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Our cover: Reflector Deep Sky Object columnist James Dire contributed this mosaic image of the June 5th Transit of Venus. It was taken from the KEASA (Kauai Educational Association for Science & Astronomy) Observatory at Barking Sands, Kauai, Hawaii. Jim used a Canon 30D camera connected to a Bushnell 4000 Schmidt-Cassegrain telescope (4-inch f/10). The exposure was 1/60 second and was processed using Adobe Photoshop CS5. Jim is Vice Chancellor for Academic Affairs, Kauai'i Community College, University of Hawaii.

To our contributors: The copy and photo deadline for the December 2012 issue is October 15. Please send your stories and photos to magazine Editor, Andy Oliver (editor@astroleague.org), by then.

The Astronomical League invites your comments regarding the magazine. How can we improve it and make it a more valuable source for you, our members? Please respond to Andy Oliver at the email address above.

Reflector

The Astronomical League Magazine

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- By fostering astronomical education,
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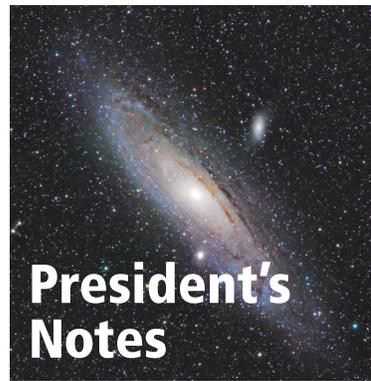
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ALCON 2012

ALCon 2012 is now history. What a wonderful event! The conference featured fabulous speakers and our guests enjoyed side trips to such outstanding locations as Yerkes Observatory, FermiLab, Adler Planetarium, Field Museum, the Tall Ship Windy and Red Witch sailing ships and the special StarBQue at Ravinia. The Higgs Particle discovery was announced by CERN just one day before our trip to Fermilab. The Astronomy Magazine Blues Band added a nice touch to the awards banquet on Saturday night. A more detailed story from the convention is present elsewhere in this issue and in a future issue.

We were honored to have David Gaynes, the director of "Saving Hubble," showcase this special documentary about the extraordinary efforts to save the Hubble Space Telescope as our awards banquet speaker. David continues to show this outstanding work across the country, and we encourage the astronomical community to support this most worthwhile effort.



In addition to the awards banquet presentation of the first-place National Young Astronomer Award to Justin Tieman and the first-place Jack Horkheimer/Smith Service Award to Benjamin Palmer, several other awards were presented. Thanks to Explore Scientific for

its longtime support of the NYAA and to the Horkheimer family and Celestron for their continuing support for the Horkheimer Service and Journalism Award programs.

Mike Simonsen received the 2012 Leslie C. Peltier Award. Among his many hats, he is the Membership Director and Development Officer for the America Association of Variable Star Observers (AAVSO). Mike has submitted over 80,000 observations to the AAVSO International Database. Explore Scientific continues its longtime support of this program.

A special Astronomical League award was presented to Dr. Roger S. Kolman for his longtime service as chairman of the Peltier committee, the Astronomical League and the astronomical community.

Continued on page 6



Top: Mike Simonsen, left, received the Leslie C. Peltier Award from Dr. Roger S. Kolman. Bottom: A Special Award was presented to Dr. Kolman from Carroll Iorg.



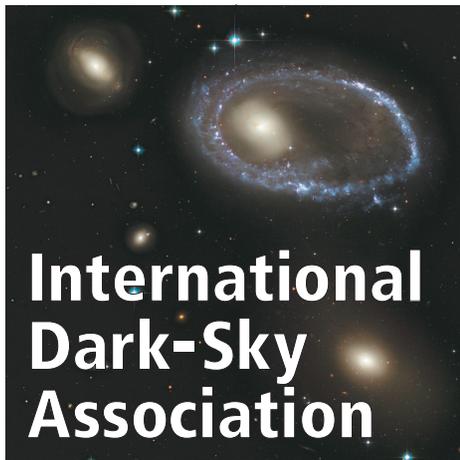
Top: The 2012 Astronomy Day Award was presented to the Northwest Suburban Astronomers by Carroll Iorg. Bottom: League Treasurer Joanne Hailey was presented a Special Award for nine years of total service.

TITLE PHOTOGRAPH: COMPLIMENTS OF TOM S. MARTINEZ, ASFC

**Southern Skies:
New Zealand's Aoraki
Mackenzie, the
World's Largest
International Dark
Sky Reserve**

Most amateur astronomy books and journals are written for observers in the northern hemisphere and not much attention is paid to objects in southern skies. The majority of the world's astronomers live, work, and observe in the northern hemisphere. Thus, it is hard for most of us to grasp the beauty of the southern skies, those areas below the southern horizon beyond our visual reach. I live in Tucson, Arizona, a fairly southern city in the US enabling me to easily see Canopus, Omega Centauri, and NGC 5128 hanging low above the southern horizon. I have even seen Gacrux, the top star in the Southern Cross, from my observatory southeast of Tucson as Gacrux briefly rose about a degree above the southern horizon. Nevertheless, the stunning nature of these objects is not really apparent until you have seen them high in the sky from the southern hemisphere. The Southern Cross, Alpha and Beta Centauri, the Magellanic Clouds and Eta Carina are not visible from most of the United States except for the southern-most portions of Texas, Florida or Hawaii. I have been fortunate enough to have visited places and observed in the southern hemisphere on a few occasions, and I can definitely state southern skies surpass our skies in almost all respects.

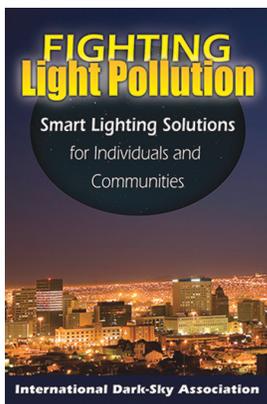
Don't ever pass up a chance to travel to and observe from a location south of the equator. With this in mind, I was extremely pleased to hear over 1600 square miles of New Zealand's South Island have recently been proclaimed an International Dark Sky Reserve, the largest in the world. The Aoraki Mackenzie International Dark Sky Reserve (IDSR) is composed of the Aoraki/Mt. Cook National Park and the Mackenzie basin. I was fortunate to visit this area in 2000 on a trip through New Zealand's South Island. It is hard to decide in this region which is more beautiful, the daytime views of the mountains, rivers and fields or the overwhelming dark nighttime skies filled



with the splendors of the southern heavens. The new reserve has a "Gold" level status which means the skies are almost totally free of light pollution. The IDSR's Mackenzie Basin has the clearest and darkest night skies in New Zealand. The area's first residents, the Maori, used the night sky to navigate

to the island and integrated star lore into their culture and daily lives. The new IDSR honors that history by keeping the night sky as a protected, integral part of this area's natural and cultural landscape.

Outdoor lighting controls were first instituted in this area during the 1980's to minimize light pollution for nearby Mt. John Observatory which is in the new Dark Sky Reserve. These efforts have been increased and updated to not only protect the observa-



tory and the reserve but also to stimulate stargazing tourism, conserve energy, and protect wildlife. I was most fortunate to spend a night on Mt. John Observatory as well as enjoy daytime visits to Tekapo and the Mt. Cook environs. Mt. John Observatory is the premier observatory in New Zealand and is operated by the University of Canterbury, Christchurch, NZ. Mt. John

overlooks Lake Tekapo and environs. I can honestly say its daytime views of Lake Tekapo and more distant Mt. Cook, the tallest mountain in New Zealand, easily rival its nighttime views of the Southern Milky Way. It is thrilling for me to welcome a new Dark Sky Reserve that I have actually visited and personally feel a connection with. I cannot think of a location that more aptly deserves to be a Dark Sky Reserve.

IDA's Dark Sky Places program, IDASPlaces, is one of IDA's most successful and most important efforts. Please check it out at www.darksky.org/IDSPlaces.

TIM HUNTER

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Reflector

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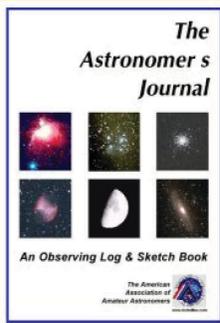
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Oct. 20, 2012 & April 20, 2013

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For more information, contact
Rickey Ainsworth
Assistant Astronomy Day Coordinator
616-929-1721
rainsworth@grmuseum.org
astroleague.org/al/astroday/astroday.html

Continued from page 4

League Treasurer, Joanne Hailey, was recognized for her total of nine years of service with the League. Tom Lynch was elected as our new Treasurer. We would like to welcome Tom to the Executive Committee. John Goss and Carroll Iorg were re-elected to the positions of Vice President and President, respectively.

The 2012 Astronomy Day Award for Best Event in Population category (small) was presented to the Northwest Suburban Astronomers from Carpentersville, Illinois, and includes a \$150 check.

Other Astronomy Day winners were:

South Shore Astronomical Society and Scituate Public Library, Plymouth, MA, for Best Event in Population Category (large), \$150 check;

Kalamazoo Astronomical Society, Kalamazoo, MI, for Best Event in Population Category (medium), \$150 check;

Popular Astronomy Club, Moline, IL, for Best Award Year After year, \$50 check.

Thanks to the sponsors of the Astronomy Day Awards, *Sky & Telescope* and the American Astronomical Society.

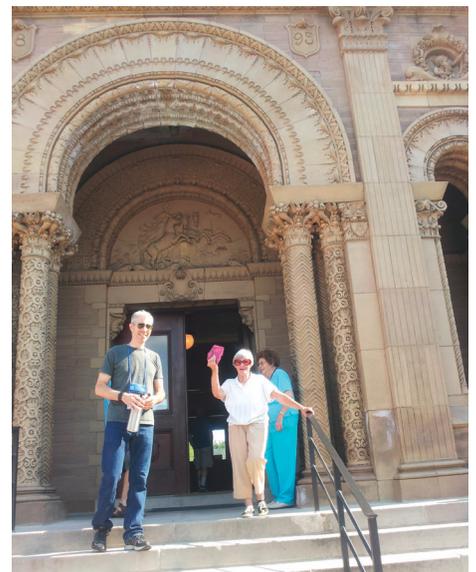
Also thanks to the co-chairs of ALCon 2012, John Goss and Audrey Fischer for a great convention. We appreciate the volunteers from the Chicago Astronomical Society and the many other volunteers who gave a good deal of assistance at the event.

International Clubs Possibility

There is consideration being given to A.L. membership by international clubs. Please check the article in this issue.

New Observing Award Programs Approved by the League Council

Three new programs were approved this year. They are the NEOs, Asterism and the Stellar Evolution observing award programs. More specifics will be posted on the League website soon.



David Gaynes, director of "Saving Hubble," and Joanne Hailey visited the Yerkes Observatory.

League Collaborative Venus Transit Certificate & Pin Special Event Program in Conjunction with NASA

Many of you responded to this special event, whether it was scheduling events for the public, providing the transit certificates to your public guests or submitting the calculations to earn your special events certificate and pin.

New NASA Iphone Game "Comet Quest"

NASA has notified us of its special educational Iphone game that is now available. This app can be downloaded from <http://itunes.apple.com/us/app/comet-quest/id504786625?mt=8&ls=1>.

ALCON 2013 in Atlanta July 7-20

Planning is now in progress for ALCon 2013. Co-chairs are Vice President John Goss and Ken Poshedly.

Mark your calendar now.

Great skies!

Carroll Iorg

The Astronomical League's Youth Awards 2013— Prepare Now!

Wouldn't it be great to be young again and to be entering amateur astronomy! Now is the time to start considering the Astronomical League's youth awards for 2012: the National Young Astronomer Award (NYAA) and the four Jack Horkheimer Youth Service Awards.

If you know a young person who has been involved in an astronomy related research project— either of his or her own doing or through an educational institution— please consider nominating that person for the NYAA. He or she must be between 14 and 19 years of age.

If you know a League member, 18 years or younger, who has brought amateur astronomy to your club or to the public through outreach, presentations, writing, or observing, please consider nominating that person for one of the four Horkheimer Service Awards. One of these awards is more specialized than the others— the Horkheimer/O'Meara Journalism Award. It requires a person who is 8 to 14 years of age to compose a 300 to 500 word essay on any science related topic.

Since the deadlines for the National Young Astronomer Award is January 31, 2013 and for the Horkheimer Awards is March 31, 2013, except for the Journalism Award which is April 10, 2013, now is the time for potential candidates to work on their projects and to participate in various astronomy events.

If you are a club officer, nominate them. If you don't, no one else will! Complete information about each award can be found at www.astroleague.org/all/awards/awards.html

The Great Andromeda

Galaxy, known as M31, has to be the best galaxy visible in our nighttime skies, other than the Milky Way, of course. It spans 3 degrees, the length of six full moons side-by-side. M31 is visible without optical aid and is a splendid sight in binoculars and small rich-field telescopes. In larger telescopes, its spiral structure becomes apparent. I often wonder why it wasn't entry 1 in Charles Messier's famous catalog. M31 is usually the first galaxy spied by beginning astronomers in their first telescopes and is a favorite object at public star parties.

But there is another fascinating spiral galaxy in Andromeda, known as NGC891, worthy of inspection in 8-inch or larger telescopes. NGC891 is located half-way between the cool double star Almach (Gamma Andromedae) and the open star cluster M34. So star-hopping to its location is pretty easy. The bright orange star in the lower left corner of the accompanying image shines at magnitude 6.7 and is located 22 arc-

minutes from the center of NGC891. This star is easily seen in any finder scope. So for any eyepiece field spanning half a degree of sky, if this star is at the center, NGC891 should be near the edge of the field.

NGC 891 is a superb example of an exactly edge-on spiral galaxy. Although it only shines at magnitude 10, all of its light is concentrated on

DEEP SKY OBJECTS

EIGHTH OF A SERIES

A STRIKING EDGE-ON SPIRAL GALAXY IN ANDROMEDA

By Dr. James Dire, Kauai Educational Association for Science & Astronomy

a disk that is 12.9 arc-minutes long and barely over 1 arc minute wide. Therefore, it is easier to see than a face-on 10th magnitude galaxy.

My accompanying image of NGC891 is a 30-minute exposure taken with a 4-inch apochromatic refractor with an SBIG ST-200XCM CCD camera. Notice the dark equatorial band spanning the entire length of the galaxy. This should be visible in larger telescopes from dark observing sites. Averted vision might bring out the dark lane better than direct viewing. The dark lane is not really dark, but a magnitude fainter than the surrounding galaxy due to dust located in the plane of the galaxy blocking some of the light from beyond.

Our galaxy has similar clouds of dust

and dark nebulae that account for the Great Rift seen along the Milky Way between Cygnus and Sagittarius. Long, ultra-wide-field exposures of the Milky Way tend to resemble images of NGC891.

In the image of NGC891, there appear to be numerous stars imbedded within the confines of the galaxy. All of these stars are foreground objects located in the Milky Way Galaxy, as we cannot resolve individual stars in NGC891. The brightest of these foreground stars is located just north of the galactic core about one-third of the way between the center of the galaxy and the edge (see the accompanying image). This 12th magnitude star should be visible in an 8-inch or larger telescope and can be used as a measure to determine how much of the galactic disk is visible in the eyepiece. For larger telescopes, the 13th magnitude star located at the south edge of the disk can be used for the same purpose.

NGC891 is the fourth brightest galaxy

in the constellation Andromeda following M31 and its two satellite elliptical galaxies, M32 and NGC205. The galaxy is located 27 million light years away. Its size and total luminosity are very similar to our home galaxy. Because we see it edge-on, we don't know if it's a normal spiral galaxy or a barred spiral galaxy like the Milky Way Galaxy. ✨



HORKHEIMER YOUTH SERVICE AWARDS

The Astronomical League is pleased to announce the winners of the **2012 Jack Horkheimer Youth Service Awards**. This marks the fifteenth year of the program, which is made possible by the generous sponsorship of the family of television's Stargazer, the late **Jack Horkheimer**. The first place finisher receives an expense paid trip to ALCon, a commemorative plaque — plus a \$1000 check. The second place finisher also receives a \$1000 check.

First Place Finisher Horkheimer/Smith Award: Benjamin Palmer, Albany Area Amateur Astronomers

One critical component of our hobby is outreach, whether it is aimed at the general public or meant to excite interest in young people. Partly due to his work as a **Rising Star Intern** at the **Dudley Observatory**, Benjamin Palmer has devoted much of his astronomy-related activities to promoting the wonders of the skies through conducting telescope observing sessions, presenting formal talks and writing extensively about the science and the hobby of astronomy. He realizes that the future of amateur and professional astronomy lies with the young and he is always investigating new avenues to connect with people of all ages. Ben is seventeen years old and lives in Queensbury, New York.



First Place Finisher Horkheimer/Parker Award: Samantha Carter, Texas Astronomical Society of Dallas

Samantha Carter is the **Raffle Coordinator** for the **Texas Astronomical Society** and has received the **Texas Astronomical Society's "Double Star"** award for her service to the Society. Samantha has logged many hours of outreach at school events and Girl Scout activities. She earned the **Texas Star Party's Novice Pin, 5x5 Pin, and About Face Pin** and she is enjoying completing the Astronomical League's **Messier Club** and **Urban Observing Club**. Samantha is entering sixth grade and lives in McKinney, Texas. ✨



HORKHEIMER/O'MEARA JOURNALISM AWARD



The 2012 Horkheimer/ O'Meara Journalism Award

The Astronomical League extends its congratulations to thirteen-year-old Katelyn Skaer of High Meadows School in Roswell, Georgia for winning the 2012 Horkheimer/O'Meara Journalism Award competition. Katelyn was nominated by the Atlanta Astronomy Club for her essay.

A star is born (and dies)

In the midst of space, a void of air, a new beginning arose. A cloud of hot gas and dust was coming together at a massive speed. As the contents grew closer and closer, it became heated inside the gas and dust cloud. Friction rose, the mass swirled even tighter. A vortex of extraterrestrial matter was formed. Temperatures soared, gas whooshed about in the swirling cloud. In the center of the space vortex, a small, but very hot, bright ball of gas was born as a part of the cloud collapsed in on itself. It became a star.

The protostar grew relatively quickly, absorbing gas and dust quite speedily. A disk formed around it, composed of dust and other material. This created an erratic influx of material. The amount of infalling matter decreased as the star consumed that of its surroundings. At the core of the protostar, a thermonuclear reaction ignited the hydrogen sufficiently, causing the protostar to move to the T-Tauri stage.

The star had reached its theoretical "adolescence". Like human adolescents, things quickly turned violent. Massive explosions hurled jets of matter far into space. Solar flares and coronal mass ejections stirred up by the solar wind wreaked havoc on the young star's surface. The light from the star flashed irregularly, curving this way and that. This stage did not last long though. Within a few million years, the T-Tauri stage was finished. The star was now fully fledged and burning bright.

Several billions of years later, the star grew old. Fusion in its core weakened as gravity threatened dominance. Fusion was losing. Fast. The core fused new elements frantically, in a futile attempt at self preservation. From the second the star made iron, it was doomed.

The iron in the core absorbed the energy of the fusion, giving gravity the edge. The star collapsed rapidly, almost eliminating fusion. But then, fusion fought back in a last-ditch effort. With the last ebbing of its energy, the star exploded in a violent eruption known as a supernova.

As the giant star collapsed to a neutron star, a rare magnetic event happened suddenly. The magnetic field of the star shifted drastically. Instead of becoming a neutron star, the density of the dead star increased many times. It shrunk to approximately 20 kilometers across, but nearly weighing as much as its former glory. It became a solar phenomenon known as a magnetar. Magnetars lasted only millennia, instead of millions of years. The magnetar's gravity was so intense that a cubic centimeter of it on Earth would have punched a hole through the core. The star created many extreme gamma ray bursts in its spectacularly small life time, but, like any star, it eventually died. ✨

A TALE OF

TWO TREATS

By Bob Gent, President, Huachuca Astronomy Club of Southeastern Arizona
Former President of the Astronomical League

It seems there is always some exciting astronomical event on the horizon. This year, we had an annular eclipse centerline pass over Arizona on May 20, and a two weeks later on June 5, we watched the last Venus transit for over 105 years.

My wife, Terrie, and I observed the annular eclipse from Page, Arizona, and the weather was great with clear skies and little wind. We observed the eclipse with nearly 100 other astronomers who had traveled to **Wahweap View** in **Glen Canyon National Recreation Area**. The viewpoint had a panorama in all directions. Since the moon was near apogee, it was too small to cover the entire sun. So, it was not only a partial eclipse, it was an "annular" eclipse, as well.

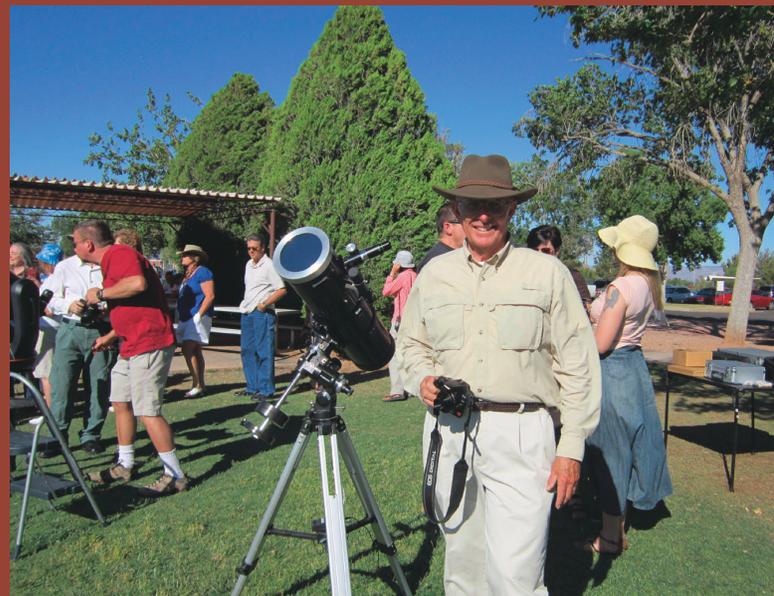
We brought two scopes, a Meade 6600 and a Celestron C8, both on clock drive equatorials. Lunt Solar Systems (CEO Andy Lunt and his staff) were there with one of their big gun H-alpha scopes, and it was very impressive. I visited them several times to watch the progression of prominences. Several large sunspots were also present to keep those people with Mylar filters interested.

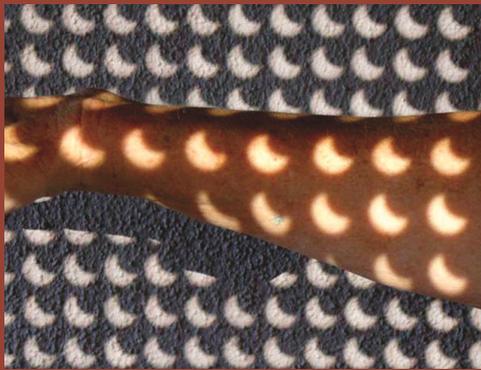


We were about two dozen local **Huachuca Astronomy Club** members who made the nearly 500 mile drive from Sierra Vista to Page. The chief park ranger said she thought about 600 people in total visited the viewpoint to watch the eclipse. We had US, French, German, and Japanese tour groups stop by.

Jumping ahead sixteen days later on June 5, we set up telescopes in **Veteran's Memorial Park** in Sierra Vista, Arizona to witness the **Venus Transit**. We advertised on our website and in the local newspaper about this rare event. Throughout the afternoon, there were hundreds of visitors at the park. We distributed eclipse glasses, gave away our new club tri-folds, and much more.

HAC members had a lot of scopes, too. Ken Kirchner brought his new 10-inch Dobsonian, Eric Sundius brought his Celestron SCT, Kim Rogalski brought a nice H-alpha scope, Glen Sanner had his camera with telephoto setup, Robert and Connie Kelher had a wonderful projection system running, and I saw Bob Kepple with a Coronado PST. I brought two clock drive equatorial Newtonians. We received many dozens of compliments and many people said, "It was really nice for the your club to share their telescopes for this exciting event." ✨





This multiple pinhole photo was taken by Dan Brocius of the Smithsonian Institution, Whipple Observatory in southern Arizona.

Left: The author took both photos with his 6-inch Meade Newtonian. The eclipse photo was taken on May 20, and the transit (the last until 2117) photo on June 5 using a Thousand Oaks filter with a Canon Digital Rebel.



Upper right: Shortly before the May 20 annular eclipse, astronomer's telescopes were at the ready on Wahweap View in Glen Canyon National Recreation Area. Photo by Bob Gent.

Bob Gent with his 6-inch Newtonian at Veteran's Memorial Park in Sierra Vista for the Transit of Venus on June 5. Photo by Terrie Gent



Dozens of tour buses dropped off visitors, and this group from France watched as the sun entered annularity. The Huachuca Astronomy Club set up several telescopes, and they distributed eclipse glasses to many of the hundreds of people who visited. Photo by Bob Gent.

A young astronomer and his mom observed the Transit of Venus at Veteran's Memorial Park in Sierra Vista, AZ. Photo by Bob Gent.



Robert Kelher showed the Transit of Venus using his projection system.

Opening photograph: The Glen Canyon National Recreation Area is full of spectacular sights. This photo was taken from the edge of a cliff nearly 1,000 feet above the Colorado River.

"I HEARD THAT THE WORLD ENDS IN DECEMBER 2012"

Story and diagram by John Goss, Vice President, Astronomical League

Some people have heard that the world ends on December 21, 2012 due to a devastating planetary alignment, perhaps in combination with the sun's aligning with the center of our galaxy. They have also heard that certain "authorities" have uncovered proof that the ancient Maya foretold this, that the Maya calendar ends on this date, and that on that date, the world ends. Amateur astronomers tend first to cringe, then to chuckle when they hear the year "2012" connected with the word "Maya." Why not confront the December, 2012—Mayan Calendar silliness by showing the public the locations of the winter solstice and the center of the Milky Way on the celestial dome? Between September 6 and 18, a bright moon is not present in the early evening sky, but the summer southern Milky Way and Sagittarius gloriously are. This is a hidden opportunity to get people under the stars and get them familiar with the sky. It then won't be so mysterious to them and they'll be less likely to be taken in by doom-sayers predicting the end of the world due to celestial agents.

Even though the direction of the galactic center and the location of the winter solstice are in the same general area of the sky, they are separated by thirteen apparent moon diameters. (In three-dimensional space, they are also separated by 27,000 light-years.) Contrary to the claims of some reports, the

sun does not align with the center of the Milky Way on the winter solstice, December 21, 2012.

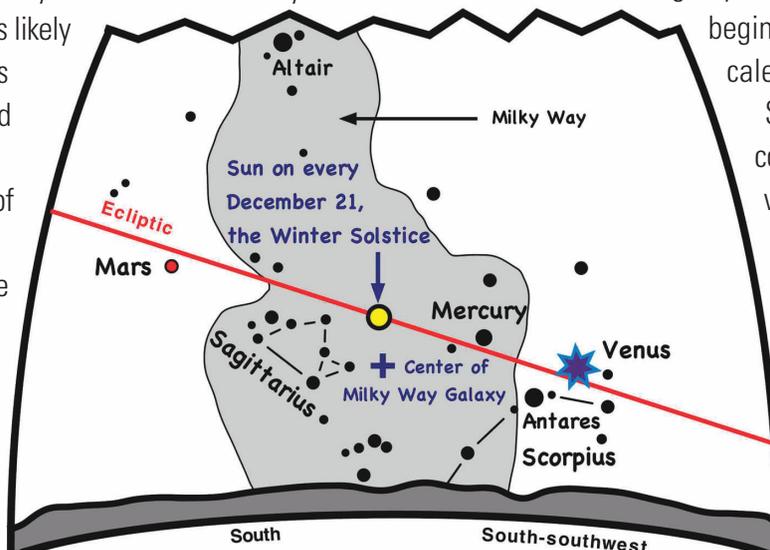
On the solstice or at any time around the solstice, no unusual planetary alignments occur. Venus will be situated in the direction above Antares, far to the right of the sun, while Mercury will be positioned half way between the sun and Venus. Mars will be located to the far left of the sun. The four largest planets, Jupiter, Saturn, Uranus and Neptune, will be placed nowhere near the direction of the sun. There is nothing remarkable about where the planets are located in our sky.

Archeologists specializing in the Maya civilization do not agree on the complicated Maya calendar. Some believe that one of its long term counting segments ends on December 21, 2012. The calendar continues the following day when the next segment

begins. Therefore, the Maya calendar does not end.

Sadly, too many people don't connect the prophets of doom with the profits of doom: no profits, no prophets.

The League's statement on the subject, "It is 2012 on Planet Earth and all is well in the Celestial Neighborhood," can be accessed at www.astronomicalleague.org/files/articles/goss/WorldEndsDecember2012.pdf ✨



Sky scene looking towards the south and south-southwest at 1:30 p.m., December 21, 2012. This is also the scene—minus the planets and the sun—at 9:00 p.m. on September 15.

The Pros Seek Our Help

By Wayne Green, Astronomical League Pro/Am Committee Chair

At the May 2012 joint meeting of the Society of Astronomical Sciences (SAS) and American Association of Variable Star Observers (AAVSO) in Big Bear, CA, Dr. Arne Hendon stated that most objects brighter than 17th magnitude belong to the amateur community. He also pointed out that amateurs have the time and resources to follow targets over long periods, where the professionals do not. Dr. Dedrei Hunter of Lowell Observatory introduced the Lowell Amateur Research Initiative (LARI), a call for participants to assist with observations for a long list of projects. (Please see www.lowell.edu/LARI_welcome.php) All of these ventures are well suited to most imagers.

Through the Astronomical League's Pro/Am committee, we seek to introduce professionals to our capable amateurs. The pros are asking our help with long term observations of large fields and objects brighter than 17th magnitude. We also want a way to respond quickly to emergency observations that crop up occasionally.

We are not alone in this work. The advanced amateur communities including AAVSO, ALPO (Association of Lunar and Planetary Observers), AMS (American Meteor Society), CBA (Center for Backyard Astrophysics), and IOTA (International Occultation Timing Association) provide excellent opportunities to learn while contributing much needed data.

Many of these programs are ones that you can do under the light polluted skies in your backyard. Mercury and Venus are often visually observed under twilight conditions. You can make timings of moon transits of Jupiter. Over longer time periods, you can watch for structural features to come and go with Mars, Jupiter and Saturn.

Lately, one discussion recognizes how difficult it is for people with a serious interest in astronomy and astrophysics to equip themselves with telescopes, mounts, cameras and observatories — not to mention finding the time to observe at night. We do have jobs and family responsibilities, after all!

We tend to accumulate equipment over time with an eye towards retirement, or the empty nest, or both. We can learn about astronomy through professional collaboration as simply as processing images and data using a computer during our spare time on evenings and weekends. This is something we can surely do while we grow the budget for our own equipment.

One real benefit to these collaborations is that our new knowledge and enthusiasm carries over into our public outreach efforts.

The short story is, with clever thinking, we can really participate in astronomy.

This quarter's example collaboration: Dr. Fran Bagenal, University of Colorado, and I had a discussion about how the amateur community can help NASA's JUNO mission. Amateurs routinely obtain images and data that rival space-based observations. Dr. Bagenal seeks to match our images to the data taken by JUNO.

We have a few "Jupiter Seasons" to refine our techniques before serious observing occurs during JUNO's mission-time in the Jupiter system. The craft is scheduled to make about 33 orbits within the intense radiation field of Jupiter before the radiation essentially ends the mission. We want to obtain as much ground information as possible in both optical and radio wavelengths.

Talk about one great opportunity!

There are lots of other projects where amateurs can make our contributions. Visit www.astroleague.org/proam and start collaborating today!

Call for League officer nominations

The two-year term of the office of National Secretary ends on August 31, 2013. If you are interested in using your talents to serve in this important position, we would like to hear from you. Please volunteer!

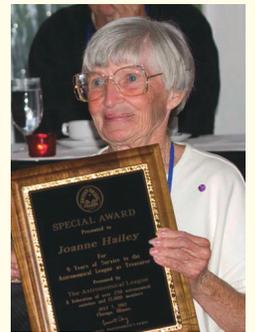
For specific information regarding the duties and responsibilities of this office, please refer to the League's bylaws, which can be accessed on the League website at astroleague.org.

Candidates should send Nominating Committee Chair John Goss, vicepresident@astroleague.org, background statements explaining why they are interested and a photo of themselves for publication in the *Reflector*. Please limit all statements to approximately 250 words. All nomination materials must be submitted by March 15, 2013.

It has been a privilege

Soon I will end my third term as your treasurer and Tom Lynch will be taking over as your new treasurer.

The last three years have been great. I have met many new people and been able to associate with some of the giants in the field of Astronomy. I have been to many lovely places including Bryce Canyon and Chicago where I finally got to Yerkes Observatory. I appreciate the fellowship and friendship I enjoy with all of you.



I would like to thank the Executive Committee and all other members of the council and league I have served with over the past three years. I could not have done the job without your help and support and I know you will give your full support to Tom as he learns the responsibilities of being treasurer.

Thank you so much for the lovely plaque I received in Chicago. I will treasure it.

I will miss all of you but it has been a privilege and honor to serve as your Treasurer and hope you will continue to stay in touch.

In the meantime, "Keep Looking Up."

Joanne L. Hailey, "Jo," Outgoing Treasurer

Just after World War II the idea for a telescope in space

was first given serious consideration, as the needed foundations in

rocket science and related technologies were being developed. Many years in planning and construction and launched on my birthday in 1990, the Hubble Space Telescope and I have several things in common. Our primary light gathering surfaces are shaped incorrectly but, using corrective optics, perform to specifications. We share an affinity for staring at particular points in space for long periods of time and, being towards the ends of our careers and working for large organizations, there are plans underway for our successors and retirement. I do hope my retirement party is not as spectacular as that planned for Hubble, and look forward to many more years of productive celestial study after reentry.

In 1995 Dr. Robert Williams, then director of the Space Telescope Science Institute, spoke at a Texas Star Party I attended. A few months later he announced an unprecedented project. One hundred hours of his discretionary time had been reserved for Hubble to observe one spot in space above the handle of the Big Dipper. Just

to see what was there. Nothing like it had ever been done, and other images of the area had shown little or nothing present. It was a bold and daring gamble because, if nothing had been found, it may have gone down as the biggest waste of telescope time since Lowell's Martian canals. But the results were spectacular. In an area the size of a grain of sand held at arm's length, three thousand galaxies were seen stretching back billions of years in time and distance. Unusually shaped galaxies were found, merging and interacting with each other, opening a window into the early era of galaxy formation. The known and observable universe had just become a lot larger and more interesting.

When these images were released in the spring of 1996, I recall opening the May issue of *Sky and Telescope* and feeling

overwhelmed at what I saw. This was a sea change in our understanding of the cosmos. I had been using my 25" Tectron reflector for two or three years, finding interesting targets to view such as Arp and Hickson groups, Abell clusters and eponymous objects as Einstein's cross. Shoemaker-Levy 9 was seen as a string of beads after breaking up from its previous encounter with Jupiter, before its final impact with the gas giant. But with this new and profoundly attractive Deep Field calling me to the table, these previous objects became mere entremets. I recall spending 40 minutes viewing the Deep Field at the 1996 Texas Star Party using my 25" telescope at 661 power, guiding by hand atop my ladder with a hood over my

A FIELD OF DREAMS

The end of time is near
Amid summer night's dreams
The scope of ages shows
As far as eye can see

head, coming up for air on occasion almost willing the objects to be seen. At the time there were no wider images available deep enough to

give reference, and magnitudes were not available for objects within the field. I just did not know whether they were possible to see. I made a drawing and put it away. What chance could one have of viewing objects in such a faint and distant field?

These observations languished for a long time but, as I was preparing a talk for our local astronomy society I revisited them. By then the Hawaii group had done photometry on many of the principle galaxies for their "Active Catalog of the HDF". Wider images were now available to help orient the field of stars around the HDF in my drawing. To my great astonishment as I reviewed the drawing, two of the galaxies in the Deep Field were represented! I was unable to reproduce the observation from my home in Minnesota, and the next time this field could be observed from a similar site had to wait until the 2004 Texas Star Party. With my 25" scope the star/galaxy, #2/3, and galaxy #0 were seen in the field after much careful searching. The latter is the brightest galaxy in the Deep Field at magnitude 18.9



This view of nearly 10,000 galaxies is called the Hubble Ultra Deep View. The smallest, reddest galaxies, about 100, may be among the most distant known, existing when the universe was just 800 million years old. The nearest galaxies, well-defined ellipticals, thrived 1 billion years ago, when the cosmos was 13 billion years old.

PHOTO COURTESY: NASA, ESA, AND S. BECKWITH (STScI) AND THE HDF TEAM

(620 nm). That same night Bob Summerfield of Astronomy To Go was using his 36" Tectron telescope, almost ready to call it a night at two a.m. I wandered over and inquired if he wanted to attempt one more field. Initial reluctance was transformed to anticipation with the mention of the HDF, and we used that wonderful instrument to get the best view I have had of this area. We spent many minutes viewing it and Bob, David Moody and I were able to confirm a number of galaxies in the field. I saw a total of seven galaxies: five within the HDF, and two just outside the northern and southwest edges of this field. The ones inside the HDF corresponded to the Hawaii numbering system of galaxies #0 and #6, along with the combined object star#2/galaxy #3, and two unnumbered galaxies at the northern and southwest edges of the field. There were also

galaxies seen just beyond the southwest edge of the field and to the northeast of the galaxy at the northern edge. There were clearly many galaxies seen in this field, and this view superseded all previous attempts in my 25" to that point. Follow up attempts in another 36" telescope that same night 45-60 minutes later, and in Jimi Lowrey's 48" scope several years after that could not reproduce the clarity of that view. Two or three galaxies were seen by Jimi, Tim Parson and myself in the 48" scope, showing sky conditions are key to viewing these objects at the limit. I feel we were extremely fortunate on that early morning of May 22, 2004 to observe the Deep Field with conditions of such clarity.

In 2003 the Space Telescope Science Institute released a new and deeper view of our Universe, the Ultra Deep Field, depicting an area in Fornax containing over 10,000 galaxies in an area a few arcminutes wide. This image represented one million seconds, or twelve nights, imaging one small region. Extrapolated to the whole sky, this correlated to 50 billion galaxies being potentially visible!

I made a finding chart with images of this field and my first opportunity to view it was in 2006 with my new 32" f4 reflector at the Okie-Tex Star Party near the Oklahoma-New Mexico border. A very dark site at 4500 feet altitude, the nearest town of significant size is 35 miles away. Conditions were very good on the night of September 17th and, using a 3.5mm eyepiece giving 929 power, I was able to see the brightest galaxy within the HUDF at magnitude 19.4 after many minutes of viewing. Dr. Stephen Beckwith, the principal investigator for the HUDF, supplied information for this object, #328 in his catalog.

In 2008 I had the opportunity to view this field again at Okie-Tex with the 32" scope at about five in the morning, as a local high school teacher came by with several of her very motivated students. They asked what we were viewing and, and after initial hesitation I told them we were looking for galaxies in the HUDF. They surprised us by relating they had recently studied it in their astronomy class. We showed them the field but they were not able to recover any galaxies or stars because of their faint nature. It was a thrill to share the experience and we encouraged them to continue their effort. With a long and careful study of this field I was able to recover the brightest two galaxies, #328 again and the second brightest galaxy, #3822, a mag 20.2 face-on spiral in the southern corner of the field. The two brightest stars in the HUDF were also seen.

Many astronomy groups are purchasing large reflectors and placing them in advantageous sites. I recommend these fields of dreams from the Hubble as ambitious projects for dedicated amateurs willing to push the limits of what is considered visible. I discovered through stalking my prey with a kernel of hope through the maze of uncertainty, "Diresville" it's not. ✨

Dave Tosteson
Chisago City, Minnesota
djtost1@gmail.com

Correction: The author of "As Far as Abell" in the June issue was Dave Tosteson, not Dave Toteston. Our apologies.

Explore the Moon

With our brand-new Moon globe!



Sky & Telescope, the essential magazine of astronomy, has produced a beautiful and extremely accurate new 12" globe of the Moon. Unlike previous Moon globes based on artistic renderings, this new globe is a mosaic of digital photos taken in high resolution by NASA's Lunar Reconnaissance Orbiter under consistent illumination conditions. The globe shows the Moon's surface in glorious detail, and how the nearside actually appears when viewed through a telescope. It also shows the farside in equal detail. The globe includes 850 labels that identify major basins (maria), craters, mountain ranges, valleys, and the landing sites of all the Apollo missions and robotic lunar landers.



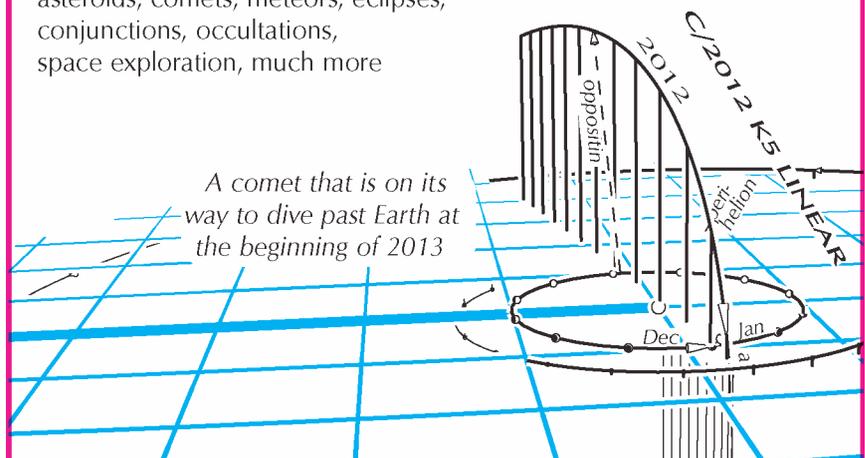
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Editor's Note: Congratulations to all these outstanding astronomical observers! All awards except the Herschel 400 require current **Astronomical League** membership for eligibility. If you have questions about an award, please ask the corresponding **Observing Club Chair**. Their contact information can be found under the **Observing Club** site at www.astroleague.org/observing. If further assistance is required, please contact either of the two **National Observing Program Coordinators**.

Asteroid Award

No. 44, Sue Wheatley, Gold, North Houston Astronomy Club; No. 45, Brad Young, Gold, Astronomy Club of Tulsa

Binocular Double Star Award

No. 31, Al Lamperti, Delaware Valley Amateur Astronomers; No. 32, Ed Valla, Tallahassee Astronomical Society; No. 33, John Eaccarino, Amateur Observers' Society of New York; No. 34, Nelson Walker, Member-at-Large; No. 35, John Rudd, Texas Astronomical Society of Dallas; No. 36, George Robert Kepple, Huachuca Astronomy Club; No. 37, Steve Boerner, Astronomical Society of Eastern Missouri; No. 38, Becky Ramotowski, The Albuquerque Astronomical Society

Binocular Messier Award

No. 938, Lloyd Watkins, Cumberland Astronomical Society; No. 939, Rod Poynter, San Antonio League of Sidewalk Astronomers; No. 940, Kurt Green, Wehr Astronomical Society; No. 941, Emory Horvath, Member-at-Large; No. 942, Kevin Johnson, Minnesota Astronomical Society; No. 943, Jake Hairrell, Minnesota Astronomical Society; No. 944, Ric Heins, Minnesota Astronomical Society; No. 945, Joseph R. Goss,



Indiana Astronomical Society; No. 946, Nathan Wright, Northwest Suburban Astronomers; No. 947, Alvan Parker, Midlands Astronomy Club; No. 948, Darrick Gray, Astronomical Society of Kansas City; No. 949, Bill Smith, Bucks Mont Astronomical Association; No. 950, Richard Linn, Central Texas Astronomical Society

Carbon Star Observing Program Award
No. 18, David P. Rudeen, Etna Astros Astronomy Club; No. 19, Vincent R. Scheetz, Delaware Valley Amateur Astronomers; No. 20, John Rudd; Texas Astronomical Society of Dallas; No. 21, Patrick Birck; Prescott Astronomy Club; No. 22, Jonathan Schuchardt, Delaware Valley Amateur Astronomers

Comet Award
No. 59, George J Robinson, Silver, Member-at-Large

Constellation Hunter - Northern Skies Observing Program Award

No. 121, Christopher Kersey, Baton Rouge Astronomical Society; No. 122, Mark Simonson, Everett Astronomical Society; No. 123, Mark Johnson, Austin Astronomical Society; No. 124, Brad Payne, Northern Virginia, Astronomy Club

Deep Sky Binocular Award

No. 327, Lee Green, Twin City Amateur Astronomer, Inc.; No. 328, David Lloyd, Astronomical Society of Eastern Missouri; No. 329, Faith Jordan, Member-at-Large; No. 330, Gregory M. Brown, Member-at-Large

Flat Galaxies Award

No. 13 Regular, Michael A. Hotka, Longmont Astronomical Society; No. 13 Honorary, Michael A. Hotka, Longmont Astronomical Society; No. 14 Honorary, William A. Skelley, Tallahassee Astronomical Society; No. 15 Regular, Louis Marchesi, Delaware Valley Amateur Astronomers

Galileo Observing Program Award

No. 22, Bob Jardine, TAC-AL; No. 23, Jim Kethcum, Astronomical Society of Kansas City

Globular Cluster Program Award

No. 207, Michael D. Stewart, Astronomical Society of Kansas City; No. 208, Faith Jordan, Member-at-Large; No. 209, Philip Hall, Member-at-Large; No. 210, Gregory M. Brown, Member-at-Large; No. 211, Jim Kaminski, Member-at-Large; No. 212, Steve Boerner, Astronomical Society of Eastern Missouri; No. 213, Robert C. Nederman, Astronomical Society of Kansas City

Herschel 400 Award

No. 477, Nelson Walker, Member-at-Large; No. 478, Michael D. Stewart, Astronomical Society Of Kansas City; No. 479, David M. Douglass, East Valley Astronomy Club; No. 480, Becky Ramotowski, American Assoc of Amateur Astronomers; No. 481, Elaine B. Osborne, Echo Ridge Astronomical Society

Herschel II Award

No. 77, Mr. Dick Francini, Neville Public Museum Astronomical Society; No. 78, Mr. Mark Johnston, TAC-AL; No. 79, Mr. Rex Kindell, Stillwater Stargazers Astronomy Club; No. 80, Mr. Brian Morton, Stillwater Stargazers Astronomy Club

Local Galaxy Group and Galactic Neighborhood Observing Club Award

No. 18, Rod Gallagher, Oklahoma City Astronomy Club, M/DA

Lunar Observing Award

No. 767, Nina Chevalier, San Antonio League of Sidewalk Astronomers; No. 771, Phillip Hiatt, Michiana Astronomical Society; No. 772, Andre Cruz, Northeast Florida Astronomical Society; No. 773, Lloyd Watkins, Cumberland Astronomical Society; No. 774, Brad Burrell, Richland Astronomical Society; No. 775, Steve Boerner, Astronomical Society of Eastern Missouri; No. 776, Bob Scott, Island County Astronomical Society; No. 777, Kevin Nasal, Neville Public Museum Astronomical Society; No. 778, Rod Poynter, San Antonio League of Sidewalk Astronomers

Lunar II Award

No. 46, Marilyn Sameh, Wabash Valley Astronomical Society; No. 47, Gilbert Raineault, Member-at-Large; No. 48, Jnani Cevvel, Member-at-Large

Messier Award

No. 2496, Darrick Gray, Honorary, Astronomical Society of Kansas City; No. 2546, Thomas Rocco Pennino, Honorary, Astronomical Society of Long Island; No. 2546, Thomas Rocco Pennino, Honorary, Amateur Observers Society of New York (dup.); No. 2569, William Wood, Honorary, Little Colorado River Valley Astronomy Club; No. 2575, Steve Boerner, Honorary, Astronomical society of Eastern Missouri; No. 2586, Lloyd Watkins, Honorary, Cumberland Astronomical Society; No.

Title photograph: M64, the "Black Eye" galaxy; NASA and The Hubble Heritage Team (AURA/STScI)

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jws.wright@yahoo.com

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2587, Edward W Sunder, Honorary, Barnard Astronomical Society; No. 2588, Mike Krzywowski, Honorary, Austin Astronomical Society; No. 2589, Phil Yehle, Honorary, Tucson Amateur Astronomy Association; No. 2590, Andrea Boeck, Honorary, Omaha Astronomical Society; No. 2591, Wayne Boeck, Honorary, Omaha Astronomical Society; No. 2592, Todd Billeci, Regular, The Astronomy Connection; No. 2593, Gilbert Raineault, Honorary, Member-at-Large; No. 2594, David Adalian, Regular, Tulare Astronomical Society; No. 2595, Forrest Smith, Honorary, Baton Rouge Astronomical Society; No. 2596, John Robinson, Honorary, The Astronomy Connection; No. 2597, Larry Farrington, Regular, The Etna Astros Astronomy Club

Meteor Award

No. 142, Mark Simonson, 12 hours, Everett Astronomical Society; No. 150, Bob Vickers, 24 hours, West Kentucky Amateur Astronomers

Planetary Nebula Award

No.49, William Conner, Advanced Award, Indiana Astronomical Society

Solar System Observing Program Award

No. 71, David Rudeen, Etna Astros Astronomy Club

Southern Arp Award

No. 3-V, Al Lamperti, Delaware Valley Amateur Astronomers; No. 4-V, Michael A. Hotka, Longmont Astronomical Society

Sunspotter Award

No. 128, Grant Martin, Astronomical Society of Eastern Missouri; No. 129, Diane Ketchum, Middle Georgia Astronomical Society; No. 130, Cindy Krach, Haleakala Amateur Astronomers

Universe Sampler Award

No. 107, Lauren Rogers, Telescope, Austin Astronomical Society

Urban Observing Award

No. 141, Kevin Johnson, Minnesota Astronomical Society; No.142, Michael Overacker, Star City Astronomy Network; No. 143, Cliff Mygatt, Olympic Astronomical Society;

Variable Star Program

No.15, Bill Pellerin, Houston Astronomical Society

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Foreign Clubs, International Membership, and the Astronomical League

The Astronomical League is currently composed of ten regions across the United States and each club belongs to one of them. No region is dedicated solely for international memberships. Over the past year, as has happened in years past, several foreign clubs have inquired as to the possibility of joining the League. As it stands, there is no clear avenue for them to obtain League membership. We would like to hear your thoughts about creating an "International Region" as a means for foreign clubs to join the League. An "International Region" would mean that foreign clubs would have representation on the Astronomical League's National Council, just as any of the other ten regions currently do. Please send your comments to League President Carroll Iorg, president@astroleague.org.

Electronic version of the Reflector available

Beginning with this issue, the Reflector will be available online. All members will continue receiving a printed version through the mail. We would like to hear your thoughts on the League offering an online version. Please send them to Reflector editor, Andy Oliver, editor@astroleague.org.

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Okie-Tex Star Party

Kenton, OK; Oklahoma City Astronomy Club
www.okie-tex.com

September 13 – 15

Mt. Bachelor Star Party

Sunriver Nature Center and Observatory, Oregon
www.mbsp.org

September 13 – 15

CalStar

Paso Robles, California
www.observers.org/CalStar

September 13 – 16

Great Lakes Star Gaze

Gladwin, Michigan; www.greatlakesstargaze.com

September 13 – 16

Prairie Skies Star Party

Bourbonnais, Illinois; <http://llprairieskies.org>

September 13 – 16

Iowa Star Party

Coon Rapids, Iowa; www.iowastarparty.com

September 13 – 17

4th Annual Acadia Night Sky Festival

Bar Harbor, Maine
www.acadianightskyfestival.org

September 14 – 16

Idaho Star Party

Bruneau State Park, Idaho
<http://isp.boiseastro.org>

September 14 – 16

Black Forest Star Party

Cherry Springs State Park, Pennsylvania
www.bfsp.org/starparty/index.cfm

September 15

Virginia Association of Astronomical Societies (VAAS)

Richmond Astronomical Society
www.richastro.org

September 21 – 22

Astronomy at the Beach

Kensington Metropark, Brighton, Michigan
www-personal.umich.edu/~dgs/kensington

September 22 – 23

Pacific Astronomy and Telescope Show

Pasadena, California
www.rtmcastronomyexpo.org

October 6 – 14

Twin Lakes Star Party

Dawson Springs, Kentucky
www.wkaa.net

October 7 – 14

Peach State Star Gaze

Deerlick Astronomy Village, Georgia
www.atlantaastronomy.org/PSSG

October 8 – 14

Eldorado Star Party

X-Bar Ranch, Eldorado, Texas
www.texasstarparty.org/eldorado.html

October 10 – 13

Enchanted Skies Star Party

Socorro, New Mexico; www.enchantedskies.org

October 10 – 14

Heart of America Star Party

Butler, Missouri; www.askc.org/HOASP

October 11 – 14

Nightfall

Borrego Springs, California
www.rtmcastronomyexpo.org

October 11 – 14

Illinois Dark Skies Star Party

Jim Edgar Panther Creek State Fish and Wildlife Area, Illinois; www.sas-sky.org

October 11 – 16

Staunton River Star Party

Scottsburg Virginia
www.stauntonriver-starparty.org

October 12 – 22

Mid-Atlantic Star Party

Robbins, North Carolina; www.masp.us

October 19 - 21

Custer's 34th Annual Astronomy Jamboree

Custer Observatory, Southold, New York
www.custerobservatory.org

November 7 – 11

Deep South Regional Star Gaze

Norwood, Louisiana; www.stargazing.net/dsrsg

November 10

Night Under the Stars

Alamo Lake State Park, Arizona
www.azstateparks.com/Parks/ALLA/events

November 10 – 11

Arizona Science & Astronomy Expo

Tucson Convention Center, Tucson, Arizona
www.scienceandastronomy.com

November 12 – 18

CSPG Fall Star Party

Chiefland, Florida
www.chieflandstarpartygroup.com/fall.html

The 2013 Astronomical Calendar: Specially priced for League members

The Astronomical League is pleased to announce a special offer for our members from the Universal Workshop, the producers of Guy Ottewill's popular Astronomical Calendar. They are making the 2013 edition of the Astronomical Calendar available at a discounted price. There are plenty of good reasons why it has been published for nearly thirty-five years. The 2013 edition will not disappoint!

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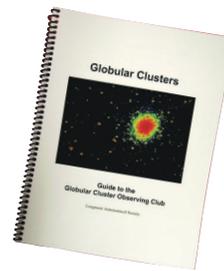


Carbon Stars

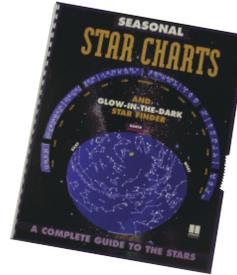
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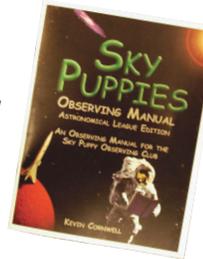
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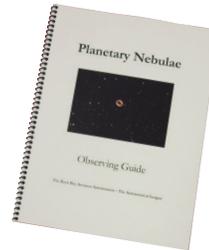
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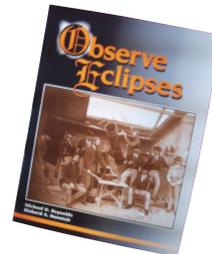
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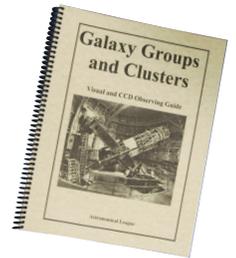
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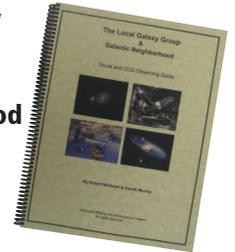
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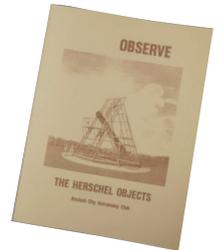
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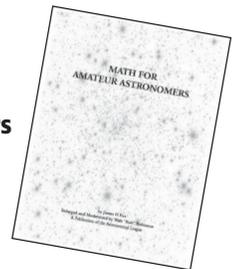
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