The High Desert Observer

March 2016

The Astronomical Society of Las Cruces (ASLC) is dedicated to expanding public awareness and understanding of the wonders of the universe. ASLC holds frequent observing sessions and star parties and provides opportunities to work on Society and public educational projects. Members receive the *High Desert Observer*, our monthly newsletter, plus membership to the Astronomical League, including their quarterly publication, *Reflector*, in digital or paper format.

Individual Dues are $30.00 per year

Family Dues are $36.00 per year

Student (full-time) Dues are $24.00

Annual dues are payable in January. Prorated dues are available for new members. Dues are payable to ASLC with an application form or note to: Treasurer ASLC, PO Box 921, Las Cruces, NM 88004. Contact our Treasurer, Patricia Conley (treasurer@aslc-nm.org) for further information.

ASLC members receive electronic delivery of the HDO and are entitled to a $5.00 (per year) Sky and Telescope *magazine discount.*

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March Meeting --

Our next meeting will be on ***Friday, March 18***, at the DACC Main Campus, Room 141, Technical Studies Building, starting at 7:00 p.m.

The speaker will be Kyle Uckert

Topic: The Search for Life.

Member Info Changes

All members need to keep the Society informed of changes to their basic information, such as name, address, phone number, or emai address. Please contact Treasurer@aslc-nm.org and jkile3916@gmail.com with any updates.

Outreach

Outreach is a very important part of ASLC. We are always looking for more volunteers to help us educate the public. Even if you do not have a portable telescope to bring to the events, please consider attending our public outreach programs to help answer questions, share knowledge and point out constellations in the sky.

Events

ASLC hosts deep-sky viewing and imaging at our dark sky location in Upham. We also have public in-town observing sessions at both the International Delights Cafe (1245 El Paseo) and at Tombaugh Observatory (on the NMSU Campus). All sessions begin at dusk.

At our Leasburg Dam State Park Observatory, we hold monthly star parties. Located just 20 miles north of Las Cruces, our 16" Meade telescope is used to observe under rather dark skies.

Please see *Calendar of Events* for specific dates and times.

ASLC Board of Directors, 2016

Board@aslc-nm.org

President: Daniel Giron; President@aslc-nm.org

Vice President: Christina Lugo; VP@aslc-nm.org

Treasurer: Patricia Conley; Treasurer@aslc-nm.org

Secretary: John McCullough; Secretary@aslc-nm.org

Director-at-Large: Tracy Stuart; Director1@aslc-nm.org

Director-at-Large: Ed Montes Director2@aslc-nm.org

Immediate Past President: rrichins73@comcast.net

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Librarian: ***OPEN***
Loaner Telescope: Daniel Giron (Temporary) **OPEN***
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From the Prez

March 2016

Last month we said good-bye to one of our members, Ron Kramer. For several years, Ron has been an active member of the ASLC serving as President, HDO Editor, Director of the Board and in many other positions as well, making valuable contributions to the Society. Ron is now taking the helm of a publishing company in Arizona. Best wishes to him and his company.

Since Ron Kramer was serving as Director of the Board at the time of this transition, this left a vacancy. It was quickly filled with the nomination of and acceptance by Ed Montes. Ed has shown himself to be a valuable member during last year's Astronomical League Convention (ALCON) and was the only person the entire Board of Directors considered being a worthy successor. The Board is grateful for his acceptance of the nomination and welcome Ed as the new Director.

On another note, this year's speaker roster is filling up nicely. We do have open spots for September and October so, if anyone would like to give a presentation to the club or know of someone who would like to give a presentation on a topic that would interest the ASLC, please let me know.

A debt of gratitude to all of the members who have made presentations or will be making presentations this year, as well as to those who provided speakers from outside the ASLC. Thanks.

I still encourage members to take advantage of any educational offerings by members. Member Robert Kimball is offering an introduction to the astroimaging software PixInsight to anyone interested. So if you are already into astroimaging or would like to start and learn about this imaging program, please contact Robert.

There are activities in the works for club members, especially for those getting started in astronomy so, please stay tuned. If there is any kind of learning activity you would like to have, let us know through the Yahoo group mail so we can start organizing.

We do have an offering for a club star-b-que sometime this year. Mary Alba, the daughter of the late ASLC co-founder Walter Haas, wants to host a star-b-que for the ASLC. In February's meeting there was some discussion and a few members showed interest in perhaps having this in October. I will bring up the topic again in the March meeting to further flesh out the plans. Anyone who was unable to attend February's meeting and is interested in a star-b-que please let me know.

Thanks to all who have made and continue to make valuable contributions to the Society. The year is still young and there is a lot to look forward to. See you at the March meeting.

Daniel Giron, Jr.

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Outreach Events

by Jerry McMahan

Leasburg, Saturday, February 6,

The beginning of a busy week. Dave Doctor operated the observatory. Chuck Sterling and myself, set up telescopes. Sid Webb set up two scopes. Sid set up at a different location than Chuck and I, which did provide

a wider coverage for park visitors to find scopes and get directions to the observatory. Andrew Messant also participated. Daniel Giron set up binoculars and gave away more prizes.

It was a cold night, but the seeing was good. We had a good session.

Tombaugh Elementary, Thursday, February 11

We had a late start due to a medical emergency nearby. The school is used to land helicopters for such problems. We had to wait for the ambulance and copter to leave before we could get in the gate. When we did get started we had the usual large crowd for that event.

New Mexico State Astronomy students brought two telescopes. Chuck Sterling set up his 100mm refractor. Tracy Stuart brought his 8 inch Schmidt as did Bert V. Ed Montes was also there with a scope. I brought the 8 inch on the LX 80 mount.

Every one had a successful evening. Well, almost every one. When I aligned my scope, it wanted to go to stars that were not visible. I started over several times, with the same result. I finally just pointed the scope at Sirius. I had to reposition the scope very often since it did not seem to be tracking at all. I asked Chuck a hypothetical question about the probability of such a problem being equipment difficulties, or operator stupidity. He replied, "Meaning you." I thought he jumped to that correct conclusion a little to fast. At first I thought I had missed setting up on North, but it turned out that I was not not the problem. More about the problem later on.

Tombaugh Observatory, Friday, February 12

The open house was attended by Steve Shaffer, operating the 12.5 inch scope and my self. I did not cause any major problems that I am aware of this time. Ann McFee was there again. She spent a lot of time telling the public about our club and about the Moongaze scheduled for the next night.

Steve had the club's scope on the Moon and on the Trapezium in the Orion Nebula.

Moongaze, Saturday, February 13

It was my third night in a row. Chuck Sterling took his 10 inch LX200 scope off of the fork mount and put it on his new Orion Atlas goto mount. It was the first use of the mount and did the job it was supposed to do. I brought the 8 inch LX 80 mount again.

I had the same alignment problem as I had at Tombaugh Elementary. It picked the same unavailable alignment stars as before and insisted the the Moon was on the horizon to the East, rather than almost straight up. Chuck suggested doing a factory reset. I did it, putting in my zip code, rather than Longitude and Latitude. I tried to align the scope again, and it worked. The second alignment star was very close the center of the telrad.

We had a couple, that have been coming to our events and to some meetings, stay the entire session. They were a lot of help. They can't make the next meeting, but plan to be at the one after it.

We looked at the Moon, and had our first Moongaze view of Jupiter, which cleared the building just before 9 PM.

Desert Hills Elementary, Thursday, February 18

Ed Montes brought his refractor, Steve Shaffer had his Dobsonian, Chuck Sterling, again, had the 10 inch on the new mount. Since we had a Moon, I brought the ETX 125.

Even with the Moon, the Orion Nebula was apparent. Sirius and the Pleiades's were also among the targets. We also had an appearance of the International Space Station.

We are ahead of the pace from last year for outreach events. That will probably change as things slow down for schools when daylight savings time starts. Why is that still a thing?

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Calendar of Events (Mountain Time - 24 hr. clock)

Mar	01	16:11	Last Quarter Moon
	04	04:30	Jupiter: Double transit, Io and Europa
	05	18:00	Dark Sky Observing at Leesburg Dam State Park
	08	04:00	Jupiter at opposition
	08	18:54	New Moon
	11	06:19	Jupiter: Double transit, Io and Europa
	11	19:00	NMSU: Tombaugh Observatory Open House
	12	18:00	OUTREACH; MoonGaze, International Delights Café
	13	00:00	Daylight Saving Time begins
	14	20:12	Jupiter: Double transit, Io and Europa (Jup = 20º Alt)
	15	11:03	First Quarter Moon
	18	19:00	ASLC Monthly Meeting; DACC Main Campus, Room 141
	19	22:24	Spring Equinox
	21	21:56	Jupiter: Double transit, Io and Europa (Jup = 47º Alt)
	22	19:00	OUTREACH; AFROTC from Mayfield HS at LDSP
	23	06:02	Full Moon
	23	06:20	Partial Lunar Eclipse (Moon = 11º Alt)
	28	23:58	Jupiter: Double transit, Io and Europa (Jup = 64º Alt)
	31	09:17	Last Quarter Moon
	31	17:30	OUTREACH; University Hills STEM Event (Solar)
Apr	02	19:30	Dark Sky Observing at Leesburg Dam State Park
	05	02:17	Jupiter: Double transit, Io and Europa (Jup = +42º Alt)
	07	05:24	New Moon
	07	18:00	OUTREACH; New Sunrise Elementary School (Solar)
	11	18:30	OUTREACH; Tombaugh Elementary School
	12	04:35	Jupiter: Double transit, Io and Europa (Jup = +06º Alt)
	13	21:59	First Quarter Moon
	15	19:30	NMSU: Tombaugh Observatory Open House
	16	19:30	OUTREACH; MoonGaze, International Delights Café
	21	23:24	Full Moon
	29	19:00	ASLC Monthly Meeting; DACC Main Campus, Room 141
	29	21:29	Last Quarter Moon

Be sure to visit our web site for the latest updates: *www.aslc-nm.org*

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Announcements

March's ASLC speaker is Kyle Uckert.The topic will be The Search for Life. Kyle will speak about his dissertation research on the detection of microscopic lifeforms in caves using a portable infrared spectrometer developed at NMSU. He will describe the relevance of caves on other planets for the search for life in the universe, the scientific instruments that may be implemented to find microbes in caves on Mars, the development and testing of an IR spectrometer at NMSU for life detection, and the robotic exploration of caves, including the field test of a cave climbing robot in a lava tube in New Mexico.

Kyle is completing his final year as a NASA Space Technology Research Fellow PhD candidate in Dr. Nancy Chanover's research group in the Department of Astronomy at New Mexico State University. His dissertation topic is on the characterization of biosignatures in subterranean rocks using a suite of in situ instrumentation techniques. He has also participated in other research projects, including the optimization of mass spectrometers for the detection of organics, the development of a portable IR spectrometer, the analysis of a stellar occultation by Neptune, and an evaluation of the solar system observing capabilities of the James Webb Space Telescope.

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Meeting Minutes

by John McCullough

Minutes, February 2016 ASLC Meeting

Show & Tell:

Fred Pilcher does photometry and spends most nights measuring the brightness of various objects. Recently, he powered up his system and aligned his telescope making fine adjustments. The hand controller of his system seemed to have "glitches" during operation. Fred knew he had to have a functional controller and soon had a replacement on the way. He also expected to have to perform periodic error corrections when the new controller was installed. Since the correction data appeared to be available once the replacement controller was installed, Fred surmised the data resides in the telescope/computer rather than the controller itself. In any case, Fred has obtained good exposures since the receipt of his replacement hand controller.

Fred also wanted to address the recent public announcement of the apparent confirmation of the existence of gravitational waves in the media. He had remained somewhat skeptical of the announcement until he was able to do more research but now is convinced the data confirms the observation. Fred thinks we should stay tuned for additional announcements including watching for "flashes" in the sky. Einstein's theory of general relativity seems to work "so far" but be alert for additional developments. Bert Stevens reported he did see a report of a Gamma Ray Burst (GRB) from about the same time and direction as the black hole merger that apparently generated the recorded gravitational waves.

John Gilkison and Daniel Giron shared the results of the recent meeting with the City of Las Cruces public works employees regarding new street lighting. Copies of John's and Sid Webb's reports were also circulated amongst the members. John and Sid met with the City personnel for about an hour and they seemed receptive to the concerns raised by John and the Society concerning the lighting ordinance. However, the City is still "working" on the issue. John will present the issue to the City Council on 29 February and report to the Society.

Sid Webb displayed a poster for Astronomy Day 2016 that will be held on 14 May at Leasburg Dam State Park (LDSP). He is seeking volunteers to make brief presentations on topics that will interest the general public. These presentations may be made at either the park's amphitheater or the observatory. There will also be a competition of a series of questions with the grand prize being a telescope. Correct answers to the questions will require some research ahead of time and Daniel is trying to get local schools involved.

John Gilkison would also like to get schools involved in viewing the Mercury transit on 09 May.

Call to Order:

Daniel Giron, President, Astronomical Society of Las Cruces (ASLC), called the business meeting to order at 7:30 pm., 26 February 2016, Room 141, Doña Ana Community College (DACC), Las Cruces, New Mexico.

President's Comments:

Daniel Giron, President, welcomed the group to tonight's meeting. He thanked Fred, John, and Sid for the "Show and Tell" session and for addressing the several topics of interest. Daniel asked that all members be sure to check in on the roster and visitors and guests sign the guest list. He then asked if all members had received the latest edition of the Society's newsletter, the High Desert Observer (HDO), had a chance to read it and if there any were any comments or concerns. Noting none, he asked for approval of the January meeting minutes as published in the HDO. Ed Montes moved for approval, Kim Morgan seconded, and the January minutes were approved by acclamation.

Treasurer's Report:

The Treasurer, Trish Conley, was not present at tonight's meeting. There was no Treasurer's report.

Committee Reports:

Outreach Committee:

Chuck Sterling, Outreach Coordinator, reported on pending events. An evening event will be held at LDSP on 05 March. Monthly Moon Gaze will be at International Delights Café (IDC) on 12 March. A star party will be held at LDSP for local Air Force ROTC students on 22 March (23 March will be a bad weather backup). An event will be held at Sunrise Elementary on 07 April; because of Daylight Savings Time, this will be a mostly solar event. Society members plan a viewing session at the Cosmic Campground 04 05 March. Members can check the yahoo group for details.

Tombaugh Observatory:

Steve Shaffer, Committee Chairman, was not at tonight's meeting. Jerry McMahan reported the last several open houses have gone well and have been well attended.

Membership:

Judy Kile, Committee Chairman, recognized visitors Bob Stack, Charles Hamwee(?) from New Jersey, and another visitor that neglected to sign in.

There were no additional committee or officer reports.

Old Business:

1. March 2016 Monthly Meeting – The March meeting will be 18 March because of unavailability of the DACC campus during Spring Break the next week.

2. Speakers – Kyle Uckert will speak at the March meeting. His topic is somewhat of a follow-up to Dr. Nancy Chanover's presentation on searching for extraterrestrial life. Kyle is a PhD candidate in Dr. Chanover's research group in the Department of Astronomy at New Mexico State University.
Penny Boston, scheduled to make a presentation at the April meeting, has had to reschedule for November.

John Gilkison stated he may have a replacement speaker. Daniel asked that others contact him if they have potential presentations/presenters. Cristina Lugo, Vice-president, has suggested that the Society hold a movie night or astro-bingo in lieu or in addition to a regular monthly meeting. Steve Barkes offered to provide a report on the Texas Star Party (TSP) 2016 at the June meeting and Bert Stevens will make the presentation at the August meeting. Speakers are still needed for September and October

There was no additional old business discussed.

New Business:

1. PixInSight – Robert Kimball has been using this software instead of PhotoShop for several years. If any members, particularly astro-imagers, would like an introduction to its use, please contact him. There are also two seminars on the software being held in Tucson, AZ, in the near future. Check your email for additional details.

2. Star-B-Que – Mary Alba, Walter Haas' (Society founder) daughter, has offered to host a star-b-que at her home for the Society. Potential dates are a weekend in October.

3. Ron Kramer Resignation – After eight years in Las Cruces, Ron is relocating to Arizona for business reasons and must resign his position as Director-at-Large on the Society's Board. He said he plans to expand his role in the Astronomical League (AL) and various educational endeavors. Daniel offered him many thanks for his service to the Society over the years and a certificate of appreciation. Vice-President Cristina Lugo provided a going-away card and a gift card to Lorenzo's in appreciation of Ron's service. Ed Montes has agreed to fill out Ron's term as Director-at-Large.

There was no additional new business for discussion.

Items for Sale:

No items were announced for sale.

Announcements:

There were no announcements made.

Recognitions/Achievements:

There were no recognitions or achievements announced at tonight's meeting.

The business portion of the meeting was adjourned at 7:54 pm

Presentation:

This month's speaker was Society member Alex Woronow on "Astronomical Spectroscopy – From an Amateur Perspective. Facets of the physical and chemical attributes of stars, nebulae, and novae lie exposed to simple spectrographic equipment, affordable to many amateur astronomers. The spectrographic observations made by amateurs can contribute significantly to professional studies, and many "campaigns" organized through amateur interest-groups provide

-Respectfully submitted by John McCullough, ASLC Secretary

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Back at the Telescope

by Bert Stevens

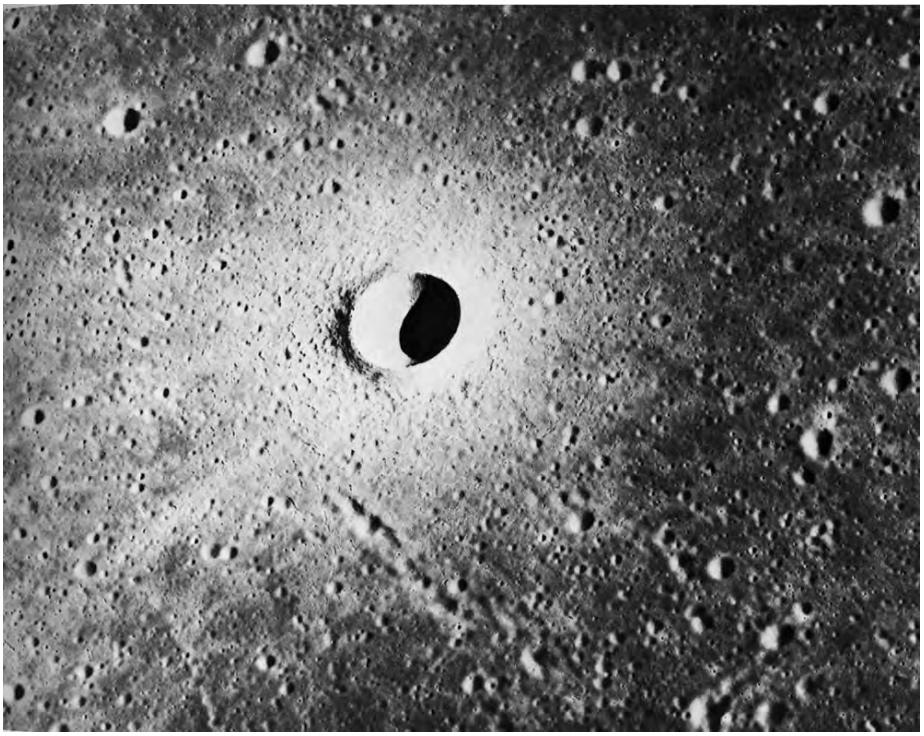
I was recently looking at the Moon as it went through its phases. There was a thin crescent in the west as I was coming out of the grocery store. A week later the first quarter was hanging high in the sky when I came home from work. Another week went by and the full Moon was rising in the east out the family room window in the evening. The last quarter Moon appeared in the morning sky a week later as I headed for work. Then the Moon was gone, starting the cycle all over again.

The Moon has been a companion to many of us since we could look up into the sky and comprehend what we were seeing. When I first got involved in astronomy, the Chicago Astronomical Society had just built a grazing occultation cable to compete with the one built by the Milwaukee Astronomical Society. For an active group of amateur astronomers in the Midwest, occultation work was very important.

Occultations were primarily lunar in those days. Minor planet occultations had not started being predicted yet, partially because the minor planet orbits were not accurate enough to make predictions and computers did not have enough power to make the calculations in bulk. Therefore, we would target stars sliding along the northern or southern edges of the Moon in a grazing occultation. Sometimes it would be a group of us covering the area where multiple events could occur, other times it was just me on some desolate farm road, watching that old Moon coming up over an open field.

Occultations at the time were important because they helped improve the orbit of the Moon in advance of the Apollo landings. Even after the landings, they were still important to provide information to compare with spacecraft measurements. However, occultation work was only one lunar observing project amateur astronomers were participating in at that time.

Another very interesting project involving the Moon was the observation of Transient Lunar Phenomenon (TLP). For centuries, observers had seen unusual manifestations on the Moon. Many of these reports are on file with the Association of Lunar and Planetary Observers (A.L.P.O.). On June 18, 1178, at least five monks from Canterbury (England) saw the upper limb of a new crescent moon split in two and a flaming torch appeared between the two split ends. This happened a number of times, and then the Moon took on a blackish appearance. While this sounds like it may have been an asteroid impact, it was more likely a meteor that just happened to be in the direct line with the Moon.



Linné Crater

The 2.5-mile-diameter Linné crater is located in the western part of Mare Serenitatis. The bright ejecta blanket blown out of the crater during its formation along with the rays of secondary impact craters are typical of a young crater of any size.

In a more modern observation, the British astronomer Sir William Herschel observed three red dots on the dark section of the Moon on April 19, 1787. The cause to these dots is unknown, but Herschel thought they were volcanoes. There was an unusual aurora that night that spread all the way southward to Italy. A month later, the number of sunspots peaked. Was this some effect caused by the increased solar activity or an actual event on the Moon?

In 1866, J. F. Julius Schmidt, an experienced lunar observer and mapmaker claimed that the crater Linné had changed its appearance. He compared the present view of the crater with the drawings of J. H. Schröter and his own earlier drawings of the crater made before 1843. Schmidt observed that at oblique illumination, the crater was invisible, while at high illumination, the crater appeared as a bright spot. He said that Linné did not appear as a normal crater under any illumination. Today, we see it as a normal young impact crater about 1.5 miles across.

An early spectroscopic observation of a TLP was made by Russian astronomer Nikolai A. Kozyrev with a 48-inch telescope and spectrometer. He was observing the central peak of the crater Alphonsus when he noticed “a marked increase in the brightness of the central region and an unusual white colour.” The spectrometer showed bright emission lines from carbon molecules (C2 and C3). While he was watching, the brightness faded and the spectrum returned to normal.

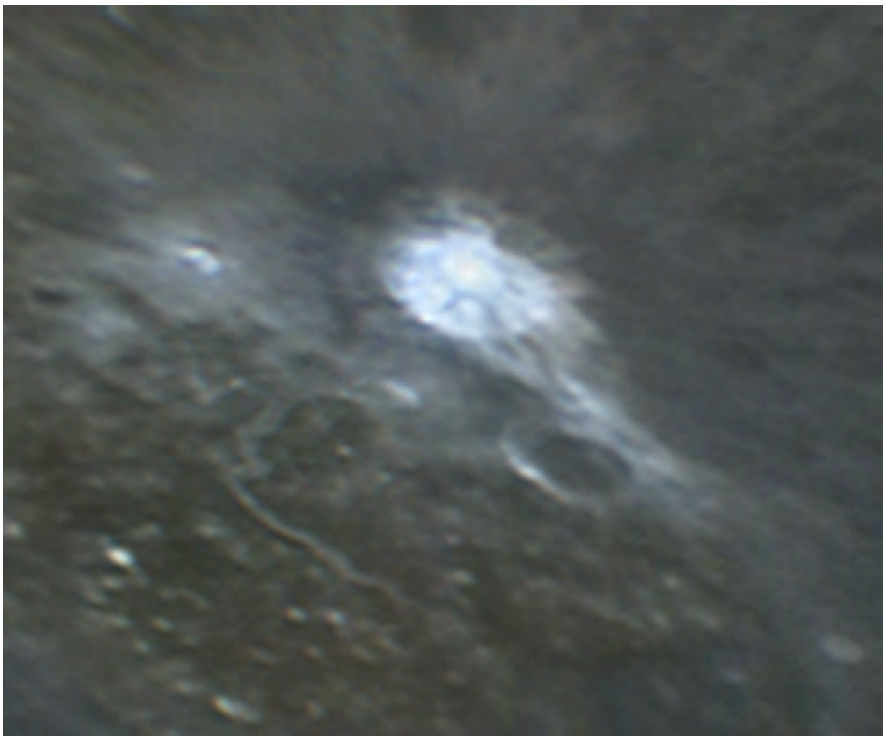
Moon - A TLP Captured

On November 15, 1953, Leon Stuart of the Columbia University Department of Astronomy caught a TLP while photographing the Moon. The TLP is the small, bright spot in the center of the image.

The modern era of interest in transient lunar phenomena began when two cartographers, James Clarke Greenacre and Edward M. Barr, from the Aeronautical Chart and Information Center were observing from Lowell Observatory in Flagstaff, Az. On October 29, 1963, they observed very bright red, orange, and pink color phenomena on the southwest side of the Cobra Head, a hill southeast of the lunar valley Vallis Schröteri and the southwest interior rim of the crater Aristarchus. The acceptance of these observations was due to Greenacre’s exemplary reputation as an impeccable cartographer.

According to the great space promoter and spacecraft designer, Willy Ley: “The first reaction in professional circles was, naturally, surprise, and hard on the heels of the surprise there followed an apologetic attitude, the apologies being directed at a long-dead great astronomer, Sir William Herschel.” Even so, TLPs were still not universally accepted as a real phenomenon.

Lunar observers since then have continued to observe events on the lunar surface. Over 1,500 TLP events have been cataloged since 557 A.D. Some of these events can be explained by the unsteady seeing conditions in our atmosphere or unusual lighting conditions on the lunar surface. Once these are eliminated, many of the remaining events occurred in the Aristarchus region (including Schröter's Valley, Cobra's Head and Herotus). Other events were reported in Plato, Mare Crisium, Tycho, Kepler, Grimaldi, and Copernicus.



Crater Aristarcus

Mike Deegan of Mike's Astroimagery UK in London took this image of the Aristarchus region during a flow-glow on December 17, 2005. This image was taken with a 10-inch telescope and shows a bluish glow emanating from the crater. It is possible that this was a TLP in progress while he was making a photo-mosaic of the Moon.

While many lunar astronomers simply ignore TLPs, Columbia University astronomers Cameron Hummels and Arlin Crotts have been studying TLPs with a two-pronged approach. One prong is to build an automated TLP detector. Using amateur-sized telescopes, they are monitoring the Moon with a low resolution, high-speed monitor. This system provides five thousand images a second with each pixel covering about six miles on a side. A computer system analyses the images, looking for any changes.

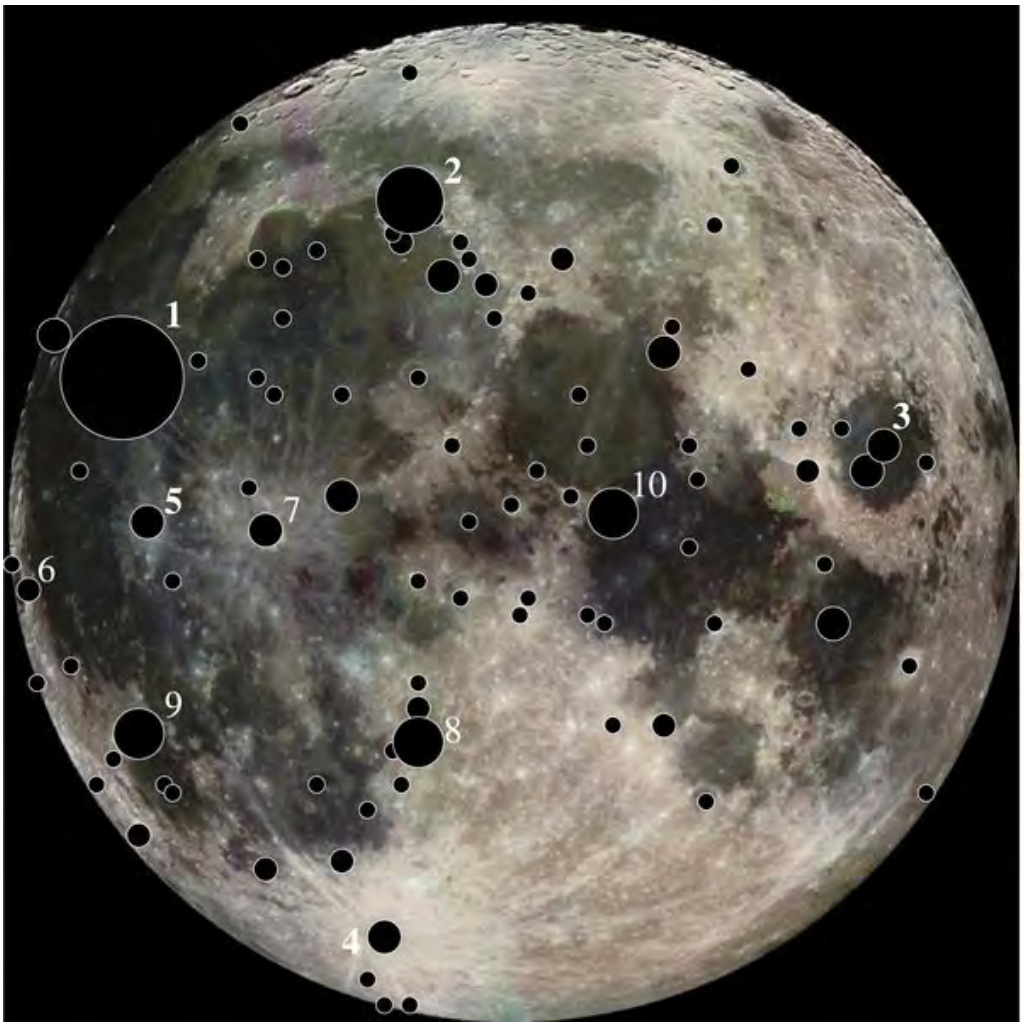
A second monitor only takes one image every ten seconds, but each pixel covers just 0.7 miles on a side. These images are also run through a program whose algorithm looks for changes in the images. The algorithms in the analysis system are so sensitive that they should be able to detect TLPs that would not be visible to the human eye. No results have been reported from this system yet.

Professor Crotts has also done a sophisticated statistical study of the classic Cameron and Middlehurst TLP catalogs. Looking at the observations reported over time by an ever-changing set of observers, Crotts has determined that around eighty percent of TLP observations are of real events on the Moon.

But what really causes these events? Crotts links the location of these events to moonquakes (the same as earthquakes, but on the Moon) and the emission of radon gas detected by Apollo missions and the Lunar Prospector spacecraft. Crotts thinks that TLPs are caused by the escaping gas that can explosively lift the regolith (the loose collection of dust and rocks covering the hard, rocky, lunar surface) above the surface, creating a TLP.

Crotts goes further and speculates that some of the expelled gas may be water vapor, which could become ice and interact with the regolith in complex ways. This speculation is extraordinary, since one of the primary discoveries of the Apollo program was that lunar rocks are "bone dry", with no water content. Even so, recent studies indicate that there might be some extremely small amounts of water in the lunar rock.

TLPs seem only to occur in selected areas of the Moon. Crotts proposes that these areas actually have a layer of ice under them that can sublimate into water vapor. This would provide the gas to build up under the surface to provide the explosive uplift to create the TLP. Problem solved.



Not quite, a kilometer wide layer of ice under Aristarchus and the other primary TLP areas is highly speculative with the Moon being so devoid of water in the rocks. It seems highly unlikely that there is so much ice under the surface. Nevertheless, it is an interesting theory, and maybe someday we will send a rover to Aristarchus to see if we can find ice there or not.

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Lunar TLP Distribution

Arlin Crotts plotted the incidence of TLPs on the lunar surface. The more TLPs that were reported in that area, the larger the black circle. The marked features are (1) Aristarchus (including Schröter's Valley, Cobra's Head and Herotus), (2) Plato, (3) Mare Crisium, (4) Tycho, (5) Kepler, (6) Grimaldi, (7) Copernicus, (8) Alphonsus, (9) Gassendi, and (10) Ross D. When Crotts analyzed the observations, only the first seven features appeared to have real events. The events reported at the last three did not appear to be real.

Photo of the Month

OBJECT Pelican Nebula (IC 5070) Distance: 1,800 light years
Telescope Takahashi FS-60C @ f/6.2
Mount Takahashi EM200 Temma II
Camera QSI 540wsg @ -15C
Filters Astrodon Ha (3nm), Astrodon Tru-Balance I-Series LRGB Gen 2
Guider SX Lodestar
Settings 7x20min Ha, 4x5min L (bin1x1); 4x5min ea RGB (bin2x2); AstroArt5, CS4 (slightly cropped, 10xdarks/flats/fdarks/bias)
Date/Location: 2 November 2015 - Las Cruces, NM
This image is LHaRGB, where Ha was used in combination with Luminance and Ha:R (80:20) was used for the Red channel.