The Observer

The Official Publication of the Lehigh Valley Amateur Astronomical Society

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January 2017

Volume 57 Issue 01

ad astra

I really enjoyed our December Meeting and Holiday Party, and I think everyone, or at least almost everyone who attended did as well. That turned out to be considerably fewer than last year. We had about 35 people, enough for a nice gathering but we all had plenty of elbow room.

Maybe some folks stayed away this year because they weren't feeling too enthusiastic about the program we planned. Afterwards, there were some hallway comments that support this idea, such as "I was thinking, a trivia contest? Really? But that was fun!!!" So, while we may or may not have a trivia contest again some time, we will definitely be open to trying new things once in a while. Anyway, congratulations to this year's winners, the Blue Comets, and to the 2nd and 3rd place teams, the Non-Alpha Centaurians and the Fredadorians.

Our January meeting (January 8 at 2 p.m. at Trumbower Hall, Muhlenberg College) will feature our own Ron Kunkel on the topic of Solar Observing. While it's back to the routine presentation format, I expect it to be anything but boring. Ron's unofficial "Hey, do you want to look at the sun?" program at Pulpit Rock is probably the most extensive outreach effort that we have, catching hundreds of unsuspecting hikers every year in the snare of daytime "gravel path astronomy." Well, dozens, at least; and it is well worth their time, or anyone's, to check out the sun through Ron's excellent setup.

Switching Gears

Starting with this month, I am taking my contribution to The Observer in a different direction. I am running out of topics for "popular science" articles, and they can take a lot of time (admittedly I got a bit carried away last month.) Mostly, I want to focus on the 40" telescope project. So I will be keeping Ad Astra short and sweet, but I will also be writing the **Schlegal Observatory Report**. Look for the first installment elsewhere in this issue.

Astronomy Leading the Way

But it won't stop me from tossing in a good tidbit if I run across one, such as this series of slides from a few years ago by physicist John Baez: https://goo.gl/eecfoq (You may have heard of John's cousin, Joan, the singer.) Anyway, I found this in the blog of Scott Aaronson (https://goo.gl/MXg3Ms) where he summarizes: "the three big discoveries of the past 25 years — dark matter, dark energy, and neutrino mass — all [...] came from astronomy, and not one was predicted by theorists." So keep your eye to the eyepiece! Ad Astra.

— Rich Hogg

General Meeting: Open to the Public
Sunday, January 8, 2017 at 2 p.m.

Muhlenberg College, Trumbower Rm. 130

(Lithgow Science Auditorium)

"The Sun, Stars, and Solar Observing"
Featuring Ron Kunkel

Ron (r.) will cover the properties of the Sun, and of stars in general, including how they work and how our Sun fits in with other stars. He will also discuss the various methods of observing the Sun, both from an equipment standpoint, and what you can expect to actually see.

If you haven't already, you can pick up your LVAAS 2017 calendar at this event for a cost of $20. Proceeds benefit the LVAAS Greater Lehigh Valley educational outreach program. Thank you for your support of LVAAS.

2017

Is Here! Happy New Year!

If you haven't already done so, it's time to renew your LVAAS membership.

First, download the renewal form from this link:

http://lvaas.org/filemgmt_data/files/LVAAS2017MembershipRenewalForm.pdf

Then, please send it, along with your check, to the address on the form.

LVAAS Astrophotography Calendar 2017

The LVAAS 2017 calendar is available for purchase at all general membership meetings, including those to be held at Muhlenberg College over the winter months. All proceeds will benefit the LVAAS Greater Lehigh Valley educational outreach program.

Thanks again to everyone who helped make our calendar happen again this year!

- Sandra Repash, Calendar Editor

Calendar Cover Photos Credit: Gary A. Becker

HELP WANTED: No Experience Necessary. Operate/manage small retail establishment. Manage inventory and purchasing of beverages, snacks, hot dogs, custom-branded apparel and SWAG, and astronomy-related curiosities and media. Staff retail counter at Star Parties and General Meetings, or coordinate volunteers to do same. Procure and distribute beverages at Christmas Party, same plus additional staples at annual Picnic. Account for revenue, expenses, and profits, and report to owning organization. * * * The Red Shift needs a new proprietor!!! * * * Position opening in December. Apply in person or by e-mail to director@lvaas.org *

- **LVAAS calendars will be available at general meetings held at Muhlenberg College during the winter months.**

***LAST CALL!** Deadline is January 22, 2017!*

Hello Everyone,

*I've given talks at your astronomy clubs regarding my experiences visiting large observatories in Chile through the **Astronomy in Chile Educator Ambassadors Program (ACEAP)**. This exciting opportunity is now officially open for new applicants. Please share the following with your membership. I'd be happy to answer any questions you have or you can contact Tim Spuck, who is the coordinator for the program. This is an amazing experience to work with wonderful people, visit incredible facilities, and learn and share how modern astronomy is done today.*

Best wishes and good luck to all the applicants!

Peter (Detterline)

Dear Potential ACEAP Applicant,

The Astronomy in Chile Educator Ambassadors Program (ACEAP) has been an incredible success these past 2 years. To date 18 astronomy educators (formal and informal) from across the US and its territories have traveled to Chile for this amazing experience, and these individuals have paved the road for what we all hope will be an enduring program for years to come.

We are in the process of seeking the necessary funds to continue ACEAP, however to date funding has not yet been secured for ACEAP 2017, and it is unlikely we will have confirmation of funding until February 2017 or later. Please know that the ACEAP Leadership Team is committed to exploring avenues to keep the program going, and we believe the success of ACEAP 2015/2016 significantly increase the likelihood of continued funding from NSF, but there are no guarantees. Depending on funding, ACEAP 2017 may not take place at all, or may be altered significantly from ACEAP 2016/15.

With this understanding, we are opening the application process for ACEAP 2017. Although there is a level of uncertainty, it is necessary to move forward with the application process if we are to adequately plan for the selection of a 2017 Cohort and a 2017 Expedition. All applications must be submitted online at https://www.surveymonkey.com/r/ACEAP2017 by 11:59 PM (your local time) on Sunday, January 22, 2017. Again, please keep the uncertainties about ACEAP's future in mind as you consider applying for ACEAP 2017. As soon as we have any news on future funding, we will share it with you and the rest of the community.

To learn more about ACEAP or to apply to ACEAP 2017 please visits our website at https://public.nrao.edu/look-deeper/aceap or visit us on Facebook at https://www.facebook.com/AstronomyAmbassadorsProgram/.

Thank you so very much for your time and consideration, and your understanding and patience as we work to secure future funding for ACEAP 2017 and beyond. If you have any questions, please direct them to Mary Mayo (ACEAP Program Administrator) at mmayo@nrao.edu, Tim Spuck (ACEAP PI) at tspuck@aui.edu, or Charles Blue (ACEAP Co-PI) at cblue@nrao.edu.

Sincerely,

Tim and the ACEAP Leadership Team

Minutes for the LVAAS General Meeting of 10 December 2016

The December General Meeting, aka the annual Holiday Party, was held at Grace Community Church in Allentown, PA. The meeting started just after 2:00 P.M. Director Rich Hogg, after extending greetings to all, made a few quick announcements. The trivia contest, the program for the meeting, would require that people form teams of six. He also announced that the 2017 LVAAS calendars had arrived and were for sale for $20. Interested buyers should see Carol Kiely. Also those present and wishing to renew their memberships should see Scott Fowler, the new Membership Director. With those announcements, he then declared the buffet open and the approximated 35 attendees converged on the wide selection of carry-ins provided.

After the meal, Rich called on Bill Dahlenburg to conduct the installation of the elected officers for 2017. In a short ceremony Bill installed Rich Hogg as Director, Ron Kunkel as Secretary, and Gwyn Fowler as Treasurer. Assistant Director-elect Sandy Mesics was absent. With the exception of Gwyn, all officers were elected to their second term. Rich then thanked the outgoing officer, Treasurer Scott Fowler, for his two years of service in that position. Scott will be staying on the Board as he agreed to become Membership Director. Rich then thanked the membership for supporting him this past year and their confidence for his second term as Director. Lastly, Rich thanked Chuck and Donna Bradbury for their two years of service as Directors of Membership Services.

Rich and new Membership Director, Scott Fowler, then conducted readings for new members. First readings were conducted for Dave Melman, a resident of Allentown. There were no second readings.

Rich then turned the meeting over to our guests, Dave Melman and Tim Duch, who conducted a very interesting astronomy trivia contest. Those present formed into teams of about six persons each. There were a total of six teams competing. After five rounds of ten questions each, there was a tie between two of the teams for first place. The tied teams were the Non-Alpha Centaurians, consisting of Gwyn Fowler, Scott Fowler, John LaShell, Bob and Chris Mohr, Chris Voth and his young son Aiden, and the Blue Comets, consisting of Ron Kunkel, Tom, Jermaine, and Ted LeDoux, and Bob and Kathy Weiss. The tie-breaking questions was “What is the light travel-time between the Sun and Saturn?” The Blue Comets won the question and subsequently each member of the team got a $15 gift certificate toward items for sale in the Red Shift. Note, the origin of the names for these two teams is interesting. In the case of the Non-Alpha Centaurians, their name derived from the recent renaming of the well known star Alpha Centauri, to Rigil Kentaurus, its name from antiquity. In the case of the Blue Comets, they liked the name "Comets," but that was a bit too plain, so since they all had on something blue in color, they chose the name "Blue Comets." The trivia game turned out to be a lot of fun.

Lastly, the next General Meeting will be held at 2:00 P.M. on Sunday, January 8th, at Muhlenberg College.

The meeting adjourned at about 5:00 PM.

Minutes prepared and submitted by Ron Kunkel, Secretary.

Schlegel Observatory Report

by Rich Hogg

January, 2017

This is the first in what is planned to be a monthly update on the progress of completing the engineering and build of the Schlegel Observatory at Pulpit Rock. When possible (usually), I'll incorporate feedback and input from other members working on the project, most importantly Observatory Director Frank Lyter and Maintenance Director Ron Kunkel.

This first installment will be a list of all the different topics we might be covering in coming months, as sort of an introduction and "to-do list." I'll end each month with a summary of the most recent milestones and current activities.

Here is the list!

Optical system design **-** the primary mirror is figured and we know its focal length; we need to choose the exact spacing and back focus to aim for, considering the mechanical constraints as well as issues such as field of view of the finished system.

Coating system and vendor **-** there are a couple of different vendors for coating the mirrors and a couple of different options for the enhancement layers which will go over the aluminum, with different optical and longevity characteristics.

Baffling **-** we need to determine what light shielding is required to maximize contrast and minimize stray light while preserving the field of view allowed by the reflecting surfaces. Also, the dust cover for the primary mirror needs to be modified to make room for the baffle.

Mirror support **-** we need to complete the design of the system to support the primary and secondary mirrors so the telescope can be pointed in various directions without causing distortion.

Ventilation, heating, and cooling **-** we need to minimize the effects of thermal variation on the image quality, and we might want to consider gently heating the mirrors and electronics when not in use to minimize condensation.

Cleaning - we need to make provisions for being able to clean the primary.

Focuser and drawtube - the focuser which was constructed is not complete and needs to be readied for standard eyepieces.

Collimation - we need to consider how we will collimate the telescope; at the same time we we will look at the arrangements for focusing by moving the secondary.

Polar alignment - the mount needs to be aligned to the Earth's axis, and according to our information this will require enlarging one of the mounting holes in the base of the scope.

Power supply - we need to design the system to bring 120VAC to the telescope and convert it to the various DC voltages needed for the subsystems that make up the instrument.

Control electronics - we will choose the components that will be used to control everything.

Motor controls - we need to re-integrate the electronics for "making the wheels turn."

Drive train - once we have the instrument moving again, we need to check out all the motors and gears and make sure everything is in good shape.

Encoders - we'll finalize the design of how the telescope will know what it is pointed at.

Telescope control interface and software - we'll put together everything needed to allow an astronomer to point the instrument at a celestial body.

Protection - it is a given that a little bit of rain is going to get through the dome from time to time. We need to come up with a way to cover the instrument with secondary protection such as a tarp when it's not in use.

My approach to this project: I can really only speak for myself in this regard, although I think there are other folks who share at least some of my views towards it. I remember when I first saw the forty-inch and I was flabbergasted by the ambition of the project and how close it seemed to be to completion, and I was struck by the feeling that this is a project worth finishing. My feelings about that have not changed. I think that the efforts that have already gone into this telescope should not be allowed to go to waste, and that's why I have decided to make it a personal priority to push it over the finish line. But we are no longer directly guided by the vision of most of those original contributors; we don't know what they wanted to use the telescope for, and we don't know what we and future LVAAS members will find to use it for. Therefore I recognize that when it is finished, it may not be "finished." We will get to "first light" and then use it for a year, two years, or five years before we'll get to know it, and then maybe we will decide that it needs something more. But for now, we are being careful to not make too many assumptions about where that path will take us. We are going to bring the telescope on line with only minimal changes from the original design, carefully and sensibly chosen to the best of our ability to get to operational status as efficiently and economically as we can, and only then will we consider more ambitious changes.

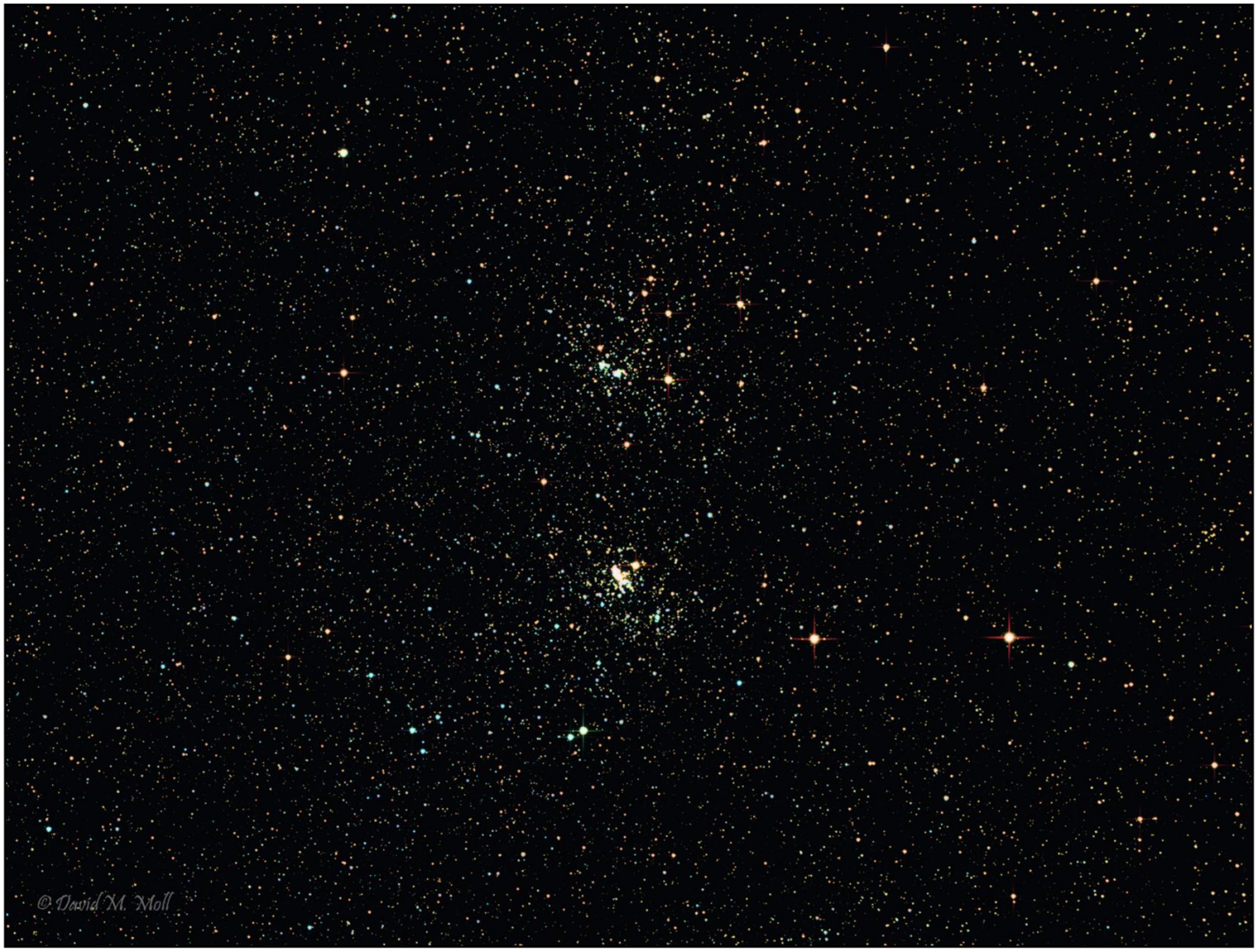
Thus, given the water damage we experienced in the observatory and the need to replace drywall, we decided to take the opportunity to upgrade the electrical wiring while the walls were down. Also, we have decided to take advantage of the latest technology to upgrade the control electronics, but the existing motors and the motor driver electronics seem good, so we'll stay with what we have for now. The airbag system for axial mirror support should work fine, so we'll stick with it, but we need something to support the mirror radially (edge supports, in other words) because a suitable system was never designed.

I welcome constructive feedback on every aspect of the project. If you think there is a specific problem that we are not considering, please tell me what it is. If you think there is a better approach to some aspect of the system, I want to hear about it.

Current Status and Activities: Figuring of the primary mirror is complete and it is at the workshop of John Pratte for machining of the central opening, which may be happening or even completed by the time you read this. Next, we need to select a coating vendor and a coating system, and transport the mirror to the vendor to be coated. In the meantime I am working on the electrical power distribution for the telescope, and we are finalizing plans to complete the building renovations in the Spring.

The Double Cluster: NGC 884, above and NGC 869, below, in Perseus

By Dave Moll



Imaged from Neffs, PA, Monday, Oct. 24, 2016. 15X2-minute frames aligned & stacked, 30 minutes total integration. Astro-Tech AT65EDQ Quad Apo scope, SBIG STF-8300C main camera SX Lodestar X2 guide camera, iOptron CEM-60 mount. Nebulosity 4 capture/preprocess, Photoshop CC final process. D. M. Moll photo.

Ron's Ramblings

Ron's Ramblings is a monthly series of articles describing some recent or otherwise important event in astronomy. The ramblings will attempt to describe both the astronomical event and its significance. Obviously, the description will be that of a rambling amateur astronomer.

Beyond the Standard Model

Multiple experiments clearly indicate that there's more to the Universe than just the particles of the Standard Model (SM). While experiments indicate that super-symmetry and extra dimensions probably don't exist, there are at least five pieces of evidence that there's more to existence than the SM alone. In this article I briefly identify those five lines of evidence.

1. Dark matter

When we look at the effects of gravitation in the Universe, it appears that there is some type of matter that doesn't interact with light in the way that the particles of the SM do. Based on structure formation, colliding galaxy clusters, gravitational lensing, Big Bang nucleosynthesis, baryon acoustic oscillations, and anisotropies in the Cosmic Microwave Background, it's clear that normal matter made of SM particles only accounts for about 15% of the total mass in the Universe; 85% of the mass appears dark. If dark matter is a particle, then, based on the way it clumps and strongly clusters, it must be a particle beyond the Standard Model.

2. Massive neutrinos

The three neutrinos of the SM were predicted to be mass-less particles. However, in the last decade, neutrino masses were constrained via the discovery of neutrino oscillations and were found to be very low in mass, but definitively not mass-less. The general way of explaining this typically involves additional very heavy particles that are extensions to the Standard Model. Without a new particle, the tiny, tiny masses of the SM neutrinos are completely unexplained. Whether or not massive neutrinos exist, they are almost definitely indicators of a new physics beyond the Standard Model.

3. Strong CP violation

In weak force interactions, both Charge (C-symmetry) and Parity (P-symmetry) are not forbidden by the SM and both have been simultaneously detected in multiple experiments. Additionally, there's nothing in the SM forbidding CP-violations in strong force interaction. But none have been observed to an extraordinary level of detail in experiments. Any physical explanation of these results indicates a new physics and the existence of a new particle beyond the Standard Model.

4. Quantum gravity

The SM is totally devoid of any hint of the gravitational force or interaction. Yet, the best theory of gravitation, General Relativity, breaks down at extremely large gravitational fields or at extremely small distances, into the problem of singularities. To explain these singularities a quantum theory of gravity is required.

Additionally, if the Cosmic Microwave Background is determined to be polarized, then gravity must be a quantum theory. The inescapable conclusion is that there must be at least one quantum gravitational particle beyond the Standard Model.

5. Baryogenesis

The vast preponderance of baryonic matter over antimatter is not explained by the SM. This matter-antimatter asymmetry doesn't necessarily demand the existence of new particles, but only one of the theories that proposes to explain the asymmetry does not required new particles beyond the Standard Model.

Now many of these problems are interrelated, and possibly only a few new particles beyond the Standard Model could account for a solution to all of these problems. In the next Ron's Ramblings, titled Tweaking the Standard Model, I will discuss just such a new theory and how, by simply adding a few undiscovered particles, numerous problems in particle physics and cosmology were simultaneously solved.

References:

Ethan Siegel. (2016, November 24). Five Independent Signs Of New Physics In The Universe. Retrieved from http://www.forbes.com/sites/startswithabang/2016/11/04/five-independent-signs-of-new-physics-in-the-universe/#47673c328b6e

The end of my ramblings until next month. Ron Kunkel

StarWatch

by Gary A. Becker

Godspeed John Glenn

The death of John Glenn on December 8 marked the passing of yet another person who was greatly admired by the public and me especially. He was a role model who exemplified all that was good about humanity, and at 95, the last surviving member of the famed Mercury 7 crew, the first American astronauts to fly into space.

In a July 30, 2015 interview with Glenn conducted by Paul Levinson (***Touching the Face of the Cosmos***, along with Michael Waltemathe, Connected Editions, New York, 2016), Glenn spoke about religion and space travel among other topics. “My going into space strengthened my religion—to see everything, what we are part of, part of creation, to see whole nations and oceans and everything at a single glance, that just strengthened my belief. That’s not where it came from, it just strengthened the beliefs I already had.”

About taking our religion with us as humanity ventures into space… “…I think we take our religious faith with us wherever we go and the same is true going into space. And it will be true whether we go to Mars, or Pluto, or wherever we may wind up eventually going. …Once we get there our religious faith and belief or beliefs will not be altered, except maybe we’ll appreciate the enormity of it all, more than we ever did before.”

About the conflict between science and religion… “They are complementary. I don’t see them as competitive at all. I think they’re complementary. The more you know about things, the more you appreciate, the more it strengthens your religious beliefs.” Did going into space change you as far as what you thought about the universe and humanity’s place in it? “No, not really. I think some people… say there I was in space and saw the face of God or something like that. That’s not the way it was at all with me.”

About seeing the universe as a spiritual experience… “It’s an experience, yes, that backs up my religious faith. It doesn’t replace, didn’t start it, didn’t stop it, just strengthens it.”

Godspeed, John Glenn.

© **Gary A. Becker –** beckerg@moravian.edu **or** garyabecker@gmail.com
Moravian College Astronomy - astronomy.org

"This picture is to the best of my knowledge the first hand-held camera picture ever taken from space. I took it during the first orbit of my Friendship 7 flight on February 20, 1962, during the early stages of our first effort to accomplish manned orbital flight. NASA knew that pictures from orbit were an important part of showing the public the beauty of space, as well as the importance of exploring it. The camera I used was a very simple Minolta Hi-Matic, which was one of the first of the automatic cameras."

~ John Glenn

***John Glenn** was a World War II pilot, Senator and the first American to orbit the Earth.*

Color photograph of North Africa from space, taken by John Glenn in the Friendship 7 spacecraft during NASA's Project Mercury MA-6 mission, Feb. 20, 1962

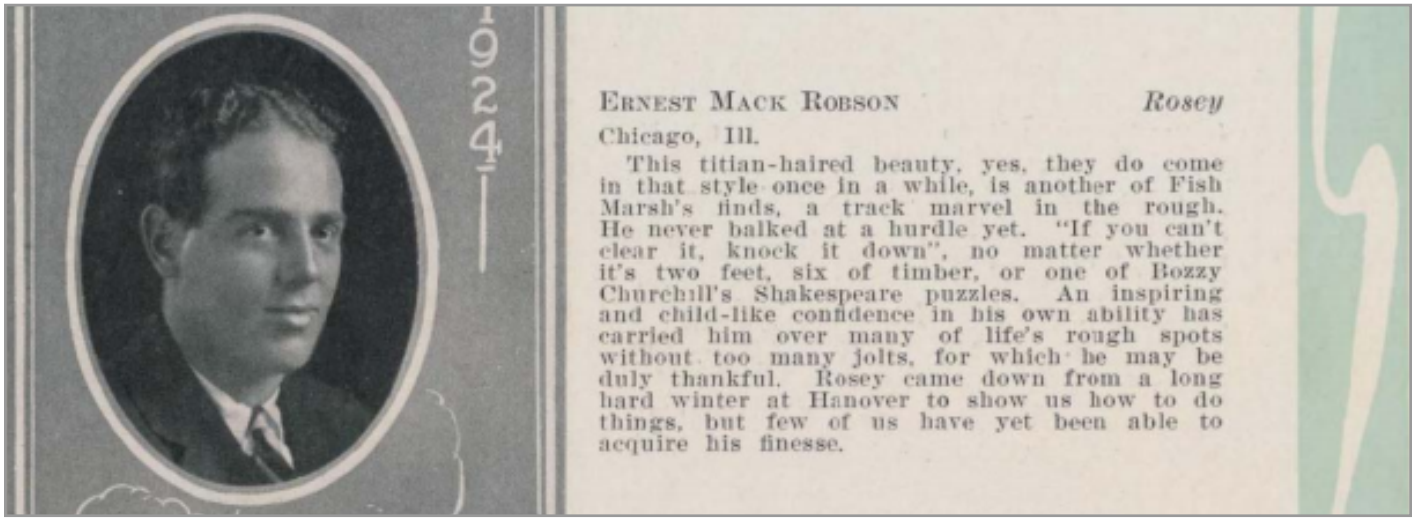
(Photo and quotation excerpted from time.com Nov. 17, 2016: http://time.com/4558781/john-glenn-influential-photo/)

From the LVAAS Archives:

The Robson Family and LVAAS

By Sandy Mesics

Fifty years ago, in 1967, Ernest M. Robson started his first term as LVAAS Director. Best described as a raconteur in the style of Studs Terkel, Ernie was one of LVAAS's most interesting characters. He was born in 1902, and attended Harvard Boys High School in Chicago. He went on to Amherst College, earning an AB (Baccalaureate in Arts) degree in 1924. He claimed to have been a student of Robert Frost, which is possible, since Frost taught on and off at Amherst. Frost was appointed to the Amherst Faculty as Full Professor in 1917, and taught at Amherst until January 1920 when he quit over a dispute with administration. Frost returned in 1923 and taught until his formal teaching duties ended in 1925. Regardless of whether he studied under Frost, young Robson became very interested in poetry, making it his life's avocation.


1924

ERNEST MACK ROBSON *Rosey*

Chicago, Ill.

This titian-haired beauty, yes, they do come in that style once in a while, is another of Fish Marsh's finds, a track marvel in the rough. He never balked at a hurdle yet. "If you can't clear it, knock it down", no matter whether it's two feet, six of timber, or one of Bozzy Churchill's Shakespeare puzzles. An inspiring and child-like confidence in his own ability has carried him over many of life's rough spots without too many jolts, for which he may be duly thankful. Rosey came down from a long hard winter at Hanover to show us how to do things, but few of us have yet been able to acquire his finesse.

During the great depression in the 1930s, he was a fur trapper in New York State, where he organized his colleagues into a cooperative which enabled them to obtain a fairer price for their pelts. In 1940 Robson was reported to be a writer living at 81 Horatio Street in New York City, while spending his winters trapping in the Catskills. There were also some unsubstantiated rumors that he had spent some time as a minor league baseball player. During World War II, Ernie served in the overseas service of the Red Cross, where he served with the Marines in the Pacific theater. He was one of the first Americans to visit Hiroshima to witness the horrors of the atom bomb.

Ernie's professional work was in the field of detergent chemistry. His chemical background included graduation from Pratt Institute Chemical School with supplementary work at New York University and The City College of New York. As a detergent chemist, he was technical director of the New York Rug Cleaning Association in 1955.

Ernie's wife, Marion Robson, taught in the New York City school system and participated in the experimental work for the revision of the arithmetic curriculum. Her other interests included the graphic arts and the graphic representations of astronomy. She drew the composite images for an LVAAS globular cluster project. Marion was LVAAS Secretary in 1964 and 1965. In 1967 she served as Program Chairperson and was responsible for

the first members' night on August 7, 1967, during which both junior and regular members presented short papers.

Ernie and Marion had a son, Robby Robson, who was very active in amateur astronomy from a young age, and in 1966, at the age of 12, was director of the junior group of LVAAS, the Ursa Major Astronomical Society (UMAS). (See the March, 2016 Observer).

The Robsons became LVAAS members in 1960. In 1967, Ernie was elected Director. As LVAAS Director, Ernie encouraged younger members and supported the Ursa Major junior group. He felt that fostering a love of astronomy in youth would be the key to LVAAS's success. Without a doubt, Ernie was deeply philosophical, as evidenced by his January, 1967 column in the Observer, "From the Director's Desk:"

> "In summary, I wish to return to the cultural services of our society (LVAAS); its help to those who wish to sense how their existence may contact the existence of the universe. Because we are a link between the public and the professional astronomer, we are an intermediary in transmitting knowledge of the universe. That is a cultural act. ... That is why, if we can make ourselves a model astronomy group, we may contribute something of a deeper value to American life."

During 1967, Ernie was instrumental in negotiating with Henry Kawecki for the acquisition and development of Pulpit Rock. He spearheaded the fundraising to build the road to that site, and then convinced Metropolitan Edison to provide power to Pulpit Rock at no cost to LVAAS. He supervised the design and construction of the Schlegel-McHugh Observatory, and was successful in lobbying the Windsor Township Zoning Board to pass a light pollution ordinance. He worked with colleagues from Villanova University to set up a photometry program using the Schlegel- McHugh Observatory.

☆ STAR DUST

April 1966 Vol.XXIII, No.8

NCA WELCOMES GUESTS FROM THE LEHIGH VALLEY SOCIETY

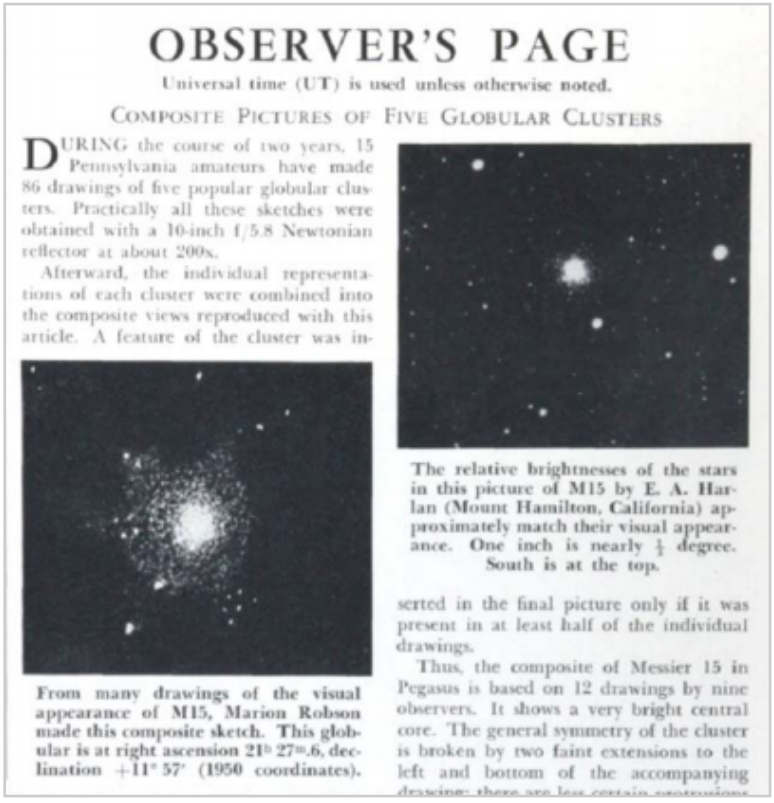
Marion Robson Ernest Robson

At the April meeting, we will be visited by two fellow amateur astronomers, Mr. and Mrs. Ernest Robson. The Robsons come to us from the Lehigh Valley Amateur Astronomy Society and will present a paper on "Composite eye piece images of globular clusters." The Robsons became interested in the globular clusters, first because of their spectacular images, and later because of the significance of their information when observed and recorded by self corrective perceptual methods. - Continued p. 2

The Robsons became interested in globular clusters, and subsequently became active observers and recorders of these objects. They delivered papers on globular clusters to many astronomical societies including the LVAAS, the Symposium of Amateur Astronomers of New Jersey and Eastern Pennsylvania, the Lebanon Pennsylvania Amateur Astronomy Society, the Rittenhouse Astronomical Society, as well as the National Capital Astronomers in Washington DC. They also spoke at the Astronomical League convention in Seattle in 1972.

Ernie also gave presentations on "Poetry and Astronomy," using traditional poetry and his own "intonemic" poems to review the cosmological influence on the cultural imagination.

Their work was on display in the July 1966 Sky and Telescope article: “Composite Images of Five Globular Clusters.” This article featured sketches of globulars by several LVAAS members in addition to the Robsons: William Ference, Vic Lasco, George Maurer, Bill McHugh, Mike Meiley, Curt Rinsland, RobbyRobson, and Paul Shenkle.



OBSERVER'S PAGE

Universal time (UT) is used unless otherwise noted.

COMPOSITE PICTURES OF FIVE GLOBULAR CLUSTERS

DURING the course of two years, 15 Pennsylvania amateurs have made 86 drawings of five popular globular clusters. Practically all these sketches were obtained with a 10-inch f/5.8 Newtonian reflector at about 200x.

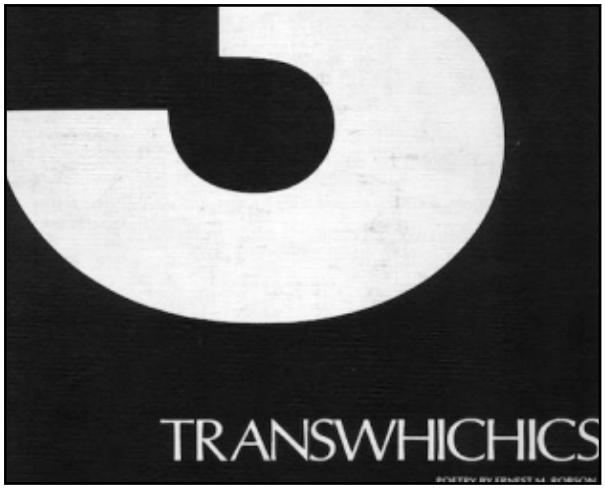
Afterward, the individual representations of each cluster were combined into the composite views reproduced with this article. A feature of the cluster was inserted in the final picture only if it was present in at least half of the individual drawings.

Thus, the composite of Messier 15 in Pegasus is based on 12 drawings by nine observers. It shows a very bright central core. The general symmetry of the cluster is broken by two faint extensions to the left and bottom of the accompanying drawing; there are less certain protrusions

The relative brightnesses of the stars in this picture of M15 by E. A. Harlan (Mount Hamilton, California) approximately match their visual appearance. One inch is nearly ½ degree. South is at the top.

From many drawings of the visual appearance of M15, Marion Robson made this composite sketch. This globular is at right ascension 21h 27m.6, declination +11° 57′ (1950 coordinates).

Meanwhile, Ernie continued to write poetry, and he and Marion founded Primary Press to publish some of his work. Some of Ernie’s works include:



The Orchestra of the Language (Yosell, 1959)

“The Wind Listens” anthology of poetry.

“TRANSWHICHICS” (Dufour Editions, 1969)

“Poetic Potentials in the Information of Astronomy” (Urania [Polish Academy of Science] Sept. 1970)

“Thomas Onetwo” (Something Else, 1971)

“Toward Lyra and the Swan” (The AL Reflector Feb. 1971)

“I Only Work Here” co-authored with Marion Robson (Dufour, 1975)

“Poetic Potentials in Information of Astronomy” (Parker Ford: Primary Press, 1976)

“Against Infinity: An Anthology of Contemporary Mathematical Poetry” co-authored with Jet Wimp (Primary Press, 1979) and described by one reviewer as “... truly one of the strangest anthologies I’ve seen.”

“Freedom Cannibalism Creative Love & the Values of Cosmic Nonsense: A Philosophical Manifesto” (1986)

The pair also delivered technical papers to the Speech Association of America.

For over a decade, Ernie and Marion regularly hosted a holiday party for LVAAS members at their homes; first in Kempton, and then after 1964 at Parker Ford. This was a much anticipated and well-attended event. According to a report in the January, 1965 Observer:


The Robsons and their 10-inch f/5.8 Newtonian scope.

"Music was the order of the day at Kempton last month. Folk songs to the tune of Dick Machamer's guitar and more familiar strains issued by Terry Zavecz's squeezebox greeted the members who came inside to seek warmth and refreshment after the exhilarating outdoor activities which occupied us on first arrival – i.e., tramping through the pine-forested hills searching for a Christmas tree to chop down and drag to your car or, if a member of the younger set, a fast game of ice hockey or baseball on the frozen pond.

"Later, after we had enjoyed one of Marion's excellent meals and we sat before that gigantic fireplace, mesmerized by the dancing flames, there were the strangely beautiful sounds of ancient Latin chants heard through Ernie's 15-inch woofer. Ah, what a set of memories."

Some stories about how the junior members behaved at this annual event are legendary: just one example was when two junior members smuggled a live turkey into Ernie's study, and left it there for him to discover the next morning. Yet the Robsons endured all this with good humor.


Deborah Jean Warner is with the Smithsonian Institution's Museum of History and Technology. Here convention chairman Ernest Robson congratulates her on the afternoon banquet talk. She is author of *Alvan Clark & Sons — Artists in Optics*, available for $4.25, plus 35 cents postage, from the Smithsonian Bookstore, 14th and Constitution Ave. NW, Washington, D. C. 20560. Photograph by Gary Becker.

November, 1976, SKY AND TELESCOPE 339

Ernie and Marion were instrumental in the very successful 1976 joint convention of the Astronomical League and Association of Lunar and Planetary Observers ASTROCON) held at LVAAS and in conjunction with Kutztown University. The convention hosted 667 amateurs from 50 clubs in 36 states and Australia. At the time, this was the largest Astronomical League convention ever. This event helped to put the struggling Astronomical League back on solid financial footing.

In 1984, I was living in Miami, and had the opportunity to attend the first Miami International Book Fair. Among the hundreds of vendors were Ernie and Marion. I had not seen them in over 15 years. We got reacquainted, and I was happy to see that despite Marion being in her mid ‘70s, and Ernie then 82, neither had lost their energy and enthusiasm.

In summer 1988, Ernie and Marion drove to Oregon to visit their son Robert. It was there, while visiting a Shakespearean festival that Erne was stricken and later died on July 5. At the August 1988 LVAAS Board of Governors meeting a motion was made and carried that LVAAS designate the newly-constructed library as “The Ernest M. Robson Library.” A memorial plaque was put on the door in memory of Ernie and the service he gave the Society.

The Robson Library was dedicated at the General Meeting on October 9, 1988. George Maurer led the ceremony, and Marion Robson was on hand for the ribbon cutting. Marion even supplied refreshments for the reception following. Gary Becker presented a slide program as a tribute to Ernie. Marion eventually moved to Oregon to be with her son, Robby. She passed away in 2005 at the age of 96.

LVAAS owes a debt or gratitude to Ernie and Marion Robson for the contribution of their time and talents to our organization.

Sources:

LVAAS Observer, January 1967, August-Setptember 1988.
National Capitol Astronomers Stardust Newsletter, April 1966.
Sky and Telescope, July 1966 and November 1976.

*This article is provided by **NASA Space Place.** With articles, activities, crafts, games, and lesson plans, NASA Space Place encourages everyone to get excited about science and technology. Visit spaceplace.nasa.gov to explore space and Earth science!*

Big Science in Small Packages

By Marcus Woo

About 250 miles overhead, a satellite the size of a loaf of bread flies in orbit. It's one of hundreds of so-called CubeSats—spacecraft that come in relatively inexpensive and compact packages—that have launched over the years. So far, most CubeSats have been commercial satellites, student projects, or technology demonstrations. But this one, dubbed MinXSS ("minks") is NASA's first CubeSat with a bona fide science mission.

Launched in December 2015, MinXSS has been observing the sun in X-rays with unprecedented detail. Its goal is to better understand the physics behind phenomena like solar flares – eruptions on the sun that produce dramatic bursts of energy and radiation.

Much of the newly-released radiation from solar flares is concentrated in X-rays, and, in particular, the lower energy range called soft X-rays. But other spacecraft don't have the capability to measure this part of the sun's spectrum at high resolution—which is where MinXSS, short for Miniature Solar X-ray Spectrometer, comes in.

Using MinXSS to monitor how the soft X-ray spectrum changes over time, scientists can track changes in the composition in the sun's corona, the hot outermost layer of the sun. While the sun's visible surface, the photosphere, is about 6000 Kelvin (10,000 degrees Fahrenheit), areas of the corona reach tens of millions of degrees during a solar flare. But even without a flare, the corona smolders at a million degrees—and no one knows why.

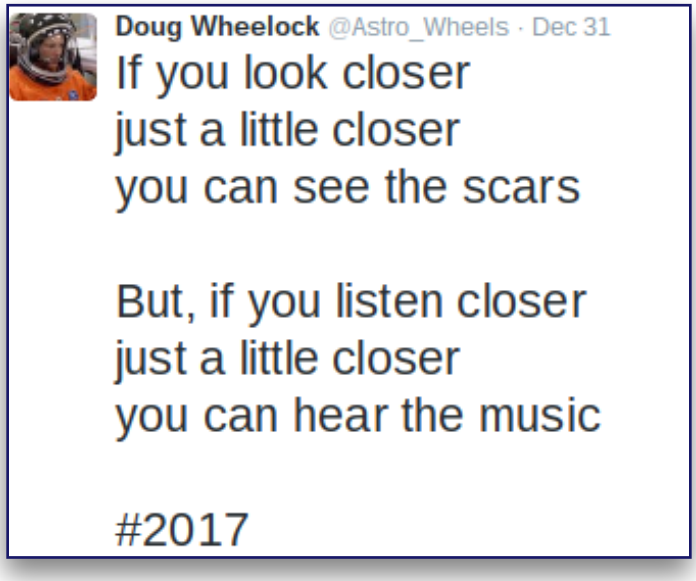
One possibility is that many small nanoflares constantly heat the corona. Or, the heat may come from certain kinds of waves that propagate through the solar plasma. By looking at how the corona's composition changes, researchers can determine which mechanism is more important, says Tom Woods, a solar scientist at the University of Colorado at Boulder and principal investigator of MinXSS: "It's helping address this very long-term problem that's been around for 50 years: how is the corona heated to be so hot."

The $1 million original mission has been gathering observations since June. The satellite will likely burn up in Earth's atmosphere in March. But the researchers have built a second one slated for launch in 2017. MinXSS-2 will watch long-term solar activity—related to the sun's 11-year sunspot cycle—and how variability in the soft X-ray spectrum affects space weather, which can be a hazard for satellites.

So the little-mission-that-could will continue—this time, flying at a higher, polar orbit for about five years. If you'd like to teach kids about where the sun's energy comes from, please visit the NASA Space Place: http://spaceplace.nasa.gov/sun-heat/en/

Astronaut Tim Peake on board the International Space Station captured this image of a CubeSat deployment on May 16, 2016. The bottom-most CubeSat is the NASA-funded MinXSS CubeSat, which observes soft X-rays from the sun—such X-rays can disturb the ionosphere and thereby hamper radio and GPS signals. (The second CubeSat is CADRE — short for CubeSat investigating Atmospheric Density Response to Extreme driving - built by the University of Michigan and funded by the National Science Foundation.) Credit: ESA/NASA

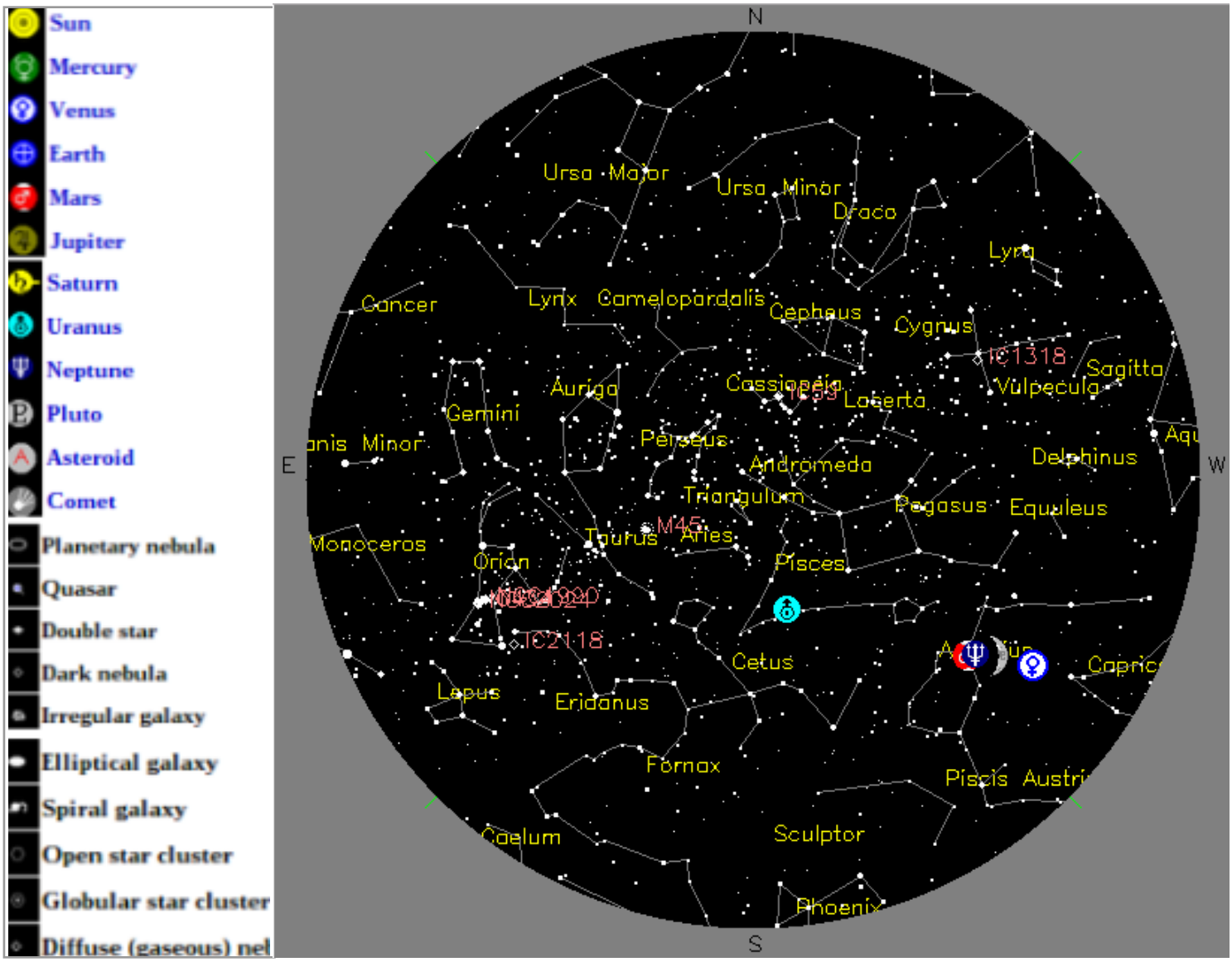
Oh, Snap!



Source: Astronaut Doug Wheelock on twitter.com;
posted December 31, 2016, New Year's Eve.

Oh, Snap! is a recurring feature of LVAAS members' celestial and astronomy-related items which have been generously shared for the enjoyment of our readers. Kindly submit material to editorlvaas@gmail.com.

Sky above 40°33'58"N 75°26'5"W at Tues 2017 Jan 3 0:00 UTC



Your Sky was implemented by John Walker in January and February of 1998. The calculation and display software was adapted from Home Planet for Windows.

The GIF output file generation is based upon the ppmtogif module of Jef Poskanzer's pbmplus toolkit, of which many other components were used in creating the images you see here.

ppmtogif.c - read a portable pixmap and produce a GIF file

Based on GIFENCOD by David Rowley [mgardi@watdscu.waterloo.edu].

Lempel-Zim compression based on "compress".

Modified by Marcel Wijkstra [wijkstra@fwi.uva.nl]

Check out additional features of ***Your Sky*** *at* : http://www.fourmilab.ch/yoursky/

Please visit lvaas.org for up-to-the-minute calendar information

JANUARY 2017

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
01	02	03	04	05 First Quarter Moon	06	07
08 General Meeting - 2:00 PM Muhlenberg	09	10	11	12 Full Moon Astro Imaging 7:00 PM	13	14
15	16	17 LVAAS Scout Group	18	19 Last Quarter Moon	20	21
22 Deadline for submissions to the Observer	23	24	25	26	27 New Moon	28
29 LVAAS Board of Governors Meeting	30	31				

FEBRUARY 2017

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			01	02	03 First Quarter Moon	04
05	06	07	08	09 Astro Imaging 7:00 PM	10 Full Moon	11
12 General Meeting - 2:00 PM Muhlenberg	13	14	15	16	17	18 Last Quarter Moon
19 Deadline for submissions to the Observer	20	21	22	23	24	25
26 New Moon LVAAS Board of Governors Meeting	27	28				

2017 LVAAS Event Calendar

2017 LVAAS Event Calendar	Sundays		Board meeting	Thursday	Friday	Saturday	Mondays	Multi-Day Weekends	Moon Phase			
	General Meeting time	location		Astro-Imaging	Lunatics and Stargazers	Star Parties	Scouts at S. Mountain	Scouts at Pulpit R.	New	First	Full	Last
January	2:00 PM 8	Muhlenberg	29	12	no mtg	no mtg		no camping	27	5	12	19
February	2:00 PM 12	Muhlenberg	26	9	no mtg	no mtg		no camping	26	3	10	18
March	2:00 PM 12	Muhlenberg	26	9	3 & 31	4		no camping	27	5	12	20
April	9	S.M.	30	13	no mtg	1		7 – 9	26	3	11	19
May	7	S.M.	21	11	5	6		19 – 21	25	2	10	18
June	11	S.M.	25	no mtg	2	3		9 – 11	23	1 30	9	17
July	05:00 PM 8	S.M.	30	no mtg	28	29		14 – 16	23	30	9	16
August	12	Pulpit	27	no mtg	25	26		4 – 6	21	29	7	14
September	10	S.M.	24	7	29	30		8 – 10	20	27	6	13
October	8	S.M.	29	5	27	28		6 – 8	19	27	5	12
November	2:00 PM 12	S.M.	26	2	no mtg	25		3 – 5	18	26	4	10
December	2:00 PM 9	Grace Community	17	7	no mtg	no mtg		no camping	18	26	3	10

MegaMeet May 26th to 28th

July, Aug & Dec are Saturday meetings with rain date on Sunday
Jan., Feb., and March meetings are at Muhlenberg College
August meeting is at Pulpit Rock
December meeting / Holiday Party is at at Grace Community Church
All meetings 7 P.M. unless otherwise noted

Contributed by Bill Dahlenburg

Publishing images is a balancing act!

When preparing your images for publication in The Observer, please consider the following guidelines:

Put the quality in:

- Considering the "print" size of the image, make sure you have at least 150 pixels/inch.
- Use a reasonably good quality for the JPEG compression ratio.

But watch the "waistline"!

- Don't go too much above 200 pixels/inch max.
- Use the lowest JPEG quality that still looks good!
- Shoot for <300KB for a 1/2 page image or <600KB for a full page.

Tip: If you're not Photoshop-savvy, you can re-size and compress undemanding images ("human interest", not astro-images), with an online tool such as http://www.ivertech.com/freeOnlineImageResizer/freeOnlineImageResizer.aspx. It will also tell you the pixel size and file size of your original, even if you don't download the processed copy.

The Observer is the official monthly publication of the Lehigh Valley Amateur Astronomical Society (LVAAS) Inc., 620-B East Rock Road, Allentown, PA, 18103 and as of June 2016, is available for public viewing. Frances A. Kopy, editorlvaas@gmail.com.

Members please use above email address for submissions.

Society members who would like to submit articles or images for publication should kindly do so by the Sunday before the monthly meeting of the BOG (please see calendar on website) for the article to appear in the upcoming month's issue. PDF format is preferred. Early submission are greatly appreciated. Articles may be edited for publication. Your comments and suggestions are invited.

Every effort is made to properly credit the sources of the material used in this publication. If additional credit is required, please notify editorlvaas@gmail.com with the required information for a timely correction.

To become a member of LVAAS, please follow the directions on the application form, which can be downloaded at: http://lvaas.org/filemgmt_data/files/LVAAS2017MembershipRenewalForm.pdf.

For existing members to update LVAAS information or to make member contact changes or corrections, please contact LVAAS membership@lvaas.org.