

OBSERVER



A STELLAR VALENTINE

IC 1805 - THE HEART NEBULA

Over 7500 light years away in the constellation Cassiopeia, the Heart Nebula (IC1805 or Sh2-190), is a huge complex of ionized hydrogen, free electrons and dust 180 light-years across. The nebula is energized by several 50 solar-mass stars in the open cluster Melotte 15 in its bright center, also known as NGC 896. This image, comprised of 14, 6-minute RGB exposures, was made by Darrell Dodge on November 23, 2011 at the EGK Dark Site with a modified Canon 450D through a 72mm f/6 AT72ED refractor.

Image © Darrell Dodge

Calendar

- 2..... Groundhog Day
- 7..... Full moon
- 14... Last quarter moon, Valentine's Day
- 21..... New moon
- 29..... First quarter moon

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FEBRUARY SKIES

by Dennis Cochran

Orion is front and center now, a constellation that nicely outlines its subject—the hunter raising his club and shield, or whatever, and whistling to his dogs, Canis Major and Minor. The Big Dog (Sirius), is below-left of the hunter; look for that super-bright star poking his doghead out of the bushes on the horizon. The Little Dog is higher, even with Orion's upraised arms, a two-star grouping with one of them bright: Procyon, a mere eleven light-years away. Procyon's companion is a faint white dwarf.

Below the Little Dog and east of Orion is a larger but fainter constellation, Monoceros the Unicorn. His head is east of Betelgeuse and his horn points upwards towards Gemini. Open clusters from Messier's catalog live with the beast: Messiers 46, 47, 48 and 50 are all under the animal. It might be

easier to start from Sirius to find them. M50 is about 40% of the way from Sirius to Procyon. M46 and M47 are close together straight east of the Dog Star. M48 is northeast of that pair and east of M50, a bit farther east than Procyon. M46 has the planetary nebula NGC 2438 on its upper edge. It's described in the *Peterson Field Guide to the Stars and Planets* (2nd Ed.) as "an irregular patchy ring." People with big telescopes and dark skies may be able to see the nebular patch IC 2177 and some fainter clusters just south of M50.

Level with Sirius but in the western direction is the constellation Lepus the Hare, directly under Orion. Below the middle of this group is the globular cluster M79, at about the level of M41, which is the star cluster south of Sirius.

Continued on Page 3

PRESIDENT'S CORNER

by Ron Pearson

February is a month of strange transitions and holidays. Amid great fanfare and media coverage, people that barely believe the weatherman's daily forecast and supercomputer models of climate change developed by the best scientists in the country, look to the shadow of a large, furry rodent in Pennsylvania to tell us what the weather will be for the next six months. This holiday is followed by one that touts a small cherub with a bow and arrow who prompts millions to go out and buy goofy cards, chocolate and flowers for those we love. If that's not enough strangeness, at the end of this month, we add an extra day to the year 2012! Since by some strange coincidence the world will end before the end of the



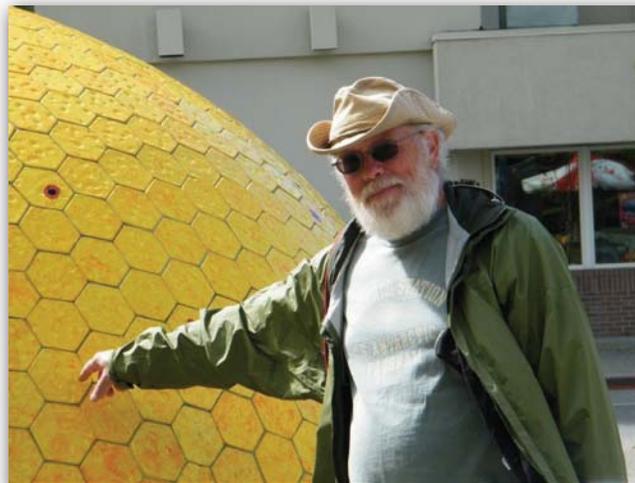
year, I guess we need an extra day! This last bit of strangeness is due to our astronomical circuit around the sun—As in not being quite a perfect 365 days. It takes a bit longer to go around the sun, so rather than have a frac-

tion of a day every year, we add on that little extra every four years.

What's up in the sky while we celebrate these rather strange holidays? Jupiter, the huge planet we've waited for so long to get up in an early evening sky, is fast disappearing leaving Orion the Hunter all alone to hunt Taurus the Bull. But Mars, which has been an early morning riser, starts making its appearance earlier and earlier in the evening sky as it creeps under Leo, who leads the parade of galaxies that many are already hunting with anticipation for the March Messier Marathon.

In a strange bit of February timing, we have no Open House at Chamberlin this February—rather we have *two* in March. In February after the furry rodent shadow day, we hold elections at our Annual Meeting to elect another group of sometimes strange people to conduct the business that needs to be done to keep the DAS an active astronomical society for the next year. Then, in March, we hold our Annual Banquet to welcome the newly elected and honor those who have served us this past year. I hope you'll participate in this DAS bit of business and fun. Our vice-president Lisa has lined up a great speaker for the banquet, retired Astronaut Bruce McCandless, who will tell us about his strange adventures of being one of the very few humans to float above our blue Earth as a free satellite, tethered only by the force of gravity, and becoming a living astronomical object!

Clear skies, and "Keep Looking Up!"



DAS SCHEDULE

FEBRUARY

- 3 DAS Annual meeting at D.U.'s Olin Hall: Election of Officers (Begins at 7:30 P.M.).
- 10 E-Board Meeting at Chamberlin (Begins at 7:30 P.M.)
- 17-19 EGK Dark Sky weekend
- 24-26 EGK Dark Sky weekend

MARCH

- 3 Open House at Chamberlin Observatory (Begins at 6:00 P.M.) Mars Opposition
- 9 E-Board Meeting at Chamberlin (Begins at 7:30 P.M.)
- 10 DAS Banquet, Election and Installation of Officers (6-9 P.M.)
- 23-25 EGK Dark Sky weekend (Messier Marathon)
- 31 Open House at Chamberlin Observatory (Begins at 7:30 P.M.)

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

March 15 - April 14 at 8:00 P.M.

April 15 - August 31 at 8:30 P.M.

September 1 - September 30 at 8:00 P.M.

October 1 - March 10 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 Pimental |
| Chuck Habenicht | David Shouldice |
| Ron Hranac | Dan Wray |
| Ron Mickle, Past President | |
| President Emeritus, Larry Brooks | |

Committees

- Van Nattan-Hansen Scholarship Fund:**
Tim Pimental (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:**
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The *Observer* is available in color PDF format from the DAS website.
- Website:**
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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

FEBRUARY SKIES (CONTINUED FROM PAGE 1)

If you want to stretch your neck, or just exercise your “GoTo” capability, consider going straight north through Orion and Auriga towards Polaris. We’re looking for the famous pair M81 and M82, different sorts of galaxies close together in the sky. They are members of the Ursa Major galaxy cluster. Don’t go up to Polaris to find them—use the traditional method of looking at the dipper part of the Big Dipper, and imagine a line across its space from the Gamma star to its Alpha star at the pouring lip of the dipper, then extend this line in the same

direction, roughly northwest, for the same distance. M81 is a “Grand Design” spiral while M82 is a side-on starburst galaxy. Just south of the pair are two more cluster galaxies—NGCs 3077 and 2976.

While you’re up in that neighborhood, go back to the Big Dipper. Southeast of the Beta star, the one below the pouring lip of the dipper, is the fainter galaxy M108 and the Owl Nebula (M97), which is another planetary nebula. Small scopes show the disk of the latter object, while

larger ones may enable you to see the two dark spots in the disk that make it resemble an owl.

I don’t have to tell you to bundle up on these long, cold winter nights. If you do brave the weather, however, you’ll have some of the clearest skies you’ll see all year. And don’t forget those bad things that can happen whilst you try to observe, like falling, slipping, tripping, dropping and so on. The tingle of danger is the spice of our hobby, no?



SHADOW CROSSING

Using Chamberlin Observatory’s historic 20-inch Alvan Clark refractor, David captured Jupiter’s great red spot and its moon Europa casting its shadow on the “King of Planets.”

Image © David Shouldice

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.



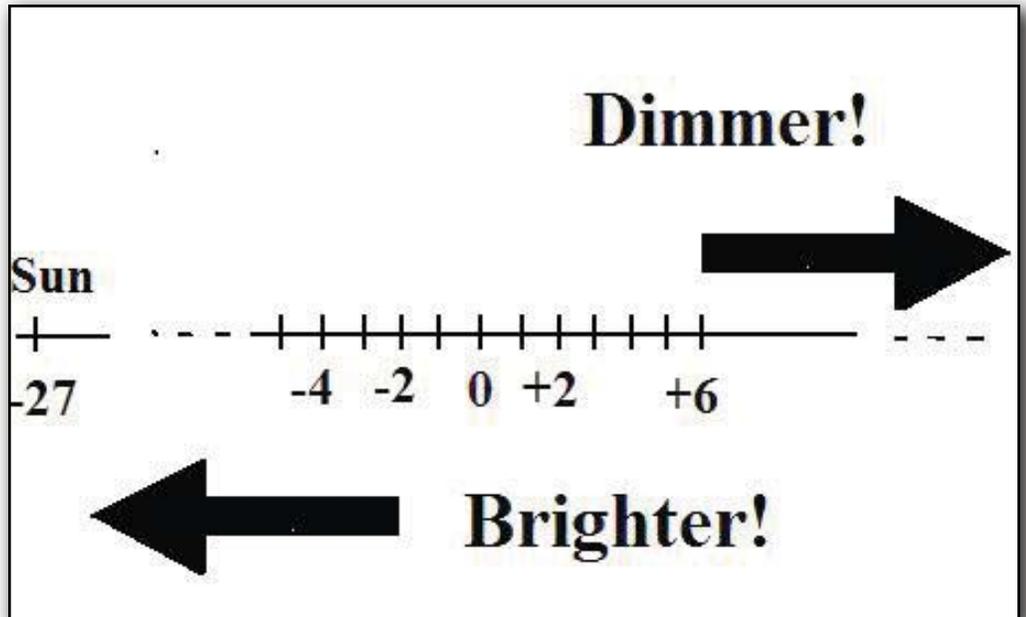
BEGINNERS BITS — MAGNITUDES

by Lisa Judd

If you're a casual stargazer that doesn't like scientific terms, rest assured that there are a few simple ones that just require a definition. The term "magnitude," in astronomy, is simply brightness: the lower the number the brighter the object. So the stars in the big dipper are about 1st magnitude, and on a dark night we can see stars as dim as magnitude 6 with the naked-eye. Binoculars can take you down to 8 or 9th magnitude, and larger telescopes allow you to see dimmer and dimmer things; The Hubble Space Telescope sees to 22nd magnitude. The numbers can go negative, too (Sirius is -1, Venus can get up to -4, and the sun is -26), and variable star observers know very well how to estimate the decimal interpolations. These are the basics, but there are a few details about this concept, specific to astronomy, which every observer should know.

First of all, the scale is a little different than in other areas of science. Most people think of Magnitude as being powers of 10, like they are on the Richter scale for earthquakes and just about any other measurement system of the same name. But in astronomy, the difference of one magnitude unit is measured as the 5th root of 100. The reason for this is kind of ridiculous, though—someone decided that 6 was a good number of magnitudes to categorize with the naked eye, then did the math to figure what kind of physical light-output difference that concept would quantify.

A star's brightness to our eyes depends on how far away it is, so the meaning of the term "brightness" or "magnitude" often depends on whether you're talking to a hobby observer or a stellar physicist.



MAGNITUDE SCALE

Credit: <http://brane-space.blogspot.com/>

"Apparent brightness/magnitude" is how we see it, and "intrinsic brightness/magnitude" is independent of our view and measures how much energy a star puts out, also called "luminosity." If we could map all the sky's stars according to their intrinsic rather than apparent brightness, the sky would look much the same, with a few very noticeable differences for nearby stars like Sirius and Procyon.

This difference is well pronounced between the two Summer Triangle stars Vega and Deneb. Vega looks slightly brighter to us, but it's only 26 light-years away—whereas Deneb is 1,500 light-years away and still about as bright. Since any light's brightness drops by the square of distance, you can imagine how much more luminous Deneb really is—in fact, it's a class of object that some astronomers like to call a superstar, with 50,000 times the output of our sun.

A deep-sky object also has a particular brightness, but the monkey wrench is that the total light output is measured across the expanse of sky the object covers. Observing literature will report that M33 is a magnitude 5.7 object, but when you look at it and see nothing, you'll get a lesson in how big it is. If we could shrink it to an average Sombrero-galaxy size, it'd be very bright, but instead that light covers several times the area of the full moon. So, don't always trust the literature—it takes experience to learn what to expect you'll see.

Questions, comments and corrections are welcome. My email address is lm_judd@hotmail.com.



NGC 247

Photo left: This fairly large and dim galaxy in the constellation Cetus the Whale is about 20 X 6 arcminutes across. It was taken at the Okie-Tex 2011 star party. Joe used an SBIG ST-2000XM CCD camera on his 18-inch f/4.5 Newtonian Telescope. He made 20-minute exposures each from HaLRGB filters and five- minute sub exposures.

Image © Joe Gafford

BANQUET SPEAKER: BRUCE MCCANDLESS II: "SPACE TELESCOPES: WHERE THEY ARE HEADED, AND WHY."

Former astronaut **Bruce McCandless II** (Captain, USN, Ret.) needs little introduction in the space community. After flight training from the Naval Aviation Training Command, he was part of the class of 19 astronauts selected by NASA in April 1966. He served on the astronaut support crew for Apollo 14 and as backup pilot for Skylab. His chance to fly came in 1984 with the 10th shuttle mission, STS-41B Challenger, where he earned fame for the development and first, untethered, four-hour free flight of the Manned Maneuvering Unit (MMU). Then in 1990, he served on STS-31 Discovery (with current NASA administrator Col. Charlie Bolden) for the initial deployment of the Hubble Space Telescope. He also holds a patent for a tool tethering system used on spacewalks.

He will speak about, "Space Telescopes: Where They are Headed, and Why."

—DAS Vice-President, Lisa Judd



FLOATING FREE

In February 1984, Mission Specialist Bruce McCandless II went farther away from the confines and safety of his ship than any previous astronaut had ever been. This space first was made possible by the Manned Maneuvering Unit or MMU, a nitrogen jet propelled backpack. After a series of test maneuvers inside and above Challenger's payload bay, McCandless went "free-flying" to a distance of 320 feet away from the Orbiter. This stunning orbital panorama view shows McCandless out there amongst the black and blue of Earth and space.

Photo at left: The official Space Shuttle portrait of Astronaut Bruce McCandless, II., attired in the Shuttle Extra Vehicular activity (EVA) suit with the manned maneuvering unit (MMU) attached.

Captions and image credits: NASA

HAVE YOU RENEWED YOUR MEMBERSHIP for 2012?

If not, please send your renewal materials to Brad Gilman ASAP.

If you misplaced the 2012 membership renewal form, please get one here:

www.denverastro.org/miscfiles/membershipapp.pdf

NASA'S SPACE PLACE

THE NERDIEST VIDEO GAME EVER

A Space Place Partner Article
by Dr. Tony Phillips

NASA has a job opening. Wanted: People of all ages to sort, stack, and catalogue terabytes of simulated data from a satellite that launches in 2015. Agile thumbs required.

Sorting terabytes of data? It's more fun than it sounds.

In fact it's a game: Satellite Insight. The Space Place Team at the Jet Propulsion Laboratory created the entertaining app for iPhones to get the word out about GOES-R, an advanced Earth science satellite built by NOAA and NASA.

Described by the Los Angeles Times as possibly "the nerdiest game ever," Satellite Insight may be downloaded for free from Apple's app store. Be careful, though, once you start playing it's hard to stop. Some reviewers have likened it to Tetris, one of the most popular video games of all time.

GOES, short for "Geostationary Operational Environmental Satellite," is the workhorse spacecraft for weather forecasters. NOAA operates two (at a time) in geosynchronous orbit,

one above the west coast of N. America and one above the east coast. They monitor clouds, wind, rain, hurricanes, tornadoes and even solar flares. The GOES program has been in action since 1975.

GOES-R is the next-generation satellite with advanced technologies far beyond those of the older GOES satellites. It has sensors for lightning detection, wildfire mapping, storm tracking, search and rescue, solar imaging, and more. Many of the sensors are trailblazers. For example, the Advanced Baseline Imager has 60 times the capability of the current imager—16 channels instead of 5. It has twice the spatial resolution and five times the temporal refresh rate, including the 30-second imaging of weather systems over a region of 1000 km x 1000 km. Also, the Geostationary Lightning Mapper can count and pinpoint lightning bolts over the Americas 24/7. It's the first such detector to fly on a geosynchronous satellite, and it could lead to transformative advances in severe storm warning capability.

All in all, GOES-R represents a "huge technological leap from the current GOES." We know this because Satellite Insight tells us so. The app has an informative "Learn More" feature where players can find out about the satellite and the data they have been sorting.

Which brings us back to sorting data. It's a bit like eating Cheerios; just don't tell the kids it's nutritious, and they love it. Helping GOES-R gather and stash data from all those advanced sensors is just as satisfying, too—a dose of Earth science wrapped in thumb-flying fun.

More information about Satellite Insight may be found on the web at <http://itunes.apple.com/us/app/satellite-insight/id463588902?mt=8>. The game also available in web form (flying thumbs optional) at spaceplace.nasa.gov/satellite-insight.

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



SATELLITE INSIGHT

Download a free iPhone app that's fun *and* educational!

DAS 2012 Spring Banquet Invitation

Election and Installation of Officers, and Recognition of Volunteers

You are cordially invited to the Denver Astronomical Society's Annual Banquet on Saturday, March 10th from 6 to 9 pm at Columbine Unitarian-Universalist Church, 6724 S. Webster St., Littleton (see map). Our featured speaker this year is **former astronaut Bruce McCandless II (Captain, USN, Ret.)**, known for developing and flying the Manned Maneuvering Unit (MMU) in 1984 and deploying the Hubble Space Telescope (HST) in 1990. Cpt. McCandless will be speaking to us on **"Space Telescopes—Where they are headed and Why"**.



Due to space considerations, seating is limited to 75, so **get your reservations in ASAP**. An online reservation form may be found at www.denverastro.org/banquet.html. The form can also be printed to send in with your payment. This year's banquet will feature a Deluxe Mexican Taco Buffet catered by Taco Mojo Mexican Catering in Littleton. Cost per person is \$18.00 and includes beer, wine, juices and soft drinks.

Please indicate the number of people in your party on the form below. Clip off the form for mailing so you will have this sheet for reference. Please include a check payable to the "Denver Astronomical Society" or "DAS" and mail the form and check to Brad Gilman at the below address:

Brad Gilman
 DAS Treasurer
 ATTN: Spring Banquet
 7003 S. Cherry St
 Centennial, CO 80122-1179



 (cut here and keep top portion)

Name: _____

Phone: _____

Email: _____

Deluxe Taco Mojo bar includes
 Shredded Beef Barbacoa, Grilled
 Citrus Chicken, Grilled Vegetables
 and Grilled Corn & Tomato Salad.

Total # Meals: ____ X \$18 = \$ ____

GRAND TOTAL = \$ _____

