

OBSERVER

APRIL CELESTIAL WONDERS

HICKSON 44

Hickson 44 is an interacting galaxy group in the direction of the star Algieba in Leo at a distance of 100 million light-years. From bottom to top, its members are NGC 3185, NGC 3187, NGC 3190, and NGC 3193. Together, they are Arp 316. Darrell took this image at the EGK Dark Site on November 30, 2013 and March 9, 2014. He made nine RGB sub-frames totaling 65 minutes. He used a modified Canon 450D through an AstroTech 8-inch f/8 Ritchey-Cretien astrograph. By the way, CONGRATULATIONS, Darrell, on receiving the "The Bill Ormsby Memorial Volunteer Service Award." Wow -- do you ever deserve it!!

Image © Darrell Dodge

Calendar

- 4.. Aldebaran 2.0° S of the moon (1 A.M.)
- 7..... First quarter moon
- 14..... Mars at closest approach to Earth (7 A.M.)
- 14. Total lunar eclipse begins (see Page 3)
- 15..... Full moon
- 22..... Last quarter moon
- 29..... New moon

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APRIL SKIES

by Dennis Cochran

Cancer has given way to **Leo**—and **Leo Minor**, a slightly s-shaped line of four stars over the mane of Leo. Two shapely constellations grace the south: **Crater** the Cup, a semicircle with two legs, and **Corvus** the Crow, a distorted square east of Crater. **Hydra** the Water Snake wriggles up from the southeast so that her head, a small circle of stars, is right under Cancer waiting, no doubt, for a fish or frog to come by.

Jupiter is still big in the southwest. Three of its moons, Io, Europa and Callisto, align perpendicular, not parallel, to Jupiter's equator on the 21st after 9 P.M. MDT. Io is moving fast so that the three are best aligned at 9:15 P.M. **Mars** is east of Corvus in Virgo, above Spica, her alpha star. On the 14th Mars will be closest to Earth and who knows what will happen. Don't hold your breath, however.

The UFO fleet is in the shop having its death rays preterdigitized. Mars is best seen around midnight when its light (the Sun's light, actually, bounced off of Mars' surface) will be cutting through the least amount of Earth's atmosphere to reach your blinking eyeball.

Between the near-the-head part of Hydra and Regulus (the heart of Leo), is **Sextans** which is on the celestial equator. It is shown on *Peterson's Field Guide to the Stars and Planets*, Chart 26, as a three-star corner of 120 degrees. Hevelius thought it up around 1690; perhaps the sextant was the technical wonder of the day. Sextans is the address of the famous Spindle Galaxy (NGC 3115), a small but intensely bright object in amateur scopes and home of the nearest one-million Solar mass black hole. Peterson's mentions

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PRESIDENT'S MESSAGE

by Ron Hranac

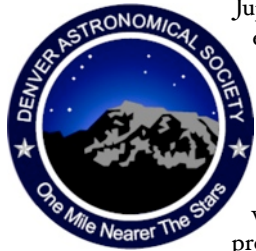
What comes to mind when you see or hear the phrase "amateur astronomer"? Think about that for a moment, then read the following definition of "amateur" from *Webster's New World Dictionary*.

am·a·teur (am' ə ch ər, -tər, -toor) *n.* [Fr. < L. *amare*, to love] **1.** one who does something for pleasure, not for pay; nonprofessional **2.** one who is somewhat unskillful—**adj.** of or done by amateurs—**am'a·teur'ish** (-choor'-) **adj.**—**am'a·teur'ish·ly** *adv.*—*am'a·teurism n.*

The part of the definition that caught my eye is "one who does something for pleasure. . ." Perhaps more important is the derivation of amateur from the Latin *amare*, which means "to love." There is little question that most members of the Denver Astronomical Society are proud of the amateur astronomer title, and the vast majority partake in the hobby for pleasure.

I suspect that many of us also love what we do in astronomy, whether it's simply gazing at the heavens on a clear night, working on observing every object on the Messier or some other list, shooting beautiful astrophotos, being involved in public outreach, collecting meteorites, listening to a short-wave radio for the sounds of

Jupiter or the sun, or whatever other part of the hobby is of interest. And we readily do so without compensation. To be fair, there are a few among our membership who also work or have worked in the profession.



DAS President Ron Hranac during Solar Day at the Denver Museum of Nature & Science.

Image courtesy of Jeff Tropeano

Are any of us somewhat unskillful? If you asked me to grind a mirror for a homebrew Newtonian, I'd have to shake my head and admit that sort of thing is beyond my skill level. Could I do it with instruction? Sure. But without that instruction, I'm in the category of way more than somewhat unskillful, at least when it comes to grinding mirrors. Still, I consider myself an amateur astronomer, and the aforementioned definition of "one who does something for pleasure" certainly fits.

Given some of the equipment now available to amateur astronomers, the line between what defines an accomplished amateur astronomer and a profes-

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DAS SCHEDULE

APRIL

- 8 Open House (Begins at 8:00 P.M.)
Jupiter and Mars!
- 11 DAS General Membership Meeting at Olin Hall (Begins at 7:30 P.M.).
Speaker: Dr. John Spencer (See back page)
- 14 Passover begins at sundown
- 18 E-Board Meeting at Chamberlin (Begins at 7:30 P.M.),
Good Friday
- 20 Easter
- 25-27 EGK Dark Sky weekend

MAY

- 3 Open House (Begins at 8:30 P.M.)
Jupiter, Saturn, Mars!
- 9 DAS General Membership Meeting at Olin Hall (Begins at 7:30 P.M.).
Speaker: Dr. Frank Eparvier, L.A.S.P. at C.U.
- 16 E-Board Meeting at Chamberlin (Begins at 7:30 P.M.),
- 30-1 EGK Dark Sky weekend

Open House costs: If the skies are clear, \$2 per person (\$5/family), and \$1 per person in the event of inclement weather.

Public nights are held at Chamberlin Observatory every Tuesday and Thursday evenings beginning at the following times:

*March 10 - September 30 at 8:30 P.M.
October 1 - March 9 at 7:30 P.M.*

Costs to non-members are: \$3.00 adults, \$2.00 children and students with ID.

Please make reservations via our website (www.denverastro.org) or call (303) 871-5172.

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The Executive Board conducts the business of the DAS at 7:30 p.m. at Chamberlin Observatory. Please see the Schedule of Events for meeting dates. All members are welcome.

www.denverastro.org

APRIL SKIES

that up in Leo we see the western edge of the Virgo cluster of galaxies.

Galaxies M95, M96 and M105 are east of Regulus beneath the supine body of Leo at around $10^{\text{h}} 40^{\text{m}} 14^{\circ}$, and 30 million light-years away. The M65-M66 pair are farther east at $11^{\text{h}} 20^{\text{m}} +13^{\circ}$ under the θ (theta) star of Leo at the right angle of his hind-quarter triangle. In each case with these Messier objects, several NGC galaxies are also in the vicinity. **The Virgo Cluster** is east of this—we'll discuss it more next month. If you scan Leo Minor above Leo's mane (because of its shape some people call it the sickle—of a lion?), northwest of the β (beta) star is galaxy NGC 3158, brightest of a faint group at $10^{\text{h}} 15^{\text{m}} +39^{\circ}$. North of that is the western part of **Ursa Major**, the stars west and south of the dipper bowl. This area includes the Three Leaps of the Gazelle, three pairs of bright stars trending S.E. to N.W. like footprints, starting with ν (nu) and ξ (xi) UMa around $11^{\text{h}} 17^{\text{m}} +34^{\circ}$, then μ (mu) and \omicron (omicron) at $10^{\text{h}} 20^{\text{m}} +43^{\circ}$ and ending with κ (kappa) and ι (iota) around $9^{\text{h}} 0^{\text{m}} +48^{\circ}$.

There is a strew of galaxies west of Leo Minor in the region of the α (alpha) star of **Lynx** at $9^{\text{h}} 22^{\text{m}} +34^{\circ}$. West of that in Lynx about 30^{m} and a bit south is galaxy NGC 2683. South and east in Leo is lonely galaxy NGC 2903 at $9^{\text{h}} 34^{\text{m}} +21.5^{\circ}$. West of there is M44, Praesep (the manger) or **Beehive Star Cluster**, a naked-eye and binocular object at the center of Cancer.

There are doubles in this region. West of M44 is ζ (zeta) Cnc at $8^{\text{h}} 14^{\text{m}} +18^{\circ}$, a triple system of yellow stars. Back in Leo, Denebola, the bright star at the east end of the beast is a gorgeous optical double, blue and orange. ζ (zeta) Leo, in the mane (sickle) of Leo above the brightest such star, γ (gamma), is a yellow-gold pair. Can you see the color difference?

There is a **total lunar eclipse** (mostly) on the 15th, starting on April 14th at 10:45 P.M. and ending on the 15th at 4:30 A.M. our time. Totality is from 1:07 A.M. to 2:25 A.M. Tell me about it, will ya? ★

TOTAL LUNAR ECLIPSE (APRIL 14)

- Penumbral Eclipse Begins at 10:54:37 P.M. MDT
- Partial Begins 11:58:19 P.M.
- Total Eclipse Begins 1:06:47 A.M.
- Full moon 1:42 A.M.
- Greatest Eclipse 1:45:40 A.M.
- Penumbral Eclipse Ends: 4:37:37 A.M.



OCCULTATION

Imaged in front of Don's house at 9:35 P.M. MDT on March 10, 2014, λ (lambda) Gem (low right) disappeared behind the dark limb of the moon. He used a Canon T1i camera with settings: 34 mm focal length, ISO 800, f/5.6 and 1/500 second. He hand-held the camera over a 55 mm eyepiece on a Celestron C8 telescope.

Image © Donald Lynn

ABOUT THE DAS

Membership in the Denver Astronomical Society is open to anyone wishing to join. The DAS provides trained volunteers who host educational and public outreach events at the **University of Denver's Historic Chamberlin Observatory**, which the DAS helped place on the National Register of Historic



Places. First light at Chamberlin in 1894 was a public night of viewing, a tradition the DAS has helped maintain since its founding in 1952.

The DAS is a long-time member in good standing of the **Astronomical League** and the **International Dark Sky Association**. The DAS's mission is to provide its members a forum for increasing and sharing their knowledge of astronomy, to promote astronomical education to the public, and to preserve Historic

Chamberlin Observatory and its telescope in cooperation with the University of Denver.

The DAS is 501 (c)(3) tax-exempt corporation and has established three tax-deductible funds: the Van Nattan-Hansen Scholarship Fund, the DAS-General Fund and the Edmund G. Kline Dark Site Fund.

More information about DAS activities and membership benefits is available on the DAS website at www.denverastro.org ★

DAS Software Review

DEEPSKY ASTRONOMY SOFTWARE FOR MAC AND WINDOWS

by Bruce Heath and Mike Hotka

DeepSky Astronomy Software (DAS) is an all-in-one software program that is a planetarium program that also allows you to easily plan and log your observing sessions.

This is a feature rich program and at \$30 for the full download version, it is a great deal. More information about the features of DAS and additional screen shots can be found on the website <http://www.deepsky2000.com/masterdownload.htm>.

The most used features of DAS are: making observing plans, recording each object observed into the DAS database, printing detailed star charts and generating reports of objects observed. Other features that are useful include:

- Display objects that are visible tonight at your location.
- View over 410,000 photographs of galaxies, nebulae and other objects.
- Log your observations or enter them into your observing journal.
- View real-time information on the Sun, Moon, and Planets.
- Read observing notes from more than 8,000 other observers.
- The ability to do image processing.
- Control your telescope from the program via the ASCOM telescope control interface.

There are observing plans for many of the Astronomical League's Observing Programs distributed with this software. By diligently adding each observation you make into the database, once you complete the program you can print a report of *Observed Objects per Plan* and, *voila*, you are ready to submit this print-out to the program's coordinator for verification.

The chart features are extremely robust. You have access to three sets of charts, including DAS's proprietary Cartes du Ciel. The DAS charts offer a finder chart by object ID with expanded detail about the object's characteris-

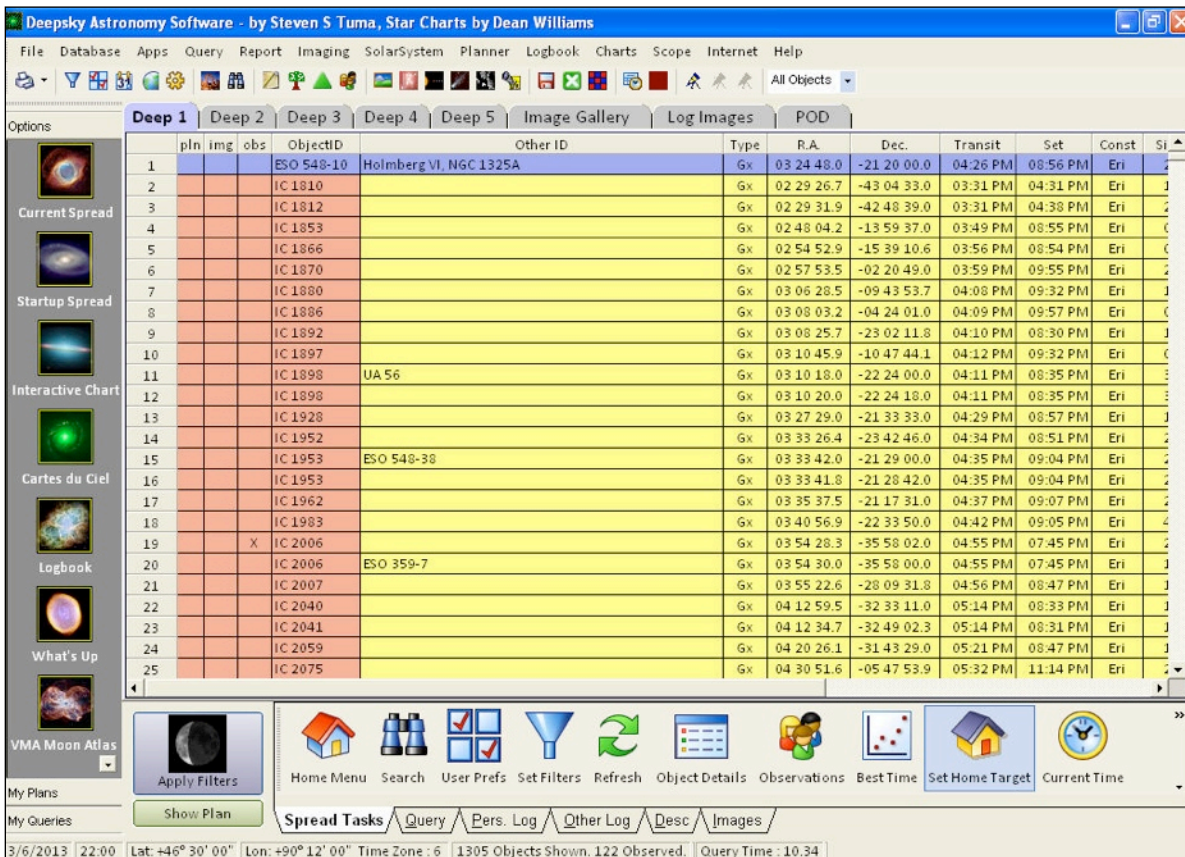
tics on the left margin. A separate and larger chart displays the objects in a user's observing plan. It allows the user to zoom and adjust the star field incrementally by increasing or decreasing magnitude (the maximum value is about magnitude 17.5) which can give you a FOV from 1 degree to 150 degrees. You can move the chart up/down or left/right to view other portions of the sky, show the coordinate or RA grid, flip charts vertically or horizontally, center on a specific object, add Telrad circles and change the chart background and star color. You can do this with just one click. These charts contain enough detail that they are very easy to use to star-hop to any celestial destination.

Another feature that is useful is if you make a sketch of an observation, you can scan the sketch into your computer as a jpeg file and attach the image to your recorded observation in the DAS database.

DAS comes preloaded with many catalogues that are part of its database. You can query objects based on various criteria to zero in on those objects you want to observe. You can then easily make an observing plan out of these queried results. If you happen to come across an object not in the DAS database, you can add it to the database so you can record that you observed the object.

DAS works on any Windows operating system including 98, ME, NT, 2000, XP, 2003, Vista, Windows 7, Windows 8 (not RT). DAS will even work on a Mac if you are using the Parallels VM software.

The best thing about the DAS software is the personal support you get from the creator and developer of this program, Steve Tuma. He is an email away and responds to your questions very quickly. This support, in addition to a few Denver club members who already use this software, can help you gain experience with this wonderful observing planning and management program. ★



A screen save of the Main Screen of DeepSky Astronomy Software. Courtesy: Bruce Heath and Mike Hotka

MEET YOUR FELLOW ASTRONOMER

by Dena McClung

Amateur astronomers come from all walks of life, and this month's profile features an engaging new mom who still finds time to share the world of natural science with others.

Diane Rogers Bischoff loved hiking and camping while growing up in Boulder City, Nevada. She spent many evenings outside with her dad under the dark desert skies, sometimes using his small refracting telescope. At age 10, the family moved to Albany, Oregon, and Diane's interests in math, science and engineering grew stronger. While taking an engineering course, Diane built a balsa wood bridge that won the Professional Engineers of Oregon Model Bridge Building contest in a statewide competition during her junior year of high school.

Diane attended Santa Clara University before moving to a Tennessee college. Her major changed a few times, as various fields appealed to her. She liked the fact that as a geologist, she'd be able to spend time outdoors, and utilize her knowledge from her study of physics and engineering. She earned her bachelor's degree in geology from Austin Peay State University in Clarksville.

Diane entered the environmental field and worked in Nashville for five years. One example of her work there was finding and remediating soil and water contamination at gas stations, where underground fuel tanks had corroded and leaked.

Diane's first telescope, which she used while in Nashville, was a refractor.

Diane and her fiancé, Christopher, moved to Denver in 2006, where she worked as a geologist for two oil and gas service companies. She was excited to be moving to Colorado because a lot of the state's geology is visible above ground level.

Diane joined the DAS in 2009 and uses binoculars and a 6-inch Celestron Schmidt-Cassegrain go-to telescope, observing mainly from her back yard. She was excited when she made her own discovery of the

Beehive Cluster, and loves looking at M42. She describes astronomy as "looking back in time." While on a trip to Indonesia, she took in new constellations, despite oil well flares. She had a dramatic view of Scorpius, using her iPhone to confirm it, because she had never been able to see any of it but the northernmost star from home.

Since joining the DAS, Diane has been to a couple of Public Night events and has visited the dark sky site, where the extent of Denver's light pollution dawned on her as she saw it even from such a distance. She enjoys the opportunity to discuss astronomy with other club members, and looks forward to attending lectures at some point. She takes her telescope on camping trips to enjoy darker skies, and hopes to someday be able to volunteer with the DAS.

Six months ago, Diane and Christopher became parents to Roxanne, and Diane chose to become a stay-at-home mom. Christopher works from home, which they share with two Australian cattle dogs. Diane loves that she and her daughter have names related to astronomy: Diane is from the Roman moon goddess, Diana; and Roxanne's middle name, Artemis, is the Greek equivalent of Diana. She is looking forward to introducing Roxanne to astronomy and other natural sciences.



Diane, Roxanne (Diane's 6-month-old daughter), Saffire (the dog) and Diane's Celestron NexStar 6SE.

Image courtesy: Diane Rogers Bischoff

Diane volunteers once a week at Dinosaur Ridge, serving as a tour guide and museum docent, and enjoys helping visitors discover all it has to offer. ★

PRESIDENT'S MESSAGE

sional astronomer is occasionally a bit blurry. Look at the quality of astrophotography being done today by some amateurs, and compare their astrophotos with the images from professional observatories just a couple of decades ago. Amateur astronomers have to their credit the discovery of quite a few comets, the odd supernova, new nebulae, and impacts on Jupiter. Amateurs contribute to the science of such things as double and variable stars, and collaborate with professionals on a variety of research projects.

I've heard it said that if one looks at the membership of the DAS from a big picture perspective, we can, generally speaking, be grouped into one of three major categories. One group of DAS members likes to use the Edmund G. Kline Dark Site. Yet another group enjoys coming to lectures at the general membership meetings each month in the University of Denver's Olin Hall. And the third group comprises the public outreach crowd, volunteering at monthly open houses, our twice-weekly public nights, and events such as Colorado Astronomy Day at the Denver Museum of Nature and Science. Without a doubt there is some overlap among the three groups, some members fit in all three, and there are

members who don't fit in any of these three admittedly broad categories. Perhaps a fourth category is members who just enjoy the camaraderie of hanging out with others who happen to share the same passion about our hobby.

Yet most of us, regardless of which group we may or may not be part of, are amateur astronomers. We do what we do for pleasure and without pay, both of which are the very definition of the word amateur. We're amateur astronomers because it's fun, because it's educational and we like to learn, because we like to teach, because discovering a new object—new for us, anyway—in the night sky comes with a certain satisfaction, or because we never tire of hearing someone say "Wow!" the first time he or she looks at the moon or maybe Saturn through a telescope. Most of us are amateur astronomers because there's a little bit of the Latin *amare* in what we do. Being an amateur astronomer for pleasure and without pay may fit the definition of amateur, but *amare*—to love—is the essence of being an amateur astronomer. ★

(CONTINUED FROM PAGE 2)

A NEW METEOR SHOWER?

According to The Royal Astronomical Society of Canada's *Observer's Handbook 2014*, there will be a new meteor display next month due to a predicted outburst from "debris related to comet 209P/LINEAR" on May 24 beginning around 1:00 A.M.-2:00 A.M. MDT. Furthermore, "it is highly likely this will be the strongest meteor display of 2014 visible from North America."

Perhaps sacrifices to the weather gods will be in order.

According to Kelly Beatty of *Sky & Telescope* magazine, "Earth will plow through a dense stream of dust particles shed by Comet 209P/LINEAR. Dynamicists think the crossing could result in an intense meteor shower—maybe even a 'storm'—and North Americans will have front-row seats." Could we see 1,000 meteors per hour?

Stay posted at: <http://www.skyandtelescope.com/observing/highlights/The-Next-New-Meteor-Shower-231466791.html?e=5>.

NASA'S Space Place

OLD TOOL, NEW USE: GPS AND THE TERRESTRIAL REFERENCE FRAME

by Alex H. Kasprak

A Space Place Partners' article

Flying over 1,300 kilometers above Earth, the Jason 2 satellite knows its distance from the ocean down to a matter of centimeters, allowing for the creation of detailed maps of the ocean's surface. This information is invaluable to oceanographers and climate scientists. By understanding the ocean's complex topography—its barely perceptible hills and troughs—these scientists can monitor the pace of sea level rise, unravel the intricacies of ocean currents, and project the effects of future climate change.

But these measurements would be useless if there were not some frame of reference to put them in context. A terrestrial reference frame, ratified by an international group of scientists, serves that purpose. "It's a lot like air," says JPL scientist Jan Weiss. "It's all around us and is vitally important, but people don't really think about it." Creating such a frame of reference is more of a challenge than you might think, though. No point on the surface of Earth is truly fixed.

To create a terrestrial reference frame, you need to know the distance between as many points as possible. Two methods help achieve that goal. Very-long baseline interferometry uses multiple radio antennas to monitor the signal from something very far away in space, like a quasar. The distance between the antennas can be calculated based on tiny changes in the time it takes the signal to reach them. Satellite laser ranging, the second method, bounces lasers off of satellites and measures the two-way travel time to calculate distance between ground stations.

Weiss and his colleagues would like to add a third method into the mix—GPS. At the moment, GPS measurements are used only to tie together the points created by very long baseline interferometry and satellite laser ranging together, not to directly calculate a terrestrial reference frame.

"There hasn't been a whole lot of serious effort to include GPS directly," says Weiss. His goal is to show that GPS can be used to create a terrestrial reference frame on its own. "The thing about GPS that's different from very-long baseline interferometry and satellite laser ranging is that you don't need complex and expensive infrastructure and can deploy many stations all around the world."

Feeding GPS data directly into the calculation of a terrestrial reference frame could lead to an even more accurate and cost effective way to reference points geospatially. This could be good news for missions like Jason 2. Slight errors in the terrestrial reference frame can create significant errors where precise measurements are required. GPS stations could prove to be a vital and untapped resource in the quest to create the most accurate terrestrial reference frame possible. "The thing about GPS," says Weiss, "is that you are just so data rich when compared to these other techniques."

You can learn more about NASA's efforts to create an accurate terrestrial reference frame by searching here: <http://space-geodesy.nasa.gov/>.

JOB JAR

VICE VEEP

I love being the DAS Vice President! The work is so rewarding and our board is always a great bunch of folks. But in my fourth year of service to you, I recognize that a vibrant club should have new people and new ideas to keep us all rocking along freshly, so it's time to open up the opportunity for someone else next year. To provide for an easy transition, I'd like to mentor someone on the nuts and bolts of veepy duty, even if it's just a matter of being cc'd when I do it by email. There are four main functions: the two larger ones are scheduling speakers and planning parties, and the minor ones are donut duty and the quarterly drawing for the S&S Optika gift certificate. This person should be one of our regular faces that frequently attends the monthly general membership meeting.—*Lisa Judd*

MERCHANDISE SALESPERSON

The DAS has a new goal for 2014. There's a supply of small club merchandise, such as mugs and pins and possibly t-shirts (in the future), that we'd like to sell at Open Houses. Technically they've been available at the ticket desk, but it's time to advertise them more openly on their own table, as a means to support our non-profit organization. If you're looking for a way to participate in Open House, mingling with club members and the public in a lighted room with very little physical activity required, this spot is for you! Let any of your officers know if you'd like to man the "trinket table" for the club, and perhaps work with quartermaster Ed Scholes whenever we need to get some new stuff made.

FINANCE COMMITTEE MEMBER

A volunteer is needed to become the third member of a new finance committee which provides financial oversight and guidance to DAS.

If you would like to volunteer for any of these positions, please contact vp@denverastro.org.

Kids can learn all about GPS by visiting <http://spaceplace.nasa.gov/gps> and watching a fun animation about finding pizza here: <http://spaceplace.nasa.gov/gps-pizza>. ★

Artist's interpretation of the Jason 2 satellite. To do its job properly, satellites like Jason 2 require as accurate a terrestrial reference frame as possible. *Image courtesy: NASA/JPL-Caltech.*



DENVER ASTRONOMICAL SOCIETY OFFERS SCHOLARSHIPS

As mentioned last month, the DAS Van Nattan-Hansen Scholarship program provides support for worthy graduating high school students or undergraduate college students majoring in astronomy and the physical sciences. Typically, two awards of \$1,000 each are made each year.

Applicants will only be considered if their information is received no later than June 15th of each year. Awards will normally be made by August 1st. Please mail to:

Tim Pimentel, Chair Person; The Van Nattan-Hansen Scholarship Committee; PO Box 100621; Denver, CO 80250-0621; vnh@denverastro.org.

Applicants shall demonstrate that they meet the following criteria:

- Applicants must either be graduating high school seniors or undergraduate college students in good standing.

- Enrollment equivalent to at least a half-time load for the academic term as defined by the institution

- Applicants will be considered no more than 5 times for a fulltime student and 8 times for a half-time student

All requests for consideration should be accompanied by the following information:

- Official Transcripts showing a grade point average of at least 3.0 on a 4.0 scale (or equivalent) including the final transcript of the applicants last semester.

- A dated and signed letter of intent demonstrating the applicant's interest and the declared major

- Letters of recommendation from at least two reputable sources

Information provided by all applicants becomes the property of the Van Nattan-Hansen Scholarship Committee. Please send copies of required information as appropriate. Documents cannot be returned.

Awards and Judging

Scholarship awards shall not discriminate on the basis of race, color, sex, age, ethnic or national origin, religion, or disabilities. The decision of the Van Nattan-Hansen Scholarship Committee shall be considered final. Preference is given to Astronomy majors.

The Van Nattan Scholarship Committee

- Chair: Tim Pimentel
- Ivan Geisler
- Brenda Wray
- Ron Pearson

SOME POPULAR "SUMMER" STAR PARTIES

(Click on event to go to website for registration information)

• Astronomy Day (spring)	Everywhere!	Apr/May
• RTMC Astronomy Expo	Riverside, CA	Memorial Day weekend
• Texas Star Party	Fort Davis, TX	5/25-6/1
• Grand Canyon Star Party	Grand Canyon, AZ	6/21-6/28
• Rocky Mountain Star Stare	Colorado	6/25-6/28
• Golden State Star Party	Aldin, CA	6/25-6/29
• Table Mountain Star Party	Ellensburg, WA	7/22-7/26
• Nebraska Star Party	Valentine, NE	7/27-8/1
• Badlands Astronomy Festival	Badlands Nat. Park	8/2-8/4
• Idaho Star Party	Bruneau, ID	9/19-9/21
• Okie-Tex Star Party	Kenton, OK	9/20-9/28
• Enchanted Skies Star Party	Socorro, NM	9/24-9/2
• Colorado Astronomy Day and DAS Open House		9/27
• Eldorado Star Party	Eldorado, TX	10/20-10/25





THE ORION NEBULA

The Orion Nebula, or M42, is a diffuse nebula that is visible with the naked eye. One of the brightest nebulae in the sky, it is a favorite of amateur astronomers and astrophotographers, even in bright, light-polluted skies. Jeff took this image from his backyard in light-polluted Lakewood, CO on March 2, 2014 with a Canon 60D DSLR through a 10-inch Newtonian. He made 30 30-second exposures, with dark and bias frames that were stacked and processed with PixInsight.

Image © Jeff Tropeano

WELCOME NEW DAS MEMBERS!

Bruce Albright Leslie Koshigoe
 Gabriel Bergmiller Allen Kranz
 William Carney Jono Slavin
 Jeff Kanipe Patricia Smedley

CORRECTIONS TO THE MARCH 2014 OBSERVER:

Apologies for missing these: the DAS Van Nattan-Hansen Scholarship story was missing some fine points, therefore, Ron Pearson rewrote it (See page 7). NGC 4565 (the March cover photo) is 40 million light-years away, not 40 light-years and M35 in Gemini was incorrectly identified as a globular cluster. It's actually an open cluster.



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