Astronomical Society of Las Cruces

The High Desert Observer

The Bulletin of the Astronomical Society of Las Cruces

Sharing the Universe with our Community for over 60 years

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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, which includes their quarterly publication, *Reflector*.

Individual Dues are $30.00 per year

Family Dues are $36.00 per year

Student (full-time) Dues are $24.00

Dues include electronic delivery of the *HDO*. 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

ASLC members are entitled to a $5.00 (per year) Sky and Telescope *magazine discount.*

ASLC Board of Directors, 2014

Board@aslc-nm.org

President: Rich Richins; President@aslc-nm.org

Vice President: Steve Shaffer; VP@aslc-nm.org

Treasurer: Patricia Conley; Treasurer@aslc-nm.org

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Director-at-Large: Jerry Gaber; Director2@aslc-nm.org

Immediate Past President: csterling@zianet.com

Director Emeritus: Walter Haas

January Meeting

Our next meeting will be on January 24, 2014, at the DACC Main Campus, Room 77, starting at 7:00 pm.

Society member Bill Stein will present ***The November 3, 2013 Hybrid Solar Eclipse: An Experience from Kenya***

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 constellations in the sky.

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.

Annual Dues

Please note that annual dues are due in January, 2014. Please contact our Treasurer, Patricia Conley (treasurer@aslc-nm.org) for further information. Dues can be paid at the January, 2014 meeting or via mail, sent to Treasurer ASLC, PO Box 921, Las Cruces, NM 88004.

Committee Chairs

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Jerry Gaber: jerrygaber@gmail.com
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The President's Column

Happy 2014! First, I'd like to thank Chuck Sterling and the rest of the 2013 ASLC officers and committee members for serving the club so well. I hope to build on this success during 2014.

Do you remember the first time you looked at Saturn's rings or the Moon's surface through a telescope? For most people, it's a 'wow' moment. It's a moment of connection with the cosmos, and an opportunity to share knowledge. As an active outreach participant, it's a moment I've gotten to see thousands of times in the eyes (and from the mouths) of members of our community. In a world of Hubble images, it never ceases to amaze me how much individuals enjoy looking at objects through a real life telescope with their own eyes (in real time, no less).

ASLC does outreach very well, and we can do it better. To that end, I created a Facebook page last week. We already have an excellent web site, but many people (especially younger adults) seem to prefer Facebook for their web communications. The Albuquerque club has a Facebook page with the best part of a thousand 'likes'/ followers. Imagine the impact on outreach if we can get a couple hundred local teachers following our Facebook page.

In order to make our Facebook page a success, we're going to need people to read and post to the site regularly. If we can create and maintain a 'one-stop' page full of current news and information, it will be used by our community. I'm hoping that we can get several individuals to monitor a specific web site or listserver, and share information from that source to our Facebook page. It's also a place where we can share our eye candy (astrophotos) with more individuals than is possible via our Yahoo groups.

If you do Facebook, find the page, like the page, and post to the page. If you don't yet do Facebook, consider joining. We'll talk more about this at this month's meeting. Dr. Bill Stein will be our honored speaker. I hope to see you there.

Outreach Events for December, 2013 and January, 2014

by Jerry McMahan and Steve Shaffer

Saturday, December 14, Moongaze

A combination of the club's holiday party and an in-between phase of the Moon, led to a second Moongaze this month. Chuck Sterling set up his 10-inch Schmidt Cassegrain and Jerry McMahan brought the ETX-125 Maksutov.

It was cold, but not as cold as the previous Saturday. We decided to pack things up at about 9:30. Early on, Venus looked very impressive as a thin crescent. It went from about a half phase to the crescent since the Moongaze a month earlier. As it often happens, some people thought they were looking at the Moon, and were impressed to find that the planet Venus goes through phases like the Moon.

The Moon was a couple of days before full, but the terminator was in a good position to show the crater Aristarchus and Schroder's Valley. Tycho's ray system also made for a good conversation piece. When Jupiter cleared the buildings, we could see all four Galilean moons, but were only able to see Europa for a few minutes before it passed in front of the planet. Europa's shadow should have been visible and may have been under higher magnification and a little better seeing conditions.

One of John McCullough's co-workers was present. She intends to join the club in January. One of my former math students also came to look through the scopes.

Winter Solstice, December 21, Leasburg Observatory

I don't think that Mother Nature should take the first day of winter so seriously. There was no need for high winds, clouds, and snow on the mountains. This was supposed to be daylight and evening event. It is the third time in a row that we have not been able to use the 16-inch at the observatory. Since Jerry Gaber replaced the electronics

and the scope is working as is should, it would be nice to actually get to try it for a public outreach event.

Chuck Sterling, Rich Richins, Ron Kramer, Judy Kile, Tracy Stuart, Daniel Giron and Jerry McMahan made the attempt, but we mostly just talked and tried to stay warm while the wind blew into the observatory door. It would have been nice if our last event of the year had worked out. As Ron said, sooner, or later, we will have good weather and an opportunity to put the scope through its paces for the public.

Friday Jan. 10, 2014 NMSU Open House,
Jerry McMahan and I assisted 81 people in looking at the Moon. Later in the evening, when things slowed down and Jupiter cleared the tree to the east we switched to it. Nice view but I resisted the urge to increase the power.

Saturday Jan. 11, 2014 Sky Safari
I think it was cancelled but no one told me. I was the only one to show up. The four people I invited came and two young ladies that had heard about it Friday night came. We looked at the Moon, Jupiter and the Great Orion Nebula. The Great Orion Nebula was not seen Friday night because I had forgotten to remove the lower shutter door.

After everyone left I went back to Jupiter and increased magnification to the 15mm eyepiece, which Jerry said is good for more than 300x. Backed it down to the 26 mm eyepiece and sat and looked for 45 minutes. Thought I was seeing the Great Red Spot for the first time, but it did not strike me as such. Later my software told me it was visible from 2345 to 0345. I was seeing six to eight stripes and more detail than I had ever seen. A good night. Closed up and went to International Delights and talked with Chuck and Jerry.

Calendar of Events: January 2014 - February, 2014 (Mountain Time - 24 hr. clock)

JAN	22	23:29	Moon - Mars Conjunction
	23	02:22	Moon - Spica Conjunction
	23	22:19	Last Quarter Moon
	24	19:00	ASLC MONTHLY MEETING, Room 77, DACC Main Campus
	25	07:18	Moon - Saturn Conjunction
	25	14:30	OUTREACH EVENT: Leasburg Solar and Nighttime Observing
	28	19:36	Moon - Venus Conjunction
	30	14:38	New Moon
	31	02:59	Mercury Greatest Eastern Elongation
FEB	01	Dusk	DSO Upham
	02	13:05	Mars - Spica Conjunction
	06	12:22	First Quarter Moon
	07	20:00	OUTREACH EVENT: Tombaugh Observatory Open House
	08	07:41	Moon - Aldeberan Conjunction
		18:30	OUTREACH EVENT: Moon Gaze, International Delights Café
	14	16:53	Full Moon
	15	20:00	OUTREACH EVENT: Tombaugh Observatory Sky Safari
	19	07:54	Moon - Spica Conjunction
	19	16:59	Moon - Mars Conjunction
	21	15:39	Moon - Saturn Conjunction
	22	10:15	Last Quarter Moon
		18:30	OUTREACH EVENT: Leasburg Observatory
	27	14:24	Moon - Mercury Conjunction
	28	19:00	ASLC MONTHLY MEETING, Room 77, DACC Main Campus

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

ASLC 2013 Holiday Party by John McCullough

Although not the last major event of 2013, the Society held its 11th Annual Holiday Party on 7 December in lieu of a regular monthly business meeting. Rather than hold the party at the Experimental Aircraft Association (EAA) hangar at the Las Cruces Airport as has been done the last few years (thanks to Wes Baker), this year's event was at Lorenzo's Restaurant's Saratoga Room across from the Pan American Center. As outgoing President Chuck Sterling noted in his December "The President's column-inch….", "The ASLC Holiday Party on December 7th was quite a success."

The party started about 6:00 pm with a time of socializing and camaraderie accompanied by live music provided by Merideth and Jim while a slide show of images collected by members during 2013 ran continuously. The group of thirty-plus members and guests, including a few from the Leasburg Dam State Park staff, then proceeded to dine on a choice of pastas accompanied by tossed salad and garlic bread catered by Lorenzo's. This was followed by cheesecake and tiramisu for dessert.

Following dinner, there was a gift exchange and Chuck gave a brief recap of the events of 2013. He then handed the "trappings of office" (projector, Christmas decorations, extension cord, banners, i.e., "the works", aka the "regal paraphernalia") to Rich Richins who will be serving as ASLC President for 2014. Rich responded with a few remarks of his own.

After more socializing, the party broke up shortly after 8:00 pm. As there were two other ASLC events the same evening, several members left the Saratoga Room and met Jerry McMahan at the International Delights Café for the first of two Moon Gaze events in December. Steve Shaffer opened the Tombaugh Observatory at NMSU for the Sky Safari, but both venues were lightly attended because of the cool weather.

Thanks to all for attending and participating. It was great to end the year on such a pleasant note.

Back at the Telescope by Berton Stevens

For the minor planet community, 2014 started with a bang, quite literally. 2014 AA, a small minor planet impacted the Earth over the central Atlantic Ocean on January 1 around 9 p.m. MST. This is the story of 2014 AA and how astronomers did or did not react to it.

We had clear skies over the southwest at the end of 2013 and the beginning of 2014. While some observers were out celebrating the New Year, others were actively observing minor planets. Among this later group was Richard Kowalski, a well-known minor planet observer who is part of the Catalina Sky Survey. Catalina (Observatory Code G96), has a 1.5-meter telescope on Mt. Bigelow in the Catalina Mountains just north of Tucson. Kowalski was scanning the sky just before midnight Mountain Time (around 6:18 a.m., January 1, Universal Time) when he came across on eighteenth magnitude object that was moving fairly rapidly (roughly 10"/minute). Catalina routinely runs into such objects, so he was not particularly excited by this discovery. Using Catalina's standard process, he gave it a temporary designation of VA9A092 and submitted it to the Minor Planet Center.

The Minor Planet Center (MPC) is the central clearing house for all minor planet observations. They also compute orbits and assign permanent minor planet names and designations. Since VA9A092 was clearly not a main-belt minor planet because it was moving so quickly, it was immediately posted to NEOCP (Near Earth Object Confirmation Page). Catalina had observed this object for a little over an hour so the MPC's ability to predict VA9A092's position, but the accuracy of the prediction would rapidly deteriorate without additional observations.

I picked up VA9A092 as part of my routine minor planet observing run the next evening. No one else had followed it up yet and the orbit from the MPC did not indicate that it was going to hit the Earth. There had also not been any chatter on the Minor Planet Mailing List about it being an impactor, so I put it into my observing plan. It was an evening object, so the telescope imaged it fairly early in the run. I stacked up the images and looked for a bright (18th magnitude) object.

Not finding anything. I ran the ephemeris from the NEOCP again, this time at 1-minute intervals. I used the R.A. and declination to position the cursor where the object should be and still did not find anything. I then checked the "uncertainty map" from the NEOCP and all the possible positions were some 17 degrees from the predicted location. They were also color-coded black, meaning the object would be coming within one lunar distance from the Earth sometime in the next 100 hours. The end of the ephemeris had the object swinging around from right ascension five hours to right ascension sixteen hours, indicating the object was going to pass close to the Earth and then be in the morning sky. Nonetheless, this object was not in my images and I went on to the next object.

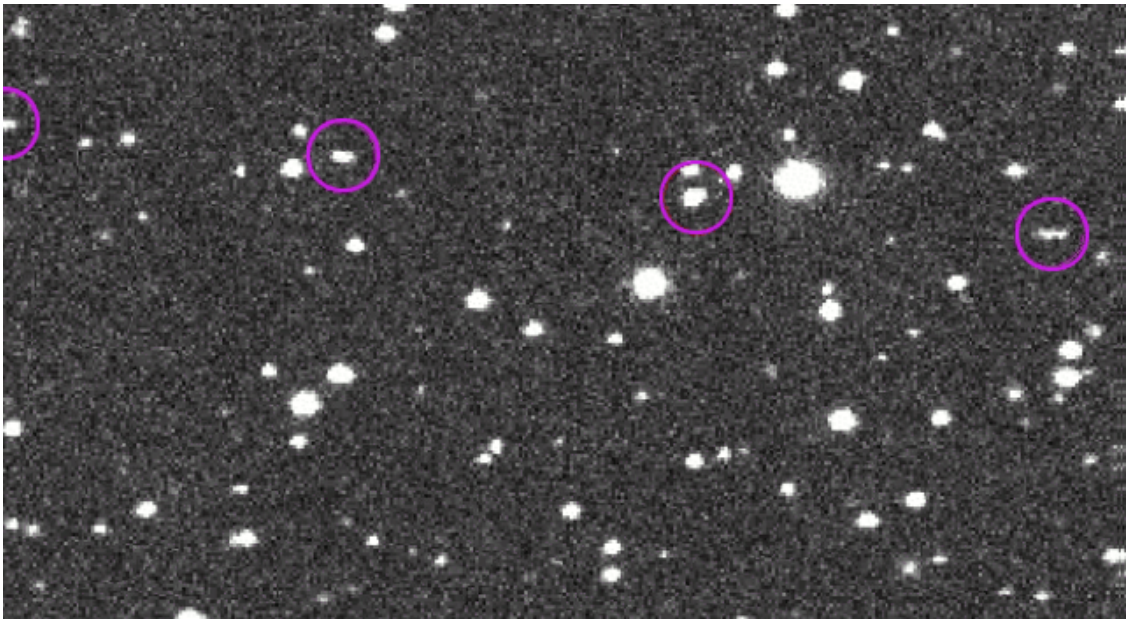
The next morning, the MPC released Minor Planet Electronic Circular (MPEC) 2014-A02 announcing that VA9A092 had been given a provisional designation of 2014 AA and that it had impacted the Earth based on calculations by Bill Gray of Project Pluto and Guide software fame and Steve Chesley (NASA/JPL). Bill Gray computed a set of possible orbits for 2014 AA based on possible errors in the reported positions and used these to project possible impact points. These impact points spread from central Africa to Central America, with the most likely point being over the central Atlantic.

Shortly thereafter, Peter Brown (University of Western Ontario) announced that he had an impact point for 2014 AA. Dr. Brown was working with a network of detectors that recorded infrasound, acoustic energy with frequencies less than 20 hertz. These were established as part of the Comprehensive Nuclear Test Ban Treaty for detecting atmospheric nuclear tests and locating the source. But they also will detect meteor explosions in our atmosphere.

In analyzing the data, Dr. Brown found that three stations (Bolivia, Brazil and Bermuda) had detected the impact of 2014 AA. By triangulation, he was able to come up with a location near 40° west, 12° north and a time of 9:02 p.m. on January 1. That is about 1,900 miles east of Caracas, Venezuela, in the middle of the Atlantic Ocean. The infrasound from the impact was just above the noise level and had it been daytime, it would have been lost in the noise. This preliminary location has not been corrected for winds which affect the propagation of infrasound waves.

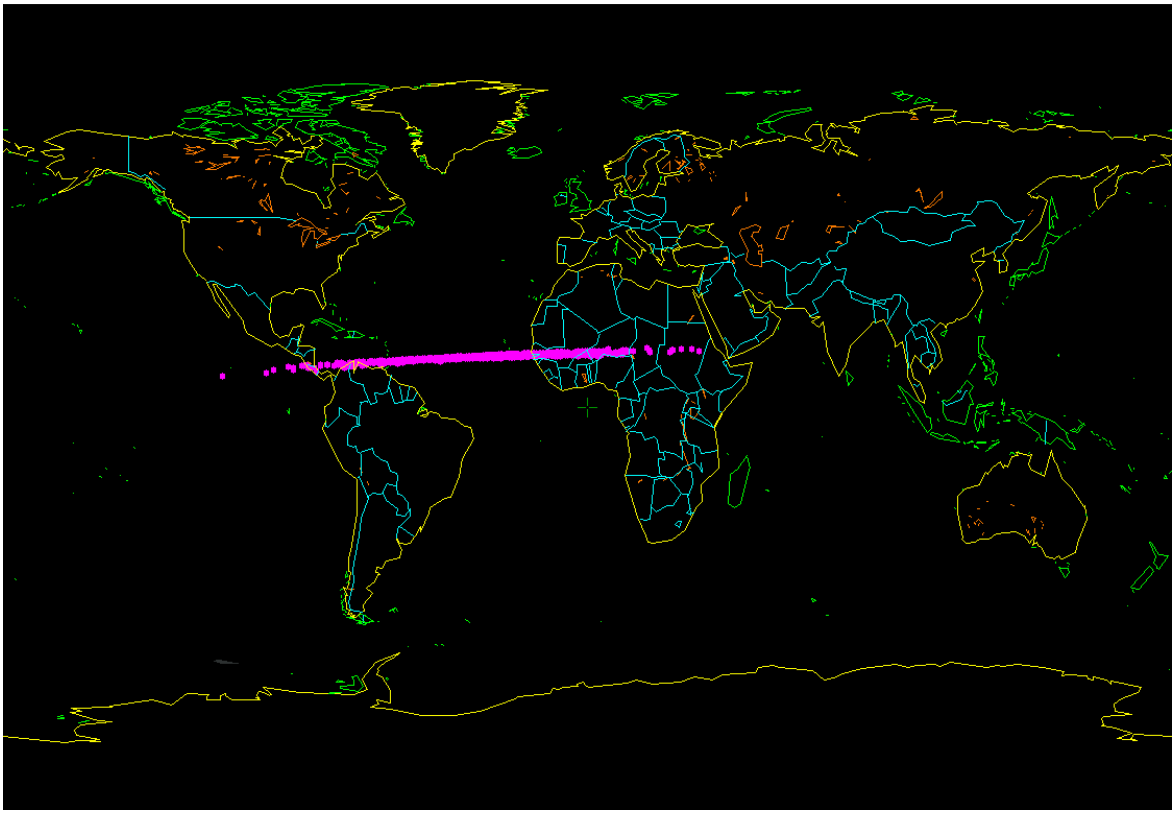
Dr. Brown estimates that the impact was probably between 500 and 1,000 tons of TNT, implying the object was roughly the size of a small car. This matches very well with the size estimated from the observed magnitude of the minor planet, roughly 6 to 9 feet (2 to 3 meters).

There have not been any reports of any observations of 2014 AA's impact in the atmosphere. This is not surprising in the middle of the Atlantic Ocean. If anyone had seen it, it would have been a great show, Mother Nature kicking-off the New Year with her own fireworks!



2014 AA moves across Catalina Sky Survey's field of view so quickly that it moves enough during an exposure to leave a streak. These images were taken between 11:18 p.m. and 11:46 p.m. MST (06:18 and 06:46 UTC). It was already January 1, 2014 Universal Time. 2014 AA is between magnitude 18.1 and 19.1. (Image credit: CSS/LPL/UA)

Bill Gray used Monte Carlo (random statistical) methods to compute a set of orbits for 2014 AA. He then used these orbits to compute where and when each orbit would bring 2014 AA into Earth's atmosphere. Those impact points are plotted here in magenta. The impact would have occurred January 1 between 4:11 p.m. (easternmost impact) and 10:33 p.m. T (westernmost impact).



Three infrasound detectors just barely registered impact of 2014 AA. Each detector recorded the time of the event and knowing the speed of sound, the actual impact time could be computed. Then the distance from each station is computed and a circle drawn around each station. Where the three circles intersect is the location of the impact. This plot is preliminary and the effect of the wind has not been taken into account. When it is, the impact point will probably move a little further east.

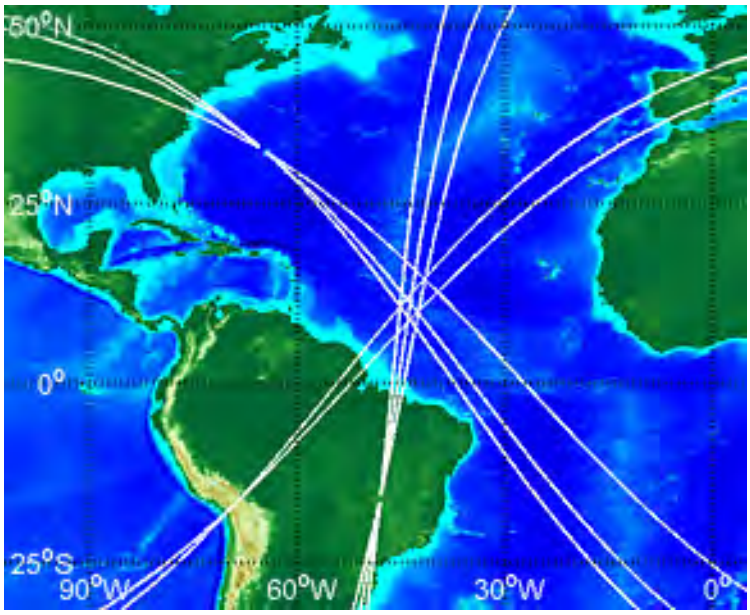


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Image of the Month

This image of NGC 7000 (North American Nebula) was taken by Jeff Johnson

Telescope: Takahashi FS-60C @ f/6.2
Mount: Takahashi EM200 Temma II
Camera: QSI 540wsg @ -15C
Filters: Astrodon Ha (3mm)
Guider: SX Lodestar
Settings: 3x15m Ha (bin1x1); AstroArt5, CS4+ star reduction (cropped, 10x darks/flats/fdarks/bias)
Date/Location: 27 December 2013, Las Cruces, NM