TAAA DESERT SKIES BULLETIN **Observing Our**

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Desert Skies

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SOCIATIO

July 2021

Membership Meeting

TAAA's next general member meeting will be held on Friday, July 2, 2021, and available online. The Main Presentation starts at 6:30 PM and is open to the public. A Members Only Meeting will follow. Non-members may attend the Main Presentation via Facebook at https://www.facebook.com/ TucsonAstronomy/. Members should attend the meeting via Zoom. The Zoom link will be sent to members via email before the meeting.

Main Presentation at 6:30 AT

Title: Solar Cycle 25 and The Association of Lunar & Planetary Observers Solar Section (ALPOSS)

Presentation: Solar cycles are on average 11 years, with the Sun's sunspot activity during them transitioning from quiet to active and back to quiet in that time. At its quietest, the Sun is at solar minimum, where we are now. During a good solar maximum, the Sun will be covered with spots, and with the right filters, seen to be erupting with flares and huge prominences. Solar Cycle 25 is the current solar cycle. It began in December, 2019, with the Sun at its least active. ALPO Solar Section Coordinator and long-time TAAA member, Richard 'Rik" Hill will talk about the Sun's current ramp-up, comparing the three major predictions for its increasing activity, and explaining how The ALPOSS observes this rampup, with its members contributing to the database of solar observations. Solar cycle predictions are very important; 'space weather' or conditions in space change much like weather on Earth. Solar outbursts lead to a range of effects, from breathtaking auroras, to the disruption of satellites, radio communications, the power grid, and yes, even smart phones.

www.tucsonastronomy.org

July 2 @ 6:30 pm - 9:00 pm



Presenter: Richard "Rik" Hill's interest in astronomy was galvanized at age 8 when a substitute teacher in his two-room schoolhouse in rural Oakland County, Michigan, brought a telescope to school and projected an image of the Sun. In the Navy, Rik served as a radar tech on a ship chosen as an Atlantic backup recovery ship for Apollo 8. Since 1975, he's been a member of the Association of Lunar & Planetary Observers (ALPO) and the American Association of Variable Star Observers (AAVSO). From 1979-1991, Rik operated the Burrell Schmidt telescope on Kitt Peak. In 1982, he founded ALPO's Solar Section. In 1999, Rik began working with the Catalina Sky Survey (CSS), a near-earth asteroid search project, through which he discovered thousands of asteroids, naming over 120 of them before retiring in 2015. In retirement, he is still the Coordinator for the ALPOSS. He also enjoys working at his home observatory, collecting fossils big and small, cultivating bonsai trees, vegetable gardening, and taking in rescue cats. Rik is married to Dolores Hill, who works on the OSIRIS-REx mission team to return a soil sample from the asteroid Bennu.

June, of course, is our Grand Canyon Star Party (GCSP) month and we had great TAAA virtual star party with contributions engineered by Jim Knoll, Jim O'Connor, Bernie Stinger and Rick Paul as well as some wonderful evening lectures relating cultural beliefs focusing on astronomy. (In another section of this newsletter is more detail about the GCSP and the link to view all the GCSP activities.) Jim and Susan Knoll also got special permission (since the GCSP was virtual) to conduct some solar viewing in person at the Canyon, as well. The recordings of the nightly presentations and the star party presentations will remain available on our YouTube Channel for a while.

Our winter visitors have left and viewing activity tends to lessen in Tucson with the heat, the summer monsoons (we hope), and smoke from summer fires. So, summer can be a great time to do some astronomy reading, viewing of the many great videos, getting equipment in shape, or outlining those plans and goals for future observing programs or photography.

by Mae Smith

The TAAA Board met on June 9, 2021 and some actions taken included:

- 1. A discussion of the Treasurer's Report resulted in consolidation of some unused dollars and placing them in the Endowment Fund.
- 2. A recent meeting with the CAC Construction Project contractor resulted in some spending change orders as well as clearer discussion of potential completion. A new procedure was developed of scheduling regular discussions with the contractor on a monthly basis.
- 3. The Board learned that Member Planet charges a 5% fee on all TAAA revenue, donations, etc. collected through the site. In future, donors of larger sums should be encouraged to mail checks to TAAA, P O Box 41254, Tucson, AZ 85717 to prevent the deduction of 5% that would occur if donated through the website.
- 4. CAC and TIMPA (all pads) are currently available for member use with reservations according to site schedule arrangements.
- 5. The Board approved donation of a \$250 eyepiece to the Astronomical League as a prize to be awarded at their annual conference.

TAAA Trivia: Pre-COVID TAAA Activities

If you have questions or wish to discuss something in the Trivia, contact Mae Smith.

One of the enjoyable aspects of history is the sense of perspective that it provides us. And, of course, one of the joys of astronomy is that it does the same thing: there is always a sense of various dimensions of perspective to be found in astronomy.

Today's trivia centers on a bit of perspective.

Since its inception in 1954, most TAAA Presidents have served in that office for 2 or 3 years. However, one person served as TAAA President for 19 years.

- 1. Who served as TAAA President for 19 years?
- 2. When did he serve?
- 3. What is a perspective from that Presidency?
- 4. What were the summary reflections on his TAAA experience shared by that President?

TAAA 2022 Calendar

There is still time to submit images for next year's TAAA calendar. If you have already submitted images but have not heard back from me, please try again.

Susan OConnor

TAAA Endowment Fund Grows

TAAA recently announced the establishment of the Tucson Astronomy Endowment Fund. This account was established for the long-term support of TAAA, with the income from its investments slated to support TAAA's ongoing mission of astronomy education of members and the public. The generous members of TAAA have already shown their support by contributing to the Fund. With investment gains, the fund is now over \$3700. You too can be a part of TAAA's mission of the future by contributing. It's simple. Go to <u>Tucsonastronomy.org</u>, select the 'Donate' button on the top right menu, follow the selections and chose ENDOWMENT from the list of donation possibilities.

A Great Source of TAAA's History by John Kalas

About two years ago, Mae Smith and I were chatting in the Reynolds-Mitchell warm room one evening during a CAC star party. We were discussing how nice it would be to document the club's history. I mentioned to Mae that I had started accumulating some old TAAA newsletters from various members. The vintage Desert Skies newsletters contain a wealth of fascinating, historical information about the club. I offered to start scanning the paper copies of the newsletters, so the files could be added to the library of more recent newsletters already posted on the TAAA website.

Fast forward almost two years. I recently completed the first phase of recording the club newsletters from 1990 through 2005 (2006 to 2017 editions were already posted on the website). Ed Foley recently loaded the older newsletters onto the website. Terri Lappin has given me several cartons of additional older documents to sort through. I will be working on these editions in the near future.

It would be great if the club could locate the oldest newsletters that members may have in their possession, anything before 1990. If you have any, please let me know at <u>jckalas@cox.net</u>.

The newly posted vintage newsletters are filled with amazing information and insight into the past operations and activities of the club. If you're interested, take a look (<u>TAAA Resources ></u> <u>Desert Skies Newsletters</u>). I will let you know when the next batch of newsletters gets posted.

School/Public Star Party Requests

by Jim Knoll

We do not have any school or public star parties for July and with any luck we will have an active Monsoon. The June 5 - 12 Virtual Grand Canyon Star Party went well. The National Park Service did a great job scheduling interesting talks. TAAA did three of the virtual star parties (airing the first Saturday, Monday, and Thursday). Focus Astronomy did several and Lowell Observatory did one. If you did not get a chance to watch them live, the schedule and links to Facebook and/or YouTube are <u>here</u>.

Our paid star party program (Tucson Stargazing Adventures) is beginning to pick up as well. We have two resort events scheduled in July. Income from the paid events helps fund the Chiricahua Astronomy Complex (CAC) Operations and Maintenance (O&M). If you have any family or corporate events planned, keep the paid program in mind. Help us spread the word. Dates and details for all the programs are on the Tucson Stargazing Adventures web page.

Starry Messengers

by Terri Lappin

With an increase in face-to-face events, the Starry Messenger SIG wants to reconnect with volunteers who want to support our outreach events through non-telescope means. We have around 100 activities, presentations, and projects to choose from spanning the entire range of astronomy topics. If you're interested in activities such as determining meteorites from Earth rocks, demonstrating eclipses, or talking about black holes, please consider volunteering for our Night Sky Network (NSN) Toolkit program. Best of all, most don't depend on the weather, which means we don't need to cancel outreach events due to clouds! To see a list of these projects (and download them), visit https://nightsky.jpl.nasa.gov/download-list.cfm. The TAAA has nearly all the materials to support these projects. We can train you or you can train yourself using videos from the NSN. Generally, we work in pairs so you can ease into the role of outreach volunteer by shadowing someone with more experience. For more information about the Night Sky Network Toolkit Program, contact Terri Lappin.

SMSIG on the Web

Astronomy Fundamentals SIG

by Connor Justice

The next meeting is **July 8th at 6:30 pm - 8:00 pm**. Topics to be determined. Contact <u>Conner Justice</u> for Zoom link and more information. <u>AFSIG on the Web</u>

Access videos of previous meetings through the Members Only section of the TAAA web site.

Astro-Imaging SIG

by Greg Ruppel

The July AISIG meeting will be Monday, July 26 at 7 pm, by ZOOM. Check out <u>AISIG On the Web</u> or contact <u>Greg Ruppel</u> for the latest information and Zoom links

Gregg and the AISIG folks are very active on the <u>TAAA groups.io</u> forum. Check out all the helpful advice and amazing images, there. For more information or instructions on how to join the forum, check out the <u>TAAA</u> <u>Forum</u> web page.

June Highlights from the Astro-Imaging SIG



NGC 5972 in Libra by Tom Eby.

This ring form 11.3 mag Sb(rs)b type galaxy is about 80 MLY distant, features a foreground 9.6 mag star which is a red dwarf. A number of quasars in the background, I marked one at right in the inverted image. Not much other info I could find about this galaxy other than some images....no SN candidate seen. Was quite windy last night for awhile but it settled down nicely just before starting this one.

RC8 f/8 / ST10XME ccd (selfguided -5C) / CEM70ec mount, 5-15-2021 2 hrs exp. PI/CS5



M51 Galaxy in Canes Venatici by Randy Smith

Imaging telescopes or lenses: celestron C11 Imaging cameras: ZWO ASI 183MC Pro (cooled) 183 Mounts: SkyWatcher EQ6-R Pro Guiding cameras: ZWO ASI 294MC Pro (cooled) 294 Software: ZWO ASIAIR PRO ASIAir Pro · ZWO EAF AutoFocuser EAF Focuser · Pixinsight Filters: Optolong L-Pro 2" L pro Accessory: Scope Buggy

Full Sized Image

Observing Sites

Effective May 1, 2021, CAC & TIMPA will be open at full capacity (all pads are open).

The COVID Rules are posted on the TAAA Website (<u>http://tucsonastronomy.org</u>) under the respective Observing Site (TAAA Resources, Observing Sites) and contain additional information.

TIMPA by Ralph Means

TIMPA (Tucson International Modelplex Park Association), Dark Sky site west of the Tucson Mountains. <u>TIMPA on the Web</u>

Location: The TIMPA observing site is located a few miles beyond the Desert Museum.

TIMPA July Star Party Dates: July 9-10

TIMPA Director: Ralph Means

Chirichaua Astronomy Complex

by Jim Knoll

Chiricahua Astronomy Complex (CAC) is the club's dark observing site, located in Cochise County approximately 100 miles southeast of the center of Tucson. If you would like to attend, you must make a reservation (see below). Reservations are on a first come – first serve basis.

CAC on the Web

Unless you are qualified to open and close the site, dates will be limited to those around the New Moon and are listed on the CAC webpage. July dates are 8-15 (New Moon 9th). August dates are 5-12 (New Moon 8th). All facilities are open.

We are implementing a <u>reservation form</u> on the website for all CAC reservations. Click <u>here</u> or click on the TAAA Web Site (<u>https://tucsonastronomy.org</u>), then the TAAA Resources tab, CHIRICAHUA ASTRONOMY COMPLEX (CAC) tab, CAC DARK SITE RESERVATIONS tab, and complete the form to make a reservation. Please start using it to make your reservation. After the initial reservation then we can coordinate any changes via email.

CAC Director: Jim Knoll

by Doug Smith What's Up list for July 2021 – August 2021

Fellow amateur astronomers. Many of the Astronomical League observing programs can be done from our backyards. The following is a list of objects visible during July and August for the more common observing programs.

Constellation Hunter Program – Northern Sky

The following constellations are well placed for observing for July and August:

Aquila, Bootes, Corona Borealis, Draco, Hercules, Lyra, Sagitta, Serpens Caput, Serpens Cauda, Ursa Minor, Vulpecula

Messier Observing Program

The following Messier Objects are well placed for observation during July and August (listed in ascending RA): M5, M80, M4, M107, M13, M12, M10, M62, M19, M92, M9, M14, M6, M7, M23

Lunar and Binocular Lunar Observing Program

The following is a list of the dates for the lunar phase when observations should be made during July and August:

New Moon:	July 10, August 10
40 Hours waxing:	July 12, August 12
72 hours waxing:	July 13, August 13
4 days old:	July 14, August 14
7 days old:	July 17, August 17
10 days old:	July 19, August 19
Full (14 days old):	July 24, August 24
Gibbous:	July 1, August 1, August 31
72 hours waning:	July 7, August 7

Solar System Observing Program

The following list describes the various solar system objects and their visibility during July and August:

Mercury is an early morning object during July. Becomes an evening object during August.

Venus is an evening object during July and August.

Mars is getting very low in the evening sky during July and August setting earlier each day. Well into twilite by August.

Jupiter and Saturn are evening objects during July and August, rising earlier each day.

Uranus is a late evening object in July and August, rising earlier each day.

Neptune is a late evening object in July and August, rising around the same time as Jupiter and Saturn.

Urban Observing Program

The following deep sky objects are well placed for observing during July and August: M5, M4, M13, NGC 6210, M12, M10, M62, M92, M6, IC 4665, M7

The following Double Stars are well placed for observation during July and August: Beta Scorpius

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The Lunar and Planetary Laboratory invites you to participate in the Eighth Annual Art of Planetary Science: Space Travel, occurring September 24-26th, 2021. The theme for this year's exhibition will be Space Travel, featuring art inspired by the past, present and future of space exploration in addition to works featuring our solar system and beyond and works created from scientific data. Our goal is to bring together the thriving science and art communities in Tucson, celebrate the beauty of science and be inspired by our universe.

This year we are planning both an online and an in-person gallery. Our in-person events will include relevant safety precautions to help prevent the spread of COVID-19 and are subject to cancellation should conditions worsen and preclude us being able to safely offer this event.

Art of all types (2D, 3D, audio, film, written works) and levels are encouraged to submit. We will also be awarding prizes to artwork in four categories: data art, fine art, special theme (space art), and kids art. Check out our website for some inspiration and photos of past events along with the online submission form. Submissions are open May 15 - August 15th, 2021.

Art will be virtually displayed on our website starting September 24 through October 31, 2021. Visit <u>www.lpl.arizona.edu/art</u> for more information and email <u>lpl-taps@list.arizona.edu</u> with any questions.

IDA's 'Capture the Dark' Photography Contest

We are very excited to announce that the second annual Capture the Dark Photography Contest is now open for submissions! It's free to enter and open to entrants of all skill levels worldwide. So, show us what you've got!

This year, there are a total of 8 contest categories, including Connecting to the Dark, International Dark Sky Place, The Impact of Light Pollution, The Bright Side of Lighting, Crea-

tures of the Night, Deep Sky, The Mobile Photographer, and Youth. Please note that we only accept one entry per category per person. Winners of each category will receive a prize package that includes a Peak Design field pouch and camera strap, a PhotoPills license, a feature in our Nightscape publication, the IDA blog and social media, an IDA membership, and IDA swag.

Want more details? Head to <u>www.darksky.org/capturethedark</u> for category descriptions, submission instructions, and more.



by Mae Smith

- 1. Who served as TAAA President for 19 years? Don Strittmatter who worked as Chief Scientist Engineer at Hughes Aircraft/Raytheon
- 2. When did he serve as TAAA President? 1957-1976. (Don passed away in December 2020 at age 85.)
- 3. What is a long term perspective related to Don's Presidency? "The biggest very long-term [TAAA] project that lasted for decades was the Weekly Telescope and Mirror Making Class. It started in the basement in the old Steward Observatory and then moved to the basement of the new Steward office complex and then to the Flandrau Science Center. Over the years lots of TAAA members [youth and adults] gave countless hours of their personal time to make this project very successful. However, the Biggest Project we might have done, we turned down. It was an offer by Dr. Baker, a renowned lens designer and scientist, to build and give us a 40" telescope if we got it located somewhere in the mountains around Tucson, maintained it, and managed it with a full-time staff. I had just gotten married and was starting my professional career at Hughes and, unfortunately, I could not commit that kind of time and neither could any of our TAAA Membership; so we had to pass up the offer."
- 4. What were the summary reflections on his TAAA experience that Don shared at TAAA's 2004 50th Anniversary celebration? "The 19 years as President of TAAA Were Great, and I am happy to see the association continued to grow and that it has taken on many new and wonderful projects. However, the best thing is that you share Dreams and work together to make them happen while Having Fun. Keep it up!"

So, TAAA, in 2021, keep on, keeping it up!!! (Quotes from "Our Past Presidents' Recall. TAAA. 1954-2004. The First 50 Years.")

Committee Reports

Nominations and Volunteer Resource Committee

by David Rossetter

The NVRC is looking for a new Membership Manager. This person will be involved in redefining the position as it moves more online. However, the job still entails picking up mail, depositing checks, signing up new and renewal members and answering membership questions at in-person meetings once they start up again. Please contact the committee if you are interested.

nvrc@tucsonastronomy.org

David Rossetter - Chair, John Christensen, Ken Bertschy, Allen Force

Notes From The Editors

If you have a Desert Skies Bulletin contribution, please send it to Co-Editor, David Rossetter. We would love inperson reports of club events, non-club events, and other creative articles. If you have astro-images you would like to share, we would appreciate it if you would coordinate with the Astro-Imaging SIG. The montly deadline for submissions is the 24th.

<u>David Rossetter</u> – Co-Editor Ken Bertschy – Co-Editor

Skyward

By David H Levy with Roy L. Bishop

July, 2021

"Nature had spoken to him."

Gravity is one of the most fundamental things in physics. Everything and everyone has gravity. The more massive something is, the more gravity it has. When you jump into the air, Earth's gravity brings you back down. What you cannot see while you are in the air is that your gravity brings Earth towards you just a wee little bit, off-setting the extra push away from you that your feet gave Earth when you jumped.

Isaac Newton presented the first ever mathematical description of gravity in 1687. I admit that I know nothing about gravitation, except that it is all around me. I do recall the myth that Newton was sitting under a tree when an apple fell on his head. Supposedly, he then formulated his law of gravity. Did the apple actually fall on his head? I doubt it. But at his childhood home in the village of Woolsthorpe, England, he probably did witness an apple fall from a tree.

During the last half of the nineteenth century physicists realized that Newton's theory of gravity did not accurately describe the orbit of Mercury, the planet closest to the Sun. Mercury's elongated orbit precesses slightly faster than Newton's theory predicts. Several unsuccessful attempts were made to account for this discrepancy.

Newton's theory, which assumes that gravity is a force, held sway for more than two centuries, until superseded by Albert Einstein's General Theory of Relativity in 1915. A decade earlier, Einstein realized that mass and energy are two aspects of one thing, and that space and time are interrelated, a blended spacetime. With General Relativity, Einstein treated gravity not as a force, but as the geometry of spacetime. The geometry of spacetime is curved by the mass-energy of matter, and the curvature instructs matter how to move.

Now comes the hard part. When Roy Bishop, emeritus professor of Physics at Acadia University, pointed out to me that gravitation is geometry, and not a force at all, I didn't believe him at first. But Dr. Bishop is the most brilliant person I have even had the privilege of knowing. Recently he described gravity this way, and he is right:

"Einstein spent several years in an eventual successful attempt to include gravity in a modified description of spacetime. Early in his progress toward that goal Einstein had what he called the happiest thought of his life — that if a person were to fall off the roof of a house, while falling she would not feel a force of gravity. Before she falls, she feels the force of the roof supporting her. When her fall comes to its abrupt halt she feels the ground pushing against her. If she cannot feel a force of gravity while she is falling, why pretend that she felt a force of gravity when the roof supported her before she fell, or that she feels a force of gravity when she is lying on the ground?

"When thinking about the falling lady, Einstein had the fantastic insight that perhaps gravity never was a force. By late in 1915 he had that insight in elegant mathematical form such that the resulting theory, General Relativity, can be used to make precise predictions concerning gravitation."

Skyward (continued)

Einstein was elated when, on November 18, 1915, he found that his General Theory of Relativity predicted the measured precession of Mercury's orbit. According to his friend and biographer Abraham Pais: "This discovery was, I believe, by far the strongest emotional experience in Einstein's scientific life, perhaps in all his life." Pais then continues with five words that crystallize that profound experience: "Nature had spoken to him." After several years of work, on that day Einstein knew that he was the only person on Earth who understood gravity!

Today, there are thousands of people who understand gravity. Roy is one of them. Most of us, including me, are not one of them. But reading it described so well is one of the pleasures we can feel as we try to appreciate the wonderful cosmos in which we live. Not only does General Relativity correctly predict the precession of Mercury's orbit, but it is essential to the programs used in the GPS navigation system, and it describes the gravitational waves (ripples in the geometry of spacetime) generated by two coalescing black holes, directly detected 100 years after 1915 by LIGO, the Laser Interferometer Gravitational-Wave Observatory.



The photograph, taken by Roy Bishop after a surprise rainstorm, shows Sir Isaac Newton's birthplace.