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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ASLC Board of Directors, 2017

Committee Chairs

January Meeting --

Our next meeting will be on ***Friday, January 27***, at the Good Samaritan Society, Creative Arts Room starting at 7:00 p.m.

The speaker will be Howard Brewington

Topic: The Electromagnetic Spectrum.

Member Info Changes

All members need to keep the Society informed of changes to their basic information, such as name, address, phone number, or emai address. Please contact Treasurer@aslc-nm.org and jkile3916@gmail.com 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 2017

In my home state of South Carolina, I became seriously involved with amateur astronomy in preparation of comet Halley's 1985 return. That same year, I joined the Midland Astronomy Club in Columbia, which had nearly a hundred members. I dabbled in astrophotography, but comet hunting became my passion. In 1989, I discovered South Carolina's first comet and was elected president of the Midland club. To increase my chances for additional finds, I moved to Cloudcroft, NM in 1990. In 1991, I was elected the president of the Alamogordo Astronomy Club, and I discovered my second and third comets.

In 1992, the Astronomical Society of Las Cruces invited me to give a talk about my comet hunting adventures; that was also the year that I discovered my fourth comet. I was very impressed with ASLC's history, newsletter, outreach programs, and huge knowledge base. So, I made myself available when asked to do additional presentations over the years. In 1996, I found my fifth and final comet. Then, in 1997, I became the director of the Tombaugh Planetarium and IMAX Theater in Alamogordo. I did that for a few years before moving back to South Carolina in 1999 and enrolling at USC in Columbia. After graduating in 2002, I was hired by NMSU's astronomy department to operate a 2.5-meter telescope for the Sloan Digital Sky Survey. I retired in 2015 and became more active in my various hobbies including amateur astronomy.

I've admired the Astronomical Society of Las Cruces since 1990, and I'm very pleased to be your 2017 president. I want to thank Daniel Giron for his past two years of service as club president as well as all other officers and project chairs. I hope to see you at the January meeting as we make 2017 another great year for our club.

Howard J. Brewington

* * *

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

by Jerry McMahan

Desert Spring Christian Academy, Thursday, November 10

Chuck Sterling said it was sprinkling, at his house, while loading his 10 inch into the car. By the time the event was starting, the sky was clear. There was a very good turnout so it was good that we had several scopes to observe Saturn (for 5 minutes before it went behind a building), Venus, the Moon, Alberio and the Pleiades's.

Bert Verstraete came with his 8 inch. Ed Montes brought his small refractor, which was admired by Steve Shaffer, who set up his 4.5 inch Dobsonian. I had the usual ETX 125.

One man, a photographer, took a cell phone picture through the ETX. It is not easy to hand hold a cell phone up to the eyepiece and get a good picture. His was the best I have seen. Even when zoomed in, the crater Gassendi was easy to see, including the crater floor. It was a very good focus.

Leasburg, Saturday, November 19

I was a nice, clear, but a little cold night. Daniel Giron and Bob Armstrong operated the observatory and I had the only telescope set up out side. The 8 inch, on the LX 80 mount put goto objects within the field of view with a low power eyepiece. This was surprising since I did a fake alignment before darkness.

We had a number of people look through the scopes and many stayed for most of the evening. The 16 inch was used to view many objects and I had Venus, Saturn (briefly), the Pleiades's, the Double Cluster and the Andromeda galaxy. The seeing was pretty good. The 8 inch was showing more then just the core of M31. The spiral arms could be spotted across the field of view of 1.25 degrees. We also took a look at the satellite galaxies M32 and M110, or NCG 205 if you are Astronomy magazine which does not recognize the Messier designation.

Acton Academy, Wednesday, November 30

We were originally scheduled two days before this date. Tracy Stuart, Daniel Giron, Chuck Sterling and I attended that Monday since the weather forecast said it would clear by 6 pm. The report was wrong, so Chuck re-scheduled for Wednesday. This time we had clear skies.

We also had a lot of telescopes. Tony Levatino, Niles Allen, Ed Montes, Sid Webb, Ed Montes, Tracy Stuart, Chuck Sterling and Jerry McMahan brought scopes. Niles had his home made 15 inch Dobsonian.

Tombaugh Observatory Open House, Friday, December 9

Steve Shaffer opened the dome for the club's 12.5 Cassegrain. Charles Turner and Jerry McMahan assisted. We had the Moon and Mars and Steve found Uranus, a difficult feat to locate the planet in a bright area with a difficult to maneuver telescope. The Astronomy students had a little trouble getting started since both scope ins, in the other two domes had lost alignment. They did get things working, so we all had a good session.

Moongaze, Saturday, December 10

Chuck Sterling and I attended a memorial service, in Timberon NM, for a close friend. We didn't know when we would be back so Chuck informed club members that we might not be able to make it to Moongaze. Several club members came through for us. Daniel Giron, Tracy Stuart, Rich Richins and Steve Shaffer all brought scopes.

I had loaded the ETX 125 into the car the day before in case we did get back in time. Chuck and I both went to the International Delights after getting back into town. I saw that we had enough club members with scopes to cover the session, so I did not unload the ETX. Instead, I did what I do best, which is just get in every ones way. The others stepped in to save Moongaze.

Columbia Elementary, Thursday, December 15

Chuck warned people, by e-mail to avoid driving into the sandbox. He was polite enough not to mention why the warning was necessary. It was me! I got stuck in the sand box last year. This time I parked a 1000 feet from it, until I realized I need to sneak by it to unload the car.

Other people, who did not get stuck in the sandbox included Chuck Sterling, Tracy Stuart, Sid Webb and Ed Montes. We have had bad luck at this school in the past. A couple of years ago, the only thing visible through the clouds was the North Star. Several scopes on the same star did not make for a very interesting evening.

This time was different. It was clear and we had five scopes set up for a large turnout of students, parents and teachers. We had many objects to observe. I don't think anyone pointed to Polaris this time.

Leasburg, Saturday, December 17

Due to the approaching holidays, the Leasburg event was moved up a week. The weather included high winds, clouds, blowing dust and limited visibility. As a result the event was canceled since the weather report indicated more of the same during observing hours. Of course , the weather cleared and the wind died down by around starting time. As Chuck Sterling reported, by e-mail, "If you don't like the weather in New Mexico, wait 10 minutes." It was too late to re-schedule by this time, so no event.

Summary for the year 2016 outreach events

As usual, Chuck Sterling put in a lot of work organizing school star parties, providing the schools with information, recruiting volunteers and attending the events himself.

The year started with an above average number of events, but ended a little below average since the time that I have been keeping records of such things. The reason was an above average cancellation rate due to bad weather and clouds. Still we had 21 members (including one former member) that participated in outreach events. That number may not include someone that participated in the Renaissance Faire, but not in other events.

I would like to let members know that you do not have to bring a telescope to participate.

A new year, Moongaze, Saturday, January 7, 2017

Our first event of the new year was the Moongaze at the International Delights. Chuck Sterling brought his 100mm refractor and I had the ETX 125. It was a cold night and the new semester, for schools, had not started. As a result, we did not have a large crowd, but most of what we did have were enthusiastic about what they were seeing.

The Moon, the Pleiades, Venus and Mars were observed. Chuck was also able to get Neptune in the refractor. Neptune was between Venus and Mars. A few days earlier, on New Years Eve, Mars and Neptune were only about 90 arc seconds apart. Unfortunately, It was cloudy that night and a few nights before and after, but we did have clear skies for this event.

* * *

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

Jan	05	12:47	First Quarter Moon
	07	18:00	OUTREACH; MoonGaze, International Delights Café
	12	04:34	Full Moon
	12	06:00	Venus at greatest elongation (47º E)
	17	15:36	Vesta at opposition
	19	03:00	Mercury at greatest elongation (24º W)
	19	15:13	Last Quarter Moon
	20	19:00	NMSU: Tombaugh Observatory Open House
	21	23:24	OUTREACH; Dark Sky Observing at Leesburg Dam State Park
	27	17:07	New Moon
	27	19:00	ASLC Monthly Meeting; Good Samaritan Society, Activities Meeting Room
Feb	01	18:30	Tombaugh Elementary Star Party
	03	21:19	First Quarter Moon
	03	19:00	NMSU: Tombaugh Observatory Open House
	04	20:00	OUTREACH; MoonGaze, International Delights Café
	10	17:32	Full Moon
	10	18:00	Penumbral Lunar eclipse (Moon rises in eclipse)
	16	18:30	Desert Hills Elementary Star Party
	18	18:00	OUTREACH; Dark Sky Observing at Leesburg Dam State Park
	18	12:33	Last Quarter Moon
	24	19:00	ASLC Monthly Meeting; Good Samaritan Society, Activities Meeting Room
	26	07:58	New Moon

Be sure to visit our web site for the latest updates: *www.aslc-nm.org*

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Announcements

1. January's ASLC speaker is Howard Brewington. The topic will be The Electromagnetic Spectrum. The presentation includes the who, how, and when different portions of the EM spectrum were discovered. It will include the birth of radio astronomy and show observations in IR, UV, X-ray, and Gamma-ray.

2. New ASLC member, Mike Nuss of Deming, is trying to organize a trip/tour of the observatories near Safford, AZ in June, including the Vatican Observatory and the Large Binocular Telescope. He will make an informal presentation before the meeting to outline the plans

3. The agreement to use the facilities at Good Sam for our meeting prohibits members from bringing in ANY food or beverages from outside, except water in a container with a screw lid. Take note: no more Starbucks or Saturn Cookies!

* * *

Meeting Minutes

by John McCullough

Minutes, November 2016 ASLC Meeting

Show & Tell:

No items were offered for discussion.

Call to Order:

Daniel Giron, President, Astronomical Society of Las Cruces (ASLC, the Society), called the November 2016 business meeting to order at 7:30 pm, 18 November 2016, Creative Arts Room, Good Samaritan Society Las Cruces Village, 3011 Buena Vida Circle, Las Cruces, New Mexico.

President's Comments:

Daniel Giron, President, welcomed the group to tonight's meeting and emphasized that tonight is the Society's final formal meeting for 2016. The December gathering will be a holiday party at Vice-President Cristina Lugo's home. Tonight's meeting is also a week earlier than usual (third Friday instead of fourth Friday) to accommodate the Thanksgiving holiday. He asked that all members and guests register their attendance on the sheets that are available at the back of the room. The minutes for the October meeting were presented in the Society newsletter, the High Desert Observer (HDO). If there are no corrections or additions, Daniel asked that the October meeting minutes be accepted. Robert Williams moved that the minutes be accepted as submitted and Kim Morgan seconded. The Treasurer, Trish Conley, was not present but Daniel announced that $69 in donations was received at this year's Renaissance Faire. He also noted annual dues for 2017 are now payable at the following levels: $36 for family memberships, $30 for individual memberships, and $24 for student memberships.

Committee reports:

Outreach Committee:

Chuck Sterling, Outreach Coordinator, reported there will be star gazing open houses at Leasburg Dam State Park (LDSP) on 19 November and 17 December. There will be a star party for the Acton Academy on 28 November (30 November is a backup). The Tombaugh Observatory will be open on 09 December and there will be MoonGazes at International Delights Café (IDC) on 10 December and 07 January. Two school star parties are scheduled for February 2017 with details to follow via email.

Tombaugh Observatory:

Last month's open house was clouded out but nineteen (19) people showed up for the Tombaugh family reunion event. The Tombaugh children had been special guests at the October meeting when the monthly presentation focused on Clyde Tombaugh's tenure and contributions at White Sands Proving Ground (now White Sands Missile Range).

Renaissance Faire 2016:

Daniel Giron reported there were weather issues early on (high winds and rain on Friday for setup), but after the skies cleared, the fair was an overall success. Sunday was an excellent day for solar and planetary observing.

Holiday Party:

This year's Holiday Party will be on 03 December at Cristina Lugo's home. It will be potluck; please contact her regarding what you will bring and for directions.

Announcements:

There were no announcements

Sale Items:

An 8" Dobsonian (Orion 1 XT8 Classic Dob) has been offered for sale for $275. Please see Rich Richins' email for details.

Recognitions:

John Kutney recognized Bert Stevens for the astronomy column posted in the Las Cruces Sun News for the last eighteen months. Bert thanked Daniel Giron for his efforts for the Society this year.

Presentations:

Howard Brewington will provide a presentation at the January 2017 meeting on the electro-magnetic spectrum. Gary Starkweather will present on photo mosaics at the February meeting.

Presentation:

This month's presentation was by Dr. Penelope Boston. Dr. Boston is Director of the NASA Astrobiology Institute (NASA Ames Research Center, CA). From 2002-2016, she served as Associate Director of the National Cave and Karst Research Institute (Carlsbad, NM) and Professor and Chair of the Earth and Environmental Sciences Dept. at the New Mexico Institute of Mining and Technology (Socorro, NM). Research areas include geomicrobiology and astrobiology in extreme environments (especially caves and mines, hot and cold deserts, high latitudes and altitudes); geological processes creating caves on other planets and moons; human life support issues in space and planetary environments; and use of robotics and other technologies to assist exploration and advance science in extreme Earth and extraterrestrial environments. She holds a PhD from the University of Colorado, Boulder. Amongst other honors, Boston received the 2010 Science Award from the National Speleological Society, and the Caving Legend Award from the Ft. Stanton Cave Study Project. Her topic was "The Planet Within: Exploring the Subsurface from New Mexico to Mars and Beyond".

The November meeting of the Astronomical Society of Las Cruces concluded at 9:06 pm.

-Respectfully submitted by John McCullough, ASLC Secretary

* * *

Back at the Telescope

by Bert Stevens

High-energy cataclysmic events occur frequently in the universe. These energetic explosions happen both inside our galaxy and in other galaxies. The most common of these events are novae and supernovae. A new star (or, more accurately, one that has brightened into visibility) is categorized as either a nova or a supernova, depending on how much energy it produces.

Novae occur in a binary star system. The two stars in a binary are usually have different masses. The heavier star will age more quickly, becoming a red giant and then a white dwarf. The lighter-weight companion continues as a main-sequence star, becoming a red giant when it uses up the hydrogen in its core.

Whether still main sequence or red giant, the younger star's outer atmosphere is siphoned off by the white dwarf's gravity. This stream of mostly hydrogen gas accumulates on the surface of the white dwarf. As the incoming gas accumulates on the white dwarf's surface, its temperature increases as the weight of the gas increases the pressure. In a normal environment, the increased temperature would cause the hydrogen gas to expand, but the white dwarf's intense surface gravity prevents that from happening, so the temperature and pressure continue to rise.

When the accretion layer reaches a temperature of around thirty-six million ºF, hydrogen fusion commences in this layer. While it is possible with the right conditions to have a stable hydrogen fusion occur, it is much more likely that a large part of the hydrogen will fuse all at once in a nova explosion.

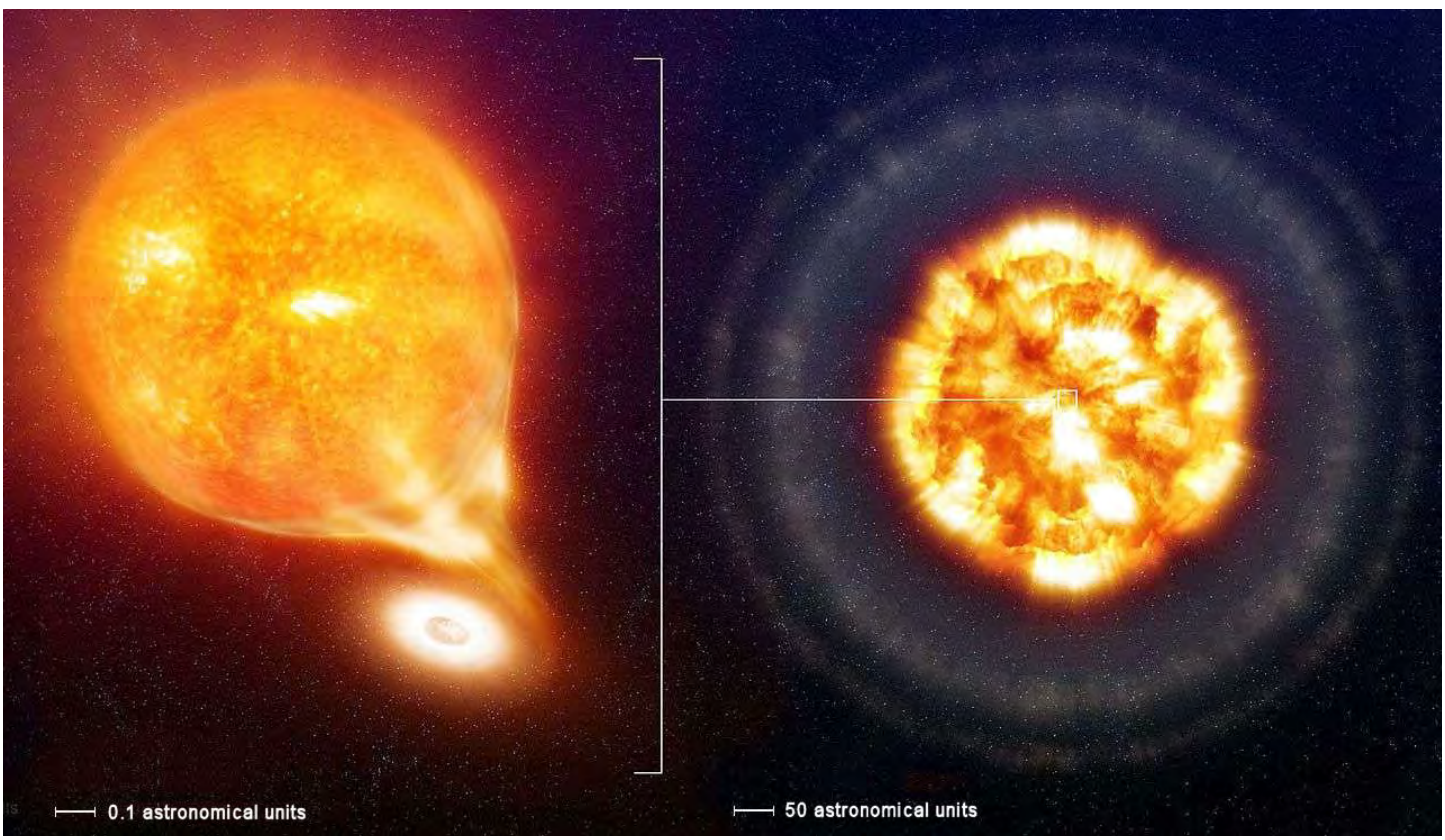

Figure 1: Supernova or Nova Mechanics: *This is an artist's conception of the mass transfer from a red giant or main sequence star to its older white dwarf companion. Material is transferred to the white dwarf through the L1 point. Eventually a thermonuclear reaction will occur. If it were confined to the surface of the white dwarf, this would be a nova and can happen repeatedly. If the reaction occurs in the white dwarf's core, the white dwarf is blown apart in a supernova explosion © ESO*

The nova will eject a small amount of material into space, forming a small nebula. The white dwarf is not destroyed by this explosion, so the process can start again. Novae that happen repeatedly are called recurring novae. As long as material can be accreted from the younger star, the nova can explode repeatedly. If the younger star evolves and the white dwarf can no longer accrete material from it, then the nova explosions will cease.

The other common cataclysmic event is a supernova. Supernova types Ib, Ic, and II come from the collapse of a massive star's core and we will leave them for another time. Just like with a nova, type Ia supernova starts with a white dwarf star that is pulling material from a companion star in a binary system. As the hydrogen accumulates on the surface, the added weight compresses the core of the white dwarf, heating it up. When the temperature reaches a critical level, nuclear fusion of carbon and oxygen resume in the white dwarf's core.

With nuclear fusion restarted in the core, the dwarf's temperature increases rapidly. In its final seconds, the white dwarf's core starts converting carbon and oxygen into heavier elements, releasing so much energy that the heat-generated pressure overcomes the star's gravity, blowing it apart in a type Ia supernova explosion.

Type Ia supernovae are very energetic, but they all appear to have about the same basic energy output, brightening the star system to the same absolute magnitude. Absolute magnitude is a way of measuring the intrinsic brightness of a star. When we look at a star in the sky, its apparent brightness (magnitude) depends upon its intrinsic brightness and its distance. Since we can measure its magnitude, if we have one of the other two factors, we can compute the remaining one.

Astronomers measure an object's intrinsic brightness by computing its absolute magnitude. The absolute magnitude of an object is the brightness of that object when it is observed at the standard distance of exactly 10 parsecs (32.6 light years), assuming no astronomical extinction of starlight. Objects that have the same absolute magnitude have the same intrinsic brightness.

When astronomers could independently measure the distance to the type Ia supernova along with its apparent magnitude, they discovered that type Ia supernovae all have the same absolute magnitude. This made the type Ia a standard candle that had the same intrinsic brightness anywhere in the universe. When a type Ia detonated, astronomers could measure its magnitude and compute the distance to the supernova.

Recent discoveries, however, have shown that all type Ia supernova do not have the same brightness. There might actually be three flavors of type Ia supernova. A great deal of research is in progress to relate the spectra of these supernovae to the different types. This story is still being written, as is its effect on the expansion of the universe and the existence (or not) of dark energy.

Between the nova and the supernova, there is another type of explosion that is more energetic than a nova, but less than the energy of a supernova. This new type of stellar eruption is called an Intermediate-Luminosity Red Transient or ILRT. Like the other two explosions, the ILRT also happens in a binary system. Another name for these events is Intermediate Luminosity Optical Transient or ILOT, since some of these events appear to be blue and not red.

The exact mechanism to generate these intermediate events is still being studied (how great is it that there are still many areas of astronomy that we do not have all the answers!). Current thinking is that these events are caused by a pair of stars sharing a common envelope of gas.

Figure 2: ILRT in M 99

This is a 45 by 26 arc-second field in the Virgo spiral galaxy M99 shows an intermediate luminosity red transient that appeared in 2010. Called PTF 10fqs, it is the gold-colored object just right and above center. It is somewhat outside the main spiral arm of this galaxy in this image taken by the Hubble Space Telescope.

Starting with a close binary pair of stars, the heavier star of the pair starts to enter the giant phase, expanding its atmosphere outward. The other star in the system continues in its main sequence phase. As the giant's atmosphere expands, some of it drifts off into space. The bloated atmosphere near the main sequence star crosses to the main sequence star through the L1 Lagrangian point.

The Lagrangian points are locations in a two-body system where it is possible to have a stable orbit. L1 is between the two bodies where their respective gravity fields cancel each other out. The gas from the giant passing through the L1 point is incorporated into the main sequence star which expands the main sequence star's atmosphere. The area where the main sequence star, or any star, can maintain gravitation control is called the Roche lobe.

The Roche lobe is a teardrop shaped area, with the apex (the L1 point) pointing toward the other star. When gas from the giant star has filled the Roche lobe of the smaller star, the gas can start to leak out the L2 point on the side of the smaller star away from the giant. This can happen if the amount of gas being transferred is more than the smaller star can absorb.

The gas leaking out of the L2 point spreads out around both stars. Since it does not owe gravitational allegiance to either star, it moves with a different velocity than the gas trapped in the gravity well of either star. This independent gas is the common envelope of the two stars.

As the two stars orbit each other, they run into the gas of the common envelope, producing drag on both stars. As the drag slows them down, their orbits start to contract, bringing them closer together. The kinetic energy that the stars lose is converted to thermal energy that heats up the common envelope,

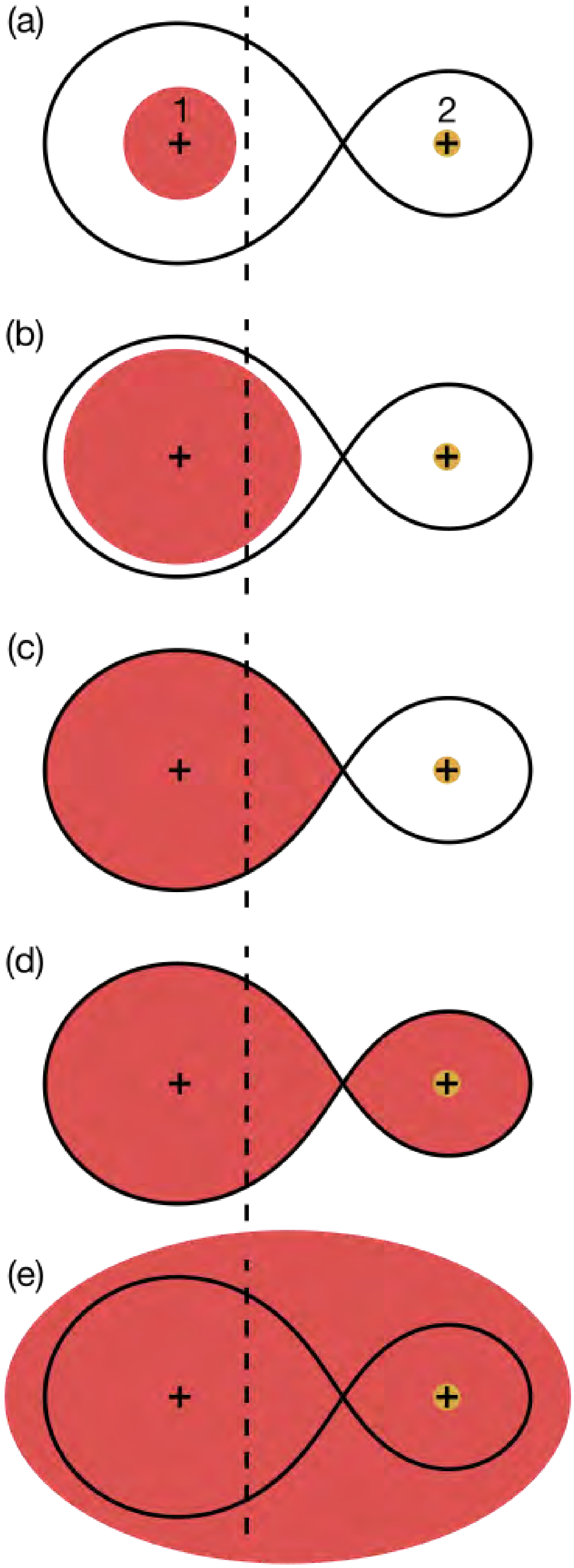

Figure 3: Common Envelope

This is schematic representation of the formation of a common envelope. The more massive star (left) in a binary system starts to expand, filling its Roche lobe. The gas leaks through L1 to the smaller star, filling up its Roche lobe. If this gas is coming too quickly, it can leak out and form a common envelope around both stars.

causing it to expand outward even further. Up to this point, each star's core remains unchanged even with all this activity going on around them.

As they become very close inside their common envelope, they begin to distort and finally merge. The merger produces an intense burst of energy that we see as an intermediate luminosity red transient. The flash, moving outward through the surrounding gas cloud produces a light echo that we can observe as it expands through the system. This is what we are seeing with V838 Monocerotis.

On January 6, 2002, N. J. Brown (Quinns Rocks, W. Australia) found V838 Mon had flared up as part of a routine nova patrol. An analysis of previous observations of the area set January 1, 2002 as the date of the flare-up, bringing the star to magnitude 11. In February, the star brightened again up to sixth magnitude, making it temporarily the brightest star in our galaxy. A third brightening occurred after it had faded to ninth magnitude. In early March, it brightened to magnitude 7.5.

Astronomers began taking spectra of this star, but it did not match with a normal nova. The hydrogen-alpha line was very weak. In a normal nova, it is very strong as the hydrogen is blown off the surface of the white dwarf and into space.

The ILRT flash does not disrupt the star. With the two stars merged, the common envelope is no longer heated by the drag on the stars. Without the additional heat, the expanding envelope begins to cool and the reduced temperature causes it to appear a deep red. The star fades over a few months as it attempts to regain stability with its new configuration; exactly what we see in V838 Mon.

The progenitor object for V838 Mon was likely an F class main sequence star hovering around magnitude 15.6. Based upon the motion of the light echo, which is expanding at the speed of light, V838 Mon is about 20,000 light-years away from us in the

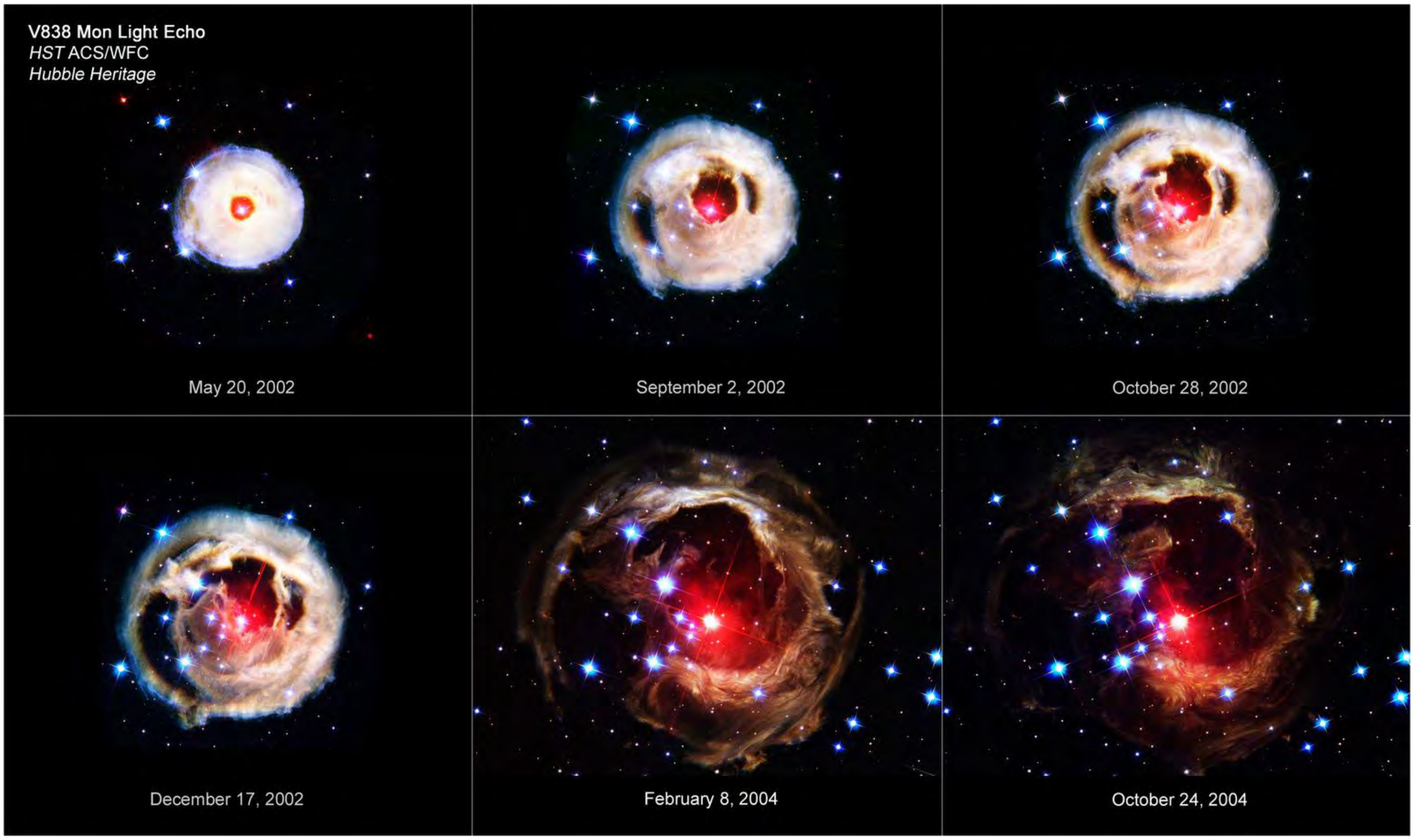

Figure 4: Light Echo from V828 Mon
The light echo from the outburst of V828 Mon expands outward from the star in this sequence of images from the Hubble Space Telescope. When a star flares, it lights up the gas around it. As the light reaches further from the star, it lights up gas further away. So this sequence is showing existing gas being lit-up by the flare and not new gas coming outward from the event.

direction almost opposite that of the galactic nucleus. This places it near the outskirts of our galaxy.

The evidence for V838 Mon being a stellar merger is mostly indirect, but it did make astronomers aware of this scenario. In 2008, the outburst of V1309 Scorpius occurred in a field being monitored for several years by the Optical Gravitational Lensing Experiment (OGLE) project. This Polish project, being carried out at Las Campanas Observatory in Chile, observes selected areas in the galactic bulge and the Magellanic Clouds at regular intervals. It has discovered many variable stars and 17 exoplanets.

The progenitor star of V1309 Sco was monitored by OGLE and was determined to be a contact binary. The observations also showed the orbital period decreasing during the years before the outburst. These observations showed that at least some of these events are caused by catastrophic stellar mergers.
This is not the only scenario for Intermediate Luminosity Red Transients. While this explains ILRTs among old population stars, there are also ILRTs among younger population stars that might be caused by stars with eight to twelve solar masses where an electron capture process triggers a supernova explosion. They may also be some type of outburst from the poorly understood luminous blue variable stars. These outbursts are about two magnitudes brighter than the star-merger ILRTs. Two examples of this type of event are the 2008 (SN 2008S) and 2010 outbursts in the nearby spiral NGC 300.

The gap between the classical novae and the supernovae is slowly being closed as we study new events like V838 Mon and V1309 Sco. Other similar events include the M31 “Red Variable” of 1988, SN 2008S, V1309 Sco, SN 2010da, and the M99 optical transient of 2010. There are still mysteries in our sky and we have much to learn from these events.

Photo of the Month

Description for NGC 1763

NGC 1763 lies in the Large Magellanic Cloud. It is the 2nd largest known stellar nursery in the LMC and resides in an extensive Ha-emission region (hence the faint reddish background). This image was made using an f/4.5, 20" Planeware & PL6303E camera, located at the iTelescope facility in Sliding Spring, Au. The exposures were

- Ha: 16x300" (shot R, but opted not to use it too)
- G: 22x60" + 9x180"
- B: 20x60" + 9x180"

All processing accomplished in PixInsight

- The longer and shorter exposures were combined using HDRComposition. (Simple weighted combinations introduce highly detracting artifacts.)
- Ha was combined in by a simple linear weighting of Ha after a linear fit of Ha and Green to the Blue channel.

The final crop (as shown) is only ~0.1 degrees on a side.

Alex Woronow

Photo of the Month

OBJECT Comet 45P
Telescope Celestron C-6 with Hyperstar
Mount Celestron Evolution
Camera QHY183C
Settings 10 sec exposure
Date/Location: 8 January 2017 from Lower Mimbres Valley Observatory

Photo of the Month

LBN 777 is a reflection nebulae in Taurus cataloged by Beverly T. Lynds Catalogue of Bright Nebulae. It is both a reflection nebula along with a dark nebula. In the wide field covering 1.6 degrees one can see the Vulture Nebula (LBN 777) toward the upper right center which looks like the head of a vulture. Barnard 207 is the Dark Nebula above the eye of the vulture's head. LBN 777 is rarely imaged and many of the other very faint dust clouds in this frame are not named in my software.

This was one of my favorite images of 2016 since I was surprised to obtain any definition on this nebula from the light pollution of Las Cruces. "Dark on dark" makes for poor contrast. RGB images are notoriously poor from Las Cruces. Additional sub frames would have brought out more definition of the faint nebulas.

Takahashi Epsilon180 / FLI ML 16200 /LRGB 1x1 15x5 min / CCDstack / Photoshop

Image by John Kutney on 12/01/2016 -Location Las Cruces

Photo of the Month

OBJECT The Pacman Nebula (NGC 281)
Telescope Astro Tech 8 inch Imaging Newtonian @ f/4
Mount Celestron CGE
Camera Canon 60 Da
Guider Autoguiding was with a Meade DSI-Pro-I and an Orion 80ED refractor using PHD v2.6.2
Settings The final image uses 47 (of 50) 90-second exposures at ISO1600
Date/Location: 30 October 2016 - Las Cruces, NM
All post processing was done with Images Plus 6.05 and Photoshop CS4 (GradientXterminator and Carboni Astro Tools)

By Chuck Sterling

The nebula was discovered in August 1883 by E. E. Barnard, who described it as "a large faint nebula, very diffuse." The multiple star HD 5005, also called β1, was discovered by S. W. Burnham. It consists of an 8th-magnitude primary with four companions at distances between 1.4 and 15.7 seconds of arc. There has been no appreciable change in this quintuple system since the first measurements were made in 1875.

Photo of the Month

OBJECT Pelican Nebula (IC 5070) Distance: 1,800 light years
Telescope Astro Tech 8 inch Imaging Newtonian @ f/4
Mount Celestron CGE
Camera Canon 60 Da
Guider Autoguiding was with a Meade DSI-Pro-I and an Orion 80ED refractor using PHD v2.6.2
Date/Location: 192 December 2016 - Las Cruces, NM

By Chuck Sterling

The primary object of this image, Van den Bergh 5, is the reflection nebulosity surrounding the bright star. I was shooting from my back yard again, and this object being relatively large in the field of view, essentially covering it, and its brightness around mag 2, prompted the attempt to get a shot of it. Well, that was pretty easy... There is not much to show other than the glow, and very little definition or detail visible. The image was brightened to try and show two other reflection nebulae nearby. IC 59 is near the bottom center of the frame, barely visible, and IC63 is the more prominent nebula to the lower right of the bright star. There are a couple of other nebulae scattered in the frame, pretty much invisible in this image, and for which I do not have identifications.