A S T R O N O M Y

Rochester Skies

Lunar Observing ✶ Crossword Puzzle ✶ StarBQ News ✶ Review

Rochester Astronomy Club Newsletter www.rochesterskies.org Issue #11 Q3 '08

RAC
Rochester Astronomy Club

Come Experience the Universe

It is the same good news as it does each year—the nights are getting longer. That's right astronomy fans, our northern pole is pointing away from the Sun. The sum of all the degrees Fahrenheit for the next several star parties won't equal a single StarBQ. but along with that we get to enjoy observing the sky at 6:00PM. Don't let the temperature keep you from observing, just be prepared with some winter wear: long down coat, long johns, wool socks, caps, gloves, scarves, chemical warmers of every variety, anything thick and fuzzy... and flannel, flannel, flannel! If winter astronomy doesn't make your eyes twinkle, you can still join the indoor activities.

The RAC has twelve meetings every year. One is dedicated to the Holiday party/elections and we generally have January covered beforehand, but we have about ten meetings left to account for. If you have something to present, an idea for a meeting, or know somebody who knows someone who's cousin gives talks, let us know. We can always use help filling the year with great astronomy.

Kirk Severson receives kits from JPL through their Night Sky Network program. We need to get these kits in front of people whether it be a RAC event, a school classroom, scout events or anywhere. The kits are educational and hands on. If you have an idea where we can present these, or if you'd like to help in that endeavor, please contact Kirk.

There's a lot of planning that needs to be done for the International Year of Astronomy (IYA). We will need participants from the club and I promise you it will be even more fun to participate than attend as a guest. IYA will be an astromiganza!

The club could also use help with newsletter and web site content, info for before and after our main presentations, advertising, contributions, recruiting new members, Scout-Reach, and of course there is always the constant need to keep ones eye's fixed on the sky.

Contents

SO YOU THINK A$TRONOMY IS AN EXPEN$IVE HOBBY?

By Dean Johnson

One of the most asked questions when there is an outreach event is, "How much does your telescope cost?" There are two ways to answer that; (1) how much it cost me when I first got it, or (2) how much it costs now since I've upgraded it. But I usually give them the quick answer, "A thousand bucks". That's a figure that anyone can wrap their brain around, and while the John Q. Public likes the nice crisp views they get when they look through my scope, they blanch at the thought of that much cash flying out of their wallet.

I have a Celestron 8" Schmidt-Cassegrain. It is a nice medium sized telescope, but when you take a look around at a star party, it is really pretty ordinary. It's not a monster scope like our President Randy's 18" Obsession (Hail to the Chief!) and doesn't have

the high tech set-up like "Elvis" (the RAC's 12" Meade LX200, but it gets the job done to where I am working on my 6th and 7th observing certificates from the Astronomical League.

There are two ways to look at how expensive a telescope is. One is straight cash and the other way is how much time and enjoyment you get out of your scope, and not just your telescope, astronomy fans, but all your astronomy gear.

I had always wanted a Schmidt-Cassegrain, ever since the days I went to Bemidji State University after I got out of the Marine Corps. I had a nice little Jason refractor that I had worked for during my high school days and thought that was a good telescope until I got my first look through a Celestron 8" SCT that Bemidji's Astronomy department had. Wow! I can still recall the thrill of looking through that for the first time. It was one of those classic short orange tubes that are collectors items these days.

I kept my little Jason refractor and got good use out of it, but always dreamed of getting an SCT. Somehow the right opportunity never came up, but my longing became greater after the comet Shoemaker-Levy 9 hit Jupiter. My longing turned to resolve after the great Comets Hayakutake and Hale-Bopp made their way through our solar system in the late 1990's. I knew I was missing out on some serious events in astronomy.

Then a dark cloud with a silver lining came my way. I have been planting trees since 1983 and am well regarded by the Houston County DNR for my work. They have a lot of wealthy land owning clients who need forestry work done and my name gets mentioned a lot, especially when it involves the hand planting of trees. One guy that I met, and like a lot, is a lawyer in Houston County who is a terrific guy with one bad flaw. He forgets to pay you promptly after you do work for him, and I'm not the only one that this has happened to. You WILL get paid eventually, but in this case it took a year and a half and three heartfelt letters on my part to get the money. In fact it took so long that my lovely wife Betty had forgotten about it and when the check finally came, she just handed me the letter and said, "Here, this is for you."

I took a look at the return address and knew right away what it was, a check for $650. I thought, "It's now or never, baby!" So I used that check, sold my 70mm Meade GoTo that I had for $200 and scraped together another $150 from bartending at the Legion to send away for my telescope. It got to me on October 29th, 2002.

When I got it I remember thinking, "Wow!" It was all shiny and new and I was thrilled.

Betty didn't share my excitement, "You're not going to get any more telescopes are you?" "Oh no, honey, this is it!"

As they say, the Road to Hell is paved with good intentions. I just loved my new scope and looking through it brought back all those memories from college. The star clusters M37, M36 and M38 in Auriga looked just like the photographs in Burnham's Celestial Handbook. It was shortly after this that my reawakening in astronomy took another good turn by joining the Rochester Astronomy Club.

Going to club meetings and star parties was just icing on the cake, plus getting to meet and become friends with so many nice people! One of the best is now my old buddy Duane Deal. Looking over his astronomy gear is like being a kid in a candy store on the week before Christmas. "Hey, Dean! Check this new eyepiece out.", or "Take a look at what this looks like through an OIII filter." The first time Duane whipped out his laser pointer I was floored. A guy has to have one of those, doesn't he? How about an adjustable chair so your back doesn't get sore?

Duane has more gadgets than Maxwell Smart and James Bond put together and over the years I've bought a lot of stuff through him and have always gotten a great "Duane deal".

I did end up buying another telescope, a 4.5" Celestron Newtonian, but I almost had to buy that one. The lady didn't understand the equatorial mount and hated to go outside in the cold and practically gave it to me. I got a $700 scope for $200. Betty didn't mind, by now she had gotten used to my intense interest in our hobby and even reads my observing journals from time to time.

I always journal my observations, and after I started my search for the Astronomical League double star list, I knew that a tracking mount was essential if I was going to make progress on getting observing certificates. Once again, Duane came through for me and sold me an Orion SkyView Pro equatorial tracking mount for a ridiculously low price. Every night I'm out there tracking down some obscure faint fuzzy and am busy drawing it into my journals, I thank the Good Lord for sending Duane my way.

You should always take the time to look through other peoples gear at star parties. See what trips their trigger about astronomy and what they use to observe. I haven't met a single person yet who isn't very accommodating and willing to share what they know about the

night sky. There is an amazing amount of stuff out there and you'll often run across something that will make sense for you to get.

It might be something as simple as a new finder scope. The one on my 4.5" Newtonian was comparable to something you'd get out of a box of cereal. I looked through a 9 x 50 finder scope at a star party and had to have one. I got that through Binoculars.com ($300) and put it on my Celestron G8. The Newtonian got the G8's original 6X30 and the trash can got the one the Newtonian came with.

Another *must* that I had to have was to go to a 2" star diagonal and eyepiece system. It lets in a lot more light than the standard inch and a quarter setup that my G8 came with and I am very happy with it. My scope can handle higher magnification much easier now. It wasn't cheap to switch, but it was well worth it.

I figure that with telescopes, binoculars, eyepieces, filters, books, charts and other accessories, that I have about $3000 in astronomical gear. If I broke that down by the hour, what would it come to? I found an easy way to figure that out when I crossed the thousand hour mark of observing on September 19th of this year. That's three bucks an hour, astronomy fans. Another 500 hours and I'll have it down to the price of a beer at the Legion.

With all the stuff that I've got, if the Star Nazis came to my house and took away everything except for one item, my most valuable possession is my journals. It is the proof of what I have seen, who I have spent time under the stars with and the record of my journey in astronomy. Those journals are treated with tender loving care at home and are the source of entertainment on many a cloudy cold winter night. When I am out observing they go through everything I do and sometimes have quite the story to tell.

What's next to buy? If I wanted to get everything I wanted, it would take more than I've already spent. How about a Coronado PST for when I go after the Astronomical League's Sun-spotter's Award? A Mac laptop computer for when I go after the Planetary Nebula certificate? (Duane's working on that one!) Maybe a 16" Meade Lightbridge if I ever get to the Arp Galaxy Cluster hunt? But the very next item I'm saving my pennies for is a 13mm Tele Vue Ethos 2" eyepiece. From everything I've read and heard they are the eyepiece to get, and they're only $620! (Psssst, don't tell Betty!)

RAC

Advice for Beginners

By Duane Deal

1) Get to a star party! This is where you will find out what observing is all about. If the sky is clear and dark, you'll find out if the magic is there for you.

2) Try out some binoculars. You won't see as much detail in objects, you will however experience the fun of finding them. Start with a star chart (like *Sky & Telescopes Pocket Sky Atlas* or similar chart) and a good list of binocular objects to find (M2, M3, M13, M31, M34, M36, M37, M38, M42, M44, M45...). Don't let yourself get frustrated if you can't find these objects. If you do this while attending a star party, an experienced observer can walk you through the process. With a little help, you'll be bagging objects quickly.

3) If you like the experience you've had up to this point, it's time to consider your own scope. Some people buy a brand new scope, others option for a used scope. My advice, don't spend a lot on your first scope. In fact, I recommend a used Dobsonian. This is the least expensive scope for the aperture (size of the opening that captures light). Saving some money on the scope allows you to spend extra on important accessories.

4) Good scopes are too often hampered by bad accessories. If the mount is bad, you will have trouble aiming it. If the finder is bad, you'll have trouble locating what your looking for. If your focuser doesn't move smoothly, you'll find it difficulty reaching the focal point. If your eyepieces are bad, you won't see objects clearly once you do reach focus. If you're not comfortable while viewing, you won't take the time to really appreciate them. Once you buy a scope, don't be afraid to splurge on a good finder scope, a couple good eyepieces and an adjustable chair. These items will improve your scope and observations, and you'll keep these tools to use with all your future scopes.

Your scope becomes your personality under a starry sky. The type of scope you get, the mount it is on, the accessories you use, are all a part of your astronomy experience.

Don't Blink Or You'll Miss *Saggittarius!*

By Randy Shekeruk

Okay! I may be exaggerating a bit!

However, it seems so true for us people living as far north as The Land Of Ten Thousand Lakes!

The fact is that Sagittarius is the southern most zodiacal constellation and is out in the sky for no more than eight hours here in SE Minnesota (daylight and nighttime hours combined). In fact, Sagittarius is not even visible, or just partially visible in the far northern regions of the world, such as Alaska.

The best time to view Sagittarius is in the summertime when it is basically out all night in the southern part of the sky. At the start of summer, Sagittarius was coming into view in the southeastern part of the sky when I would get home from work at 11:30 PM. Though at the end of summer, Sagittarius was already fading off in the southwest at that same time.

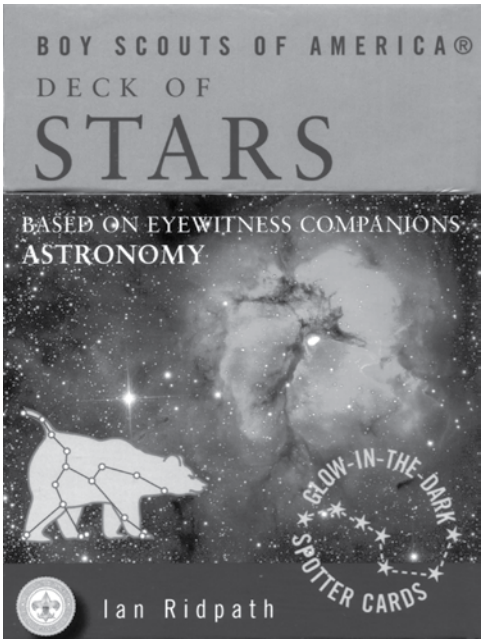
When Sagittarius is out though, what a sight it is to look at with your naked eyes! And it is my favorite constellation in the sky as well as my astrological sign! There are times when the Sun, Moon, and Planets trickle through Sagittarius. This last summer, it was Jupiter's turn to do so. Although, the Moon does it monthly, and the Sun does it yearly. But if you are one of those people who dread winter, Sagittarius is not a good constellation for the Sun to be near. Sagittarius is also a great constellation if you love deep sky objects such as nebulas and star clusters. Sagittarius has many of those around!

Below, is a picture I took of the constellation Sagittarius with bright Jupiter nearby. Enjoy! RAC

Here is a 16 second exposure I took of Sagittarius, a teapot with the handle on the left, the lid on top, and the spout on the right watering my maple tree in my front yard. To the upper left is the bright planet of Jupiter which is shining just below the teaspoon.

Boy Scouts of America Deck of Stars

By Duane Deal



People in the club have talked about finding an astronomy related deck of cards, but the decks of cards I've seen up to this point have been limited. One of the most popular decks has hand drawn art of each constellation's representative figure and holes punched in where the major stars are. My rating of that particular deck is low, as is their usefulness. I doubt anybody could find anything in the sky based on the information those cards contain. Another deck I've seen recently has a pretty good diagram of constellation asterisms and their major stars, but still lacked in useful information. One step closer, but still more of a desk trinket.

Tonight I purchased the Boy Scouts of America Deck of Stars, and was rather impressed, especially considering the limited space a 3.75" x 5.5" card has. The constellation charts are beautifully done in color and easy to read. The charts include stars down to magnitude 6.5, and all stars brighter than magnitude 5 are labeled. Each chart includes the bright objects located within the constellations boarders. These include: open clusters, globular clusters, diffuse nebula, planetary nebula, supernova remnants and galaxies. Even a black hole or two gets charted, which I think is a bit silly.

The chart shows both the asterism and the constellation boundaries, something often missing from cards of this type. In addition, the stars of the asterism are painted with glow in the dark ink, so night sky observers could try to locate the real stars with the aid of these phosphorescent helpers.

The back has a short and sweet description of the constellation, followed by a photo of a prominent object within its borders. Several features of interest are also added, which may include a special star (variable or other), a binary star, or a particular stand out Messier or NGC objects.

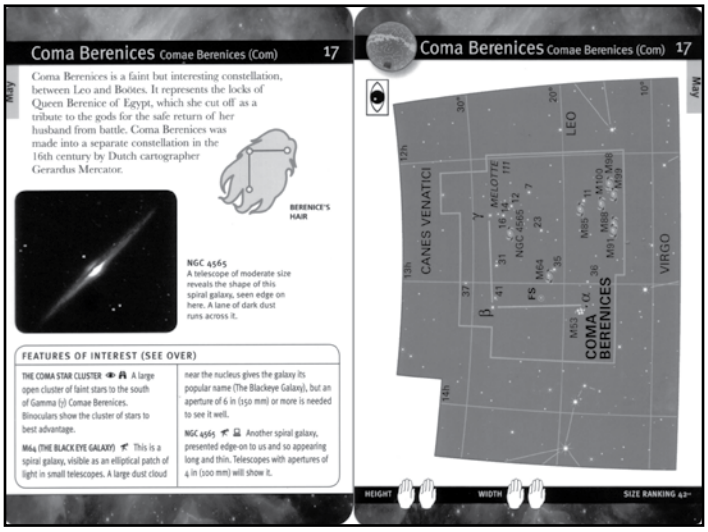
These cards beat all others for all the points mentioned, but suffer a major shortcoming. They only contain 42 constellations. It's not even so bad that they eliminated most southern constellations, but they came to the conclusion to eliminated others for no apparent reason. For instance, they include Vulpecula but exclude Sagitta. Same is also true of Corvus (included) and Crater (excluded). Did they draw some line regarding which constellations were more interesting? In that case, Scorpius should be included but isn't. It is a bit southerly, but not much more so than Sagittarius or Ophiuchus which are both included. All told, there are about a dozen absent constellations that should've been included.

In their place, the deck includes some additional fold outs that contain very basic information. Some of the information may be useful to a novice observer and is well done considering the limited space. An example of this is a depiction of the difference between what one could see in a 3" scope as apposed to a 12" scope. The ambitious task of explaining astrophotography in such a limited space should have been left out. That information could and should fill a book and the vacated space used to include the missing constellations.

The quality of the cards is very good, capable of standing up to the environment of a dark sky. The sturdy protective box they come in would even stand up to a grueling hike in a backpack.

Even with the glaring issue of not playing with a full deck, I have to give the cards my recommendation as they are very well done and have a wealth of information. If you know somebody who would benefit from a constellation deck, or would just like to have a set for yourself, they are more than justifiable at $9.99.

RAC



a SHOT in the Dark

By Duane Deal

Having floated peacefully through our solar system, by whatever the odds may be, a small meteoroid crosses Earth. The journey seemingly eternal as the stone surreptitiously approached the blue planet. Energy from the rock's amazing velocity had been negligible until finally closing on and plummeting into the resistant atmosphere. Zipping through the exosphere and thermosphere like nothing, a view from the meteoroid showing what was a pale blue dot, become a blue disk, and then instantly become a 360 degree horizon that encompasses the particle like a colossal speeding whale engulfing a microscopic plankton. Ramming against the mesosphere, thin air around the body becomes compressed, super-heating into a luminous plasma, which in turn heats the meteor, searing it. The sheer ripping of air molecules and a sudden burst of shock wave sending a thunderous rumble through what gasses exist high above the Earth. A fantastic sound hurled in all directions, but appreciated as much as a tree falling in a forest with nobody around.

Journeying through space for unknown years and miles, and in a short 10 to 50 miles, in less than a handful of seconds, the particle vaporizes in dazzling light. The epitaph of the small body is a vapor trail glowing like the path of a Disney wand waved across the sky; only for a moment, and all fades.

Meteōros, the Greek word meaning high in the air, is an eye-catching spectacle that all who see are drawn to exclamation. Common enough that most children have wished upon one; yet rare enough that the excitement while seeing one never fades.

Meteor events typically take place in the mesosphere, 50-90km above the Earth's surface. Temperatures here drop as low as -100°C. This is far above any flying aircraft and below any orbiting craft. Scientists know less about the mesosphere than any other layer of Earth's atmosphere, often calling it the ignorosphere. A cold and lonely place, the only company a meteor has here is a rare noctilucent cloud.

At the Rochester Astronomy Club's first annual StarBQ, the sky put on a fantastic meteor show, including several fireballs and one bolide. A fireball is a meteor that shines at magnitude -4 or greater, outshining the brightest planets in our sky. The brightest fireballs are called bolides. Although lacking a specified definition, a meteor that explodes is always referred to as a bolide.

The first of two bolides I've seen was at Eagle Bluff. Dean Johnson and I were star gazing into the wee hours. At this particular moment, he was at the tree line doing the wee part, I was gazing at the south, south-west sky. It was bright enough to make me stand and give a more grand exclamation than any normal meteor deserves. Dean, facing the opposite direction, saw the reflected light and shadows cast from it. I remember when the fireball ended abruptly in an even greater flash, the excitement filled me with an insatiable urge to catch these events as often as possible. I continue to look up whenever the night sky sparkles above my head.

Meteors can be evasive. Any given hour may display one or two, but how long can one keep their eye's peeled? When will I see a meteor strike? The answers lie in knowing when meteors *will* strike.

Meteor showers happen all the time. According to http://meteorshowersonline.com, there are 99 meteor showers! However, most of these are minor showers, meaning that there may be only a few extra meteors every hour. Meteor showers can span as long as an entire month but peak on a specific night and even at a particular time. Meteor showers do overlap and on a given night you could see meteors from many showers.

There are eight major showers. A major shower can have dozens of meteors per hour or more. If you want to see meteors, catch a major shower at its' peak, sometime between midnight and sunrise. 2:00AM to 3:00AM has always been my best meteor observing times. This is when you can sit on the face of the Earth heading into the shower and yet remain out of dawn's glow.

Meteors are best viewed from a dark sky. Catch a meteor shower near new moon or when the Moon sets earlier than the showers active period. If you can get away from light pollution you'll be able to

enjoy more of the faint meteors.

Plan ahead for major meteor showers. If you wait for the perfect shower, say a Friday night during a new Moon on a warm summer night, you may be waiting for years. When that day does come, it has a pretty good chance of being cloudy. My advice is to alter your life to intercept the meteor rather than the other way around.

2009 has some opportunities to behold meteors. The first opportunity is on the Sunday morning of January 4th when the Quadrantids streak across the sky at 25.5 miles per second. The Moon sets at about 1:30AM, so it will be a cold and sleep deprived night. Dress warm and find a way to observe comfortably, if possible.

Wednesday morning, April 22nd will bring the Lyrids streaking the sky at 29.8 miles per second, leaving wonderful vapor trails. Temperatures should be more comfortable but you may want to take the day off of work to see them. The Moon is well out of the way and if it's clear, this shower will be worth a day of vacation.

Another Wednesday morning on July 29th, the Delta Aquarids will light up the sky. The Moon sets before 11:00PM leaving the sky dark and hopefully clear. If the weather is predictable, this should be the most comfortable meteor shower of the year.

Then it gets cold and interesting. The Orionids on October 22nd (Thursday morning), the Leonids on November 18th (Wednesday morning), and the Geminids on December 14th (Monday morning) will all be Moonless showers. The Orionids are famous for fireballs and the Leonids for high numbers and 33 year interval meteor storms. The Geminids are known for not only being the most reliable meteor shower with high frequency meteors, but also for multi-colored meteors (65% white, 26% yellow and 9% blue, red and green).

Don't miss the opportunity to see a meteor shower and possibly a brilliant fireball. Get together with friends and enjoy the night sky in good company. Staying awake at night alone is difficult. Kirk Severson and I were out twice this past year and both times we fell asleep under a cold sky. We woke up in the Gamehaven Scout Reservation parking lot in such a haze we couldn't see 10 feet. Kirk said, "I've woken up in a fog before, but this is ridiculous."

When you do decide to observe a meteor shower, bring whatever it takes to enjoy the stay. All the chairs and coolers full of beverages people bring to see a one hour fireworks display will also be required to view meteors for an evening. In addition, dress appropriately for the weather. A sleeping bag and a pillow is a good idea. You'll be looking up for quite a while and that is most easily done laying down.

Observing meteors on a regular basis can be a hobby in itself. At the International Meteor Organization (http://www.imo.net), you'll find all of the resources needed to make, record and submit observations. These observations can lead to furthering the understanding of meteor showers. RAC

Major Showers

Shower Name	Date Range	Peak Range
Quadrantids	Dec 28-Jan 7	Jan 3/4
Lyrids	Apr 16-25	Apr 22
Eta Aquarids	Apr 21-May 12	May 5/6
June Lyrids	Jun 10-21	Jun 15/16
Southern Delta Aquarids	Jul 14-Aug 18	Jul 28/29
Perseids	Jul 23-Aug 22	Aug 12/13
Orionids	Oct 15-29	Oct 21
Leonids	Nov 13-20	Nov 17/18
Geminids	Dec 6-19	Dec 13/14

Minor Showers

Shower Name	Date Range	Peak Range
Zeta Aurigids	Dec 11-Jan 21	Dec 31/Jan 1
January Boötids	Jan 9-18	Jan 16-18
Delta Cancrids	Dec 14-Feb 14	Jan 17
Canids	Jan 13-30	Jan 24/25
Eta Carinids	Jan 14-27	Jan 21/22
Eta Craterids	Jan 11-22	Jan 16/17
January Draconids	Jan 10-24	Jan 13-16
Rho Geminids	Dec 28-Jan 28	Jan 8/9
Alpha Hydrids	Jan 15-30	Jan 20/21
Alpha Leonids	Jan 13-Feb 13	Jan 24-31
Gamma Velids	Jan 1-17	Jan 5-8
Aurigids	Jan 31-Feb 23	Feb 5-10
Alpha Centaurids	Feb 2-25	Feb 8/9
Beta Centaurids	Feb 2-25	Feb 8/9
Delta Leonids (DLE)	Feb 5-Mar 19	Feb 22/23
Sigma Leonids	Feb 9-Mar 13	Feb 25/26
Eta Draconids	Mar 22-Apr 8	Mar 29-31
Beta Leonids	Feb 14-Apr 25	Mar 19-21
Rho Leonids	Feb 13-Mar 13	Mar 1-4
Leonids-Ursids	Mar 18-Apr 7	Mar 10/11
Delta Mensids	Mar 14-21	Mar 18/19
Gamma Normids	Mar 11-21	Mar 16/17
Eta Virginids	Feb 24-Mar 27	Mar 18/19
Pi Virginids	Feb 13-April 8	Mar 3-9
Theta Virginids	Mar 10-Apr 21	Mar 20/21
Tau Draconids	Mar 13-Apr 17	Mar 31-Apr 2
Librids	Mar 11-May 5	Apr 17/18
Delta Pavonids	Mar 21-Apr 8	Apr 5/6
Pi Puppids	Apr 18-25	Apr 23/24
April Ursids	Mar 18-May 9	Apr 19/20
Alpha Virginids	Mar 10-May 6	Apr 7-18
April Virginids	Apr 1-16	Apr 7/8
Gamma Virginids	Apr 5-21	Apr 14/15
Epsilon Aquilids	May 4-27	May 17/18
May Librids	May 1-9	May 6/7
Eta Lyrids	May 3-12	May 8-10
Northern May Ophiuchids	Apr 8-Jun 16	May 18/19
Southern May Ophiuchids	Apr 21-Jun 4	May 13-18
June Aquilids	Jun 2-Jul 2	Jun 16/17
June Boötids	Jun 27-July 5	Jun 28/29
Corvids	Jun 25-July 3	Jun 27/28
Tau Herculids	May 19-Jun 19	Jun 9/10
Ophiuchids	May 19-July 2	Jun 20/21
Theta Ophiuchids	May 21-Jun 16	Jun 10/11
Sagittariids	Jun 10-16	Jun 10/11
Phi Sagittariids	Jun 1-Jul 15	Jun 18/19
Chi Scorpiids	May 6-Jul 2	May 28-Jun 5
Omega Scorpiids	May 19-Jul 11	Jun 3-6
June Scutids	Jun 2-Jul 29	Jun 27/28
Alpha Lyrids	Jul 9-20	Jul 14/15
July Phoenicids	Jul 9-17	Jul 14/15
Alpha Pisces Australids	Jul 16-Aug 13	Jul 30/31
Sigma Capricornids	Jun 18-Jul 30	Jul 10-20
Tau Capricornids	Jun 2?-Jul 29	Jul 12/13
Omicron Draconids	Jul 6-28	Jul 17/18
Northern Iota Aquarids	Aug 11-Sep 10	Aug 25/26
Southern Iota Aquarids	Jul 1-Sep 18	Aug 6/7
Alpha Capricornids	Jul 15-Sep 11	Aug 1/2
Northern Delta Aquarids	Jul 16-Sep 10	Aug 13/14
Kappa Cygnids	Jul 26-Sep 1	Aug 18
Gamma Aquarids	Sep 1-14	Sep 7/8
Aries-Triangulids	Sep 5?-15?	Sep 11/12
Alpha Aurigids	Aug 25-Sep 6	Sep 1/2
Eta Draconids	Aug 28-Sep 23	Sep 12/13
Gamma Piscids	Aug 26-Oct 22	Sep 23/24
Southern Piscids	Aug 12-Oct 7	Sep 11-20
Arietids	Sep 7-Oct 27	Oct 8/9
Delta Aurigids	Sep 22-Oct 23	Oct 6-15
Eta Cetids	Sep 20-Nov 2	Oct 1-5
October Cetids	Sep 8?-Oct 30?	Oct 5/6
October Cygnids	Sep 22-Oct 11	Oct 4-9
Draconids (GIA)	Oct 6-10	Oct 9/10
Epsilon Geminids (EGE)	Oct 10-27	Oct 18/19
Northern Piscids	Oct 5-16	Oct 12/13
Northern Taurids (NTA)	Oct 12-Dec 2	Nov 4-7
Southern Taurids (STA)	Sep 17-Nov 27	Oct 30-Nov 7
Andromedids	Sep 25-Dec 6	Nov 14/15
Alpha Monocerotids	Nov 13-Dec 2	Nov 21
Alpha Pegasids	Oct 29?-Nov 17?	Nov 1-12
Ursids	Dec 17-25	Dec 22
Delta Arietids	Dec 8-Jan 2	Dec 8/9
11 Canis Minorids	Dec 4-15	Dec 10/11
Coma Berenicids	Dec 8-Jan 23	Dec 18-Jan 6
Sigma Hydrids	Dec 4-15	Dec 11/12
December Monocerotids	Nov 9-Dec 18	Dec 11/12
Northern Chi Orionids	Nov 16-Dec 16	Dec 10/11
Southern Chi Orionids	Dec 2-18	Dec 10/11
Phoenicids	Nov 29-Dec 9	Dec 5/6
Alpha Puppids	Nov 17-Dec 9	Dec 2-5

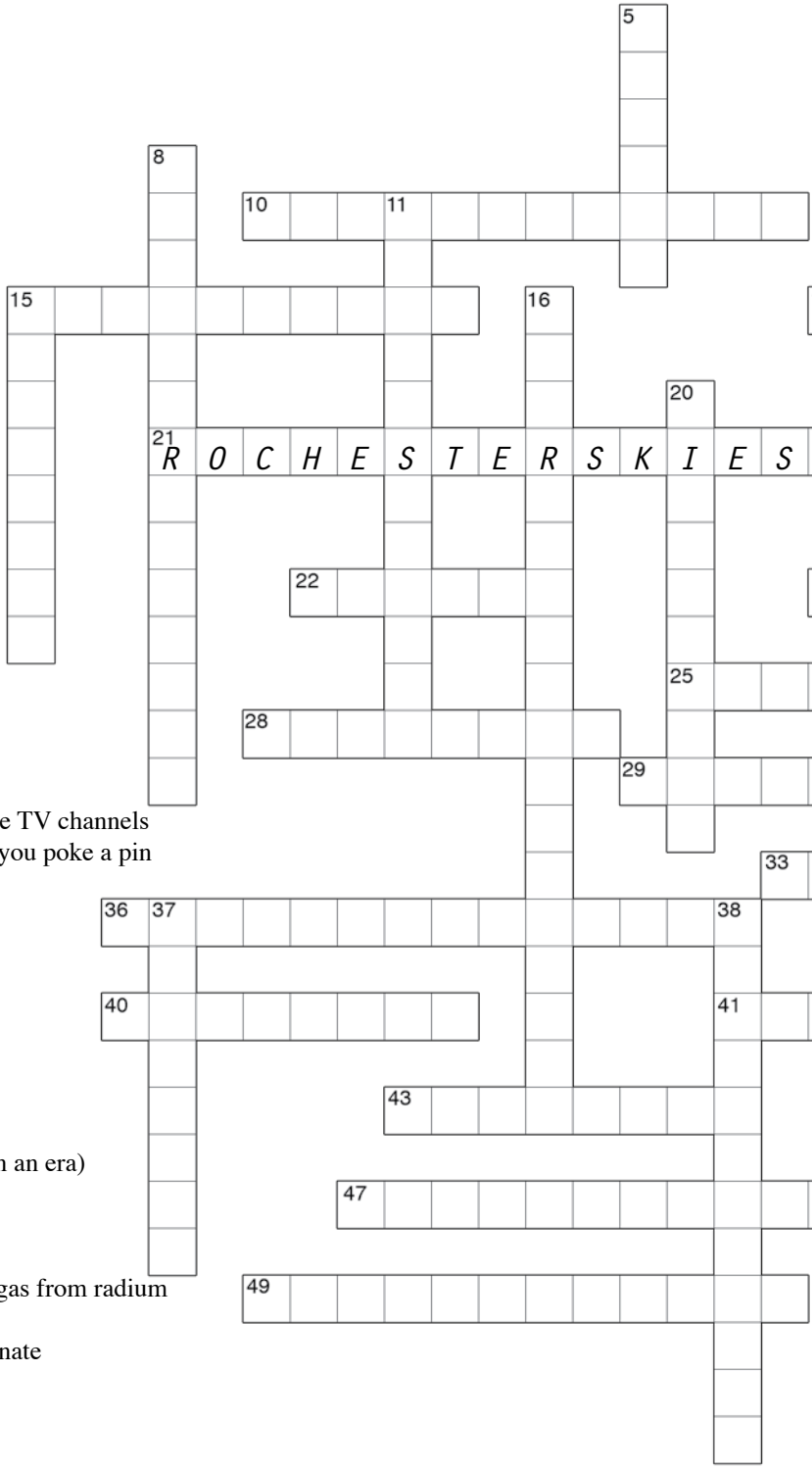
Draco Mars War Song

Two Answers

Each answer is two answers, the

Across

4. darker shadow of the Earth during lunar eclipse/latin dance
6. serpiginous constellation south of cancer/robust
7. lunar sea (Latin)/500 sheets of paper
9. Orion is hunting this animal/rhythmical beating
10. 12th sign of the Zodiac/aromatic seasonings
12. one of the stars in the summer triangle/ l_____ at the office
15. author "Around the World in 80 Days"/not ever
17. 3rd letter of Greek alphabet/molten rock
19. vast cloud of gas and dust in interstellar space/ can not do
21. our web address name/one less than 4 score-smooch
22. the Lion/ he is married to Lena
23. symbol for the cosmological constant/mother with no hair
24. lunar (marsh of sleep)/best grade you can get
25. constellation between Pisces and Taurus/to lift up
26. dark blotch on the Sun/what drano does to your sink
28. 4th rock from the Sun/what Venus de Milo is missing
29. Epsilon Pegasi/not coarse
30. 2nd full moon in a month/grease the car
31. red supergiant in the "Square"/celibate
33. we "speed on" to this/gel used in cooking
35. small weaker tide of minimal range/back of neck
36. Joe Butterfield's topic/in the presence of oxygen
40. 2nd letter of Greek alphabet/ to aid
41. 2003 VB12/belonging to Mr. Star-B-Q
42. another star in the summer triangle/cowboy rope
43. satellite/not stereo
44. one of the naked eye double stars/these reefs are disappearing
45. the $E=MC^2$ guy/numbers 90 to 99
47. two stars revolving around each other/very smart
48. Upsilon Scorpii/they are used to turn wood
49. when a meteoroid enters the Earth's atmosphere/used to change TV channels
50. planet's orbit at most distant from the Sun/what you get when you poke a pin through a piece of paper



Down

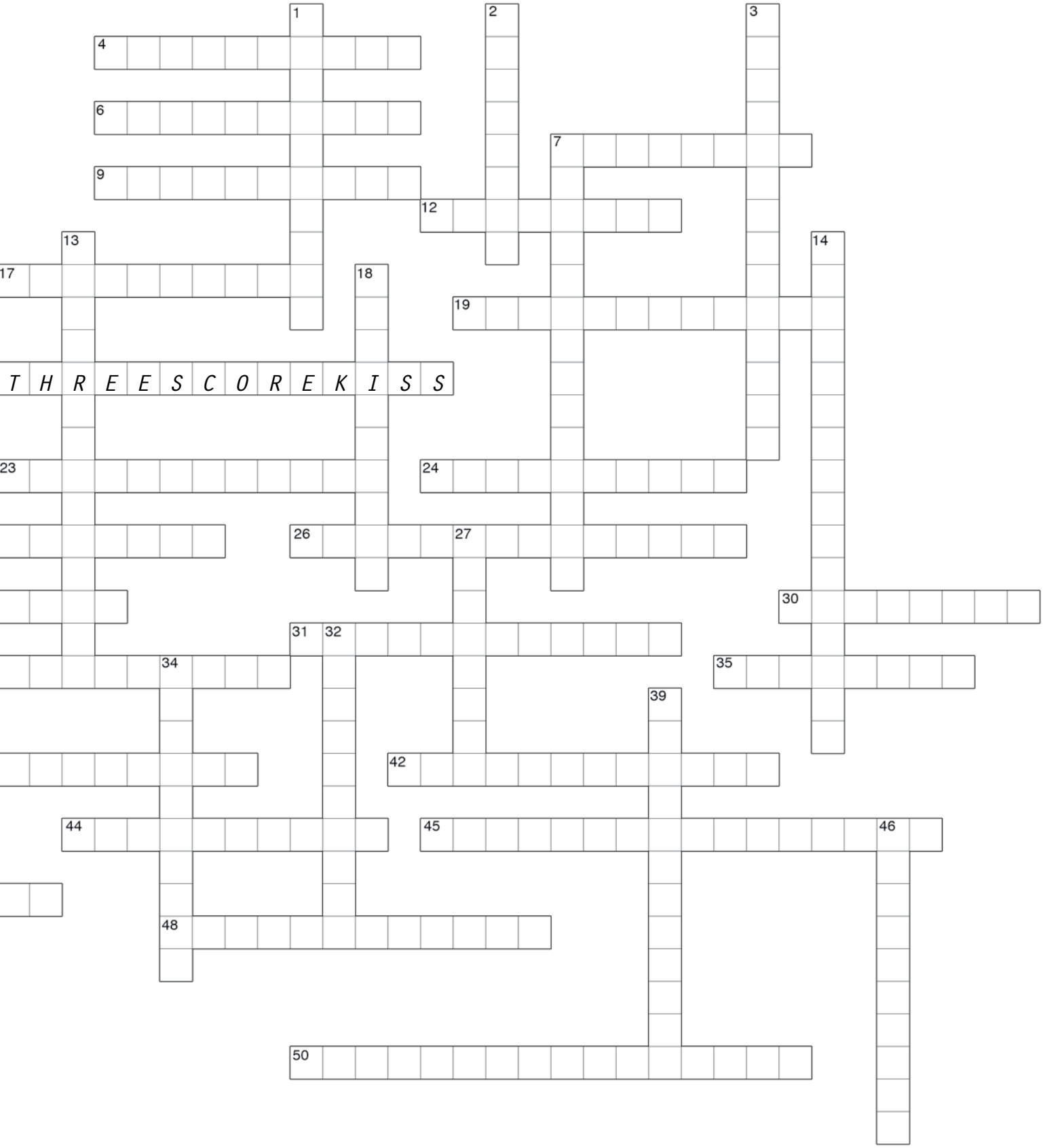
1. relating to the Moon/relating to forearm bone
2. "Crane" constellation/decorative floor coverings
3. colossal genesis explosion/idle talking
5. International Space Station/Female bro
7. lunar impact crater SE of Tycho Crater/pleasantly entertaining
8. measure of sunspot activity cycles (E.Walter)/without guns
11. Egyptian king, 2700 BC/an extended period of time (more than an era)
13. 15th letter of Greek alphabet/stupid
14. Seven daughters of Atlas/Duane's pumpkin dessert
15. the "Ship's Sail" constellation/latin "to wash"
16. only naked eye galaxy in northern hemisphere/produced inert gas from radium
18. Delta Herculii/when it _____ it pours
20. only moon in the solar system with dense atmosphere/contaminate
27. Dutch astronomer/part of a tree underground
32. amulet/month of vernal equinox
34. relating to the Sun/verbal tests
37. moon of Saturn discovered by Giovanni Cassini/ rabbit
38. twin of Pollux/theatrical performers
39. outermost atmosphere of the Sun/small mammal with "masked" eyes
46. our global body/this organ pumps blood

/ Anagram Crossword

/ Stars We Won

By Rebecca Bomgaars

second an anagram of the first. Enjoy!



Answers will be posted on www.rochesterskies.org/forums under publications/newsletter/RSNL Q3 08

THE LUNAR 100

(or how I learned to love the Moon, and finally quit underestimating it!)

By Dean Johnson

Photo by Scott Regener

The Moon. What can you say about it that hasn't already been said? Plenty, if you are an amateur astronomer tackling the Astronomical League's Lunar Club target list. And once I finished the Lunar 100, I learned what a humbling and wonderful experience it can be.

The Moon is a constant presence in astronomy. Even when it is not in the sky at New Moon, most of us stargazers are busy planning star parties and personal viewing sessions. That is a deep sky observers favorite time of the month. Even from four days prior and after New Moon, the light from our nearest neighbor has very little effect on deep sky objects.

The time around First and Last quarter Moon are favored by astronomers going after outreach events. The big, showy lunar surface, made ever so more dramatic by the stark boundary of the Moon's terminator, shows the difference between daylight and darkness and gives its features a 3D effect. Only Saturn gets as many "Wow's!" as the Moon. There's also plenty of time after the Moon's setting at First Quarter, and before the Moon rises at Last Quarter to get some decent dark sky observing in.

And then we have the Full Moon. Brilliant in the night sky, favorite object of lovers and wintertime coyote hunters, to astronomers it is usually as welcome as a full Moon to a werewolf. It's a good time to leave the scope in the house and find an astronomy conference somewhere.

After I finished my Double Star search, I knew I needed a new challenge. At the Rochester Astronomy Club's 2006 Christmas party, I set my sights on the Herschel 400 list. However, I realized if this was the only observing goal I pursued, it would limit me to dark sky observing only. Going after the Lunar 100 would be a good compliment to it. Double stars can be pursued in partial to strong moonlight, and going after the features on the Moon would give me an even better chance to rack up a lot of telescope time.

I started my Lunar 100 quest on December 26th, 2006. The first time out I recorded nine targets – Mare Crisium, Aristoteles and Eudoxus, Mare Serenitatus, Theophilus, Cyrillus and Catharina, Maurolycus and Stoffler. I wrote down in my journal: "Nine down in my 1st attempt at the Lunar 100. Not bad." I thought it was going to be a piece of cake. How wrong I was.

The winter of 2006-2007 wasn't as bad as the winter of 07-08. I had several subsequent observations of the Moon, but did not record any more targets. February of 07 the weather turned bad and I didn't get out again until the Lunar eclipse of March 3rd, 2007. That was when the Moon rose in the east fully eclipsed on a very cold late winter evening. It revived my interest in the Moon which up until then I had been mostly ambivalent about.

My second Lunar 100 targets were recorded on 3-22-07 when I journaled craters Petavius, Funerius, Wrottesley, Snellius, and Stevinus. That was four more objects in one session and only reinforced my sanguine attitude about the Lunar 100. That was also the night I started in on my Binocular Messier hunt, and while very fun to do, it proved to be another distraction from the Moon.

I recorded two more L-100's in April and then didn't get any more done until late August, even though I viewed the Moon on several occasions, including the second lunar eclipse of the year on the morning of August 28, 2007. On July 6th at 12:10 a.m. I witnessed the Moon rise, and even drew a pretty fair sized drawing of it. I wrote, "It is very lovely, but I didn't want it to come up so soon, Oh well." I still wasn't taking the Moon seriously, but that was about to change.

In late August and September of 07, the Oakes Forestry boys went up to Meeker County in west central Minnesota to tackle the 90 Acre Buckthorn Job From Hell. During the day we tore into a buckthorn jungle and in the evening I watched camp while the others went fishing and got ready for observing. After supper we'd listen to the Twins games around the campfire, but as soon as it got completely dark, I'd head off to the baseball field across from Lake Koronis campground and

set up in straightaway center field.

It is amazing how dark the sky is there. There is one light pole with two lights, but they didn't work! (Amazing! I wish the three streetlights around my house would learn how to do that.) The campground across the highway had one streetlight, but was largely blocked out by trees and too far away to interfere. The highway had very little traffic. It was beautiful. I had that ball field all to myself.

Lots of Binocular Deep Sky objects were recorded there, and since we were up there for nearly a month, there wasn't much to do except concentrate on the Moon when it was up in the sky. I started to really study the Moon, and learn what I was looking at. I marveled at crater Eratosthenes at the end of Montes Appenines on the southern end of Mare Imbrium. Eratosthenes was the Greek who lived in Egypt who attempted to measure the circumference of the Earth. He came very close to its true value and he has a splendid crater on the Moon.

I used Antonin Rukl's Atlas of the Moon. I found it invaluable for finding my targets. One of the best things about it is that it not only tells you the names of the features you're looking at, it tells you who they were named for and what those people did on planet Earth. As I went down the Lunar 100 list, I looked up each and every one and it gave me a deeper understanding of the Moon, and how many astronomers in history contributed to our knowledge about it. The Moon started to become a lot more interesting place.

We finally got that 90 acre job done and we returned home to our homes in Houston County and me to my beloved Flatin Farm hay field. Little did I know that I would see the Lake Koronis ballfield again, but that's a story for another time. I was just happy to be home and while I got a few more of the Lunar 100 targets, another distraction was soon to come my way in the form of spectacular Comet Holmes.

When that comet grew to be the largest object in the solar system, along with the growing diameter of Mars at its last opposition, the Moon once again took a back burner until the Astronomical Winter of Discontent shut off the observing stove for two solid months, gave me one night in January, and then tacked on another month for good measure. It was with a good deal of chagrin that I confided in my old buddy Duane that while I had been at the Lunar 100 for over a year, I only had 38 targets to show for it.

Finally the weather cleared for the third Lunar Eclipse in less than a year on Feb. 20, 2008. Seeing the Moon darken in Leo between Regulus and Saturn was a real (cold) tonic even though it meant standing outside in 15F weather for nearly six hours. By March 10th, I was back on track and really buckled down, taking extra care in my observations and doing a lot better job on my drawings.

By April 18th, I had 73 of the Lunar 100 and even managed to rack up crater Schickard at the Jim and Gwen Plunkett Observatory during the RAC's trip to the 2008 NCRAL at Port Washington, Wisconsin. I enjoyed that as much as helping to make the map of a barred spiral galaxy out of empty beer bottles in the hallway of the hotel at 2 o'clock in the morning.

When I got home from the NCRAL trip, the sky of course was perfect, so I asked my lovely wife Betty if she minded if I went stargazing at the Flatin Farm. She looked at me like, "You've already spent the whole weekend at the astronomy conference, and now you want to go stargazing?!??" But she gave me her blessing and away I went.

I set up on the hay field I love so well as the Sun set, and twilight deepened. I had my Herschel 400 targets all picked out and figured I could get at least two before the Moon came up. But just as I was about to swing my scope to the constellation of Leo, the Moon rose big and beautiful on the eastern horizon.

I looked at it for a good long moment watching it rise and something wonderful took place. For the first

Dean recording his Lunar observations at the Jim & Gwen Plunkett Observatory during the NCRAL '08 trip. Phil Yehle standing by. Photo by Randy Hemann

time in my life I wasn't disappointed to see it come up and interfere with deep sky observing. I just took it in and switched from one observing list to another. That night since the Moon was just one day past Full I recorded some long neglected "easy stuff" and recorded the Man in the Moon, the Woman in the Moon, the Rabbit in the Moon, and the Cow Jumping over the Moon. The Woman in the Moon is the easiest thing to see for me in binoculars or a telescope. I also recorded four more craters and Promontorium Agarum on the edge of Mare Crisium. It was a glorious night for astronomy.

I think my favorite night of the Lunar 100 quest was the night of May 15th, 2008. I set up my scope on my deck of my house and recorded nine of the Lunar 100. Among the targets that night, I saw and studied the Clavius craterlets. This crater is named for the German astronomer and mathematician Chistoph Klau, described as "the Euclid of the 16th century." There is something very satisfying watching an arching chain of craters inside one of the biggest features on the Moon and knowing that your family is sleeping peacefully inside your house.

Vallis Schroteri was the last telescopic target I had to get on the Aristarchus plateau and I had to wait a whole month to get that because I got clouded out the first time I tried. Another valuable lesson; "Get 'em while you can, because if you don't, they won't come around again until the next Lunar cycle."

Three of the last four items on the list were the ones I thought would be the easiest. Cresent Moon Waning, New Moon in the Old Moons Arms and Crescent Moon Waxing. They are all Naked Eye Objects and I can't believe I left them for last. The morning I got Crescent Moon Waning was June 30th when the Moon rose just before dawn with the Pleiades right next to it. It was one of the most beautiful things I've ever seen in binoculars.

The last observation of the Lunar 100 was the evening of July 3rd, 2008 when I observed an 18 hour old Crescent Moon Waxing. It was as thin a crescent as I've ever seen and ironic to think I was finishing my Lunar 100 list with the start of a brand new lunar cycle.

I'll never look at the Moon the way I did in the past. I understand it a lot better now and get so much more enjoyment out of it. In fact, I liked it so much that I'm into the Lunar II program. If you pursue the Lunar 100 program, I recommend the Rukl atlas and Charles Woods book, The Modern Moon which deals with the processes that shaped the lunar surface.

I hope you get out there and enjoy our nearest neighbor in space. The Moon is as important and beautiful as anything in astronomy, and a very challenging object in its own way.

RAC

Rochester Skies Restaurant Review

By Duane Deal

If you're looking for a good restaurant, look no farther than Dean's Boxelder BBQ & Bistro. It's quite a large place, out of the way and yet easy to find. The sign work is beautiful and fitting for the evening decor.

Quite busy in the morning and afternoon, the Bistro is always comfortable and relaxing. The establishment has a great atmosphere, which is increasingly apparent as evening commences. Dark, clear and stable; one would have to travel 100s of miles to find its equal. The food was wonderful and nobody is left wanting.

Eggs and sausage in the morning, spiced just right. A range of food in the evening, including lamb, steak, hamburgers and more. Dean's specialty potatoes were wonderful. These were a baked potato with spices, butter and bacon; baked to perfection. Potato salad, bing cherries and brownies were a nice touch as well. Not recommended for most patrons, fresh gopher comes highly recommended for the feline variety. Hershel the cat gives it four paws up!

Dean's Boxelder BBQ & Bistro

In addition to the wonderful food, several varieties of beer and wine were available. Easy parking, great location, wonderful food and a panoramic natural view.

Dean's Boxelder Bistro would receive my highest rating of 5 stars, if it weren't for the fact that it already had over 6000 prominently displayed overhead, and no stars in this review could hold a standard candle to that.

The Rochester Astronomy Club's first annual

StarBQ

By Duane Deal

The winds of winter are upon us and yet memories of the Rochester Astronomy Club's first annual StarBQ conjures up hot days and summer nights. The event was so well received that afterwards attendees were already looking ahead and planning for next year.

Dean Johnson is my #1 observing partner and dear friend. There is no better host for the RAC's official star party than he. Dean's a big guy with large arms and hands. He was made for Timber Stand Improvement (TSI). If you can imagine a burly Norwegian lumberjack that says "Ya" a lot, you can imagine Dean. But that description is like viewing Orion without ever looking through a scope.

In general, amateur astronomers are the warmest, easiest going, friendliest people you could ever meet, but Dean outdistances them by a light year. Dean is about the American Legion where he also tends bar. As an ex-marine, there isn't a Veteran's Day parade in Spring Grove that Dean isn't part of. He's devoted to his friendly and pleasant wife Betty, well mannered son Matthew who is a great speller and pretty daughter Laura who makes a great StarBQ sign. Dean also teaches Sunday school at his church. It doesn't take long before you realize the love he has for his family and respect he has for God. I don't know a more well rounded individual. If I had to spend two years in a tin can on my way to Mars with another guy, I'd pick Dean. Dean somehow infused his personality right into the StarBQ, which was warm, easy going and friendly.

The party ensued on a Friday, with people showing up throughout the afternoon. Cars, scopes and tents were all lined up as the Sun crept lower.

Dinner kicked everything off under a large boxelder tree. Tables and chairs in the shade accommodated all. A giant grill served as the kitchen nearby, and large trash cans kept the place tidy. A port-a-potty was across the road within easy reach, but not too close to the eating arrangement. Dinner conversations trailed off with a worm orange glow from the setting Sun.

That is where the StarBQ mascot made himself known. Hershel the cat, a fuzzy gray tabby, preferred the dining area over all else. This cat was happy to have our company and let us know by serpentining around, purring.

With stomachs satisfied, everybody moved off to mingle among the scopes and prepare for an evening of night sky viewing. When darkness blanketed the sky, it was apparent why we ventured far enough south to leave Minnesota. It is hard to call it a dark sky with so much starlight. The horizon was low and stars went all the way down to meet it. I've never seen Sagittarius so highly suspended in the sky. In the opposite direction, *everything* was circumpolar. The sky looked as it should, vastly bigger than the Earth.

The line of equipment allowed everybody a great look at the Universe. The scopes were mostly Dobs and Schmidt Cassagrains, collectively

Photo by Kathrine Myrah

presenting a wonderful range of wide field of views and high magnification. The range of targets viewed is too vast to list, but the showpiece was Sagittarius. The southern constellation fully visible with all of its contents on display, including a denizen to the constellation, Jupiter.

The meteors were amazing that night. Not only were they common but they were uncommonly bright. Oooh and aaahhh was heard all evening long. To top these off, there were fireballs. These particular meteors cast shadows as they shot across the sky. There were times when I thought somebody had taken a flash photo behind me and then everybody would erupt in post fireball chatter. Even among these fireballs there was a crown jewel. A bolide which concluded in a bright pulse, signaling an abrupt, explosive ending.

Photo by Kathrine Myrah

Visitors came and went all evening. They'd stop briefly to look at the heavens and learn a bit about the universe, then they'd head on down the road. Enough people came by to call it a legitimate outreach event. Questions were flying and knowledge was flowing. Dean, with a memory like a steel trap, gushed with names, distances and speeds to objects all over the Universe. Observing with Dean is like observing with a living, breathing Norwegian Celestron Skyscout, "Ya."

The momentum of the sky carried everybody into the early morning and only then did the field fall silent to the sleep of astronomers. It seemed only moments later the Sun rose to present a comfortable day. At least half of the attendees headed back to a more earthly world, but the rest of us weren't done yet.

Breakfast under the boxelder was welcoming and then people went about their daily business. There was some reading, frisbee tossing, and discussions going on. Jerome Taubel and his son and daughter had brought their bows, which made for fun sport. Friendly visiting continued through lunch and dinner before the second night fell.

Saturday brought another wondrous night, with fewer people and more journaling. It was an opportunity to get a few hidden NGCs crossed off our lists. We spent hours hunting for objects, talking astronomy, tweaking equipment and enjoying each others company.

Somewhere in the dark, Hershel the cat started making a choking sound. We went looking to see what

was going on, even though none of us knew the feleinlich maneuver. We found him munching on some prey he had caught in the field. A gopher with undoubtedly no appreciation for astronomy. "Good cat Hershel!"

A distant storm brewed on the horizon. All evening it drew gradually closer. As the storm edged closer, a 2AM collective conclusion to pack up and head out was reached. Tents were being folded and equipment packed. It was then that the brightest meteor of the weekend ripped the sky. You didn't have to see the meteor to see the affect as it lit up the field like several vehicles high-beams. I was looking the opposite direction and saw the light from it cast everywhere. Jerome had his van lights on and still saw the light from the meteor clearly. It was a fantastic exclamation point to a wonderful event.

Many hands made quick work of packing and very quickly the field was returned to being a hay field. A convoy of tail lights headed northward up the road.

Photo by Kathrine Myrah

Those skies expect us back for the second annual RAC StarBQ on August 22nd, 2009. Jupiter will rise with Neptune near sunset, followed by Uranus. After 2:00AM, Mars will pop up in Taurus, with Orion making a good target before dawn.

Maybe Hershel will be back. Maybe we'll see fireballs fly again. I know one thing, I'll be going even if it were just Dean and I and a starry sky. However, I'm expecting more people, longer fireball trails and brighter stars. I hope to see you there!

RAC

Rochester Skies

Newsletter of the Rochester Astronomy Club

Club Meeting *International Year of Astronomy*	**Jan**	**13**	
Star Party *Observing at Eagle Bluff*	**Jan**	**23**	*
Club Meeting	**Feb**	**12**	
Star Party *Observing at Eagle Bluff*	**Feb**	**8**	*
Club Meeting	**Mar**	**10**	
Star Party *Observing at Eagle Bluff*	**Mar**	**27**	*
Club Meeting	**Apr**	**14**	
Star Party *Observing at Eagle Bluff*	**Apr**	**24**	*
Outreach *Int. Year of Astronomy at Mayo High School*			

*Events subject to change due to weather. Please check up-to-date resources for details.

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