The Denver
OBSERVER
MARCH 2011

MARATHON MARCH ON!!

STAY OUT OF THE WATER

Our galaxy abounds with vibrant and colorful supernova remnants. Sharpless 248, in Gemini, certainly holds to its moniker, the Jellyfish Nebula. Spawned by a supernova blast some 20,000 years in the past, IC 443 is half-again as large as the full moon and harbors a neutron star at its core. Best captured in h-alpha, Alan Erickson did just that for 100 minutes, coupled with 40 minutes of RGB images with a Quantum Scientific camera on an Astro Physics mount carrying a 7-inch Maksutov-Newtonian telescope.

Image ***© Alan Erickson***

Calendar

4.....New moon
12..... First quarter moon
17..... St. Patrick's Day
19.....Full moon
21..... Vernal Equinox
26..... Last quarter moon

Inside the *Observer*

MARCH SKIES

by Dennis Cochran

Jupiter is going, going . . . gone, and Saturn is coming on strong. Mercury, the "Messenger of the Gods," delivers a message to Jupiter in the evening sky on March 16, passing two degrees north of the big guy. The South Equatorial Belt is an on-again, off-again sight that is reported to sometimes appear as a thin strand; What do you see? As if to balance the early setting of Jupiter, Saturn rises around 8 P.M. at the beginning of the month and by month's end, at sundown. It becomes decently viewable an hour later.

Pegasus dives into the west, drawing Andromeda with him. To glimpse its great galaxy, observe it early in the evening in the northwest at the beginning of your session. Farther east and south, Orion and his dogs are well-positioned. At public star parties you can find M31, maybe, and M42 and Saturn, as well as all those star clusters we spoke of last month: M41, 46-48, 50 and 93. These clusters are the winter analog of the gaseous nebulae of Sagittarius in the summer, objects that are well-placed for evening viewing only one quarter of the year. If you look at M31 on the north side of Andromeda or M33 on her south, stop at the Beta star of Andromeda in between and then sweep east to the similarly-bright Alpha star and continue on towards Perseus to find cluster M34. Auriga and his three clusters M36-38 are now west of the zenith. Straight west of him are the Pleiades, another sight to reveal to your guests before it sets in the west.

Farther east one can look halfway between Procyon, the bright star in Canis Minor, now near the meridian, and Regulus, farther east in Leo, to find M67 just above the little polygon of stars that represents the head of Hydra. Procyon, incidentally, has a faint companion, the 2nd-closest white dwarf to the Sun. In case you

Continued on Page 3

PRESIDENT'S CORNER

by Ron Pearson

March brings us to a quarter turn in our voyage around the Sun and the time when we can, hopefully, dust off our scopes if they've been sitting in a warm house, and start collecting those photons from galaxies and nebulae that left their stars of origin millions and millions of years ago. In early March, DAS members have their first opportunity to find and observe, in one night, all the brightest and best of those deep-sky objects that were first mapped by Charles Messier in the late 1700s. This "Messier List" of objects includes all the major types of deep sky objects: Galaxies, planetary nebula, and star clusters, both open and globular. The "Messier Marathon" is a great opportunity to get out to our Dark Sky Site and rub elbows on crowded pads with many other DAS'ers with varying levels of equipment and experience. If you've just started out, it's a great way to really learn "star-hopping" and reading a star chart, or learn to use your new "go-to" computer-driven telescope. Even if you don't find all the M-objects in one night, you'll take a big step in learning the sky and using a telescope or binoculars. You can make a giant leap toward an M-List Observers award or just find a few objects and really observe them for details and try out different eyepieces or scopes. As in all running marathons, there are those who run the race to set new records, and "runners" that walk or run at a slow pace to show they can do it or enjoy being part of the race and pushing themselves to new a personal best.

Then in mid-March when the Moon makes it too bright to observe those faint fuzzies, we invite you to join us at our Annual Banquet where we gather to share a good meal, swap more tall tales of seeing a faint galaxy or imaging a storm on a planet, or maybe just having survived another winter. The dinner is also our opportunity to hand over DAS officer and e-board positions to those returning or meet the new faces who will be guiding this Society for the next year. This is followed by a talk about astronomy, and this year our speaker is a bit more special than past years, because one of "our own" long-time Student Members, Naomi Pequette, will be presenting a talk on her recent research. Naomi has "grown-up" with the DAS as one of our Van Nattan-Hansen Scholars and will soon be taking the next big steps in her career to be a professional astronomer as she completes her undergrad degree at DU in June. She is truly 'running the Astronomy Marathon' in her life which started in high school science and math classes. I hope you will all join us in hearing Naomi's talk and congratulating her!

Finally, astronomy is all about observing "stuff" up in the sky, from the Messier Marathon to "Fossil Galaxies," and in February, March and April, each and every one of you is invited to make observations as part of the Global Night Sky Watch. This is a global campaign of observing the night sky from your location and estimating how bright are the faintest stars you can see to measure light pollution. Our Public Night operators have been asked to participate in this at Chamberlin Observatory with the public, but it is something we can all do from our backyard or porch. If we log our observations with the NASA Night Sky Network, the DAS can be awarded with Sky Quality

Continued on Page 3

DAS SCHEDULE

MARCH

4-5 **EGK Dark Sky weekend (Messier Marathon weekend!) See Page 4.**
12 **Open House at Chamberlin (Begins at 6:00 P.M.)**
19 **DAS Spring Banquet and Inauguration of Officers (Takes the place of the General Membership meeting(Begins at 6:00 P.M.).**
25 **E-Board Meeting at Chamberlin (Begins at 7:30 P.M.)**

APRIL

2 **EGK Dark Sky weekend (Alternate Messier Marathon weekend)**
9 **Open House at Chamberlin (Begins at 7:30 P.M.) Saturn viewing!**
15 **DAS General Membership meeting (Begins at 7:30 P.M.).**
22 **E-Board Meeting at Chamberlin (Begins at 7:30 P.M.)**

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.

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

www.denverastro.org

MARCH SKIES *(CONTINUED FROM PAGE 1)*

have a radio telescope, two pulsars hang around Hydra's head, one just north of its Delta star and the other a head's width southwest.

Back at Orion's belt, you will notice that it points down-left towards Sirius. Halfway in between and a bit farther left is the Beta star of Monoceros the Unicorn, a triple star of blue components. North of that, just west of the Rosette Nebula (east-southeast of Betelguese) and its embedded cluster, NGC 2244, is ϵ (epsilon) Monocerotis, a blue and gold double star.

Last month in *Astronomy* magazine (Page 52), Neale Monks wrote about galaxies one could see from the suburbs. Two of them are in Camelopardalis, that middle-of-nowhere constellation between bright Capella in Auriga, and Polaris. Monks favored the face-on spiral NGC 2403, tucked in a lonely corner of the heavens, but he didn't provide a map. My second edition of the *Peterson Field Guide to the Stars and Planets* (Chart 4 on Page 177) shows it in the eastern reaches of the Giraffe's realm. East of that are α (alpha) and β (beta) Ursa Majoris, the stars on the western edge of the Big Dipper's bowl. Face north and find this end of the dipper, then follow a line that connects the pouring lip of the bowl west past η (eta) Ursa Majoris to ο (omicron) Ursa Majoris at the constellation's pointed far-west end. Now remember the Eta-to-Omicron distance and go that far diagonally up and left (west) of Omicron to find NGC 2403 between two prominent stars. The other galaxy Monks mentions, NGC 2655, is closer to Polaris. This is a lenticular galaxy (a bit like a tight spiral with a fat nucleus). Go back to η (eta) Ursa Majoris between the lip of the bowl and Omicron at the pointed west end of Ursa Majoris. North of here (down if you're facing north) about an Eta-to-Omicron distance and slightly to the right are the famous M81-82 pair. Enjoy these old favorites, remembering that M81 is the "Grand Design" spiral and M82 is the Starburst Galaxy. Now venture on to NGC 2655 by going halfway on towards Polaris and searching west for several galaxies, of which NGC 2655 is the most prominent.

UNTIL WE MEET AGAIN

The Andromeda Galaxy is, without contest, the top choice in observed spiral systems. This massive sister to the Milky Way is headed toward a rendezvous and eventual merging with us in the very-distant future—news at 11. As it dives into the west, NGC 224 leaves us with an enticing invitation to watch the skies for its return, five months hence. Details: ST-8e camera, LRGB exposures totaling four hours.

Image © Steve Solon

If there's nothing else to do, try for the Whirlpool Galaxy, M51, above the end of the dipper's handle. The blob at the end of one spiral arm is actually a smaller galaxy, NGC 5195, that has gone past M51 and pulled that spiral arm after it. Now, if you can see Arcturus low towards the eastern horizon, you could drift straight east two-thirds of that distance to find M3, one of the sky's brightest star clusters. There are alot of objects coming up over there that we'll talk about another day.

Meetings: Messier Marathon at the EGK Dark Sky Site or wherever you happen to be on Saturday the 5th. The following Saturday, the 12th, is the Open House at Chamberlin, while the Saturday after that, the 19th, is our Banquet at 6 P.M., once again at the Columbine Unitarian-Universalist Church on the southwest side of town (See Page 5). The E-Board meets at Chamberlin on Friday the 25th at 7:30 P.M.

PRESIDENT'S CORNER *(CONTINUED FROM PAGE 2)*

Meters. This is a "citizen-science" campaign to raise awareness of light pollution, and something we can all do to help preserve the thing we love most about astronomy, our night sky. When you report an observation, I hope you'll also post it to our DAS denverastro yahoogroup so all of us can work together to put our observing to a broader use. For more info see: h*ttp://www.globeatnight.org/index.html*

Remember, you are invited to participate in all these great opportunities to share astronomy! So, see you in the dark and at our Spring Banquet dinner.

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-exampt 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.*

MESSIER MARATHON 2011

Article and photo by Darrell Dodge

With the observing weather as unreliable as it's been this year, it's probably a good thing that we'll have two chances to try a Messier Marathon at the DAS Dark Site in 2011.

The first opportunity is March 4th-6th, probably just days from when you receive this *Observer*. The second (and probably better) one is April Fool's day through April 3rd.

Which ever weekend you try, there will be DAS members at the Dark Site if the weather is good.

March - April is the only time during the year when observers at perfect 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 alot 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. Because of the importance of starting to observe as soon as possible after sundown, it's absolutely imperative that participants arrive at the site early (6:00 P.M. or so in March). 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 smart because the site is often packed on clear Marathon nights.

We'll have Marathon log forms at the site, which provide a check list of objects in one of the preferred orders for observing. You can also download a checklist in PDF format on the DAS Web site at *http://www.denverastro.org/messiermarathon.html*, where you'll also find some marathoning hints. And there will be a sign-up sheet for those wanting to make a competition out of it. For those who've tried a Marathon and been frustrated by early evening or morning clouds, the feat can seem impossible to achieve without a lot of luck. But you'll need perseverance and stamina too. Last year, both Jim Holder and Brian Fry managed to manually star-hop to 106 of the objects in not-so-great weather. Go-to scopes are allowed, of course, and can give you more time to take in the views. But a classic marathon requires star-hopping.

The toughest object in the early evening (especially in April) is M74, the low surface-brightness face-on Sc galaxy in Pisces, which is dropping into the Denver skyglow in the West as darkness falls. (However, don't spend 30-45 minutes on M74 or you'll get behind and lose more objects.) The morning challenge in early March is the globular cluster M30 in Capricorn, which -- on the morning of March 5th— virtually rises with the Sun. On April 2nd, M30 rises about 90 minutes before the Sun, but the hills to the southeast of our dark site are just high enough to block it until morning twilight is well underway. In between M74 and M30 is a literal feast of deep sky wonders.

It's important to remember that the first actual completion of a marathon was in 1985! So anything over 90 objects is a great achievement, especially if it's your first try. Happy Marathoning!

MESSIER MAGIC

The interacting galaxies M81 and M82 are two of the sights you'll see before or after the recommended midnight nap, just before diving into the Virgo cluster. But which is which? You'll need to distinguish them to get credit for seeing them.

Image © Darrell Dodge

SPRING BANQUET SPEAKER NAOMI PEQUETTE

by Steve Solon

The Denver Astronomical Society is very pleased (and just a bit proud) to announce that Ms. Naomi Pequette will be the featured speaker at the Annual Spring Banquet on March 19 (See Page 5).

Ms. Pequette is an undergraduate senior at DU, pursuing studies in Physics and Astrophysics. She is utilizing a computer code in her efforts to model part of the Epsilon Auriga stellar system, which has recently undergone its gradual fading and return-to-brightness cycle. Her efforts will help to decipher the structure and content of the disk of material that causes the star's visual and spectrographic variations.

In preparation for her impending job with the Denver Museum of Nature and Science, she is also beginning research using an All-Sky Infrared Camera developed by Dr. Demitri Klebe, Space Sciences Content Specialist at the museum, and head of Solmirus Corporation.

Ms. Pequette is a three-time recipient of the Van Nattan-Hansen Scholarship Award, the DU Chancellor's Scholarship, and the National James Bernard Willet Education Memorial Scholarship, a merit-based recognition of her academic achievement, as well as her work in science education and public outreach. She also won the prestigious National Young Astronomer Award in 2007.

Her presentation at the banquet will highlight the results of her research, completed last summer at the University of Wisconsin-Madison during an internship funded through the National Science Foundation.

In her spare time, she also serves with the DAS in its many public outreach functions, displaying a genial manner and passion for teaching that are the true hallmarks of a young, passionate astronomer, one of whom the DAS is very proud.

Plan to join us at the banquet for what promises to be an insightful, inspired look into her diligent and rewarding research.

DAS 2011 Spring Banquet Invitation

You are cordially invited to the Denver Astronomical Society's Annual Banquet. Our featured Astronomer this year is DAS Student Member and Van Nattan-Hansen Scholar, Naomi Pequette. Naomi will talk on **"Stellar Populations of Fossil Group Galaxies." She presented this talk at the 2010 conference of the American Astronomical Society.**

This year's banquet will be held on Saturday evening, March 19th from 6 to 9 pm at the Columbine Unitarian-Universalist Church, 6724 S. Webster St., Littleton (see map). The dinner will feature a Mexican Buffet catered by Angie's Family Restaurant in Littleton. Cost per person is $15.00. Mexican beer will be served @ $1 per bottle.

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 address:

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

Feel free to email Brad at treasurer@denverastro.org or me at president@denverastro.org if you have any questions. – *Ron Pearson, President*

- -

(cut here and keep top portion)

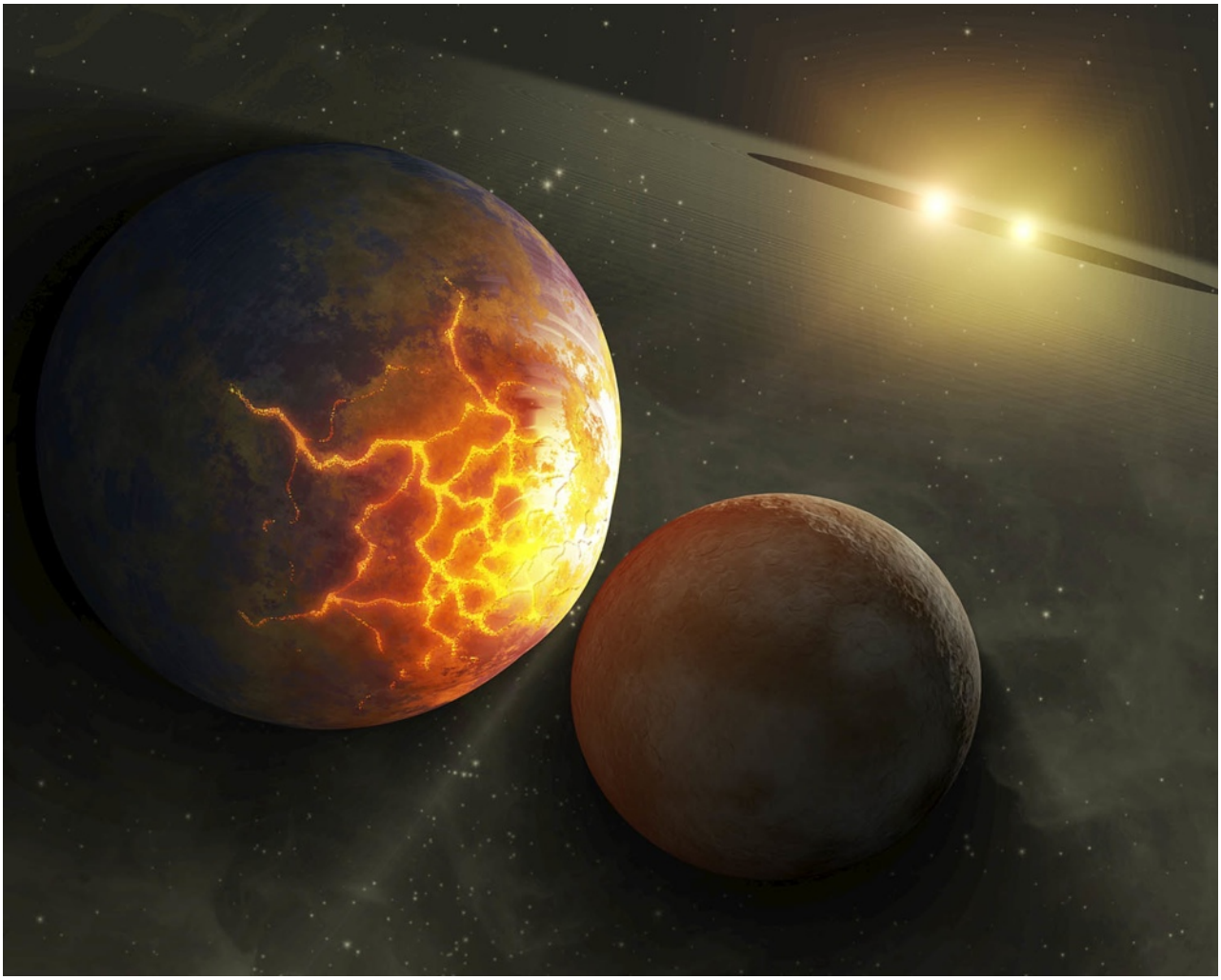
DAS 2011 Spring Banquet (Mail with payment to: Brad Gilman, 7003 S. Cherry St., Centennial, CO 80122-1179)				
Name:				
Phone:				
Email:				
	☐ Mexican Buffet includes: *Enchiladas (chicken) Chili Rellanos Taco Salad*			
	☐ *Total # Meals:*		*X $15=*	*$*

GRAND TOTAL (Amount of enclosed check made out to "DAS"):	$	*Includes salad, bread, NA beverages & dessert*

NASA'S SPACE PLACE

THANK GOODNESS THE SUN IS SINGLE

A Space Place Partner Article
by Trudy E. Bell



SMASHING! Planetary collisions such as shown in this artist's rendering could be quite common in binary star systems where the stars are very close.
Courtesy NASA/JPL

It's a good thing the Sun is single. According to new research, Sun-like stars in close double-star systems "can be okay for a few billion years—but then they go bad," says Jeremy Drake of the Harvard-Smithsonian Astrophysical Observatory in Cambridge, Mass.

How bad? According to data from NASA's Spitzer Space Telescope, close binary stars can destroy their planets along with any life. Drake and four colleagues reported the results in the September 10, 2010, issue of The Astrophysical Journal Letters.

Our Sun, about 864,000 miles across, rotates on its axis once in 24.5 days. "Three billion years ago, roughly when bacteria evolved on Earth, the Sun rotated in only 5 days," explains Drake. Its rotation rate has been gradually slowing because the solar wind gets tangled up in the solar magnetic field, and acts as a brake.

But some sun-like stars occur in close pairs only a few million miles apart. That's only about five times the diameter of each star—so close the stars are gravitationally distorted. They are actually elongated toward each other. They also interact tidally, keeping just one face toward the other, as the Moon does toward Earth.

Such a close binary is "a built-in time bomb," Drake declares. The continuous loss of mass from the two stars via solar wind carries away some of the double-star system's angular momentum, causing the two stars to spiral inward toward each other, orbiting faster and faster as the distance shrinks. When each star's rotation period on its axis is the same as its orbital period around the other, the pair effectively rotates as a single body in just 3 or 4 days.

Then, watch out! Such fast spinning intensifies the magnetic dynamo inside each star. The stars "generate bigger, stronger 'star spots' 5 to 10 percent the size of the star—so big they can be detected from Earth," Drake says. "The stars also interact magnetically very violently, shooting out monster flares."

Worst of all, the decreasing distance between the two stars "changes the gravitational resonances of the planetary system," Drake continued, destabilizing the orbits of any planets circling the pair. Planets may so strongly perturbed they are sent into collision paths. As they repeatedly slam into each other, they shatter into red-hot asteroid-sized bodies, killing any life. In as short as a century, the repeated collisions pulverize the planets into a ring of warm dust.

The infrared glow from this pulverized debris is what Spitzer has seen in some self-destructing star systems. Drake and his colleagues now want to examine a much bigger sample of binaries to see just how bad double star systems really are.

They're already sure of one thing: "We're glad the Sun is single!"

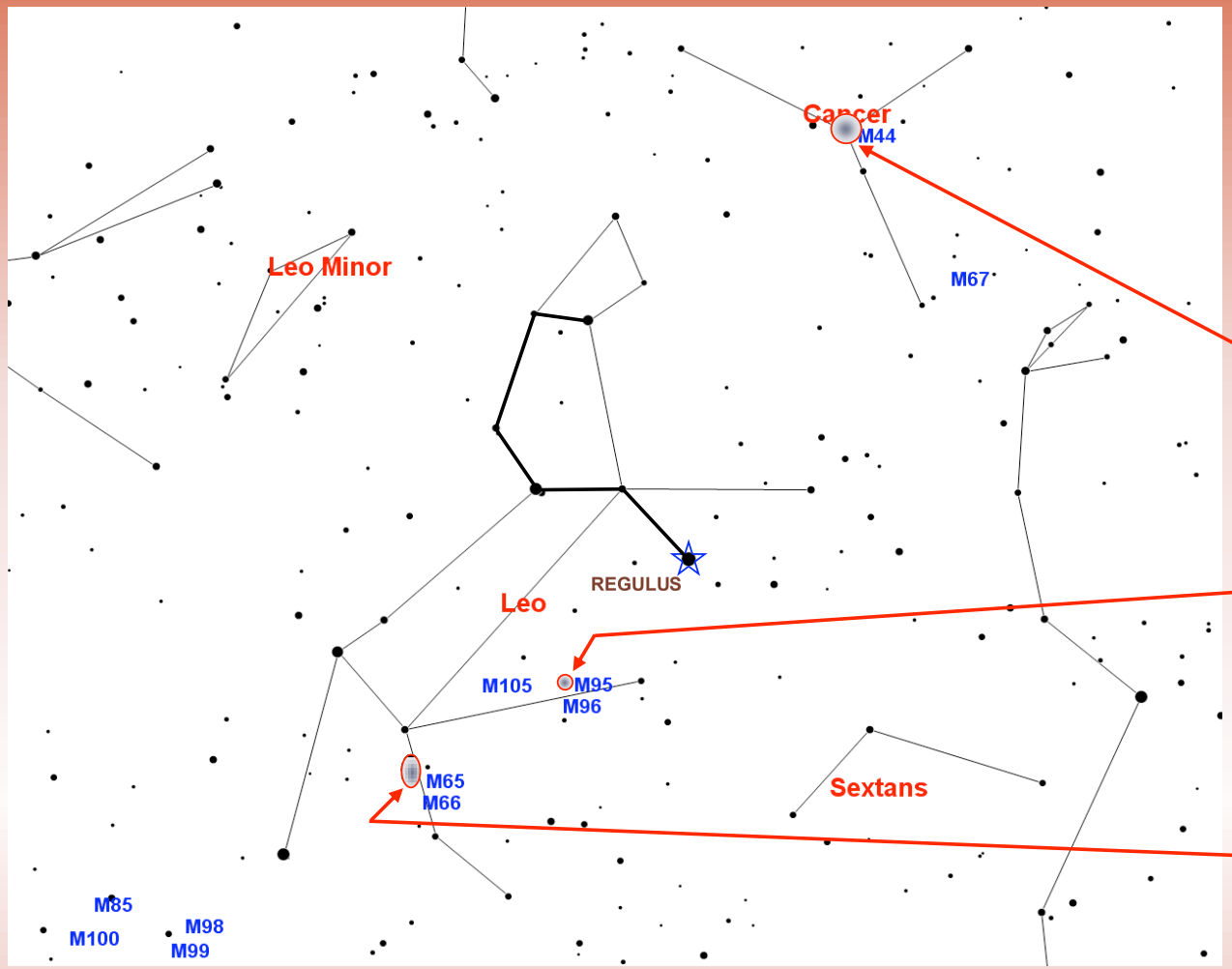
Read more about these findings at the NASA Spitzer site at *http://www.spitzer.caltech.edu/news/1182-ssc2010-07-Pulverized-Planet-Dust-May-Lie-Around-Double-Stars*. For kids, the Spitzer Concentration game shows a big collection of memorable (if you're good at the game) images from the Spitzer Space Telescope. Visit *http://spaceplace.nasa.gov/en/kids/spitzer/concentration/*.

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

NEW ASTRONOMER'S DEN

March, 2011

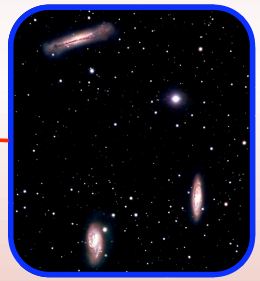
The Lion's Lair and Cancer's Square Herald Spring's Arrival



High Eastern Sky — 9 p.m.

The famous hive of luminous bees, M44 sparkles under almost any conditions. Known from as early as 260 B.C., the "Manger" contains 350 suns, one of which is an eclipsing binary. NGC 2632 is ~570 l-ys distant.

M95 displays one of galaxy-doms most prominent central bars, linking the sides of an enormous star-forming ring 2000 light-years wide. Messier catalogued this system four days after it was discovered in 1781.



While not quite as famous as the Mills Brothers singing trio, NGC 3628, M65 and 66 certainly draw telescopic attention in Leo's hindquarters. Small, fast instruments will contain all three in the same field of view. The gravitationally-bound systems, collectively, reside 38 million l-ys away.

As Winter (hopefully) departs, we leave beautiful, nebula-laden constellations and begin the annual journey into the galaxy-rich star fields of Spring, led by the sickle-shaped head of **Leo the Lion**. Beginning the parade of spirals, ellipticals and irregulars is the region below Leo's flank, containing some of the most wondrous stellar systems visible in the sky; a careful search yields the *"Leo Trio"* of NGC 3628, M65 and 66. Stay tuned—the host of galaxies in Leo's field are but a portent of things to come. For an eyepiece filled with magic, M44 in Cancer is hard to beat. This open star cluster lies at the juncture of the Crab's legs and abounds with beautifully rich stellar color and definition.

DENVER ASTRONOMICAL SOCIETY
One Mile Nearer The Stars

denverastro.org

star chart courtesy *TheSky6* astronomy software suite.

SWIMMING UPSTREAM (IC 410)
This nebula in Auriga hosts the neon bright tadpole nebulae (lower left). The image is a mosaic of six frames made with an ST-2000 ccd camera on Joe's 18-inch f/4.5 Newtonian telescope at the DSS. The series was taken during the first and last week of January 2011. He made 30/20/10/10/10 minutes of HaLRGB filtered exposures with five minute subframes on each frame.

Image © Joe Gafford

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