Longmont Astronomical Society
May 2019 Newsletter

“Tarantula” by Tally O’Donnell

Vol. 33 No. 5 - ISSN 2641-8886 (web) - ISSN 2641-8908 (print) - May 2019
Notes from the President: Bill Tschumy

We had another great public star party at Rabbit Mountain on April 13th. Lots of scouts along with other folks attended. The skies were cloudy as we set up but cleared (as predicted) as darkness fell. We got lots of positive feedback from it.

Our new website is now live. You don’t have to do anything special to get there. Just go to www.longmontastro.org to see it. You log in using your email address. The first time logging in you will have to click “Forgot Password” and be sent a link to reset your password to whatever you want.

Once logged into the new site, it would be great if you could check your Profile and edit it to correct anything that might be out of date. It would also be great if you could set a profile picture so others can see what you look like. This can be restricted so only club members can see it. Setting a picture will help others in the club learn your name and recognize you.

Suggestions for making the new web site even better are always appreciated.

Last month’s meeting was our first at the First Evangelical Lutheran Church. Marty and his wife put out a great spread of Mexican food for us to eat. That was above and beyond the call of duty and we really appreciated it.

We are still looking for a new permanent meeting location. Stay tuned.

LAS Meeting – May 16, 7pm at First Evangelical Lutheran Church

“Lucy: The First Mission to Jupiter’s Trojans” by Dr. Hal Levinson, SWRI

Lucy will be the first space mission to study Jupiter’s swarm of Trojan asteroids. It will revolutionize our knowledge of planetary origins and the formation of the solar system.

Lucy will launch in October 2021 and, with boosts from Earth’s gravity, will complete a 12-year journey to seven different asteroids — a Main Belt asteroid and six Trojans, the last two members of a “two-for-the-price-of-one” binary system. Lucy’s complex path will take it to both clusters of Trojans and give us our first close-up view of all three major types of bodies in the swarms (so-called C-, P- and D-types).

No other space mission in history has been launched to as many different destinations in independent orbits around our sun. Lucy will show us, for the first time, the diversity of the primordial bodies that built the planets. Lucy’s discoveries will open new insights into the origins of our Earth and ourselves.
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### About LAS

The Longmont Astronomical Society Newsletter ISSN 2641-8886 (web) - ISSN 2641-8908 (print) is published monthly by the Longmont Astronomical Society, P. O. Box 806, Longmont, Colorado. Newsletter Editor is Vern Raben. Website URL is [https://www.longmontastro.org](https://www.longmontastro.org).

The Longmont Astronomical Society is a 501 c(3), non-profit corporation which was established in 1987. Our main goal is to promote local amateur astronomy. This is accomplished through regular monthly meetings, star parties and public observing sessions.

Regular meetings are held every month (except December) on the third Thursday. The current location is at the First Evangelical Lutheran Church, 3rd Avenue and Terry Street, Longmont, CO. Meetings are open to the public and begin at 7:00 PM.

A broad spectrum of topics are covered at the meetings and include such things as deep sky observing, planetary imaging, narrow band imaging, equipment discussions and demonstrations just to name a few. These subjects are presented by both club members as well as special guests who are professional astronomers or experts in a particular field.

The Longmont Astronomical Society is affiliated with the Astronomical League ([https://www.astroleague.org](https://www.astroleague.org)). The Astronomical League is an umbrella organization of amateur astronomy societies in the United States.
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Solar System Highlights

Moon

New moon: May 4 at 4:47 pm
First quarter: May 11 at 7:31 pm
Full moon: May 18 at 3:12 pm
Third quarter: May 26 at 10:35 am

Image credit: Brian Kimball

Mercury

Mercury is not visible with a naked eye this month

Venus

Venus is not visible with a naked eye this month

Mars

Mars is in constellation Taurus on the 1st; it moves to Gemini on the 16th. Best time to view it is around 9:30 pm. On May 1 it is magnitude 1.6 in brightness and the disk is 4.2 arc sec across; it dims to magnitude 1.8 and the disk to 3.9 arc sec by the 30th.

Jupiter

David Elmore

Jupiter is in constellation Ophiuchus all month. It is magnitude -2.6 in brightness and the disk is 45 arc sec across.

The Great Red should cross the center of Jupiter's disk at the following times this month assuming a longitude of 303° (see http://jupos.privat.t-online.de/rGrs.htm).

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<tr>
<th>Date</th>
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<td>4:10 am</td>
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<td>May  6</td>
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<td>May 16</td>
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<td>May 20</td>
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<td>May 25</td>
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<td>May 28</td>
<td>11:45 pm</td>
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<td>May 31</td>
<td>1:23 am</td>
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<td>June  1</td>
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Neptune

Neptune is in constellation Aquarius; it is magnitude 7.9 in brightness and the disk is 2.2 arc sec across. Best time to view it would be around 4:30 am.

Meteor Showers

The Eta Aquariads meteor shower peaks on night of May 4-5. The Moon is new that night so circumstances are good. Unfortunately for us this meteor shower is best observed from the southern hemisphere; even so there may be a few visible here.

Comets

Unfortunately there aren't any comets visible that are brighter than magnitude 12 this month.

Saturn

Saturn is in constellation Sagittarius all month. Its brightness increases from magnitude 0.5 on the 1st to magnitude 0.3 by the end of this month. Its disk increases from 17 to 18 arc sec across.

C/2018 Y1 (Iwamoto) by Gary Garzone
Cassini
The floor of Cassini is flooded with lava which appears to be the same level as the surrounding Imbrium. The lava rose so high that only the central mountain peak is barely visible above it.

Aristillus / Autolycus
Crater Aristillus is 34 miles across and has multiple terraces inside its rim. To its north is an unnamed “ghost” crater. (A ghost crater is one nearly covered by lava flow). It has multiple central peaks which won’t appear until later in the evening. To the southeast is 24 mile wide crater, Autolycus.

Ptolemaeus, Alphonsus, Arzachel
Ptolemaeus is nearly 96 miles in diameter and appears somewhat hexagonal in shape. There is no central peak. Look along its floor for “ghost craters”; these craters were nearly filled with lava so their outline is barely visible.

Crater Alphonsus has craterlets that have dark halos surrounding them thought to be caused by volcanic activity.

Crater Arazachel is a relatively young crater; it is 74 miles wide and 4900 feet deep. It has terraced walls, rilles, and craterlets.

Regiomontanus
Crater Regiomontanus has an oval appearance. It appears quite worn from numerous impacts. Its central mountains are distinctly off-center.

Put in a high power eyepiece on your telescope and you may see a tiny crater nearly centered on the highest central peak.
Navigating the May night sky: Simply start with what you know or with what you can easily find.

1 Extend a line northward from the two stars at the tip of the Big Dipper’s bowl. It passes by Polaris, the North Star.

2 Through the two diagonal stars of the Dipper’s bowl, draw a line pointing to the twin stars of Castor and Pollux in Gemini.

3 Directly below the Dipper’s bowl reclines the constellation Leo with its primary star, Regulus.

4 Follow the arc of the Dipper’s handle. It first intersects Arcturus, then continues to Spica. Confirm Spica by noting that two moderately bright stars just to its southwest form a straight line with it.

5 Arcturus, Spica, and Denebola form the Spring Triangle, a large equilateral triangle.

6 Draw a line from Arcturus to Vega. One-third of the way sits “The Northern Crown.” Two-thirds of the way hides the “Keystone of Hercules.” A dark sky is needed to see these two dim stellar configurations.

Binocular Highlights

A: M44, a star cluster barely visible to the naked eye, lies to the southeast of Pollux. B: Look near the zenith for the loose star cluster of Coma Berenices. C: M13, a round glow from a cluster of over 500,000 stars.

Astronomical League www.astroleague.org/outreach; duplication is allowed and encouraged for all free distribution.
The May meeting was at the David Skaggs building at 325 Broadway in Boulder, CO. Dr. Doug Biesecker gave a presentation about the STEREO satellites. He talked about some of the non-solar discoveries by the STEREO spacecraft such as comets. He also discussed the current solar cycle.

We then went down the hall and Steve Albers showed the ‘Science on a Sphere’ exhibit with some new STEREO and SOHO projections and high resolution projections of planets and moons.

Jerry Wilkerson gave a brief overview of making mirrors. With 6” or 8” mirrors the time frame for grinding a mirrors is 15 minutes to 2 hours. Polishing a mirror is difficult and can take up to 5 hours. It takes attention to detail, an ability to follow directions, and knowledge of how to make corrections. Jerry estimates the cost for a 6” mirror (from a flat) is $21.95-blank and 8” $39.95-blank. Cost for pre-curved blank would be about $10 more for each. Total price would be less than $100.00 per mirror aluminized. Jerry and Leigh would help with the mirrors.

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From Our Newsletter Archives

May 2009

May 1999

May 1989

We had a very nice star party at Tom Pebble’s house in the black forest near Colorado Springs. We had two 6 inch scopes, a 5.5 in comet seeker, an 8 in. Schmidt-Cassegrain, a 10 in. Schmidt-Cassegrain, a 10 in. Newtonian, a 12.5 in Newtonian and binoculars. The night started out clear and stayed that way most of the evening. We saw NGC 4565, M101, Owl Nebula, and M13. There was a nice response to last months quiz, here is this months: In what year did Sir Isaac Newton invent the Newtonian Telescope?
LAS Meeting Minutes for April 18 by Joe Hudson

Meeting Minutes
April 18, 2019
1900 hours MDT
Location: First Lutheran Church,
3rd and Terry Street,
Longmont, Colorado.

Bill Tschumy, President, opens and moderates:

Visitors
John and his son Elija Kieser

Introductions of Officers:
President: Bill Tschumy
Vice President: Stephen Garretson
Treasurer: Marty Butley
Secretary: Joe Hudson
Board members:
Vern Raben
David Elmore
Tally O’Donnel
Brian Kimball
Gary Garzone

Announcements:
• May 10 at 9 p.m. “Night Sky revealed: Evening Astronomy Event” at Sandstone Ranch
• May 11 at 8 p.m. LAS / BCPOS Star Party Rabbit Mountain, the speaker is Deborah Price and topic “The Moon and more”
• May 16 at 7 p.m. LAS Monthly meeting at First Evangelical Lutheran Church, the speaker is Dr. Hal Levinson who will talk about the NASA Lucy Mission

Short Presentation on the Solar System by Elija Kieser:
Elija Kieser visited the LAS meeting with his father, John. Elija is a middle school student who brought a recent project of his, a model of the solar system, replete with major body placement and supporting data. Elija described the planets, giving average orbital distances, circumferences, and the duration of each planet’s ‘year’. When asked “what did you personally find most surprising as you conducted your studies?”, Elija replied “the temperature of Venus” and the further study of why it is even hotter on Venus than Mercury (Venus is 864F or 462C). Elija received warm applause at the end of his talk, and was encouraged to return.

Speaker for the evening

Dr. Amanda Hendrix, Planetary Science Institute, Boulder, Colorado. Dr. Hendrix engages in UV spectroscopy of planetary surfaces including icy satellites, asteroids, Earth’s moon, Mars and Jupiter’s moon Io. She studies surface composition, weathering processes and radiation products.

Topic: “Ocean Worlds in the Solar System”
Dr. Hendrix talk focused on the abundant water believed to exist the moons of (primarily) the Jovian and Saturnian systems and the mechanisms used in the discovery and further analysis of each. As with all primary discovery, many ‘messengers’ have led to current understanding: visual imaging, radiometric, magnetic fields if present, etc.

She described the outer moons, starting with the five largest ‘ocean worlds’, Ganymede (the largest), Titan at 2nd largest, then Callisto, Europa, and Enceladus, and included the anticipated interior structure of each: core, middles, top, a couple are consistent rocky slushy ices. Europa has been known since Voyager to have an ocean by the cracks and motion of the surface but hard evidence finally came from Galileo’s Magnetometer.

Other key points: Ganymede and Callisto have subsurface oceans, Ganymede with an ice shell ~ 150 km thick, ocean 100 km plus, may have ice shells above and below water. Callisto’s ocean is believed to be pretty thick at 150 to 200 km. Some evidence for plumes on Europa caught (in the UV) on a couple Hubble images as Europa transited Jupiter.
Ganymede has an internal magnetic field, it is the only moon in the solar system to possess one. Ganymede must have a molten core (from tidal energy dissipation) to generate a field, and even shows aurora at times.

Are there other ocean worlds? Maybe Pluto and Triton, and Ceres. Did a subsurface ocean help re-orient materials to create the plain to south? And is Ceres an ocean world or was in the past with any remnant heat from radiogenic heating?

Triton has density of 2g/cc, surface presence of liquid hydrogen, methanes, dark plumes, maybe carbon rich deposits (or Nitrogen sublimating) but no free water.

Future missions (no promises until liftoff):
Europa Clipper 2023 - Is it really an ocean world, how habitable, and is there life?
Europa Lander (no date) - As above and land directly to search for life.

Titan Dragonfly 2025 (arrive Titan 2034) Quad copter discovery vehicle, two year mission flying to various targeted study areas.

In closing, is there life in the ocean worlds? On Earth, yes, life may have begun in the oceans. On Earth where there is water, there is life. Therefore as we search for water, then search for the right conditions, we may the search there for life.

Longmont Astronomical Society would like to extend sincere thanks to Dr Hendrix. LAS is very fortunate to have such skilled friends in the scientific community will to share of time and talent. Thank you again Dr Hendrix.

Business Meeting

Finance Report by Marty Butley

Marty reviewed club financials and membership. Make sure you have your current email on file with Marty.

Prior Business:
New web site is live - please review your info ad post a picture of yourself.

Tonight’s Business
Bylaws updates:
1. Renewal period of membership - 12 months from date you join, not from January as in the past.
2. Duplicate Language cleanup
3. Non-discrimination and sexual harassment language

Primary discussion point: there is need for the club to have a process / procedure to address such incidents. Some members thought the process stated in the bylaws. Vern motions we accept dues and language cleanup as is, and then leave non-discrimination and sexual harassment language to the exec board to handle. Marty seconds. All ‘Aye’, motion carries.

Dues Increase
Formal Board proposal to increase dues to $26. Very little discussion on this. (Dues last raised 25+ years ago). Gary Garzone moved we raise dues to $26USD, Michelle Blom seconds, All in attendance ‘Aye’, motion carried.

Meeting Location
Various preferences drove discussion, only specific action is that Brian Kimball volunteered to contact the ownership of iHop (whom he knows) to seek their agreement for use of the space as in years past -
• restore ability to dim or shut lights and music, etc.
• ensure enough wait staff and kitchen staff the nights we come
• please actively take our food orders starting when we arrive
• Brian will report back to the club in May or prior if he has news.

Meeting closed.
This map shows where NASA’s Opportunity rover was located in the Perseverance Valley on June 10, 2018, the last date it made contact.

The yellow traverse route begins at Opportunity’s landing site, Eagle Crater, and shows its 28.06 mile journey to its current location on the rim of Endeavour Crater.

The rover was descending into the crater when a dust storm ended the mission.
Endeavour crater