Current Astronomy

RIVER BEND ASTRONOMY CLUB NEWSLETTER

NOVEMBER/DECEMBER
2013

Kitt Peak National Observatory near Tucson, Arizona.
Photo by Bill Breeden.

INSIDE THIS ISSUE

River Bend Astronomy Club is a member of the Astronomical League.

River Bend Astronomy club serves astronomy enthusiasts of the American Bottom region, the Mississippi River bluffs and beyond, fostering observation, education, and a spirit of camaraderie.

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River Bend Astronomy Club is a member of the Astronomical League, dedicated to fostering astronomical education, providing incentives for astronomical observation and research, and assisting communication among amateur astronomical societies.
www.astroleague.org

River Bend Astronomy Club is a member of the NASA Night Sky Network, a nationwide coalition of amateur astronomy clubs bringing the science, technology and inspiration of NASA's missions to the general public. See our **online calendar** on the NASA Night Sky Network at *http://nightsky.jpl.nasa.gov/*

Monthly Meetings

Saturday, November 2, 2013 • 7:00 PM
Saturday, November 30, 2013 • 7:00 PM
Saturday, December 28, 2013 • 7:00 PM
For meeting locations, please see our calendar at www.riverbendastro.org.

Looked Up Lately?

Join River Bend Astronomy Club

Want to learn more about astronomy? The members of River Bend Astronomy Club invite you to join. You won't need expensive tools or special skills – just a passion for observing the natural world.

- Meetings offer learning, peeks through great telescopes, and fun under the stars.
- Access to the club website, www.riverbendastro.org, where members share news and photos.
- Get connected with our member-only online discussion group.
- Borrow from the club's selection of solar telescopes.
- And that's not all! Through club membership you also join the Astronomical League, with its special programs and colorful quarterly newsletter *The Reflector* to enrich your hobby.
- We meet monthly, observe regularly, email news and quips constantly, and generally have a good time. Won't you join us?

Name_____
Address_____
City_____State_____Zip_____
Phone_____
Email address_____
Where did you hear of our club?_____
_____
How long have you been interested in astronomy?_____
Do you have optical equipment?_____
Are you afraid of the dark? ___Yes ___No (just kidding)
I am submitted my application for:
_____Adult Membership(s) ___Youth Membership(s)
$20/year each $15/year each
(18 yrs. and up) (17 yrs. and under)
I enclose a check for $_____ made out to:
Mike Veith, Treasurer, RBAC
Signature_____
Date_____

Mail to: River Bend Astronomy Club
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Questions? Contact us by email at rbac@riverbendastro.org.

Mount Lemmon SkyCenter SkyNights Stargazing Report – September 2, 2013

By Bill Breeden

TUCSON, ARIZONA – Monday, September 2, 2013 was the day my wife Rita and I had planned on ascending Mount Lemmon, just northeast of Tucson, for Adam Block's SkyNights stargazing session. The skies had been partly to mostly cloudy all day, with temperatures around 100 degrees. We were expecting a call from Adam between 11am and noon to confirm if the program was still a go. Rita and I spent the morning at Sentinel Peak Park ("A" Mountain), which overlooks downtown Tucson, taking pictures and just relaxing and watching the skies in anticipation of the evening stargazing program at the summit of Mount Lemmon. About 10:30am we decided that we better get into town, closer to Mount Lemmon, so we headed for In-N-Out Burger for lunch.
Adam called us on our home phone back in St. Louis, so I called him back to be sure the program was still on. He reported that although the forecast was not perfect, the program would go on. Yay!

This is just one of the amazing views we had while driving up Mount Lemmon, on the way to the SkyCenter. Photo by Rita Breeden.

Rita and I left our hotel in Tucson about 1:30pm to begin the journey to Mount Lemmon SkyCenter. We had a long drive ahead of us: We first had to get to the base of the mountain, then of course drive up the mountain itself. The drive up the mountain is about 28 miles, and that does not include driving to the base of the mountain. I also wanted to have time to take pictures on the way up the mountain, and we were supposed to meet Adam at the gate to the SkyCenter at 4:00pm. So, we had just two and a half hours. All of my worrying about the schedule notwithstanding, we did get there on time!

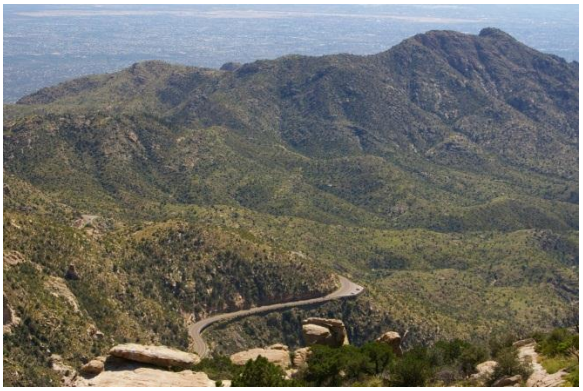
We took many photos on the way to Mount Lemmon, and many more while driving up it on Mount Lemmon Highway. What awesome views up here! Mount Lemmon Highway offers spectacular views of the Catalina Mountains and Tucson, and there are several pull-outs that you can stop at and admire the view and take pictures. We set up our tripod at several of these pull-outs and took some great pictures!

We arrived at the gate to the SkyCenter at around 3:45pm (surprisingly!), so we took some photos and ate some snacks. We met a couple that had been camping on the mountain, and they were just packing up to drive back down. We talked for quite a while – people are sure friendly out here!

The drive up Mount Lemmon Highway is a real treat in itself. This is a view of the San Pedro River Valley. Photo by Bill Breeden.

Adam arrived at the gate promptly at 4:00pm, and led a caravan of about five vehicles up to the SkyCenter. We parked in a small parking area, and Adam then drove all of us (about ten people) up to the observatory by bus. Inside the dome, Adam introduced us to the 32-inch

Schulman Ritchey-Chrétien (RC) telescope, billed as “Arizona’s largest dedicated public viewing telescope.” We also met the observatory’s other inhabitants: Lady bugs! Hundreds of them crawling and flying around the observatory, landing on anything and anyone! Of course they were harmless, but took some getting used to nonetheless. We saw our personal “first light” through the 32-inch Schulman, the star Arcturus! Adam pointed out that bright stars could be seen during full daylight, especially with the help of a computer-guided telescope. When doing this, of course be careful to avoid pointing a telescope anywhere near the sun! Adam then showed us views of the Sun through another telescope mounted with a safe solar filter. Sunspots were clearly visible, as this was a white-light solar filter. Amazing!



As we ascend Mt. Lemmon, the Mt. Lemmon highway recedes in the distance, and Tucson can be seen as well. Photo by Bill Breeden.

We then rode to the visitor center by bus. Once inside the visitor center, we were seated around tables in a medium-sized room, and Adam gave us an informative lecture on amateur astronomy. He covered most of the basics: The size of the solar system, the Milky Way galaxy, the size of our universe, definitions of common astronomical terms, how to use a planisphere, how to use and focus binoculars, and much more. Dinner is included in the price of the program, and it was very generous indeed, with enough sandwiches, chips, cookies, granola bars, veggies, and fruit to feed a small army.

Next, we made our way to an area atop Mount Lemmon that is ideal for watching the setting sun. From this location, we could see Kitt Peak! The Mayall 4.0-meter telescope observatory and the McMath-Pierce solar telescope building were distant but clearly visible, especially through binoculars! This was exciting because Rita and I were also going to Kitt Peak two days after this visit to Mount Lemmon SkyCenter. Before the sun set, Adam pointed out our shadows on the side of an observatory building. What color were our shadows? Black? Gray? No – Adam pointed out that our shadows are blue! He explained that since the sky is blue (sunlight is scattered by Earth’s atmosphere, which mostly absorbs red light leaving a blue sky), our shadows also appear blue! Then we watched and photographed the beautiful sunset, and we waited for the elusive “green flash.” (We didn’t see it.) Adam next pointed out Venus as it popped out of twilight. While walking back to the visitor’s center after sunset, a bright object, perhaps magnitude -6, could be seen in the northwestern sky about 25 to 30 degrees in altitude. Jupiter? No, too bright. Venus? No, we already see that in the sky! The Moon? Too small! What is it! Why – it’s a weather balloon! It was clearly a weather balloon – especially in binoculars! Too cool!

Rita and I arrive at the gate to the Mt. Lemmon SkyCenter. Photo by Bill Breeden.

Once it got dark, Adam took us by bus to the area just outside the observatory to show us some binocular objects. The sky was cooperative for the most part, with just a few clouds drifting by now and then. It was dark enough now that most bright constellations could be seen, such as Ursa Major, Cassiopeia,

Scorpius, and Sagittarius. Adam pointed out the double-star Mizar in the handle of the Big Dipper in Ursa Major. We then pointed binoculars at the Milky Way area of the sky around Sagittarius, and observed the Lagoon Nebula (M8) and the Trifid Nebula (M20). They appeared small but distinct in our binoculars. We also observed two open clusters (M6 and M7) in the same area of the sky.

The group then headed for the observatory and its 32-inch Schulman telescope. This telescope was set up tonight for visual observing, but typically Ritchey-Chrétien telescopes are used for imaging and astrophotography. Our first object would be the planet Venus. The cloud-covered planet, in gibbous phase, was clearly visible through the TeleVue Nagler eyepiece. Each visitor took a turn peering through the eyepiece, seemingly now unaware that the lady bugs we had dealt with earlier were all gone! Adam let me know that they all tend to clump together and hide somewhere by night.

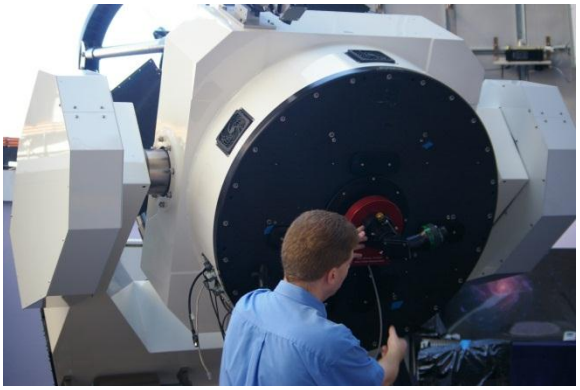
Adam Block introduces the group to the 32-inch Schulman Ritchey-Chrétien telescope. The telescope we used for safe solar observing is visible near the back. Photo by Rita Breeden.

Next up was the beautiful blue-and-gold double star Albireo in the constellation Cygnus. I am used to viewing this star through my 8-inch telescope; through the 32-inch, it was big and bright! The colors were obvious to me, but not quite as much for the observers that were new to stargazing. After Albireo, we viewed an intense red carbon star, which was an amazing sight. As visitors moved about in the dark observatory taking turns at the eyepiece, my wife and I discussed the objects we were observing through the 32-inch RC, since we have had much experience at the eyepiece of my 8-inch Schmidt-Cassegrain telescope (SCT) back in St. Louis, as well as views through many different telescopes during the past ten years.

It was time to view a deep-sky object through this big telescope! Next up was the Swan Nebula in Sagittarius (M17). This cloud of dust and gas is about 5,000 light-years away, and through the 32-inch RC, the nebula stood big and bright, although no color was visible. The Dumbbell Nebula (M27) in Vulpecula also appeared as a very large, cloudy smudge that took up a very large percentage in the field of view. Spectacular!

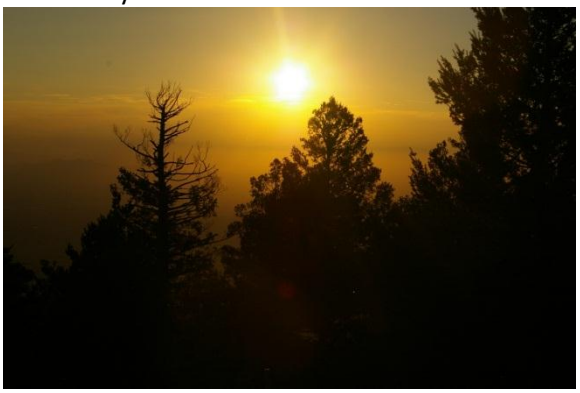
Now, Adam pointed the large telescope at a planetary nebula in the constellation Ophiuchus. This planetary nebula, NGC6572, shines at magnitude 8.1. Now, this would be quite bright even in my 8-inch SCT back home, so what would it look like through a 32-inch telescope? Rita and I took a look through the eyepiece. It was small but quite bright, and obviously not stellar. Planetary nebula are usually not that exciting (with the exception of the Ring Nebula), and some require averted vision. Through the 32-inch telescope, this one was easily seen with direct vision.

If you are a regular reader of my stargazing reports, then you know that I absolutely love open clusters in a low-power eyepiece of a telescope. Open clusters are most of the reason that I bought my two TeleVue Panoptic eyepieces, 19mm and 24mm. So I was excited when Adam announced that he was pointing the 32-inch Schulman at the Wild Duck Cluster (M11) in Scutum. And indeed, the view was impressive! It appeared as diamonds on black velvet!



Adam Block prepares the 32-inch Shulman telescope for visual observing. Photo by Bill Breeden.

Unlike me, most experienced observers prefer globular clusters to the open clusters that I love so much. Why? Well, it is easy to understand – they are big, bright, and beautiful. Adam was moving the large scope to M13, the biggest, brightest globular cluster in the northern sky. I have seen this cluster in just about every shape and size telescope imaginable, so I was curious to see how it would look through this one. It was big and bright, with stars resolved almost to the core! In my experience, if M13 does not impress a first-time observer, then that individual will never catch 'the fever' for astronomy.



Sunset from atop Mount Lemmon. Photo by Bill Breeden.

The Veil Nebula in Cygnus is notorious for being difficult to observe, for two reasons. First, it is DIM. An OIII filter helps, but large aperture is the best bet for spotting this nebula. Second, it is LARGE. Low power is required, and low power is hard to get with large-aperture telescopes. So, you basically have two properties (dim and large) that work against each other for best viewing. Adam pointed the big 32-inch Schulman at the Veil (NGC6960/6992) and I braced for a jaw-dropping view. Wow! There it was, sprawling across the entire Nagler field of view. Our observing experience obviously helped me and Rita enjoy the view, as others in the observatory were hard pressed to understand what we were so excited about. Even through such a large telescope, a view of the Veil Nebula by an inexperienced observer can be challenging to appreciate. Yes, they see it, but I would suspect that they do not understand the meaning of being able to observe such an elusive deep-sky object with direct vision. The ability to look right at the Veil – without having to rely on averted vision, an OIII filter, or other tricks – is not to be underrated. The trouble is, the casual observer will never understand this, but then again, they have never struggled to see the Veil with an 8-inch telescope using averted vision. I still get excited about getting a fleeting glimpse of it with averted vision through my 8-inch SCT!

After the program, Adam emailed us a listing of all the sky objects we observed, complete with images and descriptions. This keepsake souvenir is quite unique and makes for a clever and thoughtful memento of your night of observing at the SkyCenter. It also provided me with a guide when writing this article. Thanks, Adam!

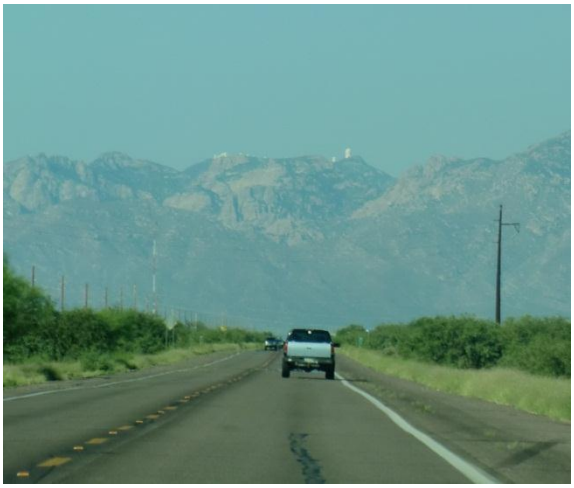
Mount Lemmon SkyCenter is a division of the University of Arizona's Science department. It is supported by individuals and public and private foundations in order to advance the mission of SkyCenter – "to provide unique educational experiences in their sky island setting to all ages." At the time of this writing, the cost is $60 per adult (age 18 and up) and $30 per youth (ages 7 to 17). Please note that for safety reasons, children under age 7 are not permitted at the SkyCenter. For more information, visit the SkyCenter SkyNights website at http://skycenter.arizona.edu/programs/public/skynights. RBAC

Kitt Peak Tour and Stargazing Report – September 4, 2013

By Bill Breeden

TUCSON, ARIZONA – September 4, 2013. After visiting the Mount Lemmon SkyCenter two days earlier, it was now time for my wife and me to visit Kitt Peak during our time in Tucson. Kitt Peak is located about 60 miles southwest of Tucson, at an elevation of 6,875 feet in the Tohono O'Odham Nation. The National Observatory occupies this land by permit and under an agreement with the Tohono O'Odham tribe.

The drive to Kitt Peak is very scenic. Most of the drive out of Tucson is via Arizona State Highway 86, known as Ajo Way in Tucson. This highway travels over much flat desert, with Kitt Peak standing majestically before us as we approached the mountain. Before we reached Route 386 (Kitt Peak Highway), we encountered a U.S. Border Patrol station. Later we discovered that this is due to Route 86's proximity to the US-Mexico border, rather than because of the border with the Tohono O'Odham Nation.



Kitt Peak rises in the distance, with the Mayall 4-Meter Telescope Observatory easily visible just right of center. Photo by Rita Breeden.

Once we reached the base of the mountain, we drove the 12 miles up the mountain road to the summit of Kitt Peak. The many observatory buildings were quite impressive as we approached the visitor center.

We were scheduled for all four programs today, so this was sure to be fun (but long!) day. There were to be three telescope tours, then finally the Nightly Observing Program (NOP), starting at sunset.

Perhaps the most distinct building on top of the mountain, the McMath-Pierce Solar Telescope stands over 130 feet tall and extends more than 300 feet into the mountain itself. The building resembles the number "7" laying on its side, with the longest side facing due north, at an angle equal to Kitt Peak's latitude of about 32 degrees. The solar telescope works by reflecting an image of the Sun down the long axis of the building, reflecting it back up the tube to yet another mirror, then back down again to be focused into equipment for analysis. All this length and reflecting cools the image to a manageable temperature. The Sun image is studied in many wavelengths, as well as spectroscopically. Currently, studies are being conducted on solar activity and why it is less than anticipated during this solar maximum.

The Mayall 4-Meter Telescope Observatory from the road up to the summit. Photo by Bill Breeden.

At 11:30am, our tour or the 2.1 Meter Telescope began. Jim, our docent, explained that this telescope is a Cassegrain design built in 1964. It is still in use. The observatory building has a visitors area, basically a cordoned-off area

surrounded by windows so that visitors can come in and see the equipment without disturbing the astronomers and observatory staff. If you have never seen a 2.1-meter (82 inch) telescope up close, it is very impressive. The telescope is equipped with imaging equipment attached where the eyepiece would be.

After the second tour, Rita and I enjoyed a leisurely lunch that we brought up the mountain in a cooler, along with lots of water and Gatorade. We had extra time available before the Mayall 4 Meter Telescope tour began at 1:30pm.

The Mayall 4 Meter Telescope Observatory is visible from Tucson, and is Kitt Peak's flagship facility. This is also Kitt Peak's longest telescope tour, lasting about two hours. Rita and I made the half-mile hike to the observatory (more difficult than we expected due to the altitude), and took many pictures of the observatory and the surrounding view from the mountaintop. Upon entering the building, we were guided to another "fishbowl," a room specially designed to accommodate visitors. From this room, you can see the telescope, the gigantic mount, and the inside of the observatory dome. You can also see a control room, with working astronomers, telescope operators, and facilities staff.

The McMath-Pierce Solar Telescope. A mirror can be seen on top that follows the Sun across the sky and reflects its light down the telescope building. Photo by Bill Breeden.

The 4-Meter telescope and mount were truly of gargantuan proportions. This is a 158 inch telescope, to put it in familiar terms. The mount is not connected directly to the floor or to the catwalks that staff move about upon, but instead is fixed to a separate pier to isolate vibrations.

Our docent, Jim, shows us the 2.1-Meter Telescope observatory building. Photo by Bill Breeden.

Rita and I had planned our tours of Kitt Peak on the same day as the Nightly Observing Program, without having any real plans for the intervening two hours or so. The mountaintop closes to the public at 4:00pm, with only the visitor center opening again at 5:30 for the Nightly Observing Program. With nothing else to do, Kitt Peak staff played a DVD of Neil DeGrasse Tyson's *400 Years of the Telescope*, and we settled in the visitor center to watch the movie.

The Nightly Observing Program consisted of three parts: An overview of astronomy lecture, binocular observing, then telescope observing in the public telescope observatory next to the visitors center. The observatory contains a 20-inch Ritchey-Chrétien telescope, equipped with a 17mm Nagler eyepiece.

The 2.3-Meter Bok Reflector building (left), and the Mayall 4-Meter Building (right). The Mayall building is visible from Tucson. Photo by Bill Breeden.

Two Kitt Peak docents, Lucas and David, shared the task of running the Nightly Observing Program for us tonight. Lucas began by providing all of us with a planisphere and showing us how to use it. Of course Rita and I already know how to use it, but the instructions were very helpful to the rest of the group. Next, he provided a nice pair of binoculars for each person for the evening, and showed us how to adjust and focus them for our eyes. Very informative, especially for those new to stargazing.

Then we were led outside to an area behind the visitor center to do some actual stargazing, both unaided-eye and binocular. Kitt Peak skies are very dark, showing as in the gray zone on Google Earth's light pollution overlay. The Milky Way gleamed bright overhead, with the Great Rift obviously visible through Cygnus. Lucas pointed out various deep-sky objects for us to observe through our borrowed binoculars.

The Mayall 4-Meter Telescope (white), and its mount (blue). Photo by Bill Breeden.

For the last part of the evening, Lucas turned over the program to David for running the telescope portion. Our group was led into the observatory next to the visitor center, under the illumination of glowing red light around the staircase leading into the building. The telescope viewing was run in a very organized fashion. We were seated along the inside wall of the observatory, and took turns approaching the eyepiece in the order we were seated. Only one person at a time was up at the telescope at any one time, so there was no bumping around the equipment (or other people) in the darkness. We were treated to views through the observatory 20-inch Ritchey-Cretien telescope. Objects were selected in approximate order of distance from Earth: First planets (Saturn), then stars (Albireo), nebulae (M17 and M8), an open cluster (M11), a globular cluster (M13), and finally the Andromeda Galaxy (M31). There may have other objects as well.

The telescope observing lasted about 90 minutes. All of the objects were quite impressive through the eyepiece, although I will say that my enthusiasm for observing these objects through my modest 8-inch Schmidt-Cassegrain has not been spoiled. The thrill of observing these familiar objects through such a large telescope at an extremely dark location, great as it is, is about the same as the thrill of running my own telescope and spending longer amounts of time appreciating the beauty of each celestial target. The law of diminishing

returns applies when observing through larger and larger telescopes. The views through very large telescopes are certainly better, but not as noticeable visually as you might expect. (Photographically would be another matter.) Kitt Peak is an amazing facility, and the contributions that have been made to science and astronomy are world-class. But for the visual amateur astronomer like myself, nothing still beats the thrill of setting up my own telescope, selecting my own deep-sky objects, and lingering at each one for as long as I like. After the airplane ride to Phoenix, the drive to Tucson and up Kitt Peak mountain, the drive to Danville does not seem the least bit daunting!

Rita Breeden (center) standing in front the of the public outreach observatory, next to the Kitt Peak Visitors Center. Photo by Bill Breeden.

Ever drive down a mountain road, with hairpin turns, at night with your headlights off? I have now! Kitt Peak is a research observatory, so they require that you descend down the first mile or so from the summit with your headlights off. If your car has automatic headlights, they will tape covers over them until you reach the one-mile point. The idea of it was scarier than actually doing it. My eyes were dark adapted, and they lead you down that first mile by caravan. I simply followed the taillights in front of me, jokes about following taillights over the side notwithstanding. Anyway, Rita and I did just fine, and reached the base of the mountain, and finally back to Tucson, with no problem.

At the time of this writing, Kitt Peak telescope tours are priced at $9.75 per person for all three telescope tours (this is the total). You can also request a self-tour map and visit the same three telescopes on your own for no cost. The other observatories and telescopes on the mountain are not open to the public, but you are welcome to walk the grounds and take pictures. The Nightly Observing Program costs $42 person and includes a generous box dinner, which for us was a ham sandwich, potato chips, an apple, a granola bar, a small pack of Oreos, and bottled water. For more information about Kitt Peak's tours and programs, visit their web site at http://www.noao.edu/outreach/kpoutreach.html. RBAC

See Comet C/2012 S1 (ISON) this November and December!

By Bill Breeden

Comet ISON has received a lot of attention this year from astronomers world-wide. It reaches perihelion, it's closest approach to the Sun, on November 28. Astronomers are hoping that the comet will reach unaided-eye visibility some time before and after November 28, especially the period of November 14 through December 12.

Beginning in late October, get your binoculars out before dawn and try to find Comet ISON in southern Leo. It shines about magnitude 9 at the time of this writing in late October, and that is with no Moon in the sky. During the next month, it will brighten considerably, but astronomers cannot predict precisely how bright it will get. It could reach magnitude -6, which brings it just at the threshold for daytime visibility. Due to its proximity to the Sun, do not use any optical aid to find it while the Sun is above the horizon.

During November and most of December, comet ISON will be best viewed before dawn. Around November 17 and 18, the comet is near the bright star Spica. By late December it becomes an evening (and morning) object, heading almost due northward toward Polaris.

Here is where to find Comet ISON in the sky during weekends in November and December.

Sat. 11/2 RA 11hr 18min Dec +05° 42'
Look for ISON in the morning sky (Sunday morning 11/3) before the sun rises, in southern Leo below Mars. Predicted to be about 8th magnitude.

Sat. 11/9 RA 12hr 01min Dec -00° 05'
Look for ISON in the morning sky (Sunday morning 11/10) before the sun rises, in western Virgo, near Beta Virginis, below Mars. Predicted magnitude is around 7.

Sat. 11/16 RA 13hr 03 min Dec -08° 08'
Look for ISON in the morning sky (Sunday morning 11/17) about 5:00AM, in Virgo near the bright star Spica. Should reach 5th magnitude.

Sat. 11/23 RA 14hr 31min Dec -17° 38'
Look for ISON in the morning sky (Sunday morning 11/24) about 6:00AM, in Libra near Saturn, Mercury, and the star Zubenelgenubi. Predicted magnitude is 3.5.

Sat. 11/30 RA 16hr 21min Dec -16° 21'
Look for ISON in the late afternoon, setting just after the Sun sets. It sits very close to the Ophiuchus-Scorpius border. On November 28 and 29, it reaches its brightest magnitude, possibly reaching -6 (wow!). Look for it in the daytime sky near the Sun. Caution – DO NOT USE OPTICAL AID.

Sat. 12/7 RA 16hr 12min Dec -02° 36'
Comet ISON sets with the sun, so it will be difficult to observe. Your best bet is to try to see it in the morning sky about 5:50AM, just before the Sun rises. It is located in Serpens Caput, near the Yed stars of Ophiuchus. It should be about 4th magnitude.

Sat. 12/14 RA 16hr 10min Dec +12° 11'
Look for ISON in the evening sky just after sunset. It is located in Serpens Caput, near the border with Hercules. It will be about magnitude 5. Look for a tail!

Sat. 12/21 RA 16hr 14min Dec +32° 01'
ISON will be in the Northern Crown (Corona Borealis), visible for a while after sunset. It will still be around 5th magnitude, and should have a visible tail.

Sat. 12/28 RA 16hr 25min Dec +60° 16'
Look for ISON in Cassiopeia. The comet is far enough north now to be circumpolar, so it is visible all night. It should be about 6th magnitude.

Because of ISON's far northerly declination during the holidays, some astronomers are calling it the Christmas Comet of 2013. Be sure to catch this comet, and happy observing!

RBAC

RBAC's Monthly Observing Lists

These lists include brighter deep-sky objects that transit near 10:00 PM each month.

November Observing List

Prepared by Bill Breeden

Double Stars (Astronomical League's Double Star List)
_____ 1. Eta Cassiopeiae SAO 21732 Achird Const. CAS Type DS RA 00 49.1 Decl. +57° 49' Mag. 3.4 7.5
_____ 2. 65 Piscium SAO 74295 Const. PSC Type DS RA 00 49.9 Decl. +27° 43' Mag. 6.3 6.3
_____ 3. Psi 1 Piscium SAO 74482 Const. PSC Type DS RA 01 05.6 Decl. +21° 28' Mag. 5.6 5.8
_____ 4. Zeta Piscium SAO 109739 Const. PSC Type DS RA 01 13.7 Decl. +07° 35' Mag. 5.6 6.5
_____ 5. Gamma Arietis SAO 92680 Mesarthim Const. ARI Type DS RA 01 53.5 Decl. +19° 18' Mag. 4.8 4.8
_____ 6. Lambda Arietis SAO 75051 Const. ARI Type DS RA 01 57.9 Decl. +23° 36' Mag. 4.9 7.7

Carbon Stars (Astronomical League's Carbon Star List)
_____ 1. WZ Cassiopeiae SAO 21002 RA 00 01 15 Decl. +60 21 19 Mag. 6.9 – 11.0 Per. 186 Class C9 (N1)
_____ 2. SU Andromedae GSC 2793:243 RA 00 04 36 Decl. +43 33 04 Mag. 8.0 – 8.5 Per. Irr. Class C6 (Nb)
_____ 3. SAO 109003 (Pisces) GSC 594:778 RA 00 05 22 Decl. +08 47 16 Mag. 8.2 – 8.3 Per. ? Class C (G4V)
_____ 4. VX Andromedae GSC 2794:14 RA 00 19 54 Decl. +44 42 33 Mag. 7.8 – 9.3 Per. 369 Class C4 (N7)
_____ 5. AQ Andromedae GSC 2270:318 RA 00 27 31 Decl. +35 35 14 Mag. 6.9 – 8.6 Per. 346 Class C5 (Nb)
_____ 6. NSV 15196 (Andromeda) SAO 74353 RA 00 54 13 Decl. +24 04 01 Mag. 8.3–8.7 Per. 755 Class C1 (Rp)
_____ 7. W Cassiopeiae GSC 368:1824 RA 00 54 53 Decl. +58 33 49 Mag. 7.8 – 12.5 Per. 406 Class C7
_____ 8. Z Piscium SAO 74593 RA 01 16 05 Decl. +25 46 09 Mag. 6.5 – 7.9 Per. 144 Class C7 (N0)

Messier Objects
_____ M31 NGC224 Andromeda Galaxy Const. AND Type GAL RA 00 42.7 Decl. +41 16 Mag. 4.8
_____ M32 NGC221 Companion of And Galaxy Const. AND Type GAL RA 00 42.7 Decl. +40 52 Mag. 8.7
_____ M33 NGC598 Const. TRI Type GAL RA 01 33.9 Decl. +30 39 Mag. 6.7
_____ M74 NGC628 Const. PSC Type GAL RA 01 36.7 Decl. +15 47 Mag. 10.2
_____ M76 NGC650 Little Dumbbell Nebula Const. PER Type PN RA 01 42.4 Decl. +51 34 Mag. 10.1
_____ M103 NGC581 Const. CAS Type OC RA 01 33.2 Decl. +60 42 Mag. 7.4
_____ M110 NGC205 Const. AND Type GAL RA 00 40.4 Decl. +41 41 Mag. 9.4

Caldwell Objects
_____ C1 NGC188 Const. CEP Type OC RA 00 44 24.00 Decl. +85 20 00.0 Mag. 8.1
_____ C2 NGC40 Const. CEP Type PN RA 00 13 00.00 Decl. +72 32 00.0 Mag. 11.6
_____ C8 NGC559 Const. CAS Type OC RA 01 29 30.00 Decl. +63 18 00.0 Mag. 9.5
_____ C10 NGC663 Const. CAS Type OC RA 01 46 00.00 Decl. +61 15 00.0 Mag. 7.1
_____ C13 NGC457 ET Cluster Const. CAS Type OC RA 01 19 06.00 Decl. +58 20 00.0 Mag. 6.4
_____ C17 NGC147 Const. CAS Type EG RA 00 33 12.00 Decl. +48 30 00.0 Mag. 9.3
_____ C18 NGC185 Const. CAS Type EG RA 00 39 00.00 Decl. +48 20 00.0 Mag. 9.2
_____ C28 NGC752 Const. AND Type OC RA 01 57 48.00 Decl. +37 41 00.0 Mag. 5.7
_____ C43 NGC7814 Const. PEG Type SG RA 00 03 18.00 Decl. +16 09 00.0 Mag. 10.5
_____ C51 IC1613 Const. CET Type IG RA 01 04 48.00 Decl. +02 07 00.0 Mag. 9
_____ C56 NGC246 Const. CET Type PN RA 00 47 00.00 Decl. -11 53 00.0 Mag. 8
_____ C62 NGC247 Const. CET Type SG RA 00 47 06.00 Decl. -20 46 00.0 Mag. 8.9
_____ C65 NGC253 Sculptor Galaxy Const. SCL Type SG RA 00 47 36.00 Decl. -25 17 00.0 Mag. 7.1
_____ C70 NGC300 Const. SCL Type SG RA 00 54 54.00 Decl. -37 41 00.0 Mag. 8.1
_____ C72 NGC55 Const. SCL Type SG RA 00 14 54.00 Decl. -39 11 00.0 Mag. 8.2
_____ C104 NGC362 Const. TUC Type GC RA 01 03 12.00 Decl. -70 51 00.0 Mag. 6.6
_____ C106 NGC104 47 Tucana Const. TUC Type GC RA 00 24 06.00 Decl. -72 05 00.0 Mag. 4

Royal Astronomical Society of Canada Objects
_____ 6. NGC185 Const. CAS Type G-E0 RA 00 39.0 Decl. +48 20 Mag. 11.7
_____ 7. NGC281 Const. CAS Type EN RA 00 52.8 Decl. +56 36 Mag. -
_____ 8. NGC457 ET Cluster Const. CAS Type OC RA 01 19.1 Decl. +58 20 Mag. 6.4
_____ 9. NGC663 Const. CAS Type OC RA 01 46.0 Decl. +61 15 Mag. 7.1
_____ 13. NGC253 Const. SCL Type G-Scp RA 00 47.6 Decl. -25 17 Mag. 7.1
_____ 14. NGC772 Const. ARI Type G-Sb RA 01 59.3 Decl. +19 01 Mag. 10.3
_____ 15. NGC246 Const. CET Type PN RA 00 47.0 Decl. -11 53 Mag. 8

_____ 110. NGC40 Const. CEP Type PN RA 00 13.0 Decl. +72 32 Mag. 10.2

December Observing List

Prepared by Bill Breeden

Double Stars (Astronomical League's Double Star List)

_____ 7. Alpha Piscium SAO 110291 Al Rischa Const. PSC Type DS RA 02 02.0 Decl. +02° 46' Mag. 4.2 5.1
_____ 8. Gamma Andromedae SAO 37734 Almach Const. AND Type DS RA 02 03.9 Decl. +42° 20' Mag. 2.3
_____ 9. Iota Trianguli SAO 55347 Const. TRI Type DS RA 02 12.4 Decl. +30° 18' Mag. 5.3 6.9
_____ 10. Alpha Ursae Minoris SAO 15384 Polaris Const. UMI Type DS RA 02 31.8 Decl. +89° 16' Mag. 2.0 9.0
_____ 11. Gamma Ceti SAO 110707 Kaffaljidhma Const. CET Type DS RA 02 43.3 Decl. +03° 14' Mag. 3.5 7.3
_____ 12. Eta Persei SAO 23655 Miram Const. PER Type DS RA 02 50.7 Decl. +55° 54' Mag. 3.8 8.5
5.5
_____ 13. Struve 331 SAO 23763 Const. Type DS RA 03 00.9 Decl. +52° 21' Mag. 5.3 6.7
_____ 14. 32 Eridani SAO 130805 Const. ERI Type DS RA 03 54.3 Decl. -02° 57' Mag. 4.8 6.1

Carbon Stars (Astronomical League's Carbon Star List)

_____ 9. V Arietis SAO 92853 RA 02 15 00 Decl. +12 14 23 Mag. 8.3 – 10.8 Per. 77 Class C4 (R8)
_____ 10. SAO 129989 (Cetus) GSC 5285:3 RA 02 35 06 Decl. -09 26 34 Mag. 8.2 – 8.5 Per. ? Class C2 (R3)
_____ 11. UY Andromedae GSC 2832:2 RA 02 38 23 Decl. +39 10 09 Mag. 7.4 – 12.3 Per. ? Class C5 (N3)
_____ 12. V623 Cassiopeiae SAO 23858 RA 03 11 25 Decl. +57 54 11 Mag. 7.3 – 8.1 Per. ? Class C4 (R5)
_____ 13. Y Persei GSC 2873:1287 RA 03 27 42 Decl. +44 10 36 Mag. 8.1 – 11.3 Per. 249 Class C4 (R4)
_____ 14. V466 Persei NSV 1223 RA 03 41 29 Decl. +51 30 11 Mag. 8.4 – 8.9 Per. ? Class C5 (N5)
_____ 15. U Camelopardalis SAO 12870 RA 03 41 48 Decl. +62 38 54 Mag. 6.9 – 7.6 Per. ? Class C3 – C6 (N5)

Messier Objects

_____ M34 NGC1039 Const. PER Type OC RA 02 42.0 Decl. +42 47 Mag. 5.5
_____ M45 Pleiades Const. TAU Type OC RA 03 47.0 Decl. +24 07 Mag. 1.6
_____ M77 NGC1068 Const. CET Type GAL RA 02 42.7 Decl. -00 01 Mag. 8.9

Caldwell Objects

_____ C5 IC342 Const. CAM Type SG RA 03 46 48.00 Decl. +68 06 00.0 Mag. 9.2
_____ C14 NGC869/884 Double Cluster Const. PER Type OC RA 02 20 00.00 Decl. +57 08 00.0 Mag. 4.3
_____ C23 NGC891 Const. AND Type SG RA 02 22 36.00 Decl. +42 21 00.0 Mag. 9.9
_____ C24 NGC1275 Per A Radio Source Const. PER Type IG RA 03 19 48.00 Decl. +41 31 00.0 Mag. 11.6
_____ C67 NGC1097 Const. FOR Type SG RA 02 46 18.00 Decl. -30 17 00.0 Mag. 9.2
_____ C87 NGC1261 Const. HOR Type GC RA 03 12 18.00 Decl. -55 13 00.0 Mag. 8.4

Royal Astronomical Society of Canada Objects

_____ 10. IC 289 Const. CAS Type PN RA 03 10.3 Decl. +61 19 Mag. 12.3
_____ 12. NGC891 Const. AND Type G-Sb RA 02 22.6 Decl. +42 21 Mag. 10
_____ 16. NGC936 Const. CET Type G-SBa RA 02 27.6 Decl. -01 09 Mag. 10.1
_____ 17. NGC869/884 Double Cluster Const. PER Type OC RA 02 20.0 Decl. +57 08 Mag. ~4.4
_____ 18. NGC1023 Const. PER Type G-E7p RA 02 40.4 Decl. +39 04 Mag. 9.5
_____ 21. NGC1232 Const. ERI Type G-Sc RA 03 09.8 Decl. -20 35 Mag. 9.9