

OBSERVER

Milky Way Delights



ANTARES MAELSTROM (IN SCORPIUS)

The “Heart of the Scorpion,” Antares, blazes in the summer sky. It’s often mistaken for the planet Mars and is about 600 light-years distant. Shown upper left in this image, it’s an easy signpost for the glittering globular cluster, M4, below it. Ron shot this at Fox Park, WY., at the 2008 WUTS star party. He used a 180mm f/2.8 Nikon ED lens on a Canon XTi DSLR. It’s a result of a stack of 5 x 5 minute exposures.

Image copyright 2009 Ron Pearson

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JULY SKIES *by Dennis Cochran*

Hercules is overhead, so we’ll talk about him next month. Just below him, though, is that large bell-shaped constellation, Ophiuchus, which occupies the region above Antares in Scorpius. Remember from last month that Serpens Caput, the head of the serpent that Ophiuchus is wrestling, sticks out of the western corner of the wrestler, starting at his Delta star. Also, we mentioned M5, the really bodacious globular cluster to be found generally northwest of the Delta corner of Ophiuchus at the western point of an equilateral triangle whose vertical east side is the line between the Mu and Epsilon stars of Serpens Caput. If you find M5, by the way, remember there is an isolated knot of galaxies to be explored in Virgo just west of it. Now, if you follow the Serpens Caput trail north past Mu and

Epsilon to its Delta star, the one below the 3-starred head of the snake, you’ll discover a double star of magnitudes 4 and 5.

Back at the horizontal line connecting Delta Ophiuchus and Mu Serpens Caput, turn the other direction and go east into the vast void of the wrestler, about that distance plus more, to find the globular cluster pair M10 and M12. Continuing east to that side of the bell-shaped Ophiuchus takes us to M14, another glob.

Now slide up that east side of Ophiuchus to his Beta star. Just above that is IC 4665, a rich open cluster. Cruising to the east and lifting a bit above horizontal will bring you to the planetary nebula (exploded star) NGC 6572,

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PRESIDENT'S CORNER

In April 2008, the Denver Astronomical Society was contacted by the Institute for Learning Innovation (ILA) in Edgewater, Maryland. ILA had been contracted by the Astronomical Society of the Pacific, who in turn received a grant from the National Science Foundation to conduct a national survey of astronomy clubs and societies. The project, "Sharing the Universe", had several objectives, including determining what methods of outreach were used by different organizations, how to stop the perceived decrease in membership or sustain new members. ILA has tentatively agreed to travel to Denver and present the results of the survey with the DAS membership at the General meeting on August 7. Keith Pool is finalizing the plans and will keep the membership posted via the DAS listserv.

In this edition of the President's Corner I would to take the opportunity to recognize two members who have made significant contributions to DAS and the local outreach efforts. Brad Gilman, our Treasurer, spends many hours keeping the financial books for the society. As a non-profit organization, DAS requires additional attention to ensure our business of outreach is done in accordance with tax law. Brad also serves on the Public Night teams and has gained the nickname Scopehound. He is also on the Executive Board. While we appreciate his hard work, we seldom tell him so. Brad, good job!

Frank Mancini is DAS's Chair for Financial Development. For me, Frank's most notable accomplishment was serving as DAS point person for fund raising that lead to the renovation of Chamberlin Observatory. During that time, Frank worked with officials at University of Denver, the Colorado State Historical Society and other organizations to secure the necessary funding. When the dust had settled at Chamberlin Observatory, almost half a million dollars was secured and spent. In addition to Financial Development Frank also to serves on the Public Night teams and the Executive Board. Thanks for all the hard work, Frank.

To both Brad and Frank, you have my promise that as President I will continue to lobby for a percentage



DAS PRESIDENT

Ron Mickle close to the Valley of the Kings in Egypt. The two Colussi of Memnon are what remains of the mortuary temple built by Amenhotep III in c 1350 B.C.E.

Photo by Joanie Mickle

increase in pay for the (volunteer) effort you put forth.

There are several noteworthy events in August I would like to mention, and in doing so, encourage readers to consider participation in one of the events. Using Jupiter as a starting point, locate Neptune, which is only a few degrees away. Most seasoned observers have located all the planets, but if you're a relative newcomer, or haven't taken the time to find the outer gas giants, now would be a good time to do so. Also, Saturn's rings will only be visible for a short time before they go edge-on. Moving north, as in Fox Park, Wyoming, is the 19th annual Weekend Under the Stars hosted by the Cheyenne Astronomical Society and the Laramie Astronomical Society. The dates are August 20-22. For more information, visit the DAS Calendar. And last, but certainly not least are the observations of Epsilon Aurigae. With a period of 27.1 years, it has the longest period of any eclipsing binary star system. Epsilon Aurigae is also the record holder for the longest eclipse, at almost two years. The interesting phenomenon that separates eAur from other eclipsing binaries is the out-of-eclipse variation in brightness. While several theories have been put forth as to why this happens, it is still a mystery, hence the reason

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Society Directory

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- | | |
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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

DR. MARK BOTTORFF TO SPEAK AT THE JULY GENERAL MEETING



DR. BOTTORFF

Dr. Mark Bottorff is shown with the traveling "Yard Scope" at last year's Rocky Mountain Star Stare.

Photo by Keith Pool

by Keith Pool

Dr. Mark Bottorff will again grace our presence with one of his lively entertaining and educational talks at the July 10th general meeting. This time his talk will be "The Interstellar Medium; or the Junk Between the Stars."

For those of you who do not know Dr. Mark or haven't been to one of the general meetings in the last few years, allow me the opportunity to fill you in. Dr. Mark is home-grown, having graduated from Littleton High School in 1976. During the early to mid 1970s, he was also a regular fixture around Chamberlin and the DAS as an associate member, early recipient of a Van Natten-Hansen Scholarship award, and sole public night operator of the 20-inch Clark Saegmuller refractor. He also worked at S & S Optika, back before they moved to the Brookridge shopping Center.

After Graduation from LHS, Mark went on to earn his MS degree in applied mathematics from the University of Colorado

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JULY SKIES (CONTINUED FROM PAGE 1)

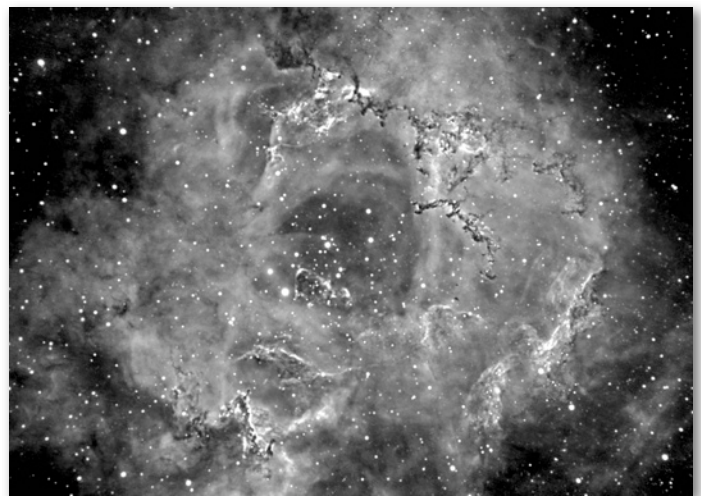
and just east of that is the low-power open cluster NGC 6633, while yet further east and down a bit is the larger cluster IC 4756. All of these just mentioned are in the region east of Beta Ophiuchus. If you had trouble tracing the globs across the middle of Ophiuchus but you can find Alpha Oph at the top of the bell, Beta is below it and only slightly dimmer.

If you go east of Beta Oph to IC 4756 as outlined above, the great Scutum star cloud is directly below you. From the city it might not look like much. It is to the left of Ophiuchus and down a bit, in the region above Sagittarius, which we will explore later in the year. Aim down ten degrees from IC 4756 to find the Wild Duck Cluster, M11, a particularly nice concentration of stars in a busy part of the sky.

Faint Fuzzy Finders: west of the bottom of Ophiuchus is the constellation Libra, with Beta and Alpha diagonal with respect to the horizon, Alpha at the lower right. Sigma is below Alpha, down on the ecliptic. A bit west of Sigma is NGC 5694, a faint globular cluster of small diameter, one of the most distant globs that we can see. As a challenge, see if you can find it—maybe even image it.

Back in the 'hood, Saturn is hanging out all evening in the south and southwest. Observe

the continuing drama of the rings going flat, during which the larger satellites line up to participate in transits, shadow transits and occultations that you can read about in the astro mags. On Independence Day, we have a 3/8 moon, so to speak, that you can show the neighbors along with Saturn, and then no moon on the 21st. Astrophotographers will be out at the Dark Sky Site on the Saturday before that and we'll all be at Chamberlin for the Picnic and Open House on Saturday the 25th.



EVERYTHING'S COMING UP ROSES

The alpha line of hydrogen at 4.5 nanometers reveals plenty of interesting details and generates a three-dimensionality to the tortured wisps of nebulosity surrounding open cluster NGC 2244 (the Rosette Nebula) in Monoceros. The hot stars in the cluster are causing nebular compression, sparking a tremendous amount of star formation. This image, spanning 100 light-years across, was taken with an 80mm refractor and a 4.5 mm Astrodon h-alpha filter and comprises 120 images totaling four hours.

Photo by Steve Solon

THE RIVERSIDE TELESCOPE MAKERS CONFERENCES: REMINISCES FROM BIG BEAR

by Jack Eastman



JACK EASTMAN,
DAS CHIEF OBSERVER

Photo by Joe Gafford

As in the past, the Sun moves north, the dead looking trees start to green up and lilacs are blooming. Time to think of another Riverside Telescope Maker's Conference (RTMC) out in the Land of Shaking Mountains at Big Bear, California. The trip, which I have described many times before, is becoming a bit routine, West on I-70 with a dinner stop in Salina, Utah, at Mom's Cafe (it's still there!) and on to I-15, southwest through Las Vegas, site of never ending highway construction, to a campsite near Halloran Summit. Next morning, on to Barstow, then up the back grades (16%) into Big Bear, Motel 6, dinner at La Paws (it's also still there!)—great beef enchiladas! Friday morning, up and on to Camp Oakes, find a campsite and set up for three days of observing, swap meets and best of all, reuniting with old and new friends and meeting new people with common (and maybe uncommon) interests. Here are a few notes from the past few RTMCs.

2007 was good (aren't they all?). Typically, after finding a campsite and getting set up, it's off to find old friends and, once again, renew acquaintances. Again, as in the past, there was a superb lineup of speakers on a wide range of topics. The keynote this time was Alex Filippenko, "Dark Energy and the Runaway Universe." Alex is an outstanding speaker and educator. The Robert Fulton Goff Invitational Lecture on Optics and Optical Design was a presentation by Al Nagler of Televue Optics, "Giant Eyepieces that Swallow Spacecraft" and the introduction of the Ethos 100-degree apparent-field eyepiece. Mike Simmons talked about international cooperation among amateur astronomers, "Astronomers without Borders." Tim Thompson talked about dark matter, "The Dark Side of Matter", and a very interesting talk by Peter Wise, "A Brief History of the Telescope From the Bronze Age to the Space Age". He described the making of mirrors from bronze alloys throughout his-

QUICK TIPS FOR SUBMITTING IMAGES

by Steve Solon

There is, I believe, an astroimager in every astronomer, professional or amateur (the line is becoming blurrier by the year). Trouble is, too many budding imagers take great shots, but are too introverted to show them to others—either that, or they're not sure how to put them together to send over the internet.

After you've done your processing, a couple of additional procedures are all that are necessary to get your images ready to send. First, be sure to resize your image to avoid that "blocky" look. Most image processing software have similar commands. If you use Photoshop (any version), simply go to Image>Image Size. In the Document Size portion of the window, make sure your Width, Height and Resolution are in inches, inches and pixels/inch, respectively. Also, make sure that Scale Styles, Constrain Proportions and Resample Image are checked (Bicubic in the drop down menu here is a good choice.)

For dimensions, start with a Width of 8 inches; the Height will automatically adjust. For the *Observer*, a decent resolution for

sending and printing is 300 pixels/inch. These figures will yield an image that's 3 to 4 megs in size. You can certainly bump up the dimensions and/or resolution, depending on your connection speed, but 300 p/i produces good results for publication.

Secondly, as far as looks, make sure to add a little more Brightness and Contrast to your image; publication, especially black and white printing, tends to subdue these characteristics.

Finally, save your work as a JPEG. While this file type creates some small artifacts in compression, they are generally not noticeable and the files are easily inserted in the publication pages Patti Kurtz uses to produce the newsletter.

For submission elsewhere (and I do encourage you to submit them elsewhere), simply email the image editor of the desired publication and ask for their resolution requirements.

If you have any questions about image processing, drop me a line.

As always, shoot, *Shoot*, **SHOOT**.—galaxyshots@att.net.

tory, finally to the speculum telescope mirrors of the 18th century. He talked about his own experiments with metal mirrors, with examples of his work. The G. Bruce Blair Medal, given by the Western Amateur Astronomers (WAA) at their summer meeting at RTMC, was awarded to the late Carter Roberts of the Eastbay Astronomical Society. Among his many accomplishments in public outreach was his work with the Chabot Science Center and its move to a new location a few years ago. More can be seen by googling G. Bruce Blair Medal and clicking on his name, as well as short bios for the other recipients through the years. The attendance for 2007 was 1488.

The 2008 trip was interesting—howling winds on the desert, in fact all the way from Grand Junction, Colorado. Tornadoes on the Colorado plains took out the small town of Windsor, and in California, torrential rains and wind. It blew a freight train off the tracks near March Air Force base, and gave 18-wheelers a hard time. Big Bear, sort of between the desert storms and the stuff coming in from ocean, was cloudy and cold. I don't think it got above freezing and the first night went down to 11 degrees F. Saturday and Sunday nights were 10 degrees. Snow, drizzle and generally non-astronomical weather prevailed. If that weren't enough, the food was somewhat less than par, and as I understand, generated numerous complaints. To me it sure seemed things were much better, gastronomically, in times past. But the reunions with old and not so old friends are what made it special in spite of the weather.

The keynote speech was "From Nine Planets to Nine Billion Worlds—visualizing the new frontiers of astronomy" by Chris Butler, the 2006 recipient of the G. Bruce Blair Medal; truly an excellent presentation. Tim Thompson talked about the evolution and morphology of galaxies and Roger Ceragioli was the invited speaker for the Robert Fulton Goff Invitational Lecture on Optics and Optical Design. His topic was Bernhard Schmidt's Secret Telescopes. Apparently, Schmidt, in addition to his revolutionary widefield camera, had built Cassegrain-type telescopes with spherical secondaries and coma free designs long before Dall, Kirkham, Ritchey and Chretien had come up with their designs. He was a true genius in the field of optics. I would hope Roger would publish his work in *Sky & Telescope*, the *Journal of the Antique Telescope Society* (ATS) or the like.

The G. Bruce Blair Medal winner for 2008 was Marni Berendsen. She, among many other accomplishments, helped put together the NASA Night Sky Network, a coalition of over 200 astronomy clubs dedicated to public outreach, funded by NASA and the Astronomical Society of the Pacific (ASP). More can be seen on the WAA website under "G. Bruce Blair Medal".



MIKE SIMMONS (FAR RIGHT) ACCEPTS THE WAA'S G. BRUCE BLAIR AWARD AT THIS YEAR'S RTMC

Other folks on-stage are (Left to Right), previous Blair award winners John Sanford, Jack Eastman, Richard Berry, Ed Krupp, Ashley McDermott, Bob Stephens, and WAA President Jack Borde.

Photo by Sherri Simmons

Probably the all time highlight took place during dinner Sunday night—the flawless landing of Phoenix in the polar regions of Mars.

Shots of the folks at Lockheed Martin and the University of Arizona showed Ed Sedivy, program manager on Phoenix, and Peter Smith, Principal Investigator, both in 7th heaven and on cloud 9. In earlier times I had the privilege of working with both of these folks on Mars Pathfinder, the Huygens probe on Cassini and the Chandra X-ray telescope. All too soon it was over, and time to head back up the creek and over the hills to Colorado. The attendance for 2008 was 1088.

Well, yet another year passed, all too quickly I might add, and I'm headed into the sunset once again, telescopes, cameras, clothing suited all the way from tropical islands to the South Pole; again, routine. Weather seemed much better this time—yes, headwinds, but much less severe. At Big Bear it was sunny, about 65 degrees—very pleasant indeed. The roads around the motel are terrible, many potholes looking for a street, but I managed 12 miles out East of the airport on the bike. This time there were signs designating a bike route, but obviously by someone who had never seen a road bike; maybe suited to moun-

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JULY SPEAKER (CONTINUED FROM PAGE 3)

at Denver in 1986. He then moved to Carlisle, PA where he taught at Dickman College for three years before going on to the University of Kentucky where he worked as a research assistant and earned his Ph.D. in 1999.

Mark is currently an Associate Professor at Southwest University in Georgetown, Texas, where he teaches Physics and Astronomy. Still active in public outreach, he conducts public nights using the Uni-

versity's 16-inch Cassegrain reflector at the Fountainwood Observatory.

Although astronomy is Mark's chosen profession, he is also an avid amateur as well. He regularly observes through a 4-inch refractor that he built as a teenager, and owns a 6 inch refractor and 12-inch reflector as well. Recently he has taken up the fine art of astrophotography. His most recent attempt included obtaining spectra of some of the brighter stars using his 4 inch telescope. The purpose of this is to

see how much astronomy one can do using smaller telescopes, as he recently received a Mellon Grant to enhance astronomical education through the use of small telescopes.

As always, the general meeting will be held in room 105 at Olin Hall on the D.U. Campus. Following the meeting, refreshments and conversation and, hopefully, views through the 20-inch, will take place at nearby Chamberlin Observatory.

PRESIDENT'S CORNER (CONTINUED FROM PAGE 2)

for more data. It is suggested that for amateur astronomers, a fairly simple way to do photometry is to capture data through BVRI filters using a 50 mm camera lens and a DSI Pro camera (information taken from published technical paper and book coauthored by Dr. Robert Stencel).

If you have any questions regarding the previously mentioned events, please contact me. I may not have the answer, but I can direct you to the person who does.

Clear skies!—*Ronald E. Mickle, President.*

MARK YOUR CALENDARS!

We hope to see you at Chamberlin for the annual DAS Picnic/Potluck and Open House on July 25. Bring your favorite dish to share. The picnic begins at 3:00 P.M. and the Open House begins at 8:30 P.M.

Image (at Right) courtesy Joe Gafford



THE EARTH AND SKY PHOTO CONTEST ON DARK SKIES IMPORTANCE

www.darkskiesawareness.org

Deadline September 21, 2009

This photography contest is open to any amateur photographer of any age, anywhere in the world. The theme of this contest is "Dark Skies Importance." Photos must combine some elements of the night sky (e.g., stars, planets, the Moon or celestial events) set against the backdrop of a beautiful, historic, or notable location or landmark somewhere in the world.

Photographs must be taken during 2009, the International Year of Astronomy, and submitted by September 21, 2009. Winners will be announced on October 31, 2009. Details on this program, including the site to submit photos, can be found at www.darkskiesawareness.org.

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 Public Outreach 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.

REMINISCES FROM BIG BEAR (CONTINUED FROM PAGE 5)

tain bikes, but not the road bike. This worked up my appetite, so another pigout at La Paws, a good night's rest and off to the camp the next morning. It was New Moon, which promised dark skies, and the weather looked quite good. Also gas was a lot cheaper than last year, so I assumed we would have a record crowd. I had no trouble finding my usual campsite, and it seemed there were very few folks there on Friday. So far, no official tally of attendance for 2009 but judging from the short lunch and dinner lines there were noticeably fewer folks. Maybe the short lines were a result of last year's awful eats!

Everything that was not so good last year was just the opposite this time. The sky was spectacularly clear, almost coronagraph quality during the day, clear every night all night and livable temperatures—in the 80s during the day and 40s at night. The coldest for me was 38. One fellow said it got down to 29 at his camp. Dinner Friday night—steak!—and very good. And so it was, the meals were more than adequate and excellent quality. Unusual for the site at Camp Oakes was the excellent seeing. Saturn, globular clusters and close double stars were spectacular even though there was noticeable light pollution in the west (looked like evening twilight stayed on all night) from the greater Los Angeles basin and also glow in the east from the desert communities, Palm Springs, Indio and all. Looking at Gamma Virginis, Porrima, with my 6-inch refractor split it nicely, the separation listed at 1.1 seconds. Zeta Bötēs was a stretch, but I think I detected it as well, elongated, as did at least one other person. We agreed on the position angle, so I'll call it resolved, although split may be too strong a description. I thought it difficult for a separation of 0.9 arc seconds, and with good reason. Upon checking, the current separation is more like 0.7"! Dawe's limit for the resolution of a 6-inch is 0.74"—testimony to the art of Alvan Clark so many years ago and the good seeing. With the big (75mm) "comet eyepiece" M81 and M82 were a beautiful sight in the 6-inch, both galaxies easily seen in the 1.4 degree field, helped by the relative darkness of the sky to the north.

There was, again, the usual swap meet. I did practice unusual restraint; mainly there wasn't a lot that got my "can't live without it" switch turned on. The only thing of note was a .001-inch dial indicator with one-inch travel on a really powerful magnetic base; got that at a yard sale in Big Bear while riding the bike around before dinner the previous Thursday.

This year's keynote address was E. C. Krupp, director of the Griffith Observatory, on the subject of Public Outreach, with hints on effective outreach methods. Hopefully he will publish this in the Griffith Observer or on the web in the near future. The Robert Fulton Goff Invitational Lecture on Optics and Optical Design this time was Robert Sigler talking about Glass-Liquid Apochromats. Getting full apochromat color correction requires the use of glasses having "abnormal dispersion", that is dispersion characteristics different from "ordinary" glasses, which is difficult. Certain liquids have these properties to a much greater degree than the glasses, and combined with glass can produce nearly perfect color correction. Scott Kardell, of Palomar Observatory, gave a great talk on the construction of the 200-inch Hale telescope, reminiscent of Todd and Robin Mason's outstanding documentary, "Journey to Palomar", which they previewed several years ago at RTMC. Tim Thompson, JPL and LAAS, tried to bring some sanity to String Theory in his excellent presentation. That's still way beyond me. The real treat for me was Tom Johnson's presentation, "The Beginnings of Celestron", the very early history of

what evolved into Celestron. That brought back fond memories of my beginnings in the field of optics and optical sciences with Tom so many years ago. Finally, this year's G. Bruce Blair Medal winner was Mike Simmons of the Mt. Wilson Observatory Association.

Again, all too soon, it was done. Huge breakfast burrito Monday morning, get packed up and head for the high country. Again, weather was perfect, cool through the deserts and not all that cold in the mountains. It seems Denver had nonstop rain the week I was gone; everything was green and a bit soggy, but it is good to be back. Can't wait for next year!

THE PLANEWAVE INSTRUMENTS BOOTH AT RTMC

Photo courtesy Mike Simmons



FROM THE EDITOR:

Thanks are in order to all the wonderful contributors of this issue for their writing, editing and hard work behind eyepieces and cameras. The quality of images I've received over the last few years has been extraordinary. The images are so extraordinary, in fact, that I'm toying with the idea of putting together a DAS 2010 Calendar. Any thoughts, including objections, are welcome. It could be done through "Shutterfly" fairly easily.

Contributions are welcome! A reminder: all copy and photos are due to the editor by the second Friday of the month *prior* to publication. For instance, all copy and photos/images submitted for the August issue, are due by the second Friday of July.

Special thanks to Darrell Dodge for proofreading the *Observer* for the last several years. Darrell, you did a most remarkable job at keeping the *Observer* clean and looking great. Thank you, Steve Solon for taking up the reins in editing and proofreading. I'll try to be easy to work with. Thank you, thank you!

Clear skies to all (prayers to the weather gods for a break from rain, thunderstorms, hail and tornados!)

—Patti Kurtz (p_kurtz@comcast.net)

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DAS SCHEDULE

JULY

- 4 Independence Day
- 10 General Meeting at D.U.'s Olin Hall
(Begins at 7:30 P.M.)
- 17 E-Board meeting at Chamberlin Ob-
servatory (Begins at 7:30 P.M.)
- 18-19 EGK Dark Sky weekend
- 25 DAS Picnic (Begins at 3:00 P.M.) and
Open House (Begins at 8:30 P.M.)

AUGUST

- 7 General Meeting at D.U.'s Olin Hall
(Begins at 7:30 P.M.)
- 14 E-Board meeting at Chamberlin Ob
servatory (Begins at 7:30 P.M.)
- 20-22 Weekend Under the Stars
(WUTS)
- 22-23 EGK Dark Sky weekend
- 29 DAS Open House (Begins at 8:30
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.



The Denver Astronomical Society
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