A S T R O N O M Y

Rochester Skies

A publication of the Rochester Astronomy Club

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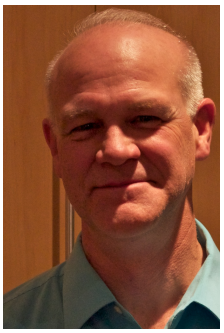
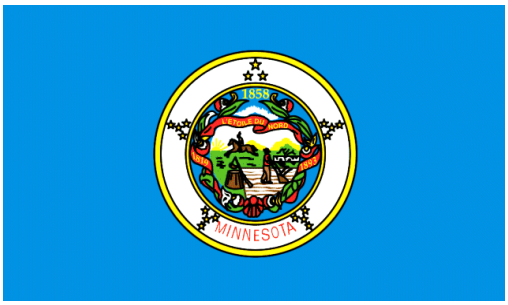


Star of the North

by President Randy Hemann



On the 11th of May,1858, Minnesota was admitted into the Union. Our state's nickname is the "North Star State." Our official state flag was adopted in 1893 and revised in 1957.

Twenty-one out of 50 state flags portray stars on them. Ten more of them actually portray our own star, the Sun. Most of the stars represented on state flags are symbolic, but for 3 states, including our own, an actual star is referenced. In all 3 cases, it is the North Star!

Minnesota's official state flag was adopted in 1893 and revised in 1957. A red banner with yellow letters has the state motto, "L'ETOILE DU NORD", French for "The Star of the North". Nineteen yellow stars surround the seal on a white band; these stars symbolize that Minnesota was the 19th state to enter the union after the first 13. The top-most star on the state seal is slightly larger than the rest, and it represents the state of Minnesota.

Maine's has a star above the state seal representing the North Star, because it was the northernmost state of the Union when it was admitted. On its flag, the state coat of arms is placed on a blue field. In the center of the

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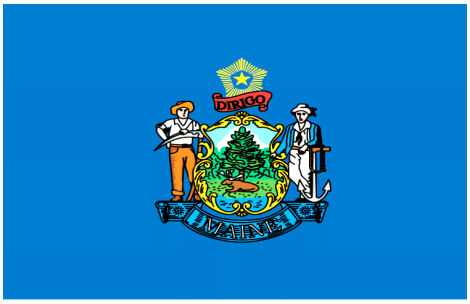
shield a moose rests under a tall pine tree. A farmer and seaman



represent the work that people did in early times. The North Star represents the state motto: "Dirigo". ("I Direct").

Lastly, Alaska's state flag is probably the most "astronomical" flag not only in the States, but perhaps in the world, as it depicts the Big Dipper asterism pointing to the North Star.

There is a fascinating story behind the origin of Alaska's state flag. This story, courtesy of the Alaska State Museum, goes as follows:

More than 30 years before Alaska was to become a state, the Alaska Department of the American Legion sponsored a territorial contest for Alaska children in grades seven through twelve. A flag was needed to represent the future state of Alaska and somebody thought it would be a good idea to tap into the creativity of these kids.

Contest rules were circulated throughout the Alaska Territory in January, 1927. The rules stipulated that the first stage of the competition would take place at a local level. Each town would set up a panel of judges that would determine the ten best local designs and forward these to Juneau where the final competition would take place. A total of 142 designs were forwarded to Juneau.

Several interesting concepts were represented, and eventually rejected, in the submissions reviewed by the Juneau Flag Committee. All of these concepts were rejected as too specific to one or another certain aspect of the vast Alaska Territory. A couple of designs centered on Polar Bears. One design displayed a Polar Bear on an iceberg. Another had a Polar Bear balancing at the top of the globe. Others depicted imagery representing the fishing and mining industries of Alaska. About 1/3 of the entries centered on the territorial seal.

The winner of the contest was a seventh grade Aleut student, thirteen year old John Bell (Benny) Benson from Chignik. He was living in an orphanage in Seward, the Jesse Lee Mission Home, at the time of the contest.

He designed the present Alaska State Flag with a blue background to represent the sky and the Forget-me-not flower. On that background were placed eight gold stars to represent the Big Dipper and the North Star. The Big Dipper forms part of the constellation Ursa Major or Great Bear; symbolizing strength. The North Star represents the future state of Alaska, the most northerly in the Union. Benny's simple, elegant design was adopted by the Alaska Territorial Legislature in May, 1927.

For his efforts, Benny received first prize, a gold watch that was engraved with his flag design. In addition, the Alaska Legislature awarded Benny $1,000 toward a trip to Washington, D.C. to present the Alaska Flag to President Calvin Coolidge. Unfortunately, the trip to Washington never took place due to prior commitments of the President. Though Benny never made it to Washington, his territorial flag became the Official "State" Flag when Alaska joined the Union in 1959. The Alaska Legislature decided to apply Benny's award of $1,000 to his education. Benny chose to study diesel mechanics.

What a great story! Here is a copy of Benny's submission:

Alaska State Museum - Juneau

The Inner Solar System

by Dean Johnson

The Solar System/Planetary Observers Club as presented by the Astronomical League is broken down into three parts; 1. Observations of the Sun and the Moon. 2. Observations of the Inner Solar System, and 3. Observations of the Outer Solar System. In newsletter #18, I wrote about my observations on the Sun and the Moon, and also noted that long before I was even aware of there being a certificate and pin on the Solar System, I was making progress on achieving that award. Thank God for journaling!

In this segment, I will write about my observations on the Inner Solar System, which include the planets Mercury, Venus, and Mars, plus observations on the asteroid belt and comets. All these objects are counted by the Astronomical League as belonging to the Inner Solar System.

For Mercury, the observations are pretty straightforward and simple. You only have to have observed (and recorded!) an observation of Mercury in the evening and morning twilight. This may not seem very challenging, but you must remember that the great Nicholas Copernicus, who steered us down the path to a heliocentric solar system (one where all the objects in the Solar System revolve around the Sun and not the Earth) lamented on his deathbed that he had never seen the planet Mercury.

The innermost planet of our Solar System is best seen in the evening sky during the month of March and in the morning sky in the month of September when the tilt of our Earth's axis seems to propel Mercury furthest away from Earth's horizon. This is important because Mercury never gets any higher than 28 degrees from the Sun. Mercury can be seen at other times during the year, but an observer needs both a clear horizon and a pair of binoculars to make it easy. My observations that I sent in were recorded on the evening of March 12th, 2005, 6:47 p.m. at Eagle Bluff where I made my first stab at a Messier Marathon, had lots of Girls Scouts at the scope early, then ice later on and recorded 30 Messiers. The morning observation came on June 19th, 2003 at dawn on the Nieberling sod field at Hokah where I was employed at the time. This was before I joined the RAC in June of 2004.

For extra credit on Mercury, I threw in the transit of Mercury which occurred on Nov. 8, 2006. I sent in a copy of the article I wrote up for the RAC newsletter and it also had a couple of pictures. This aced the Mercury qualifications for me.

Venus, while much easier to observe, has its own challenges to master, and for me, the greatest was getting a daytime observation of it. This I accomplished on September 4th, 2010 at the Flatin Farm hayfield. I took an observation of the Sun, which was showing a few small sunspots at 7 p.m., then looked for Venus, first in my binoculars at 7:23 p.m.,

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then found it naked eye at 7:29 p.m. The Sun set at 7:34 p.m., so I made it with five minutes to spare. Roger Southwick would find this very easy to do as per his effortless spotting of Venus naked eye at the 3rd Annual Star B-Q. He did it with a half an hour to spare!

The phases of Venus were very easy to get. Since I always journal my observations, I already had this. Venus is a wonderful naked eye object. To me, it is always a thrill to see its reappearance in the western sky after a long absence. Telescopically it basically sucks until it reaches quarter phase. A gibbous Venus is small, bland and terribly distorted with chromatic aberrations to begin its march to its zenith. Once quarter phase is reached, it gets bigger, showing more of a crescent as it drops toward the western horizon. Near inferior conjunction, when the crescent is very thin, it takes on an "Earthshine" appearance. Of course this is not Earthshine, but a bending of light through the upper levels of its thick atmosphere. As it reappears in the morning sky, this reverses and Venus looks great to begin with and becomes more boring as it recedes to go behind the Sun for superior conjunction.

There are two tasks to complete for Planet Mars. Neither is very difficult, but they can be time consuming. The first is drawing albedo features of Mars. At nearly every conjunction of Mars, one or both of the polar ice caps are visible to a medium sized scope. You have to submit a drawing of Mars to qualify for the award. If you see dark markings on the planet, sketch them in as well. If you get lucky with a favorable opposition (like the one coming up in June of 2018) you could even include features like Valles Marineris, the Hellas basin and the volcanos on the Tharsis plateau. The Astronomical League stresses that the drawings do not have to be terribly artistic. Just a simple sketch will do, and please include the time, date, location, conditions and equipment that you are using.

The second criteria for Mars is that you need to record the retrograde motion of the planet as the Earth nears conjunction with its nearest outward planetary neighbor. This can only be done once every 26 months. One cloudy winter night, I was idly perusing the various Observing Clubs the Astronomical League had and I clicked on the 'Solar System/Planetary Observers' club. As I went down the list of what was needed I realized that I already had most of what was required. In fact, it reminded me of the scene in the movie 'Groundhog Day' when Bill Murray asks Andie MacDowell what her ideal man would be like. As she rattled off her qualifications for the ideal man, Bill looks off into space and murmurs "Me, me, me. Wow, I am really close on this."

I had 22 of the 25 needed for the award, (there are 27 categories altogether). What I was missing was the daytime observation of Venus, the record of

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where the Sun set on the western horizon, and the retrograde motion of Mars. So in the fall of 2009 and winter of 2010, I began recording the positions of Mars as we approached conjunction.

One word of advice…if you decide you want to do this, WAIT FOR THE CONJUNCTION OF 2018!! The winter of 2009/2010 was colder than the Ninth Circle of Hell (Dante's Inferno). On the night of January 1, 2010 I was up on my deck to get Mars' position. It was one day past Full Moon and I could see the Moon, Mars, Regulus and Gamma Leonis. That was it in that part of the sky. I looked for the Beehive cluster (M44) in Cancer until tears ran down my face from the cold, and never found it because of the intense moonlight. But I did record Mars' position on 14 different occasions from September 2009 to April 2010 and on most of these occasions I included the naked eye, binocular and telescopic observations of what I saw.

The next category is observations of asteroids. This is not terribly difficult. All you have to do is find a prominent asteroid or two (I recommend Vesta and Ceres) and record their positions against the background stars, go back to the same field of view a night or two later and draw the same field. One of the "stars" will have moved and that is your asteroid. There are lots of finder charts out there and I usually use the ones in Astronomy magazine.

Since I like asteroids anyway, I had boatloads of observations and only needed to copy off stuff that I had already done. The ones I sent in were on Vesta and Ceres, which are the easiest to find and track. I am currently over halfway to the 25 mark for a silver certificate on asteroids (you need 100 for a gold certificate and pin) and that is something that I pursue, but don't go all out for.

The last category is observations of comets. This is pretty easy stuff. I am only a couple of comets away from getting a silver certificate in this (gold is 25) so all I had to do once again was copy off stuff I already had. The ones I sent in were on Comets SWAN and Lulin. This is still one more example of how I had made observations and progress towards something I never even knew existed.

The next installment of Solar System/Planetary Observers award will deal with the Outer Solar System. Until then astronomy fans, may you all enjoy AGNFA!

Three of the pins mentioned in this article are pictured above. Pins are available to any member of the Astronomical League (members of the Rochester Astronomy Club are enrolled as members of the Astronomical League as part of their dues) who complete the observation requirements for the particular club. There are 38 observing programs currently available, covering just about every aspect of the hobby. For some, no special equipment is required, though many do require a modest telescope. Please ask our ALCOR representative and author of the above article, Dean Johnson, any questions you might have about how to obtain an award or assistance in selecting an award. More information can be found on the Astronomical League's web site:

http://www.astroleague.org

Thank Goodness for Magnetism

by Dr. Tony Phillips

Only 93 million miles from Earth, a certain G-type star is beginning to act up.

Every 11 years or so, the solar cycle brings a period of high solar activity. Giant islands of magnetism—"sunspots"—break through the stellar surface in increasing numbers. Sometimes they erupt like a billion atomic bombs going off at once, producing intense flares of X-rays and UV radiation, and hurling massive clouds of plasma toward Earth.

This is happening right now. Only a few years ago the Sun was in a state of deep quiet, but as 2012 unfolds, the pendulum is swinging. Strong flares are becoming commonplace as sunspots once again pepper the solar disk. Fortunately, Earth is defended from solar storms by a strong, global magnetic field.

In March 2012, those defenses were tested.

At the very beginning of the month, a remarkable sunspot appeared on the Sun's eastern limb. AR1429, as experts called it, was an angry-looking region almost as wide as the planet Jupiter. Almost as soon as it appeared, it began to erupt. During the period March 2nd to 15th, it rotated across the solar disk and fired off more than 50 flares. Three of those eruptions were X-class flares, the most powerful kind.

As the eruptions continued almost non-stop, Earth's magnetic field was buffeted by coronal mass ejections or "CMEs." One of those clouds hit Earth's magnetosphere so hard, our planet's magnetic field was sharply compressed, leaving geosynchronous satellites on the outside looking in. For a while, the spacecraft were directly exposed to solar wind plasma.

Charged particles propelled by the blasts swirled around Earth, producing the strongest radiation storm in almost 10 years. When those particles rained down on the upper atmosphere, they dumped enough energy in three days alone (March 7-10) to power every residence in New York City for two years. Bright auroras circled both poles, and Northern Lights spilled across the Canadian border into the lower 48 states. Luminous sheets of red and green were sighted as far south as Nebraska.

When all was said and done, the defenses held—no harm done.

This wasn't the strongest solar storm in recorded history—not by a long shot. That distinction goes to the Carrington Event of September 1859 when geomagnetic activity set telegraph offices on fire and sparked auroras over Mexico, Florida, and Tahiti. Even with that in mind, however, March 2012 was remarkable

It makes you wonder, what if? What if Earth didn't have a magnetic field to fend off CMEs and deflect the most energetic particles from the Sun.

The answer might lie on Mars. The red planet has no global magnetic field and as a result its atmosphere has been stripped away over time by CMEs and other gusts of solar wind. At least that's what many researchers believe. Today, Mars is a desiccated and apparently lifeless wasteland.

Only 93 million miles from Earth, a G-type star is acting up. Thank goodness for magnetism.

With your inner and outer children, read, watch, and listen in to "Super Star Meets the Plucky Planet," a rhyming and animated conversation between the Sun and Earth, at http://spaceplace.nasa.gov/story-superstar.

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

A New Messier Marathon Record (With a Little Help from a Friend)

by Dean Johnson

March of 2012 had been warmer than usual, but also wet and cloudy. The weekend for the Messier Marathon had been scheduled for March 23/24 and Friday the 23rd ended up a NO GO. Saturday didn't look much better that morning, but at least it was dry enough for me to work in the woods. So I went. Much to my surprise when I got home, my lovely wife Betty said, "You've got an email from Jerome and he called a little bit ago. I think everyone is going to Eagle Bluff." Lo and behold, the CSC had changed and the sky was getting clearer. So I packed up my stuff and headed to Lanesboro.

By the time I got there, the Marathon was just getting under way during the three stages of twilight (civil, nautical and astronomical). Jeff (our RAC ISS guru) and Jarrarda Newland were already there along with fellow RAC members Rebecca "Starbie" Bomgaars and Barb Hanning who is also known as Ellenvega (her RAC forum moniker. Her middle name is Ellen and Vega is her favorite star.) Mike Rowlands of the LCAAS was already there and had started in on the first objects. Jerome, Jillissa and Julie G. arrived just after I did. Luka Bajzer arrived a bit later and this filled out our group to tackle the Messier Marathon.

Author Dean Johnson with Luka Bajzer

I pulled in by Barb and set up my equipment. The night was indeed clearing with a thin crescent Moon setting and Jupiter and Venus making for a nice lineup in the west with the Pleadies not far above the two planets. One thing I noticed right away which became more ominous as the night wore on was that it felt a little damp, which I noted in the opening paragraph of my journal.

It was fortunate for me that I pulled in by Barb because like the well organized librarian that she is, she was working from a list that gave us the order in which to catch the Messier Marathon from the western horizon up to the zenith. She would call out the object needed to be seen, someone would hunt it down, most of us would scurry over for a quick look and I would record the object and time it was observed in my journal. Then I'd ask Barb "What's next?" She would call out the next object and the process would be repeated all over again. We quickly fell to the work like a well-oiled machine and by 9:30 p.m. had cleared the western horizon to where we could relax a little bit. At that point we had 15 Messiers.

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At 9:58 Mike Rowlands, the President of the LCAAS, even took a break to nab the E and F stars in the Trapezium of Messier object M42 before that took the dive into the horizon. This is one of Mike's "specialty observations" i.e. something that he really enjoys doing. I picked out the E star just fine, but had to be coached into finding the position of the F star which I could pick out very well once I had been told of its position.

Now the dew became more noticeable because from this point on it started affecting our equipment. Jerome had jury-rigged a nifty table that kept the dew off his star charts and other things and can even defog an 8" Schmidt Cassegrain. I was going to miss that table later on in the night.

Then came a moment that warmed an old Marine's heart. I had a thermos of coffee with and asked anyone if they wanted some. Luka wanted a little, but didn't have a cup and I had left Spring Grove in such a hurry that I didn't bring any extras. He said "I'll find something" and came back after a couple minutes with an empty plastic pop bottle. I smiled, filled it about half, and said to Luka, "You'd have made it in my beloved Corps." He got as big a kick out of that as I did.

By midnight we had 36 Messiers in the bag and one of the highlights everyone had to take a look at was the planetary nebula NGC 2438 in M46, located in the constellation of Puppis. It is supposed to be a foreground object, but it sure looks pretty with all those stars behind it.

Midnight was the time Jerome, Jillissa and Julie G. hit the road. I had blundered and stepped on Jerome's electrical cord a bit earlier and cut power to his stuff. I offered to hook it back up, but he said "No big deal, we have to take off at midnight anyway." There went 3 good observers and that wonderful dew proof table.

M63, The Sunflower Galaxy, as photographed by Mike Corrigan

I think Starbie had taken off by then (we had a nice look at M41, one of my favorites, through her scope) and Jeff and Jarrarda left shortly after the Taubel's took off. Luka and his fine array of binoculars left by 1 o'clock so then it was Mike, Barb and me. From midnight till 3 o'clock in the morning we nabbed 22 more Messiers by working through Corvus, Hydra, Virgo, Hercules and Canes Venatici. We had an excellent time working through "The Realm of the Nebulas" or all the galaxies in Virgo. This upped our total to 58.

Then Mike announced that he had to leave. After he loaded up and left, I looked at Barb and was wondering if she was going to pull the pin. At this point I had been up for 21 hours and was getting very fatigued. If she would have gone, I would have too. But she just looked at me and asked "So how many more do we need?" (to get the record).

Ellenvega wasn't going anywhere.

We needed 17 more to tie, and one more to break the old record of 75. By this time the star clouds of the Milky Way were rising, but so were the dew points. My 8" SCT was hopelessly compromised by the damp, but Barb has one of those nifty Orion 8" Dobsonians and they have such a nice long tube that they are nearly impervious to moisture. In my humble opinion, they are the best starter scope on the market, hands down.

She nabbed most of the remainder, (that girl can starhop with the best of 'em) while I burned up nearly an eighth of a tank of gas defogging my scope several times to get other objects like the little globular M80 in Scorpius. I was most useful with my laser pointer or looking at the Messier object to confirm what we saw.

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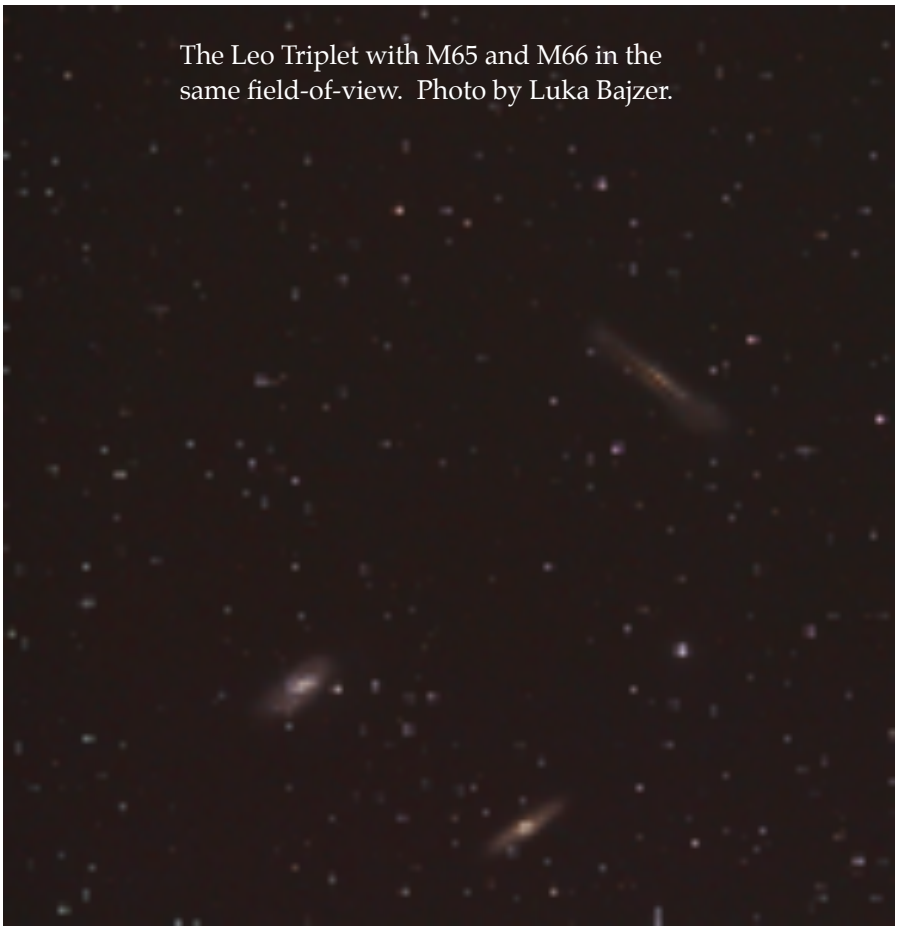


The Leo Triplet with M65 and M66 in the same field-of-view. Photo by Luka Bajzer.

By 4:27 Barb's finderscope had massive dew problems and we had a tough time finding the planetary nebula M27 in Vulpecula. I finally found it, Barb took a look and said "That's it?" It was a big fuzzy blob of light from the moisture, but I knew we were in the right spot and said "Yep." Someday she'll have to have a look at that through Randy's scope on a dry night. In his 30" EVO it is simply spellbinding.

We finished with 3 galaxies in Canes Venatici (M51, M63, M94) and several objects in Sagittarius (M8, M20, M21, M22, M24 and finally M11 The Wild Duck Cluster in Scutum. It was 5:30 in the morning and I was really tired, but with a little help from a friend, Mike Rowlands who had observed M74 and M33 earlier in the night, the RAC has a new Messier Marathon record of 81 objects.

M33, The Pinwheel Galaxy, as photographed by Luka Bajzer.

The real heroine of the night was Barb Hanning. That determined young lady wanted that record and was not to be denied. I personally think it would have taken an F5 tornado to get her out of the Eagle Bluff parking lot. She too, could have been a candidate to wear the Eagle, Globe and Anchor of the United States Marines.

This new high water mark for the club and will be something to keep an eye on in the years to come. It has gone, as far as I know, from 29 objects on March 12th, 2005 in my first solo shot at it for the club at Eagle Bluff when I got iced out, to 26 Messiers on March 23rd 2007 when we got clouded out at 11:35 p.m., to 75 Messiers on March 27th, 2009, the previous best. I joined the RAC in June of 2004, so I cannot attest to any previous attempts. My apologies to the elder members in the club if the 2012 figure is not the record.

The RAC should be around for a long time and it will take a few years before 81 is beaten. An astronomy club needs a clear dry night with a favorable Moon phase, and because of Moon phase and weather, we only get a decent shot at a Messier Marathon every two to three years. If we had had a night with low dew points this year, I think we'd have cleared 90 for sure.

A new Messier Marathon record! It took knowledge, skill, teamwork and tenacity. It was a great night, a challenging night. It was A Glorious Night For Astronomy.

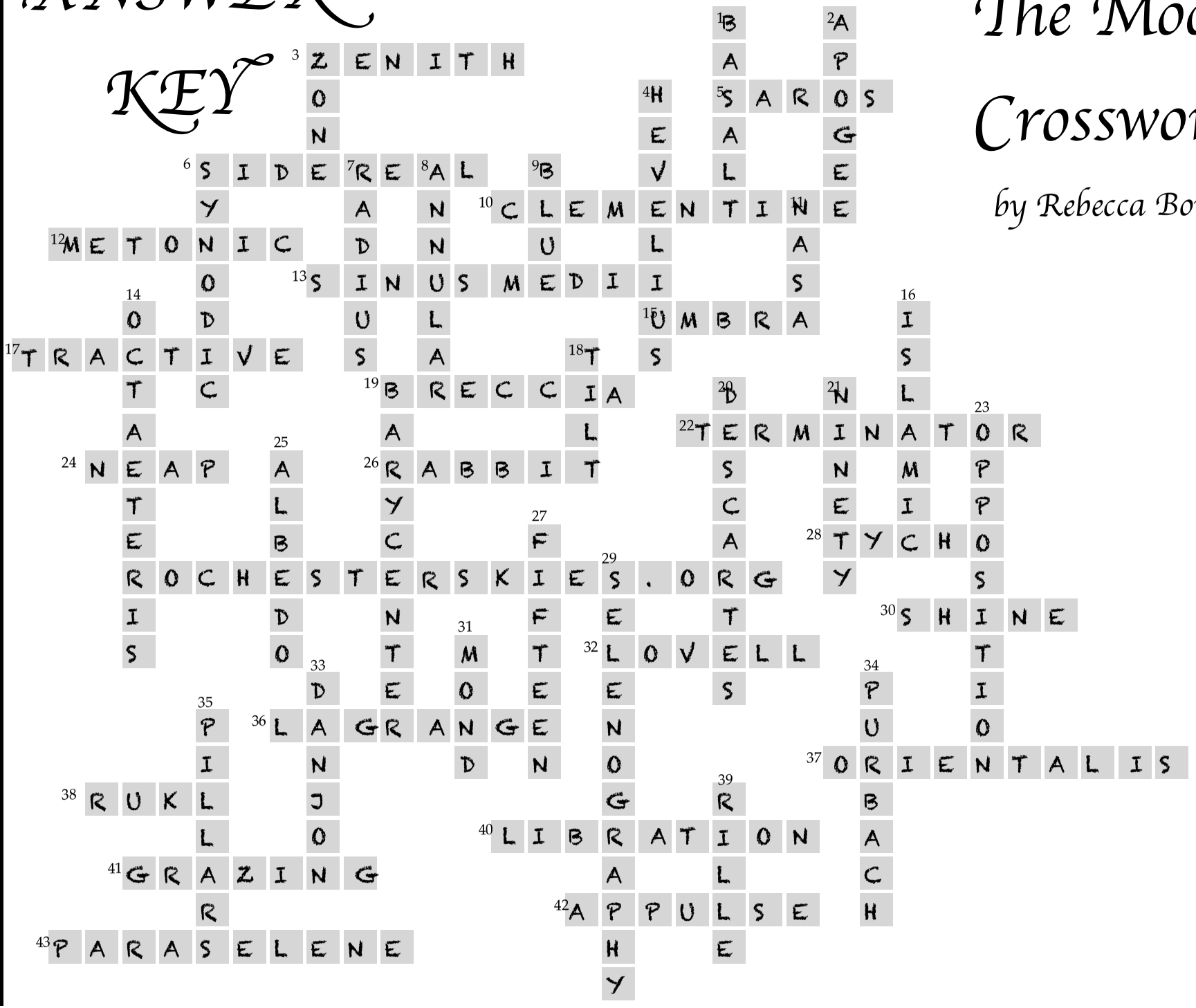
The RAC Shows off the Venus Transit

Photos by Joe Connell

ANSWER KEY

The Moon Crossword

by Rebecca Bomgaars



Rochester Skies

Upcoming Events

June 15/16	-	Dark Sky Weekend at Eagle Bluff*
June 22/23	-	Dark Sky Weekend at Eagle Bluff*
July 4-7	-	AlCon 2012, Chicago, IL
July 10	-	Monthly Meeting @ RCTC - TBD
July 15-20	-	Nebraska Star Party
July 20/21	-	Dark Sky Weekend at Eagle Bluff*
August 14	-	Monthly Meeting @ RCTC - TBD
August 17/18	-	Dark Sky Weekend at Eagle Bluff*

* Events subject to change due to weather. Check Rochesterskies.org for updates

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