

The High Desert Observer

January 2018

The Astronomical Society of Las Cruces (ASLC) is dedicated to expanding public awareness and understanding of the wonders of the universe. ASLC holds frequent observing sessions and star parties and provides opportunities to work on Society and public educational projects. Members receive the *High Desert Observer*, our monthly newsletter, plus membership to the Astronomical League, including their quarterly publication, *Reflector*, in digital or paper format.

Individual Dues are \$30.00 per year

Family Dues are \$36.00 per year

Student (full-time) Dues are \$24.00

Annual dues are payable in January. Prorated dues are available for new members. Dues are payable to ASLC with an application form or note to: Treasurer ASLC, PO Box 921, Las Cruces, NM 88004. Contact our Treasurer, Patricia Conley (treasurer@aslc-nm.org) for further information.

ASLC members receive electronic delivery of the HDO and are entitled to a \$5.00 (per year) Sky and Telescope magazine discount.



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Outreach: Chuck Sterling; csterlin@zianet.com

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HDO Editor: Charles Turner; turner@milkywayimages.com

Masthead Image: February 10, 2017 From Las Cruces, Moon rising over the Organ Mts in Penumbral Eclipse.

January Meeting --

Our next meeting will be on **Friday, January 26**, at the Good Samaritan Society, Creative Arts Room at 7:00 p.m.

The speaker will be Chris Brownell and the topic will be Astronomy from the Mimbres Valley.

Member Info Changes

All members need to keep the Society informed of changes to their basic information, such as name, address, phone number, or email address. Please contact Treasurer@aslc-nm.org with any updates.

Events

ASLC hosts deep-sky viewing and imaging at our dark sky location in Upham. We also have public in-town observing sessions at both the International Delights Cafe (1245 El Paseo) and at Tombaugh Observatory (on the NMSU Campus). All sessions begin at dusk.

At our Leasburg Dam State Park Observatory, we hold monthly star parties. Located just 20 miles north of Las Cruces, our 16" Meade telescope is used to observe under rather dark skies. Please see *Calendar of Events* for specific dates and times.

What's Up ASLC?

January 2018



First, I'd like to wish everyone Happy New Year! Secondly, I want to congratulate the ASLC membership on our successful year. We did lots of outreach, had great presentations for our monthly meetings, were represented at major star parties, and our after-meeting happy hour was nicely populated. Moreover, financial adjustments were made to reduce our outgoing expenditures, and the club's bottom line enjoyed a very welcomed boost via two generous donations. I'm also pleased to report that we picked up several new members in 2017. It was really a great year! So, let's keep this momentum in high gear.

We already have several volunteers for our monthly presentations in 2018, but we need more. If you'd like to do a presentation this year, please feel free to contact me, and I'll get you scheduled. We also need volunteers for our ongoing outreach programs. This club activity is a great way for new members to get acquainted with the seasoned members of the Society. Another benefit of outreach participation for newbies is training and advice on various types of astronomy equipment. If outreach has no appeal for you, please join us for our post-meeting refreshments at the Pecan Grill where the conversation is always lively. Star parties are yet another way to get to know ASLC members.

During the week of May 06 to 13, for example, I'm heading back to Fort Davis for my sixteenth Texas Star Party. If anyone's interested in attending the TSP this year, you need to go ahead and let them know since they use a lotto system for registration. If a large crowd is not your game, we'll have small groups of members at the Cosmic Campground and Rusty's RV Park during the same time frame as TSP. Then in October, a small group of ASLC members will be heading back to the Okie-Tex Star Party in Kenton, Oklahoma. It's going to be another FUN year of amateur astronomy.

Since it's January, it's time to pay dues again, so we'd really appreciate everyone's continued support and participation. Club dues help pay our ongoing annual expenses, e.g., webpage fees, safety-deposit box, post office box, liability insurance, and so on. Our insurance allows us to do outreach for school groups and the local community in general. So, by joining the Society, you're also making an investment in our mission to share the universe with interested residents in southern New Mexico. Our club was started in 1951, and the passion of our membership is the reason we're still here today. I hope to see everyone at the January meeting, and I thank you for your enthusiasm.

Howard Brewington
ASLC President
January 2018

* * *

Outreach

Outreach is a very important part of ASLC. We are always looking for more volunteers to help us educate the public. Even if you do not have a portable telescope to bring to the events, please consider attending our public outreach programs to help answer questions, share knowledge and point out objects in the sky.

Outreach Events
2017 Year-End Report
 by Jerry McMahan

Award, Saturday, October 28, 2017

I didn't get this in the previous month. Before the Moongaze that night, one of our members, Moe Azzolini, was presented an award as a 2017 Distinguished Alumni from the Dona Ana Community College. He received an Associate of Arts degree in 2014. He has since gained a degree from New Mexico State University and a Master's in Social Work from the University of Southern California.

Congratulations Moe.

Red Hawk Golf, Wednesday, November 8

I did not personally accomplish much due to not being able to find the venue. I finally called Chuck Sterling and he lead me to the observing session. By this time it was dark and I had trouble setting up the ETX 125. Trish Conley helped me with the set up so I was eventually able to get in about 20 minutes at the scope.

Others had a much more productive experience. Rich Richins had his 16 inch Dobsonian. Sid Webb brought his 10 inch Dobsonian. Chuck Sterling set up his 4 inch refractor. Ed Montes participated with his refractor and announced that he was going to Africa for outreach events at a hotel.

I know I am not listing everyone, but it was dark! It was a good dark, clear sky, but the humidity was very high. Water covered my scope.

Desert Christian School, Friday, November 10

First a disclaimer, or two. We had a lot of participation from new members, so I apologize if I forget who attended, or misspell a name. I will learn everyone eventually. After all, I did learn Chuck Sterling's name in less than 50 years.

This was a very busy and successful event. Chuck Sterling had his refractor, I had the ETX 125, Howard Brewington set up his 8 inch Dobsonian and Brent Emmanuel brought his 10 inch Meade LX 200 Classic. Brent also brought his son, who attends the school.

Chuck found Saturn, low in the sky. I had Alberio. The Andromeda galaxy and the Pleiades's among other targets observed.

Leasburg, Saturday, November 11

Members Mike Kopezewski, Howard Brewington, Chuck Sterling, Rich Richins, Sid Webb and Jerry McMahan participated. Chuck and Howard were in the observatory and Rich set up his 16 inch Dobsonian. I joined him out on the grass, with the ETX 125.

This marked the end of a busy week. The weather was good and the event included an Astronomy class from the Community College (I think).

Tombaugh Observatory, Friday, November 17

This event was near New Moon, so it could have been good for a few deep sky objects. Could have been except for the clouds. Steve Shaffer and I were in the South dome with the 12.5 inch scope. Vega was sometimes visible, so Steve pointed the scope at that star tried to get the nearby Ring Nebula. The clouds never cleared enough to see that faint object, but Steve made a valiant effort. The Astronomy Department had trouble finding stars to align the goto scopes. They finally were able to align and did get a couple of deep sky objects. No luck for Saturn however.

Moongaze, Saturday November 25

We may have set a record for the number of club members that made an appearance, even though some of the regulars were not present. Most were new members. I set up the ETX, Chuck had his refractor, Brent Emanuel brought his 10 inch LX 200 and Steve Shaffer used his 4.5 inch Dobsonian.

Stephen Wood, Mike Kopezewski, Steve Barkes, Trish Conley attended. Roseann Baca, Vita and Orme brought their guest, Dolores Lara. Chuck did get Saturn early. The "Lunar X" was visible on the Moon. It was a pretty good night.

Tombaugh Observatory, Friday, December 8

A cold night and college finals week resulted in a low turnout (37 by Steve's count). Steve and I had limited objects, near new Moon, mostly because it was very difficult to move the scope due to position and cold weather. We just left the scope pointed at Vega.

Leasburg, Saturday, December 9

This was an evening of scope problems. I could not get the ETX 125 to work. I don't know if it was the cold and humidity, or operator incompetence. Chuck set up his 4 inch refractor. Sid Webb, Bob Armstrong, Howard Brewington and Mike Koczewski were at the observatory.

There was a problem with the 16 inch scope in the observatory. Chuck was called over to help with the problem. This left me with something to do since the refractor was on the Pleiades, so I took it over. The 16 inch problem was resolved. The ETX got the night off.

One girl actually knew the classification system for stellar temperatures. That is pretty unusual.

Moongaze, Saturday, December 23

Chuck Sterling, Howard Brewington and I attended the last event of the year. It did not look good due to clouds. I had set up the ETX 125, but the Moon could not be seen. One man and his son wanted to look, but I pointed to the clouds and explained that we could not see anything. I continued to look for the Moon with no success. Five minutes later I looked up and it was completely clear. I have never seen it clear that fast. Chuck set up his refractor so we did observe the Moon and the Pleiades.

Since college classes were out for the holidays, we did not have many observers. The three of us spent most of the time discussing politics. No arguments. We agree with each other on about everything. You know the saying about great minds.

Summary

I think we had a pretty good year as a club. Outreach went well, but for the second straight year we had fewer hours of outreach time. Part was due to bad weather, but we had fewer school setups this year. Many of the schools that did ask for telescopes were private and church schools. I am guessing that budget cut backs resulted in fewer requests from public schools. Chuck agrees.

* * *

Calendar of Events (Mountain Time - 24 hr. clock)

Jan	01	17:13	Sun Sets
	01	19:25	Full Moon
	06	17:00	OUTREACH; Dark Sky Observing at Leesburg Dam State Park
	08	15:26	Last Quarter Moon
	16	19:18	New Moon
	18	17:00	OUTREACH; Star Party for Tombaugh Elementary School
	24	15:20	First Quarter Moon
	25	17:30	OUTREACH; Columbia Elementary School Star Party, 5:30 - 7:00 pm
	26	19:00	OUTREACH; Tombaugh Observatory open at NMSU
	26	19:00	ASLC Monthly Meeting; Good Samaritan Society, Activities Meeting Room
	27	17:00	OUTREACH; MoonGaze, International Delights Café
	31	06:28	Full Moon, the second one this month! and a Lunar Eclipse
Feb	01	17:41	Sun Sets
	07	08:54	Last Quarter Moon
	10	17:45	OUTREACH; Dark Sky Observing at Leesburg Dam State Park
	15	14:06	New Moon
	15	17:30	Desert Hills Elementary School Star Party
	23	01:09	First Quarter Moon
	23	19:00	ASLC Monthly Meeting; Good Samaritan Society, Activities Meeting Room
	23	20:00	OUTREACH; Tombaugh Observatory open at NMSU
	24	18:00	OUTREACH; MoonGaze, International Delights Café

Be sure to visit our web site for ASLC information: www.aslc-nm.org

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Announcements

1. The program for the January meeting will be a presentation by Chris Brownell on the Astronomy from the Mimbres Valley.
2. January is the time to pay your dues. Many members pay at the January meeting. You can also view and download information at our website: www.aslc-nm.org Check out the first page of this HDO for rates and instructions for mailing your dues.
3. The agreement to use the facilities at Good Sam for our meeting prohibits members from bringing in ANY food or beverages, except water in a container with a screw lid. Take note: no more Starbucks or Saturn Cookies!
4. Don't forget there is a Lunar Eclipse on Wednesday, 31 January 2018. This one is early in the morning, just before sunrise, so set your clocks and get everything ready the night before. You do not need a telescope because this is a great naked eye event. You need to be comfortable, so dress warmly, a comfy chair, and a way to brace your arms if you use binoculars. You will need a good, flat western horizon because the show is low in the west. First contact is about 03:53 and the shadow will begin to cut into the Moon from the upper left and the Moon's elevation is only about 26°. The umbra or darker part of the shadow will begin moving onto the Moon about 04:50 when the Moon's elevation is about 16° and will last until moonset, about 07:02. Lunar eclipses are unpredictable in appearance, but often there are reddish or pinkish colors on the Moon. Sunrise is at 07:02, so expect the brightening sky to wash out the shadows and colors before the Moon sets. If you are going to photograph the eclipse, get your shots in early! Everybody enjoy and send in some photos for the HDO next month.

5. One of our members has published a book. It is not exactly about astronomy, but since he is an amateur astronomer, there are some pertinent discussions. John Giliison is the author of "Driving on the Moon.: If you are curious, it is available on Amazon. It is a collection of blogs about electric vehicles. Check it out.

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Meeting Minutes
ASLC Monthly Meeting
November 2017 Minutes

Show & Tell:

No topics were offered for discussion.

Call to Order:

Howard Brewington, President, Astronomical Society of Las Cruces (ASLC, the Society), called the November 2017 business meeting to order at 7:13 pm, 17 November 2017, Creative Arts Room, Good Samaritan Society Las Cruces Village, 3011 Buena Vida Circle, Las Cruces, New Mexico. President's Comments:

President's Comments:

Howard Brewington, President, welcomed the group to tonight's meeting, which was being held on the third rather than the fourth Friday of the month to not conflict with the Thanksgiving holiday. There were several guests present. Mike and Denise Whelan have moved to the area from Connecticut. Vita Montano, Stacia Orme, and Roseanne Baca became interested in astronomy as a result of the Great American Eclipse this summer and decided to check out the Society after visiting the ASLC booth at Ren Faire 2017. Howard welcomed them all and asked all members and visitors to sign in on the rosters at the rear of the room. Howard reminded everyone of the Southwest/Mexican-themed Holiday potluck dinner to be held at his home at 5:30 pm on 02 December. He noted the Society has been in existence since 1951 (66 years now) after being founded by Pluto-discoverer Clyde Tombaugh, among others. A main focus of Society members is enabling public education and outreach. Howard thanked Charles Turner for the November edition of the High Desert Observer (the Society's newsletter, the HDO) which included an article on star evolution by member Bert Stevens and images by members John Kutney and Jeff Johnson. John noted an image by member Robert Armstrong was featured on the cover of the current Reflector magazine (quarterly publication of the Astronomical League). The minutes of the October 2017 meeting were also published in the HDO. If there were no corrections or discussion, Howard asked that the minutes be accepted as submitted; they were accepted by acclamation.

Treasurer's Report:

Trish Conley, Treasurer, presented a status of the Society's accounts. She noted a net income of \$162.21 for the Society in October. She also noted that membership dues are payable 01 January 2018

Outreach:

Chuck Sterling, Outreach Coordinator, reported on upcoming events. There will be Moon Gazes at International Delights Café (IDC) on 27 November and 23 December. The Holiday party at Howard's will be 02 December. The next Open House at the Observatory at Leasburg Dam State Park (LDSP) will be 09 December. A school star party at Tombaugh Elementary is planned for 18 January. Check for details on the yahoo group.

RASC Observers Handbook:

Bert Stevens had posted an email so those members interested in an issue of the 2018 Royal Astronomical Society of Canada (RASC) Observers Handbook (US version) might make their request(s). In addition, Trish Conley will place an order for 2018 Planetary Society calendars for those who wish them.

Renaissance Arts Faire 2017:

This year's Ren Faire was 04 05 November at Young Park. Trish Conley reported the Society's participation was a success and thanked all members that helped.

Presentation:

This month's presentation was by ASLC member Steve Barks on "Astronomical Applications for Arduinos, Part 1". An Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino boards are able to read inputs – a light on a sensor, a finger on a button, or a Twitter message – and turn it into an output – activating a motor, turning on an LED, publishing something online. In Part 1, Steve discussed the basics of the system and how different components can be assembled to accomplish these tasks. In a future session, he will focus on specific astronomical applications and projects.

Christopher Brownell will provide the presentation at the January 2018 monthly meeting.

The November meeting of the Astronomical Society of Las Cruces concluded at 8:27 pm. A social time followed at Pecan Grill.

-Respectfully submitted by John McCullough, ASLC Secretary

* * *

Back at the Telescope

by Bert Stevens

One of the brightest and most well-known nebulae in our sky is in the sword of its namesake constellation. The Orion Nebula is young and has many regions in which stars are currently forming. Since all these stars are young, the supermassive stars have not had time to burn out and are prevalent in this area of space.

The many of the bright stars in Orion are part of the Orion Molecular Cloud Complex that permeates the constellation of Orion. Many of the bright stars that make up the constellation form the Orion OB1 stellar association. In addition to the bright luminaries, several thousand lesser-mass stars are also part of the Association.

The OB1 Stellar Association is divided into four major parts, assigned letters a through d. OB1a is composed of stars northwest of Orion's Belt. This subgroup has an average age of twelve million years. OB1b is closer to the Nebula, encompassing Orion's belt and associated fainter stars. These stars are only around eight million years old. Getting even closer, the stars in Orion's sword form OB1c, which are only three to six million years old. Finally, OB1d is the Nebula itself and its associated stars. These are the youngest stars in the Orion OB1 Association.

The bright stars in Orion are formed from the Orion Nebula as well. Rigel is about eight million years old and its motion can be traced back to a point near the Orion Nebula. Betelgeuse is the same age while Saiph is a little older at 11.1 million years. The odd man out is Bellatrix, which is closer to us at only 250 light-years while the rest of the OB1 stars are between 800 and 1,344 light-years away.

With so many stars being formed in this area, multiple-star systems are a natural result. Near the center of the vast Orion Nebula complex is a small area called the Kleinmann-Low Nebula (also known as the Orion KL Nebula). Named after Douglas Kleinmann and Frank J. Low, who discovered it in 1967, this is the

Figure 1: The giant Orion Molecular Cloud responsible for most of the bright stars in Orion, as well as the Great Orion Nebula itself is divided into smaller subgroups. These subgroups are classified by age and the distance from the center of the Cloud at the Orion Nebula.

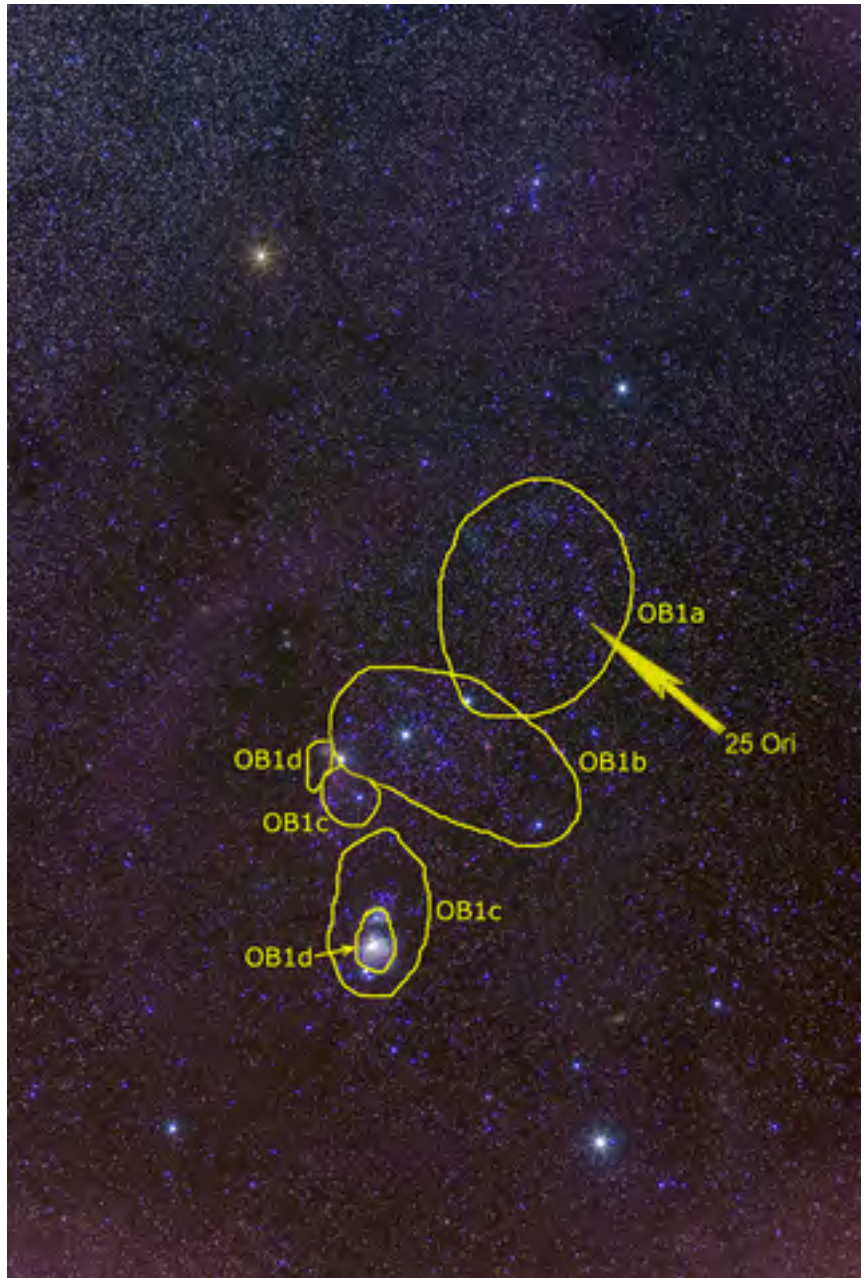




Figure 2: The Kleinmann-Low Nebula (also known as the Orion KL Nebula) is marked by the small box just above the Trapezium near the Center of the Great Orion Nebula. This is an area of intense star formation.

most active star forming region in the entire Orion Nebula. It is completely surrounded by a thick blanket of dust that blocks visible light. This region can only be probed in the infrared or radio part of the spectrum.

With all the activity in this area, astronomers have been making in-depth studies of this area. As they worked through the stars in the Kleinmann-Low Nebula over the last few decades, they discovered two stars that

were moving unusually fast, so fast that they could see significant motion of the stars over an eighteen-year period.

The first was discovered in 1967 by Eric Becklin and Gerry Neugebauer during their infrared survey of the Orion Nebula. Becklin and especially Neugebauer were pioneers in infrared imaging of the sky. Their observation of the Orion Nebula uncovered one of the brightest objects in the sky at wavelengths less than 10 micrometers, the Becklin–Neugebauer Object, or BN Object.

Further observations of this object showed that it is a B-type star that has a circumstellar dust disc around it. This implied that this is a very young star, perhaps only a few hundred thousand years old. It was not until 1995, when radio observations showed that the star's speed was an amazing 60,000 miles per hour.

The other star was only visible in radio observations. Called Source I, this object is moving at 22,000 miles per hour. This object is probably about ten solar masses and also has a thick circumstellar disc. It is so shrouded in dust that it is not even visible in infrared, but only in the radio spectrum.

These two stars are moving in opposite directions. Tracking their motion backward, the two stars appeared to have come from the same point in the nebula about 540 years ago. They are believed to have been part of a multiple-star system that came apart, sending the two stars flying off into space.

But when astronomers generated computer models of the breakup, they found that there were more than just these two stars involved. From the energy dynamics, there should be at least one, and possibly more, stars that had been part of this multiple star system.

An international team led by Massimo Robberto of the Space Telescope Science Institute in Baltimore, Maryland was searching for free-floating planets in the Orion Nebula using the infrared sensor on Hubble's Wide Field Camera 3 to image the Nebula. Team researcher Kevin Luhman compared images taken in 2015 with those in 1998. He found a star that had substantially shifted position over that interval. Computing the motion implied by the images, the speed of this new source was a fantastic 130,000 miles per hour.

The new star was called Source X. Projecting the path backward put this star at the same location as the other two, making it the missing star from the now-defunct multiple star system. No other fast-moving stars have been found in the area, but that does not mean there might not be another star that is from this system.

The process of dissolving a multiple star system starts with all the stars orbiting around their mutual center of gravity. Eventually, the orbits of two of the stars change to bring them closer together. The cataclysmic event could be either a glancing blow of those two stars to form a very tight double star or

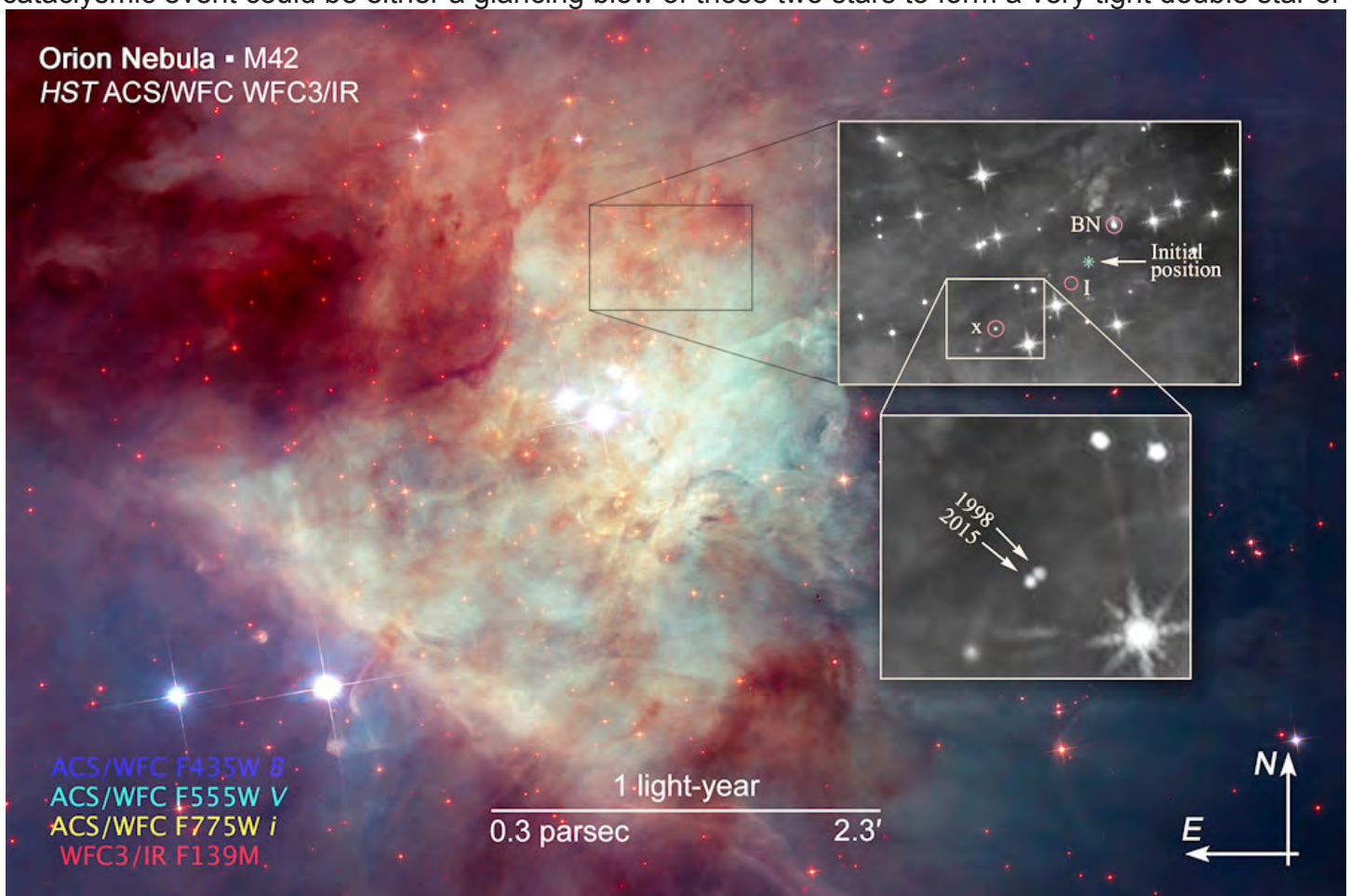


Figure 3: Source X was discovered to have moved between 1998 and 2015. This is the third star, along with Source I and BN that 540 years ago belonged to a multiple star system at the point marked “initial”. It is not known if any of these three are actually a very close binary. This composite image of the Kleinmann-Low Nebula, part of the Orion Nebula complex, is composed of several pointings of the NASA/ESA Hubble Space Telescope in optical and near-infrared light.

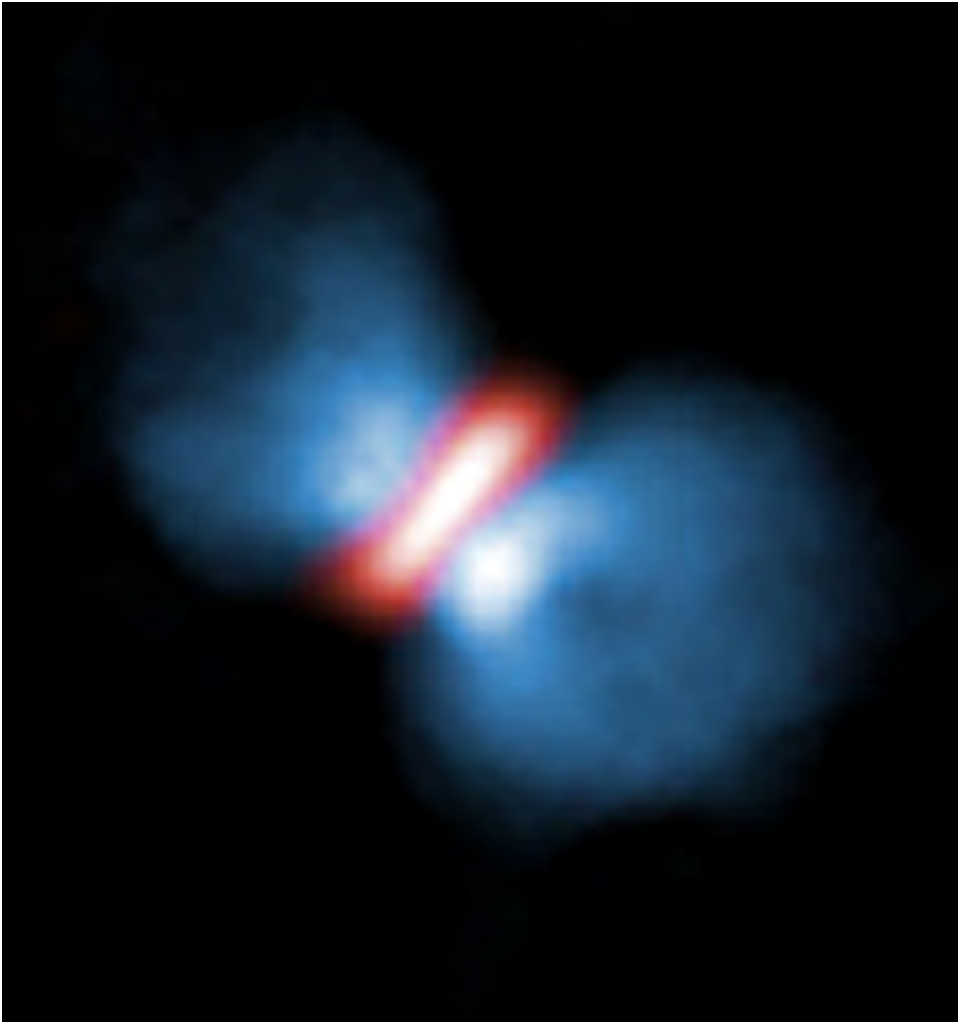


Figure 5: In the Orion KL Nebula, Source I was observed by the ALMA radio telescope, showing the circumstellar disc (white-red) around this massive star. Material flung to the edges of the disc become trapped in the magnetic field of the star and flows outward in a bipolar flow. The disc is about twenty A.U. across.

A gas cloud that will give birth to a new star rotates slowly, but as the star forms and the cloud contracts, it spins ever faster. The MDW model expels the rotational energy out along the bipolar outflows from the new star. This will keep the star from having a very rapid rotational rate.

Star formation is messy and there is much we do not know about it. But with new facilities like ALMA and the James Webb

Space Telescope, we will be able to continue to learn more about stellar evolution.

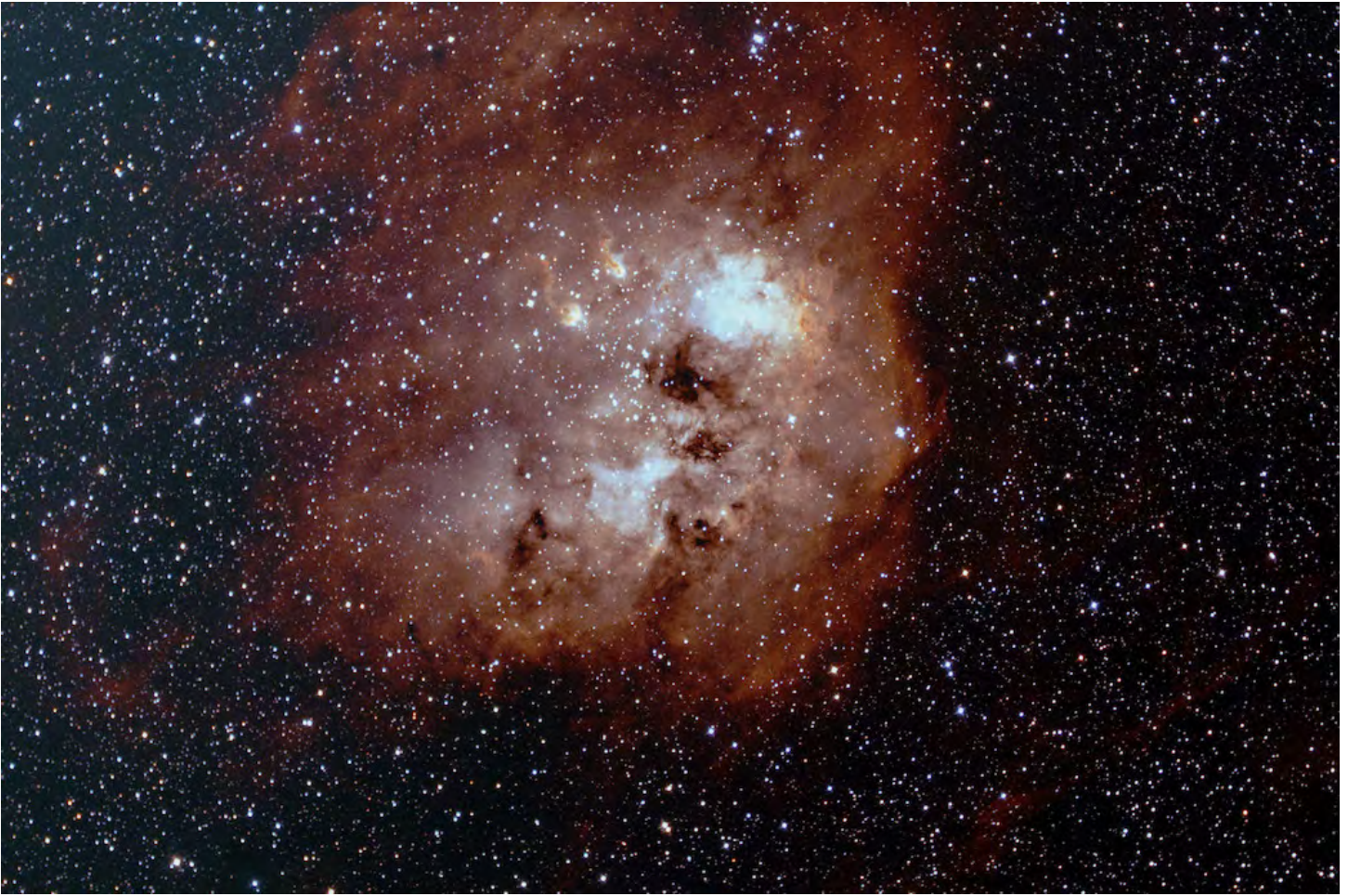
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Photo of the Month



Star Trails around the North Celestial Pole: John Gilkison mounted his Canon T3i on a tripod and made a 42 min exposure at 200 ISO at 18 mm focal length.

Photo of the Month



OBJECT IC 410 is an emission nebula in Auriga. Two streams of material, known as the “Tadpoles of IC 410” are located in the upper center of the image. The tadpoles consist of denser, cooler gas and dust. Because of these tadpoles, IC 410 is sometimes nicknamed the Tadpoles Nebula.

Telescope Takahashi Epsilon

Camera QSI 6120

Settings LRGB 4x3min; Ha 10x5min; SII 6x5min

Processing PS6/

Date/Location Las Cruces 12-13-2017

by John Kutney

Poem of the Month

#5

Let me be free
of this thing
I am its slave
to do with on a whim
what it pleases.
I am trapped forever
in its chains
bound inseparably to it
doomed to drag it
or be dragged
forever.

Free me
Let me soar and be weightless
Limitless
Ever expanding to burst
like a shower of stars in the night.

Release me
from its commonness
its inertia
It is death and I am trapped
Inside
Until the void engulfs me
and I no longer am

Or is it then that I will be?

John Kutney '73

Photo of the Month



© Jeff Johnson | jeffjastro.com

OBJECT **IC 434 and Horsehead Nebula (B33) region** **Distance: 1,500 light years**

Telescope Takahashi TOA-130F @ f/7.7 **Mount** Takahashi EM200 Temma II

Camera QSI 690wsg @ -15C

Filters Astrodon Ha (3nm), Astrodon Tru-Balance I-Series LRGB Gen 2

Guider SX Lodestar

Settings 15x5min L (bin1x1); 3x5min ea RGB (bin2x2); AstroArt5, CS4 (slightly cropped, 10xdarks/flats/
fdarks/bias)

Date/Location 12,15 December 2017 - Las Cruces, NM

Notes This image is LRGB and was imaged over 2 nights. I purposely left out narrowband H-alpha (Ha) for this session as Ha will wash out the blue reflection region to the lower left, and I wanted to preserve more of the inner details without blending. Copyright Jeffrey O. Johnson



© Jeff Johnson | jeffjastro.com

OBJECT NGC 7635 - Bubble Nebula **Distance:** 7,100 to 11,000 light years
Telescope: Takahashi TOA-130F @ f/7.7 **Mount:** Takahashi EM200 Temma II
Camera: QSI 540wsg @ -15C
Filters: Astrodon Ha (3nm), Astrodon Tru-Balance I-Series LRGB Gen 2
Guider: SX Lodestar
Settings: 12x10min Ha, 3x10min L (bin1x1); 4x5min ea RGB (bin2x2); AstroArt5, CS4 (slightly cropped, 10xdarks/flats/fdarks/bias) **Date/Location** 3 September 2017 - Las Cruces, NM
Published as Astronomy Magazine Picture of the Day, 15 Dec 17 (screenshot); Published as Space.com "100 Most Amazing Space Photos of 2017" (screenshot); Published as Space.com "Space Image of the Day"; - 28 Nov 17 slot (screenshot) This image is LHaRGB, where Ha was used in combination with Luminance and Ha:R (80:20) was used for the Red channel. Copyright Jeffrey O. Johnson

Photo of the Month



IC443, “Jelly Fish Nebula” Deep Sky West RCOS 14.5” STX-16803

Happy new year.

Narrow Band (SHO)

Total Exposure: 26.5 hours

Processed in PixInsight

Alex Woronow

Faint Light Photography

Photo of the Month



IC 5146 - The Cocoon Nebula: IC 5146 (also Caldwell 19, Sh 2-125, and the Cocoon Nebula) is a reflection/emission nebula and Caldwell object in the constellation Cygnus. The NGC description refers to IC 5146 as a cluster of 9.5 mag stars involved in a bright and dark nebula. The cluster is also known as Collinder 470. It is located near the naked-eye star Pi Cygni, the open cluster NGC 7209 in Lacerta, and the bright open cluster M39. The cluster is about 4,000 ly away, and the central star that lights it formed about 100,000 years ago; the nebula is about 12 arcmins across, which is equivalent to a span of 15 light years.

When viewing IC 5146, the dark nebula Barnard 168 (B168) is an inseparable part of the experience, forming a dark lane that surrounds the cluster and projects westward forming the appearance of a trail behind the Cocoon. Also, the small reflection nebula Vdb147 is adjacent to the right, just below center on this image.

Chuck Sterling, Las Cruces, NM

Telescope for Sale



For Sale: Meade ETX 125 with multi coated lenses, electronic view finder, hard carrying case and Auto Star 3.12 for Windows. It's in perfect new-like condition; asking price is \$575. Contact Kurt Bergstrom at 360-259-1358 or cyclorider32@aol.com