



AOH OBSERVER

Winter 2018

The Newsletter of the Astronomers of Humboldt

My Last President's Note

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On November 18th, the AOH held its General Meeting and Board of Directors election (see page 2). At that meeting, I announced that I would be stepping down as President of the AOH after serving a two year term. The last two years has been quite a learning experience. While it was hard work, I have enjoyed the experience of leading the AOH. It has been great fun to immerse myself in all things astronomy from trying out telescope gadgets to STEM education/outreach to participating in various astronomy adventures. The AOH has accomplished much in the last two years. This was all possible because of the hard work of the Board, our outreach volunteers, and the members who attended our events. The best part of the job has been getting to know our members (both long-time and new). I am always impressed by the willingness of members to help each other out. One of our newest recruits recently commented that our club is like a community and she appreciates the help and encouragement that she has received. AOH members are simply the best!

I want to acknowledge the support I received from the AOH Officers and Board of Directors during the past two years. Ken Yanosko (Secretary 2017, Vice-President 2016) has given me much needed guidance, and was my sounding board during my two years as President. I want to thank Ken for his tireless work on the website, for helping with the newsletter, and for being one of the principal contacts for outreach. Mark Mueller (Vice-President 2017, Secretary 2016) has been a great community ambassador, and I want to thank Mark for his work with the news media (especially in the run up to the August 21 eclipse) and for his promotion of the club to the community. It has not gone unnoticed that many attendees to our star parties (and ultimately new members) have come through him. I could always count on Mark to lead our star parties or to lend a helping hand to our members whether it be fixing a telescope or giving a star hop lesson. I always joke that Bob Zigler is the one officer who kept me out of jail. I am grateful to Bob for his work as Treasurer, for keeping the AOH compliant with Federal and State agencies, and for giving the AOH the benefit of his legal expertise. Past-President Russell Owsley has been a mentor to me and someone that I could turn to for good advice and an honest opinion. The Board Members Bernie Christen, Greg Deja, Dan Eaton, and Mark Wilson have given me the benefit of their knowledge on a variety of topics ranging from equipment repairs and purchases to the handling of various club-related matters. Their emails, personal conversations, and phone calls of encouragement meant a great deal to me especially when the job of being President seemed overwhelming.

Finally, I want to give a hearty congratulation and best wishes to President Mark Mueller. For new members who may not know him, Mark is a veteran AOH member, a long-time Board member, and has served as AOH Secretary (2013-2016) and Vice President (2017). He is well-versed in a number of topics such as astronomy, telescopes, computers, building gadgets etc. Mark has some exciting ideas for the AOH in 2018. The AOH is indeed fortunate to have Mark at the helm.

As the AOH Observer signs off for the year, I want to thank the members who have contributed to the newsletter during this year: Bill Hogoboom has been generous in sharing his excellent images, Mark Mueller and Ken Yanosko have contributed entertaining and humorous articles about their travel adventures, and Susie Christian has kept us all smiling with her "Heavenly Bodies" submissions. Thank you to Ken Yanosko and Don Wheeler for proofreading the newsletter and catching all my misspellings, grammatical faux pas, and factual errors. We'll be back in Spring 2018.

Wishing everyone clear skies in 2018!
Grace Wheeler, AOH Past-President

AOH General Membership Meeting and Board of Directors Meeting

by Grace Wheeler, Past-President

On November 18, 2017, the AOH held its General Membership Meeting/Board of Directors Meeting at Babe’s Pizza in Eureka. We had 16 members in attendance. The agenda included the Treasurer’s Report (Bob Zigler) and an update on on the various club projects (Grace Wheeler). Future plans and purchases for the AOH were also discussed. The minutes of the General Membership/Board of Directors Meetings can be found at the Member’s Only Page at http://astrohum.org/members_only/minutes.php On behalf of the Officers and Board of Directors, I want to thank all of the attendees who braved a very chilly night to attend this meeting.

AOH Board of Directors Election

The main goal of the meeting was to present our slate of nominees for the 2018 Board of Directors to the Membership. Because we had a quorum, we were able to have the slate of nominees approved and elected (in accordance with the AOH By-laws). Please welcome your 2018 AOH Board of Directors:

Bernie Christen, Greg Deja, Dan Eaton, Brent Howatt, Mark Mueller, Russell Owsley, Grace Wheeler, Mark Wilson, Ken Yanosko, and Bob Zigler.

Nine out of the ten Board Members listed here have served during the past two years (and some for several years now). We are fortunate that Bernie, Greg, Dan, Mark M., Russ, Mark W., Ken, and Bob have agreed to guide the AOH for another term. I want to take this opportunity to introduce our newest Board Member, Brent Howatt. Brent joined the AOH in 2016, and during the last year he has been an enthusiastic and skilled volunteer with our AOH Outreach program. Brent is a native Humboldtter, and a graduate of Eureka High and Humboldt State University (Biology, 1970). While in high school, Brent taught astronomy merit badge classes at the old Tish Tang Boy Scout camp in the Trinity River. Brent has spent the majority of his life in Humboldt County, but more recently lived for 10 years in Sonoma County where he was a member of the Sonoma County Astronomical Society and the Robert Ferguson Observatory (RFO); Brent maintains his membership in both organizations and is a docent for the RFO. I know that the AOH will benefit from Brent’s experience and knowledge.

Elections of AOH Officers

Following the adjournment of the General Membership Meeting, the Board of Directors convened to elect the 2018 Officers. The following individuals were nominated: Mark Mueller for President, Mark Wilson for Vice-President, Ken Yanosko for Secretary, and Bob Zigler for Treasurer. The vote to elect the Slate of Officers was unanimous.

Congratulations to President Mark Mueller, Vice-President Mark Wilson, Secretary Ken Yanosko, and Treasurer Bob Zigler.

The 2018 AOH Officers and Board of Directors



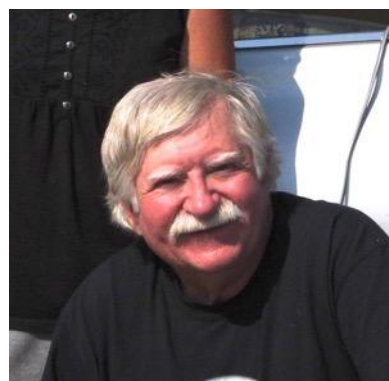
Mark Mueller, President
Board Member



Mark Wilson, Vice-President
Board Member



Ken Yanosko, Secretary
Board Member



Bob Zigler, Treasurer
Board Member



Grace Wheeler, Past-President
Board Member



Bernie Christen
Board Member



Greg Deja
Board Member



Dan Eaton
Board Member



Brent Howatt
Board Member



Russell Owsley
Board Member

AOH Announcements

AOH Membership Renewals

If you haven't done so, please renew your membership. Fifteen dollars pays for an individual or family membership.

The membership form can be found at <http://astrohum.org/membership.html>.

When you renew, please consider making a tax-deductible contribution to the AOH. Membership dues and donations go towards outreach or equipment purchases for our Kneeland Observatory. The Astronomers of Humboldt is a 501(c)3 California nonprofit.



Save the Date: 2018 Annual AOH Potluck

Ken Yanosko will be notifying our membership in January about our Potluck. Please remember to RSVP and sign up for a dish. The Potluck will be held on February 10th from 6-9 p.m. at the Humboldt Area Foundation. Our guest speaker will be Dr. Paola Rodriguez Hidalgo, HSU Professor in Physics and Astronomy.

Spring Club Calendar (January through April 2018)

This schedule is reprinted from <http://astrohum.org/upcoming.html>

Saturday January 6. **Public Observing at Arts Alive.** If the weather is clear, we will set up scopes at the Gazebo in Eureka from 6 to 9 pm.

Saturday January 13. **Regular Monthly Meeting.** We will have an observing session at Kneeland Observatory if the weather is clear. Otherwise, there will be an indoor presentation. Before you go, check back here for possible last-minute changes.

Wednesday January 31. **Total Lunar Eclipse.** The umbral or "dark shadow" phase of the eclipse begins at 3:48 am and ends at 7:11 am, with totality between 4:52 am and 6:08 am, Pacific Standard Time. No formal AOH activity is planned. Set your alarm for this early-morning event.

Tentative meeting dates and special events for the rest of the first half of 2018 (check back for details):

Saturday February 3. **Public Observing at Arts Alive.**

Saturday February 10. **AOH Annual Potluck.** At Humboldt Area Foundation, 363 Indianola Rd, Bayside. 6 to 9 pm. Guest speaker: Professor Paola Rodriguez Hidalgo of the HSU Department of Physics and Astronomy.

Saturday February 17. **Regular Monthly Meeting.**

Saturday March 3. **Public Observing at Arts Alive.**

Friday March 16 or Saturday March 17. **Messier Marathon.**

Saturday April 14. **Regular Monthly Meeting.**

Night Sky Network Webinars

Members of the AOH can register to "attend" webinars at the Members' Only Page

http://astrohum.org/members_only/webinars.php

These webinars are live monthly broadcasts of astronomy and space mission related topics. Speakers are scientists affiliated with academia and/or NASA/JPL. The live webinar format allows the listener to ask questions of the speaker.

This page also contains links to videos of past webinars and related materials.

September 21, 2017 at Skyfish School

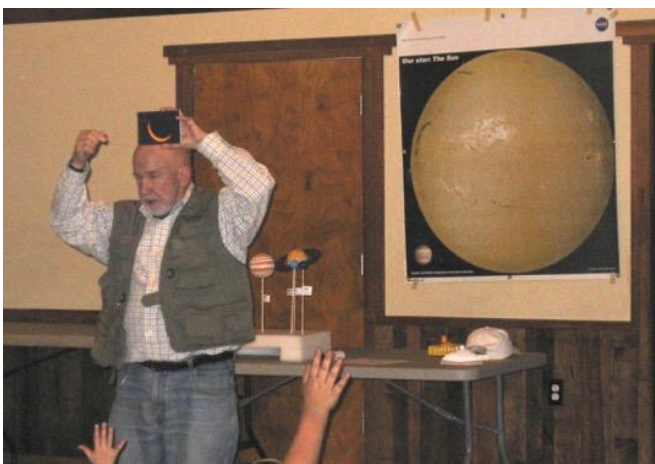
Our first outreach of the fall season had us (Ken Yanosko and Grace Wheeler) making the trek to Skyfish School in the southern Humboldt town of Briceland. About 55 students, 20 parents, and 5 staff members were camping out overnight at the school, and a stargazing party was on the evening schedule. The early evening clouds had us worried that we might not be able to observe. While the students burned off some energy with an after dinner soccer game, Ken and I hurriedly came up with an alternative viewing activity in the event that we were clouded out. Ken set up a small photo of Saturn about 100 feet away from his C-8 while I hastily constructed an artificial star field using a black garbage bag, rubber bands, the sharp end of a poster pin, and an oversized flashlight. (Of course, after all that effort, one is only tempting fate that the skies will clear, and this is what actually happened.)

As we waited for the skies to darken, Ken gave an introductory talk about the solar system in the school cafeteria. The students learned about the planets, their location from the sun (My Very Excellent Mother Just Served Us Nice Pie*), and their sizes and characteristics. For the Sun and Moon, Ken showed a photo from the 2018 solar eclipse and discussed how eclipses happen. By the time Ken was finished with his talk, the clouds had magically dissipated and it was clear skies all around. We decamped to the telescopes and the students, parents, and teachers had the opportunity to view Saturn, the Hercules Cluster, the Lagoon Nebula, and the Andromeda Galaxy. The Skyfish School community were wonderful hosts and they invited us to their annual Petrolia camping trip (volunteers?).

*Ken pointed out that this was an old mnemonic and that Pluto has been reclassified as a dwarf planet.



Introducing the Solar System Planets.



Ken asking the students questions about the August 21 solar eclipse.



Ken and a student showing how many Jupiters would fit across the diameter of the sun.

October 16, 2017 at Kneeland Airport

We had an excellent star party at the Kneeland Airport in October with 11 members and 7 guests in attendance. It was warm for an October evening and the humidity was low. Except for some low clouds to the west, conditions were excellent for a star party. Ken set up his C-8 and hosted a group from the Redwood National Park Stargazer's workshop. AOH members Brent, Eva, Kathy, and Don also had their telescopes available for viewing. We started off the evening with a view of Saturn and its moon Titan, followed by a 7:33 p.m. flyover of the ISS, and then we moved on to various clusters and galaxies. Shaina Niehans, who taught the workshop, set up her own 10-inch Dob and found M13, M81/82, Andromeda, the Double Cluster, and some of the Sagittarius clusters. Mark Mueller gave a lesson on how to use setting circles on his C-8. At the other end of the runway, a video astronomy demonstration was set up using an Atik Infinity camera, a 6 inch SCT, and a PC computer. Using the computer, we viewed images of globular clusters (M5, M13), star nurseries (Lagoon and Trifid Nebulae), and planetary nebulae (Ring, Dumbbell, and Little Dumbbell) on the computer screen. I was able to "kid-test" this with 7 year old Coy who gave me great feedback.



AOH Members (L to R) Ken, Sharon, Mark M., Eva and Brent setting up telescopes.



Brent aligning his C-8 telescope.



Ken with the crew from the Redwood National Park, Ryan, Shaina, and Laura.

October 21, 2017 at College of the Redwoods Science Night

This was the second year that the AOH has appeared at the College of the Redwoods Science Night. The 2016 appearance was a soggy affair which had us presenting in a back parking lot that was poorly visible to the public. This year I asked for an additional indoor space so that we could keep our displays dry. CR assigned us to the Humanities Building which put us in the center of campus. As a result, both indoor and outdoor displays received many visitors. The title of our program was "Adventures in Astronomy". Our indoor displays included a meteorite/meteorwrong demonstration (Russ O.), scale model of the solar system (Bob Z.), indoor telescope viewing with three types of telescopes (Ken Y., Mark M.), and constructing planet masks at the astronomy craft table (Kathy B., Don W.). Telescopes were set up outside the Humanities Building to view Saturn (Mark M. and Nina G.), and also behind the Science Building (last year's venue) to view Saturn, the Ring Nebula and the Perseus Double Cluster (Brent H. and Grace W.) We had about 250 adults and children who visited our indoor and outdoor locations. There was an enthusiastic and appreciative response from everyone who participated in our adventure. A huge thanks to our AOH volunteers who worked tirelessly throughout the evening.



Ken Yanosko with our display with three different types telescopes: refractor, reflector, and a Maksutov-Cassegrain.



Bob Zigler demonstrating the scale model of The solar system. The size of the planets are scaled to a one meter sun.



Kathy Blume supervising the planet mask makers



Our indoor display room received many visitors.



Learning to distinguish meteorites from "meteorwrongs".



Russ was busy all evening with the meteorite collection.



Mark Mueller and the Astrocan. The small scope was the perfect size for kids to view Saturn.



Grace Wheeler showing the setup for video astronomy. On the screen is a live view of the Ring Nebula.



Viewing Saturn through a Newtonian reflector.

November 4, 2017 at Kneeland Fall Festival

The volunteers were Russ Owsley, Greg Deja, Mark Wilson, Mark Mueller, and Grace Wheeler.

The Kneeland Fall Festival was from 4-7 p.m. The day turned out to be partly cloudy with some clearing to the west. Greg and Grace set up a C-6 with a solar filter and the Coronado Solarscope; all of the scopes were put away after an hour because of clouds. Russ kept the observatory open and gave tours to the students, parents, and a few of the firefighters (who were visiting the school).

Inside the library, we set up a table with our meteorite/meteorwrong display. In keeping with the carnival theme of the Fall Festival, we set up a “dart” game using the Earth and Moon as targets, and Velcro wiffle balls as asteroids (this is actually a modification of a Night Sky Network cratering exercise). We had several kids come by to play our game; we took this opportunity to talk about asteroid collisions, and why cratering is different on the Earth versus the Moon.

By 6:45 p.m., the sky had cleared considerably and Russ was able to find Saturn through the Observatory C-14. One little boy and his mother had come by earlier to look through the C14 and Russ told them to come back at sunset. They stayed until the end, and were thrilled to be able to view Saturn which was quite low in the western horizon. We had about 10 people, including the Principal Justin Wallace, come by and look through the scope at Saturn. Principal Wallace was impressed and said that he would encourage the parents and students to attend our Kneeland School star parties.



Mark Mueller, Mark Wilson, and Greg Deja posing outside the Kneeland Observatory.



Trying to hit the moon or the earth with an asteroid with eyes closed.



When Mark Wilson is left in charge ☺



Staying until the very end to see Saturn.

November 29, 2017 at Brookdale Senior Living, Fortuna CA

Presenters: Don and Grace Wheeler

This was a Moon/Star Party with the residents of Brookdale (postponed from October 27, 2017 Observe the Moon Night). This was our second visit to the senior home and one that was highly anticipated since we had planned to use video astronomy to view deep objects. (The impetus to develop a video astronomy program was in part inspired by the residents at Brookdale). We set up the C8 telescope to view the moon, and the C-6 was outfitted with the Atik web camera for showing deep sky objects. We thought it might be difficult to “see” the DSOs because of the lights in the courtyard, the presence of gibbous moon, and haze that was in the air. Despite these conditions we were able to find the Ring Nebula, Dumbbell Nebula, Hercules Globular Cluster, and the Double Cluster in Perseus. We discussed stellar evolution, cosmic distances, and spectroscopy. The residents were thrilled to be able to view these deep sky objects, and because it was a cold evening, we could do this viewing in a relatively short time. We plan to meet again in late winter to catch the Orion Constellation.

Pictures shown below are the Brookdale residents braving a very chilly evening to partake in an evening of stargazing. We want to thank these participants (including Brookdale coordinator Linka Wakefield) for their enthusiasm and for helping us test out the feasibility of video astronomy in an outreach setting.



December 9, 2017 at Kneeland School

Our December star party was held at Kneeland School on Saturday the 9th. It was so warm that most of us wore only light jackets throughout the night. The sky condition was excellent and humidity was low. We had a good turnout of members: Brent Howatt (C-8), Bill Hogoboom (C-8), Don Wheeler (120 mm apo-refractor), Frank Simpson (C-8), Mark Wilson (C-9.25), Grace Wheeler (C-8, and C-6 with a deep sky webcam), Ken Yanosko (operating the C-14 in the observatory). Our observers included Kasum and Deepak, new AOH members John Carleton Thomas and Stormy, and long-time members Bernie and Claire Christen (and we all took turns looking through each other's telescope). We took advantage of the late autumn evening to view objects in the Summer Triangle, autumn constellations (Pegasus, Andromeda, Cassiopeia, Perseus, Triangulum, and Pisces), and winter constellations (Orion and Taurus). Collectively we viewed planetary nebulae (Ring and Dumbbell), galaxies (Andromeda and its companions M32 and M110, Pinwheel, M82, M74, Deerlick), open clusters (Owl cluster, Pleiades, M103, Double Cluster in Perseus) and the globular cluster M15 in Pegasus. In Taurus, we found the supernova remnant Crab Nebula. We patiently waited for Orion to rise above the trees in order to view the Orion Nebula (M42, M43) and the Flame Nebula (NGC 2024). Throughout the evening we were treated to an occasional streak of a Geminid meteor. Thank you to all who came to our last star party of 2017! It was a very fun evening.

A gallery of deep sky objects taken in Humboldt County with the Atik Infinity camera can be found here: <https://astrohum.imgur.com>



Stormy viewing a deep sky object on the computer screen.



Stormy viewing a deep sky object through a C8 telescope.



The Ring Nebula is a planetary nebula in the constellation Lyra (2,238 light years from Earth).



The Deerlick Galaxy (NGC 7331) is an unbarred spiral galaxy in the constellation Pegasus, 40 million light years from Earth.

A look back at our 2017 Outreach

As we close out 2017, I want to acknowledge the following volunteers for their participation in our 2017 outreach events:

Mark Bailey, Kathy Blume, Bernie and Claire Christen, Greg Deja, Dan Eaton, Mike Foster, Jeff Goodman, Nina Greenberg, Bill Hogoboom, Brent Howatt, Eva Laevatsu, Mark Mueller, Russ Owsley, Frank Simpson, Mark Wilson, Ken Yanosko, Don Wheeler, Bob Zigler, and Sudheer and Birgitte Baba.

This year, the AOH has done a total of 24 outreach events which include our Kneeland star parties (8), school visits (4), presentations to youth groups (4), observing with seniors (2), and participation in various community events (6). Considering the size of our club, this number speaks volumes about the dedication of our volunteers. Anyone who has participated in outreach realizes that it is hard work, but it is also satisfying. Whether it is greeting visitors and making them feel welcome, to operating a telescope, to explaining how eclipses occur, it is all very much appreciated by our community. It is gratifying that the Astronomers of Humboldt is recognized as an organization that can be counted on to provide quality astronomy programming. Thank you to all of our volunteers for sharing your time, equipment, knowledge, and enthusiasm with the public.

My Great American Eclipse Experience

By Mark Mueller with the essential help of Julie St. Pierre and Lisa Hockaday

With the dawning of the year 2017, I realized that I better get my act together and figure out how I'm going to see the Great American Eclipse on August 21st.

Eastern Oregon, touted as being one of the ideal places to watch this eclipse, was predicted to have the best weather prospects along the path of totality. I learned that the town of Madras, together with NASA, was setting up a huge wingding they called Solarfest, with a festival and entertainment, and camping in a large farmer's field closer to the eclipse centerline, dubbed Solartown, where people were invited to take up residency while waiting to watch the eclipse. So I bought tickets for a campsite in Solartown, an extra parking spot in case I needed one for my trailer, and shuttle tickets to travel between Solartown and Solarfest, so I could stay out of my car while there.

As August approached, stories predicting crazy traffic, gas shortages, and crowds filled the news. My strategy was to get there early and leave the day after to avoid the crowded roads in each direction. I planned to be fairly self-sufficient by bringing food and other provisions to last the 5 days I planned to be there -- it would be basic, but I knew I wouldn't starve. I made a portable shower; and filled a five gallon can of gas, to allow me to travel that much farther before needing to stop for gas on the way home.

I left Eureka about 7AM on Thursday, August 17th, and got to Highway 97 several hours later where the traffic was heavy, yet still going above the posted speed limits. I finally got to Madras at 5PM. The only real delay that I encountered driving to Madras was in the line to enter the camp at Solartown. It was a pleasant wait, though, because they would check 6 or 7 campers in at a time, and then the line would move up a fair amount. That provided me and other drivers some time to get out of our cars to stretch and chat.

Grace, our president of AOH, had given me an additional camping ticket for a site at Solartown since she had an opportunity to camp at the municipal airport across the highway near the NASA live feed. At check-in, I asked how the parking permit works, and they didn't know, so they gave me another camping ticket! I ended up with three 20 x 20 campsites! My friend, Max, was arriving on Saturday, and now there would be plenty of room for us to camp, set up the observatory, park our cars, and the trailer.

I wanted to be in the middle of the action. And since I wasn't planning on leaving early, there was no need to be near an exit; so I drove toward the center of Solartown on the lookout for a place with people I'd like to camp around. I came to this one spot where there was a large group. I was a little unsure; but for the most part it felt like a good group of people, so I set up across the road from them, with some empty space around me. I figured people would look at my long hair, teardrop trailer, old Miata, and make a positive assumption about me.



This is the Frey camp in ACTION!! This picture was taken during the partial part of the eclipse.

As it turned out, I really enjoyed being with all the people that moved in near me; but the multi-generational group of 100 people across the way -- from Frey Vineyards in Mendocino, our neighboring county to the south -- were super friendly, creative, and active. Unlike me, this group wasn't just bringing the basics -- they literally had a kitchen sink! They had hula hoops, poi, and juggling. And the kids would make up songs on the fly and fashion kites out of long plastic bags. They set up a table full of crafts items to make customized solar masks. When Julie, my new friend from the Frey Camp, told me her story of watching the Great Eclipse of 1991 in Costa Rica, I cried. What a great story of her first total solar eclipse! I would later find out how well she captured the experience.

Suzanne and her daughter Christina arrived and asked if it was okay if they camped next door and I said, "of course!" Suzanne works for FEMA and had many fascinating stories about disasters and how things are coordinated to help the victims. On Friday I took her to the airport, by cargo bike, kitty-corner across the highway to sight-see. Her daughter got a ride with their friends, who also joined our camp. We cruised around the taxiways and looked at all the food vendors, small camps, and NASA's live streaming setup. We also saw some people with a Stearman biplane giving airplane rides! For a mere \$300 you could go on a 20-minute flight. I gave Christina a ride back to camp after that. And then we all had dinner together at camp that night.



Suzanne and Mark getting ready to ride to the airport on Mark's Cargo Bike.

Among other camping neighbors -- Shannon, a teacher, with his son Garrett and wife Laura -- are a family that made the trip from Michigan. I'm not sure if they knew what to think of all these wild and crazy folks from Mendo and Humboldt... At first, they kept to themselves, but as we all introduced ourselves and got to talking, they warmed right up. Shannon ended up making an elaborate alphabetical list based upon our immediate surroundings and observations to figure out solar eclipse nick-names using our initials. Because I like to admire the way people arrange their electron fields, I earned the Solartown moniker of Madras Electron-field Moon-eclipser!

Friday afternoon another friend, Mitch, showed up and moved into the camp next door. He brought a solar tattoo stamp and bicycle. During the days, Mitch rode his bicycle all over the greater Madras area. Sandie and Kelly came by and set up their camp, too. They replenished the beer supply and contributed a bunch of Hawaiian leis they found in a free pile. They set up a coffee table, complete with flower arrangement, which really made the camp feel quite pleasant and festive.

My friend Max arrived on Saturday and set up camp. We had a super little community at our camp site! Sandie said it was like a mini Burning Man. As people strolled by we would spray them with cooling mists, mark them as an honorary member of our tribe with a temporary tattoo, and let them look at the sun through my telescope (with solar filter) to see the huge and plentiful sunspots!



We were giving solar tats to passersby.

On Sunday, the day before the eclipse, Professor Norman Murray, an astrophysicist from the University of Toronto, and part of the Frey Camp, gave a talk on what we could expect during the eclipse. It was fun to give him a few leading questions about the moon and orbits. Afterwards, when he took a look through my telescope, I exclaimed, "A real, live astrophysicist just looked through my telescope!" Without skipping a beat, Katrina Frey joked, "He'll never wash the eyepiece again!" And Julie quipped that I should get his autograph. That gave me the idea to ask everyone that looked through the C-8 telescope to sign it. I encouraged everyone to use the C-8 and learn some of the basic operations so they could use it without my guidance during the eclipse; and now its new, graffiti finish reflects how many people took me up on the offer.



3380 Julie showing off her custom Solar Viewing glasses made from the same number 14 lenses she used to watch the eclipse in 1991 in Costa Rica! Also my highly autographed Celestron C-8 telescope. In the background is the Edmund Scientific Astroscan "Hippy Scope" that we used to view the totality.

When Monday morning -- eclipse day -- finally arrived it was a bit cloudy. We were all concerned, but fortunately the sky cleared up as eclipse time approached. It was looking to be a warm 30 C. We were all buzzing with excitement and it felt like electricity was in the air! Someone was checking the clock for the official first contact, which marks the moment when the partial eclipse begins. Meanwhile, the celebratory sound of corks popping from Frey Totality organic champagne punctuated the air. We all shared looking through the C-8. I had my super wide field Edmund Scientific Astroscan telescope, otherwise known as the Hippy Scope, ready to go for viewing the totality.



From Left to Right: Mark, Anna, Katrina, and Julie showing off our custom solar viewing glasses.

The hula hoops, poi, and juggling were in full swing. And we were all donning our customized eclipse viewing masks. Julie had made hers using the same number 14 welding lenses she viewed the 1991 eclipse with. Everyone was quite huggy! An eclipse can have that effect, I found. As the temperature rose, I took my shirt off. As we got closer to totality, the temperature dropped to about 15 C, and I had to put my shirt back on!

We were watching Mount Jefferson, about 60 kilometers to the west, begin to darken as the umbra moved east. With totality quickly approaching, I brought the Hippy Scope to the party and aimed it at the sun by looking at the shadow where the cylinder meets the ball shape. As the umbra approaches, it becomes noticeably darker and darker, and there are unique things to anticipate in the seconds before totality: Bailey's Beads, followed by the Diamond Ring effect. When the outside edge of the moon "grazes" the Sun, its concentrated rays shine through the rugged lunar topography, allowing "beads" of sunlight to shine through in some places, and not in others. It's all happening so quickly at this stage, and during all that, I missed Mount Jefferson being overtaken with darkness as the umbra approached. But ooohhh, to see Bailey's Beads and the Diamond Ring with my own eyes! These were so gleaming, and more spectacular than I imagined... I guess it's fair to say that I like shiny things.



Taken during totality. Can you see the AWESOME in everyone's face?

Finally, we were at second contact, when the eclipse went total! It got very dark; but the quality of light is strange, like that of a moonlit night, with a lingering hint of twilight. After Bailey's Beads and the Diamond Ring so brilliantly appeared, I took a look through the Hippy Scope. I saw the ephemeral corona for the first time, with Rigel also in the field, and then invited others to look. I kept my mind together long enough to see Venus, but couldn't focus long enough to find Mercury or Mars. My experience is that everything near the eclipse was pulsating with a silvery glow. We all gasped in awe -- real awe, not that of the "awesome, man" cliché. Just before third contact, when the total eclipse ends as the moon starts moving away from the sun, I pushed the Hippy Scope out of aim so no one would fry their eyes. And then the diamond ring flashed and went into Bailey's beads. Amazing!

To my bewilderment, within minutes of third contact, people were starting their cars and trying to drive home! I hadn't been drinking or partaking in anything like that; but my head was still in the clouds and I was in no shape to be driving. It took me a couple of hours before I felt that my feet were back on the ground! Besides, camp was so fun. Why leave so soon? Unfortunately, Suzanne and Christina had a white water rafting trip next on their agenda, so Max and I helped them pack up and bring their stuff to their car and we said our goodbyes.

Julie and I decided to keep the buzz alive by walking around Solartown, and discovered the Leopard Lounge, a camp set up as a bar with music and drink specialties. It was amazing -- they weren't charging for drinks, they only accepted donations. What better way to start winding down?

To summarize, here is the ecstatic truth¹: Silvery wisps of the sun's corona were reaching down to me, inviting me into the collective experience of the total eclipse... love... our planet... and all of us together! I felt connected to the past eclipse experiences of ancestors. Love surrounded me, all my new and old friends, and about a hundred thousand others, as we watched, hugged, and cried a little beneath our celestial umbrella.

1. Ecstatic Truth as defined by Werner Herzog:

<https://www.rogerebert.com/rogers-journal/herzogs-minnesota-declaration-defining-ecstatic-truth>

The Night Sky Report: The Winter Constellations

By Grace Wheeler



Figure 1. The star chart generated by Stellarium for January 15, 2018 at 9:00 p.m. PST. The outline of the Winter Hexagon is in yellow and contain these stars at the vertices: Pollux, Castor, Capella, Aldebaran, Rigel, Sirius, and Procyon.

The Winter Hexagon is an asterism of the winter night sky that contains the brightest stars of the constellations Auriga (Capella*), Taurus (Aldebaran*), Orion (Rigel*), Canis Major (Sirius*), Canis Minor (Procyon*), and Gemini (Pollux*, Castor*). The other winter constellations include Monoceros which lies on the celestial equator, and Lepus and Puppis which reside in the southern hemisphere. *These are the names of the bright stars.

Auriga (Charioteer) is a pentagonal shaped constellation that lies north of the celestial equator. The shape of the constellation is thought to represent the helmet of the charioteer. Capella is the brightest star in Auriga. Notable deep sky objects are the open clusters M36, M37, and M38. <http://www.constellation-guide.com/constellation-list/auriga-constellation/>

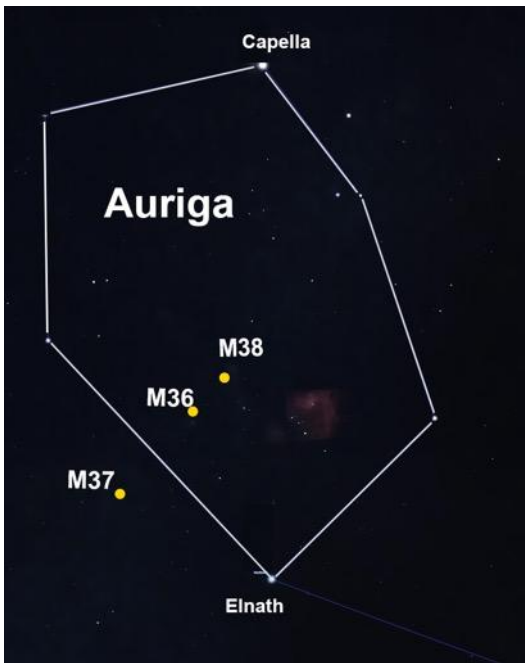


Figure 2. The location of M37, M36, and M38 in Auriga. (Image generated in Stellarium)



Figure 3. Messier 37 is the brightest open cluster in Auriga. (Image: C-6; Atik Infinity camera with stacking).

Taurus (the Bull). The bright orange star Aldebaran is the fiery eye of the bull. Taurus is known for the two open clusters Pleiades (mag 1.6) and the Hyades Cluster (mag. 0.5) which is near Aldebaran. Both clusters are naked eye objects but best viewed with binoculars or small telescopes. The Pleiades is composed of hot type B stars and is one of the nearest clusters to Earth. Taurus also contains M1, the supernova remnant. It is thought that M1 corresponds to the supernova observed by Chinese astronomers in 1054.

<http://www.constellation-guide.com/constellation-list/taurus-constellation/>



Figure 4. The constellation Taurus Showing the location of M1 and the Pleiades. (Image generated in Stellarium)



Figure 6. M45, the Pleiades, is an open cluster in Taurus (Image credit: Digitized Sky Survey; NASA/ESA/AURA/Caltech)



Figure 7. M1, Crab Nebula, is a supernova remnant in Taurus. (Image: C-6, Atik Infinity camera w/stacking).

Gemini (the Twins). The constellation is found in the northern hemisphere and is known for its two brightest stars Castor and Pollux. Pollux, an orange giant star, is the brighter of the two. The whitish star Castor is actually made up of 3 sets of double stars known as Castor A, Castor B, and Castor C. With a small telescope, it is possible to resolve Castor A and B. Notable deep sky objects in Gemini include the M35 open cluster (mag. 5.3), the distant open cluster NGC 2158 (seen in the periphery of M35), and the double-shelled planetary nebula known as the Eskimo Nebula (NGC 2392).

<http://www.constellation-guide.com/constellation-list/gemini-constellation/>

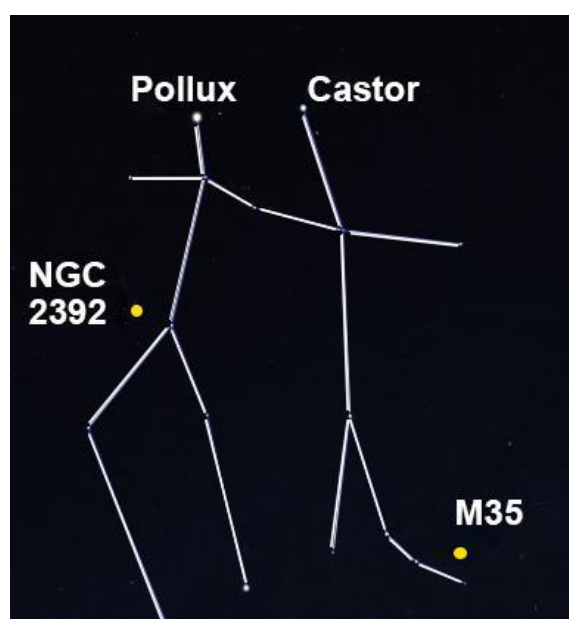


Figure 8. Gemini constellation showing the location of M35 and NGC 2392. (Image generated in Stellarium)

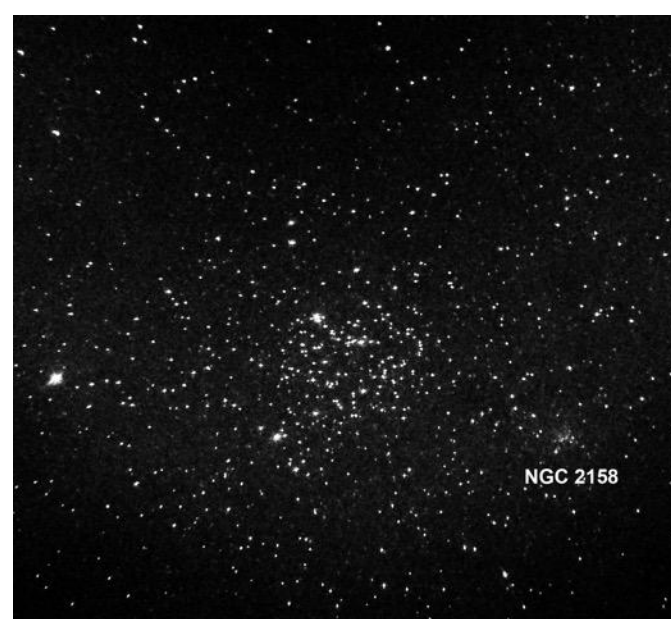


Figure 9. M35 is a large open cluster in Gemini. The more distant open cluster is NGC 2158 is seen in the periphery of M35. (Imaged with a 130 SLT and a Pentax Q7)



Figure 10. NGC 2392, the Eskimo Nebula, is a blue double-shelled planetary nebula. (Image: C-8 and Atik Infinity camera w/ stacking).

Orion (the Hunter). Orion lies on the celestial equator and is one the most recognizable constellation of the winter sky. In Greek mythology, the stars of Orion are thought to represent the “hunter” and he is flanked by his hunting dogs Canis Major and Canis Minor. In some stories, Orion is seen in the sky pursuing the Seven Sisters of the Pleiades. Other lore has Orion hunting the rabbit Lepus. The two brightest stars of Orion are Rigel (blue supergiant) and Betelgeuse (red supergiant). Orion’s Sword lies beneath the belt stars Mintaka, Alnilam, Alnitak. The Sword contains the star-forming region Orion Nebula (M42, M43; see inset in Figure 11). Lying north of Orion Nebula is NGC 1977, which is part of Sh2-279 nebula, also known as the Running Man Nebula. Other notable deep sky objects include: the Flame Nebula (NGC 2024), the Horsehead Nebula, M78 reflection nebula, and the planetary nebula NGC 2022. All images shown here were taken with a C-6 and an Atik Infinity CCD Camera; images were stacked.

<http://www.constellation-guide.com/constellation-list/orion-constellation/>

<https://en.wikipedia.org/wiki/Sh2-279>

<http://stars.astro.illinois.edu/sow/n2022.html>



Figure 11: The Constellation Orion. The location of various deep sky objects are shown. (Orion’s Sword has been enlarged and is shown in the inset.)



Figure 12. Orion Nebula: M42 and M43 are star nurseries separated by dust lanes. The bright area of M42 is the Trapezium Cluster.

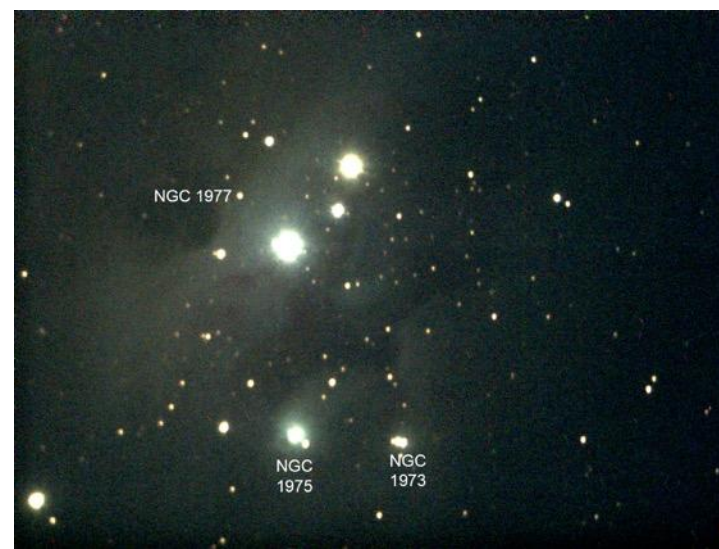


Figure 13. Sh2-279 (Running Man Nebula) is made up of NGC 1977, 1975, 1973; these are reflection nebulae. The dark regions within the nebula is what gives the Running Man Nebula its name.

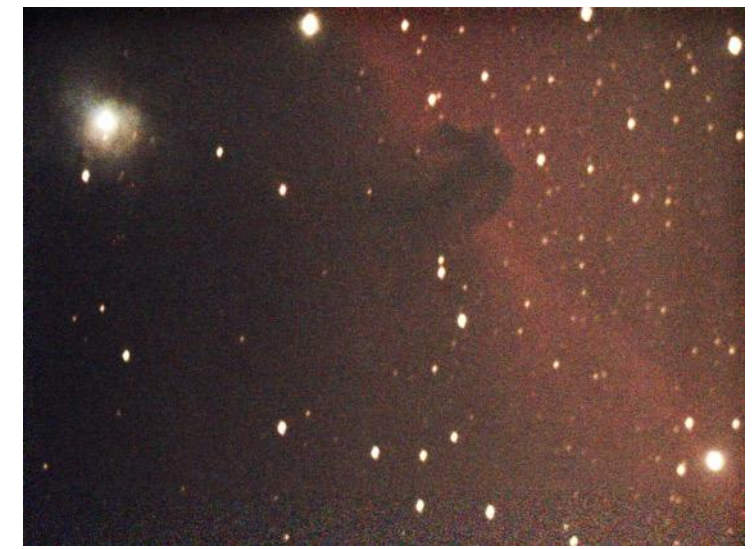


Figure 14. B33, the Horsehead Nebula is a dark nebula that is visually difficult to see. It is silhouetted against IC434, a bright emission nebula.



Figure 15. M78 is a bright diffuse reflection nebula. The two bright stars in center of the cloud illuminate the dust clouds of the nebula.



Figure 16: NGC 2022 is a 12th magnitude grayish planetary nebula. It is located in Orion’s western shoulder near the star Lambda Ori.



Figure 17. NGC 2024 is an emission nebula. Orion Belt star Alnitak (left edge of photo) emits energetic ultraviolet light into the Flame Nebula which excites the hydrogen gas of the nebula. Dust lanes bisect the nebula.

The **Orion Family of Constellations** lies on the opposite side of the sky from the Hercules Family. This grouping includes Orion, Canis Major, Canis Minor, Lepus, and Monoceros. These constellations draw from the Greek myth of the hunter (Orion) and his two dogs (Canis Major and Canis Minor) chasing the hare (Lepus). Donald Menzel (Harvard Observatory, 1975) added Monoceros (the Unicorn) to the Orion Family for completeness.

https://en.wikipedia.org/wiki/Constellation_family#Orion_Family

Included in this section is the constellation Puppis, a constellation of the southern hemisphere which lies near Sirius and Monoceros.



Figure 18. Star Chart showing the Orion Family of constellation with the locations of selected deep sky objects (DSOs). Included is the nearby constellation Puppis and its deep sky objects, M46 and M47. (Star chart generated in Stellarium with modifications)

Lepus (the Hare) is a constellation of the southern hemisphere that lies immediately south of Orion. The brightest stars are Arneb and Nihal. These can be used to star hop to the globular cluster M79. M79 lies about 42,000 light years from Earth and is one of the few globular clusters found away from the Milky Way's galactic center. It is thought to have been stolen from another nearby galaxy in the not too distant past; the nearby Canis Dwarf Galaxy is one such candidate.

<https://www.nasa.gov/feature/goddard/2017/messier-79>

Monoceros (the Unicorn) is a faint constellation of the northern hemisphere that lies on the celestial Equator. Monoceros contains the open cluster M50, also called the Heart Shaped Cluster. The other notable DSO is Hubble's Variable Nebula (NGC 2261). NGC 2261 is a comet-shaped reflection nebula that changes its brightness every few weeks (the gas and dust is lit by the star R Mon). It is named for Edwin Hubble who made early studies of it on the Hooker 100 inch Telescope on Mt. Wilson.

<http://www.constellation-guide.com/constellation-list/monoceros-constellation/>



Figure 19. M79 in Lepus (Image: C-8 and Atik Infinity camera w/ stacking)



Figure 20. M50 Open cluster in Monoceros. Image credit: Ole Nilsen

https://en.wikipedia.org/wiki/Messier_50#/media/File:M50a.jpg

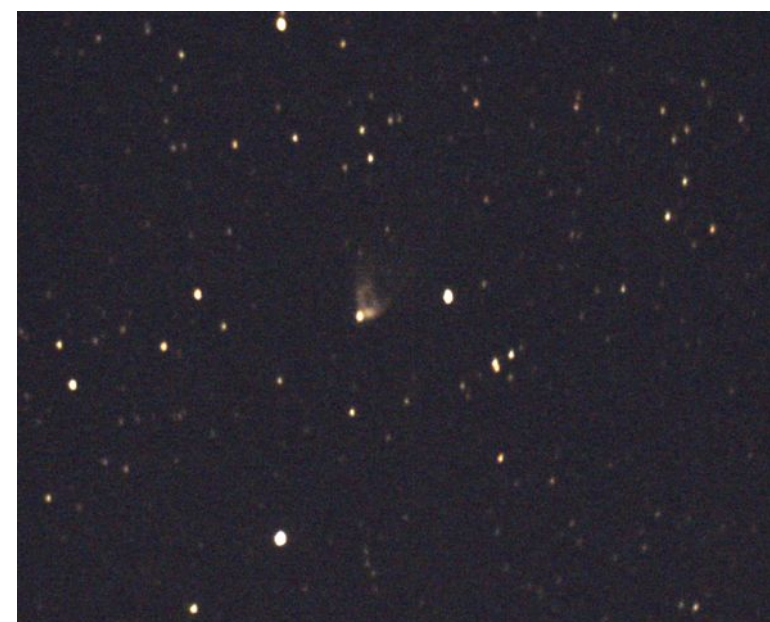


Figure 21. NGC 2261 Hubble's Variable Nebula in Monoceros. (Image: C-6, Atik Infinity camera w/ stacking.)

Canis Major (Greater Dog) is a constellation of the southern hemisphere. It contains the star Sirius, the brightest star in the night sky (magnitude -1.42). Sirius is a binary star with the brightest component being Sirius A, a main sequence "A" type star. Its companion is the white dwarf Sirius B. Canis Major contains the open cluster M41 (mag. 4.5), a cluster of about 100 stars. M41 is bright enough to be seen with binoculars or small telescope. Another notable cluster is NGC 2362 which contains at its center the eclipsing binary star Tau Canis Major. Tau Canis Major is an O-type supergiant and is classified as a beta-Lyrae variable star.
<http://www.constellation-guide.com/constellation-list/canis-major-constellation/>

Canis Minor (Lesser Dog) is a constellation of the northern skies. The constellation is recognized by its two brightest stars: Procyon (mag. 0.34) and Gomeisa (mag. 2.9). Canis Minor contains several faint deep sky objects; these are considered to be too difficult to see telescopically.
<http://www.constellation-guide.com/constellation-list/canis-minor-constellation/>

Puppis (The Stern) constellation is located in the skies of the southern hemisphere, and although it is not part of the Orion Family of constellation, it is located near Sirius and Monoceros. Puppis represents the stern of a ship and was once part of the large ship constellation Argo Navis; this large constellation was subdivided into Puppis, Carina, and Vela. Puppis contains the Messier open clusters M46, M47, and M93. M46 and M47 are large clusters that lie about a degree apart and can be seen in the same field of view with binoculars or with a small telescope. M46 is particularly interesting because it contains the planetary nebula NGC 2438 at its northern edge.
<http://www.constellation-guide.com/constellation-list/puppis-constellation/>
<https://freestarcharts.com/messier-46>

Note: All images taken with the Atik Infintiy camera shown in this article were imaged by the author.



Figure 22. M41 in Canis Major. (Image credit: NOAO/AURA/NSF).



Figure 23. NGC 2362 (Tau Canis Major Cluster). (Image: C-6, Atik Infinity camera w/stacking).



Figure 24. M46 open cluster in Puppis. The planetary nebula NGC 2438 can be seen towards the top (north) of the image. (Image: C-6, Atik Infinity camera w/ stacking).



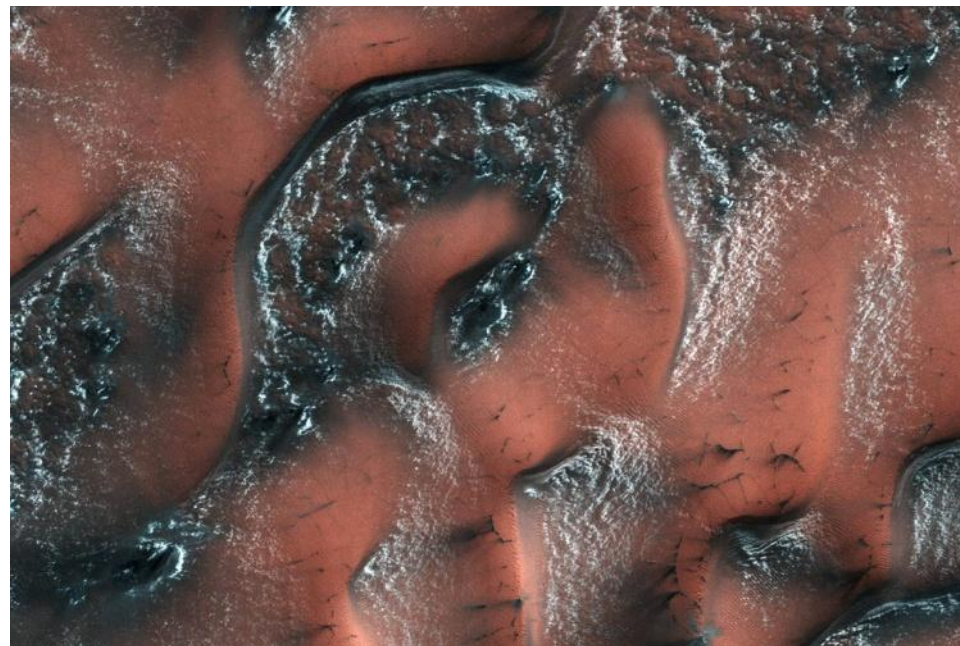
Snowy Worlds Beyond Earth

By Linda Hermans-Killiam

There are many places on Earth where it snows, but did you know it snows on other worlds, too? Here are just a few of the places where you might find snow beyond Earth:

Mars

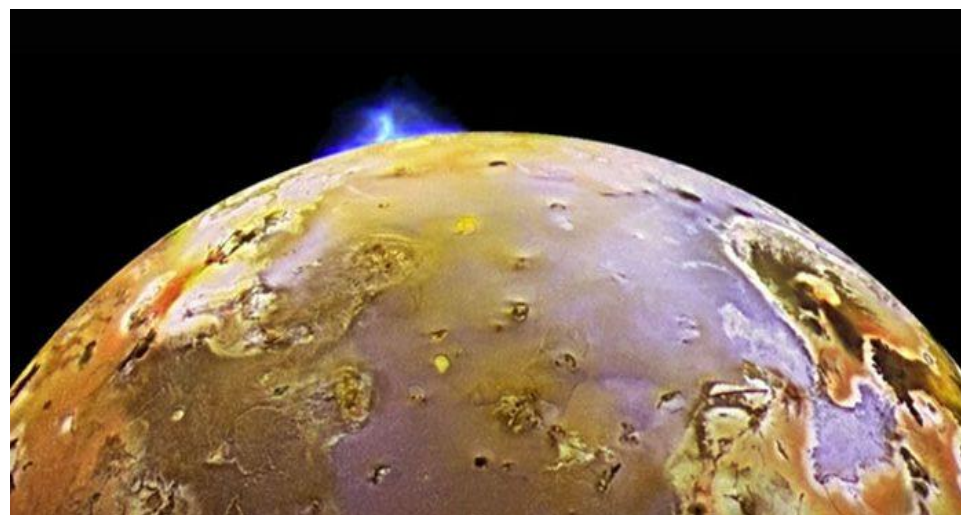
The north pole and south pole of Mars have ice caps that grow and shrink with the seasons. These ice caps are made mainly of water ice—the same kind of ice you’d find on Earth. However, the snow that falls there is made of carbon dioxide—the same ingredient used to make dry ice here on Earth. Carbon dioxide is in the Martian atmosphere and it freezes and falls to the surface of the planet as snow. In 2017, NASA's Mars Reconnaissance Orbiter took photos of the sand dunes around Mars' north pole. The slopes of these dunes were covered with carbon dioxide snow and ice.



NASA's Mars Reconnaissance Orbiter captured this image of carbon dioxide snow covering dunes on Mars. Credit: NASA/JPL/University of Arizona

A Moon of Jupiter: Io

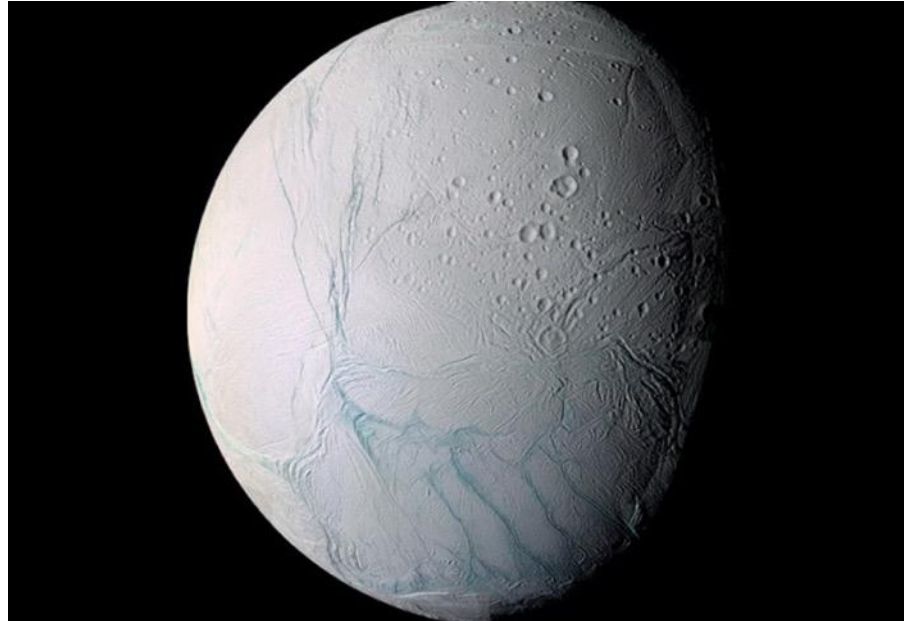
There are dozens of moons that orbit Jupiter and one of them, called Io, has snowflakes made out of sulfur. In 2001, NASA's Galileo spacecraft detected these sulfur snowflakes just above Io's south pole. The sulfur shoots into space from a volcano on Io's surface. In space, the sulfur quickly freezes to form snowflakes that fall back down to the surface.



A volcano shooting molten sulfur out from the surface of Io. Credit: NASA/JPL-Caltech

A Moon of Saturn: Enceladus

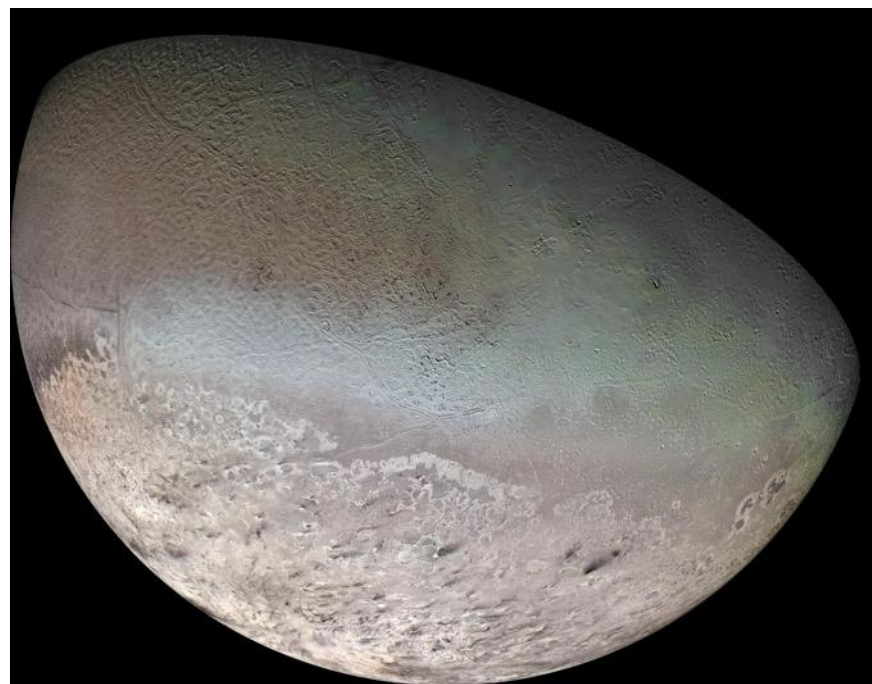
Saturn's moon, Enceladus, has geysers that shoot water vapor out into space. There it freezes and falls back to the surface as snow. Some of the ice also escapes Enceladus to become part of Saturn's rings. The water vapor comes from a heated ocean which lies beneath the moon's icy surface. (Jupiter's moon Europa is also an icy world with a liquid ocean below the frozen surface.) All of this ice and snow make Enceladus one of the brightest objects in our solar system.



Enceladus as viewed from NASA's Cassini spacecraft. Credit: NASA

A Moon of Neptune: Triton

Neptune's largest moon is Triton. It has the coldest surface known in our solar system. Triton's atmosphere is made up mainly of nitrogen. This nitrogen freezes onto its surface covering Triton with ice made of frozen nitrogen. Triton also has geysers like Enceladus, though they are smaller and made of nitrogen rather than water.



Triton as viewed from NASA's Voyager spacecraft. Credit: NASA

Remembering John Glenn

By Grace Wheeler

When John Glenn passed away a year ago, Susie Christian and I knew we wanted to honor his memory. After six months of discussion and drafts of artwork, we came up with a storyline that captures what John Glenn meant to us. Thinking of John Glenn brought back many childhood memories as we both remember the excitement of the Mercury, Gemini, and Apollo programs. Watching the rocket launches on T.V., and later witnessing the moon landings no doubt inspired a life long interest in astronomy and space exploration. As a kid, I was a space nut who spent many nights looking at the moon through binoculars or staring out at the stars and wondering what was out there. That sense of wondering would replay itself years later when I purchased my first telescope (only 48 years later) and would stay out all night perusing the sky. I feel fortunate to have "rediscovered" this love for astronomy and that I have the opportunity to share it.

Tonight on the near one-year anniversary of John Glenn's passing, I'll be up at Kneeland with the club for our December Star Party. We will be taking in the sights through telescopes and watching for "falling stars" coming from the Geminids meteor shower. On this clear December evening, I'll be remembering John Glenn and the Mercury, Gemini, and Apollo astronauts who inspired us children of the 50's, 60's, and 70's to wonder and explore.

Heavenly Bodies

by Susie Christian

