

# OBSERVER



## THE QUEST: HEAVENS' BEST

Distinctive, absorbing, entrancing. These are just a few of the words used to describe the jewels of the summer sky's southern region. Two of the prominent members in this image by award-winning astrophotographer Darrell Dodge are the Trifid Nebula (at left) and the Lagoon Nebula, the latter known for its numerous Bok globules and deep ionized-red hydrogen color. Along with several open star clusters, this superb portrait captures subtle features that entice you to journey on to the heart of the Milky Way. *Details: Honis-modified Canon 450D camera with Baader UV/IR-cut filter and Astro-Tech AT72 refractor; exposures totaling 75 minutes, processed with Nebulosity and CS5; from Fox Park, Wyoming. Image © Darrell Dodge*

### Calendar

4.....	First quarter moon
12.....	Full moon
20.....	Last quarter moon
23.....	Autumnal equinox
27.....	New moon

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## SEPTEMBER SKIES

by Dennis Cochran

If you didn't come to the August Open House on the 6th of last month you missed Vesta Fiesta, a day that NASA did "vespacious" celebrations featuring their spacecraft's flyby of that little world. We (attempted to) set up a monitor display of NASA's broadcast so we could see what they saw. I am tentative about whether this succeeded because it is in the future as I write. Meanwhile in our earthling sky, Vespa (named after an Italian motor scooter) is just coming out of the western side of Capricorn's "joker grin" this month, after which it will abruptly turn back and go east again. Augh! It's enough to make one go around muttering "Vesta, schmesta!"

The glories of summer are still with us, so look at 'em now! Sagittarius is still about as high in the southern sky as it gets, but Scorpius, preceding it in the west, is already starting his dive into the dusk. If

you want to know what the term "nebula" means these days—as opposed to 80 years ago when the term included galaxies, as in Hubble's famous book *In the Realm of the Nebulae*—look at the steam roiling out of the Sagittarius teapot. M8, 16, 20 and 21 are pretty much our gallery of nebulae easily visible in the Northern Hemisphere except for winter's M42. The Pelican and North America nebulae in Cygnus are huge and spectacular, but only in photographs. In fact, the gallery pages of the two astronomy magazines, *Astronomy* and *Sky & Telescope (S&T)*, are full of beautiful images of largely invisible nebulae taken with Ritchey-Chrétien telescopes and Apochromatic (APO) refractors.

Meanwhile Cygnus, full of the aforementioned invisible nebulae, and Lyra, pass directly overhead. East of these is the next seasonal wonder,

*Continued on Page 3*

# PRESIDENT'S CORNER

by Ron Pearson

The following are some words from the dedication of our Brooks Observatory, Aug. 20th 2011.

Thank you all for coming, especially all the members of Larry Brooks' family, and sharing this event with us. I want to make a few comments about why we are dedicating this observatory to Larry Brooks and why the DAS needs an observatory at our Ed Kline Dark Sky Site. Many members knew Larry, but many new members may not have known Larry at all. Our own observatory was on plans for the site as drawn up and advocated by Wayne Kaaz from the beginning. As mentioned by Darrell Dodge and others, there has been a lot of controversy and discussion in DAS over the years



since we acquired the site about whether to have an observatory. For 62 years the DAS has primarily been part of historic Chamberlin Observatory at DU, operating its great telescope for public outreach. Three generations have come and gone in the DAS without our own

observatory.

We are dedicating our observatory to Larry Brooks because of his years of selfless service to the DAS, four terms as President, once as Vice President. But Larry wasn't any smarter, better or dumber about astronomy than any of us in DAS or you. When I first met him when he joined about 1990, he said he didn't know anything about astronomy. But he was enthusiastic and learned a lot quickly, he acquired a telescope or two and loved books and everything new that came out about astronomy. He became a Chamberlin Public Night volunteer and 20-Inch Scope Operator soon and in a few years he was serving on the E-board and then as President. His greatest enthusiasm was helping children look through the 20-inch or at school star parties or

Astronomy Day events. He argued with Ed Kline about the dark site, helped Wayne Kaaz get the zoning changes needed with the county for the site and steered us through rough times when significant changes were threatened to be made at Chamberlin. In short, while he said he didn't know astronomy, Larry was all about service to the DAS, trying to do what was best for our Society and having fun doing it. So those are some reasons why we dedicate this observatory to Larry.

It is important that we (DAS) finally have our own observatory at this dark sky site for several reasons. While we have a dark site for members to use their own telescopes, the foremost reason for a DAS observatory is to have our own telescope for outreach to kids like scouts, school children and groups of adults at a place where they can see a dark sky and gain an appreciation of what the night sky really looks like without light pollution. Perhaps the second reason to have an observatory is to give members that have advanced beyond or have an interest in doing 'science' a location and instrument where they can come, particularly if they cannot afford a large, expensive instrument on their own, to do science or learn the techniques of collecting data or scientific images. Many amateurs around the world today are observing extra-solar planets, discovering asteroids or making other significant contributions to professional astronomy. We now have a research quality scope under a reasonably dark sky for members to use to these ends if they wish. And finally, what is probably Darrell Dodge's favorite reason, is that we now have a place to get out of the wind here on the prairie so that if, after driving many miles, it's too windy for your big dob or imaging scope, you can get out of the wind, still observe or maybe sit around with a few friends under the dome and swap tales and lies about Larry, Ed and the thousands of deep sky fuzzies you say you've observed

Continued on Page 4

## DAS SCHEDULE

### SEPTEMBER

- 9 DAS General Membership meeting (Begins at 7:30 P.M.). Speaker: Dr. Doug Biesecker, See Page 6.
- 16 E-Board Meeting at Chamberlin (Begins at 7:30 P.M.)
- 17 Open House at Chamberlin Observatory (Begins at 7:00 P.M.)
- 23-25 EGK Dark Sky weekend
- 24-2 Okie-Tex Star Party

### OCTOBER

- Oct. 1 DAS and DMNS Colorado Astronomy Day at Chamberlin Observatory (See Page 5 for information and times)
- 8 DAS Annual Auction at Chamberlin Observatory (Setup begins at 11:00 A.M., Bidding begins at 1:00 P.M.)
- 14 E-Board Meeting at Chamberlin (Begins at 7:30 P.M.)
- 28-30 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](http://www.denverastro.org)) or call (303) 871-5172.

### Society Directory

- President:**  
 Ron Pearson (303) 670-1299  
[president@denverastro.org](mailto:president@denverastro.org)
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- Treasurer:**  
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### Executive Board Members

- |                                  |                 |
|----------------------------------|-----------------|
| Jack Eastman                     | Keith Pool      |
| Joe Gafford                      | Tim Pimentel    |
| Chuck Habenicht                  | David Shouldice |
| Ron Hranac                       | Dan Wray        |
| Ron Mickle, Past President       |                 |
| President Emeritus, Larry Brooks |                 |

### Committees

- Van Nattan-Hansen Scholarship Fund:**  
 Ron Pearson (Chair)  
 P.O. Box 150743  
 Lakewood, Colorado 80215-0743
- EGK Dark Site Committee:**  
 Darrell Dodge, Interim Chair  
 Email: [darksite@denverastro.org](mailto:darksite@denverastro.org)
- IDA Representative:**  
 Dr. Robert Stencel  
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- Student Astronomy Chair:**  
 Naomi Pequette (Chair)
- Finance Committee**  
 Frank Mancini (303) 663-5263

### Volunteers or Appointed Representatives

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 The Observer is available in color PDF format from the DAS website.
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 Chad Warwick, IT Specialist
- Librarian:**  
 Phil Klos  
 DAS Information Line: (303) 871-5172
- DAS Correspondence:**  
 Denver Astronomical Society  
 Chamberlin Observatory c/o Ron Pearson  
 2930 East Warren Avenue  
 Denver, Colorado 80210

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

[www.denverastro.org](http://www.denverastro.org)

## SEPTEMBER SKIES (CONTINUED FROM PAGE 1)

Andromeda and her galaxy, now only starting to rise—more about her later. Turn around to the west to find M51 in a good viewing position off the bottom-end of the Big Dipper's handle. In our cosmology group people were arguing about the status of NGC 5195, the companion galaxy that seems to be at the end of one of M51's spiral arms or a ways beyond. It may be the case that NGC 5195 underwent the greater change when the two galaxies brushed by one another.

If you face north and find Polaris at the end of the handle of the Little Dipper you can trace a line towards the southwest horizon from the pole through the Little Dipper's cup and beyond to the twisting body of Draco the Dragon. Between the faint  $\theta$  (theta) and  $\iota$  (iota) Dra stars are the galaxies NGC 5985, 5985A and 5982 that Sue French talked about in August's *S&T*.

When you are looking at Hercules, west of the Zenith (after viewing M13 on the western edge of the keystone shape of Hercules's body), go up a keystone's height above the keystone to find another globular cluster, M92. Then follow the line down the keystone's main axis for a bit more than a keystone-height below the "stone" to look for planetary nebula NGC 6210. It has a bright inner ring and a faint outer one. A more elusive planetary is to the right of the top line of the keystone, a bit more than that line's width: NGC 6058. An OIII filter would help with this, as with any planetary.

Venus appears in the crepuscular rays of twilight at the end of the month, and cruises over



C/2009 P1 (GARRADD) AND M71 IN SAGITTA

This image was taken on August 26, 2011 with Brian's AT10RCF and STL-11000—the comet should be into Hercules by month's end.

Image © Brian Kimball

Spica on October 3, getting higher as autumn progresses. Don't miss it: it's positively crepuscular! A month later her path takes her past Antares and in another month into the Teapot's steam. You probably won't have any trouble telling which object is Venus.

Farther out in the solar system, the planet Uranus may be naked-eye and visible at magnitude 5.8 late in the month when it's at opposition. Look on the ecliptic east or southeast of Algenib, or  $\gamma$  (gamma) Peg, the star at the southeastern corner of the flying horse's great square, for the greenish planet; *S&T* has a big article about it. One of the Pisces fishes crosses between Algenib and Uranus,

with the looming planet barely below the ecliptic. Use binoculars or a wide-field scope to find it, then power-up or go to a longer f-ratio scope for a detailed look. The other mid-size gas giant, blue Neptune is fainter but well-placed just east of the eastern corner of Capricorn's "joker-grin," about 1/5 of a grin-width away. Saturn is only visible right after sunset, but big brother Jupiter rises after 9 P.M. at mid-month and will be good for viewing in the pre-midnight hours. Mars rises after midnight—but wait until next March, when it will be at its best. Keep looking up, as Jack Horkheimer used to say, and remember that alien flying saucer pilots are people too. . . sort of.

## 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](http://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](http://www.denverastro.org).



# A GRAND STAR PARTY AT THE CANYON

by Dennis Cochran

The Grand Canyon Star Party was held June 18-26, 2011 at each rim of the canyon. Because of a lucky email to the GCSP site, my brother Andy and I were invited to participate on the periphery of the North Rim party. We were to set up our scopes near Kaibab Lodge just outside the park. The main group was at the Grand Canyon Lodge (GCL) on the veranda overlooking the canyon. Most of the Arizonans that made up this group were camped at the park campground. Our meadow location was out between the DeMotte Campground (Forest Service) and Kaibab Lodge. The perk was free lodging at Kaibab for five days.

We had five days of perfect weather and clear skies. For about three hours a night we showed stars to the public, and our days were free for exploration as well as relaxation. A lot of the latter

was on the shaded porch outside the saloon at GCL overlooking the busy entranceway to the lodge where we could watch the tourists, often red-faced with frustration, that failed to find accommodation there, or at Kaibab or Jacob's Lake, which exhausts the list of the North Rim region. Reservations are a must. Besides the saloon we frequented the excellent restaurant at GCL. Kaibab Lodge, our base and crash pad, also had a restaurant and is a rustic affair on the edge of one of those long meadows that Highway 67 follows on the way to the rim, backed up against a dense fir-spruce-aspen forest. Each night we had about 40 visitors from the campground and Kaibab Lodge chattering noisily in the moonless darkness. By eleven they were gone and we were free to look at anything, but found that we were all tuckered out

after a day of driving the back roads and walking to various canyon sights.

The first three nights of the GCSP, an Arizona trio set up their Schmidt-Cassegrains in the meadow, then we were to do the last five days with our Dobs. That was the plan, but due to a booking accident we actually only did four days. As far as observation went, I found that galaxies like M51, M81/82 and the Leo Trio all eluded me. With my smaller scope I favored Saturn and Albireo and clusters. My brother concentrated on deep-sky objects with his 16-inch Lightbridge telescope. I can highly recommend this 8000-foot elevation location for astronomy, although cars entering the campground would occasionally light us up--perhaps imaging would be best pursued at another North Rim site. Either way, I urge you to check out the clear skies and beautiful surroundings.

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

Many philosophers liken our lives to a rock thrown into a pond, causing ripples and waves from what we do, each contributing to the energy and flow of life. If you think of each DAS member's telescope as a grain of sand and then if you think of picking up a handful of sand and throwing it out onto a small lake, pond, or the ocean, I think you can see (with your mind's eye) that hundreds or even thousands of thrown grains of sand cause very little ripple on the water. But if you think that one telescope, inside an observatory for many years or decades, can reach many people, show the sky and what's up there to thousands of people, like Chamberlin has over 117 years, is like a rock picked up and thrown into the water. One telescope in one observatory can serve thousands, like a rock can cause ripples and waves, extending out for great distances and interacting with other waves and ripples through time. We hope that our Brooks Observatory will be a rock.

DAS roots go back to the founding of Chamberlin Observatory. I'd like to quote from Dr. Herbert Howe, first director of Chamberlin Observatory, in his book "A Study of the Sky" (1894) in more 19th-century eloquence about observatory names;

"Ingenious and powerful instruments have been devised, which reveal wonders otherwise unimagined, and the end is not yet. Each new telescope giant is expected to win fresh laurels in old fields of endeavor, or to make discoveries which shall link its name forever with the stars."

And so, at this dedication, we link the name of Brooks Observatory forever with the stars!

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### HIGH-FLYING PASS

Shown in the smaller, enlarged image is the International Space Station as it passed in front of the moon at 2:27 A.M. on August 18, 2011. It was seen from the Evergreen, CO area where Roger Hassell, Ron Pearson and Roger Clark set up their equipment in Bergen Park.

The ISS was invisible, being in the Earth's shadow, until it crossed the moon, so getting the shot was a matter of setting up the equipment within the geographic boundaries of the viewing footprint, and waiting for it to appear at the predicted time. In this case, that was 2:27:27 A.M. MDT in Evergreen. The total transit time was about 1/2 second, so it required some very quick reaction time to trip the shutter. Roger figures that was about 1/4 second.

To get this shot, he used a D300s Nikon camera attached to a Celestron N11GPS telescope at prime focus configuration. ISO was 1250, f/6.3, 1/2000s.

Image © Roger Hassell



# GEAR UP FOR COLORADO ASTRONOMY DAY!



## WAITING FOR A GLIMPSE OF THE SUN

Kids and adults alike line up to see our local star at last year's Colorado Astronomy Day.

*Photo by Ron Pearson*

Come one, come all and celebrate your stellar hobby at Colorado Astronomy Day on Saturday, October 1<sup>st</sup>! DAS members and the Denver Museum of Nature & Science (DMNS) will join forces for a day and night of observing, talks and enjoyment with each other and the general public.

The day will begin at 10 A.M. with solar observing and astronomy outreach at the DMNS. The DAS will set up on the west patio with solar telescopes (please bring one to share if you have one), while inside the Space Odyssey area members will give talks about binocular astronomy and meteorites as well as interact with the public at the DAS outreach table regarding astronomy and club information. At 4 P.M. club members will pack up their gear and head over to the Historic Chamberlin Observatory

for viewing with the 20-inch Alvan Clark refractor, as well as through member scopes on the south lawn. The public is invited from 7 P.M. to 11 P.M. and will also be treated to astronomy talks inside the observatory (or maybe outside if weather permits).

Come help us celebrate this year's Colorado Astronomy Day by volunteering for talks, and/or bringing yourself, your solar scope to DMNS or helping in Space Odyssey, then onto a great night of scopes and skies at Chamberlin.

A DMNS volunteer sign-up sheet will be passed around at the next General Membership meeting on September 9th. DMNS volunteers will receive a lunch coupon at the museum, and if they help at Chamberlin for the evening, they'll have free pizza for dinner! If you can't volunteer, participate by coming out and enjoying a full day of astronomy at both venues with your friends and family!

## BROOKS OBSERVATORY DEDICATION

*by Chuck Habenicht*

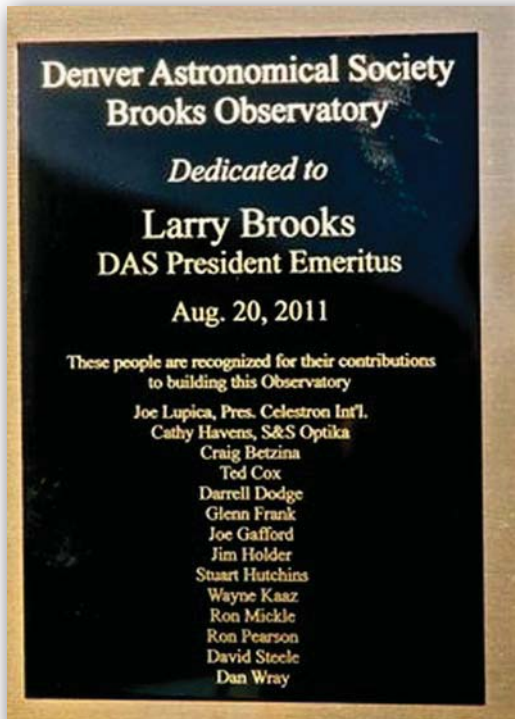
For those that missed the Larry Brooks Observatory dedication, there were many beautiful and memorable moments. The weather was about as perfect as one could ask for, with just the right amount of puffy clouds and light breezes to keep the bugs at bay. Larry's wonderful family provided great food and beverages. The dedication and ribbon cutting was a very moving experience with family and fellow club members providing vignettes into their memories of our beloved President Emeritus and friend, Larry. After dark, despite clouds and lightning storms all around the horizon, we had first light on the star Arcturus. As Darrell Dodge and Ted Cox got the C-14 telescope's "goto" system up and running, we also observed M13, M57, M31 and several other deep-sky objects.



### THE BROOKS OBSERVATORY DEDICATION

DAS friends and family of Larry Brooks gathered at the Ed Kline Dark Sky Site to dedicate the Brooks Observatory,

*Photo by Neil Pearson*



## NASA'S SPACE PLACE

**SOLAR SYSTEM SIZE SURPRISE**

*A Space Place Partner Article  
by Dr. Tony Phillips*

**N**ews flash: You may be closer to interstellar space than you previously thought.

A team of researchers led by Tom Krimigis of the Johns Hopkins University Applied Physics Laboratory announced the finding in the June 2011 issue of *Nature*. The complicated title of their article, "Zero outward flow velocity for plasma in a heliosheath transition layer," belies a simple conclusion: The solar system appears to be a billion or more kilometers smaller than earlier estimates.

The recalculation is prompted by data from NASA's Voyager 1 probe, now 18 billion kilometers from Earth. Voyagers 1 and 2 were designed and built and are managed by NASA's Jet Propulsion Laboratory. Aging but active, the spacecraft have been traveling toward the stars since 1977 on a heroic mission to leave the solar system and find out what lies beyond.

To accomplish their task, the Voyagers must penetrate the outer walls of the heliosphere, a great bubble of plasma and magnetism blown in space by the solar wind. The heliosphere is so big, it contains all the planets, comets, and asteroids that orbit the sun. Indeed many astronomers hold that the heliosphere defines the boundaries of the solar system. Inside it is "home." Outside lies the Milky Way. For 30+ years, the spacecraft have been hurtling toward the transition zone. Voyager 1 is closing in.

Much of Voyager 1's long journey has been uneventful. Last year, however, things began to change. In June 2010, Voyager 1 beamed back a startling number: zero. That's the outward velocity of the solar wind where the probe is now.

"This is the first sign that the frontier is upon us," says Krimigis.

Previously, researchers thought the crossing was still years and billions of kilometers away, but a new analysis gave them second thoughts. Krimigis and colleagues combined Voyager data with previously unpublished measurements from the Cassini spacecraft. Cassini, on a mission to study Saturn, is nowhere near the edge of the solar system, but one of its instruments can detect atoms streaming into our solar system from the outside. Comparing data from the two locations, the team concluded that the edge of the heliosphere lies somewhere between 16 to 23 billion kilometers from the sun, with a best estimate of approximately 18 billion kilometers.

Because Voyager 1 is already nearly 18 billion kilometers out, it could cross into interstellar space at any time—maybe even as you are reading this article.

## SEPTEMBER SPEAKER: DR. DOUG BIESECKER OF THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

*by Lisa Judd*

Originally from Pittsburgh, Dr. Doug Biesecker started his career at NASA/Goddard Space Flight Center (GSFC) as a data "grunt" on the Solar Maximum Mission. There, he developed his passion for all things solar, and completed his Ph.D on statistical properties and avalanche theories of solar flares at the University of New Hampshire. From there, he researched coronal mass ejections in Birmingham, England, back at GSFC, and finally at NOAA in Boulder. At the Space Weather Prediction Center, he brings in real-time data from SOHO, STEREO, and SDO, validates models, and plans for future missions. One of his YouTube videos may be found at <http://www.youtube.com/watch?v=-vx4fnRNSRQ>



"How close are we?" wonders Ed Stone, Caltech professor and principal investigator of the Voyager project since the beginning. "We don't know, but Voyager 1 speeds outward a billion miles every three years, so we may not have long to wait."

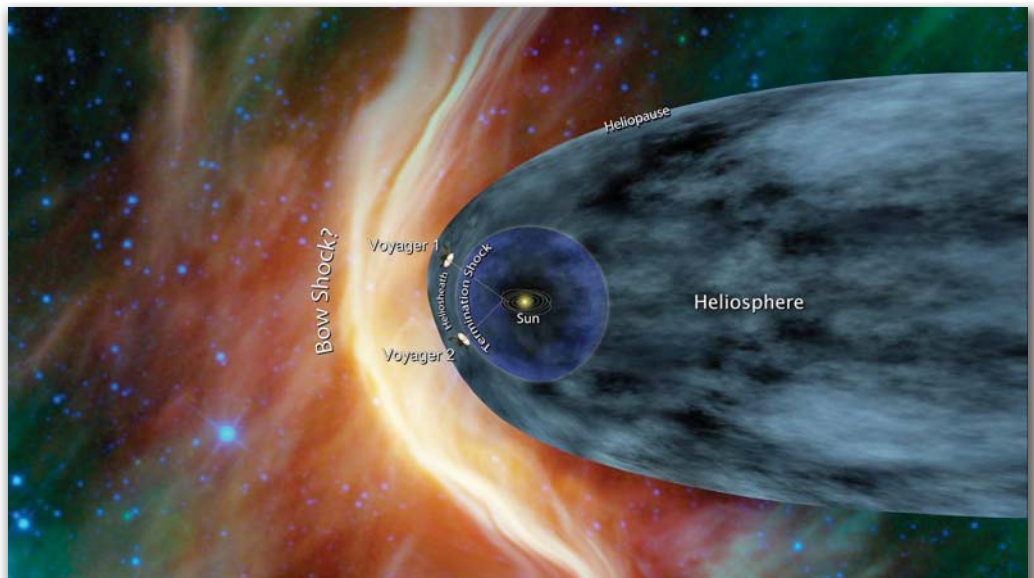
Stay tuned for the crossing.

For more about the missions of Voyager 1 and 2, see <http://voyager.jpl.nasa.gov/>. Another Voyager project scientist, Merav Opher, is the guest on the newest Space Place Live cartoon interview show for kids at <http://spaceplace.nasa.gov/space-place-live>.

### INTREPID EXPLORERS

This artist's concept shows NASA's two Voyager spacecraft exploring a turbulent region of space known as the heliosheath, the outer shell of the bubble of charged particles around our sun.

*Illustration courtesy of NASA/JPL-Caltech.*



**NEW ASTRONOMER'S DEN**

**September, 2011**

*Gaseous Denizens of the Dim Southern Skies*

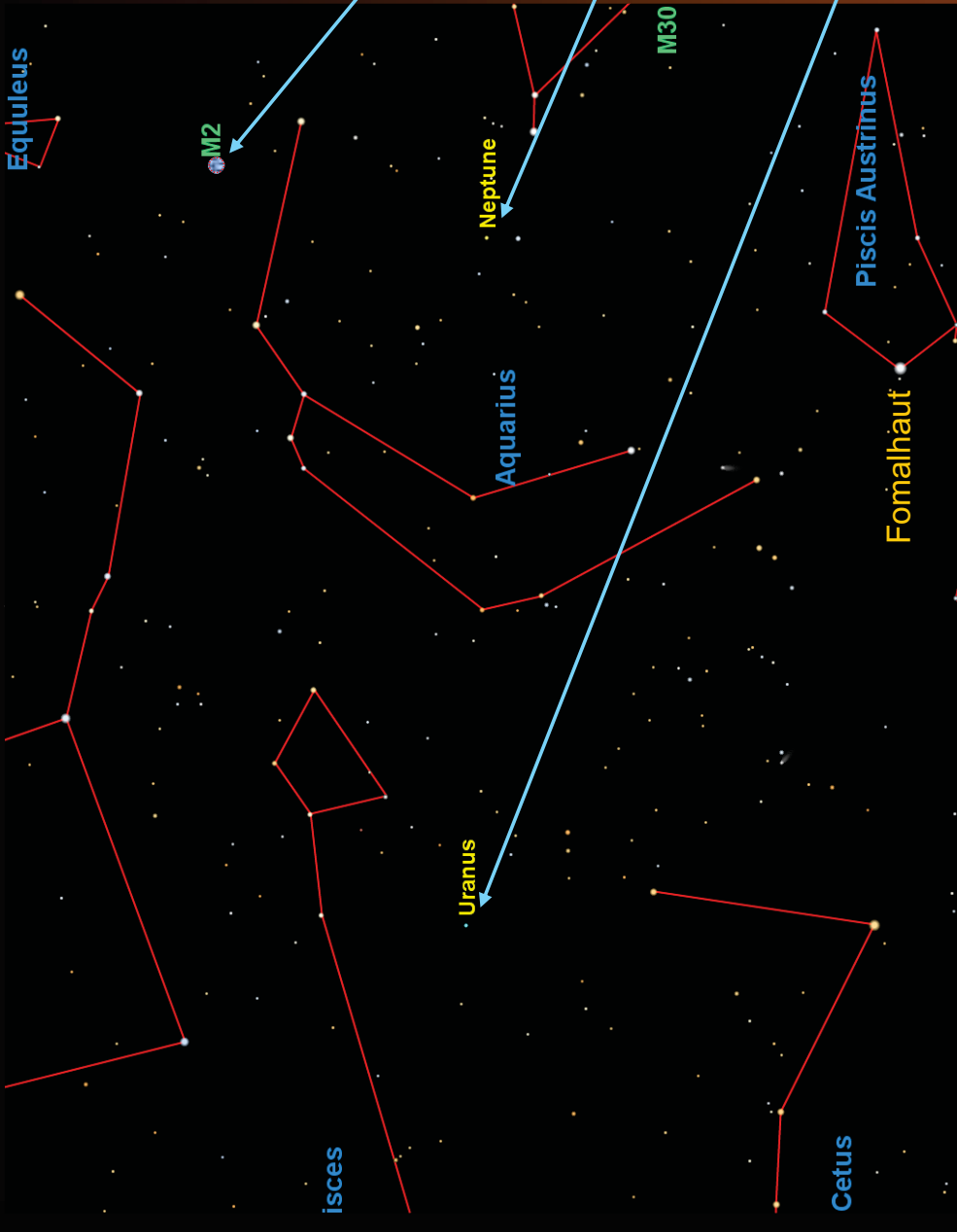
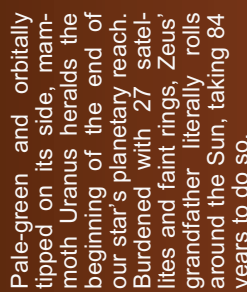


Reigning as one of the oldest and largest globular clusters known (175 ly's across), Messier 2 glows in the dark fields of Aquarius with the combined light of 150,000 suns, including 21 known variables. A trip there covers 37,500 ly's.

The Sun's fourth-largest planet has upper-atmospheric winds of 9-1200 mph—great for kites using bridge cable. With a faint ring system and 13 little ones in tow, Neptune's Christmas comes once every 165 years.



Pale-green and orbitally tipped on its side, mammoth Uranus heralds the beginning of the end of our star's planetary reach. Burdened with 27 satellites and faint rings, Zeus' grandfather literally rolls around the Sun, taking 84 years to do so.



**South—Southeastern Sky—mid-month- 9:00 p.m.**

As a matter of practice, most observers tend to avoid sparsely-starred areas of the sky, unless there's something of note to draw their attention. As such, the semi-bright star Fomalhaut in Pisces Austrinus is all that beckons the eye in this month's featured section, unless, perhaps, you'd like to explore the outer regions of the Terran system. If so, the distinctive green and blue discs of **Uranus** and **Neptune**, respectively, will tempt your imagination to consider the great void that is the outer solar neighborhood. Star-hopping is the best way to find these ammonia and methane-rich worlds, targets certainly worthy of the attempt, for you are nearing the "Land's End" of Sol's family.



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Star chart courtesy *TheSky6* astronomy software suite.  
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**GALAXY PUZZLE ANSWERS**

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!

*In case you'd like to observe them.....*

Sunflower	M63, NGC 5055	RA, Dec: 13h 16m 8.7s, 41d 59m 35s N
Fishhook	NGC 4656	RA, Dec: 12h 44m 22.3s, 32d 7m 29s N
Ringtail/Antennae	C60/61, NGC 4038	RA, Dec: 12h 2m 17.0s, 18d 54m 31s S
Eyes galaxy	NGC 4435/4438	RA, Dec: 12h 28m 4.9s, 13d 2m 29s N
Bear's Paw	NGC 2537	RA, Dec: 8h 13m 44.2s, 45d 58m 44s N
Black Eye galaxy	M64, NGC 4826	RA, Dec: 12h 57m 4.4s, 21d 38m 32s N
Pinwheel	M33, NGC 598	RA, Dec: 1h 34m 19.2s, 30d 41m 22s N
SMC	NGC 292	RA, Dec: 0h 52m 55.5s, 72d 45m 32s S
Cocoon galaxy	NGC 4485	RA, Dec: 12h 30m 52.5s, 41d 39m 29s N
Andromeda galaxy	M31, NGC 224	RA, Dec: 0h 43m 6.3s, 41d 18m 30s N
Centaurus A	C77, NGC 5128	RA, Dec: 13h 25m 56.1s, 43d 3m 24s S
Needle Galaxy	C38, NGC 4565	RA, Dec: 12h 36m 58.9s, 11d 11m 30s N
Polarissima	NGC 3172	RA, Dec: 0h 0m -0.0s, 0d 0m 0s N
Silver Coin	C65, NGC 253	RA, Dec: 0h 47m 58.4s, 25d 14m 31s S
Sombrero	M104, NGC 4594	RA, Dec: 12h 40m 23.4s, 11d 39m 30s S
Whirlpool	M51, NGC 5194	RA, Dec: 13h 30m 13.6s, 47d 9m 37s N
Spindle	C53, NGC 3115	RA, Dec: 10h 5m 34.4s, 7d 45m 9s S
LMC		RA, Dec: 5h 23m 31.1s, 69d 44m 50s S
Perseus A	C24, NGC 1275	RA, Dec: 3h 20m 17.7s, 41d 32m 43s N

**SEPTEMBER OPEN HOUSE:**

Although there was no September Chamberlin Open House on the DAS calendar due to a first quarter moon conflict with Labor Day weekend, we have decided that we can't miss out on a warm September night.

We are having an Open House on September 17th instead. We won't have a moon or planets but it will be your chance to show-off or work on your urban deep-sky observing talents! Open House will start at 7 P.M.



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