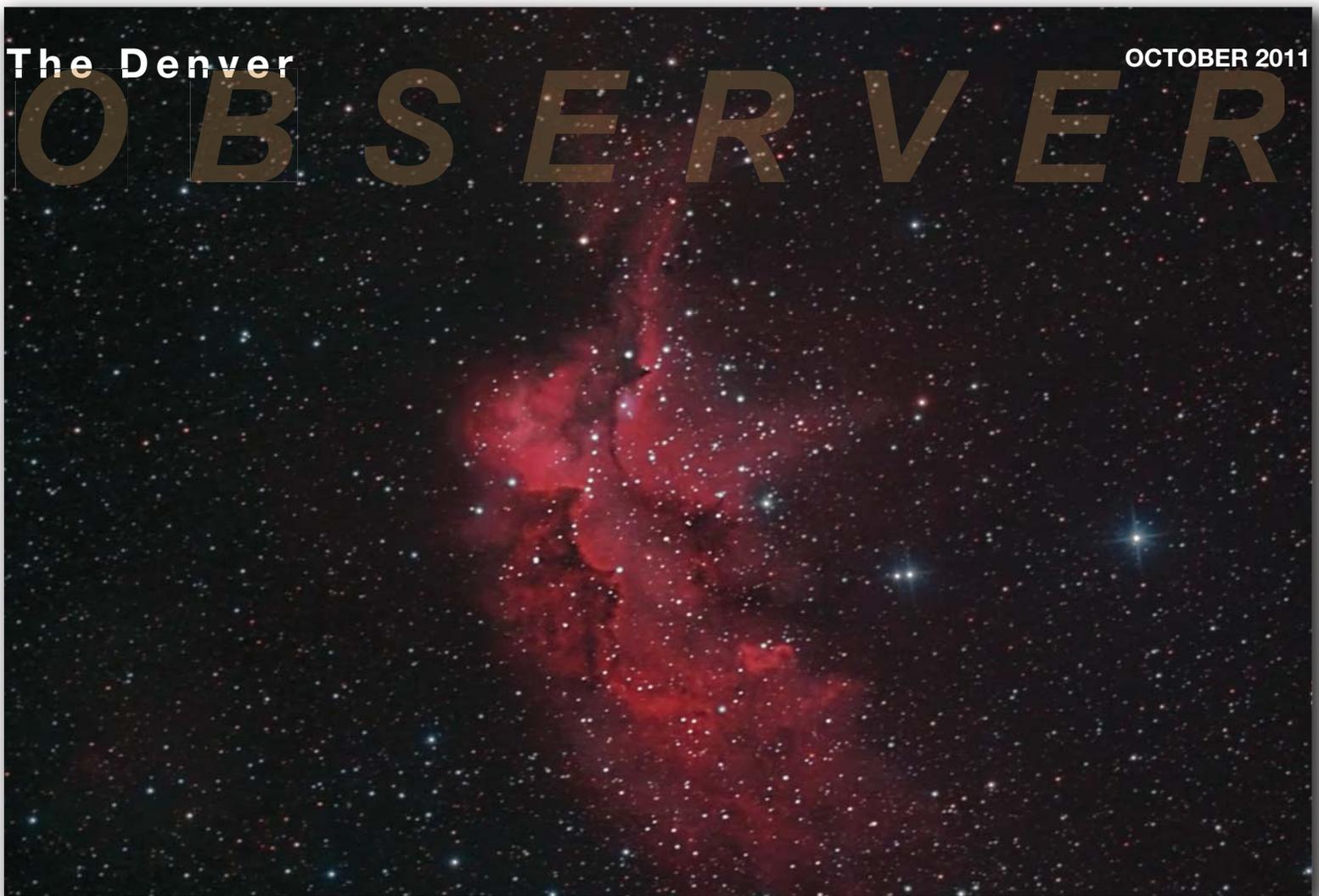


OBSERVER



A HALLOWE'EN TREAT

This image of the open star cluster NGC 7380, also known as the Wizard Nebula, was taken at the EGK Dark Site on September 24-25th, 2011 with a Canon 450D DSLR through an 8-inch f/4 AT8IN telescope (60 minutes of RGB; 90 minutes of Hydrogen Alpha). NGC 7380 is located in the constellation Cepheus, about 7,000 light-years from Earth. The star cluster is embedded in a nebula, which spans some 110 light-years. The stars of NGC 7380 formed in the last five million years, making it a relatively young cluster.

Image © Darrell Dodge

Calendar

3.....	First quarter moon
11.....	Full moon
19.....	Last quarter moon
26.....	New moon

Inside the Observer

- President's Corner..... 2
- Society Directory.....2
- Schedule of Events..... 2
- Van-Nattan Hansen Awards.....4
- Editor's Note..... 5
- Cloudy Nights Puzzle..... 5
- NASA's Space Place..... 6
- Comet Garradd Finder Chart..... 7
- Pacman Nebula Photo..... back page

OCTOBER SKIES

by Dennis Cochran

Delphinus, in my opinion, the cutest constellation, is nearly overhead these evenings. Search south from Deneb (in the tail of Cygnus the Swan) one-quarter of the way to the horizon to find the frolicking sea mammal. East of his head one dolphin's length is the dim globular cluster NGC 7006, a faint fuzzy indeed, being almost as far away from us as the Magellanic Clouds. See what you can see of this distant star city.

The Dolphin's terrestrial cousin, the less obvious Equuleus, the Little Horse, is southeast of him in the form of two short, almost-parallel lines. M15, a large globular cluster that everyone should be able to find, is down and east of Equuleus and just northwest of ε (epsilon) Peg. Equuleus is a brother to Pegasus, and was given to Castor by Mercury in the Greek story. Shining over this entire region is

the Summer Triangle member, Altair, in Aquila the Eagle. While continuing on with the big globular theme, slide down from M15 to M2 on the celestial equator just above β (beta) Aqr. It has a concentrated interior region hard to resolve into individual stars. While you're at M2, cruise east to the "Water Jar" of Aquarius, a west-facing Y asterism of four stars. The middle star of the Y, ζ (zeta) Aqr, is "one of the finest doubles in the sky." (*Peterson Field Guides: Stars and Planets*, 2nd Ed.)

If you like globs and small constellations, go north from Altair to tiny Sagitta the Arrow and find M71 along its shaft. Just north of the tip of the arrow is M27, the Dumbbell Nebula, a famous and oft-imaged planetary nebula. I think it looks more like an hour-glass than a workout weight. Another exploding star

Continued on Page 3

PRESIDENT'S CORNER

by Ron Pearson

"The DAS credo is to provide 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."

I will be including the above statement in the President's Column to remind me and all who are part of the DAS what our mission and goals are. I think it is important to have a clear vision of what the DAS is about and why we continue to serve it.

To continue my remarks from Brooks Observatory Dedication in Sept. issue—part II:



"It has been our goal to build an observatory at our dark sky site since the first plans were laid out. And I want to recognize all those who contributed to building it. We have a plaque we will install in the observatory

and as I read off the names please come up and accept our gratitude for your hard work: Joe Lupica, President of Celestron International, whose company took a badly broken C-14 OTA and refurbished it to a brand new 14-inch SCT for outreach and research at no cost to the DAS. Cathie Havens of S&S Optika who was the 'broker' for the donation and worked with Celestron to have it refurbished. The following are in alphabetic order on the plaque: Craig Betzina, who supplied the Exploradome Observatory and made us a deal 'we couldn't refuse,' Ted Cox our construction manager and builder, Darrell Dodge who is our 'Interim Head' of the dark site committee and who put many hours and miles into the building construction and coordinating us workers as well as

working out the bugs from the drive system, Glenn Frank, structural engineer reviewed the plans and helped in construction, Joe Gafford who worked on construction and photographed the construction, Jim Holder, who worked on the telescope pier, Stuart Hutchins, worked on construction, completed the pier and also installed the 300 lb. pier single-banded! Wayne Kaaz was our first dark site committee chairman after Ed Kline and had the foresight to put an observatory on the official plans and fought many battles with the county in making this dark site a reality, former president Ron Mickle who led the E-board into accepting the telescope donation and committed DAS to building an observatory for it, David Steele, who was involved in the donation, and Dan Wray who worked on construction and also has greatly improved our warming hut by installing a new floor and other improvements. We could not have accomplished this goal without this team of volunteers dedicated to its construction, so please show them your gratitude." See the photo of the Dedication Plaque in the September Observer.

Now, it's almost the 4th quarter, football season is starting up, kids are back to school and it's time for DAS members to get out and do the "fun stuff" of being an amateur astronomer. Instead of meetings and talks by professionals in the lecture hall, for the next three months we do a big Colorado Astronomy Day outreach event with our friends at the Denver Museum of Nature & Science (Oct. 1), and then our Annual Auction (Oct. 8th) at Chamberlin where you can buy, sell and tell tall tales about your telescope equipment that you've outgrown or done with or just want to pass along to some friends. We love to see and oogle your "stuff" and bidders will be waiting to see what you bring for sale. It's a great time and a great chance to make

Continued on Page 4

DAS SCHEDULE

OCTOBER

- 8 DAS Annual Auction at Chamberlin Observatory (Setup begins at 11:00 A.M., Bidding begins at 1:00 P.M.).
- 14 E-Board Meeting at Chamberlin (Begins at 7:30 P.M.)
- 28-30 EGK Dark Sky weekend

NOVEMBER

- 5 Open House at Chamberlin Observatory (Begins at 6:00 P.M.)
- 6 Daylight Saving Time Ends (2:00 A.M.)
- 11 DAS General Membership meeting (Begins at 7:30 P.M.). Members "Show 'n Tell"
- 18 E-Board Meeting at Chamberlin (Begins at 7:30 P.M.)
- 24 Thanksgiving (No public night)
- 25-27 EGK Dark Sky weekend

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

*March 9 - April 14 at 8:00 p.m.
April 15 - September 1 at 8:30 p.m.
September 2 - March 8 at 7:00 p.m.*

Costs to non-members are: \$3.00 adults, \$2.00 children.

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

Society Directory

President:
Ron Pearson (303) 670-1299
president@denverastro.org
Vice President:
Lisa Judd (626) 487-8515
vp@denverastro.org
Secretary:
Dennis Cochran (720) 870-0465
Treasurer:
Brad Gilman (720) 488-1028

Executive Board Members

Jack Eastman Keith Pool
Joe Gafford Tim Pimentel
Chuck Habenicht David Shouldice
Ron Hranac Dan Wray
Ron Mickle, Past President
President Emeritus, Larry Brooks

Committees

Van Nattan-Hansen Scholarship Fund:
Ron Pearson (Chair)
P.O. Box 150743
Lakewood, Colorado 80215-0743
EGK Dark Site Committee:
Darrell Dodge, Interim Chair
Email: darksite@denverastro.org
IDA Representative:
Dr. Robert Stencel
Email: coloida@hotmail.com
Student Astronomy Chair:
Naomi Pequette (Chair)
Finance Committee
Frank Mancini (303) 663-5263

Volunteers or Appointed Representatives

ALCor:
Darrell Dodge (303) 932-1309
Newsletter:
Editor: Patti Kurtz (720) 217-5707
Email: p_kurtz@comcast.net
The Observer is available in color PDF format from the DAS website.
Website:
Darrell Dodge
Email: dmdodge@aol.com
Chad Warwick, IT Specialist
Librarian:
Phil Klos
DAS Information Line: (303) 871-5172
DAS Correspondence:
Denver Astronomical Society
Chamberlin Observatory c/o Ron Pearson
2930 East Warren Avenue
Denver, Colorado 80210

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

OCTOBER SKIES (CONTINUED FROM PAGE 1)

nearby is the Saturn Nebula down in Aquarius, southwest of M2. If you can see the two stars at the west end of Capricorn's jester grin, ooze east from them and a hair north until you're almost above Capricorn's middle to find the Saturn Nebula. Now, can you see down to the bottom "V" of Capricorn? Go up the left side of the "V" to the middle star; just to its east is M30, another globular with a concentrated center.

Talking about concentrated centers, the gas giant Jupiter is now up all night. If you can pull enough power to view this magnificent orb closely, you will be able to see its Red Spot and several smaller white spots plus all of those fluid-dynamical curlicues that appear as details in the two equatorial bands. The giant planet is an oblate spheroid due to its fast rotation rate and gaseous composition. Nobody knows for sure how concentrated Jupiter's center is or whether it is a liquid or solid metallic hydrogen or if it even has a rocky core. The next NASA mission to Jupiter will study these aspects of the planet to try to understand Jupiter's formation, although the entire business is skewed by an uncertainty about where Jupiter formed. These questions never get answered, they just get more complicated. Meanwhile the surface we can see is concentrated enough. Jupiter will be sandwiched between the Cirlet of Pisces above, and Cetus, the Sea Monster, below—it will not be hard to find. It looks similar to one of those too-big airliners wallowing in for a landing at DIA. Regarding Cetus: the old chart-makers often showed it as a whale, sometimes



C/2009 P1 (GARRADD)

This image of comet C/2009 P1 Garradd is a combination of star-aligned and comet-aligned images. It was taken on July 30, 2011 at 6:29:09 UT at the WUTS star party near Foxpark, WY. Joe used an SBIG ST-2000XM ccd camera on his 18-inch f/4.5 JMI Newtonian telescope. He made two minutes each of the LRGB filters in one minute sub-exposures.
Image © Joe Gafford

it has a lion-like head so it looked like a Chinese dragon.

Meanwhile Saturn is lost to us just as we want to look at its stretched-out white storm trace, but he'll be back in the last two months of the year. Maybe the storm will still be . . . storming. New storm clouds seem to be welling up from the original spot.

Comet Garradd will be around for awhile (see Page 7 for a finder chart from *S&T*), not a huge pie-in-the-face like Halley's Comet was in 1910

when my father saw it as a child, but good in binoculars. On August 26 it was occulting the above-mentioned globular cluster M71 in Sagitta. In early September it passed the Coathanger asterism in Vulpecula. This month it's in Hercules.

Congratulations to Darrell Dodge. Two of his ALCON-Bryce Canyon astrophotos were published in the September *Reflector*! Also in that issue Mike Hotka co-wrote the article "What am I going to observe tonight?" We have talent in this club!

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' 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. To contribute, please see the bottom of the membership form for details (found on the DAS website: thedas.org).

More information about the DAS, its activities and the special tax-deductible funds is available on the DAS website at www.denverastro.org.

VAN NATTAN-HANSEN SCHOLARSHIP AWARD WINNERS

by Ron Pearson

At the August 12th General Meeting it was our pleasure to, once again, recognize two top students in astronomy and physical sciences with DAS Van Nattan-Hansen Scholarships. As in two previous awards, Colorado School of Mines Engineering Physics student David Bicknase received a scholarship award of \$1,000. In this incredibly hard curriculum David continues to be at the top of his class and will be entering his junior year at Mines.

The Van Nattan-Hansen Committee was also extremely gratified to award a scholarship of \$1,500 to DAS Student Member Joey Gurrentz, who has graduated this spring from Highlands Ranch High School as a National Merit Commended Scholar. Mr. Gurrentz could not attend the meeting because he was completing a summer internship at the Los Alamos National Laboratory in the Particle Physics Division. Joey will be starting his college career in the Astrophysics Honors Program at the University of Michigan. In addition to his love and interest of astronomy, he has completed college level course work in Organic Chemistry and hopes to be able to combine his interests in these sciences in his work at Michigan.

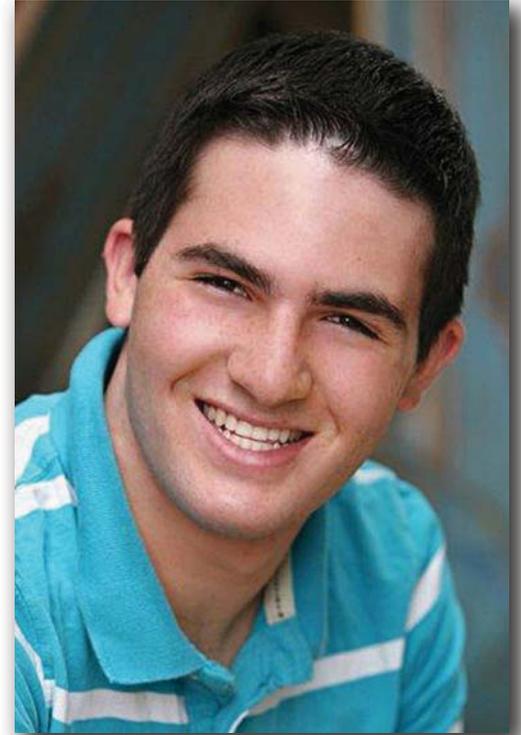
We also received and read a very gratifying letter from Van Nattan-Hansen Scholarship 2007 student Sara Simon of Morrison, CO.

This year she completed her undergraduate degree in Physics and Astronomy at the University of Colorado at Boulder, where she worked at the LASP and CASA labs on the Cosmic Microwave Background. Sara earned an honorary degree of Summa Cum Laude in Physics. She will be going on to graduate school for a Ph.D. in Physics at Princeton University, where she will continue to work in research on CMB Cosmology!

In her letter to us, Sara concludes, "I am extremely grateful to you for all your generosity to me. It is through people like you, who are dedicated to the education of future scientists, that I was able to go to college and begin my journey into scientific academia."

It is a great pleasure to pass these thanks along to all of you in the DAS who have supported and continue to support our students through the scholarship fund. You are making a great contribution to the future of Astronomy and the Physical Sciences and helping to make the DAS much more than just an astronomy club!—Ron Pearson, Chair—DAS Van-

Nattan-Hansen Scholarship Committee President, DAS



VAN NATTAN-HANSEN SCHOLARSHIP WINNER, JOEY GURRENTZ

Photo courtesy Joey Gurrentz



VAN NATTAN-HANSEN SCHOLARSHIP WINNER

Van Nattan award winner David Bicknase receives his certificate from Ron Pearson, DAS president.

Photo by Brad Gilman

PRESIDENT'S CORNER (CONTINUED FROM PAGE 2)

a few bucks or save a few bucks bidding low and selling high! A minimum of 10% of the sale goes to one of our DAS funds. Instead of a formal speaker in November, you are the stars—It's the Annual Show and Tell Meeting Nov. 11th at Olin Hall. If you've been working on a scope project or observing project or imaging, bring it and tell us about it. If it's too heavy to lug in, just take a few pix of it and put them up on the digital big screen for everyone to enjoy. If you need help or ideas on building a scope or other related equipment, this is the place to pick the brains of those who tinker and build their own "stuff." Note that some "stuff" may either come from the Annual Auction or be in it another time! December gets us

to the Annual Holiday Party with lots of great food and more tall tales or stories. Details for a possible new location this year are being worked on. But the best part of the 3rd & 4th quarter is it gets dark earlier and earlier, while in September and October at least, we usually have some of the best observing weather of the year. Cool clear nights, Jupiter rising in the east and lots of big galaxies and new deep-sky objects to view while we wait for Orion to make his evening appearance late in the 4th Quarter, as ever, chasing Taurus the Bull.

Clear skies and good astronomy "stuff!"



VESTA FIESTA AT CHAMBERLIN OBSERVATORY

A fine evening of observing and talks outside about the asteroid Vesta, the Dawn Mission and Meteorites by DAS E-Board member Ron Hranac was enjoyed by over 135 folks on August 9, 2011 "Vesta Fiesta" Open House at Chamberlin Observatory.

Photo by Ron Pearson

Editor's note:

Wow. Where did the summer go? The older I get, the faster the months seem to go.

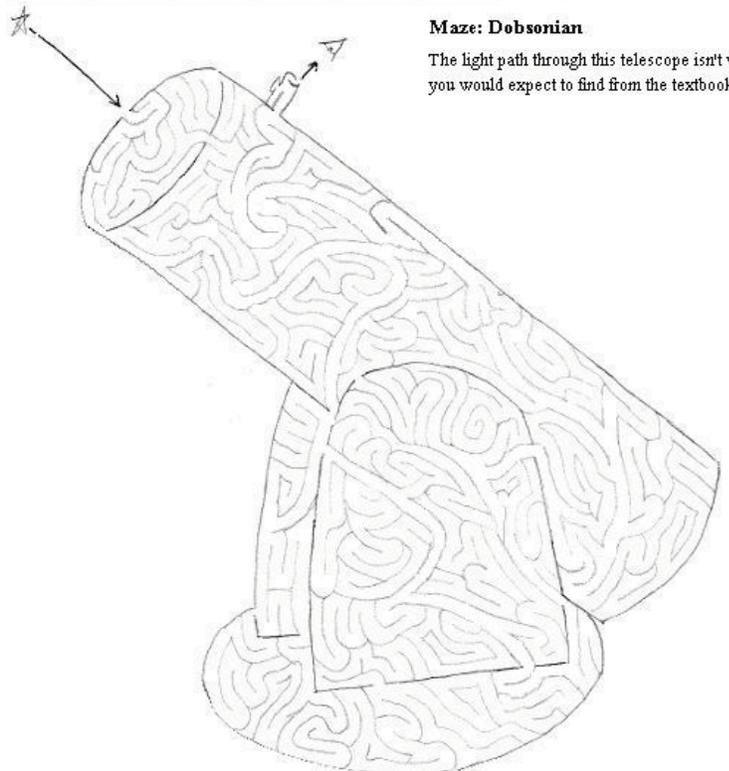
First, I'd like to thank Steve Solon for the monthly "New Astronomers Den" (NAD) chart and his generous and gentle proof-reading and editing of this newsletter. His work made my job a thousand times easier. His contributions and dedication to the DAS for so many years has made a difference in the club that I hope will be appreciated for years to come. Since he has "stepped down" from his services within the DAS, I could use some proof-reading help in the near future. If you're interested, please e-mail me with your experience. I adhere to the rules of the *Chicago Manual of Style* as much as possible.

I'd also love to have some monthly or bi-monthly column or article ideas that you would be willing to contribute.

Meeting deadlines are always a challenge when so many people are contributing, but we attempt to follow a target date of the *second Friday of each month for publication of the following month's issue*. For instance, the December issue deadline for images and copy is the second Friday of November. This deadline is for *time-sensitive articles and images*. If you have articles and images to submit and don't have a preference for which issue they land in, please, don't worry about the deadlines. Just submit!

I'd love to have a newsletter that is contributed to and written entirely by DAS members. If I receive little or no contributions, I'll go wherever I need to go to create a newsletter that I feel will "speak" to all members. My commitment is to produce a professional newsletter that has something for everyone—observers and non-observers, and advanced and novice astronomers alike. Suggestions are welcome and appreciated. Clear skies to you all!—*Patti Kurtz*

Fun Cloudy Nights.....



Maze: Dobsonian

The light path through this telescope isn't what you would expect to find from the textbooks.

NASA'S SPACE PLACE

DARK CLUES TO THE UNIVERSE

A Space Place Partner Article

by Dr. Marc Rayman

Urban astronomers are always wishing for darker skies. But that complaint is due to light from Earth. What about the light coming from the night sky itself? When you think about it, why is the sky dark at all?

Of course, space appears dark at night because that is when our side of Earth faces away from the Sun. But what about all those other suns? Our own Milky Way galaxy contains over 200 billion stars, and the entire universe probably contains over 100 billion galaxies. You might suppose that that many stars would light up the night like daytime!

Until the 20th century, astronomers didn't think it was even possible to count all the stars in the universe. They thought the universe was infinite and unchanging.

Besides being very hard to imagine, the trouble with an infinite universe is that no matter where you look in the night sky, you should see a star. Stars should overlap each other in the sky like tree trunks in the middle of a very thick forest. But, if this were the case, the sky would

be blazing with light. This problem greatly troubled astronomers and became known as "Olbers' Paradox" after the 19th century astronomer Heinrich Olbers who wrote about it, although he was not the first to raise this astronomical mystery.

To try to explain the paradox, some 19th century scientists thought that dust clouds between the stars must be absorbing a lot of the starlight so it wouldn't shine through to us. But later scientists realized that the dust itself would absorb so much energy from the starlight that eventually it would glow as hot and bright as the stars themselves.

Astronomers now realize that the universe is not infinite. A finite universe—that is, a universe of limited size—even one with trillions of stars, just wouldn't have enough stars to light up all of space.

Although the idea of a finite universe explains why Earth's sky is dark at night, other factors work to make it even darker.

The universe is expanding. As a result, the light that leaves a distant galaxy today will have

much farther to travel to our eyes than the light that left it a million years ago or even one year ago. That means the amount of light energy reaching us from distant stars dwindles all the time. And the farther away the star, the less bright it will look to us.

Also, because space is expanding, the wavelengths of the light passing through it are expanding. Thus, the farther the light has traveled, the more red-shifted (and lower in energy) it becomes, perhaps red-shifting right out of the visible range. So, even darker skies prevail.

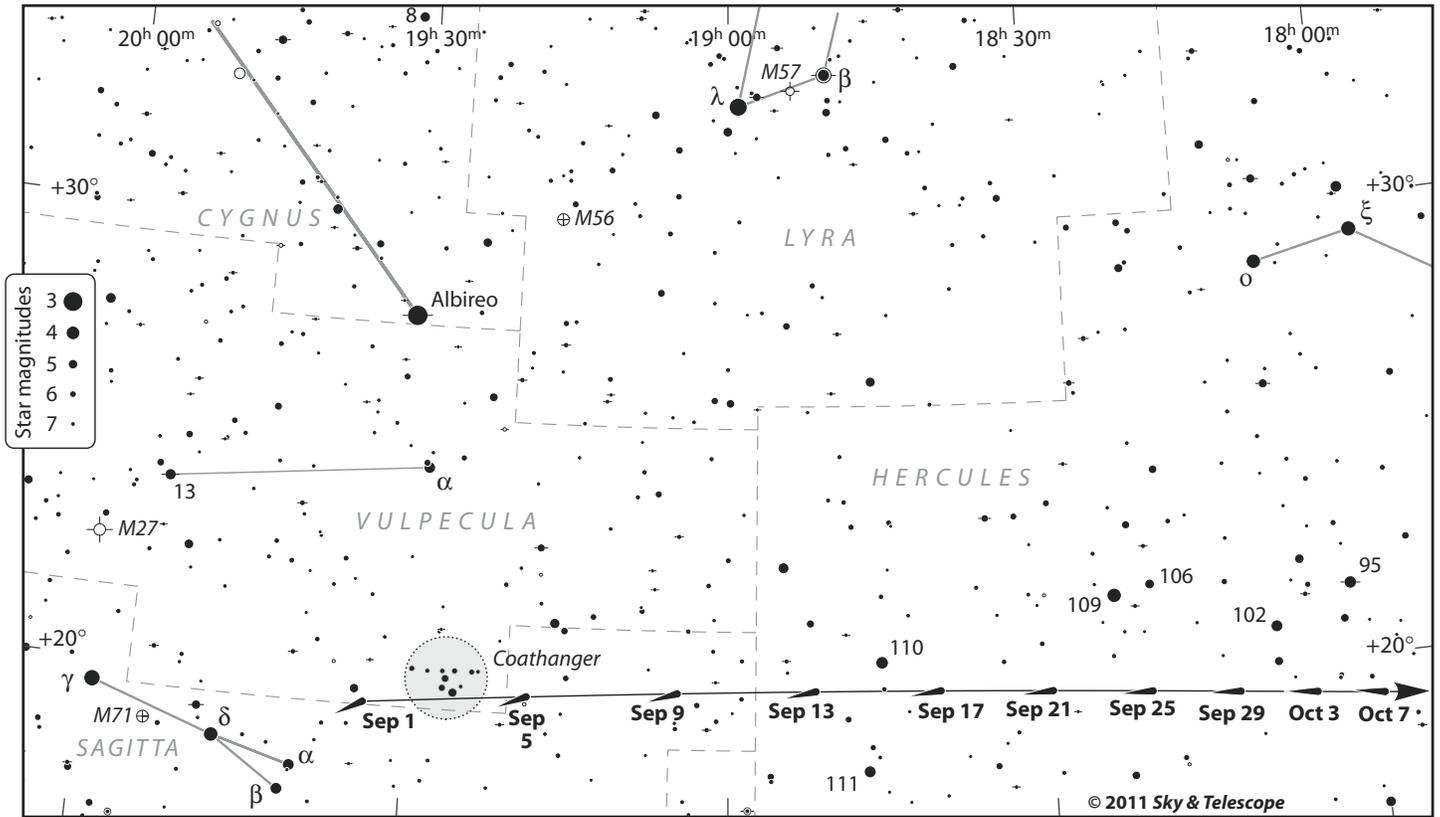
The universe, both finite in size and finite in age, is full of wonderful sights. See some bright, beautiful images of faraway galaxies against the blackness of space at the Space Place image galleries. Visit <http://spaceplace.nasa.gov/search/?q=gallery>.

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.



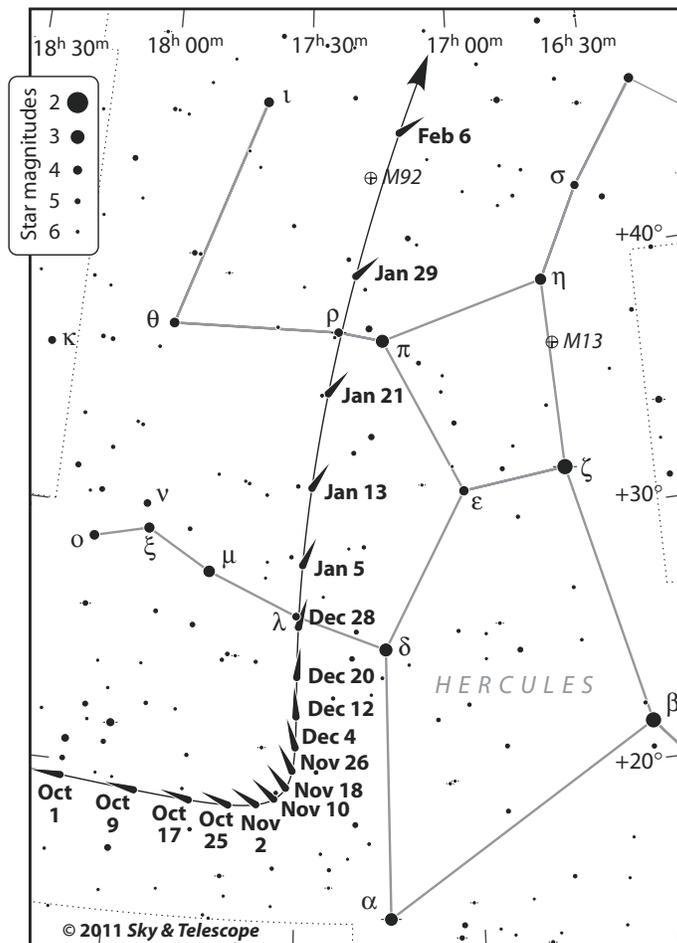
This Hubble Space Telescope image of Galaxy NGC 4414 (left) was used to help calculate the expansion rate of the universe. The galaxy is about 60 million light-years away.

Credit: NASA and The Hubble Heritage Team (STScI/AURA)



Path of Comet Garradd

Sept. 2011 – Jan. 2012



The tick marks are for 0 hours Universal Time on the dates indicated. This moment falls on the evening of the previous date in the time zones of the Americas.

The Pacman Nebula surrounding the star cluster NGC 281 (9,200 light-years distant) provides an excellent view of star formation. This image was taken July 1, 2011 at Bryce Canyon, AZ.

Image © Darrell Dodge



The Denver Astronomical Society
c/o Chamberlin Observatory
2930 E. Warren Ave.
Denver, Colorado 80210