

# TAAA DESERT SKIES BULLETIN

Observing Our

Since



Desert Skies

1954

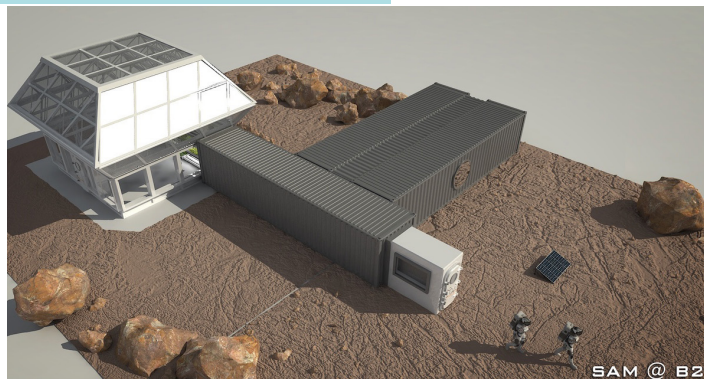
December 2021

[www.tucsonastronomy.org](http://www.tucsonastronomy.org)

## Membership Meeting

December 3 @ 6:30 pm - 9:00 pm

TAAA's next general member meeting will be held online on Friday, December 3, 2021. The Main Presentation starts at 6:30 PM and is open to the public. It will be followed by a Members Only Meeting. 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 before the meeting.



## Main Presentation at 6:30 AZT

### Constructing SAM; a Mars Habitat at Biosphere 2

Kai Staats, Director of the Space Analog for the Moon and Mars (SAM) will talk about this hermetically sealed habitat being built at the University of Arizona Biosphere 2 to simulate living conditions on Mars. The SAM pressure vessel incorporates a greenhouse and crew quarters with workshop, kitchen, common area, sleeping accommodations and airlock into the adjacent Mars yard. The greenhouse provides hydroponic and soil-based growing environments, controlled lighting, humidity, heating, and cooling. Other support systems provide clean air and water. The adjacent half acre is a replica of a Martian landscape. Pressure suits, rovers, and drones can be tested over varied terrain and obstacles. The first teams are scheduled for May 2022. Kai will describe SAM's core science research objectives and share photos and stories about the construction process.

**Presenter: Kai Staats**, science researcher, filmmaker, writer, and a veteran developer of platforms for research and science education. He was co-founder and CEO of the world-renowned Yellow Dog Linux (YDL) operating system for ten years. The YDL platform was used in Department of Energy, NASA, and University research across a full spectrum of sciences. Kai wrote the machine learning algorithm Karoo GP which has been used at the Laser Interferometer Gravitational-Wave Observatory (LIGO) for classification of glitches and supernovae; and was principal designer of the Mt. Meru Astronomical Observatory in Tanzania, the first of its kind in East Africa.

At Arizona State University Kai led the development of SIMOC, a research-grade computer simulation and educational interface hosted by National Geographic that enables citizen scientists to explore the complexity of a human habitat on Mars. At Biosphere 2, Kai and his team are taking the next big step by building SAM.

Kai is also a former president of the Phoenix Astronomical Society.

### November 2021

With the holiday season has come much additional activity. A team has worked on preparing the list of items for sale to TAAA members. You should have received the inventory of items on sale with accompanying descriptions and pictures. Items not sold prior to the Holiday Party will be sold via silent auction at the Holiday Party on December 11th (bidding ends at 7:30pm). The TAAA Board has deliberated conscientiously regarding the COVID situation and Holiday Party procedures. The final TAAA Board decision was that attendees to the TAAA Holiday Party must supply proof of vaccination. Wearing masks is optional. While we try to avoid decisions involving individual member values, the TAAA Board felt strongly that following the general guidelines currently being used for larger Tucson events should be safer for both our member hosts and member attendees. You should have received your invitation via email to the Holiday Party on December 11th including the directions for making reservations and driving directions to Ed and Janet Foley's residence. Please let myself or anyone on the Board know if you have questions.

You will also note that in October, there was an appeal made for additional donations to the current CAC Construction project: classroom, sleeping rooms, learning pad center. Donations have diminished during COVID, prices have increased, and the TAAA Board decided not to participate in fundraising for the majority of the pandemic. Thus, we are just re-starting our fundraising efforts. In 2019, TAAA participated in a successful Giving Tuesday Fundraising campaign. As you will have noted, we are currently again pursuing a Giving Tuesday Campaign. Donations given anytime in November and in early December may be included in the Giving Tuesday Campaign (or

*by Mae Smith*

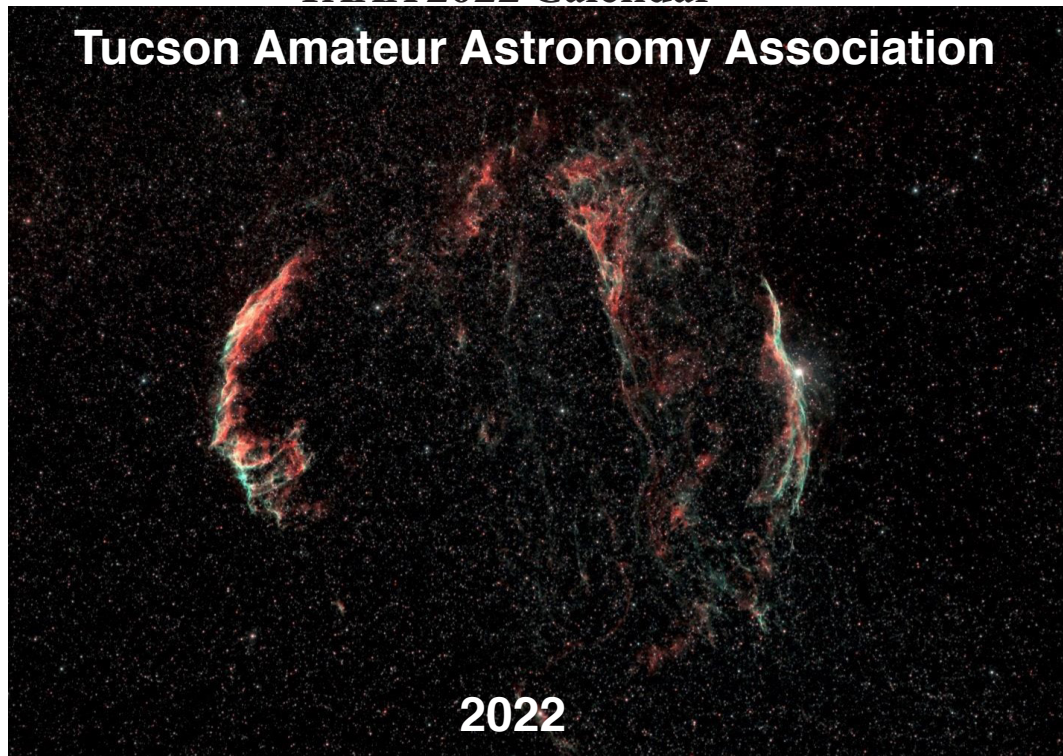
not), but the actual single Giving Tuesday date this year is November 30th, always the Tuesday after Thanksgiving.

The TAAA Board met on Wednesday, November 10th. Some Board actions at that meeting included:

1. Review and approval of the IRS 2020 990 income tax form.
2. Approval of a Junior Astronomer SIG for 10-17 year olds on condition that all involved TAAA parties are familiar with and are qualified in accordance with the TAAA Minor Policy and that there is a report back to the Board by the April 2022 Board meeting as well as traditional monthly reports being submitted to the Board as is required of all SIGs.
3. No CAC construction report again this month as the Contractor is still dealing with COVID issues.
4. Planning for the holiday party and sale was accomplished.
5. CAC reports indicate that the 4th container project is complete; a project for expansion of the RV parking from 4 to 6 spots is underway; access road routes to the new Learning Center are proposed and being studied; and the Member Observatory Project is still progressing.
6. An Astromart account payment was approved
7. A Second Fidelity Brokerage account was approved that would assist with management of Member Observatory payments
8. A TAAA Diversity policy including equity and inclusion was adopted.
9. A report of current work of NVRC was reviewed with further discussion tabled to the December meeting.

Please have a safe, enjoyable holiday season!!  
Thanks to each of you for all your contributions to and participation in TAAA.

## **TAAA 2022 Calendar**



The 2022 TAAA calendars are available. Only 25 left so hurry! The cost will be \$15 each.  
To order your calendar, please contact: [Susan OConnor](#)

## **2021 TAAA Winter Asset Sale**

Over the years TAAA has regularly received astronomy item donations from TAAA members and members of the community. When received, we first look at how we can put the item to use fulfilling TAAA's mission. If there comes a time the item becomes excess to our needs we next look to place it in the hands of members through our regular sales. The items are discounted significantly for members. The sales proceeds go to support TAAA.

In this year's sale, we have so far sold 19 items, including 7 telescopes, to members raising \$1190. There are still a few items left so check the Nov 17 2021 TAAA Winter Sale email. (Or check out the item list [here](#).)

## **TAAA 2021 Holiday Party**

Be sure to RSVP to the Saturday, December 11 Holiday Party invitation. Please [RSVP](#) by December 5. You don't want to miss the comradery, food and the astronomy goodies silent auction!

## **End of Year TAAA Giving**

As we enter the end-of-year giving season, don't forget the TAAA. See recent emails and articles about:

The [Gateway to the Galaxy Campaign](#) for the Chricahua Astronomy Complex expansion.  
The [Giving Tuesday](#) campaign for public outreach and other club activities.



### December 2021

by Jim Knoll

Thank you for volunteering your time and talents for our extremely important outreach mission. Below is the Star Party list for December, 2021. Please let me know if you can support any events listed below. If you are new to Star Party outreach, let me know and we'll be sure to help you get started. It is important you sign up for star parties if you plan to attend, whether you bring a scope or help in other ways, so I can manage who from TAAA will be on-site and for you to be included in any reminder or weather emails.

The Astronomy Events are listed on the TAAA ([tucsonastronomy.org](http://tucsonastronomy.org)) and Night Sky Network (NSN) ([nightsky.jpl.nasa.gov](http://nightsky.jpl.nasa.gov)) calendars. You do not need to log in to see any PUBLIC events. You need to LOG IN to see the school/non-profit non-public star party listings. Also, all PUBLIC star parties will be listed on the TAAA Facebook events page and will be updated based on weather, etc. in real-time. You can follow any of those events and get a notification when I update the event. Again, this is only for PUBLIC star parties listed on Facebook.

#### **Wednesday December 1** (backup Dec 2nd)

##### **WEST TUCSON**

##### **Satori School @ Cooper Center for Environmental Learning**

5403 W Trails End Rd, 85745

Age/Grade Level: Grade 4, # Participants: 25

FILLED. Stinger, Sarko scheduled.

Setup Time: 5:45 pm. Start: 6:30 pm. End: 8 pm.

Directions: West on Grant Rd, becomes Silverbell, becomes Ironwood Hills Drive which dead-ends at Camino De Oeste. Turn south. ALTERNATE: West on Speedway west of I-10. North on Camino De Oeste. Both paths: Turn west on Trails End Road and follow signs to "Cooper Center".

Viewing Location: Open area near restroom facilities. Access the site from the dirt road at the east end of the main parking lot (near the dumpsters).

#### **Saturday December 4 -- FAR WEST TUCSON**

##### **Tucson Mountain Park Ironwood Picnic Area**

7300 W Hal Gras Road,

Age/Grade Level: All Ages, # Participants: 50

FILLED -Rick Paul, Stinger, Sarko scheduled

Setup Time: 5:15 pm. Start: 6:00 pm. End: 8:00 pm.

Directions: On Kinney Road, 1.5 miles south of Gates Pass Road or 3.8 miles north of Ajo Way.

Viewing Location: Right side of road (parking pullout) near the 2nd restroom facilities (right side of road) at the Ironwood Picnic area (~3/4 of way into picnic area or approximately .6 miles).

#### **Thursday December 9 -- CENTRAL TUCSON**

##### **Safford K - 8**

200 E 13th St.

Age/Grade Level: Grades K - 8, # Participants: 350

3 Additional Scopes Needed (Jim Knoll scheduled)

Setup Time: 5 pm. Start: 5:30 pm. End: 7:30 pm.

Directions: Broadway or Congress (downtown).

South on 6th Ave to 13th St. Left (east) on 13th to the school (approximately 2 blocks).

Viewing Location: Field (Vehicle access will be provided)

#### **Saturday December 11 -- NORTHEAST TUCSON**

##### **Agua Caliente Park**

12325 E Roger Road, 85749

Age/Grade Level: All Ages, # Participants: 50

(FILLED) 0 Additional Scopes Needed (Rick Paul, David Hamory, Tom Sarko, Evan Warkentine scheduled)

Setup Time: 5:15 pm. Start: 6:00 pm. End: 8:00 pm.

Nearest Moon Phase: First Quarter

Directions: Tanque Verde Road east past Houghton to Soldier Trail. Go about two miles north to Roger Rd. Turn east for about 1/2 mile to the Park on the left (north).

Viewing Location: Parking Lot Bus Lanes (north end of parking lot).

# Special Interests Groups

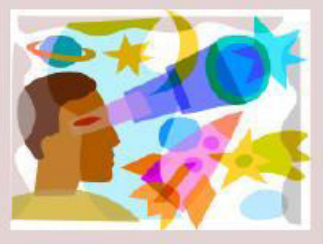
## Astronomy Fundamentals SIG

by Connor Justice

The next meeting is **December 9th at 6:30 pm - 8:00 pm**. Topics to be determined.

Contact [Conner Justice](#) for Zoom link and more information. [AFSIG on the Web](#)

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



## Starry Messengers Special Interest Group

### Opening Minds to the Universe

The Starry Messenger SIG will begin meeting monthly in 2022. Depending on our needs, some meetings will be by Zoom and others will be in-person. Our next Starry Messengers SIG meeting will be held via Zoom on Monday, January 10th at 7pm. The Zoom link will be sent via email to TAAA members.

We have two upcoming public events this spring. The Tucson Festival of Books/UA ScienceCity will be held the weekend of March 12 & 13 and the TAAA Astronomy Festival will be on Saturday, April 9th. We'll also provide awards at the SARSEF Regional Science and Engineering Fair being held in late February and early March. We will be looking for volunteers for all events.

Our meetings in January, February and March will be devoted to getting ready for these spring outreach events. The February and March meetings will be in-person (COVID conditions permitting). This will allow us to test our activities for these spring events.

We plan to hold other in-person meetings later in the year to give TAAA members an opportunity to learn some of our outreach activities. We want to encourage all TAAA members to help support the demand for activities at schools and other locations. Most of these activities take maybe 5 minutes to do with the public. They're designed for grades 4 and up, including adults, though some can be adapted to younger ages. We have over 100 separate activities from about a dozen themed Night Sky Network Toolkits, plus some activities we've created or adapted from other sources.

Anyone interested in learning toolkit activities should contact [Terri Lappin](#) (or 520-977-1290). Toolkit topics can be reviewed on the TAAA website (<http://tucsonastronomy.org/community-services/teachers-corner/>).

[Terri Lappin](#)

[SMSIG on the Web](#)

## Astro-Imaging SIG

by Gregg Ruppel

The next AISIG meeting is **Monday, December 20 @ 7:00 pm** via ZOOM. AISIG meetings going forward will be on the 3rd Monday of each month.

Check out [AISIG On the Web](#) or contact [Greg Ruppel](#) for the latest information and Zoom links. Gregg and the AISIG folks are very active on the [TAAA groups.io](#) 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 [TAAA Forum](#) web page.



by  
**Tom Eby**



**Arp 273**

64 x 2min @f/2.2,  
0.63 as/px res.  
Unguided subs,  
CEM70ec mount.

**Cave Nebula**







## **The Heart Nebula**

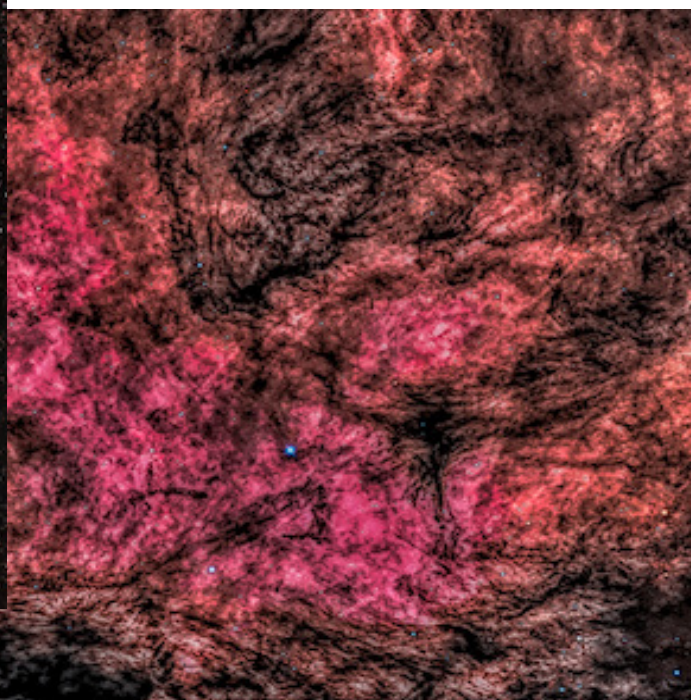
by Alan Rockowitz

2 panel mosaic of the Heart Nebula through an H $\alpha$  filter.

## **IC 1318 Wing of a Butterfly**

by Alex Woronow

<https://astrob.in/i4p555/0/>



**IC 59 and 63** by Randy Smith  
C11 w HyperStar, 2600, L-pro filter, 63x180

## The Iris Nebula

381 exposures totaling 3+ hours @ f/2.2. <https://www.astrobin.com/full/qrvr6k/B/>

by  
**Doug  
Summers**



**NGC 1398** This galaxy doesn't rise higher than 32 degrees at transit, so the airmass and seeing were a factor during capture. <https://www.astrobin.com/full/esdwb7/B/>





# Observing Sites

**CAC & TIMPA are open at full capacity (all pads are open).**

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

**Remember, reservations are required!**

## TIMPA

*by Ralph Means*

TIMPA (Tucson International Modelplex Park Association), Dark Sky site west of the Tucson Mountains.  
[TIMPA on the Web](#)

Location: The TIMPA observing site is located a few miles beyond the Desert Museum. The TIMPA site is only partially improved. There are no inside buildings provided other than restrooms. TAAA does not provide seating (members are welcome to bring folding chairs). Please note that members visiting the TIMPA site may encounter things commonly found in partially improved desert areas such as desert creatures and/or their remnants (such as gopher holes or ant hills), uneven terrain, weeds and desert pollens. Members using the site are encouraged to bring red lights and to move cautiously taking appropriate safety measures. The site does not have potable water, so bring your own non-alcoholic drinks.

### **TIMPA Star Party Dates this month:**

December 4 (Saturday) and December 10 (Friday)

Please contact the TIMPA Director to make a reservation: [Ralph Means](#)

## Chirichaua Astronomy Complex

*by Jim Knoll*

**Chirichaua 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).

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 web page.. Hosted personnel are generally on site a few days before and after these dates. All facilities are currently open, but the Board will review COVID status each month.

### **CAC Weekend Dates coming up (Friday/Saturday):**

December 3 & 4 (New Moon 4th)

December 31, 2021 & January 1, 2022 (New Moon 2nd)

January 28 & 29, 2022 (New Moon January 31st)

**Reservations:** There is a [reservation form](#) on the website for all CAC reservations. Click [here](#) or click on the TAAA Web Site (<https://tucsonastronomy.org>), 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.

## Connecting Astronomy with the Public

November 2021

by Jim Knoll

We had lots of astronomy events scheduled during November with only one school event cancelled due to Covid. Between the Public/School events and the Tucson Stargazing Adventures paid events, we had 20 scheduled with six of them at schools. Two of these events were solar



Empire Ranch Cowboy Festival

(approximately 425 participants), supporting Empire Ranch Cowboy Festival. The rest were evening events totaling 26

telescopes and approximately 845 participants. One event included the Elfrida Library in Cochise County, not far from the Chiricahua Astronomy Complex.

A couple schools were Night Sky

Network Toolkits demonstrating various astronomical concepts for school STEM Festivals or Science Fairs. If you are interested in participating with any of the Toolkits, check out the Starry Messenger Special Interest Group (SMSIG). All the Toolkits are listed on the TAAA website under Community Involvement, Teachers Corner.



Elfrida Library

On the Tucson Stargazing Adventures (TSA) paid side, we supported three resorts with 3



Ritz-Carlton Dove Mountain

telescopes, 20 volunteer hours, and approximately 150 participants. We are planning one of our regularly scheduled TSA observing events for December 27th (during the Holiday season) if anyone has family members visiting and wants to treat them to a dark sky observing session. We will be scheduling more of these sessions in 2022. More information on the TAAA Website (<http://tucsonastronomy.org>) under star parties and Tucson Stargazing Adventures.

Thanks for everyone that supported this very important mission of TAAA. We still need a couple volunteers for one of the December star parties (Safford) if you can help. See the listing under School/Public Star Party Requests. If you are new to star party outreach, we will pair you up with a mentor for a few star parties if needed or you can just jump in. Star Parties are a great way to begin learning the night sky.

### Notes From The Editors

[David Rossetter](#) – Editor

Ken Bertschy – Graphics

Terri Lappin & Jim Knoll - Proofreading

Greg Ruppel -Images

As we all give thanks this Thanksgiving weekend, I want to thank all the folks who help me put out this bulletin. Especially the folks on the left. In addition, each month we get some great contributors to make this publication special.

Thank you!



## **What's Up list for December 2021 – January 2022**

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 December and January for the more common observing programs.

### **Constellation Hunter Program – Northern Sky**

The following constellations are well placed for observing for December and January:

Andromeda, Aries, Auriga, Cassiopeia, Orion, Perseus, Pisces, Taurus, Triangulum

### **Messier Observing Program**

The summer Milky Way is setting early. The winter Milky Way is not rising until late. Now we are looking away from Milky Way, so objects are more sparse.

The following Messier Objects are well placed for observation during December and January (listed in ascending RA): M103, M33, M74, M76, M34, M77, M45

### **Lunar and Binocular Lunar Observing Program**

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

New Moon:	December 4, January 2
40 Hours waxing:	December 6, January 4
72 hours waxing:	December 7, January 5
4 days old:	December 7, January 6
7 days old:	December 11, January 9
10 days old:	December 13, January 12
Full (14 days old):	December 19, January 17
Gibbous:	December 26, January 25
72 hours waning:	December 1, January 29
40 hours waning:	December 2, January 30

### **Solar System Observing Program**

The following list describes the various solar system objects and their visibility during December and January:

Mercury is an early evening object in December moving back towards Sun in January.

Venus is an early evening object in December. Setting earlier each night and in late January becomes an early morning object.

Jupiter and Saturn set earlier and earlier in December. Saturn becomes an evening twilight object in January.

Mars emerges from morning twilight in December becoming an early morning object in January.

Uranus and Neptune are still well placed for evening observation. Neptune transits around sunset while Uranus transits around 3 hours later.

### **Urban Observing Program**

The following deep sky objects are well placed for observing during December and January:

NGC457, NGC663, Cr 463, NGC 752, Stock 2, NGC 869, NGC 884, Tr 2, M77, Tr 3, Stock 23, Mel 20, NGC 1342, M45

The following Double Stars are well placed for observation during December and January:

Delta Cepheus



## Steward Observatory Public Evening Lecture Series

The 2021/2022 Evening Lecture Series has begun. Since September 1922, Steward Observatory has been hosting public evening lectures in astronomy. The lectures begin at 7:30 p.m. MST and will be held in Steward Observatory Room N210 on the University of Arizona campus. All of the lectures are free of charge and open to the general public.

[Lecture information page](#)

[Podcasts of previous Public Evening Lectures](#)

### Fall 2021 Lectures

For Fall 2021, if you attend the lecture in person, we ask that you wear a face mask while you are inside Room N210. Face masks will be available in the room should you need one.

Should you not wish to attend in person, you can watch the lecture LIVE on ZOOM at:

<https://arizona.zoom.us/my/astr.n305>

**December 6**

Dr. Jinyi Yang, Dr. Feige Wang

Steward Observatory

Peering into the Early Universe with JWST: the Most Distant Quasars and Their Environment



### GLOBAL CONFERENCE

A Virtual, Worldwide Event #UnderOneSky2021

Watch the International Dark-Sky Association's [Under One Sky 2021](#) recordings on their [YouTube site](#). This was a 24-hour virtual event that will leave you feeling inspired and empowered to combat light pollution in your community. You'll hear from experts and storytellers in the dark sky movement and connect with passionate individuals from IDA's global network.



# Skyward

By David H. Levy  
December 2021

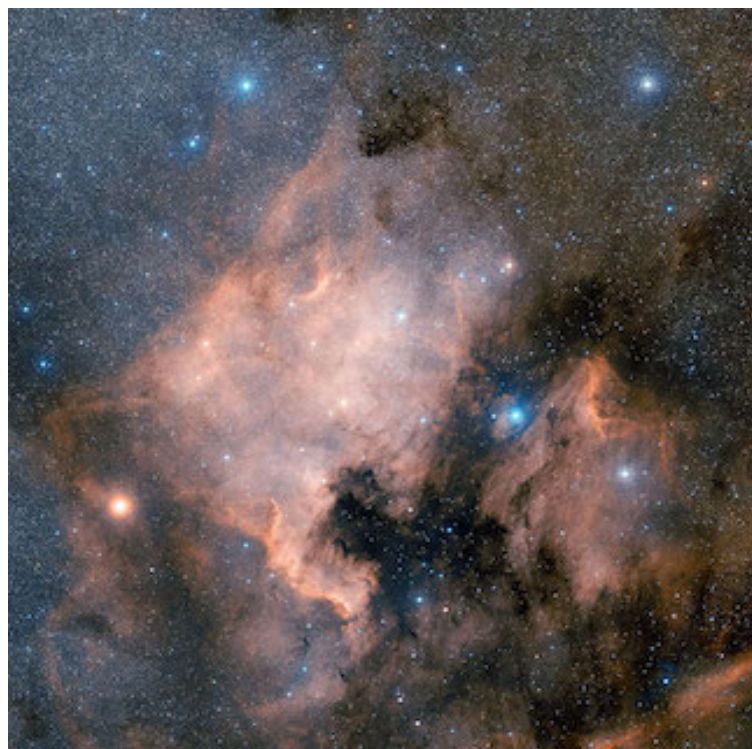
## Daffy Duck



Agreed, this seems like an awfully daffy title for an astronomy article. But there is method to the madness, and there is a story. During the late summer of 2019 there was a star party in southeast Arizona that featured a dark sky and five perfect back-to-back nights. As I spent hour after hour hunting for comets, I came across the sprawling North America Nebula in the northern sky constellation of Cygnus the swan. But this time something different appeared. It was a strange structure, the outline of a dark nebula bordered by a slightly brighter cloud. The whole feature was rather subtle, so that sometimes it was there, and then it faded so that sometimes it wasn't. I spent some time trying to determine a name for it. It looked like the head of a duck. I couldn't call it the wild duck nebula, as there is a cluster with that name. And Donald Duck is a bit confusing. So how about calling it the Daffy Duck nebula?

Thus, the structure is named after Daffy Duck. It is No. 403 in my catalog of interesting things found during my more than 56 years of comet hunting. I believe it is a small dark construction at the northern tip of the North America Nebula, about where Hudson Bay is not accurately located. It could have been where the Gulf of Mexico is, but that area is virtually impossible to spot visually, even under a dark sky. Like the Horsehead Nebula in Orion, it is very difficult to spot, and it is best viewed only in a photograph. The accompanying picture shows it at its top, a little to the left of center. The accompanying photograph was taken using the Hubble Space Telescope.

There are more than four hundred other celestial objects that have come my way over the years. Beginning with NGC 1931 which I spotted in January 1966, many of these are already well-known deep sky objects in the night. But a few are interesting groupings of stars, called asterisms, that no one has pointed out before. One of my favorites is a structure of faint stars I call "Wendee's Ring."



These always welcome objects in the sky are fun to observe and they enhance my enjoyment of my hours under the stars. When I can see Daffy Duck, it reminds me of the happy hours I spent as a child at Beaver Lake, an artificial pond near the top of Mt. Royal in Montreal, that hosts dozens of mallard ducks. On clear, moonless nights now, I offer a cosmic hello to Daffy Duck and the many objects in the night sky I have come to treasure as good friends.