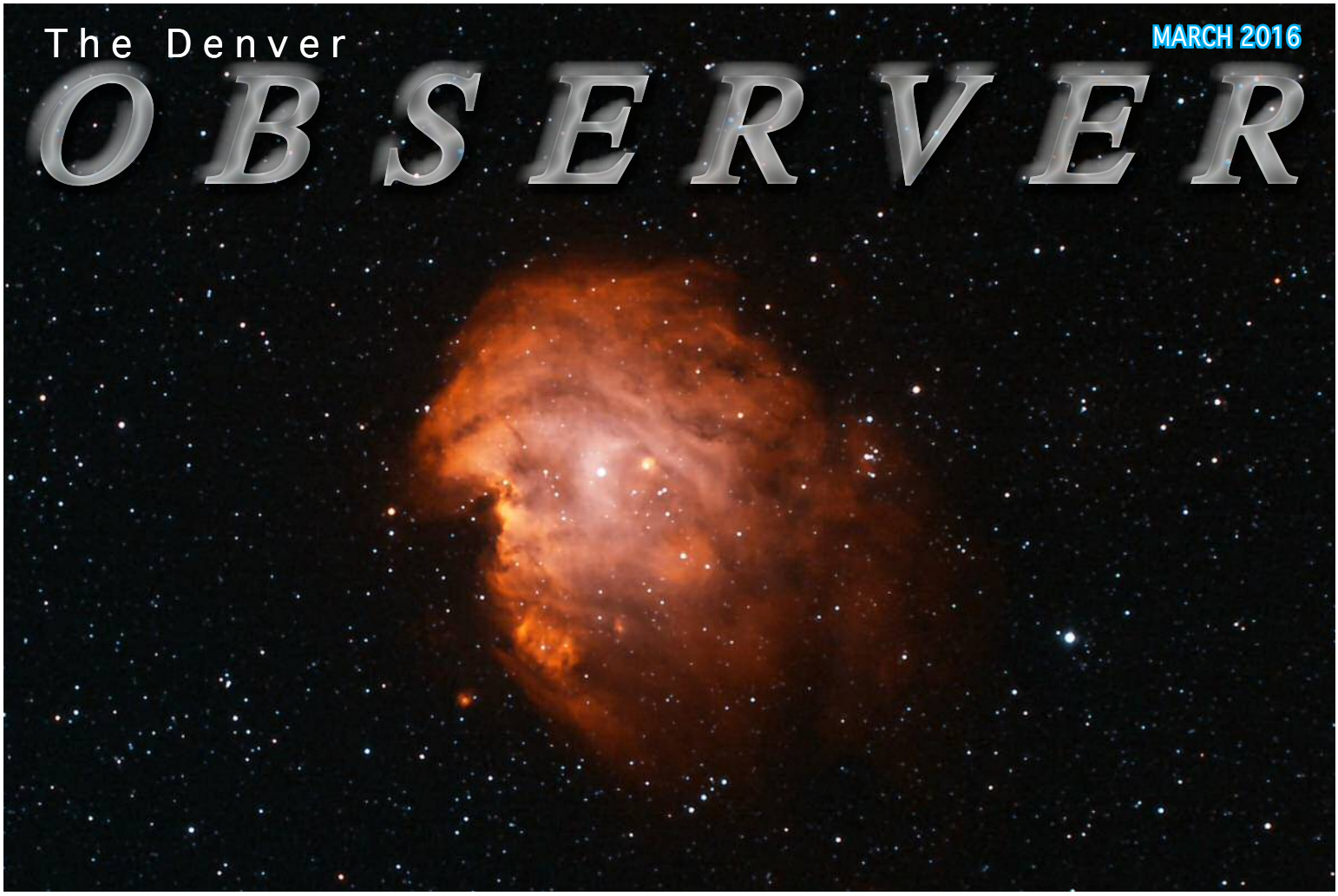
The Denver
# OBSERVER
MARCH 2016



**NGC 2175, a large nebula in Orion. Objects like this are the foundries of so-called "open star clusters," including those in this month's Skies, and the birthplace of the stars within them.** ***Image © Jon Martin.***

# MARCH SKIES

*by Zachary Singer*

*Local Sky*

This month, **Mercury** is increasingly lost in the solar glare, to reappear as an evening apparition in April. Next month's opportunities should be very good indeed.

**Venus** is also sinking into the sunrise, though it's still visible before dawn; it's slightly dimmer now at magnitude -3.8. After a night of observing, though, Venus is still stunningly bright in a telescope.

**Jupiter** comes to opposition on March 8th, so it's up all night. Its disk spans nearly ¾ of an arcminute across, making a great target. The giant gas planet is already 45° above the horizon at 10:30 PM on March 1st, and 7° higher at the end of the month—and that's not counting Daylight Savings Time, which brings everything up an hour sooner starting mid-month.

Three separate double-shadow transits will cross Jupiter's face at a time they can be seen from Denver this month; the first is on March 14th. That evening, Europa's shadow starts across Jupiter's eastern flank just before 8 PM, followed shortly by Io's. Unfortunately, the Jovian system will be low in Denver skies until almost the end, around 10 PM, Mountain *Daylight* Time. At that point, Jupiter will have climbed to about 40° up, and seeing conditions may be good enough to be worthwhile. (Try looking early, in case you get lucky.) Europa and Io are also transiting; Europa exits Jupiter's limb around 10:10 PM, and Io about 15 minutes later; both of these events should be easily visible unless the seeing is downright awful.

The same orbiting duo repeats the performance on the 21st, when Europa first crosses Jupiter's eastern limb just after 9:45 PM (watch earlier to see Io and Europa move in their orbits toward Jupiter.) Io crosses around 9:55, and the moons' shadows follow across Jupiter's face around 10:15. Because of the later hour for this event, Jupiter will be nearly 50° up (and climbing) when the shadows begin their transit, so it will be a good opportunity if the weather cooperates. Io completes its passage around 12:10 AM, with Europa and the shadow of Io following just a little over 15 minutes later.

The third opportunity comes on the 28th, as Io approaches the Jovian limb around 11:30 PM. Europa, not as close behind Io this time, fol-

## In the Observer



## Sky Calendar

| | |
|---|---|
| 1 | Last-Quarter Moon |
| 8 | New Moon |
| 15 | First-Quarter Moon |
| 23 | Full Moon |

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## Society Directory

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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.*
*http://www.denverastro.org*

# PRESIDENT'S MESSAGE

*by Ron Hranac*

*Predicting Aurorae*

Amateur astronomers who enjoy observing the Sun know that there is a sunspot cycle that reaches maximum on average about every 11 years; we're just coming off the most recent peak. During solar maxima, average solar radiation increases, as do the numbers of flares and sunspots. A side benefit of increased solar activity is the possibility of more sightings of the aurora borealis (northern lights) and the aurora australis (southern lights).

Aurorae are spectacular to see and photograph, and several DAS members have taken some beautiful pictures of the aurora borealis from Colorado. Wouldn't it be nice if there were a way to predict the possibility of aurora occurring? Well, there is.

The appearance of the northern and southern lights is closely related to solar activity. During large geomagnetic storms – which can happen when the Earth's magnetosphere is disturbed by the solar wind – low energy particles that were trapped in the magnetosphere make their way into the upper atmosphere near the polar regions, where they ionize gases and produce auroral displays. Those displays most often appear in oval-shaped auroral zones near the geomagnetic poles. If geomagnetic storms are severe enough, though, the auroral ovals may expand, causing the aurora to be visible at more southerly latitudes in the northern hemisphere and more northerly latitudes in the southern hemisphere.

Magnetometers at 13 observatories around the world are used to monitor geomagnetic activity. They detect small variations in the local geomagnetic field, and report them as K-indexes. (The K-index is expressed on a scale from 0-9, and is updated every three hours.) Because local geomagnetic conditions in the vicinity of an observatory can vary significantly from the other observatories, K values from each observatory are first converted to a standardized index, and then an average planetary value, $K_p$, is derived from the standardized values. (As an aside, "$K_p$" comes from "*planetarische Kennziffer,*" or "planetary index" in German.)

When the $K_p$-index reaches 5 or 6, that's an indication to start watching for aurorae. If it gets into the 7 or 8 range, there is an even greater possibility for aurorae (best observed away from city lights). But how can one know what the $K_p$-index is at any given moment?

There are several online resources that provide a lot of useful information about what is called space weather. The first is the Space Weather Prediction Center at *www.swpc.noaa.gov/*. The $K_p$-index can be found at *www.swpc.noaa.gov/products/planetary-k-index*, and the USAF Wing $K_p$-index is at

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# DAS SCHEDULE

## MARCH 2016

| | |
|---|---|
| 4-6 | Dark Sky Weekend (MESSIER MARATHON)—EGK Dark Site & Brooks Observatory |
| 12 | Open House—DU's Historic Chamberlin Observatory—Starts at 6:00 PM |
| 19 | Spring Banquet—6:00 PM at Embassy Suites, DTC. **Featured Speaker: Michael Carroll, who will talk about living on Titan (see "DAS News"); installation of DAS officers.** |
| 25 | E-Board Meeting—At DU's Historic Chamberlin Observatory, 7:30 PM |

During Open House, volunteer members of the DAS bring their telescopes to the Chamberlin Observatory's front (south) lawn, so the public can enjoy views of the stars and planets, try out different telescope designs, and get advice from DAS members. The Observatory is open, too (costs listed below), and its historic 20-inch telescope is open for observing with no reservations necessary.

Open House costs (non-members): If the skies are clear, $2/person ($5/family), $1/person in inclement weather. DU students with ID, and DAS members free.

Public Nights feature a presentation on astronomical subjects and a small-group observing session on the historic 20-inch telescope (weather permitting), at Chamberlin Observatory on Tuesday and Thursday evenings (except holidays), beginning at the following times:

March 10 - September 30 at 8:30 PM

October 1 - March 9 at 7:30 PM

Public Night costs (non-members): $4/adult, $3/child and students with ID. DAS members and DU students with ID: free.

Members of the public (non-DAS/DU, as above), please make reservations via our website (*www.denverastro.org*) or call (303) 871-5172.

# DAS NEWS

### *Volunteer Opportunities*

*** Please note that Lindsey Shaw has passed the baton for managing Volunteer Outreach to **Julie Candia**.

**March 2, 8:30AM - 2:40PM (with break): Solar Viewing at Benjamin Franklin Charter School in Highlands Ranch.** Studying the sun, 94 kids.

**March 16, 6:30PM - 9:30PM: Lunar Viewing/Night Viewing in Bennett, CO.** AnyThink Libraries (celebrating Space Month, studying the moon).

To volunteer, please contact Julie Candia at *external@denverastro.org* —and thanks!

### *DAS Elections*

Members of the DAS held elections for officers and the Executive Board trustees at the February 19th Annual Meeting—here is the new slate, to be seated at the Spring Banquet:

**President:** Ron Hranac
**V. President:** OPEN
**Secretary:** Jeff Tropeano
**Treasurer:** Mike Nowak
**Past President:** Ron Pearson

**Executive Board:**

Johnny Barela
Jack Eastman
Joe Gafford
Chuck Habenicht
Ed Scholes
Lindsey Shaw
Ken Sturrock
Dan Wray

Congratulations to our new and returning officers and trustees!

### *DAS Spring Banquet and Speaker*

**The DAS Spring Banquet will be held at the Embassy Suites, Denver Tech Center, on March 19, 2016.** Social Time with cash bar will begin at 6:00 PM and dinner will be served starting at 7:00. (The menu features Chicken Dijon or a vegetarian entrée.) Business includes inauguration of the new officers and E-Board, and annual participation awards. Seats are $25 each. (Make meal selection and purchase tickets at *www.denverastro.org/banquet.html* and DAS emails for further details about purchasing tickets.)

**The evening's featured speaker will be the popular science and sci-fi author and artist Michael Carroll.** His presentation topic, "Living On and Exploring Titan," will include the latest science discoveries and discuss human exploration of asteroids and outer planets. (Oily seas and methane monsoons will greet explorers on Saturn's largest moon!) Information and artwork are drawn from Mike's latest two books, ***Living Among Giants: Exploring and Settling the Outer Solar System*** (Springer 2014) and the novel, ***On the Shores of Titan's Farthest Sea*** (Springer 2015). Some books will be available for purchase, signed by the author.

**Bio:** Michael Carroll has been an astronomical, science fiction and paleo artist for over two decades. He has done work for NASA and the Jet Propulsion Laboratory. His art has appeared in several hundred magazines throughout the world, including *Time, National Geographic, Asimov's, Smithsonian, Astronomy, Harpers, Sky & Telescope, Ciel et Espace,* and *Astronomy Now* (UK). His paintings have aired on *NOVA, National Geographic's EXPLORER,* and other TV specials, and have covered numerous books, including works by Carl Sagan and Arthur C. Clarke.

### *Astronomical Stage Production Next Month*

The Fiske Planetarium at the University of Colorado in Boulder is hosting a theater group to present a work on the astronomer, Johannes Kepler, with shows this April. For more information, see *http://www.thekeplerstory.org/details.*

# 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'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 a long-time member in good standing of the Astronomical League and the International Dark Sky Association.

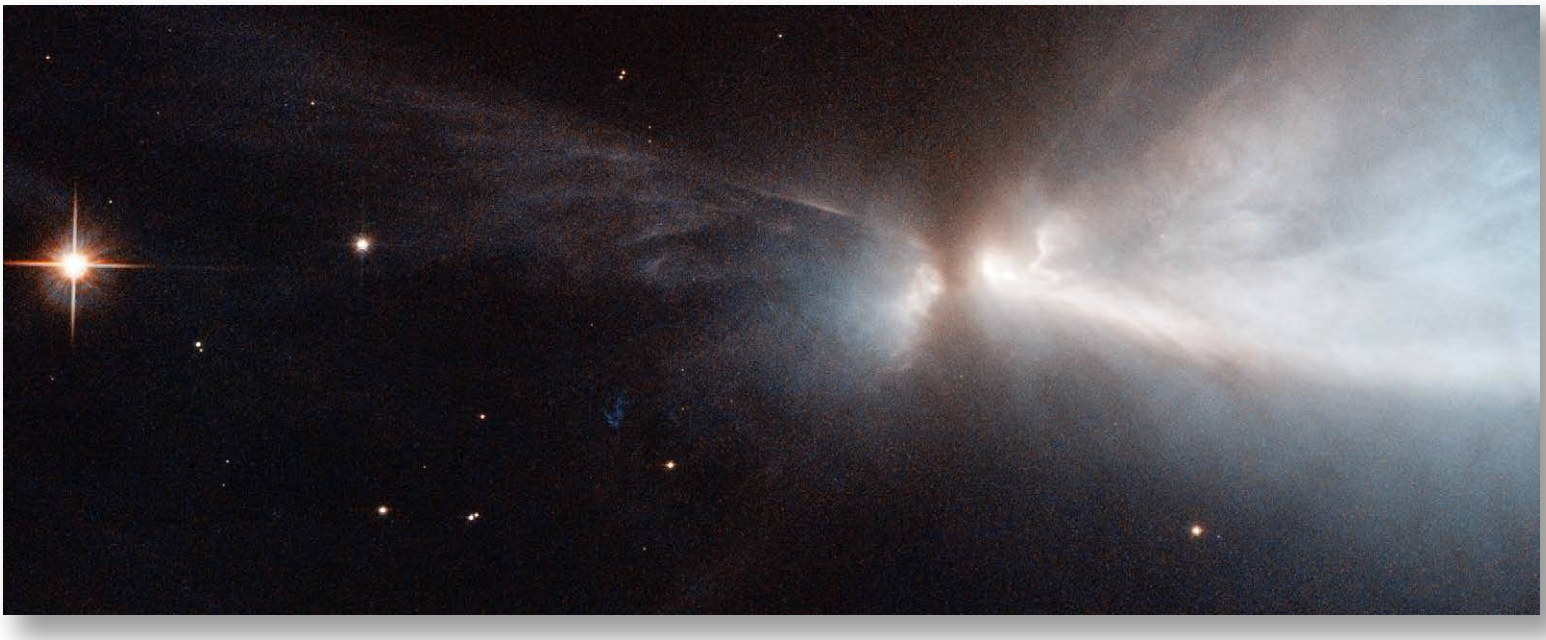
The DAS is a 501 (c)(3) tax-exempt corporation and has established three tax-deductible funds: the Van Nattan-Hansen Scholarship Fund, the DAS General Fund, and the Edmund G. Kline Dark Site Fund.

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

# THE CLOSEST NEW STARS TO EARTH

*by Ethan Siegel*

*NASA Space Place*



**Chamaeleon cloud and a newly-forming star within it—HH 909A—emitting narrow streams of gas from its poles. Image credit: NASA and ESA Hubble Space Telescope. Acknowledgements: Kevin Luhman (Pennsylvania State University), and Judy Schmidt.**

When you think about the new stars forming in the Milky Way, you probably think of the giant star-forming regions like the Orion Nebula, containing thousands of new stars with light so bright it's visible to the naked eye. At over 400 parsecs (1,300 light years) distant, it's one of the most spectacular sights in the night sky, and the vast majority of the light from galaxies originates from nebulae like this one. But its great luminosity and relative proximity makes it easy to overlook the fact that there are a slew of much closer star-forming regions than the Orion Nebula; they're just much, much fainter.

If you get a collapsing molecular cloud many hundreds of thousands (or more) times the mass of our sun, you'll get a nebula like Orion. But if your cloud is only a few thousand times the sun's mass, it's going to be much fainter. In most instances, the clumps of matter within will grow slowly, the neutral matter will block more light than it reflects or emits, and only a tiny fraction of the stars that form—the most massive, brightest ones—will be visible at all. Between just 400 and 500 light years away are the closest such regions to Earth: the molecular clouds in the constellations of Chamaeleon and Corona Australis. Along with the Lupus molecular clouds (about 600 light years distant), these dark, light-blocking patches are virtually unknown to most sky watchers in the northern hemisphere, as they're all southern hemisphere objects.

In visible light, these clouds appear predominantly as dark patches, obscuring and reddening the light of background stars. In the infrared, though, the gas glows brilliantly as it forms new stars inside. Combined near-infrared and visible light observations, such as those taken by the Hubble Space Telescope, can reveal the structure of the clouds as well as the young stars inside. In the Chameleon cloud, for example, there are between 200 and 300 new stars, including over 100 X-ray sources (between the Chamaeleon I and II clouds), approximately 50 T-Tauri stars and just a couple of massive, B-class stars. There's a third dark, molecular cloud (Chamaeleon III) that has not yet formed any stars at all.

While the majority of new stars form in large molecular clouds, the closest new stars form in much smaller, more abundant ones. As we reach out to the most distant quasars and galaxies in the universe, remember that there are still star-forming mysteries to be solved right here in our own backyard.

# Messier Marathons

*Hints for a Great Experience*

*by Darrell Dodge*

The nights of March 5th and April 9th, 2016, should be busy ones at the E.G. Kline Dark Site and the Brooks Observatory. The Moon will be close to new on both of those Saturday nights, which means those are the official Messier Marathon nights for 2016. March and April are the best months for dark sky observers at our latitude to observe all of the 110 objects in the modern version of Charles Messier's famous catalog of non-comets in one night. For a lot of reasons, however, it's probably better to have a goal of trying to observe as many as you can, rather than the entire list.

Absolutely perfect observing conditions are required to complete a Marathon at our latitude of 40 degrees north. (Lower latitudes down to 20 degrees north are better.) We've also found over the years that it's simply not possible to complete a 110-object marathon at our dark site (which is challenged by a low rise to the East and Denver's glow to the West), although several people have recorded 109 objects.

The toughest early object is M74, the faint face-on Sc I galaxy in Pisces, which is dropping into the "Denver nebula" in the West as darkness falls. The early-morning challenge is the globular cluster M30 in Capricorn, which rises in the East just before the Sun, making the cluster impossible to see in early March. Marathoners on April 9th may have a better chance for M30, but less for M74.

A recently upgraded feature at the site is the Brooks Observatory, with its 14-inch Celestron SCT on a "go-to" Losmandy G11 mount, now enhanced with the installation of a Gemini 2-mini operating system. We plan to do a Marathon in the observatory on Saturday, March 5th, in 2016, and welcome kibitzers to drop in. ("Go-to" marathons are becoming more and more acceptable, with some clubs setting up special categories for them. Still, there's nothing that can match the feeling of accomplishment gained from doing any observing program the old-fashioned way.)

What's the best telescope to use? Probably one with a reasonable aperture (at least 4-8 inches), and *with which you're familiar*. Use binoculars for large objects like the Pleiades (M45) and the beehive cluster (M44).

Let's all hope for clear skies and light winds this year!

## Hints for Happy Messier Marathons

* Practice difficult or unfamiliar areas of the sky a week or so before, using the telescope and observing aids you intend to use for the Marathon.

* Arrive at the dark site well before sundown.

* Use a checklist that presents the objects in the approximate order you will be viewing them. One checklist is available to download on the DAS Web site: *http://www.denverastro.org/miscfiles/marathon_messier_card.pdf*

* Use little colored plastic tabs to pre-mark the Messiers on your star atlas. You can also write the Messier numbers on the tabs.

* Don't use the Marathon as a way to do or complete the Astronomical League's Messier Observing Program. The AL club program requires detailed descriptive comments and there's not much time for that during a marathon. (It also requires star-hopping.)

* Do take the time to scribble some brief notable things about some of the objects. You'll appreciate having these later, especially when you're trying to remember if you really discriminated between easy-to-confuse objects like M86 and M84.

* Aim to observe as many objects as possible, not ALL of the objects.

* View easier objects first! Don't spend 30 minutes trying to see M74 while the other objects in the West are sinking out of sight. Observe M77, 31, 110, 32, and maybe M33 first.

* If you miss M110, you will probably be able to see it in the morning if your marathon is late in March.

* Try not to panic when you start going through the Virgo/Coma Galaxy Clusters. These are all bright galaxies (except maybe for M90), and you should have plenty of time because there's a break in the objects to observe when you're done.

* When you're out of objects to view, try to get off your feet and get something to eat and drink. You'll be busy from 7:10 PM to 11 PM, but a short break in the middle of that period and a longer break (even a nap in your car) sometime between 11 PM and 1:00 AM is a good idea. (If you're "*go-to*-ing," you'll be breaking about an hour earlier than that.)

* Keep reviewing your checklist to make sure you've not overlooked an object. Common objects to miss are M83 and M68.

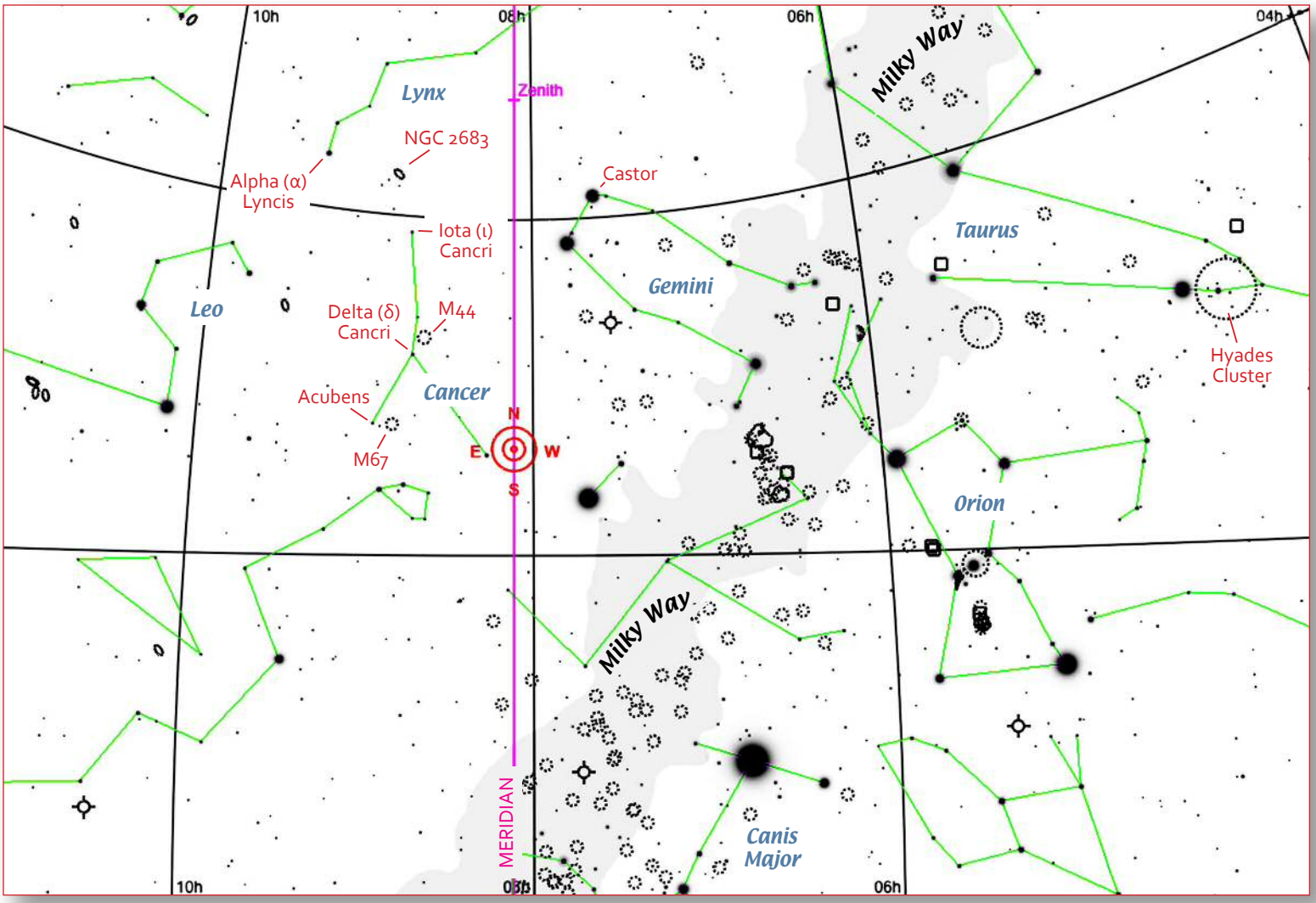
* Don't despair if you can't see M30 in the morning. As mentioned previously, it's probably not possible to see it in March, because the site is located in a shallow valley. It will still be difficult to see in April from the DAS Dark Site, though it's rising over 80 minutes before the Sun.

* Remember that all 110 objects were not seen in one night by any observer until 1985. Seeing more than 90 is a great achievement!

## President's Message

***Continued from Page 2***

*www.swpc.noaa.gov/products/wing-kp*. A good all-around website is *www.spaceweather.com*, which includes information about the auroral oval, $K_p$-index (current and 24-hour maximum), flares, and geomagnetic storms. E-mail alerts are available from spaceweather.com, too. Finally, I use an app on my iPad and iPhone called *Solar Monitor*, which includes solar images and all of the space weather-related parameters just discussed. Also handy: The app can be configured to push real-time alerts of solar flares and geomagnetic storms.




**Looking southward from Denver at 9:30 PM in mid-March; deep-sky objects are plotted to mag. 10. Cancer is a somewhat dim constellation—while it's easy enough to see in dark skies, it's not sufficiently bright to appear under light-polluted suburban skies. Look for it to the east of Gemini (see last month's "Skies" for info on that constellation), and to the west of Leo's "Sickle," or "Backward Question Mark." Gemini and Leo make great starting points, because they're brighter and therefore easier to find initially.**

*Object positions, constellation and meridian lines charted in SkySafari, and then enhanced.*

## March Skies

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lows about half an hour later, joined by Io's shadow below it. Though the timing might be inconvenient, it puts Jupiter almost due south—and high in the sky—when Io first approaches the planet, and they're still about 40° up in the southwest as Europa nears Jupiter's western edge around 2:30 AM.

We're getting closer and closer to Mars, and the planet's disk grows from about 9" to 14" across by the end of March. Careful observers in stable air should begin to see a few details on the Martian surface this month, and the situation will improve further in April. In the meantime, look for a conjunction with Graffias, Beta (β) Scorpii, a bright double star at the top of the "claw" of Scorpius—on the morning of the 16th, Mars passes within *just 10 arcminutes* (1/6°) of the star, allowing both to fit easily in a high-power field. Look for the pair about 30° above the southern horizon around 4 AM (due south around 5 AM). Graffias itself is a lovely binary with a gravitationally bound pair of stars shining at 2.6 and 4.5 magnitude; their 13.6" separation should split nicely with Mars sharing the field.

And finally, there's Saturn. If you look for it at 5 AM (before a brightening sky starts wiping out contrast), the ringed planet is about 27° above the horizon, just east of south, as the month begins. The yellowish planet, at magnitude 0.5, slightly outshines its reddish neighbor, Antares, about 8½° to the southwest in Scorpius. By the end of March, Earth will have come about half an AU closer to Saturn (9.5 AUs instead of 10), so the planet will appear slightly brighter and larger to us, but not significantly so.

### Deep Sky

Last month, we saw a beautiful open cluster, M35, in Gemini. Unlike that cluster, which lies about 3,000 light-years from Earth, **M44, or "The Beehive,"** is among the closest to us—it's in the Top 20 for nearness, out of a list of thousands. Located in the constellation Cancer, at **8h 41m, +19° 36'**, M44 is a little less than 600 light-years away. In practice, that means that this cluster, which is intrinsically more than a magnitude dimmer than M35, nonetheless appears brighter in our sky, because distance hasn't diminished its light anywhere near as much as M35's.

Under a dark country sky, 3rd-magnitude M44 is seen as a fuzzy patch of light by naked eyes, and was known to ancient observers (though they had no idea about its star-filled

***Continued on Page 7***

## March Skies

*Continued from Page 6*

contents). Because of its proximity, M44 covers a large area of the sky, extending well over a degree across—it makes an outstanding binocular target. If you have wide-field capability on your telescope, though, the Beehive really comes alive! Higher powers bring in even more stars (though naturally restricting the size of the field), and it's definitely worth having a deeper look after taking in the overall view.

The Beehive is also different from M35 in another way—it's much older, with an age in the range of 600-700 million years (M35 is estimated to be about 100 million years old). M44's greater age is deduced from its stellar population—the hotter the star, the shorter its life, and since there are now very few stars left in the cluster that are hotter (bluer and brighter) than our Sun (because those stars have already completed their life cycles), this cluster must be of its estimated age, or near it.

**Spiral Galaxy NGC 2683, sometimes called the "UFO Galaxy."** ***Image © ESA/Hubble & NASA***

Interestingly, M44 may well be related to the Hyades cluster (the "V"-shaped grouping in Taurus). The Hyades are of comparable age (because they have the same kind of stellar populations), and they share a similar motion through space with M44. The Hyades are still visible in March, high in the southwest when the Beehive comes overhead; when you see them, stop and consider that both these clusters may well have come from some gigantic common cloud….

To find M44, just look for 4th-magnitude Delta (δ) Cancri (also shown as "Asellus Australis" on some charts). You'll find Delta at the top of the triangle in Cancer's traditional outline, where it meets the straight-line section of the figure; M44 is the adjacent dim "cloud," less than 2° to the northwest ("up and right" when the constellation is overhead, and you're looking southward).

M44's constellation-mate, **M67 (8h 52m, +11° 44')**, would probably get a lot more attention if it weren't for flashy M44 taking all the limelight. I still vividly remember seeing this cluster for the first time under dark skies several years ago in my 6-inch reflector, so it doesn't take a lot of gear for M67 to make an impression. At a little less than ½° across, it's also easy to fit into the field of even long-focal-length 'scopes.

With an age estimated at about 4 *billion* years, M67 is truly ancient for an open cluster; very few of those we know of are older. Most open clusters, including the one our Sun was formed in, tend to scatter the majority of their stars in a fraction of this time, and in fact, it's thought that M67 used to be far more massive—many of its smaller members have been ejected from the system, and the larger ones have either blown off their outer envelopes (to become dying white dwarfs), or exploded as a supernova long ago.

To find M67, look for Acubens, or Alpha (α) Cancri, the star at the "bottom left" of Cancer's triangle. Centering Acubens in your Telrad or finderscope will make M67 visible near the finderscope's western edge. If your finder's field is narrower than 4°, or just for a more elegant approach, try putting Acubens on the *eastern* edge (relative to celestial coordinates) of your Telrad's outer, 4° ring, and M67 will be nearly centered in the finderscope. This trick will always work with an equatorial mount.

Since users of Dobsonian and other "alt-az" mounts usually consider "east" and "west" with respect to the Earth rather than the sky, the approach above will center M67 fairly well for an hour before or after the cluster crosses the Meridian. After that, you'll find M67 increasingly farther from your finderscope's central crosshairs, but still well inside the finder's field of view.

Our last object this month is the spiral galaxy, **NGC 2683**, just north of Cancer, in the constellation Lynx, at **8h 54m, +33° 21'**. This magnitude 9.8 spiral features prominent dust lanes in the brighter, central section of its disk. It's not too far from us, as galaxies go, so it's both large and bright in the eyepiece, with dimensions of about 2' x 9'; this galaxy's brighter areas are fairly visible in 6-inch reflectors under dark and clear skies. Since Earth's viewpoint isn't much above the plane of the galaxy's disk, the galaxy's appearance is very much foreshortened and appears "UFO-shaped." In short, NGC 2683 should be both easy enough for beginners to see, and interesting for experienced observers.

Navigation, though, is another matter. On one hand, equatorial users are in luck—just put the northern edge of your Telrad's "mid-size" 2° ring on Alpha (α) Lyncis (see charts), and slew 28 minutes of RA (6°) *directly west*. If you're reasonably aligned with the pole, this shouldn't be too tough.

If you're star-hopping with a dob, though,

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## *March Skies*

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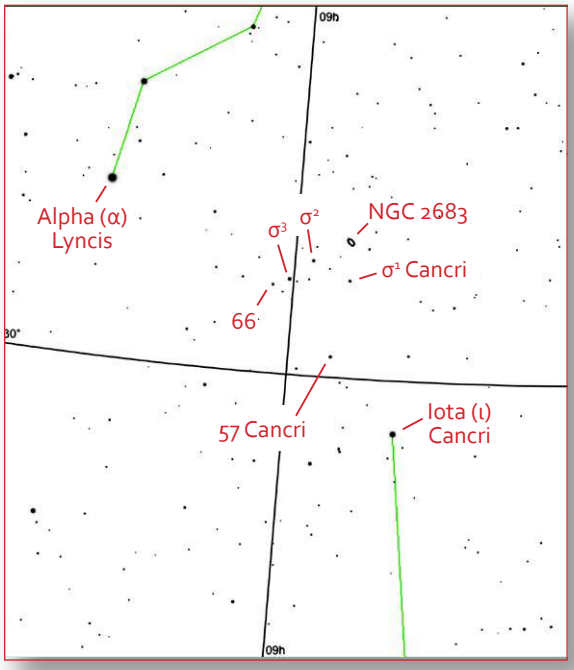
you're in for a rougher ride—all of the approaches use guide stars of only 5th or 6th magnitude. Though these stars are bright enough for naked eyes, it's *difficult at best* to see them through a Telrad's optics—you'll probably need to hop with stars in your finderscope only, so consider it a challenge!

It's arguably simplest to start the hop at 4th-magnitude **Iota (I) Cancri**, the "topmost" star in Cancer's traditional outline (Iota is also a lovely binary on its own). From there, tip your 'scope northward so Iota approaches the southern edge of your finderscope—as you do, 5th-magnitude **57 Cancri** will start to creep into the finder at the north or northeast edge. Apart from Iota, 57 should be the brightest star in the field, making identifying it a little easier—center it.




**Detail of northern Cancer and southern Lynx, with NGC 2683 and guide stars.**

Now, it's the same game again—start northward from 57, only this time, as 57 heads southward in the finder, *four* 5th-magnitude stars come into view from the north or northeastern edge. These stars, **Sigma 1, 2 and 3 ($\sigma^1$, $\sigma^2$, and $\sigma^3$) Cancri**, form a flat triangle with **66 Cancri** as its "tail." Leaving out $\sigma^1$, the rest form a rough line that points to our target, NGC 2683, with the galaxy on the northwest side—moving these stars towards the southeastern edge should roughly center the galaxy in the crosshairs. If 2683 isn't visible in your finderscope, then imagine an equilateral triangle using $\sigma^1$ and $\sigma^2$ and our invisible target (in the would-be northwestern corner), and center that unseen corner.

—See you next month.



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