



Rochester Skies

A publication of the Rochester Astronomy Club

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Quarterly Newsletter

Rochester, Minnesota

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The President's Corner

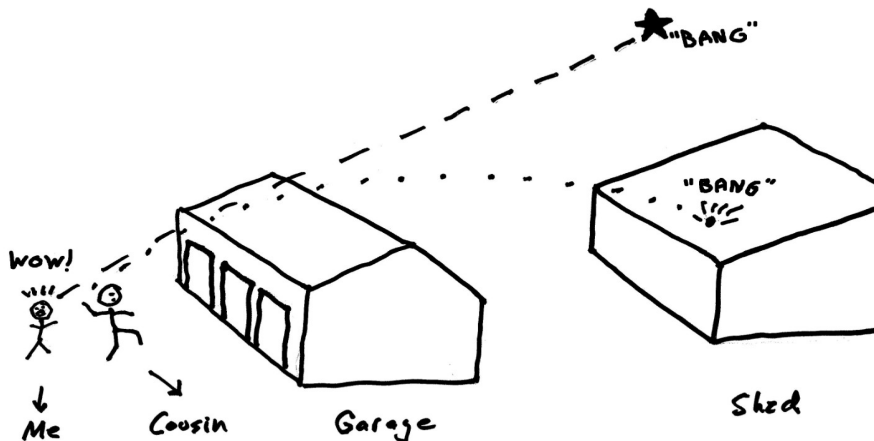
by Randy Hemann



When I was about 6 years old, I remember playing outside on warm sticky summer evenings with my cousins. Both our families lived on farms so we had plenty of room to run around and keep ourselves entertained. While our parents were inside relaxing with chit-chat or playing cards, we'd be outside working up a sweat playing games like baseball, tag, or hide and seek. If we got bored with those games or didn't have enough players, we'd just making up games involving running, throwing, or jumping. When dusk turned to dark we just kept playing on into the night, with our lone bright mercury vapor lamp high atop a tall pole in the center of our farm providing us all the light we needed.

One night we challenged each other to see who could throw the largest rock over the top of our tall car garage. Of course my older cousins could throw rocks much higher than I could. In fact, sometimes they would show me that when they threw rocks high enough over the garage, they would hit the stars! And they did! The rocks they heaved really high definitely were hitting something! In the glare of the farm light by the garage, I was certain I saw rocks disappear over the roof high into the dark sky and suddenly "hit" the stars with a loud bang! However – what actually happened was when they threw a rock high and far enough, it traveled well past the garage and smacked off the tin roof of a storage shed that was about 75 feet beyond. But what my eyes saw was a rock whizzing out into the star lit sky and what my ears heard was the "bang" a moment later when the stone "hit" the star.

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April 14th Meeting



© William Davidson



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High in the sky shines Jupiter.

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Now, 50 years later, my defense for this naivety is that back then I was just like any other impressionable young kid trusting the senses of his eyes and ears. Sure, now being older and somewhat wiser, we all find out that our senses cannot always be trusted, as they are easily led astray by our perceptions or beliefs. Still, I recall back then it made perfect sense to me, and those stars never really did look that far from me anyway. However, in my later elementary school studies, I eventually did discover that the stars were truly very far away – and very safe from anyone knocking them out of the skies with a good pitch. Nevertheless, as a kid I remember feeling for quite some time that the stars were very close to me, very “touchable”.

I received a telescope as a Christmas present when I was 10 years old. I don't recall asking for a telescope, but do remember thinking it was a pretty cool gift. It was a 3 inch reflector called the “StarMaster Precision Telescope” manufactured by the Harmonic Reed Corporation from West Conshohocken, Pennsylvania. The optical tube attached to an aluminum tripod with a ball and socket head. It came with a straight through pipe for a viewfinder and 2 plastic eyepieces. It also included instructions on how to roughly collimate the secondary. Additionally, it also came with a map of the Moon that was nearly unreadable, and a cool application form to fill out and become a member of the “Junior Starwatcher Club” for 1 dollar. (I didn't join). It was fun to look at the Moon, but all the stars quickly looked the same to me, so the majority of the time I spent with the scope was during the day. Its ability to bring the far to the near was fascinating. One fun daytime activity that I spent hours with the telescope was tracking overhead airliners and identifying them as TWA or Pan-Am. However, there were times I would still get it out at night. Unfortunately, all I knew of the night sky was basically the Moon, the Big and Little Dippers, and the North Star, and not much else. After a while I did become familiar with this one particular asterism in the winter night sky. It had 3 bright stars, tightly aligned in a row, and two other similarly bright stars positioned diagonally apart from them. Back then I never knew of or even heard of the constellation Orion, and accordingly didn't realize that my personal asterism was Orion's belt, flanked by the bright stars, Betelgeuse and Rigel. After several winters, I was noticing something peculiar around these stars. There seem to appear a bright new interloper disrupting my star pattern - a bright star that was not there before. A new star! I had to take a look.



was noticing something peculiar around these stars. There seem to appear a bright new interloper disrupting my star pattern - a bright star that was not there before. A new star! I had to take a look.



(Randy's history in becoming an amateur astronomer will continue in future issues. Please join in the discussion with your history in becoming interested in astronomy. Send your comments and pictures to rochesterskies@outlook.com.)

BE A JUNIOR STARWATCHER!
OWN THIS BEAUTIFUL PIN!

By returning the attached application form with \$1.00 you will become a member of the Junior Starwatchers. You will receive your own beautiful Junior Starwatcher pin and a copy of "Discover the Stars," a 128-page astronomy book recommended by the National Science Foundation and the American Association for the Advancement of Science.

Make Your Own
ASTRONOMICAL INSTRUMENTS

The astronomy book which you will receive describes all the parts of a telescope and shows you how it works. It includes easy illustrated instructions that show you how to build one. The book shows you how to make your own sundial, sextant, clinometer and many other experimental instruments!

MEMBERSHIP APPLICATION
JUNIOR STARWATCHERS

Fill out this application and forward it with \$1.00 (check or money order) to "Junior Starwatchers", Union Hill Industrial Park, West Conshohocken, Pa. 19428. We will immediately forward your Junior Starwatcher Pin and 128-page astronomy book.

NAME _____ AGE _____
(please print)

ADDRESS _____
(street or route no.)

CITY _____ STATE _____ ZIP NO. _____

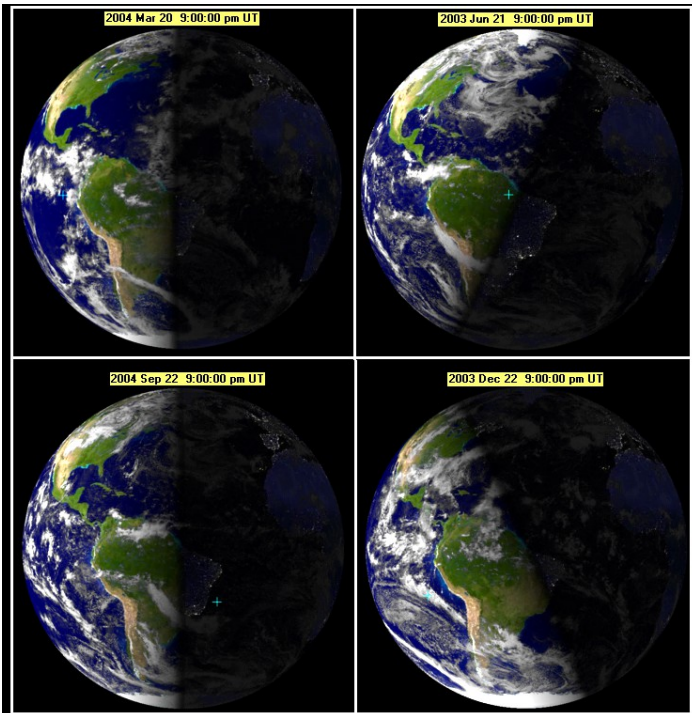


www.nasa.gov

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Seeing Darkness in a New Light

by Larry Mascotti



Eleven months of winter and one month of road construction is the usual description of the seasonal change we experience in Minnesota. But we all know that life in the land of lakes is the best kept secret in the world. We like it here because of the changing drama we experience located nearly half way between the equator and the North Pole.

Our minds seeking newness like to handle novel or discrepant events so another popular misconception about life here in Minnesota, is the idea that our summertime warmth is due to our being closer to the sun than when we are in the grip of winter. As is the case in many circumstances in understanding the conclusions we find in astronomy we cannot trust our intuition. A good site that supports the opposite viewpoint for things heating up can be found [here](#).

My instructional philosophy has been experience first followed by explanation. Backyard astronomy provides many opportunities to experience nature and avoid this

modern day outcome... "I like to play indoors better — cause that's where all the electrical outlets are," reports a fourth grader to Richard Louv. So encouraging others to watch the parade of the sun along the western horizon or measuring noon time shadow lengths is a good place to start. Another advantage of observing such change is that allow us to follow in the footsteps of those that have preceded us in time. The solar calendar has a natural rhythm that is regular and repeatable. For tools, our ancestors used sticks and stones to see the regular patterns in the apparent chaos of nature. They could now precisely predict when animals would migrate and when the rivers would be more likely to rise and flood their settlements. They could also find security by seeking harmony with the sky gods. A location that features such an ancient solution is in the northwest corner of New Mexico: the [Chaco Canyon](#).

Another dilemma emerges regarding the astronomical seasons:

December Solstice - March Equinox: 89 days

March Equinox – June Solstice: 92 days

June Solstice – September Equinox: 94 days

September Equinox – December Solstice: 90 days

Total: 365 days

The above reality allows for nice application of two critical underpinnings of our deeper understanding. Kepler's first law regarding the earth's non-circular orbit sets up an explanation using Newton's thoughts about gravity. Since gravity increases as distance becomes less, the planet will feel a greater acceleration, $F = ma$. Newton therefore supports Kepler's second law which is best demonstrated by the length of these astronomical seasons. When the earth is closer to the sun it moves faster. When it's further away it moves slower. It also illustrates that the variation in distance resulting from our elliptical orbit is only about 3%.

Often we hear that the June Solstice is the “longest” day of the year. It may be better said that this is the day with the most hours of daylight. It is also recognized as the first day of summer even though summer-like weather arrived weeks earlier. The astronomical seasons are related to the meteorological seasons but it is important to distinguish that the ones of astronomy involve special backyard turning points for the sun that we can observe and special coordinates we can plot on our sky charts.

As for the weather seasons, it is the sun that is the most dominant factor controlling weather but other factors contribute to daily conditions of the atmosphere we experience. The surface of the Earth is a mix of oceans, forests etc. and each has a different capacity to reflect and absorb the heating from the sun and these surfaces heat the

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overlying air at different rates.

How different would our experience of the joys that delight we seasoned Minnesotans if the angle between the axis of rotation (spin) and the axis of rotation (orbit) were 0° or 180°. For one, I am at peace with the ways things are and I am content not to ponder what I think I heard Beaver Cleaver once say... "What if Nature goofed off?"

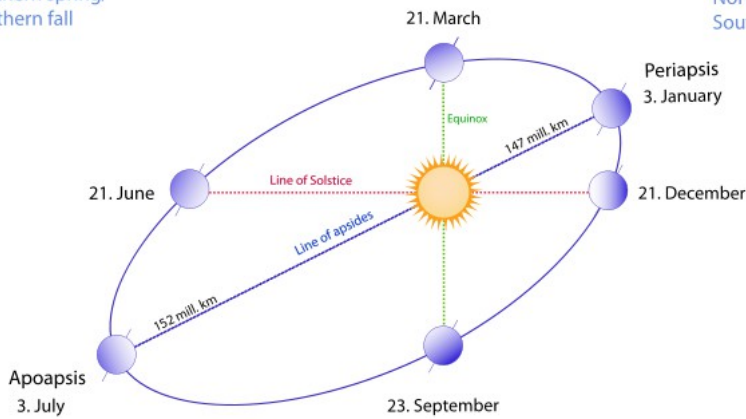
Our seasonal study would not be complete without recognizing some other ancient wisdom about the cycles that make up our human experience...

To everything there is a season, and a time to every purpose under the heaven: A time to be born, and a time to die; a time to plant, and a time to pluck up that which is planted... Ecclesiastes.



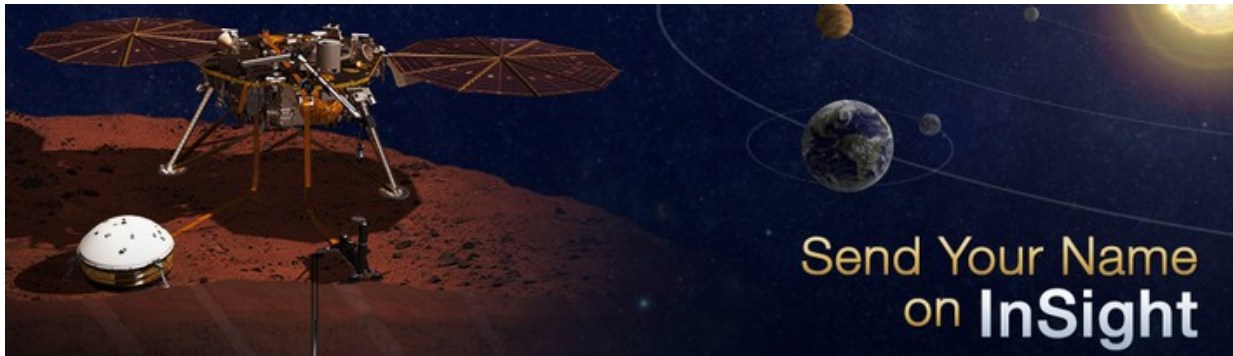
Northern spring/
Southern fall

Northern winter/
Southern summer



Northern summer/
Southern winter

Northern fall/
Southern spring



(copyright NASA) [InSight](#) (Interior Exploration using Seismic Investigations, Geodesy and Heat Transport) is a NASA Discovery Program mission that will place a single geophysical lander on Mars to study its deep interior.

But InSight is more than a Mars mission - it is a terrestrial planet explorer that will address one of the most fundamental issues of planetary and solar system science - understanding the processes that shaped the rocky planets of the inner solar system (including Earth) more than four billion years ago.

By using sophisticated geophysical instruments, InSight will delve deep beneath the surface of Mars, detecting the fingerprints of the processes of terrestrial planet formation, as well as measuring the planet's "vital signs": Its "pulse" (seismology), "temperature" (heat flow probe), and "reflexes" (precision tracking).

InSight seeks to answer one of science's most fundamental questions: How did the terrestrial planets form? (Send your name on [InSight here](#). **Deadline** is September 8th!)



Astronomical League

www.astroleague.org

ALCoord Dean Johnson



Observing programs from the Astronomical League may be found at:

[Astroleague Observing Clubs](#)

Rochester's Community Education



Paul Larson is the Planetarium Director for the Mayo High School Planetarium. All classes are located in Mayo High School in Room 1-226.

Kepler Star Wheel and Rochester at Night-Planetarium

Create a Kepler Star Wheel while touring the current night sky in Rochester.

#8380.141 Thu Sep 24 6-7 pm \$6

Lunar Reflections and Red Revelations

Revelations on why Earth is Earth.

#8349.141 Thu Oct 08 6-7 pm \$6

NEW! Sunstruck

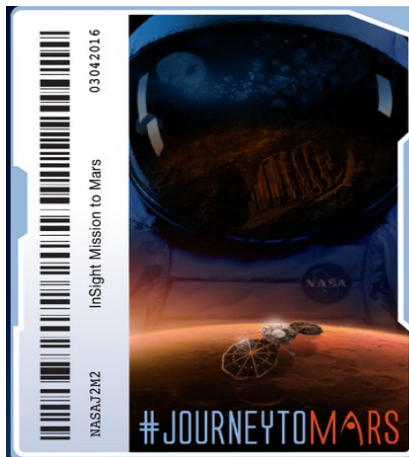
Discover the wonders of the Sun.

#8342.141 Thu Oct 15 6-7 pm \$6

Register at
www.rochesterce.org/register
 or call 507.328.4000

Sky Events

Aug 29:	Supermoon 1 of 3 for 2015: The Moon reaches Full at 13:38 CDT, 20 hours from perigee.
Aug 31:	Neptune reaches opposition at ~22:00 CDT.
Sep 04:	Mercury at Greatest Western Elongation of 27° from the Sun low in the western horizon just after sunset.
Sep 13:	“Shallow point” (also known as the minor lunar standstill) occurs over the next lunation, as the Moon’s orbit reaches a shallow minimum of 18.1 degrees inclination with respect to the celestial equator. The path of the Moon now begins to widen towards 2025.
Sep 14:	Moon at apogee at 6:28 CDT.
Sep 23:	Autumnal Equinox, 3:21 CDT.
Sep 27:	A total lunar eclipse at 21:51 CDT, first umbra contact 20:07 CDT; last umbra contact 23:26 CDT.
Sep 27:	Supermoon 2 of 3 for 2015: The Moon reaches Full at 21:51 CDT, approximately an hour from perigee. This marks the closest Full Moon of the year.
Oct 01:	Comet C/2013 US10 Catalina may reach naked eye visibility and continue brightening to magnitude 5 by November 6 .
Oct 08:	Venus 0.7° N of the second quarter Moon at 15:32 CDT. The Draconids meteor shower peaks this evening.
Oct 16:	Mercury at Greatest Western Elongation of 18.1° from the Sun low in the eastern horizon before sunrise.
Oct 20:	Orionid meteor shower is expected to peak on the night of October 20 and early morning October 21 .
Oct 26:	For the second time this year, Venus and Jupiter will engage in a close 1° conjunction in the eastern sky before sunrise. Venus will be at Greatest Western Elongation of 46.4° from the Sun.
Oct 27:	Supermoon 3 of 3 for 2015: The Moon reaches Full at 8:50 CDT.
Oct 28:	Another rare event early in the eastern morning sky, before sunrise, is a triangular conjunction of Venus, Jupiter and Mars .
Oct 30:	Aldebaran is 0.6° S of Moon at 17:45 CDT.



Upcoming Events

- Sep 08: RAC Meeting at RCTC, room EA121 (7pm).
Sep 11: Dark Sky Weekend observing (check forum)^w.
Sep 12: Dark Sky Weekend backup (check forum)^w.
Sep 18: Dark Sky Weekend observing (check forum)^w.
Sep 19: Dark Sky Weekend backup (check forum)^w.
Sep 19: Fall Astronomy Day (check forum)^w.
Sep 23: Autumnal Equinox, 3:22am CDT.
- Oct 09: Dark Sky Weekend observing (check forum)^w.
Oct 10: Dark Sky Weekend backup (check forum)^w.
Oct 13: RAC Meeting at RCTC, room EA121 (7pm).
Oct 16: Dark Sky Weekend observing (check forum)^w.
Oct 17: Dark Sky Weekend backup (check forum)^w.
- Nov 01: Daylight Savings Time ends; turn your clock back one hour.

^wCheck www.rochesterskies.org for more information.



Officers

President:	Randy Hemann
Vice President:	Kirk Severson
Secretary:	Brandon Wyman
Treasurer:	Julie Gawarecki
Web Master:	Don Schlosnagle
Astro League Coord:	Dean Johnson
Newsletter:	Bill Davidson

RAC Social Media

 rocheasterastronomy

 @rochesterskies

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<http://www.rochesterskies.org>



50 Years Ago (1965)...

February 20 – [Ranger 8](#) crashes into the Moon after a successful mission of photographing possible landing sites for the [Apollo program astronauts](#).

March 23 – [NASA](#) launches [Gemini 3](#), the [United States'](#) first two-person space flight (crew: [Gus Grissom](#) and [John Young](#)).

November 16 – [Venera program](#): The Soviet Union launches the [Venera 3](#) space probe from [Baikonur](#), [Kazakhstan](#) toward [Venus](#). (On March 1, 1966 it becomes the first spacecraft to reach the surface of another planet).

November 26 – Discovery of [NML Cygni](#), a red and the largest star known, at about 1,650 times the Sun's radius.

RAC Presentations of 2015

January: The Holiday Party with Josef Chlachula presenting his *Personal Reflections on Star-BQ 2014*.

February: Bill Davidson gave a talk on *The 2014 Summer Visit to the Very Large Array (VLA)* near Socorro, New Mexico.

March: Larry Mascotti presented *Making Mountains out of Molehills: Scale Models of the Universe*.

April: Hosted by Randy Hemann with Jerome Taubel presented *Wall-e and Finding the Best Eye Pieces* and *Got Your Reservation in for the Solar Eclipse 2017?* (Best binocular eyepiece set for Wall-e is the [24-mm Panoptics](#).) Afterwards there was an opportunity to observe the early night sky with Jupiter's Red Spot as one of the main attractions.

May: Randy Hermann presented *Astronomy in Rochester*.

June: Dean Johnson presented *Sketching the Sun Through an Alvan Clark Telescope*.

July: Randy Hermann presented, on this special day in space exploration, [New Horizons Passes Pluto](#).

August: Jerome Taubel presented [2017 Eclipse Viewing Location Selection](#).