

OBSERVER

SAVE THE DATES FOR MARATHON DAYS

HORSEHEAD AND FLAME NEBULAE

Approximately 1,500 light-years from Earth, the Horsehead Nebula (Barnard 33 within the emission nebula IC 434) is a dark nebula in Orion. Quite difficult to observe visually, it helps to have a high-contrast nebula filter to see it. Ron shot this beautiful image at his CosmicRock Observatory on January 5, 2013. He used an (unmodified) Canon 400D camera on a C-80mmED with a Televue 0.8x focal reducer-flattner, Astro-nomik CLS filter, piggybacked and guided on 12-inch Newtonian. It is an image stack of 8 x 5 minute exposures: imaged with "Nebulosity," guided with "PHD" and processed with "Nebulosity" and "CS 3 Photo-shop" all on a Macbook Pro.

Image © Ron Pearson

Calendar

4.....	Last quarter moon
10.....	Daylight Saving Time begins
11.....	New moon
19.....	First quarter moon
20.....	Vernal equinox
27.....	Full moon

Inside the Observer

- President's Corner..... 2
- Society Directory..... 2
- Schedule of Events..... 2
- Messier Marathoning..... 4
- April Speaker: Fran Bagenal: Juno... 4
- Annual Spring Banquet..... 5
- Election Results..... 5
- Ridiculously Tiny Telescopes (Pt. 2).. 6
- New Members..... 6
- Job Jar..... 7
- Science at NASA..... 7

MARCH SKIES

by Dennis Cochran

PanSTARRS is coming—aieeah! PanSTARRS the comet, that is, discovered by the telescope which gave it its name in 2011. This scope looks for asteroids and comets from Hawaii, and it works! The Jan.-Feb. issue of *SkyNews*, the Canadian astronomy magazine, shows the comet as it will appear in New Mexico on March 14th on the western evening horizon, its tail pointing straight up. We will see this streaking glob of leftover solar system stuff on that night lined up vertically with the Pleiades and the moon, like an exclamation point in the sky. On successive evenings it will climb higher into the sky, but will be dimmer, so look for PanSTARRS this month and into the Spring. Guy Ottewell's *Astronomical Calendar* for 2013 shows its path across the sky on its page 62 (Also see chart on Page 7).

Look for little sprinkles of light around the comet. These will be the UFOs coming from their rendezvous with . . . wait. I wasn't supposed to say that. No UFOs. Just kidding. Everything's okay, sort of, except for the usual stuff like CO₂-induced global warming, humanoid over-population and so on. There's nothing that you, your leaders or your television are going to worry about. Relax. Have another Gin & Tonic.

SkyNews also shows a lovely conjunction occurring two days later on Saturday the 16th—the aforementioned Seven Sisters will meet up with Jupiter, the moon and the Vee of the Hyades, a wide-spread star cluster also known as Taurus the Bull that features the red star Aldebaran (actually not a cluster member but a foreground object) in the western evening sky. You won't need a telescope for this

Continued on Page 3

PRESIDENT'S CORNER

by Ron Pearson

(CNN)—"Friday was an extremely unusual day, astronomically speaking. Just as scientists were gearing up to witness an asteroid's closest ever approach to Earth in recorded history, a sizeable meteor exploded over Russia, causing thousands of injuries and major damage to buildings." Meg Urry professor of physics, Yale University. Find the full article at: http://www.cnn.com/2013/02/16/opinion/urry-meteor-asteroid/index.html?hpt=hp_t2

Yes, Friday was an extremely unusual day, astronomically speaking. And today is another unusual day—the sun has many "spots" on its surface—some many times the size of our little Earth—there are prominences on its limb, extending a million miles out into space. Its internal fires of nuclear fusion are burning at millions of degrees, heating the planets, moons, rocks, and icy comets of the solar system, and generating clouds or clear skies over our homes. The 1st quarter moon will be rising soon, its face covered in mountains and craters of millions of impacts that occurred billions of years ago, and seas of lava and mountains of an early crust pushed up by planetoid size impacts. Tonight the gentle photons and not so gentle x-rays from stars that left their home galaxies millions and even billions of years ago will complete their journey and descend into the human made light-buckets with mirrors, from the Hubble Space Telescope to humble telescopes of DAS amateurs alike, who patiently wait to

collect them. Every day we are aware of the unusual and it becomes the usual for us. As a sociable little group on this planet we love to share our observations and stories of these events amongst ourselves. We debate what the Englishman named Herschel and his sister cataloged as some

cluster or nebula a couple hundred years ago, we follow alerts about eruptions of plasma on the sun so we might get out and see the Aurora, some of us travel to far-away places to intersect with the motions of sun and moon to witness first-hand the unusual events in the sky. For many who rarely look up and think about what lies beyond the sky, some of us quietly open a shuttered dome or set up our instruments to point a venerable glass skyward to bear witness to the unusual almost every day.

Like fresh spring winds, March brings the change of those that guide our society and set its course through better or worse. As president of the society for the past three years, standing in a long line of presidents and officers that stretch back 64 years, I have strived to both empower and recognize the do-ers in our society so that we can all grow together and make the DAS an organization worthy of those with even a bit of curiosity about the "what's out there," able to join us, and feel comfortable to learn. So, after three turns around the sun, it's time to turn the reins over to another to take the lead for awhile, and I implore that he or she never take the unusual do-ers for the usual. As Shakespeare's King Henry V implores Jupiter for his "band of brothers:"

"By Jove, I am not covetous for gold,
Nor care I who doth feed upon my cost;
It yearns me not if men my garments wear;
Such outward things dwell not in my desires:
... Be in their flowing cups freshly remember'd.
This story shall the good man teach his son;
... Why, now thou hast unwish'd five thousand men;
Which likes me better than to wish us one.
You know your places: God be with you all!"

Or, as our beloved "StarGazer" Jack Horkheimer always put it, "Keep Looking Up!" ★



DAS SCHEDULE

MARCH

- 1 E-Board Meeting at Chamberlin (Begins at 7:30 P.M.)
- 8-10 EGK Dark Sky weekend (Messier Marathon)
- 10 Daylight Saving Time Begins
- 16 Open House at Chamberlin Observatory (Begins at 7:30 P.M.)
- 23 Spring Banquet and Installation of Officers at 6:00 P.M. (See Page 4 and Back Page).
- 26 Passover Begins
- 31 Easter

APRIL

- 5-8 EGK Dark Sky weekend (Messier Marathon—Alternate)
- 12 E-Board Meeting at Chamberlin (Begins at 7:30 P.M.)
- 20 Open House at Chamberlin Observatory (Begins at 7:30 P.M.)
- 26 General Membership Meeting at Olin Hall (Begins at 7:30 P.M.) Speaker: Fran Bagenal, Juno mission co-investigator, University of Colorado, Boulder. Talk: *The Juno Mission to Jupiter: What's Inside the Giant Planet?*

Public nights are held at Chamberlin Observatory every Tuesday and Thursday evenings

beginning at the following times:

March 13 - 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
ljudd@denverastro.org
- Secretary:**
Dennis Cochran (720) 870-0465
- Treasurer:**
Brad Gilman (720) 488-1028

Executive Board Members

- Chuck Carlson Ron Hranac
Jack Eastman Naomi Pequette
Joe Gafford David Shouldice
Chuck Habenicht Dan Wray
President Emeritus, Larry Brooks

Committees

- Van Nattan-Hansen Scholarship Fund:**
Tim Pimental (Chair)
PO Box 100621
Denver, CO. 80250-0621
- EGK Dark Site Committee:**
Darrell Dodge, Interim Chair
Email: darksite@denverastro.org
- IDA Representative:**
Dr. Robert Stencel
Email: coloida@botmail.com

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: webmaster@denverastro.org
- IT Coordinator:**
Scott Leach

- 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

MARCH SKIES

(CONTINUED FROM PAGE 1)

quiet spectacle which repeats on April 13 lower to the horizon.

Something more to look for are the “Three Leaps of the Gazelle”—three visual doubles located above Leo Minor—itsself above Leo—and extending to the area above Lynx, which is at the zenith in the 9 P.M.-10 P.M. time slot. The leap-point pairs are, from east to west, ν (nu) and ξ (xi) Ursa Major (UMa) at $11^{\text{h}} 15^{\text{m}} +32^{\circ}$, then λ (lambda) and μ (mu) UMa at $10^{\text{h}} 20^{\text{m}} +42^{\circ}$, and finally, the pair ι (iota) and κ (kappa) UMa at $9^{\text{h}} +47^{\circ}$. They are identified as leaps on Ottewell’s March chart.

Now get out the scope and look for Hind’s Variable Nebula—NGCs 1554 and 1555—a smidgen northwest of the Hyades, located at the northwest corner of an equilateral triangle with δ (delta) and ϵ (epsilon) Tau, the two stars making the non-Aldebaran horn of the bull. Back at Lynx, look for edge-on galaxy NGC 2683 west of the bottom of Lynx, maybe better found from the upside-down Y of Cancer (where M44/Praesepe/Beehive lives at the center), by extending up its vertical line and continuing another 50% of that distance farther. The bottom, or southeastern, star of Lynx is Alpha, near which are other galaxies to discover. If you then look west of that end of Lynx towards the Castor-Pollux pair of Gemini, imagine drifting straight up from Castor, the northern of the pair, about one and a half times the Castor-Pollux distance to find the little globular cluster NGC 2419 all by its lonesome in the vastness of space. Its coordinates are $7^{\text{h}} 40^{\text{m}} +39^{\circ}$. At least the globular cluster, like its 150 or so fellows, has a galaxy, our Milky Way, to keep it company.★



MESSIER BAUBLE

When you find the treasure (planetary nebula NGC 2438) inside the treasure chest of M46, you get some goose bumps—especially if it’s your first time. A delight in the eyepiece, this is a close-up of the center of M46 with its planetary. Joe shot this image on March 18, 2010 with the SBIG ST-2000XM CCD camera on his 18-inch f/4.5 Newtonian: exposures of 15 minutes Ha plus 12 minutes each of LRGB, binned 2x2.

Image © Joe Gafford

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 Cham-

berlin 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.



MESSIER MARATHONING IN THE AGE OF FRACKING

by Darrell Dodge

With a little luck, the nights of March 8th and 9th, 2013 should be busy ones at the EG Kline Dark Site. The March moon is almost new on those nights, which means those are the official Messier Marathon nights for 2013. Because the new moon falls early in the month this year, the weekend of April 12-14 may also be good for a marathon.

Comet PanSTARRS will be low in the west just after twilight on March 8th and 9th, although it's difficult to tell whether or not it will actually be visible. **At any rate, care must be taken to avoid the sun on both evenings.**

Last year's marathon was a real party at the dark site, with lots of new members as well as old hands in attendance. While object lists were relatively short because of wet air that came flowing in from the eastern plains, there was a plenty of the camaraderie that can make a marathon a lot of fun.

March - April is the only time during the year when observers at perfect dark sites at our latitude can hope to accomplish the feat of observing all of the 110 objects in the modern version of Charles Messier's famous catalog of non-comets. For a lot of reasons, however, it's probably better to have a goal of trying to observe as many as you can, not the entire list. No one has finished an entire marathon at the DAS dark site (even under totally clear skies) because of the Denver "nebula" to the west and the low hills which ring the site, making early-evening and early-morning acquisitions extremely difficult. However, several DAS members have logged 109 objects, which is an incredible feat at any site.

Because of the importance of starting to observe as soon as possible after sun-down, it's absolutely imperative that participants arrive at the site early (5:30 P.M. or so). Late arrivers will not only imperil their own chances of seeing the early objects, but may also make it difficult for other observers. Arriving before dark is also a good idea because the site is often packed on Marathon nights. There are 14 powered concrete observing pads and they often fill up way before dark.

An added degree of uncertainty this year is the presence of an exploratory oil derrick 1.75 miles southeast of the dark site. As of the day this article was written (February 16th), we are operating on the assumption that drilling operations started in January will be over by the end of February. This year, for the first time, five windscreens will be available if the winds become a problem. These



STUMPED?

Is this M82 or M81? You'll have to know which one of the famous galaxy pair in Ursa Major this image captures to successfully complete a Messier Marathon. This image was taken April 2011 at the EGK Dark Site by Darrell Dodge with a modified Canon 450D DSLR through a Celestron C11 SCT.

Image © Darrell Dodge

screens also help block the oil well lights, but they are still ruinous to dark adaptation. Even observing behind the warming hut, which eliminates most direct light does not avoid this effect. Keep track of site status by checking out the dark site web page at www.denverastro.org/ds.html, where the latest known conditions are posted.

A recently-added feature at the dark site is the Brooks Observatory, with its 14-inch SCT on a "go-to" Losmandy G11 mount. We plan to be viewing Messier objects (if not doing a marathon) in the observatory on Saturday, March 9th this year.

Continued on Back Page

APRIL SPEAKER: DR. FRAN BAGENAL — THE JUNO MISSION TO JUPITER: WHAT'S INSIDE THE GIANT PLANET?



The main theme of Dr. Bagenal's research has been the synthesis of data analysis and theory in the study of space plasmas. She has specialized in the fields of planetary magnetospheres. Dr. Bagenal is a co-investigator on the Voyager Plasma Science (PLS) experiment and has worked with colleagues at MIT in analyzing plasma data obtained in the magnetospheres of Jupiter, Saturn, Uranus and Neptune. From the PLS measurements one derives the properties of the low energy ions and electrons that comprise the thermal plasmas trapped by the planets' magnetic fields. She was an Interdisciplinary Scientist on the Galileo Project, specializing in a study of the Io plasma torus in the magnetosphere of Jupiter using both in situ plasma measurements and spectroscopic remote sensing observations. Dr. Bagenal is a science team member of the Deep Space 1 mission and team leader of the plasma investigations on the New Horizons mission to Pluto and the JUNO mis-

sion to Jupiter. With Tim Dowling and Bill McKinnon she co-edited *Jupiter: The Planet, Satellites and Magnetosphere* (Cambridge University Press, 2004).

NASA's JUNO mission was launched in August 2011 and will go into orbit over Jupiter's poles in about five years. JUNO carries instruments that will probe Jupiter's deep interior and measure the amount of water—a key component of solar system evolution. JUNO is the first spacecraft to fly over Jupiter's aurora and will measure both the energetic particles raining down on the planet and the bright "northern and southern lights" they excite.★

DAS 2013 Spring Banquet Invitation

You are cordially invited to the Denver Astronomical Society's Annual Banquet on Saturday, March 23rd from 6 to 9 P.M. at Columbine Unitarian-Universalist Church, 6724 S. Webster St., Littleton (see map). Our featured speaker this year is Dr. Bill Bottke, who will be speaking on "Planet Formation: What's New with the old Solar System?"

Dr. Bottke is Director of the Department for Space Studies at Southwest Research Institute (SwRI) in Boulder, Colorado, and the Center for Lunar Origin and Evolution (CLOE) of NASA's Lunar Science Institute. He researches collisional and dynamical evolution of small body populations in the solar system (asteroids, comets, irregular satellites, Kuiper belt objects, meteoroids, dust) and the formation and bombardment history of planetesimals, planets and satellites, and how near-Earth objects (NEOs) are delivered from their source regions to their observed orbits. He earned his B.S. in Physics and Astrophysics from University of Minnesota and a Ph.D. in Planetary Science from University of Arizona in 1995.



Seating is limited to 70, so get your reservations in ASAP. The reservation form may be found at www.denverastro.org/banquet.html, and will feature a new reservation system that we hope to use for Public Night, courtesy of our talented IT guy Scott Leach. Due to space considerations, we can't accept walk-ins without a reservation. For those that are members of PayPal, you can pay directly on the site; otherwise, there is a printable version of the form to send in with your payment. Catered by Taco Mojo in Littleton, cost per person is \$20.00 and includes beer, wine, juices and soft drinks.

If you'd like to mail in the payment, please indicate the number of people in your party on the form below. Clip the form, and mail with a check payable to the "Denver Astronomical Society" to treasurer Brad Gilman here:

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 \$20 = \$ _____

GRAND TOTAL = \$ _____

ELECTION RESULTS

The election results for 2013 DAS Officers are:

- President - Ron Hranac
- Vice President - Lisa Judd
- Secretary - Dena McClung
- Treasurer - Brad Gilman
- Executive Board:
- John Barela
- Jack Eastman
- Joe Gafford
- Chuck Habenicht
- Digby Kirby
- Scott Leach
- Ed Scholes
- Dan Wray

Congratulations to all! The new officers will be installed at the Annual Banquet on March 23.



RIDICULOUSLY TINY TELESCOPES, OR HOW

I BEAT APERTURE FEVER (PART 2) *CONTINUED FROM THE FEBRUARY 2013 OBSERVER*

by F. Jack Eastman

The success of the little 40mm telescope inspired another idea for me. Celestron was also producing a 6-inch $f/8$ SCT as a long ($f=1200\text{mm}$) photographic lens. The 8.7mm thick center plug from this was about 48.3mm in diameter. It allowed for a 47.5mm aperture if used for a small primary mirror (larger than the 40mm, is aperture fever [AF] creeping in here?). The focal length of this one was 376.2mm, $f/7.9$. The smaller $f/\#$ (and larger size) meant more spherical aberration, but for this one it was still a small 0.084 waves. Still, very good. Good enough!

I decided on aesthetics for this instrument—all brass (or as much as possible) and an open framework tube—a solid brass tube would have been too easy! This thing was, indeed, labor intensive. I had a bunch of large brass washers, (rings), 67mm outside diameter, 50.5mm inside, 2.7mm thick, a fair length of 5.5mm brass rod and other assorted scraps of brass as well as some brass pipe tees and such. The rings were drilled and countersunk in six places, brass rods cut to 309mm lengths, drilled and tapped on the ends and the whole thing assembled into the center “cage.” Two more rings were drilled, spaced by about 20mm to form the attachment to the mount. Two more rings were drilled with four large and two smaller holes, four rods were cut to 40.5mm length and, as before, drilled and tapped on the ends. A 4mm thick plate was fitted between the rings, drilled out to accept the 0.965-inch eyepiece holder. The rods were drilled to accept small screws, soldered to the thin, 0.3mm, steel spider vanes. The diagonal is,

as before, a 45-90-45 prism 9.4mm on a side. This “upper cage” is attached to the main tube by three #2/56 screws and can be tilted slightly to ensure collimation of the system. The mirror cell is machined from a brass tube, equipped with a flange made from yet another of the aforementioned rings. It looks like a typical lens cell for a refractor, except the rear is a solid brass plate. The cell is attached to the main tube by a system of push-pull #2 screws. In this way it truly is more like a refractor cell, and, as with the 40mm, holds collimation perfectly.

The equatorial is, again, pipe fittings of brass and fitted with a brass worm-gear of 109 teeth. The declination axis is a long bolt, the tube attached to the head and the nut on the other end makes for a good friction adjustment. As with the 40mm, this little guy is a great performer. Its only downside is the open tube, and that means a huge amount of stray light. It must be used with a short cardboard tube around the upper cage.

This brings me to RTT #3. Perhaps this is the result of taking the entire bottle of Aperture Fever medicine in one gulp! This one was made by Joe Meyers, at the time a colleague of mine at the early Celestron. Another of Celestron’s product line was a 4-inch $f/15$ SCT. The tiny 6.2mm thick plug from its primary has a diameter of 23.4mm. Could a reflecting telescope be made this small and still have a chance at all of working? As we shall see, yes. Joe and I had talked about this tiny telescope over the years, but Joe had to admit that he’d lost it many years ago, probably in one of his moves. About a year ago I got a note that he’d found the telescope “in a box of old car parts. It’s a bit beat up, but seems to all be there.” I suggested he restore it and bring it to the Riverside Telescope Makers Conference. He said “No! You restore it etc. etc . . .” and it showed up on my doorstep a week or so later. What I didn’t expect was the equatorial mount, heavy, ball bearings, 9.5mm shafts and the counterweight, a brass focusing knob from a C-10 SCT. There was a note in the box warning me not to toss or lose three small plastic bags in a sea of Styrofoam peanuts. One had the 23.4mm primary mirror, another the 6.6mm diagonal mirror and the third, a tiny 10mm diameter eyepiece. The construction is similar to the other ones except this one had no spider. The diagonal was bonded to a short stalk, in turn bonded to a glass window. I had to re-bond this to the window, and realized it would have to be aligned perfectly to aim out at the eyepiece. Adjustment for this was no longer there, I think Joe had bonded the cell to the tube and aligned it before the epoxy cured. I was able to set up a jig (involving a small 4-jaw lathe chuck) and



THE 47.5MM PRIMARY MIRROR OF THE BRASS NEWTONIAN

Photo by Cathie Havens

carefully get things in the proper alignment. Failure to get this right would have meant more intrusive surgery on the upper end of the tube. The eyepiece was a 6mm Orthoscopic (50X) that Joe had remounted in a 10mm barrel and made the holder for it. Proportionally, this is much better for such a small telescope than a 0.965 adapter.

I was amazed at how well this little thing worked, craters on the moon, moons of Jupiter, rings of Saturn—all no problem at 50X. I was able to split Castor, at a separation the order of 4.8 or so arc seconds (2012 measure, WDS). Dawes for this is 4.8 arc-secs. The spherical aberration of this tiny system is only 0.0097 waves!

All in all, it was fun to make these little telescopes, prove that aperture (although it helps a bunch) isn’t everything, and just consider the portability! That they work at all is amazing and they work very well, indeed. ★

JACK OBSERVING WITH THE JOE MEYERS
23.4MM REFLECTOR

Photo by Wayne Green



WELCOME NEW DAS MEMBERS!

Donald Baker
Lind Ann Bisbee
Evan Bridgford
Myron China
Michelle Ellington
Melanie Graham
Umair Khan
Phillip Klapperich

Mark Knogge
Jeffrey Martz
David Parker
Cindy Quan
Scott Schafer
Ricardo Viera
Marc Wiley

REPRINTED FROM SCIENCE @ NASA:
<http://science.nasa.gov/science-news/>

A POSSIBLE NAKED-EYE COMET IN MARCH

by Dr. Tony Phillips

Comet Pan-STARRS was discovered by the Panoramic Survey Telescope & Rapid Response System atop the Haleakala volcano in Hawaii.

Astronomers use the massive 1.8 meter telescope to scan the heavens for Earth-approaching objects, both asteroids and comets, that might pose a danger to our planet. In June 2011 a comet appeared, and it was named "Pan-STARRS" after the acronym for the telescope.

In early March, the comet will pass about 100 million miles from Earth as it briefly dips inside the orbit of Mercury. Most experts expect it to become a naked-eye object about as bright as the stars of the Big Dipper.

"But," says Karl Battams of the Naval Research Lab, "prepare to be surprised. A new comet from the Oort Cloud is always an unknown quantity equally capable of spectacular displays or dismal failures."

The Oort cloud is named after the 20th-century Dutch astronomer Jan Oort, who argued that such a cloud must exist to account for all the "fresh" comets that fall through the inner solar system. Unaltered by warmth and sunlight, the distant comets of the Oort cloud are like time capsules, harboring frozen gases and primitive, dusty material drawn from the original

solar nebula 4.5 billion years ago. When these comets occasionally fall toward the sun, they bring their virgin ices with them.

Because this is Comet Pan-STARRS first visit, it has never been tested by the fierce heat and gravitational pull of the sun. "Almost anything could happen," says Battams. On one hand, the comet could fall apart—a fizzling disappointment. On the other hand, fresh veins of frozen material could open up to spew garish jets of gas and dust into the night sky.

"Because of its small distance from the sun, Pan-STARRS should be very active, producing a lot of dust and therefore a nice dust tail," predicts Matthew Knight of the Lowell Observatory.

"However," he cautions, "it could still be difficult to see. From our point of view on Earth, the comet will be very close to the sun. This means that it is only observable in twilight when the sky is not fully dark."

The best dates to look may be March 12th and 13th when Pan-STARRS emerges in the western sunset sky not far from the crescent Moon. A comet and the Moon, together, framed by twilight-blue is a rare sight. "My guess is that the primary feature visible to the naked eye will be the gaseous coma around the head of the comet," says Knight. "The comet's tail will probably require binoculars or a small telescope."

Two other key dates are March 5th when the comet comes closest to Earth (about 100 million miles away) and March 10th, when the comet comes closest to the sun. The dose of solar heating it receives just inside the orbit of Mercury could be just what the comet needs to push it into the realm of naked-eye visibility.

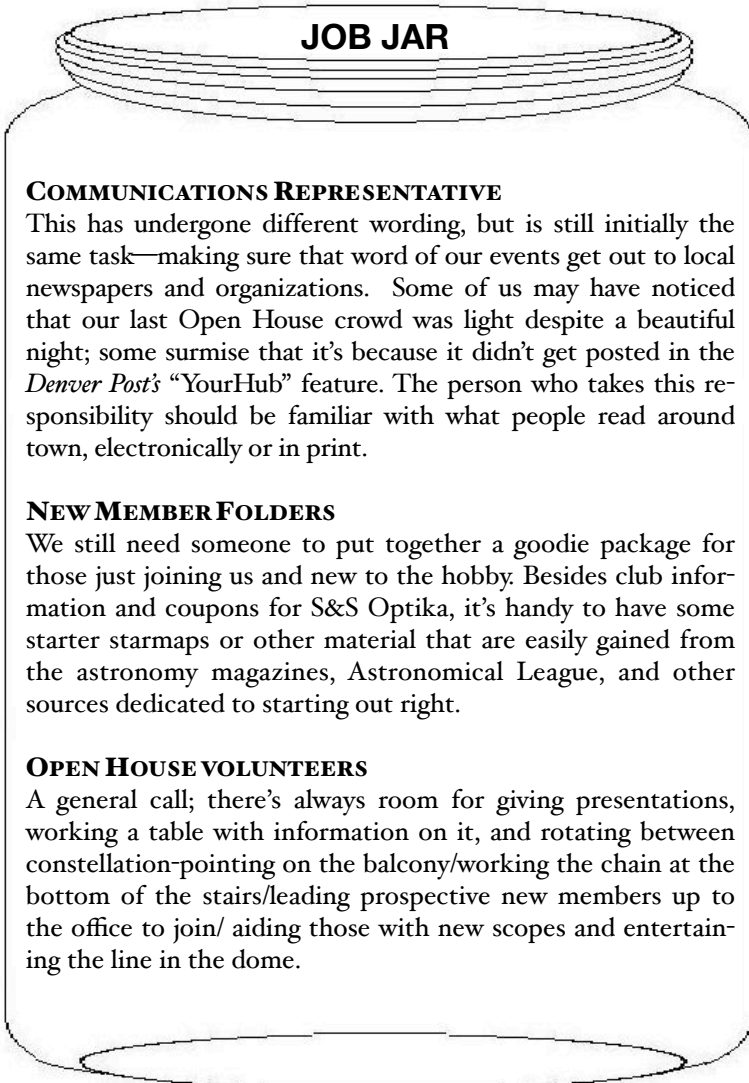
Comet Pan-STARRS should not be confused with another, even better comet coming later this year. In Nov. 2013, Comet ISON could shine as brightly as a full Moon in broad daylight when it passes through the atmosphere of the sun.

"Two bright comets in one year is a rare treat," says Battams. "This could be good." (Members, also see Darrell Dodge's article in the January 2013 *Observer*)★

An artist's concept of comet PanSTARRS progress through the sky during March.

Courtesy: Zachary Kurtz

DAS JOB JAR



COMMUNICATIONS REPRESENTATIVE

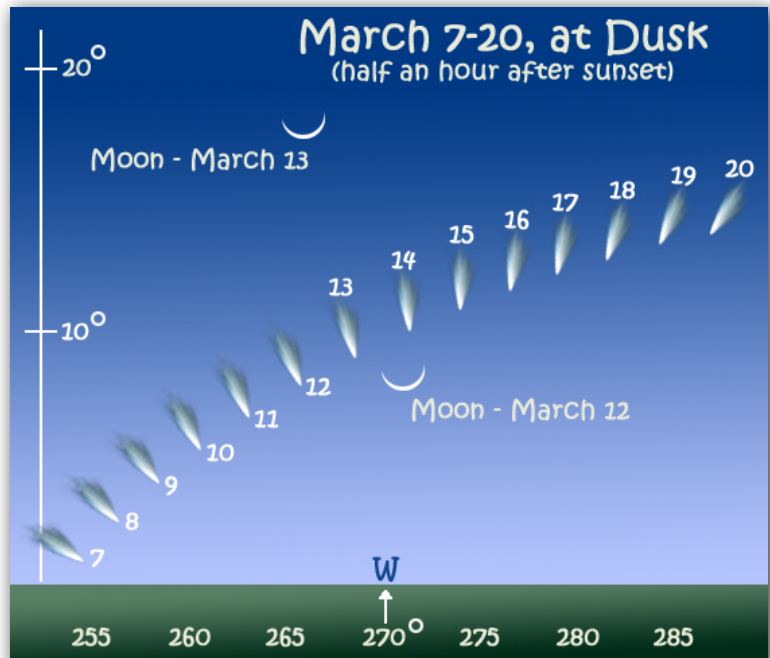
This has undergone different wording, but is still initially the same task—making sure that word of our events get out to local newspapers and organizations. Some of us may have noticed that our last Open House crowd was light despite a beautiful night; some surmise that it's because it didn't get posted in the *Denver Post's* "YourHub" feature. The person who takes this responsibility should be familiar with what people read around town, electronically or in print.

NEW MEMBER FOLDERS

We still need someone to put together a goodie package for those just joining us and new to the hobby. Besides club information and coupons for S&S Optika, it's handy to have some starter starmaps or other material that are easily gained from the astronomy magazines, Astronomical League, and other sources dedicated to starting out right.

OPEN HOUSE VOLUNTEERS

A general call; there's always room for giving presentations, working a table with information on it, and rotating between constellation-pointing on the balcony/working the chain at the bottom of the stairs/leading prospective new members up to the office to join/ aiding those with new scopes and entertaining the line in the dome.





DAS member Jennifer Kobilan gets ready for an evening of observing at the EG Kline Dark Site last Spring. Don't forget! The 2013 Messier Marathon weekend is March 8-9th.

Image: Darrell Dodge

MARATHON ARTICLE

(CONTINUED FROM PAGE 4)

Because of evening and early morning challenges, absolutely perfect observing conditions are required to complete a Marathon at latitude 40 degrees north. (Lower latitudes are better.) The toughest object in the evening is M74, the low surface-brightness face-on Sc galaxy in Pisces. The early morning challenge is the globular cluster M30 in Capricorn, which rises just before the Sun. But the hills to the southeast of our dark site are just high enough to block it until the Sun is starting to turn the sky to a neon blue, which makes the cluster virtually impossible to see. The Moon should be barely a sliver when it rises at 4:30-5:00 A.M. this year.

What's the best telescope for a Messier Marathon? Probably one with a reasonable aperture (at least 4-5 inches), with which you're familiar. Very large scopes can make the marathon more difficult because there are so many more objects to sort through. Dobs are great for these marathons because they are easy to move, have a wide field of view, and are easy to use between declination +30 and -30, where most of the Messiers are situated.

Let's all hope for clear skies, light winds, and no oil derrick lights this year!★



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