current estimated age is about 13-14 billion years).

The professor went on to describe the pressing and constant need for accurate astronomical distance measurements, and expanded on the earlier mention of the standard candle. He described how he captured a light curve that became a standard for explaining the differences in supernova type (prior to 1980, there were only Type I and Type II (i.e., those with Hydrogen in their spectra, and those without)).

His experience during an extended stay at an Arizona observatory was entertaining – and had us wondering how the situation would be resolved [spoiler: you'll have to meet him or attend one of his classes to get the full story.] The outcome was the peak light curve mentioned earlier, and he showed how it compares to the commonly used curves that describe the various supernovae types. He also described just how bright supernovae can be, i.e., visible 90% of the way across the universe, and thus excellent "standard candles", but they require calibration due to factors like red-shift and slight spectral differences.

Despite that, he referred to them as the nearest thing to a "perfect experiment" that is repeatable.

Today, Type Ia supernovae are used to accurately measure distances. He also showed a YouTube video (search there for "Supernovae Image Light Curve and Spectrum" to see it yourself) to show how the curves are calibrated for a given supernova. It was at this point that he described the "Runaway universe" in more detail, comparing theories of closed, versus flat, versus open, versus runaway models / curves.

After the curves were determined, they went back to Einstein's theory and the relationship to increasing expansion. The theory is that the universe contains a consistent amount of energy per unit volume, so as the universe expands, there is more energy – i.e., dark energy. He was asked how this compares to recent studies that say we may be in a "bouncing" universe, and he noted that the two theories are not compatible. So, it then becomes necessary to resort to Philosophy.

There was a short question and answer period. Luke then closed the presentation at 8:40.

#### **Business Section of the Meeting:**

Rodger spoke about a small group of people that went to SPOC yesterday to trim bushes and clear out spiders. He next told attendees that at the Board meeting last week, it was decided that those who paid for SPOC access after 10/1/2019, will have their expiration extended by a

year since there has been no opportunity to use SPOC this year. John will be updating the affected roster accounts in the next day or two.

Luke then reminded attendees that Board 2021 nominations are open, but will close at the end of August. Luke and Rodger are not eligible to serve next year due to the 2-sequential-term limit in the SLAS Constitution, and he asked if anybody in the audience is interested in nominating somebody or themselves.

John noted that he has received 2 emails. One of those was from Rochelle Tarin, who was in attendance tonight. She indicated she is interested in the Secretary / Treasurer position. Tom Sevcik indicated he will consider a Board Member at Large role again. Daland also indicated that he would again consider at At Large role. John indicated that as current Secretary/Treasurer he could serve in the role again but will also consider a different role. Luke mentioned that, after nominations close at the end of August, statements can be needed from nominees, with their willingness to serve and a position statement. If there are more than two people for a given role, then there will be a primary in September. The actual election is held in October.

Rodger then described some of the extra equipment at SPOC that has been donated, including a 14" LX 200 telescope, Software Bisque Paramount, an expanding pier and a 2.3 meter dome / backyard observatory\*.

These have been described in the newsletter and there has been some interest in the dome, but nobody has yet submitted a bid. Bidding will close September 1st, and (per the Board meeting last week) additional advertising channels will be investigated by Patrick.

Proceeds from the sale of equipment will go to the Jachmann Memorial Telescope project. Rodger estimated that about \$3,000 is needed to finish that telescope (a moving base and pedestal – a heavy duty GEM mount has already been purchased that can handle the Jachmann).

Rodger described the telescope as an 11" refractor, which needs the base, and dolly suitable to hold the telescope and mount. The Jachmann will not be in a separate building – it will be kept in the Kolob building and rolled out for star parties.

There being no further business, Luke adjourned the meeting.

Slides may be available on the SLAS.us site later. Please check the site.

**Meeting adjourned: 8:55 PM**

**\*Items referenced above that SLAS is selling:**

Sirius Observatory Home Model (2.3 meter) observatory dome and building including:  
Motorized dome rotation  
Maxdome controller  
Manual shutters  
3 storage lockers  
12-Volt power supply for direct-powered operation of dome and telescope accessories  
Solar panel and battery charger for battery operation of dome

Pier Tech 3 electric height-adjustable pier

Software Bisque Paramount ME telescope mount

Meade LX-200R 14-inch OTA

Custom Homeyer cradle for OTA

Optec TCF-S focuser

### **SLAS Member Information**

The SLAS Member Information file is available at <http://slas.us/slasbooks/NEWMEM.PDF>.

### **Loaner Telescopes For SLAS Members**

SLAS has several scopes available for loan to current SLAS members. Check the SLAS website under "[Membership Benefits](#)" for details.

**Contact Us** [slasinfo@slas.us](mailto:slasinfo@slas.us)

### **2020 SLAS Board of Directors**

President	Luke Moses
Meetings	
Vice President	Rodger Fry
Publicity, PR and Web Content	
Secretary-Treasurer	John Drabik
Membership Dues & Renewals	
Board Member at Large	Tom Sevcik
SPOC Star Party Coordinator	
Board Member at Large	Daland Speirs
School & Special Star Parties	

### **Appointed Positions**

Astronomical League Contact	Aleta Cox
Equipment Manager	Luke Moses
Historian	Patrick Wiggins
NASA Night Sky Ambassador	Ann House
Newsletter Editor	Patrick Wiggins
Observatory Director	Rodger Fry
Private Star Party Coordinator	Don Colton
Webmaster	Ken Warner
ZAP Grant Writer	Jim Keane

### **SPOC Advisory Committee**

Chair through JAN 2021	Rodger Fry
Member through JAN 2021	Rodger Fry
Member through JAN 2021	Stan Eriksen
Member through DEC 2020	Larry Holmes
Member through FEB 2022	Leslie Fowler
Member through DEC 2020	Patrick Wiggins
Member through JAN 2021	Jim Keane
Member while SLAS President	Luke Moses
Member through FEB 2022	Tony Lau
Member as Obser. Dir. Emeritus	Bruce Grim
Member while Harmons Rep.	Vacant

### **SPOC Telescope Instruction Coordinators**

Refractor	Marlene Egger
Ealing	Jim Keane
Grim	Rodger Fry
Clements	Leslie Fowler

## Events Calendar

**NOTICE:** Owing to concerns over the COVID-19 pandemic, all in person SLAS events are currently on hold. The board will be sending out email SLAS Blasts advising the membership about any changes.

### September 2020

09 Board Meeting may be held on line. Details to be announced via SLAS Blast emails.

16 General Meeting may be held on line. Details to be announced via SLAS Blast emails.

NOVA is a publication of the Salt Lake Astronomical Society, a non-profit organization. Nova contains minutes of meetings, Board member names & contact info, activities, reports and special club events. The editor of NOVA is appointed by the SLAS Vice-President. Members are encouraged to contribute content. Current editor is Patrick Wiggins, 4099wiggins@gmail.com.