

The Denver

# OBSERVER

Newsletter of the Denver Astronomical Society  
*One Mile Nearer the Stars*

Image copyright 2007 Philip Good

## Surf's Up!

This elusive supernova remnant in Gemini, IC443 (known as the Jellyfish Nebula) is part of a large nebular complex between Gemini, Orion and Taurus. Philip netted this object with an SBIG ST2000XM on his Stellarvue SV90T Fluorite Triplet APO telescope at f/4.7 with AP 0.67x Reducer.

# STELLAR SPRINGTIME DELIGHTS

## M A Y S K I E S

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**L**ast month Venus, our nearest neighbor among the planets and our "sister" world (only 5% smaller than Earth), was at its highest point above the horizon. This month Venus moves closer to Earth, swelling vertically while shrinking horizontally, waning to its half-moon appearance. It reaches 40° above the western horizon at sunset and is so bright that you may be able to spot it during the day. On the 9th, it passes the star cluster M35

in Gemini, to the right of the feet of the twins, and on the 19th, pairs beautifully with the crescent Moon for a good "photo op." The very next night, 25° to the lower right of Venus, will be Mercury, the messenger of the Greco-Roman gods, often depicted wearing winged sandals.

Everyone's favorite planet, Saturn, is high to the upper left of Venus but appears to move closer as the month goes by. Another really good "oh wow!" sight, the mighty Jupiter, lies far to the south in Scorpius but rises too late to be an evening object. Jupiter is near Antares, the red supergiant "Heart of the Scorpion." Rising

2 .....	Full moon
10 .....	Last quarter moon
16 .....	New moon
23 .....	First quarter moon

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Image copyright Chris Tarr

### A BLOOMING ROSE

Spectacular and flower like, the Rosette Nebula (NGC 2237) in Monoceros appears to swallow the open cluster NGC 2244 and its approximate 24 member stars. While this cluster is observable naked eye, the nebula around it is not. At low power the Rosette looks like a halo surrounding the stars: photographed, its true beauty is revealed. This region of the sky is not devoid of celestial delights—the Rosette lies only about 17° degrees northeast of the Great Orion Nebula (M42).

Former DAS member Chris Tarr dazzled us with his photography. The Rosette is a composite of two images shot at his site in Grand Lake during February and March, 2003. It was his first project using a Hydrogen Alpha filter. Aggregate exposure times are (100+70) 15, 15, and 22 minutes, respectively.

## DAS Schedule

### MAY

- 4 General Membership Meeting at D.U.'s Olin Hall (*Begins at 7:30 P.M.*)
- 11 E-Board meeting at Chamberlin Observatory (*Begins at 7:30 P.M.*)
- 18-20 Texas Star Party
- 19-20 EGK Dark Site Weekend
- 25-27 RTMC
- 26 Open House at Chamberlin Observatory (*Begins at 7:30 P.M.*)

### JUNE

- 1 General Membership Meeting at D.U.'s Olin Hall (*Begins at 7:30 P.M.*)
- 8 E-Board meeting at Chamberlin Observatory (*Begins at 7:30 P.M.*)
- 14-17 Rocky Mountain Star Stare
- 17 Father's Day
- 23 Open House at Chamberlin Observatory (*Begins at 7:30 P.M.*)

*Public nights are held every Tuesday and Thursday evenings beginning at the following times: October 1 - March 31 at 7:00 P.M.  
April 1 - September 30 at 8:30 P.M. at Chamberlin Observatory  
Costs to non-members are: \$3.00 adults, \$2.00 children.  
Please call (303) 871-5172 for reservations.*

## Society Directory

### President:

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### Vice President:

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## Executive Board Members

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Darrell Dodge

### Annual Picnic:

Keith Pool

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**The Observer is available in color PDF format from the DAS website.**

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Darrell Dodge

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*The Executive Board conducts the business of the DAS at 8 P.M. at Chamberlin Observatory. Please see the Schedule of Events for meeting dates. All members are welcome.*

# thedas.org

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even later is Mars, near the Sun towards dawn. The twin denizens of the outer solar system, Uranus and Neptune, are similarly situated as dawn objects.

The Moon is full twice this month, on the 2nd and the 31st. Our notion of a month as a unit of time comes from the 29-day lunar phase cycle, although our months are now redefined so that we get exactly twelve in a year. An interesting way to observe Luna is by watching the terminator, the dividing line between the sunlit and dark portions, cross the Moon's face as the month proceeds. Shadows near the terminator highlight a different set of craters, mountains and other features every night. New Moon arrives on the 16th, and the several days around New Moon make the best time for deep-sky observing.

Hercules the Champion is here, bringing with it M13, the largest globular cluster visible at our 40° latitude, made up of 500,000 stars. These "globs," as I call 'em, are like little galaxies of their own, yet are usually attached to a big galaxy. Messier 13 is one of 152 so far discovered, swarming like hives of bees around the Milky Way. Hercules will be high in the east in the evening this month. Look for a faint keystone-shaped constellation, like a Chinese-food take-out box, with M13 along the western edge. If you can see the bright blue star Vega, Hercules is just west of it.

M51, my favorite face-on galaxy pair—the big blob at the end of a spiral arm is a companion galaxy—is almost straight overhead at the zenith in the evening. Look at a star chart in one of the astronomy magazines to find it just off the end of the Big Dipper's handle. Then wander south past Canes Venatici and Coma Berenices (Bernice's Hair) to roam through the Virgo Cluster of galaxies, containing the big ellipticals M84, M86, M87 and fainter spiral galaxies. This area lies to the east of the tail-star in Leo, Denebola. A quartet of galaxies, M81, M82 and NGC 3077 and 2976 lies to the upper right of the Big

Dipper's pan. M81 is a "grand design" spiral while M82 is a starburst galaxy practically tearing itself apart.

To get a great view of the planets, stars, and other celestial objects, visit the Denver Astronomical Society's next Open House at 7 P.M. on Saturday, May 26 at the University of Denver's Historic Chamberlin Observatory. For the public, there is a \$1 upkeep fee to look through the Clark 20-inch telescope. Members of the Denver Astronomical Society have free access to the Clark 20-inch at Chamberlin Observatory during Open House.

Acknowledgements: *Sky & Telescope* and *Astronomy* magazines.—*Dennis Cochran*



**ANTARES SPLENDOR**  
The rho (ρ) Ophiuchi region around Antares in Scorpius is an observing delight. This image was made a few years ago by Vic Winter at the Southern Skies Star Party. His early and unexpected death on January 28, 2007 has left a hole in the astronomical community. We will say goodbye to our dear friend at this year's SSSP in July.—*ed.*

**The Southern Skies Star Party**  
**July 14-21, 2007**  
**A "Sky Watcher" offering from Phoenix Travel**  
**www.phoenix-travel.net**



# Becoming an Astronomical League Master Observer

by Darrell Dodge

One of the benefits of DAS membership is the opportunity to have your observing activities and accomplishments acknowledged by your peers across the country. You can do this by being admitted to membership in one of the Astronomical League's (AL) 28 observing "clubs." Observers qualify by completing the observing program associated with the club. In addition to the Messier list (binocular and telescopic), two Herschel lists, Caldwell list and the Arp list, there are programs for virtually every type of celestial object: the sun and moon, planets, comets, meteor showers, double stars, galaxies and galaxy clusters, globulars, open clusters, planetary and diffuse nebulae—you name it and there is probably an observing program for it. There's even a club for people with marginal observing conditions (the Urban Club.) The AL also sells inexpensive observing guides for most of the programs.

One of the "clubs" is the Master Observers, to which one is admitted after completing five required programs and five additional programs at the highest level (some programs have "silver" and "gold" levels). The required observing programs are the binocular and telescopic Messier, the Lunar, the Herschel 400 and the double star. I fulfilled the Masters requirements doing the Herschel II (400 additional Herschel objects), the urban club, the asteroid "gold" club, the Arp peculiar galaxy club, and the sunspotters club. There are many other routes depending on one's interests, equipment, and observing opportunities.

Other DAS Master Observers include Sandy Shaw, Craig Anderson and Mike Hotka. Mike has completed all but a few of the 28 AL programs.

The certificates are awarded by a busy and dedicated group of AL volunteers who receive and evaluate entries of observing

logs for one or more programs. DAS and Longmont Astronomical Society member Mike Hotka is the Club Chair for the Globular Cluster Observers Club, which he created with former DAS member Leroy Guatney and the assistance of Barbara Wilson several years ago. The globular club is an LAS project, much as the Herschel II is for the Rose City Astronomers in Oregon.

## MY ROUTE TO THE MASTER OBSERVERS CLUB

The first time I probably completed the Messier list was in 1983, a year or so after I had purchased my first "real" telescope: an 8-inch Meade Newtonian. Shortly after I thought I could count up all the objects in my log book, I read about the Messier certificate in *Sky and Telescope* magazine and thought it would be cool to get one.

But when I started to look closely at my observing notes and the certificate requirements, I realized I had a problem. Some of my observing comments were very brief or non-existent—many of them consisting only of the catalog number and type of object. I had written down a few comments on the eyepieces I was using, but not what the objects looked like at different magnifications. There were absolutely no time annotations and the see-

ing comments were not systematic. A wonderful night spent exploring the Virgo galaxy cluster was nothing but a list of numbers.

I was disappointed, but realized that there was just no way to get credit for my observing, which was impeccable in everything else but record-keeping (i.e., I would spend time on each object and make sure to discriminate close objects from each other.) But without good notes, even I wasn't sure I had really observed them all. (In fact, I had missed M90.)

I think that my situation in 1983 is similar to that of a lot of observers today, and that's too bad. Out of the 250,000 or so amateur astronomers in the U.S. (according to the AL, <http://www.abc.net.au/science/news/stories/s855549.htm>) only about 2000 are acknowledged as observing and documenting all the Messier objects, including 23 present and former DAS members. The last DAS member to do it was Craig Anderson way back in 2002.



The author sets up for a night of observing Herschel II objects and Arp peculiar galaxies in Utah's Grand Staircase-Escalante National Monument.

o b s e r v e r s d e c k

When I returned to observing in 2001 after about 18 years doing other things, I resolved to be more purposeful in my observing activities. The rest of this article will be about some of the things I learned and will provide some hints for a strategy for completing 10 of the AL observing programs.

## STRATEGY? ISN'T THIS SUPPOSED TO BE FUN?

The simple fact of the matter is that without purposefulness, I don't think anyone can ever make it through the more daunting observing programs, let alone a long list of them. That's simply because many of the programs are arbitrary (if systematic) selections of objects, some of which would usually hold little interest for most observers. Also, over 200 observing hours are required to complete the Herschel 400. Another way to look at this is to say that completing the program requires observing and writing descriptions of 10 objects a night (five hours) for 40 nights.

If you're interested in selecting some observing programs to try, the first thing to consider is observing equipment: your telescope and binoculars as well as your visual acuity. If you have a 157mm refractor, you'll have to forget about completing the Herschel 2, Arp, galaxy clusters, and probably the asteroid gold lists, but you'll be well set up for everything else, except for the dimmer Herschel 400 objects. An 8-inch Newtonian or SCT will rule out those same lists but will allow viewing of virtually all of the Herschel 400. Any telescope with an aperture of 12 inches should enable the observer to do any of the observing programs.

The next consideration is: Where to observe? There are a number of programs that can be done in most backyards with sky exposure, including the double star, the lunar, the Sunspotter, the urban list, the planet list, and the asteroid silver. I always try to keep one of those going so I'll have something constructive to do on



### UNDER THE INFLUENCE

The night sky is amass with examples of great Tugs-of-War: stars ripping each other to shreds, etc. Galaxies jump into the fracas, as well, turning beautiful spirals into the distorted and contorted. One of the most pristine examples of this galactic free-for-all is the Leo Trio, M-65, M-66 and NGC 3628. This celestial wrestling match lies 35 million light years away in the rear haunches of the mighty lion. Steve's LRGB composite image totals 260 minutes.

rare free weekday nights (or early mornings for the Sunspotter.) I was able to star-hop much of the Herschel 400 in my backyard with a 9 1/4 -inch SCT. But I needed the dark skies at the DAS dark site or at star parties to see the dim objects. The Herschel II and the Arp lists are definitely dark site programs. Among my favorite remote sites in addition to the DAS dark site are Big Bend, Death Valley, Canyonlands and Joshua Tree National Parks and the Grand Staircase-Escalante National Monument.

How detailed do your observing notes have to be? The longer one looks at an object, the more there is to describe. After something like 1800 written observations, I've developed a mental checklist for each type of object (see the 2007 Observers Handbook for ideas), a list of abbreviations (av, dv, bg, etc.) and some favorite things to look for. Some planetary nebula disks have "pretzel-like whorls" in them. A sudden drop-off in brightness at the edge of a

dim galaxy often indicates a dark lane, unless there's a bright star nearby, etc. etc. The outer margins of galaxies and the outliers of globulars are important places to look for detail, as well as the halos, cores and nuclei. I try to count the resolved stars in open clusters. And I always try to observe and describe an object with at least three different eyepieces, from low to high power, and one or more filters if the view warrants it.

When program observing, I usually spend about 15 to 20 minutes on interesting objects, such as the galaxies in interacting pairs or groups in the Arp list. It takes me another 5 or 10 minutes to put observations into a 50 to 100-word description. Sometimes this is a stretch: I've described objects as lute- and shillelagh-shaped. I like to go at a brisk, steady pace, because there will be problem objects that

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# Master Observer (continued)

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require up to an hour or more to find and verify with smaller scopes like my 9 1/4 and 11-inch SCTs. I try to make notations to identify objects that I want to return for a longer look. I'll also do quick sketches to supplement my descriptions of really complex objects or groups.

If you're interested in doing the Master Observer program, the Lunar list is a great place to start. There are 100 craters and other lunar phenomena on the list, and they are organized so that you can see them all in order near the terminator in one month with 10 or 12 clear nights. There is an optional drawing and some early morning observing, but no notes are required. As I did the program, I realized the benefits of systematic observing. It was really cool to see the lunar objects gradually be revealed as the month wore on. I could observe on every clear night without cursing the moon. And watching the sunlight touch the rims of craters and mountain peaks and spill onto the maria over a period of three or four hours was transfixing.

The Messier program should probably be the next. My notes from 2001 are really anemic, but they helped me develop an internal checklist of things to describe that started the process of learning to describe the key characteristics of each object type. I also began developing a descriptive vocabulary. While you are doing the telescopic list, take the time to observe and describe the view of each object through binoculars. You'll be doing two observing programs at the same time. I was able to see about 80 of the Messiers through an inexpensive pair of Bushnell 10 x 50 binoculars (including M1 from my backyard in Littleton!) several years after I'd completed the telescopic list. And my comments are actually more detailed. (Remember that a finder scope is NOT a pair of binoculars!)

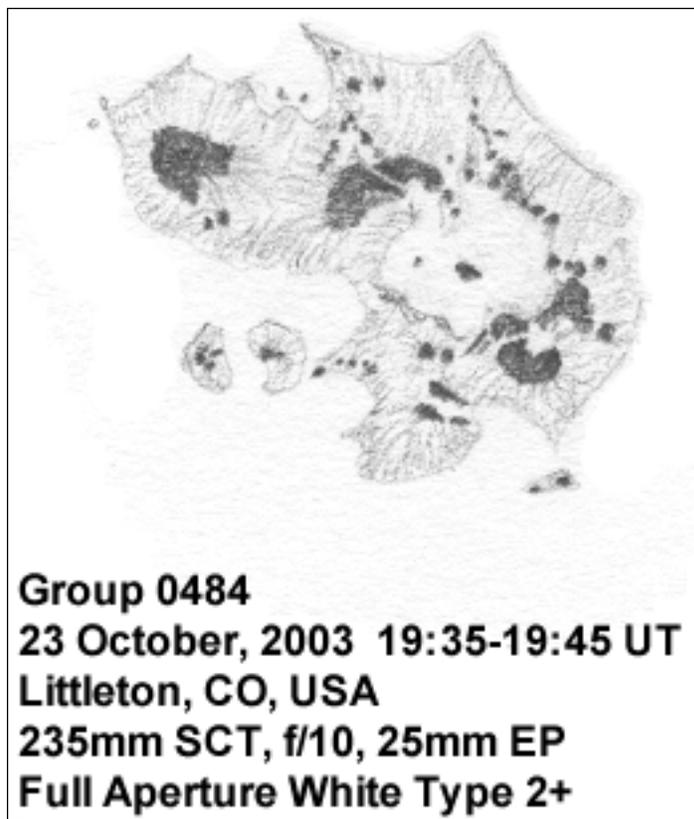
The Herschel 400 list is the most important—and in many ways the most fun—of the required deep sky programs.

Because it includes a large variety of object types, you'll be observing some deep sky objects that are included in other programs (such as the Caldwell, the Arp club, the globular cluster club, the two nebulae clubs, and others.) *These observations are acceptable to include in your observing lists for these other clubs*, as long as you meet each club's requirements, such as viewing all objects of one type at the same magnification. Also, be sure to carefully observe and document objects that are close to the Herschel 400 objects. Many of the companions of Herschel 400 galaxies are included in the Herschel II list.

The Herschel 400 list requires that the observer develop a systematic approach to acquiring the objects, as well as taking and organizing observer notes. My technique was to create an instant logbook by copying the table of objects from the AL Web site, pasting it into Microsoft Word®, and then changing the format to allow me to print it out on landscape format sheet, which I then bound into a 3-ring notebook to use at the telescope. The result has been transferred laboriously to my Web site at <http://www.telosnet.com/dmdodge/astronomy>. Unfortunately, some of the information (particularly the visual magnitudes) in the older AL guides does not conform to the

NASA Extragalactic Database (NED) or modern observing guides like *Uranometria 2000.0*. Stephen James O'Meara was at one time going to prepare a Herschel 400 observing guide, but it's not clear if that project is going to be carried through by Cambridge University Press. O'Meara was planning to provide a one-year, season-by-season approach to acquiring the objects at a rate of 8 or 10 objects per session. I used a southern sky, constellation-by-constellation approach, leaving the circumpolar objects for nights when other objects weren't visible.

My favorite observing program star party experience was the Texas Star Party in 2005, where I was going through the heart of the Herschel II list and just starting the Visual Arp program (DAS member Brad Gilman is



A huge sunspot group sketched by the author after completing the Sunspotter observing program. By the time this 15-minute sketch was finished, some areas of the sunspot group had already changed shape.



currently doing the Arp CCD program). Except for one night, the skies were grand, and I was about 100 yards from the snack bar and its hot chocolate and cookies until 2 A.M. Go-to technology is acceptable for those lists, but I found I needed to refer to *Uranometria 2000.0* to be certain I'd acquired virtually all of the objects (*Sky Atlas 2000* is not detailed enough.) It was actually easier to star-hop to some of them because I had better orientation and quicker verification than teleporting myself to the middle of "nowhere." I got in the habit of scanning the region of the object before going there as well as carefully locating the object in relation to neighboring deep sky objects.

### SUNSPOTTERS AND ASTEROID PROGRAMS AMONG THE MOST DEMANDING

The least popular and most demanding of the programs I've completed have been the Sunspotters and the Asteroid Gold (100 asteroids). The Sunspotters requires 5 detailed drawings of sunspot groups and 20 drawings of the solar disk over a period of

two solar rotations (about two months.) I was doing mine during the fall of 2003, marked by several huge sunspot groups (see drawing) and it was exciting to get up on those crisp fall mornings and see what was going on. This program has one of the best observer's guides.

The asteroid program is a lot more fun than it sounds: observing and drawing or imaging 25 and then 75 asteroids in two different positions. The key here is to prepare in detail for your observing session using a planetarium program such as *Guide 8* that can find asteroids in the sky within your telescope's magnitude range and that prints a set of good, readable charts for each asteroid. Go to the coordinates on your chart, determine which of those objects is the asteroid, make a drawing or mark its exact location on your chart, noting the UT and some orientation information, such as geometrical shapes made by the asteroid and nearby stars. Go on to other asteroids or other things and return to the spot three to five hours later. Most asteroids will have moved a sufficient distance to verify that you've acquired them. If the sky clouds over, you may have to come back to the original spot a day or two later and then find out where it's gone and make another drawing. Early in the program, you'll be doing 9 to 11 magnitude asteroids. After a while you'll be down to 12.5 mag or less, so you'll need a good bit of aperture.

Other programs I've enjoyed and would recommend are the required double star list and the globular cluster list (which I'm finishing right now.) The two nebula lists will probably be the next for me, although I'm also starting to use my asteroid-finding system in CCD photometry.

### MASTER OBSERVER?

So, after completing 10+ observing programs, will you feel like a "Master Observer?" I certainly don't! The certificate says so, but I suspect that there are many thousands of observers around the country who have better observing skills than I do who are not "Master Observers," including many

DAS members. The Master Observer program is actually more a way to *start* real observing. For me, it was a way to catch up after many years of inactivity. What it did teach me was how to make my observing more systematic. The AL observing programs require that you be good administrator and record keeper as well as good observer—sort of like combining the skills of William Herschel and his sister Caroline, who transcribed and catalogued his observations (and was a skillful observer in her own right.) I've found that this actually makes my observing more fun and rewarding because I have something to show for the many hundreds of joyful (and sometimes exasperating) hours I put into it.

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## Welcome New Members!

Chris Adams  
Jim Craib  
Gil Davies  
Dr. Grant Russell Denn  
Steven J. Gilbert  
James Lee Johnson  
Michael Hawk  
Scott Henderson  
Alisha Humphries  
Paul Messina  
Mary Ann Rose  
Dave Schlichting  
Ed Sholes

### Editor's Note:

Please remember—the deadline for newsletter copy and photos is the second Friday of each month. When this deadline is not met, it may result in a significant delay in members' receiving their copies. Additionally, it may mean no newsletter for that month at all. Please be considerate and get copy in by the deadline. I wish to produce a quality publication for members, but delay in receiving copy means I haven't enough time to edit which leads to errors in many areas. Thank you for your help.—Patti Kurtz



## About the Denver Astronomical Society

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 participates in **NASA's Project Astro** program.

The DAS' credo 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 501(c)(3) tax-exempt corporation and has established three tax-deductible funds: the Van Nattan-Hansen Scholarship Fund, the Public Outreach Fund, and the Edmund G. Kline Dark Site Fund. To contribute, please see the bottom of the membership form for details.

More information about the DAS, its activities, and the special tax-deductible funds is available on the DAS web site at [www.thedas.org](http://www.thedas.org).



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*Please make donations to the Dark Sky Site Fund payable to the DAS EGKDS Fund and mail to Steve Solon, 9774 W. Elmhurst Place, Littleton, CO 80128-5199. Please make other amounts payable to the Denver Astronomical Society and mail along with this completed form to Brad Gilman, DAS Treasurer, 7003 S. Cherry St., Centennial, CO 80122-1179.*



## Denver Astronomical Society

c/o Chamberlin Observatory  
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