

OBSERVER



WHEEL IN THE SKY

Whether galactic systems are seen edge-on or face-on is all a matter of perspective. In the case of Messier 101, the Pinwheel galaxy, face-on wins, and what a sight it is. This stellar city is almost twice the Milky Way's size, contains 100 billion suns, and harbors extremely bright HII regions. NGC 5457 is part of the same galactic arena as M 51 and glows from 25 million light years distance. Details: C-11 at f/6.3, Honis-modified Canon 450D camera; exposures totaling 59 minutes from Bryce Canyon, Utah; First Place winner in the ALCON imaging contest. Congratulations, Darrell!!!

Image © Darrell Dodge

Calendar

- 6..... First quarter moon
- 13..... Full moon
- 13..... Perseid meteor shower
- 21..... Last quarter moon
- 28..... New moon

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AUGUST SKIES *by Dennis Cochran*

I don't know about you, but I always begin my observing sessions by facing the southern sky. Maybe that is because the greatest seasonal changes occur there, while the northern sky has the same group of circumpolar constellations tumbling about. So whichever way you start, turn around and face north. Now scan east from the pole star.

Prominent in the northeast sky are the mom and pop of the Andromeda story, Cassiopeia and Cepheus, both circumpolar constellations. Cepheus, who looks like a Monopoly® game house with a very peaked roof, points his peak slightly past Polaris as he circles same. From our latitude he is always visible, but a bit hard to see, with no really bright stars, yet he is almost as big as Cygnus. Below him toward the northeast horizon is Cassiopeia, whose "W" everybody knows, and right in-between is the rich

star cluster M52, in a busy part of the Milky Way. To reach M52, go in the Alpha-Beta direction up off the bright end of the Cassiopeia "W" toward the middle of Cepheus; halfway is M52. Just west of M52 is NGC 7635, the Bubble Nebula. A rather elegant arc, the Bubble looks to be part of a planetary nebula or supernova remnant. If you go back to β (beta) Cassiopeia at the east end of the "W," hang a right and go east from β (beta) Cassiopeia to find NGC 7789, a wide-spread open cluster with a thousand stars, a good sight in binoculars. Count the stars to make sure there aren't 1,001 stars and then take a break before going in the opposite direction from β (beta) Cassiopeia for one and a half times the distance to NGC 7789 to find clusters NGC 133 and 146. Mardok (our fearless facetious flying saucer pilot) says he

Continued on Page 3

PRESIDENT'S CORNER

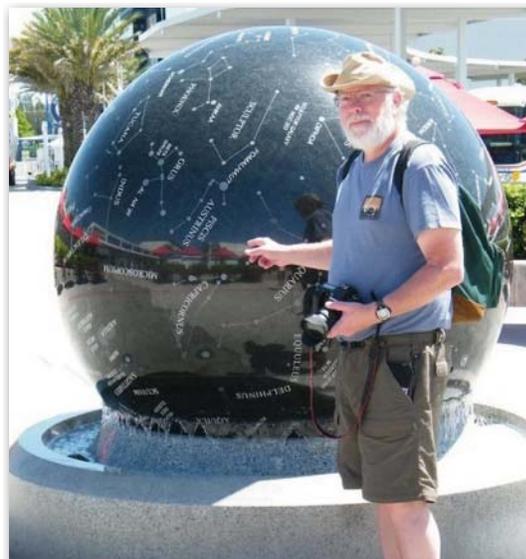
by Ron Pearson

I hope you're having a very good summer of vacations, observing and astronomy despite the monsoon weather we've gotten here in July. Quite a few of us had a fun picnic with good food and a rain shower thrown in which kept everyone closer for better conversation under the canopies and trees near Chamberlin. I heard some great reports about ALCON 2011 and the fantastic observing at Bryce Canyon NP. We even held a volunteer participation prize drawing for a \$50 gift certificate to S&S Optika. We had a lot of names to draw from due to all of you who have been coming to Open House and other events. Even the Open House turned out a fair crowd with fair skies that evening when the clouds parted for several hours. With Denver weather you just never know and the forecasts are frequently off target. So I hope we'll see you all at the August Open House for our "Vesta Fiesta" which we'll be holding with NASA-JPL to participate in the orbiting of the DAWN ion-propulsion spacecraft around the asteroid Vesta. We'll be having talks about this asteroid and exhibiting pieces of the asteroid—which are "meteorites" after they have fallen to Earth, thanks to Ron Hranac and Dan Wray. Unlike most astronomical objects we observe, like those faint fuzzies billions and billions of light years away, asteroids have a direct 'impact' on us, so not only can we observe them and measure them, we can hold them in our hands or look at them with a microscope!



Later in August join us at our Ed Kline Dark Sky Site for the dedication of our DAS Brooks Observatory. We will honor Larry Brooks's memory and his enthusiasm for observing at any dark site by finally completing the goal of—to paraphrase a certain president—of building

an observatory at the Dark Sky Site before the lease has run out! There are many folks to thank but head of the list are Celestron Inc. and S&S Optika. I hope you'll join us and many members of Larry's family on Aug. 20th for one of the most significant milestones in the history of the DAS. Details are on Page 8 of this newsletter and we ask that you RSVP us so we know to know expect you for the celebration with food and drinks. Of course we'll be observing with the Brooks Observatory C-14 telescope and telescopes you bring if weather permits that 3rd quarter moon night. See you there and *keep looking up!*



Ron Pearson, DAS president, touches the floating whole Celestial Sphere at the Kennedy Space Center Visitor Center in Florida.

Image courtesy Marilyn Pearson

DAS SCHEDULE

AUGUST

- 6 Open House at Chamberlin Observatory (Begins at 8:00 P.M.) *Vesta Fiesta!* (See Page 6)
- 12 DAS General Membership meeting (Begins at 7:30 P.M.). Speaker: Ben Wentworth: *Tactile Astronomy*
- 19 E-Board Meeting at Chamberlin (Begins at 7:30 P.M.)
- 20 Brooks Observatory dedication (5:30 P.M. RSVP see Page 5)
- 26-28 EGK Dark Sky weekend

Public nights are held at Chamberlin Observatory every Tuesday and Thursday evenings beginning at the following times:
 March 9 - April 14 at 8:00 p.m.
 April 15 - September 1 at 8:30 p.m.
 September 2 - March 8 at 7:00 p.m.

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

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

SEPTEMBER

- 9 DAS General Membership meeting (Begins at 7:30 P.M.). Speaker: TBD
- 16 E-Board Meeting at Chamberlin (Begins at 7:30 P.M.)
- 23-25 EGK Dark Sky weekend
- 24-2 Okie-Tex Star Party
- Oct. 1 DAS and DMNS Colorado Astronomy Day at Chamberlin Observatory

Society Directory

- President:**
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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

AUGUST SKIES (CONTINUED FROM PAGE 1)

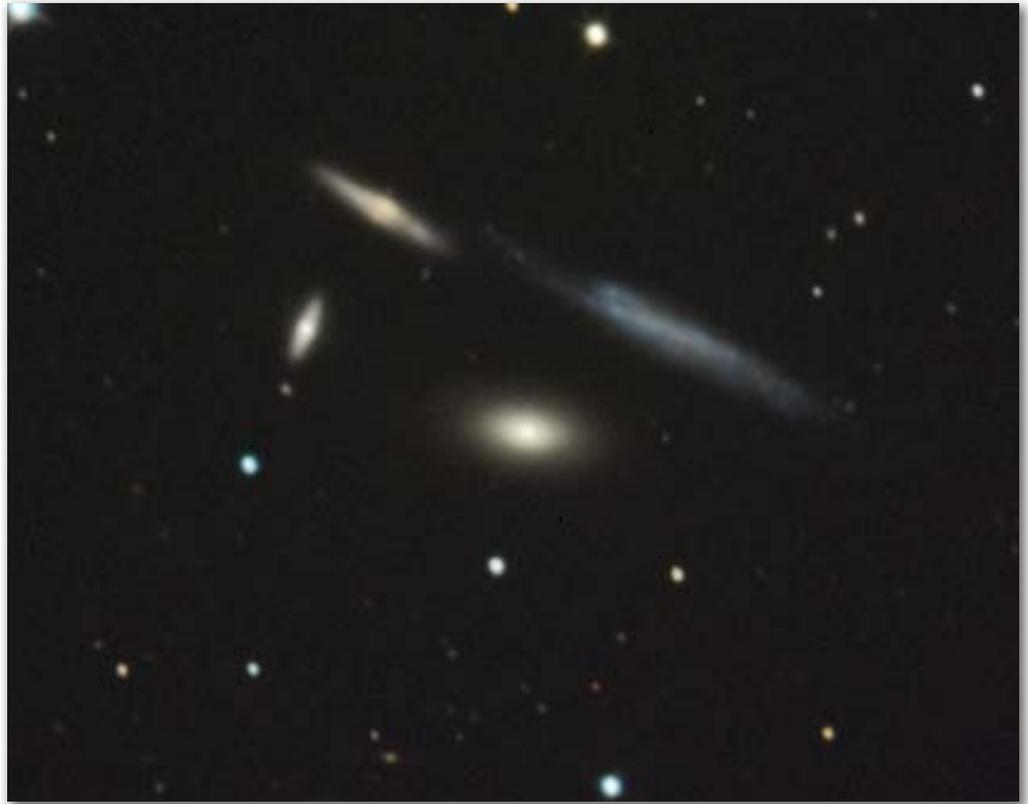
always gets confused navigating his ship through this crowded region.

To move out of the confusion of the dense Milky Way, look at the region just below the North Star. This is the large constellation Camelopardalis the Giraffe. To try for its gem, IC 342, which *Peterson's Field Guide* describes as a large beautiful spiral galaxy, it might be better to start at the faint western end of the Cassiopeia "W." Note the Delta-Epsilon distance at that end of the "W" and keep going on twice that far to just under γ (gamma) Camelopardalis. Directly below this should be the galaxy.

Planets: Saturn is still available in the western sky during the early hours of twilight. Jupiter now rises at midnight on August 1st and by ten P.M. on the 31st, so it is getting close to a time that we can show it to the public. I haven't seen it lately; is the South Equatorial Belt back yet?

Psst, hey buddy, do you want some adventure, some excitement, some dents in your head? The Perseid meteors are coming! Aieeah! Wear a helmet and keep your car in the garage. I know, I know—your garage is for storage and the car never gets in it. The Perseids streak overhead the early morning of the 13th. And they never hit the ground as far as I know—but there's a first time for everything! Come to an Open House or a General Meeting and ask our meteor people if there are Perseids in the world's, or even in their collections. Their displays are often set up on the west side of Chamberlin's circular floor space.

Turning around to look at the southern sky we discover the Summer Triangle nearing the zenith. The southeast point of the triangle is Altair, in Aquila the Eagle. He's either flying up or down; my references won't show me which. The south pole-pointing end of this arrow-like constellation, its λ (lambda) star, is just east of M11 in Scutum, that small elongated diamond shape above Sagittarius. M11 is one of those big star clusters like NGC 7789, and is called the Wild Duck. The Duck flies at the northeast end of a whitewater of nebulae and clusters cascading down over the spout of the Sagittarian teapot and ending up with the pair of star clusters, M6 and 7, just west of its spout. This tumbling torrent includes the star clusters M21, and M23 through



THINKING INSIDE THE BOX

Coma Berenices is home to several galactic clusters, not the least of which is the "Box" (NGCs 4169, 4173, 4174 and 4174). Spiral, elliptical and irregular galaxies team up in this unusual grouping. Glowing faintly at magnitude 12.2 makes this system a moderate observing challenge from a dark site. Details: 18" f/4.5 Newtonian, ST-2000XM camera; LRGB exposures totaling 80 minutes from the EGK Dark Site.

Image © Joe Gafford

26 as well as the gaseous nebulae M16, 17, 20 and 8. These latter four are known as the Eagle, Omega, Trifid and Lagoon Nebulae; they're often characterized as steam from the teapot's spout. The globular cluster M22 is farther east, just to the left of the top of the teapot. This mess of M-objects is what Messier discovered when he looked toward the nucleus of our galaxy, except that he didn't know about the nucleus. He was looking for comets and the associated fame and fortune. We wait all year for the late summer to come in order to see these tightly bunched won-

ders that he was only trying to avoid. These summer goodies exemplify the general truth that, astronomically, the south is where one finds the annuals, while the north is where one sees the perennials. Oh—and Mardok says "I'll be back! I need more specimens."

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.

THE RTMC TRAVELS OF F. JACK EASTMAN, ESQ.

by F. Jack Eastman

Yea, verily, May is already upon us and a trip “Out West” beckons—the 43rd Riverside Telescope Maker’s Conference (RTMC) at Camp Oakes, Big Bear, California. RTMC has traditionally been held over Memorial Day weekend, with the camp opening the Friday morning before. Last year it was held two weeks earlier in order to take advantage of the dark-of-the-moon, with the camp opening a day ahead. This time, we were back to Memorial Day weekend, along with a nearly-dark-of-the-moon. The trip was alot like last year, with the weather delivering just about everything on the way out: pea-soup fog, snow, rain and the like here and in the Utah mountains. The camp was to open early again, but without regular meal service. I arrived Wednesday night—enjoyed the traditional pig-out at La Paws Restaurant, then off I went for a good night’s rest at the Motel 6. Next morning, a huge breakfast, again at La Paws, and then off to camp. The camp was almost empty—few folks arrived early—and there had been much in the way of tree thinning and undergrowth removal. This led to a most unfamiliar scene with so few camps and more open space than in times past.

Thursday and Friday were mainly free days, with the vendors setting up mostly on Friday; a great time to look up old friends, reestablish acquaintances and set up camp. As mentioned before, this is a great reunion for me, having grown up in the area.

Finally, camp was established; telescopes were set up and made ready. The weather started out great; I don’t think it got below the high 40s both Thursday and Friday nights, although it was a bit breezy. The skies were good, measuring about 21.3* on the Sky Quality Meter*, not as good as Okie-Tex last fall, but good enough. Dan Schechter arrived Friday night and we were able to mount my 6-inch refractor on his very-robust Astro-

physics 900 mount. That was a big help, especially since there was a fair breeze. Views of Saturn were beautiful; γ (gamma) Virginis (Porrina) was an easy split, almost in the same field as Saturn. Dan brought up a very old telescope, wooden tube, unsigned, but almost surely a very early Clark. His description of this wonderful instrument is as follows:

“The wooden-tube telescope was made by Alvan Clark & Sons around 1860 and is unsigned. It could be the earliest portable equatorially-mounted Clark refractor known and has a clear aperture of 4-1/8-inch and a focal length of 56 inches. It came with a full set of eyepieces, solar diagonal and screw on solar diagonal on an equatorial mount. It looks very similar to the wooden-tube Clark in the London Museum of Science collection, which can be seen on page 239 of *Artists in Optics*. I am not 100% positive I know the original owner, but I do know that a gentleman named William H. Puslifer owned it in the 1860s and used it to view the total solar eclipses of 1869 and 1878.” The eyepieces and accessories were definitely Clark and we found “Clark” scratched on the field lens cell of one of the eyepieces.

There were fewer formal activities this time. Talks, demonstrations and all got started in earnest Saturday, with the traditional swap meet featuring tons of stuff. I guess I must think I’m well-stuffed; I bought a radius test gauge set and a book, *Elegant Universe* by Brian Greene, all about Superstring Theory. Most of the talks this time revolved around telescopes, especially aimed at the telescope makers. There were demonstrations of mirror grinding and discussions of eyepieces, mounts, optical testing and a question-and-answer panel discussion. Many of the presentations were concurrent, making it difficult to take all of them in. I did attend the Q&A, as I was one of the panel members—no escape from that one! There were no hard questions about optical design, so I guess I got off easy!

Saturday, before lunch, Robert Naeye, Editor-in Chief of *Sky & Telescope* magazine, gave a great talk about amateur discoveries of exoplanets, a real exercise in precision photometry! After lunch Russ Genet discussed his concept for a two-meter portable telescope(!) He set up a one-meter prime-focus reflector, designed especially for imaging—a truly impressive piece of machinery. Russ is currently a research scholar in residence at California Polytechnic State University and professor of astronomy at Cuesta College. He pioneered the first fully-robotic observatory and has authored a number of books on instrument development and research with small telescopes. Saturday evening was the presentation of the Western Amateur Astronomer’s prestigious G. Bruce Blair Medal to Scott Roberts of Explore Scientific for his outstanding contributions to public outreach; very well deserved! This was followed by the traditional door prize drawings, then the keynote talk. Dr. Peter Jennisken, an astronomer and research scientist with the Carl Sagan Center at SETI, spoke on the impact and recovery of Asteroid 2008 TC₃. This is the object, discovered while still out in space, that entered the atmosphere and landed in Sudan on October 7, 2008. Jennisken’s talk was about the



JACK EASTMAN

Jack stands beside his 6-inch Clark refractor at the Riverside Telescope Maker’s Conference.

Image courtesy of Robert Naeye, *Sky & Telescope* magazine

expedition to Sudan and subsequent recovery of fragments early in 2009. The pieces of this object are collectively called the Almahata Sitta meteorite. Analysis of the fragments showed it to be an anomalous ultra-fine-grained porous polymict ureilite containing large carbonaceous grains (you meteorite enthusiasts will recognize this!) He noted that spectra obtained of this object before entry and in the laboratory showed 2008 TC₃ to be an F-class asteroid. Afterwards, the Western Amateur Astronomers held their summer Board meeting, with only three of us in attendance - enough, however, for a quorum. Denver is a member in good standing. The only business conducted was election of new officers.

Saturday was somewhat windy, and Dan said if it was really blowing he'd probably give up and hit the sack. It was blowing, only to blow even harder as the night went on. One fellow measured the wind at a sustained 65 mph, with gusts in excess of 80! My scope, on Dan's big mount,

survived. One of the vendor's tents was found wrapped around half way up a large ponderosa pine several hundred feet away. Several folks camping in tents weren't sure if things would stay put. A couple of tents were damaged, with bent or broken poles, etc. Sunday got cold and cloudy. One fellow said not to worry, "These clouds will go away at sundown, they always do." About that time a squall arrived, dumped gropple and cooled everything off. Almost everybody packed up and a lot of 'em left, but wouldn't ya know—it cleared off and turned out to be a calm and clear night, albeit cold!

Sunday afternoon we conducted a "working group" meeting, discussed at length the future of RTMC and took many constructive ideas from the attendees, perhaps a bit biased, as those in attendance thought things were more or less good as they were. Overall, there was a seeming desire to stay with the Memorial Day weekend, moon or not. Some of the discussion was devoted to the question of whether true

telescope makers were an endangered species. We certainly hope not!

Monday morning was cool and clear, and although breakfast was not part of the meal deal, for five bucks we were fed. I must say the meals this time were among the best at RTMCs of recent memory. Breakfast down, it was off for the return to Colorado. All in all, a very pleasant trip, reconnecting with old (and new) friends and just having a good time - do it again next year! Yes! I'm hooked.

**Note: The Sky Quality Meter is an instrument that measures the background brightness of the sky. The units are magnitude-per-arc-second-squared, which relates to a rated brightness if the sky was covered with stars of a given magnitude. For example, if the sky was covered with 19th magnitude stars, the reading would be 19.0. Okie-Tex last year was 21.9 to 21.4 and the sky at Chamberlin measures -18.5, which corresponds to a visual limit of about 4th magnitude.*

BROOKS OBSERVATORY DEDICATION AND INVITATION

by Ron Pearson

The DAS is extending an RSVP invitation for all DAS members and their families to the dedication of our Brooks Observatory at the Edmund G. Kline Dark Sky Site on Saturday, August 20th, starting at 5:30 P.M. A short ceremony will be held to honor our late President Emeritus Larry Brooks and dedicate our DAS observatory to his memory. Food and drink, provided by Larry's family, will be served afterward. Depending on weather conditions we hope to open the observatory for viewing. The dedication will be held, clouds or clear. The sun will set around 8 P.M., so bring your telescope or lawn chair to enjoy the night sky with us in memory of Larry. Please RSVP that we can expect you to Brooks ObsLst tbo@denverastro.org by August 14th.



THE BROOKS OBSERVATORY PROJECT

The observatory construction crew (photo at left) on June 4th: (left to right): Darrell Dodge, Stuart Hutchins, Glenn Frank, Dan Wray, Ted Cox, and Joe Gafford. The above photo showcases Ted Cox, Joe Gafford, Glenn Frank (sitting on the ground in front of Joe) and Dan Wray.

COME TO THE VESTA FIESTA!



NASA'S DAWN SPACECRAFT

Artist's concept of NASA's Dawn spacecraft. The giant asteroid Vesta, Dawn's next destination, is on the lower left. Another larger asteroid and Dawn's second destination, Ceres, is on the upper right.

Illustration courtesy of NASA/JPL-Caltech.

From potential threats to the Earth, to their potential for natural resources, asteroids are one of the most important and unstudied components of our solar system. Using the Clark-Saegmuller 20-inch telescope during the 1890s and early 1900s, the first director of DU's Chamberlin Observatory, Dr. Howe, and his students made thousands of observations of asteroids and comets. The objective was to determine their orbits, and the observations contributed significant data to the catalogs of asteroids in the solar system. Vesta was the third asteroid discovered and is one of the largest—it is now considered to be a protoplanet. On July 16th, the NASA-JPL spacecraft DAWN entered into orbit around Vesta.

To celebrate the beginning of Dawn's year-long visit to this protoplanet, the DAS, in cooperation with DU, will host a "Vesta Fiesta"

for the public. Join us at 8 P.M. on Saturday, August 6th at this month's Chamberlin Observatory Open House for this stellar event.

The spacecraft left Earth on September 27, 2007 and will finally reach its first destination, Vesta! Dawn is the second NASA mission to be powered by an advanced NASA technology known as ion propulsion and is the first NASA mission to orbit two solar system objects.

Using data from Dawn's year-long visit

TARGET VESTA

NASA's Dawn spacecraft obtained this image (right) with its framing camera on July 1, 2011. It was taken from a distance of about 62,000 miles (100,000 kilometers) away from the protoplanet Vesta. Each pixel in the image corresponds to roughly 5.8 miles (9.3 kilometers).

Image courtesy of NASA/JPL-Caltech.



at Vesta, scientists will seek to understand some of the most fundamental questions in planetary science: how did planets form? What were the starting materials that formed our solar system? What is the origin of meteorites that fall on Earth? The Dawn Spacecraft will send back new and exciting data that give us a snapshot of the early solar system and answers to these questions and more. "Vesta Fiesta" celebrates the beginning of Dawn's exploration of this "new world" and includes presentations by Dawn team members discussing the mission and some of the latest data.

Early in the evening, our local "Vesta Fiesta" will feature viewing of the Moon and Saturn through the historic 20-inch telescope and DAS-member telescopes. DAS member Ron Hranac will present a talk entitled, "Meteorites and the Asteroid Vesta," including the latest images from NASA-JPL. There will also be a hands-on exhibit of meteorites that are believed by scientists to have come from Vesta. The asteroid rises over the Denver area after 10 P.M. and will be viewed with the 20-inch and other telescopes if conditions permit. I hope you will join us for a fun-filled educational experience.

NEW ASTRONOMER'S DEN

August, 2011

What's In Your Teapot?

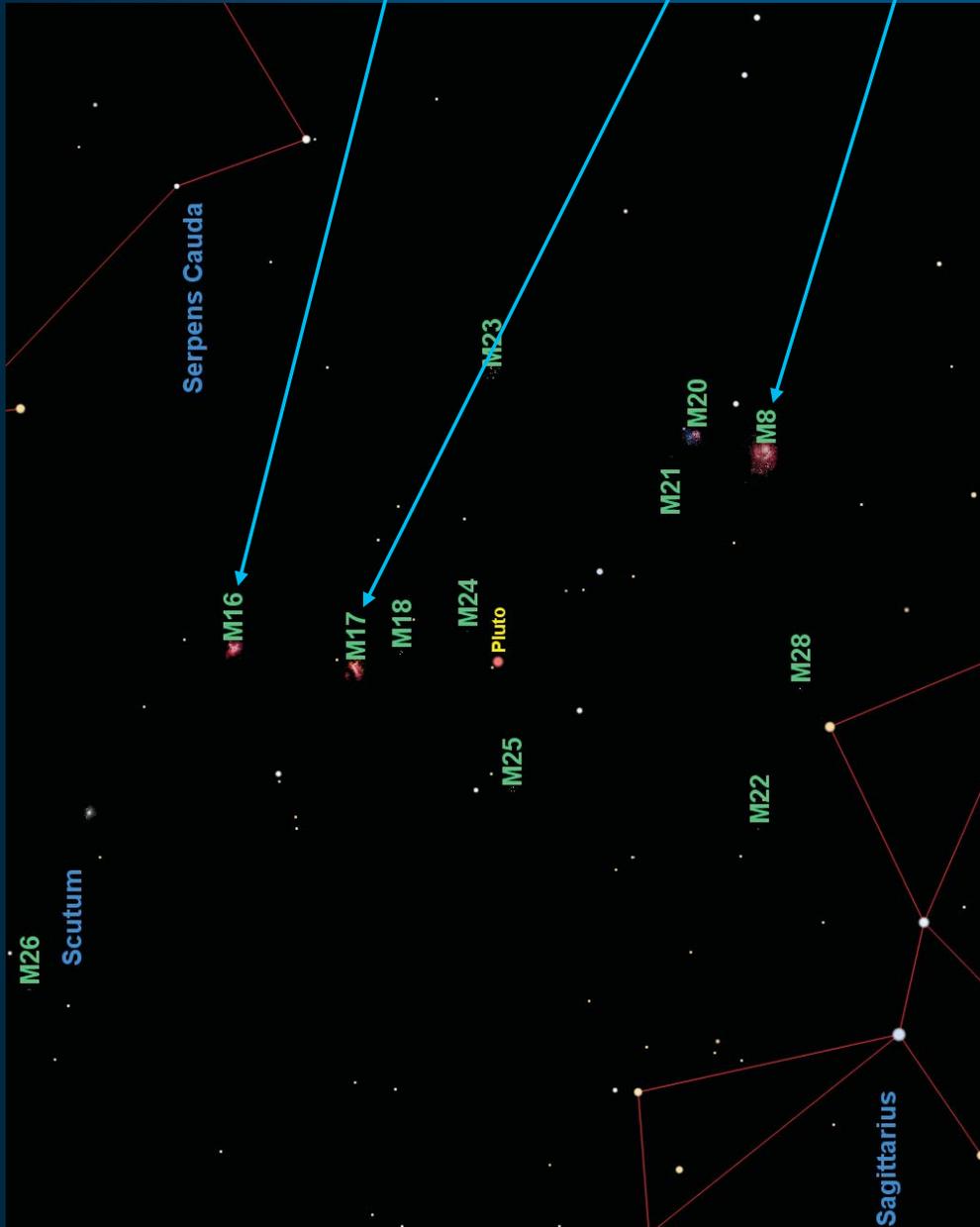


Our view of the universe changed radically with HST's image of M16, the **Eagle Nebula**. The central region, shown here, reveals the "Pillars of Creation", cold gas columns light years high. NGC 6611 is 7,000 lys distant.

The combined energy of 35 stellar engines powers the luminescence of the **Omega Nebula**, M17. Four other monikers grace NGC 6618, its 15 light year-wide HII cloud glowing from 5500 lys.



Another of the myriad HII emission nebulae, M8, the **Lagoon Nebula**, appears red to our eyes in images, while faint shades of gray-blue-green await observers under dark skies. NGC 6523 is ~5000 lys away.



Southern Sky — 9:00 p.m.

There is, undoubtedly, no where else in the night sky that holds so many wondrous objects within a small binocular sweep as the area above the 'lid' of Sagittarius's "Teapot" asterism. Nebulae and clusters abound along our line-of-sight toward the galactic center, while dark clouds of cold interstellar gas, called **Bok globules**, pervade almost every bright nebula to be found. This is a true treasure trove for novice and experienced observers alike, because into the mix, we throw our solar system's ninth planet, **Pluto**, at magnitude 14, a definitive test of star-hopping skills. Cruise slowly among the stars of the Centaur, for this is the summer Milky Way at its Messier-loaded finest.



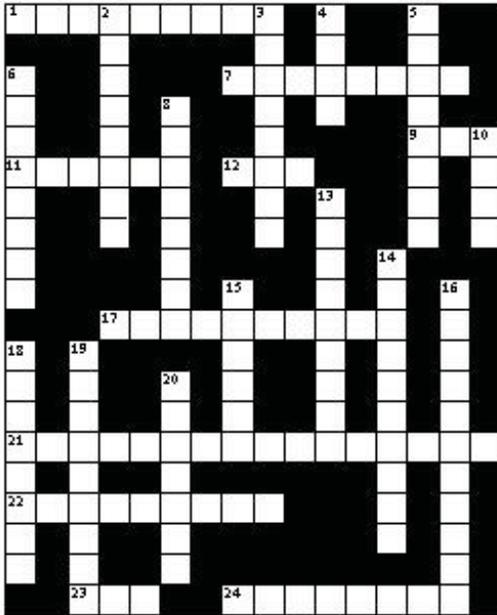
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Star chart courtesy TheSky6 astronomy software suite.
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For Cloudy Nights.....

Crossword: Named Galaxies The clues below describe famous galaxies.



ACROSS

- 1. Person-size plant
- 7. Pair of rabbit ears
- 9. Milky way satellite
- 11. Silky sleeping place
- 12. Feature of many galaxies
- 17. Early money
- 21. Another name for 15 Down
- 22. Another name for 14 Down
- 23. Another Milky Way satellite
- 24. Lead galaxy in a cluster named for its home constellation

DOWN

- 2. Tool to eat for a lifetime
- 3. Raccoon feature
- 4. Binocs are useless without them
- 5. Wildlife appendage
- 6. M64
- 8. Colorful spinner
- 10. Plentiful galaxy cluster
- 13. Damsel in distress
- 14. Southern object with a huge dark lane
- 15. Junkie's need
- 16. Far north galaxy
- 18. Tijuana topper
- 19. Charybdis
- 20. Kite-flying handle

GALAXY PUZZLE

Thanks to Lisa Judd for her hard work at creating numerous and diverse Astro Puzzles! As often as possible, the *Observer* will offer one of her talented creations. Enjoy! The answers will be published in next month's *Observer*.



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