Snake River Skies

The Newsletter of the Magic Valley Astronomical Society

www.mvastro.org

Membership Meeting

Saturday, May 14th 2016
7:00pm at the
Herrett Center for Arts & Science
College of Southern Idaho.

Public Star Party Follows at the Centennial Observatory

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Magic Valley Astronomical Society is a member of the Astronomical League

M-51 imaged by
Rick Widmer &
Ken Thomason
Herrett Telescope
Shotwell Camera

President's Message

Colleagues,

May is upon us, and that's when things really kick in! Here's what's on the docket:

- We are scheduled for a MVAS star party Friday, May 6, originally planned at Thorn Creek Ridge. Weather at this point, however, appears be a factor, so be on the lookout for announcements over the E-mail listserv.
- Monday, May 9, is the transit of Mercury. This is a morning to early afternoon transit, so when the sun arises that morning, the winged messenger will already appear to be in the lower left corner of the sun. The Centennial Observatory at the Herrett Center will be open at 6:15 a.m. that day and will close at 12:45 p.m., just after the planet's egress. From Twin Falls, the greatest transit is expected at 8:57 a.m. Please feel free to help out at the Herrett Center that day. We look forward to seeing your pictures.
- Saturday, May 14th is the annual Astronomy Day at the Herrett Center. If you can volunteer, feel free to contact Chris Anderson. If you can't because you've got family, well, bring them by.
- That evening is the monthly MVAS meeting. A few months ago, high school students competed training on the use of the Centennial Observatory telescope, and this month they'll introduce themselves to us. In addition, there's some Astronomical League information regarding outreach awards that we would like to share and discuss with you at that time as well.

Clear Views,

Robert Mayer

Calendars for March

Event Calendar

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6 New Moon Lunation 1155 	7
8 Mother's Day 	9 Transit of Mercury BAS Membership Mtg. at the Boise Public Library	10 Moon at greatest N Declination (+18.4°) 	11	12	13 First Quarter 48% Visible 	14 International Astronomy Day 
15	16	17	18	19	20	21 Full Planting Moon 
22	23	24 Moon at greatest S Declination (-18.4°) 	25	26	27	28
29 Last Quarter 47% Visible 	30 Memorial Day 	31				

Snake River Skies is the Newsletter of the Magic Valley Astronomical Society and is published electronically once a month.

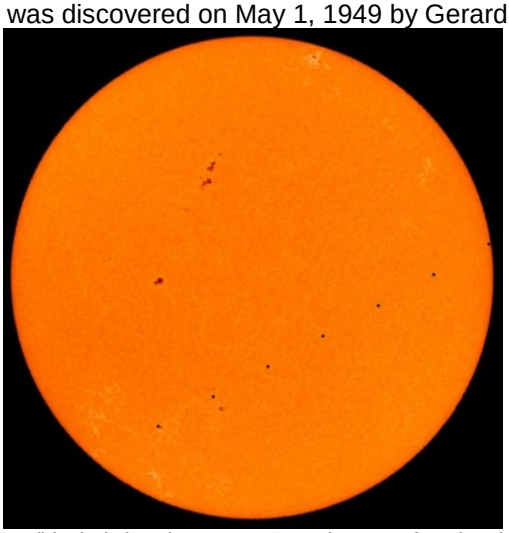
Celestial Events

All times, unless otherwise noted, are Universal Time (subtract six hours and, when appropriate, one calendar day for Mountain Daylight Time. UT is 24-hour time format).

5/1 May Day or Beltane, a cross-quarter day
5/2 Neptune is 1.6 degrees south-southeast of the Moon at 11:00; asteroid 18 Melpomene is 1.4 degrees north-northwest of the Moon at 12:00
5/3 The Moon is at the descending node at 1:28
5/5 Uranus is 2.1 degrees north-northwest of the Moon at 4:00; the peak of the Eta Aquarid meteor shower (20 per hour for northern observers) occurs at 20:00
5/6 The Moon is at perigee, subtending 33' 23" from a distance of 357,827 kilometers (222,344 miles).
5/7 A double Galilean satellite shadow transit begins at 4:39
5/8 The Moon is 0.47 degree north-northwest of the first-magnitude star Aldebaran (Alpha Tauri), with an occultation occurring in Japan, China, Russia, the Middle East, southern Europe, and northern and northeastern Africa, at 9:00
5/9 Mercury is at the descending node at 8:00; Mercury begins to transit the Sun at 11:12; Mercury is in inferior conjunction at 15:00; the Moon is 5.9 degrees south of the bright open star cluster M35 in Gemini at 21:00; Jupiter is stationary in right ascension at 23:00
5/12 The Moon is 4.7 degrees south of the bright open star cluster M44 (the Beehive Cluster or Praesepe) in Cancer.
5/13 Mercury is 0.38 degree south-southeast of Venus at 18:00; the Sun enters the constellation of Taurus at 19:00
5/14 The Lunar X (also known as the Werner or Purbach Cross), an X-shaped illumination effect involving various rims and ridges between the craters La Caille, Blanchinus, and Purbach, is predicted to begin at 1:02; the Moon is 2.2 degrees south-southwest of the first-magnitude star Regulus (Alpha Leonis).
5/15 Jupiter is 1.9 degrees north-northeast of the Moon at 8:00; the Moon is at the ascending node.
5/18 The Moon is 4.9 degrees north-northeast of the first-magnitude star Spica (Alpha Virginis); the Moon is at apogee, subtending 29' 26" from a distance of 405,933 kilometers (252,235 miles), at 22:00
5/19 Mercury is at aphelion (0.4667 astronomical units from the Sun) at 17:00
5/21 Mercury is stationary in right ascension at 22:00; Mars is 5.9 degrees south of the Moon at 22:00
5/22 Mars (apparent size 18.4", magnitude -2.05) is at opposition at 11:17; the Moon is 9.5 degrees north of the first-magnitude star Antares (Alpha Scorpii) at 14:00; Saturn is 3.2 degrees south of the Moon.
5/23 Asteroid 4 Vesta is in conjunction with the Sun at 19:00
5/24 Venus is 4.6 degrees south-southeast of the bright open star cluster M45 (the Pleiades or Subaru) in Taurus at 16:00
5/25 Pluto is 3.0 degrees north of the Moon at 15:00
5/29 Asteroid 7 Iris (magnitude +9.2) is at opposition at 18:00; Neptune is 1.4 degrees south-southeast of the Moon.
5/30 The Curtiss Cross, an X-shaped illumination effect located between the craters Parry and Gambart, is predicted to begin at 4:10; the Moon is at the descending node at 4:46; asteroid 18 Melpomene is 1.4 degrees north-northwest of the Moon at 21:00; Mars is closest to the Earth (75,280,000 kilometers or 46,777,000 miles) at 21:34

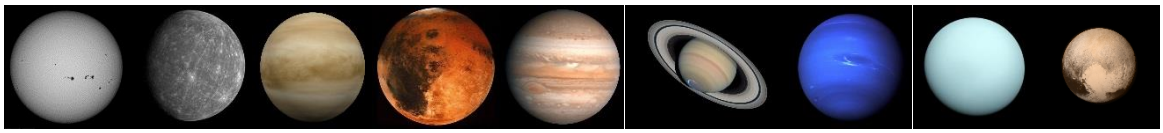
Nicolas Lacaille (1713-1762) and Joseph Lockyer (1836-1920) were born this month.

Nereid, Neptune's third-largest satellite, was discovered on May 1, 1949 by Gerard Kuiper.



Simulated solar-filtered telescope view of Mercury (black dot) as it moves across the sun's face in 1 hour intervals, from 6:30 AM MDT (lower left) to 12:30 PM MDT (far right). (Sunspots are for illustration purposes only—any sunspots on the actual day of the transit will be different in both size and location.) Picture by Chris Anderson, Centennial Observatory, Herrett Center, College of Southern Idaho Twin Falls, Idaho, USA

The Sun, the Moon, & the Planets



The Sun is located in Aries on May 1st.

In the evening, Mars is in the southeast and Jupiter in the south. Mars is located in the southeast, Jupiter in the west, and Saturn in the southeast at midnight. Mercury can be seen in the east, Venus in the southwest, Saturn in the southwest, Uranus in the east, and Neptune in the southeast at dawn.

Mercury transits the Sun on May 9th. This relatively rare event, the first one since 2006, is visible in its entirety from eastern North and South America, the Atlantic Ocean, and Western Europe. At least part of the transit can be seen from the rest of the world. Telescopes equipped with proper solar filters will be available at the East side of the College of Western Idaho, Main Campus Bldg. 5500 E. Opportunity Dr.

5:12 - **First contact.** Mercury begins to cross sun's face (pre-sunrise, not visible from Idaho).
5:15 - **Second contact.** Mercury appears as black dot completely on sun's disc (pre-sunrise, not visible from Idaho). Please dress warmly!
6:22 - **Sunrise.** Mercury already visible as a tiny black "ink drop" (silhouette) near the sun's lower left edge (only with solar-filtered telescope).
8:57 - **Greatest transit.** Mercury makes its closest apparent approach to the center of the sun's disc.
12:39 - **Third contact.** Mercury's leading edge appears to contact the edge of the sun's disc.
12:42 - **Last contact.** Mercury exits the solar disc, ending the transit.
13:00 – **Observing Ends.**

Venus is not observable this month.

The apparent brightness of Mars exceeds magnitude -1.50 on May 1st. Mars rises around 10:00 p.m. local daylight time on that date. It passes 1.2 degrees north of the globular cluster M80 on May 6th and 1.0 degree north of the second-magnitude star Delta Scorpii on May 19th. By May 19th, Mars exceeds magnitude -2.00. The best Martian opposition in eleven years takes place on May 22nd. Mars subtends 18.4 arc seconds and shines at magnitude -2.05 on that date and reaches a maximum brightness of magnitude -2.06 the next day. The Martian North Pole is inclined 12 degrees toward the Earth at opposition. Since it is late summer on Mars, the southern polar cap may be more visible than the northern one. On May 28th, the Red Planet leaves Scorpius and enters Libra as it progresses on its retrograde opposition loop. When it makes its closest approach to the Earth (0.50321 astronomical units or 4.19 light-minutes) on May 30th, Mars subtends 18.6 arc seconds and is 21 degrees south of the celestial equator.

Jupiter decreases in brightness from magnitude -2.3 to magnitude -2.1 and shrinks in angular diameter from 40.8 arc seconds to 37.4 arc seconds during May. Jupiter sets around 4:00 a.m. local daylight time on May 1st and 2:00 a.m. local daylight time on May 31st. A double Galilean satellite shadow transit involving Callisto and Io occurs on May 7th. Jupiter completes its retrograde loop on May 9th and begins to move eastward through southern Leo. The waxing gibbous Moon passes 1.9 degrees south of Jupiter on May 15th.

At mid-month, Saturn shines at magnitude +0.1 and has an apparent equatorial diameter of 18.3 arc seconds. Its rings are inclined by 26 degrees and subtend 41.6 arc seconds. Eighth-magnitude Titan is positioned north of the planet on May 5th and May 21st and south of it on May 13th and May 29th. Saturn's variably bright moon Iapetus passes two arc minutes south of Saturn on May 31st-June 1st.

Uranus is lost in morning twilight until late May.

Neptune lies within one half of a degree of the fourth-magnitude star Lambda Aquarii this month.

Pluto lies in northern Sagittarius and transits the meridian before dawn.

For more on the planets and how to locate them, browse http://www.nakedeyeplanets.com/

A wealth of current information on solar system celestial bodies is posted at http://www.curtrenz.com/astronomy.html and http://nineplanets.org/

Asteroids

Asteroid 6 Hebe (magnitude +10.5) glides southeastward through Leo this month. It passes just southeast of the twelfth-magnitude spiral galaxy NGC 3801 on May 1st and very close to Comet 9P/Tempel on May 11th. By the end of May, 6 Hebe is about two degrees northwest of Denebola. Some of the brighter asteroids reaching opposition this month include 23 Thalia (magnitude +10.4) on May 22th, 432 Pythia (magnitude +10.9) on May 26th, 7 Iris (magnitude +9.2) on May 29th, and 516 Amherstia (magnitude +10.6) on May 31th. Information on asteroid occultations taking place this month is available at http://www.asteroido.../2016_05_si.htm

Comets

Comet C/2013 X1 (PanSTARRS) travels southwestward through Aquarius during May. It can be seen low in the east before dawn. The periodic comet 9P/Tempel heads southeastward through Leo. It lies about one degree southwest of the second-magnitude star Denebola on May 21st. Visit http://cometchasing.skyhound.com/ and http://www.aerith.ne...ly/current.html for information on comets visible this month.

Meteors

The peak of the Eta Aquarid meteor shower on the afternoon of May 5th occurs near New Moon so meteor watching should be almost equally good on the mornings of May 5th and May 6th. Southern hemisphere observers are favored. Eta Aquarid meteors are debris from the famous periodic comet 1P/Halley.

Carbon Star

Notable carbon star for May: SS Virginis Right Ascension: $12^{h}\ 25^{m}\ 12^{s}$ / Declination: 00° 46′ 00″

The Deep Sky

Star maps for May can be viewed at http://www.skymaps.com/downloads.html and http://www.telescope...thly-Star-Chart

The famous eclipsing variable star Algol (Beta Persei) is at a minimum, decreasing in magnitude from 2.1 to 3.4, on May 3rd, 6th, 9th, 12th, 15th, 18th, 20th, 23rd, 26th, and 29th. For more on Algol, see http://stars.astro.i.../sow/Algol.html

Top ten deep-sky objects for May: M3, M51, M63, M64, M83, M87, M104, M106, NGC 4449, NGC 4565

Top ten deep-sky binocular objects for May: M3, M51, M63, M64, M84, M86, M87, M104, M106, Mel 111

Challenge deep-sky object for May: **3C 273** (Virgo) Right Ascension: $12^h\ 29^m\ 06.7^s$ / Declination: +02° 03′ 09″ **3C 273** is a quasar located in the constellation Virgo. It was the first quasar ever to be identified.

3C 273 / HST image

ISS

Information on Iridium flares and passes of the ISS, the Tiangong-1, the X-37B, the HST, and other satellites can be found at http://www.heavens-above.com/ Receive ISS Pass alerts via e-mail http://www.calsky.com/ or receive texts and e-mails direct from NASA http://spotthestation.nasa.gov/

Space Flowers: Flowers grown as an experiment aboard the ISS

Be Safe - Go Outside - Explore Your Universe

TELRAD for Beginners and Beyond

By Randy Holst, President BAS

The Problem

Most every new owner of a telescope has experienced the difficulty and frustration of trying to aim the scope at a particular object in the night sky. Since the telescope can only see a very small portion of the night sky, an aiming device called a “finder” is attached to the scope to make aiming easier. The finder has less magnification and a wider field of view. The finder must be adjusted so that it looks at the exact same point in space as the main telescope. This adjustment is best done during daylight, using a small distant object as a target.

Typical magnifying finder scope

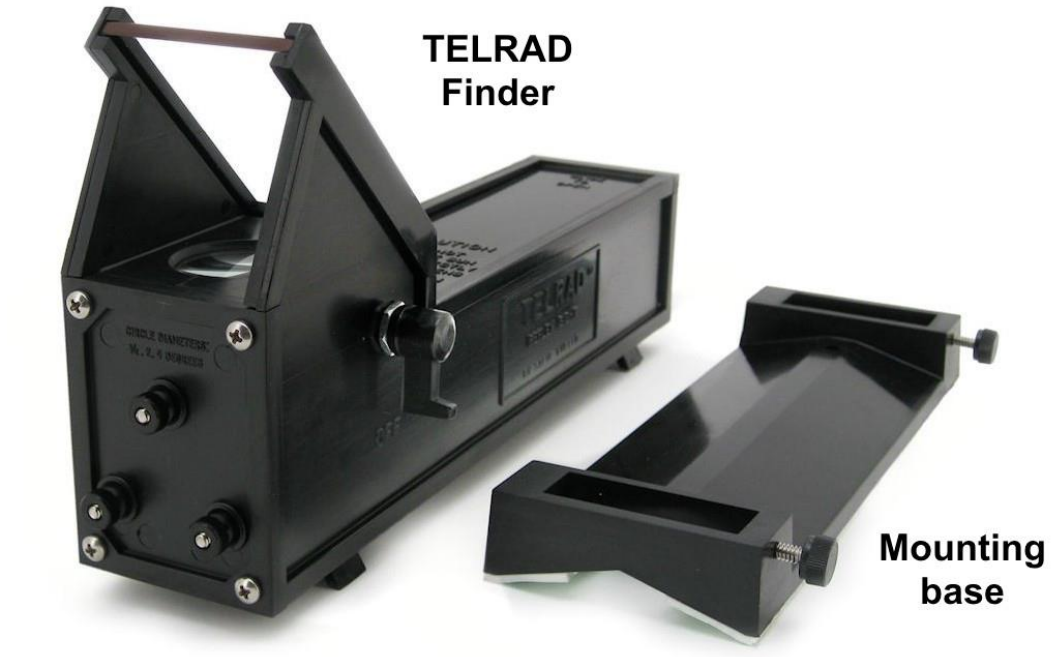
Most new telescopes come equipped with small, inexpensive ”finder” scopes, which resembles larger refractor telescopes, often 6x30 (6x magnification with a 30mm objective lens) or maybe a little larger. The problems with these finders are:

- They are difficult to focus, clumsy to aim and they go out of adjustment easily.
- Everything you see in these finders is upside down and reversed left to right.
- They are dim and provide a narrow field of view.
- Your eye must be very close to the eyepiece to see anything.

You can purchase a larger, better quality magnifying finder scope and mount but they can get quite expensive. Still, most of the problems of the lesser finder scopes will remain. These difficulties plague both beginners and well experienced astronomers alike.

Enter the TELRAD

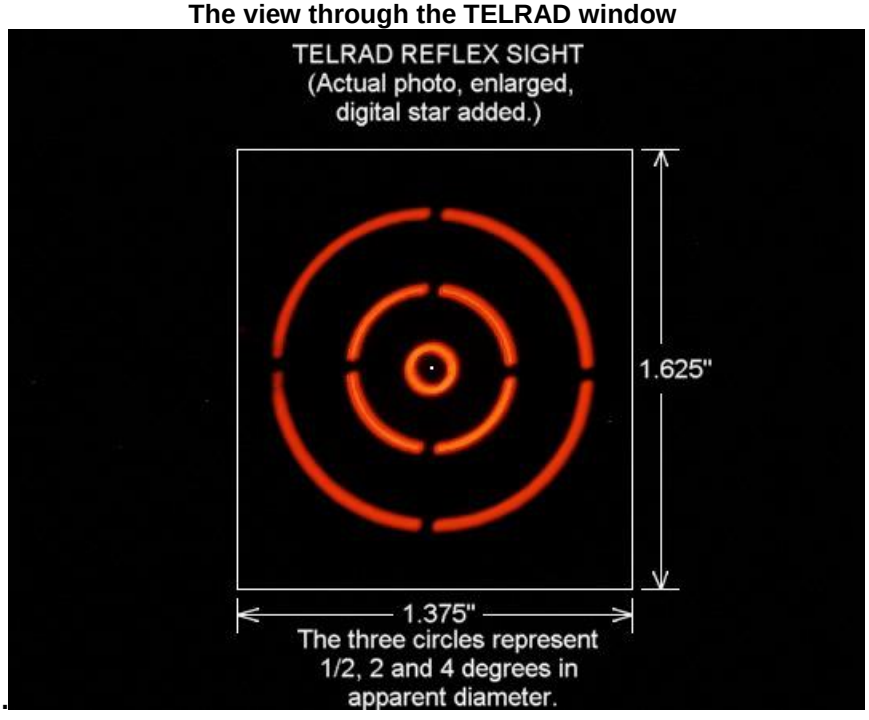
Back in the late 70’s, a mechanical engineer and amateur astronomer named Steve Kufeld figured there must be a better way and began development on the TELRAD. It was so simple and so well designed that it has remained virtually unchanged for over 30 years. It’s also inexpensive; about $40, with mounting base, from most any telescope vendor. The main idea behind the TELRAD is that it incorporates the same heads-up display principle used in modern fighter aircraft. As you look through the finder’s clear glass window at the night sky, you see a red illuminated “bulls-eye” superimposed on the star field. This is a 1x finder with no magnification yet you can precisely aim your telescope to within a small fraction of a degree.



TELRAD advantages:

- The view through the TELRAD window is “normal”, not reversed or upside down.
- You can clearly see the sky around the TELRAD window for easy orientation.
- The TELRAD “bulls-eye” helps you judge angular distances between objects.
- You can view the TELRAD “bulls-eye” image up to two feet away.
- The three adjustment knobs allow precise alignment and are not easily disturbed.
- The brightness of the TELRAD “bulls-eye” is easily adjustable.
- No focus adjustment is required as with magnifying optical finders.
- Many printed and computer star charts provide a superimposed TELRAD “bulls-eye”.
- It is easily removable, leaving the mounting base attached to the telescope.
- Self-aligning when reinstalled in the mounting base, with little or no adjustment necessary.
- Powered by two 1.5 volt AA batteries which are easy to replace and last for years.
- Can be moved to different scopes which are equipped with inexpensive TELRAD bases.

The view through the TELRAD window



Mounting a TELRAD on your telescope
Each TELRAD finder comes with a mounting base which is permanently attached to the telescope's optical tube. The base comes with double-stick foam tape which will hold the base securely to the telescope's optical tube of 4" diameter or larger. For some smaller/shorter telescopes, the TELRAD can be mounted on a home-made bracket via screw holes in the base. Be sure to save the foam lined box it is shipped in as it makes a good place to safely store it.

Adding a TELRAD to your telescope is usually not difficult and it will certainly make it much easier and more fun to use. Whether you have a simple manual Alt-Az mounted scope or a large computer controlled Go-To scope, you will surely find a TELRAD a welcome addition. Most everyone who has purchased one on my recommendation has loved it and wished they'd gotten one sooner. It really does make finding objects in the night sky much easier.

TELRAD on an 8" SCT

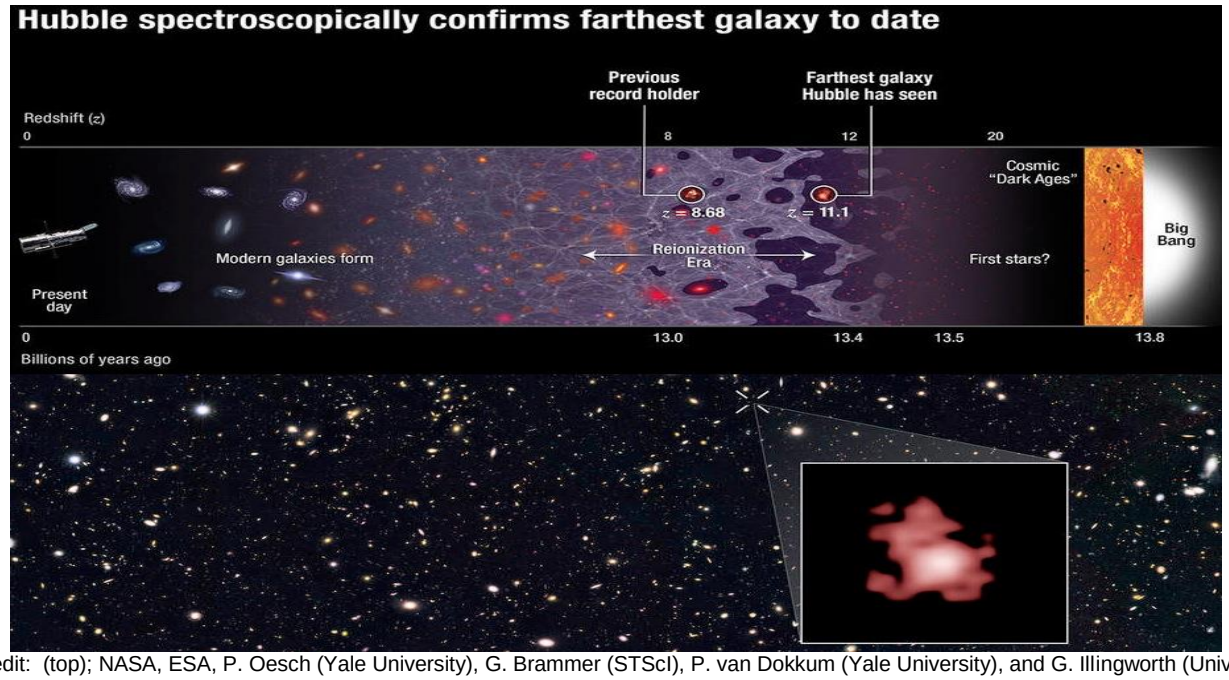
TELRAD on a 3" Refractor, with home-made bracket

Hubble Shatters the Cosmic Record for Most Distant Galaxy

By Dr. Ethan Siegel

The farther away you look in the distant universe, the harder it is to see what's out there. This isn't simply because more distant objects appear fainter, although that's true. It isn't because the universe is expanding, and so the light has farther to go before it reaches you, although that's true, too. The reality is that if you built the largest optical telescope you could imagine -- even one that was the size of an entire planet -- you still wouldn't see the new cosmic record-holder that Hubble just discovered: galaxy GN-z11, whose light traveled for 13.4 billion years, or 97% the age of the universe, before finally reaching our eyes. There were two special coincidences that had to line up for Hubble to find this: one was a remarkable technical achievement, while the other was pure luck. By extending Hubble's vision away from the ultraviolet and optical and into the infrared, past 800 nanometers all the way out to 1.6 microns, Hubble became sensitive to light that was severely stretched and red-shifted by the expansion of the universe. The most energetic light that hot, young, newly forming stars produce is the Lyman-α line, which is produced at an ultraviolet wavelength of just 121.567 nanometers. But at high redshifts, that line passed not just into the visible but all the way through to the infrared, and for the newly discovered galaxy, GN-z11, its whopping redshift of **11.1** pushed that line all the way out to 1471 nanometers, more than double the limit of visible light!

Hubble itself did the follow-up spectroscopic observations to confirm the existence of this galaxy, but it also got lucky: the only reason this light was visible is because the region of space between this galaxy and our eyes is mostly ionized, which *isn't true* of most locations in the universe at this early time! A redshift of 11.1 corresponds to just 400 million years after the Big Bang, and the hot radiation from young stars doesn't ionize the majority of the universe until 550 million years have passed. In most directions, this galaxy would be invisible, as the neutral gas would block this light, the same way the light from the center of our galaxy is blocked by the dust lanes in the galactic plane. To see farther back, to the universe's first true galaxies, it will take the James Webb Space Telescope. Webb's infrared eyes are much less sensitive to the light-extinction caused by neutral gas than instruments like Hubble. Webb may reach back to a redshift of 15 or even 20 or more, and discover the true answer to one of the universe's greatest mysteries: when the first galaxies came into existence!



Images credit: (top); NASA, ESA, P. Oesch (Yale University), G. Brammer (STScI), P. van Dokkum (Yale University), and G. Illingworth (University of California, Santa Cruz) (bottom), of the galaxy GN-z11, the most distant and highest-redshifted galaxy ever discovered and spectroscopically confirmed thus far.=

Centennial Observatory and Faulkner Planetarium

Herrett Telescope CSI Centennial Observatory

Event	Place	Date	Time	Admission
Transit of Mercury	Centennial Observatory	Monday, May 9th, 2016	6:15 AM to 12:45 PM	FREE
International Astronomy Day solar viewing	Centennial Observatory	Saturday, May 14th, 2016	11:00 AM to 4:00 PM	FREE
International Astronomy Day nighttime telescope viewing	Centennial Observatory	Saturday, May 14th, 2016	9:00 PM to 12:00 AM	FREE

Faulkner Planetarium Show Times (through Memorial Day)	
Tuesdays	7:00 PM
Fridays	7:00 PM 8:00 PM
Saturdays	1:30 PM 2:30 PM 3:30 PM 4:30 PM 7:00 PM 8:00 PM

Now Showing

About the Magic Valley Astronomical Society

Magic Valley Astronomical Society
P.O. Box 445
Kimberly, ID, USA 83341

The Magic Valley Astronomical Society (MVAS) was founded in 1976. The Society is a non-profit [501(c) 3] educational and scientific organization dedicated to bringing together people with an interest in astronomy.
In partnership with the Centennial Observatory, Herrett Center, College of Southern Idaho - Twin Falls; we hold regularly scheduled monthly meetings and observation sessions, at which we share information on current astronomical events, tools and techniques for observation, astrophotography, astronomical computer software, and other topics concerning general astronomy. Members enthusiastically share their telescopes and knowledge of the night sky with all who are interested. In addition to our monthly public star parties we hold members only star parties at various locations throughout the Magic Valley.

MVAS promotes the education of astronomy and the exploration of the night sky along with safe solar observing through our public outreach programs. We provide two types of outreach; public star parties and events open to anyone interested in astronomy, and outreach programs for individual groups and organizations (e.g. schools, churches, scout troops, company events, etc.), setting up at your location. All of our outreach programs are provided by MVAS volunteers at no cost. However, MVAS will gladly accept donations. Donations enable us to continue and improve our public outreach programs.

Membership is not just about personal benefits. Your membership dues support the work that the Magic Valley Astronomical Society does in the community to promote the enjoyment and science of astronomy.
Speakers, public star parties, classes and support for astronomy in schoolrooms, and outreach programs just to name a few of the programs that your membership dues support.

Annual Membership dues will be:
$20.00 for individuals, families, $10.00 for students.
Contact Treasurer Jim Tubbs for dues information via e-mail: jtubbs015@msn.com

Donations to our club are always welcome and are even tax deductible. Please contact a board member for details.

Membership Benefits:
Lending Telescopes: The society currently has three telescopes for loan and would gladly accept others please contact President Robert Mayer, for more information on these and other benefits.

Telescopes are an individual thing and not practical for public use. However, everyone should have the experience of a good look at the moon for at least 5 minutes in their life time. It is a dimension and feeling that is unexplainable. Pictures or TV can't give this feeling, awareness, or experience of true dimension. A person will not forget seeing our closest neighbor, the moon. Norman Herrett in a letter to Dr. J. L. Taylor, president of the College of Southern Idaho, Twin Falls, ID, USA circa 1980.