

Blame It on LeRoy

Joe Cain

It's all LeRoy's fault!! I was just a normal person until LeRoy had a friend of his (Bob Hoffman) bring his 10", LX200 over and set it up in our front yard. Bob then showed me Hale-Bopp, the Orion nebula and some other objects that I don't remember now. Bob was a member of Delmarva Stargazers and he informed me of an up-coming StarGaze (III or IV, or ?) and invited me to attend. I had just bought an Orion ST80 as a spotting scope and decided to attend and use my scope for stargazing. My wife and I packed up our trailer and set off for Tuckahoe State Park. We had no idea of what we were getting into! We pulled in and were greeted by Lyle. Not knowing the horizons or anything about stargazing, we picked a spot and set up our trailer and settled in for duration. We learned a few things of importance: set up so you can observe the area of the sky you wish to observe, most of it is hard to see when you are under the trees! Don't set up too close to the Port-a-Potties, nobody knows how to shut the doors without them slamming (at ALL hours of the night!).

The first night, LeRoy and I just walked around and talked to people, in the dark, not knowing who they were. They all were very nice and let us look through their scopes and explained what we were seeing. We felt very privileged as we saw, on our very first night, things that experienced stargazers had "Never seen it so good". The next day we tried to find them again but they all looked different in daylight! We had to recognize people by their telescopes, or their ladders, or their voices, or their expensive gear we tripped over the previous night.

As we were walking around, some guy grabbed my arm and said "Come here! You have to see this!". He then set me down at his telescope and MADE me look at the sun! BEAUTIFUL!! This was Barlow Bob. Who knew you could stargaze in the middle of the day? He invited me back that night and let me use his scope, eyepieces, barlows, etc., and showed me how to get the most out of my little scope.

We spent some time at the pavilion and met a lot of the members. They were all very friendly and interested in us! We were not used to this!! I asked a lot of questions and everyone seemed to genuinely want to help. I learned a lot that first weekend.

And then there was the food. WOW! Lima bean soup, She-crab soup, and the Hotdogs! I knew we would be back! And we did! Again and again and again.

After 2 or 3 of the weekends with this group, I was ready to buy a "real" telescope. I opted for a Meade 7" LX50. I was really impressed with the optics, but not too impressed with the mount system. It was made to use a wedge and I could not seem to get the hang of polar aligning the thing. So, a couple of years later, I wanted to upgrade. I decided on a Meade LX200 with GPS and all the bells and Whistles. I went with the 8" model thinking I would be able to do photography with it. Well, I haven't tried photography yet and I wish I had gotten a 7". Alas, they have discontinued this model.

To get back at LeRoy, I signed him up for the mirror making. We both attended with him doing the bull-work of the grinding, polishing and figuring, while I just watched and talked to people. At the end of the weekend, we ended up with a mirror blank, ready for coating. We hurried to get a telescope ready for the No-Frills Star party coming up. We made it! We brought the "Cannon" and were pleasantly surprised at the views from a scope we made with our own hands. It has now become our main scope.

I would like to thank all of the star gazers we have met, Don, Lyle, Kathy, Frank, Pj, Leonard, Barlow Bob, and all the rest of you. We have learned a lot from you all.

The Delmarva Stargazers Announces a Writing Contest.

The DMSG will raffle away astronomy gifts to members who submit articles to the Star Gazer News.

How to enter:

- 1 Open to DMSG members.
- 2 Members may submit original articles at least 500 words (1/2 page) for publication in the Star Gazer News.
- 3 Articles **must** be authored by the member.
- 4 Pictures can be included, but they do not count towards word count (1 picture ¹ 1000 words).
- 5 Must be astronomy related. Each article = one chance in the raffle. The drawing will be made at the star parties based on the previous 6 issues – need not attend to win (but it would be nice to see you there). *The editor of the Star Gazer News qualifies articles submitted.*

How to Join the Delmarva Stargazers: Anyone with an interest in any aspect of astronomy is welcome

NAME _____

ADDRESS _____

CITY, STATE & ZIP _____

E-MAIL ADDRESS (If any) _____

Do you need the newsletter snail mailed to you (Y/N)? _____

Please attach a check for \$15 made payable to Delmarva Stargazers and mail to Kathy Sheldon, 20985 Fleatown Rd, Lincoln, DE 19960. Call club President Jerry Truitt at 410-885-3327 for more information.

Star Gazing Opportunities in August, 2007

Headline: Perseid Meteor Shower August 13...last qtr moon on the 5th, new moon on the 12th... couldn't be a better arrangement for viewing this meteor shower.

Don Surles

Roman Emperor Valerian...258 AD...persecutions...executions...Deacon of the Christian Church Laurentius...bar-be-que...Comet Swift-Tuttle, Perseid Meteor Showers...and you. Do you know the connection(s)?

I am amazed that my fine Southern Baptist education continues to be upgraded, even in these wonder-post-60-years. Now, I will try to pass on my recent learnings.

It seems the latter days of the Roman Empire and the early days of the Christian religion were somewhat overlapped. There was probably some friction twixt the resident Romans and the immigrant Christians for the first couple or three hundred years after the death of Christ. The Romans probably thought their culture was being overrun and changed by the huge continuing influx of Christians.

Some of the Roman conversations heard on the street in around 100-300 AD may have been:

"What should we do with these hoards of immigrant people who want to change Rome?"

"Don't they know "When in Rome do as the Romans do"?" "

"We can't send them back...there are too many of them and we need them to make the wine."

"But for sport we will let them fight the lions in the Arena."

Seems this went on for a while...until the Christians became VERY plentiful and the Romans ran out of strong leaders...and maybe the lions just lost their taste for Christians after a while...diets need to be spiffed up occasionally. There was a general unrest in the streets and Romans blamed Christians for all the problemos of Rome. As luck would have it, a Roman named Valerian was elected Emperor around 250 AD and the dear emperor was not noted for being one of the stronger or more intelligent Roman rulers (I believe Valerian is Roman for the American moniker "George"). Apparently there was a knee-jerk reaction by brother Valerian and he decreed (decried?) in early August 258 that all leaders of the Christian Church should be put to death...immediately! That decree included the pope, priests, bishops, and deacons. Seems there would soon be some job openings in the Christian Church...opportunities for all to move up in the Church hierarchy...no mention of outsourcing or cost cutting...just executing. Between August 6 and August 10 there were several executions. The last was a Deacon named Laurentius and he met his fate on August 10th. The story says he was roasted on a red-hot gridiron, aka, bar-be-que in the South-land. Seems Brother Larry had a few words for the Roman roasters...something like, **"I am already roasted on one side and, if thou wouldst have me well cooked, it is time to turn me on the other"**.

The story continues that during this time the pagan Romans celebrated a feast day on August 6...later on, a couple of centuries, this feast day was changed to a Feast of the Roman Martyrs (of the Christian Church). Those Christians changed everything that was Roman...even the feast day!

Enter the periodic comet later known as Swift-Tuttle because it was "discovered" by Mr.(s) Swift and Tuttle in 1862 during our Civil War. Apparently the comet was around prior to 1862 because in 254 it was said that the fiery, hot tears of Bar-be-que'd Larry fell from the sky during the early days of August 254. Today, we know these Larry tears as the Perseid Meteor Shower.

Fast forward a couple thousand years...to August 2007 and the Perseid Meteor Shower that is due to peak on August 13. So, when you make your plans to view them and are counting the meteors please remember the year 258 AD and think about St Lawrence roasting on the bar-bie.

See you at the meeting in September or under the stars waiting for Larry's fiery tears to make their annual appearance.

Don...

Footnote: Comet Swift-Tuttle was thought to be a periodic 100 year comet when it was discovered in 1862. However, 1962 came...and went...along with another 30 years before the comet was again sighted.

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My first encounter with S-T was in 1970. I was teaching school in Cumberland County (Fayetteville), NC, and had rented a fully-furnished little country house from an "old" family in the area. The even-older grandmothers who had lived in the house either died or had moved to their next residence and they left all their personal belongings in the house. I wasn't snooping...but I did discover some letters between the folks at home and the men on the battlefields of the Civil War. The conversations were typical...how were mom and pop and sis etc doing, how were the crops and animals, who had died, who was born, where the other young men were fighting. But there was one reference to "Have you seen the Comet?" and "What evils does it portend?"...at that time I had never seen a comet and wondered what one would look like. Even today I have trouble imagining being on a battlefield and seeing a comet under really dark skies...not to mention the stress of war.

I almost forgot about the letters but during the mid to late 1980's S&T and Astronomy often talked about the overdue return of Swift-Tuttle and offered guesses as to when the return might be. As I read those articles I always remembered those letters...

The next encounter came in 1992 when S-T finally made a nice apparition even if it was 30 years late. At that time I was using homemade digital setting circles on my 17.5" Coulter Odyssey...they were the creation of Dave Groski. The setting circles were comprised of a Commodore 64 computer, a couple of encoders, some timing belts and pulleys, an inverter (12VDC to 120VAC), a 5" TV, and a Quick Brown Box with 64K of ram and Dave's DSC programming. Setting up the scope and computer system did take a few minutes. My observing buddy at the time was Herman Kline and he used a 10" dob...it was a "naked" star-hopping dob...easy to set up with no wires, motors, etc. By the time I had my Odyssey set up Herman would have a dozen objects logged because he was great at star-hopping...and he never let me forget that he saw them first whilst I was working on my "compooter". So, on this particular night Herman and I were out right after sunset so that we could see Comet Swift-Tuttle before it set (most comets are viewed just after sunset or just before sunrise because they are always brightest as they approach or leave the sun). The comet was in a bare starless area of the sky...star hopping to it was difficult and apparently Herman was experiencing that "lost" feeling when I announced I had located the Comet. Then he announced he had found the Comet also. After a couple of minutes we switched scopes. I heard some muttering from my scope...just muttering...I instinctively adjusted the focus of Herman's scope to fit my unique eye. And then I realized Herman's comet was actually M13 out of focus! To this day he swears I moved his scope from the Comet to M13 as a joke...and btw, we did do that occasionally to make the nights interesting.

Remind me to tell you the story of Herman waiting for the North Star to move from behind a power pole and the story of the comet I found about 2 AM directly overhead (remember comets are found near the sun...).

Shallow Sky Sorties – August 2007

By Jim Tomney

When scouting out places to have our summer vacation this year I came across a home on Seneca Lake, part of the Finger Lakes region of New York. Of course once we settled on the week I did a quick check of the moon phase (full to waning gibbous) and brought up a light pollution map of the area. As best I could tell the region ought to be as good as Tuckahoe, perhaps a bit better. While packing even the 60mm yard sale scope was out of the question the 7x50 binoculars were easy to slip into the trunk.

It was midweek before the weather finally cooperated by sending a cool front through the area. The visible sky around the home was a bit limited – nice view westward across the lake and a swath from Ursa Major to Ophiuchus. Stepping outside I felt almost a little giddy at how nice the sky looked, easily down to the 5.5 magnitude. Scanning above the Big Dipper's handle with the binoculars I readily picked out a faint glow with averted vision that represented M101. From there I hop scotched among some familiar summer globulars – M13, M10, M12, and M5. Of these M5 really impressed me, seemingly as good in the binoculars as the 60mm back home, but set amid a wonderfully wide field.

The next evening the sky was not quite as transparent so I began with Venus, a beacon high above Seneca's western shore. I quickly found that the Beehive open cluster was but a few degrees upstream on the ecliptic. Now I'm kicking myself for not throwing the camera tripod in the back of the car along with the binoculars – a pretty appulse over a gorgeous lake and me with no sure way to shoot it! Undaunted I went back inside to grab the camera and set it for a time exposure. My strategy was leveraging the fence enclosing the property to brace the camera while trying to squeeze off a couple of 15-30 second shots.

Back home the film results turned out to be acceptable if not spectacular. The best of the lot shows a little squiggle to the images if looked at closely. Venus dominates the sky but M44 does make its presence known as a hazy patch, and the lake with its colorful lights on the distant shore add interest to the shot. Maybe I can slip it into the family vacation album along next to the yellow perch.

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Star Parties “Things I don’t like”

Bill Ellis

Don't like Yippy little dogs. (Send my wife in to quiet them)
Don't like Hurricanes and Nor-Easters

Don't like the buttons on my Meade Controllers that stick in the Slew position
Don't like complaints about my LED Red Flashlight being too bright (I'm Old)
Don't like loud parties, if I'm not invited!

Don't like Trees in the way, but should have figured that out sooner
Don't like Dew, especially when I finally figured out how to align

Don't like people looking over my shoulder when I'm trying to figure out how to align
Don't like hard questions like, “what are you looking at”, especially when I'm trying to align
Don't like anyone asking me where North is when it's overcast
Don't like Horse Crap. Think you are level and then it caves in

Don't like Really Big Scopes. They give me an Inferiority Complex. Do have a little ladder!
Don't like someone saying I found M81 when I'm still looking

Don't like splitting Most Ignored Double Stars. Think there is a reason for that
Don't like tripping over wires, especially mine. Need to align again

Don't like Airplanes flying through my field of view. Hate Flying Machines. The brothers should
have stuck with making Bikes (Bill is a retired pilot. –Ed.)

Don't like finding out my lighted reticle eyepiece has been on all night
Don't like guys that say, “What are you aligning on?” I say “Capella”,
they say “in Auriga?.” I say, no, last night it was over that tree “

Don't like guys that say “With the Wind Blowing, The Dew God or Goddess won't show up”,
especially when I see frost on my OTA.

Don't know why I go to Star Parties when the weather is forecasted to be bad.

Don't think weather forecasting is a very exact science, like Doctoring and Lawyering. How come they
spend their entire careers “Practicing”. Get it right the first time! Guess I need to be careful.
(My Number Two son is an Assistant Prosecutor!)

Don't like Star Hopping. If they hop, how do you find them. Yogi Berra said,
“I know I'm lost but I'm making good time”. Sounds like Star Hopping Star Hopping to me!
Don't like the Smart Finder that came with my ETX.. Thinks it's a Dumb Finder. Rigels work great!

Don't like tripping over Park Benches in the night. Need to get a brighter LED Flashlight!
Don't like Yippy Dogs! Maureen can take care of that

Don't like the last couple of weeks before a Star Party. Neither does Maureen. Always
wants to know what I'm buying! Scope Stuff guys won't tell!

Don't like the looks I get when I say, “If the Sun is a Star, how come you can't see it at night”

Don't like snakes. First time my friend slept out in his tent at Tuckahoe, said he could hear them crawling around.
Thought only Racoons liked Peanut Butter spread around a tent! That's what Don told me!

Don't like snoring, In Stereo Surround Sound, outside my camper. Oops!

What do I like about Star Parties: Guess Jack Benny said it best when a guy threatened him.
“You're Money or your Life”. His answer “Let me think about that”!

Did you miss the ‘behind the scenes’ tour of
NASA—Wallops Island, NOAA, and the
Mid-Atlantic Regional Spaceport (MARS) ?

Read about the trip in the September issue of
The Star Gazer News.

*At right:
Don in the Launch
Control Center,
Wallops Island*



Magazine Subscriptions

As a paid member of DMSG, you can sign up -or- renew your S&T or Astronomy magazines through the club for a discount over private rate. S&T, reg. \$42.95, is \$32.95 thru DMSG, Astronomy, reg. \$44, is \$34 thru DMSG. See Tony Codella for details.

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Back home a couple of weeks later I get some clear skies and a waxing crescent Moon on a work night. Not perfect, but then again the whole point is to take the opportunity rather than waiting for superlative observing conditions. Late June is a good time to try to catch some Scorpius targets since they scale to their maximum height at a convenient hour. I align the scope finder on Beta Scorpio, one of the double stars on both the Urban list and the AL's Double Star list. The star resolves readily at 80x amid a somewhat sparse field, the primary component about two magnitudes brighter than its mate and a subtle yellow in color. The secondary is nearly due north and seems to have a blue tint about it.

With finder aligned I set off for globular M4. The environs of Scorpius are quite challenging from my back yard due to strong Baltimore skyglow. I recall my first M4 encounter as being a very unimpressive in my 6" reflector, but then the same instrument in a reasonably dark sky revealed quite a spectacular globular with a distinct chain of brighter stars running down its center. One nice thing about M4 is the relative certainty you can have in knowing that you are in the area since it lies a bit south of the line between Antares and Sigma Scorpio. So after 10 minutes of carefully sweeping & studying the area and coming up empty handed I conclude that the 60mm aperture is not going to prevail in these circumstances.

The tail of the Scorpion is even lower in the sky and requires that I move the scope to catch it between houses. My goal is the open clusters M6 and M7, and sweeping the area with binoculars quickly reveals the brighter M7. Within a few moments, "star hoping" from the edge of the neighbor's roof, I land on "Ptolemy's Cluster" and am impressed with how nice it looks given its low declination. It appears to be mainly white stars forming a few streamers and a double at its heart. About 20 stars are visible at 80x, nicely filling the field.

M6 lies a little northwest of M7 and is dimmer – I can barely pick it out in the 7x50 binoculars. It takes a little time slewing across the area but soon I see a smaller and more delicate cluster of stars. The moniker for this DSO is the "Butterfly Cluster", but I'm hard pressed to fashion a butterfly from the group. A parallelogram of its four brighter stars is recognizable with its western half likely having some stars just out of the scope's resolution, dancing in and out as I use averted vision. Almost all the stars appear a generic white but the brightest of the parallelogram anchors seems to have a warmer orangish glow about it.

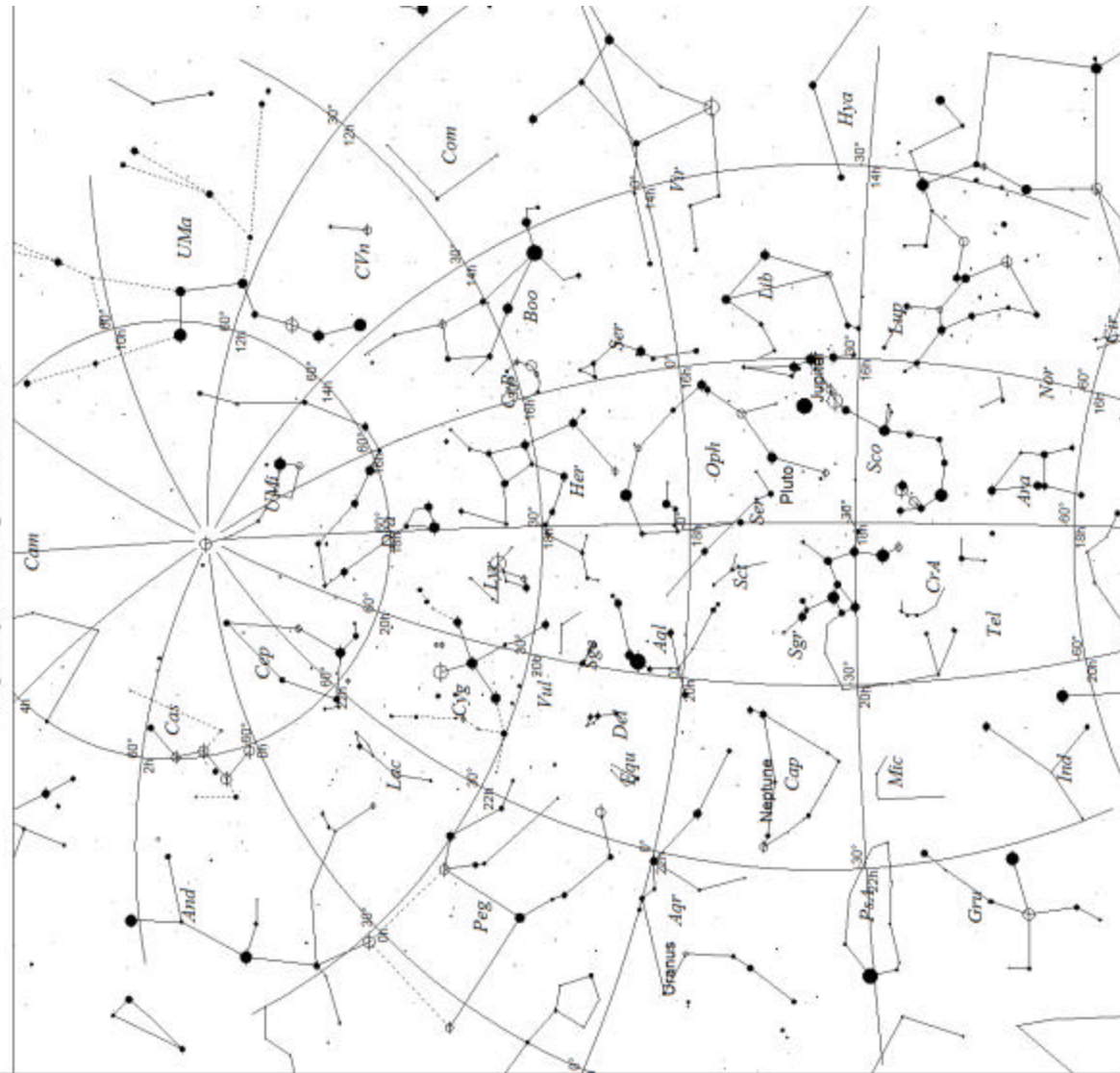
While I'd like to scoot over to Sagittarius I exercise delayed gratification and pack it in. Before turning in I research the orange star in M6 – turns out it was not my imagination as this is BM Scorpio, a variable that pulses between 6th and 8th magnitudes over a leisurely 800+ days.

Here's hoping you have clear skies ahead this month and opportunities to catch some celestial highlights for yourself!



Venus Approaches the Beehive

Skymap 10 Aug 2007 10PM



Tuckahoe State Park MD

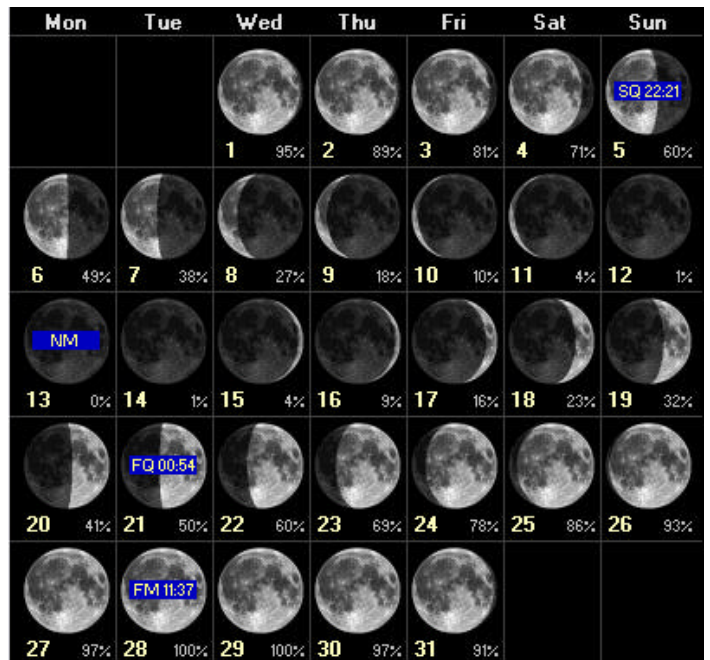
- STARS**
- <1
 - 1.5
 - 2
 - 2.5
 - >5
- SYMBOLS**
- Multiple star
 - Variable star
 - Comet
 - Galaxy
 - Bright nebula
 - Dark nebula
 - Globular cluster
 - Open cluster
 - Planetary nebula
 - Quasar
 - △ Radio source
 - × X-ray source
 - Other object

Local Time: 22:00:00 10-Aug-2007
 UTC: 02:00:00 11-Aug-2007
 Sidereal Time: 18:12:55
 Location: 38° 58' 0" N 75° 56' 0" W
 RA: 18h12m56s Dec: +23° 57' Field: 180.0°
 Julian Day: 2454323.5833

Sun and Moon Data for August 2007

Tuckahoe MD
 38.97°N 75.93°W 5hrW
 Daylight Time Civil Twilight

Date	Twilight	Rise	Sun Transit	Set	Twilight	Rise	Moon Transit	Set	%
8/1/2007	5:34a	6:04a	1:10p	8:15p	8:45p	9:52p	3:04a	8:51a	91
8/2/2007	5:35a	6:05a	1:10p	8:14p	8:44p	10:17p	3:52a	10:03a	84
8/3/2007	5:36a	6:06a	1:10p	8:13p	8:43p	10:42p	4:39a	11:14a	75
8/4/2007	5:37a	6:07a	1:10p	8:12p	8:42p	11:11p	5:29a	12:27p	64
8/5/2007	5:38a	6:08a	1:10p	8:11p	8:40p	11:44p	6:20a	1:42p	53
8/6/2007	5:39a	6:09a	1:10p	8:10p	8:39p	*****	7:15a	2:57p	41
8/7/2007	5:40a	6:10a	1:10p	8:09p	8:38p	12:25a	8:13a	4:10p	30
8/8/2007	5:41a	6:10a	1:09p	8:08p	8:37p	1:14a	9:14a	5:16p	20
8/9/2007	5:42a	6:11a	1:09p	8:06p	8:35p	2:14a	10:15a	6:13p	12
8/10/2007	5:43a	6:12a	1:09p	8:05p	8:34p	3:20a	11:14a	6:59p	6
8/11/2007	5:44a	6:13a	1:09p	8:04p	8:33p	4:30a	12:09p	7:36p	2
8/12/2007	5:45a	6:14a	1:09p	8:03p	8:32p	5:40a	12:59p	8:06p	0
8/13/2007	5:46a	6:15a	1:09p	8:02p	8:30p	6:48a	1:45p	8:31p	1
8/14/2007	5:47a	6:16a	1:08p	8:00p	8:29p	7:52a	2:28p	8:54p	3
8/15/2007	5:48a	6:17a	1:08p	7:59p	8:27p	8:54a	3:09p	9:15p	7
8/16/2007	5:49a	6:18a	1:08p	7:58p	8:26p	9:54a	3:49p	9:35p	13
8/17/2007	5:50a	6:19a	1:08p	7:56p	8:25p	10:54a	4:30p	9:57p	20
8/18/2007	5:51a	6:20a	1:08p	7:55p	8:23p	11:54a	5:11p	10:21p	29
8/19/2007	5:52a	6:21a	1:07p	7:54p	8:22p	12:55p	5:55p	10:48p	37
8/20/2007	5:53a	6:21a	1:07p	7:52p	8:20p	1:57p	6:42p	11:21p	47
8/21/2007	5:54a	6:22a	1:07p	7:51p	8:19p	2:59p	7:32p	*****	56
8/22/2007	5:55a	6:23a	1:07p	7:49p	8:17p	3:58p	8:25p	12:01a	66
8/23/2007	5:56a	6:24a	1:06p	7:48p	8:16p	4:53p	9:20p	12:50a	75
8/24/2007	5:57a	6:25a	1:06p	7:47p	8:14p	5:41p	10:15p	1:48a	83
8/25/2007	5:58a	6:26a	1:06p	7:45p	8:13p	6:22p	11:10p	2:54a	90
8/26/2007	5:59a	6:27a	1:06p	7:44p	8:11p	6:56p	*****	4:05a	96
8/27/2007	6:00a	6:28a	1:05p	7:42p	8:10p	7:26p	12:03a	5:18a	99
8/28/2007	6:01a	6:29a	1:05p	7:41p	8:08p	7:53p	12:54a	6:32a	100
8/29/2007	6:02a	6:30a	1:05p	7:39p	8:07p	8:19p	1:44a	7:45a	98
8/30/2007	6:03a	6:30a	1:04p	7:38p	8:05p	8:45p	2:33a	8:59a	93
8/31/2007	6:04a	6:31a	1:04p	7:36p	8:03p	9:13p	3:23a	10:14a	86



Moondark for August: RAW Astrophotography

Doug Miller

Astrophotography doesn't require a telescope or specialized camera. Great shots, often featured in the magazines and on popular web sites, can be captured with a point and shoot digital camera and little more than a tripod. But knowing what you're doing and familiarity with your equipment can certainly mean the difference between a *nice* shot and an *awesome* shot. One feature rarely used by the casual photographer actually allows the consumer digicam to function like a CCD camera, the gold standard for astroimaging. Many recent, especially high end, models allow saving images in a [RAW format](#). RAW isn't an acronym, but simply refers to saving the image with little to no processing internal to the camera, that is without level, contrast or gamma adjustments, sharpening or [losses due to compression](#). Actually, quite a bit of image processing goes on inside any digital camera (that's when the light is blinking) without your knowing it before it ends up on the memory card.

Unfortunately, there are disadvantages to using "raw" images as compared to the [much more common JPEG \(.jpg\) format](#). RAW requires additional processing steps to become presentable, and not all photo programs will handle these images. In addition, the RAW formats can differ between camera models, and the resulting files are considerably larger. But because the RAW image is a "digital negative" much like that from film cameras, it records far more accurate detail and brightness information that the astrophotographer can use to produce a great image or even extract astronomically important data.

How RAW works at the nuts and bolts level is key to its success. Brightness levels from all three color components are stored as they are recorded on the camera's chip. In reality, each pixel has only one of those colors, determined by a tiny filter, a particular pattern of the reds, blues and mostly greens in what is known as a [Bayer mask](#). The ratio is usually two greens for each red and blue, roughly analogous to the [color sensitive cone cells in the human eye](#). The RAW image stores each color separately, but each plane is missing half or more of the pixels' color information! Importantly, [data are stored in in 12- to 14 bits](#), that is up to 16,384 levels versus the usual 8 bits with just 256 discrete levels. To produce a viewable image, the first step is to interpolate (or "demosaic" as it is known) to compute a red, green and blue value for each pixel. Algorithms can be inside the camera (as described above) or in new photo programs (see below).

RAW imaging provides many opportunities for the astroimager. Here, the data represent actual brightness and color on a linear scale. This means that proper image calibration and processing can be accomplished, just like that standard with CCD images. Better images result. In [high dynamic range \(HDR\) photography](#), images taken with widely differing exposure lengths (or extreme "bracketing") can be [digitally combined to produce images with exceptional brightness range](#), using the extended bit-depth of the RAW format. This allows greater contrast and color fidelity, exceeding that of conventional film and much closer to our own visual impressions. Furthermore, increased bit-depth and linearity allow you to extract precise data from the images for [photometry](#) of variable stars or [spectroscopy](#). Real science is thus possible.

Many cameras now offer, though may not advertise, the RAW format, with [Nikon](#) and [Canon](#) brands seeming to be the most widely supported. Although the RAW format has existed for many years and is an established tool among professional photographers, programs to process these images are now becoming widely available. For processing the images, [Picasa](#), [IrfanView](#) and the astro-specialized [Iris](#) programs can all handle RAW files, and they are free. Choices among commercial products include [iPhoto](#), [Photoshop](#) and [Photoshop Elements](#), [ImagesPlus](#) and [AIP4WIN](#). Since file formats are proprietary and a moving target in most cases, be sure to obtain the latest available version of any image processing program. But the results will be worth the effort since RAW imaging affords almost total control over the imaging process with the convenience and low cost of consumer digital imaging. Just one more good thing for amateur astroimaging.

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*At right: Twilight with clouds,
Canon Digital Rebel, RAW image*

