TAAS Perihelion Banquet to Start New Year!

ON SATURDAY, JANUARY 14, at 6:00 P.M., TAAS members and guests will gather at the Eleganté Hotel to celebrate another highly successful year of outreach to the public, observing, and enjoying the company of fellow stargazers.

This festive event will feature excellent and valuable door prizes assembled for TAAS by Bruce Meyer, a running slideshow of quality images of our club by Phil Fleming and our astrophotographers, an innovative Trivia Contest by Barry Spletzer, and our featured speaker, Dr. Robert Fugate on “BREAKTHROUGH STARSHOT”—a project with its eye on the stars. In addition, there will be awards to the outstanding “stars” of our past year and the election of the new officers for 2017. And let’s not

continued on page 2 . . .
proof of concept for sending light-propelled nanocraft on their 100-million-mile-per-hour mission to the stars within a generation. Pete Worden, former director of NASA Ames Research Center, heads this effort, advised by world-class scientists and engineers, such as Ann Druyan, Freeman Dyson, Mae Jemison, Avi Loeb, and many others.

Dr. Fugate will tell our gathering of the concept, the beginnings, and the target—the Centauri group—and his part in this truly cosmic adventure. He will bring a copy of the electronics chip involved for you to see.

BREAKTHROUGH STARSHOT
(excerpt of article by Dr. Robert Fugate, November 16, 2016)

The urge to explore the unknown is a powerful force in the human species. The first travelers in space risked their lives as pioneers of the Last Frontier; we went to the Moon as soon as our technology would barely support such a risky venture; and today we look longingly at Mars—maybe in 15 years. But human space travel is limited in range with our present technologies, making travel outside the solar system unlikely for humans—a very advanced form of travel is needed for humans to go to the stars.

Going at the speed of Voyager, at about 5 km/sec, it would take 274,000 years to reach Alpha Proxima. Clearly, if we are serious about sending space probes to nearby stars, we need go faster!

Breakthrough Starshot is a project to go faster. The concept is to make the spacecraft ultralight by leaving the propulsion system and fuel on earth. An Earth-based laser directed at a very thin, highly reflecting membrane “sail” attached to the payload consisting of an electronics chip containing cameras, a microprocessor, and a small laser for sending pictures back to Earth. The primary goal is to get the first closeup pictures of an exoplanet.

Read the full article on page 10.

Dr. Fugate was formerly the Senior Scientist of Atmospheric Compensation at the Starfire Optics Range and is currently the owner and Senior Consultant of Arctelum, LLC. He earned his Bachelor of Science in Physics from Case Institute of Technology in 1965 and PhD in Experimental Physics from Iowa State University, where he was a NASA Fellow, in 1970.

forget the delicious buffet with beef, chicken, vegetables, salad, desserts, and beverages, as Eleganté’s chef is tops.

If you have not signed up yet for this occasion, go to www.taas.org to the Banquet article, click on the link, read all about it, and then just follow the directions to sign up and pay. Should you not be attending, please send in the proxy that was e-mailed to you to help us have a smooth election.

Our motto is Observe – Educate – Have fun.

This is one of the “have fun” parts!

Send questions to Lynne Olson at vp@taas.org.

All the details along with the latest map of the night sky are available on the TAAS web site, www.TAAS.org. Click on the Fabulous 50 link on the left side of the homepage.

The next Fab 50 session is Friday January 20, 2017, at 7:00 P.M. For questions contact Dee at taasdee@comcast.net.
November 25 Special Observing Session:
Wayne Itokazu organized his first Observing Field opening on November 25. He arrived at 4:30 p.m. and was greeted by two observers waiting at the gates, Gavin McCullough and Rich Schick. Gavin, who is a new member (welcome aboard!), brought his wife Deanna and daughter Andi to check out the site. They all left just before sunset. During this time observers Chris Watts, Fernando Torres, Edgar Fischer, and Jim Lawrence made their way in, while Kevin McKeown and Melissa Kirk checked in well after sunset.

There were no surface winds when Wayne arrived and it was blowing very lightly throughout the night. Transparency was very good and the few clouds to the south dissipated after sunset. Everyone who was there went about their business, whether it was DSO viewing, variable and double star viewing, or astro-imaging. While Wayne was imaging M42 he was amazed at how many geostationary satellites we have, as nearly half his exposures had trails in them.

As the night wore on, the sky transparency went downhill. People started to pack up around 11:00 p.m. and by midnight Wayne closed shop and secured GNTO.

All in all, it was a great night to go observing. Wayne decided to be the opener as he wanted to get an observing fix before traveling for the next three weeks. He had a feeling that the weather might turn for the worse on the regular GNTO nights.

November 26 New Moon Observing Session and Scavenger Hunt:
Vance Ley opened the site on November 26 but it was completely overcast. He closed the site soon after sunset. We will reschedule the Scavenger Hunt when better conditions permit.

November 29 Special Observing Session:
I opened the site on November 29. Joining me was Jim Kaminski (he spent the night), Martin Hilario (departed about 2:30 am after using the 17.5” Dobsonian he purchased from Dale Murray), and Dave Ochadlik, who used one of the fixed piers. The weather was cold (in the 20s all night and 19 degrees at my departure before sunrise) but the wind was calm making it bearable. All-in-all a fine astronomy night!

December 3 Special Observing Session:
Martin Hilario opened the Observing Field on December 3. Joining him was a friend and Kevin McKeown.

Kevin reported that it was a fantastic sky. It was quite warm, although frost kicked in around 2:00 a.m. Martin worked on imaging bright nebulae and his results are startling, getting great views of the Rosette, the Christmas Tree nebula, various nebulae in Cepheus, Cygnus, and even some results of the Gum nebula.

Kevin worked on 2-in-the-View objects. The Orion Nebula in the 5-inch f/5 was magnificent. The outer loop was very well seen. He recovered NGC 147 and 185 (may be wrong here), together, in the 5-inch. NGC 185 was easy, 147 a difficult, large oval. Andromeda plus companions were magnificent!

December 8 and 9 Special Observing Session:
Dick Brown opened the Observing Field and spent the night on December 8 and 9. He reported that he had a bright moon on December 8 but fairly dark skies around Orion. He obtained a pretty good image of the Horsehead. He did some spectroscopy on December 9.

December 23 3rd Quarter Moon Observing Session:
Viola Sanchez joined me at GNTO on December 23. While the observing was good the high humidity did us in. By 8:30 p.m. everything was wet and we called it a night.

December 30 New Moon Observing Event:
I opened the site on December 30 at 3:48 p.m. It was about 60% cloudy but it was warm (for December) and the wind was light.

Michele Skarlupka and her daughter (Toya Scaggs) and son-in-law (Rush Scaggs) arrived shortly after. They had the loan 8" Celestron Starhopper Dobsonian with them. They wanted to learn how to use the telescope better and view the Moon.

Donna Nutter and her grandkids Gabe and Isaac also attended. Donna was picking up a loan program telescope (Celestron 80-mm ED Refractor) and wanted to learn how to use it. Gabe is very interested in astronomy and did a nice job finding objects to look at.
The Rosette Nebula is a large spherical hydrogen alpha region that is a distance of about 5,000 light-years from Earth. The nebula has a shape that resembles a flower. It is about 50 light-years in diameter. New stars that are only a few million years old are formed in the nebula. Approximately 2,500 young stars lie in this star-forming complex.

This image was taken December 18 using an AT65EDQ telescope and a QSI 660 camera.

Exposures: 15 x 20 minutes Ha; 15 x 20 minutes OIII.

Stacked in PixInsight. Processed in Photoshop CC. – Dwight Talley
The Sidereal Times January 2017

The Official Newsletter of The Albuquerque Astronomical Society

Telescope Loan Program Update

by Jim Fordice

THE 2016 SURPLUS EQUIPMENT AUCTION resulted in raising $1,056 for the loan program. Thank-you to the six winners!

I am continuing to assemble the astrophotography package. This month I acquired a laptop to run the astrophotography software (Dell Inspiron 17 5000) and a Bahtinov mask. Also acquired this month is a new wedge for the Ultima 8 telescope.

Vito Monteleon has donated an Orion Spaceprobe 130ST EQ Reflector Telescope with equatorial mount. After I purchase some eyepieces for this nice telescope it will make a fine addition to the program.

The most recent addition to the loan program is a 10” Meade Starfinder Dobsonian. This large aperture Dobsonian includes the Magellan I digital setting circle system. This is a fine telescope for manual observations or use the Magellan I system to find 12,218 deep-sky objects, stars, and planets. A picture and specifications will be added to the website soon.

In addition to having 78% of the loan program telescopes on loan at the end of December every one of the Dobsonians, including the new Meade Starfinder, are on loan!

Outhouse Ventilation Fan Installed:
Vance Ley recently completed the installation of a ventilation fan for the outhouse. Along with having a first-class dark-sky observing site we also have one of the sweetest “not-smelly” outhouses anywhere.
Thanks, Vance.

Upcoming Events:
- January 21: 3rd Quarter Moon Observing
- January 28: New Moon Observing
- February 18: 3rd Quarter Moon Observing
- February 25: New Moon Observing

In addition to telescopes the loan program also has many accessories that include filter sets, collimators, barlows, star charts, planispheres, a green laser pointer, a sky quality meter, and a large selection of premium eyepieces. Contact me at telescope_loans@taas.org if you are interested in borrowing one of these items.

As of: 12/30/16

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As the GNTO Observing Field is available for use by TAAS members anytime. Check the TAAS website for the procedure to follow. Contact me if you have any questions.

As always, check TAAS Talk and the TAAS website for last-minute changes and updates. GNTO events are open to all TAAS members and their guests.

GNTO Director: GNTO@TAAS.org or 505-803-3640.

Under the Dome continued from page 3

Fernando Torres brought his SCT along and was there to view Comet 45P/Honda-Mrkos-Pajdušáková (successful).

By 6:30 p.m. everyone had departed or was packing up. The skies were clearing nicely but I did not stay because of surgery I had that I did not want to expose to the cold weather.

A short but enjoyable evening to finish up 2016 observing.

Don’t forget that the GNTO Observing Field is available for use by TAAS members anytime. Check the TAAS website for the procedure to follow. Contact me if you have any questions.

As always, check TAAS Talk and the TAAS website for last-minute changes and updates. GNTO events are open to all TAAS members and their guests.

GNTO Director: GNTO@TAAS.org or 505-803-3640.
M45, “The Pleiades,” is an open cluster of very bright stars located in the constellation Taurus. It is plainly visible even in light-polluted skies and is often mistaken for the little dipper.

I captured this image of the Pleiades November 23, 2016, from GNTO using an AT65 refractor with a focal length of 420 mm on a Losmandy G11 mount. An SBIG 4000XCM camera was used to capture 30 x 2’ exposures. Additional 12 x 5’ exposures were captured while I slept in the Ortega building. Due to an unknown guiding problem, only four of those subframes were usable. Nevertheless, both sets of images were processed using DSS and combined in Photoshop CS2. I was pleasantly surprised by the amount of detail that I was able to extract.

The camera used has a crop factor, relative to a 35-mm frame, of approximately 2, so the image scale is similar to what would be obtained using a 35-mm sensor with an 840-mm lens. Guiding was done using an on-camera guide chip controlling the mount through CCDsoft.

—Vance Ley
Thanks to everybody who came out to La Mesa Elementary School on December 13. You are all amazing! The school staff was ready to help us and provided sandwiches, chips, cookies, and bottles of water to all of our volunteers.

Outside under the beautiful moon, planets, and stars were John Laning, Tom Graham, Bruce Meyer, Martin Hilario with his projection system, Ahmad Jrad, Evan Lang, Fernando Torres, Gavin McCullough, Daniel Taylor, Melissa Kirk, and Bob Hufnagel. Even though the clouds scooted in and out, these dedicated TAAS volunteers gave a wonderful tour of the night sky. Fernando’s mastery of Spanish was especially helpful, since many of the students and their parents were Spanish speakers. Phil Fleming cruised the whole star party and got some photos to share with the newsletter. He also provided opera glasses for a different perspective of viewing.

Jim Greenhouse presented 4 shows inside the planetarium for 73 people. Martin Hilario and Evan Lang helped us set up and take down the planetarium equipment and get it back to storage. Sandy Fleming helped with crowd control and ticket mastering outside the gym for the planetarium shows.

Inside the classrooms were Tom Grzybowski with “All About Comets,” and Bob Shipley presenting “Rainbows in the Night Sky.”

While I was out at the telescope field, a little boy spotted a meteor. His face was positively radiant with excitement. That was the highlight of my evening. There’s so much joy in the voices and faces of the kids and their families when they see a night sky wonder, whether it’s naked eye, through a scope or binoculars, or inside the planetarium. That’s why we all keep coming back.

The weather was nice for December, and even with the clouds it was a great star party at this small neighborhood school. Thanks to our wonderful TAAS volunteers for being there to Observe, Educate, and Have FUN! Please let me know if I missed seeing anybody and failed to include them in this report.
Sharpless Sh2-115

SHARPLESS SH2-115 is an emission nebula in Cygnus about 7,500 light-years distant. The size is around 50' which converts to about 100 light-years in diameter. It is ionized by an O6 star in the open cluster Berkeley 90, which is part of Sh2-115. The nebula contains over 4,000 Sun masses. It is located just to the west of Deneb (Alpha Cyg).

Equipment: ES ED127CF f/7.5, iOptron CEM60 mount, SBIG ST8300M and FW5, Guiding SBIG SG-4 on an AT72ED f/6.

Software: CCDSoft v5.210, CCDStack v2, ImagesPlus v5.25a, Photoshop Elements v9, Astronomy Tools (false color).

Exposure: 25 x 5-minute images using a Baader Hydrogen Alpha filter 656nm with a bandwidth of 7nm.

Location: 3 miles north of Oak Flat on my backyard patio. 9 Dec 2016 start 7 PM MST.

—John Laning
The Sidereal Times January 2017

Barry Spletzer’s Collimation Rescues Wildlife Binoculars
by Amy Estelle

TAAS CHIEF SCIENTIST Barry Spletzer thrives on mechanical challenges. I know because recently I dropped off to him 13 pair of binoculars that needed collimating.

I volunteer with Bosque del Apache National Wildlife Refuge in central New Mexico and discovered these unuseable optics when sorting through a Refuge environmental education gear box.

Years of use by NM school students had taken a toll. These were 7x35 or 8x42 Bushnells and Minoltas, with a one-off from Ward’s. The most difficult task in collimating these optics is finding the access screws to the internal components.

Barry successfully collimated 12 pair. The Wards were not adjustable.

Thank you, Barry. Your work will help students identify bosque birds and perhaps glimpse stars on Refuge astronomy nights.

Barry collimates binoculars for Bosque del Apache National Wildlife Refuge

Barry Spletzer’s Collimation Rescues Wildlife Binoculars

TAAS Perihelion Banquet
Saturday, January 14, 6:00 P.M.
Eleganté Hotel

Breakthrough Starshot
Dr. Robert Fugate
FEATURED SPEAKER

DOOR PRIZES TRIVIA CONTEST BUFFET

Need help with your Telescope?

Attend the ATM meeting and receive assistance.

First and third Wednesday of the month.

Manzano Mesa Multi-Gen Center
501 Elizabeth St SE, Albuquerque, NM

map is available at www.TAAS.org
The urge to explore the unknown is a powerful force in the human species. Prehistoric Man moved between continents not knowing what was over the horizon; Polynesians sailed into an endless South Pacific Ocean with stars their only companions; Columbus set out for Asia, not knowing how far or how long it would take, only to discover a New World; Magellan explored the Pacific by sailing past the tip of South America; and explorers of North America discovered native cultures that came from Asia. The first travelers in space risked their lives as pioneers of the Last Frontier; we went to the Moon as soon as our technology would barely support such a risky venture; and today we look longingly at Mars – maybe in 15 years. But human space travel is limited in range with our present technologies because we need massive support systems to sustain life. Furthermore, on board propulsion systems must limit the acceleration of manned spacecraft to a few “gees,” - ultimately achieving only relatively modest velocities – making travel outside the solar system unlikely for humans – a very advanced form of travel is needed for humans to go to the stars.

But, as a species we have been very creative and successful in sending unmanned space probes to all parts of the Solar System and even beyond. The Voyager and Pioneer spacecraft are leaving the Solar System for interstellar space, but Voyager has been travelling for 39 years and with a speed of about 5 km/sec it would take 274,000 years to reach Alpha Proxima, the star closest to Earth. Clearly if we ever are serious about sending space probes to nearby stars we need to go faster.

Breakthrough Starshot is a project to go faster. The concept is to make the spacecraft ultralight by leaving the propulsion system and fuel on Earth, and do all the acceleration to final speed in the first few minutes of flight. The propulsion system is a very powerful Earth-based laser directed at a very thin, highly reflecting membrane “sail” that is attached (somehow) to the payload consisting of an electronics chip containing cameras, a microprocessor, and a small laser for sending pictures back to Earth. The goal is to keep the mass of the sail and electronics to about a gram (1/28 ounce). A 100 billion watt (!) laser transmitting out of a few kilometer diameter aperture could power a few meter sail to 20% of the speed of light in about 100 seconds. The sail would then coast at this speed for 20 years to reach the Alpha Centauri/Proxima star system, fly by any planets, snap about 100 pictures and send them back to Earth on an optical communications beam. It would take 4.3 years for the signal to arrive back on Earth. The primary goal is to get the first close up pictures of an exoplanet.

While no one has identified a law of physics that would be a show stopper, there are serious engineering challenges - the two biggest being the sail and the laser. In my talk I will explain the principles of light beam propulsion, provide some ideas on how to build and power the laser, briefly discuss the hazards of interstellar travel, and list the issues with sending the data back to Earth. I will also discuss the timeline for the project and give some idea of our present view of what cost trends of the technology are needed to make this feasible in the next few decades.
Welcome to New or Returning TAAS Members

Calvin Booth  
Jonas Booth  
Ron Brand  
William Brown  
Patricia Cavenee  
Daniel Clark  
Bernard Deuto  
Miles Dominey  
Eric Dose  
Len Duda  
Patricia Duda  
Maria Jaquez-Timberlake  
Matthew Letter  
Timothy Lipinski  
Paul Schoessow  
Arthur Schwalm  
Kayde Solomakos  
Tavia Solomakos  
Zykai Solomakos  
Noam Timberlake  
Ruben Trujillo  
Kevin Zavadil

Donations to TAAS

Eric Dose
Len Duda
Jim Fordice
The GE Foundation
Ron Hospelhorn
Paul Lin
Gavin McCullough
Raymond Thompson
Rick Vergas
Chuck Wiggins

Thank You

The Albuquerque Astronomical Society is a 501(c)(3) organization. Donations are deductible as charitable contributions on the donor’s federal income tax return.

Explanation of Dues and Membership Renewal Date

NEW MEMBERSHIPS are registered immediately if you pay online. If you pay by check, your membership is registered when your check is received by the treasurer.

Renewal notices will be sent out via e-mail beginning 60 days before your membership expires. If your membership is renewed before it expires or with in 90 days after it expires, your new expiration date will be advanced one year from the previous expiration date and your membership will be continuous.

If dues payment is received more than 90 days after the expiration date, you will be reinstated as a member with an expiration date set as one year from the receipt of payment.

Location, Location, Location

• Chaco Canyon  
6185’ elevation  
Latitude  Longitude  
36˚ 01’50”N  107˚ 54’36”W  
36.03’ -107.91’  
36˚ 1.83’ -107˚ 54.60’

• Oak Flat  
7680’ elevation  
Latitude  Longitude  
34˚ 59’48”N  106˚ 19’17”W  
34.99’ -106.32’  
34˚ 59.80’ -106˚ 19.28’

• UNM Campus Observatory  
5180’ elevation  
Latitude  Longitude  
35˚ 5’29”N  106˚ 37’17”W  
35.09’ -106.62’  
35˚ 5.48’ -106˚ 37.29’

For security reasons, GNTO location is available by request only, so please contact Jim Fordice, GNTO Director, for GNTO information, e-mail GNTO@TAAS.org.

Monthly Membership Report  
December 2016

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Editor’s Note

The deadline for the next issue of The Sidereal Times is Friday, January 27. The newsletter editor’s e-mail address is editor@TAAS.org.

Membership Services

for:
• Membership Inquiries  
• Events Information  
• Volunteer Opportunities

Contact Bob Anderson at membership@TAAS.org

for:
• Membership Dues  
• Address/e-mail changes

Contact Doug LeGrand at treasurer@TAAS.org

TAAS  
P.O. Box 50581  
Albuquerque, NM 87181

The Official Newsletter of The Albuquerque Astronomical Society
The Sidereal Times January 2017

The Official Newsletter of The Albuquerque Astronomical Society

Page 12
TAAS is honored to receive an "OUT-OF-THIS-WORLD" AWARD 2011 from Astronomy Magazine for Outstanding Public Programming.

TAAS is honored to receive an "Editor's Pick 2013 Best of the City" award from Albuquerque Magazine.
BEST PLACE TO STARGAZE
CELESTIAL EDITION

MEMBERSHIP

You can join TAAS or renew your membership online. Just go to www.taas.org and select “Join Us!” or “Renew Your Membership” from the main menu on the left side. Annual dues are $30 for a regular membership, $15 for educators and active military, and $5 for students. Only regular members are eligible to vote in society matters. Our new member information packet can be viewed or downloaded from the same location on the website. You can pay your dues on line through PayPal, by Visa, MasterCard, or American Express. To pay by check, mail your check to TAAS, P.O. Box 50581, Albuquerque, NM 87181-0581 or give it to the treasurer at one of our meetings.

MAGAZINES

TAAS no longer offers magazine subscriptions.

ARTICLES/ADVERTISEMENTS

Articles, personal astronomical classified advertisements and advertisements for businesses related to astronomy must be submitted by the deadline shown on the Society calendar (generally the Friday near the new Moon). Rates for commercial ads (per issue) are $120 per page, $60 per half page, $30 per quarter page, $7 for business card size. The newsletter editor reserves the right to include and/or edit any article or advertisement. E-mail attachments in Microsoft Word or compatible word processor format; ASCII and RTF are acceptable. One space between paragraphs is preferred. One column is approximately 350 words. Contact the Newsletter Editor at editor@TAAS.org for more information.

Note that the Sidereal Times is no longer mailed. It is posted on the TAAS website, www.TAAS.org.

Send submissions or correspondence to editor@TAAS.org.

TAAS ONLINE

TAAS website: http://www.TAAS.org

The TAAS website includes:

- Programs . . .
- TAAS 200
- TAAS Fabulous Fifty
- Educational Outreach: School Star Parties, Solar Astronomy Outreach
- Equipment Trader
- Telescope Loaner Program
- Telescope Making and Maintenance . . . And more
- Online Sidereal Times
- Calendar of TAAS Events
- Members’ Guide
- Links to Astronomy Resources and Members’ Blogs

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Members’ Google Group: TAAS_talk@googlegroups.com