



DECEMBER 2019

NIGHTFALL

A PUBLICATION OF THE HUACHUCA ASTRONOMY CLUB

PRESIDENT'S NOTES

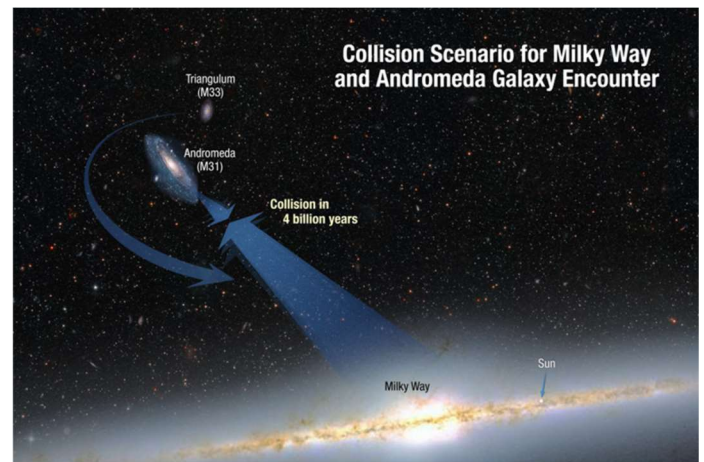
Hey, it's December, well almost, as I write this article. There is snow on the mountain tops from the first winter storm and a chilly dampness is nipping at the yard bunnies. But the sky is clearing, Happy Holidays to all. No wait, there's another band of clouds coming; still I mean it about Happy Holidays.

At the November HAC general meeting the board members were reinstated for another year, apart from VP. Bill Howard will take a time-out to restore his health, and so Dwight Hoxie, Cochise College's Astronomy teacher and relatively new HAC member, has been gracious enough to take that spot. Thanks, Dwight.

While I'm on this subject, please think about becoming a HAC board member next year, as several present board members have stayed on this year only because of loyalty to the club, and as for the rest of us, we've had a good run but would welcome a change. Only the treasurer position is in anyway challenging. But hey, people throw money at you, can that ever get old? There is very little time consumption for the at-large positions. A couple of in-person meetings a year and a running dialog during the rest of the time. You all know I just blab for a few minutes every meeting and flip through some slides; easy-peasy. The VP position is commonly tasked with getting the speakers, but there is flexibility and other board members are here to help. The current board has raised membership and built a nice bank account so you will not be starting from scratch.

Speaking of spending money, this year's Christmas Party is a potluck at our usual general meeting time (December 13, 7pm) but at the Patterson Observatory classroom. We will have wine generously donated by Rune Winery as a thank you for giving their Wine Club a little Astro-entertainment. In the past we have constricted your gastronomic gamesmanship; but not this year, knock yourselves out. The club will get a couple of main dishes and some drinks as well as (did I mention the wine?). Sign up today!

FRIENDS COMING OVER FOR A VISIT



Source: NASA; Z. Levay and R. van der Marel, STScI; T. Hallas; and A. Mellinger

If the sky clears during December and you dare to venture out at night and look up, try looking somewhere other than Orion and Taurus; say, Andromeda and Triangulum. You can do it, with a little will power. Each of these constellations has a bright (relatively bright) object that gets at least one of its common names from its respective constellation. Looking nearly straight up and northward are two galaxies at or near naked-eye brightness. If you see one or both of them with just your unaided eyes, well that's probably going to be your eyeball distance record unless we get a way far [technical term] super nova. The Andromeda Galaxy is spiral galaxy about 2.5 million light-years away from Earth and is a little larger than the Milky Way (at 220,000 light years across), and it is the largest galaxy in our local group. The other is the Triangulum Galaxy. This is a spiral galaxy smaller than the Milky Way, making it the third largest member of our local group (at about 60,000 light years in diameter), and is 2.73 million light-years away. It may be hard to determine but those two and the few satellite galaxies that orbit them are barreling towards us faster than a fully loaded freight train coming off of Tehachapi Pass. I mean it, they're moving fast. What do

you mean that's not fast in astronomical terms? Ok, how about a tricked-out Toyota, throttled full on a downhill freeway entrance? You're not buying that either? Would you believe, the local motion of Andromeda happens to be about 250,000 mph towards us? Well that's for Andromeda (M31), the Triangulum Galaxy (the Pinwheel or M33) is moving diagonally, not so directly towards us.

The physical collision between our Milky Way and Andromeda should occur some 4 billion years from now, although our gravity wells may already be touching. The pool table action of the Triangulum Galaxy isn't known for certain. Maybe it will be ripped apart and engulfed by the Andromeda Galaxy before it reaches us, or it might take part in the collision between the Milky Way and Andromeda galaxies. There is even a possibility the Pinwheel is ejected from the Local Group.

Whether or not you can see them, it is time to aim a pair of binoculars or a finder scope at one of them. Andromeda will show as a bright oval patch in binoculars. Even in a small telescope you will see that the galaxy is tilted; we see it not edge on and not face on. The oval will show center brightening and maybe a line of dimming along one of the long sides -- that is a dust lane. Also, you may see a small blob of light (much like a globular cluster), but it is a smaller version of Andromeda seemingly embedded in the galaxy. That is M32, a satellite galaxy orbiting Andromeda. In an 8" or larger telescope Andromeda's other bright satellite galaxy, M110, can be seen opposite Andromeda's core. M110 is far enough away from Andromeda's glow that it can be seen as an individual galaxy. Those with large telescopes should be very familiar with M110.

Triangulum to us is face on, we are looking through it as if from above looking down, and this makes the galaxy seem more diffuse and the harder of the two to see in any *optifier* (my newly coined term, meaning any optical magnifier). In small telescopes M33 can still be hard to pick out, even in dark clear skies. In larger scopes it looks like several separate clumps of brightness, the core is sort of feeble, and other clumps are actually contained within its multiple arms. Several of these separate clumps are also given separate NGC numbers, vestiges of a time when we did not understand the real structure of what were then thought to be nebulae and are now known to be galaxies. Think of these two as test beds for observing all other galaxies, those that are much further and much dimmer.

Anyway, as these galaxies are coming to visit in a few billion years, we should get to know the neighbors. Cool stuff for cool nights.

Now, hopefully we can all get out there and stare.

WELCOME OUR NEW MEMBERS

David Butz of Sierra Vista joined in November. He is a pilot here for training at Ft. Huachuca. John and Carissa Gonzales of Sierra Vista are our newest family membership.

Welcome! We are glad you joined.

DECEMBER HOLIDAY PARTY

There will not be a regular meeting this month. Instead we'll convene at the Patterson Observatory for a potluck dinner and holiday get together on our scheduled meeting night, Friday Dec 13. Please RSVP to David Roemer and let him know what you plan to bring.

2020 DUES

Please don't forget to pay your 2020 HAC dues if you haven't already. Most HAC memberships expire each December, so unless you joined in 2019, your membership dues are probably due this month. Thank you to all of you that have already renewed.

You may pay your dues at the holiday party, by cash or check (see the treasurer, Ted Forte). Make checks payable to Huachuca Astronomy Club. You can send your check to PO Box 922 Sierra Vista, 85636 or you can pay on-line by visiting the website (www.hacastronomy.org) and pulling down the membership menu. You can use your Pay Pal account or your credit card.

If you are not sure of your membership expiration date, just contact Ted Forte (tedforte511@gmail.com or 757-472-4344) to check the roster.

Regular (individual) dues are \$25 (\$20 military and \$10 student) and a family membership is \$35 (\$25 military).

OUR NEXT MEETING

The next regular meeting of the Huachuca Astronomy Club will be held in the community room, Student Union building, at Cochise College (901 N. Colombo Avenue) at 7 pm on Friday, January 10, 2020. Our speaker is Dr. Dennis Zaritsky.

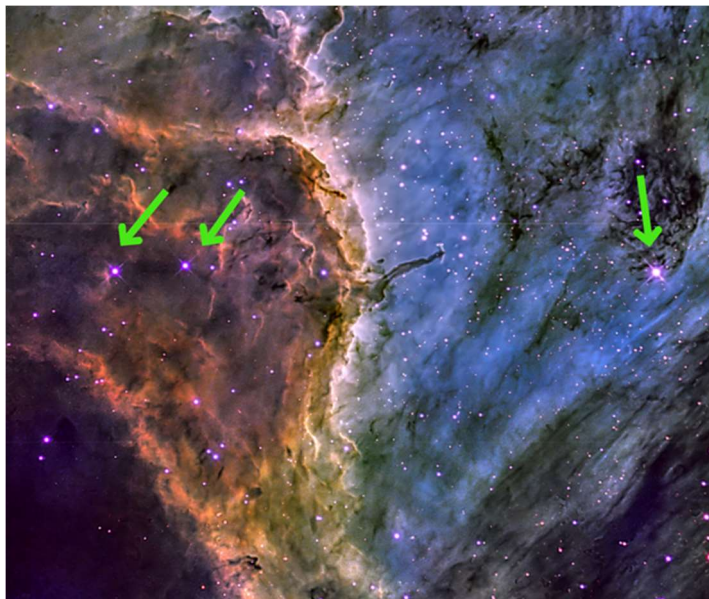
2020 BOARD OF DIRECTORS

The 2020 board was confirmed at the November meeting and will consist of David Roemer (President), Dwight Hoxie (Vice President), Bert Kelher (Secretary), Ted Forte (Treasurer) and members at large: Howard Day, Ken Duncan, Gary Grue, and Ken Kirchner. Bill Howard will remain on the board as "Past (Vice) President" since we don't have a current "Past President".

2020 SCHEDULE

HAC meetings are scheduled for the Friday nearest the full moon (when possible) and are held in the community room of the Student Union building at Cochise College unless otherwise indicated. The 2020 meeting dates are January 10, February 7 (in Patterson Obs.), March 6 (Cochise College Library), April 10 (Cochise College Library), May 8, June 5, July 10, August 7, September 4, October 2, November 6, and December 4.

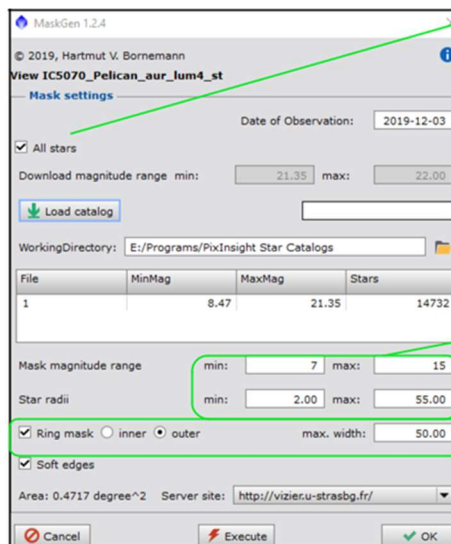
REDUCING MAGENTA STAR HALOS FROM NARROWBAND IMAGES BY ALEX WORONOW



We start with this image of the Pelican Nebula shot in SHO (narrowband) and fully processed in PixInsight using basic tools, with no attempt to control the magenta halos around the stars. Those halos, while a natural result of the narrowband imaging, are quite distracting. We will undertake to ameliorate those halos, and some of the general magenta coloring of the stars themselves.

We begin by installing a PixInsight script call MaskGen, which can be downloaded from http://www.skypixels.at/pixinsight_scripts.html Next, we 'plate-solve' the image so that its coordinates are known. This can be done with the script 'ImageSolver' or with the process 'PhotometricColorCalibration,' (Uncheck the 'Apply Color Calibration' option, if desired).

Now we invoke MaskGen. (More about MaskGen can be found [here](#).)



If you have the internet speed, elect to download all stars

Set the star magnitude limits and range of sizes here. (Trial and error)

And make a ring mask with some appropriate max width. (Trial and error!)

This gives us a mask of donuts that we can use to reveal just the star halos for further processing.



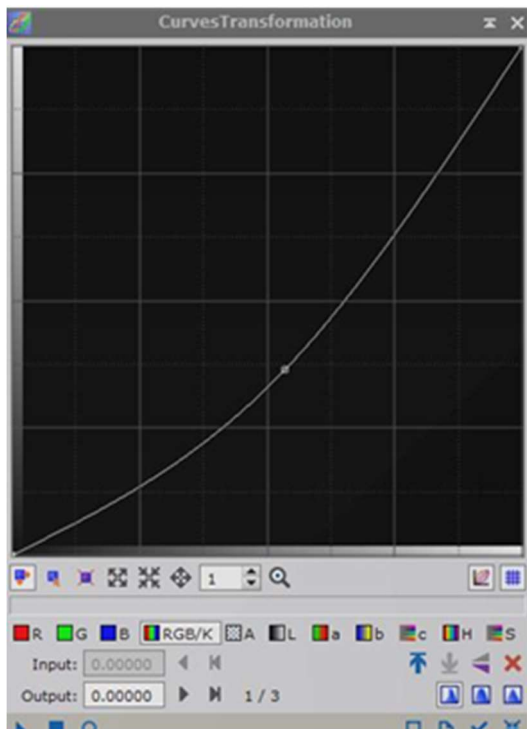
Then we use the 'Convolution' procedure to blur the donuts. Here I used a setting for the Standard Deviation = 7.6. This donut mask is applied to the image shown above. Now everything in the image is pretty much concealed except the star halos.



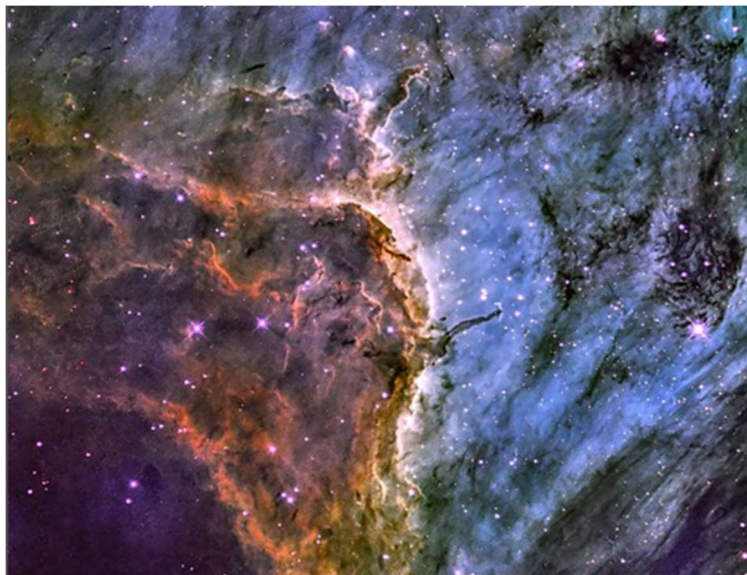
Then apply two procedures to subdue the halos and remove some of the stars' discoloration.

1) Using the Saturation adjustment, first increase its range of operation to something like 5 or so. This is done by increasing the value in the 'Range' spin box below the center of the main view. Then move the entire line down by clicking the dot at the right end of the horizontal line and dragging. Drag the line down enough to remove most (or all) of the magenta hue.

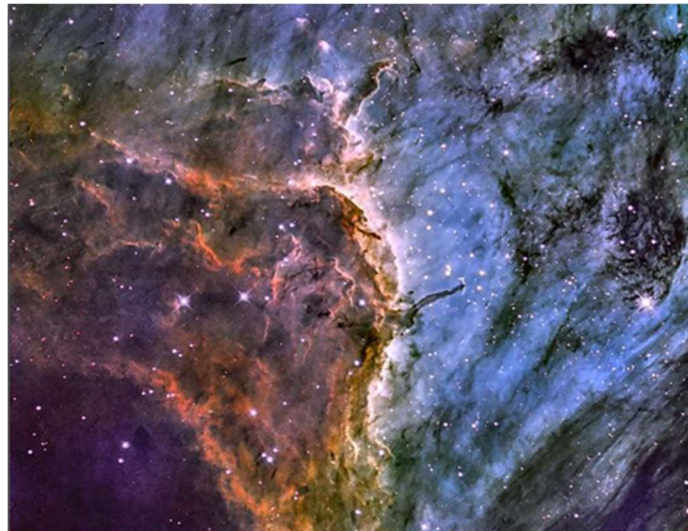
2) Next, decrease the luminosity of the image halos--through the mask, of course. I use the Curve's transform: Something akin to what's shown below



And this...



Becomes this...



NASA NIGHT SKY NOTES DECEMBER 2019

This article is distributed by NASA Night Sky Network

The Night Sky Network program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit nightsky.jpl.nasa.org to find local clubs, events, and more!

THE ORION NEBULA: WINDOW INTO A STELLAR NURSERY

BY DAVID PROSPER

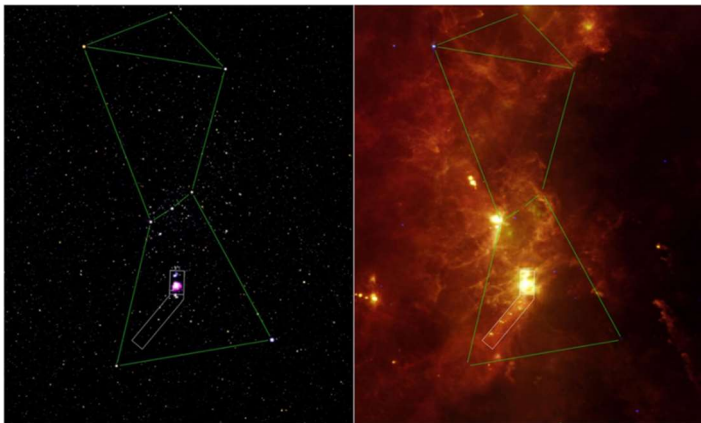
Winter begins in December for observers in the Northern Hemisphere, bringing cold nights and the return of one of the most famous constellations to our early evening skies: Orion the Hunter!

Orion is a striking pattern of stars and is one of the few constellations whose pattern is repeated almost unchanged in the star stories of cultures around the world. Below the three bright stars of Orion's Belt lies his sword, where you can find the famous Orion Nebula, also known as M42. The nebula is visible to our unaided eyes in even moderately light-polluted skies as a fuzzy "star" in the middle of Orion's Sword. M42 is about 20 light years across, which helps with its visibility since it's roughly 1,344 light years away! Baby stars, including the famous "Trapezium" cluster, are found inside the nebula's whirling gas clouds. These gas clouds also hide "protostars" from view: objects in the process of becoming stars, but that have not yet achieved fusion at their core.

The Orion Nebula is a small window into a vastly larger area of star formation centered around the constellation of Orion itself. NASA's Great Observatories, space telescopes like Hubble, Spitzer, Compton, and Chandra, studied this area in wavelengths we can't see with our earthbound eyes, revealing the entire constellation alight with star birth, not just the comparatively tiny area of the nebula. Why then can we only see the nebula? M42 contains hot young stars whose stellar winds blew away their cocoons of gas after their "birth," the moment when they begin to fuse hydrogen into helium. Those gas clouds, which block visible light, were cleared away just enough to give us a peek inside at these young stars. The rest of the complex remains hidden to human eyes, but not to advanced space-based telescopes.

We put telescopes in orbit to get above the interference of our atmosphere, which absorbs many wavelengths of light. Infrared space telescopes, such as Spitzer and the upcoming James Webb Space Telescope, detect longer wavelengths of light that allow them to see through the dust clouds in Orion, revealing hidden stars and cloud structures. It's similar to the infrared goggles firefighters wear to see through smoke from burning buildings and wildfires.

Learn more about how astronomers combine observations made at different wavelengths with the Night Sky Network activity, "The Universe in a Different Light," downloadable from bit.ly/different-light-nsn. You can find more stunning science and images from NASA's Great Observatories at nasa.gov.



Caption: This image from NASA's Spitzer missions shows Orion in a different light – quite literally! Note the small outline of the Orion Nebula region in the visible light image on the left, versus the massive amount of activity shown in the infrared image of the same region on the right. Image Credit: NASA/JPL-Caltech/IRAS /H. McCallon. From bit.ly/SpitzerOrion

WANT ADS

FOR SALE: A nearly unused ZWO 1600 with CFW and filters, and an ASA 12" Astrograph

Contact Mike Mirot

FOR SALE: Nikon camera gear and lenses

Nikon D750 w/24-120 lens, five batteries, stock charger, Nikon mc-dc-2 remote cable release, box, manual, lens and body caps \$1500

Nikon 80-400 zoom, lens caps, soft case \$1275

Nikon 70-200 f/4, lens caps \$900

Nikon 50mm f/1.8 G, 85mm f/1.8 G, lens caps \$385 set

Tamron 15-30, lens caps, \$775

Nikon D7200, Nikon 18-140 lens, Nikon 18-300 lens, Nikon mc-dc-2 cable release, two batteries, stock charger, manual, \$1100 as a set

Contact Mike J. Shade at mshade@q.com

CLUB OFFICERS AND CONTACTS

President: David Roemer

Vice President: Dwight Hoxie

Secretary: Bert Kelher

Treasurer: Ted Forte

Past Vice President: Bill Howard

Board Members-at-Large

Howard Day

Ken Duncan

Gary Grue

Ken Kirchner

Nightfall Editor: Cindy Lund cindy.jean.lund@gmail.com

Webmaster: Ken Kirchner

Facebook Editors: Bert Kelher

Website: <http://www.hacastronomy.org>

Facebook: <http://www.facebook.com/HuachucaAstronomyClub>

Email: info@hacastronomy.org

PLEASE SUPPORT OUR SPONSORS

Our sponsors have been keeping us supplied in door prizes for some years. If you have not contacted them lately, please consider this. They have a lot of great astronomical products that we all need.

For more information on products and contact information, their websites are:

Farpoint Astronomy

<http://www.farpointastro.com/>

Starizona

<http://starizona.com/>

HAC Dec/Jan Calendar of Events

SU	MO	TU	WE	TH	FR	SA
Dec 8	9	10 Venus/Saturn 1.8° apart	11  10:12 PM	12	13 HAC Holiday Party at the Patterson Geminid meteors	14 Geminid meteors
15 Geminid meteors	16	17 Youth Group at Patterson and Cocoa w/Santa In the Gardens	18  9:57 PM	19 Patterson Public Night 6PM	20	21 Winter Solstice 9:19 PM
22	23	24 CHRISTMAS EVE 	25  10:13 PM 	26	27	28
29	30	31 	Jan 1 2020 	2  9:45 PM Patterson Public Night 6 PM	3	4
5	6	7	8	9 School Visit to Patterson 9:30 AM	10  12:21 PM Hac Meeting Student Union	11
12	13	14	15	16	17  5:58 AM	18
19	20	21	22	23	24  2:42 PM	25
26	27	28	29	30 Patterson Public Night 6:30 PM	31 	

WISHING HAC A HAPPY AND HEALTHY NEW YEAR IN 2020

All event times MST. Join [HacAstro](#) to keep up to date with all of the Huachuca Astronomy Club events
Send an email to: HACastro+subscribe@groups.io