STELLAR SENTINEL
Grand Traverse Astronomical Society February 2014

John Dobson and Telescopes

By Bob Moler

I was going to write this month about telescopes: what to do with that Christmas or birthday telescope, or the telescope that's been gathering dust in the closet or attic. Then I found out that John Dobson, inventor of the unique telescope mount that bears his name, died a few days ago, at age 98. Therefore I'll relate some of my recollections and those of Richard and Susan Kuschell of his visit in 2007.

John Dobson explaining his unorthodox thoughts on cosmology at Northwestern Michigan College's Rogers Observatory in February 2007.

The GTAS president in 2006-2007 was Scott Anttila who really wanted the society to purchase a large portable telescope to take around to other venues in the Grand Traverse area. Large portable telescope really means a Dobsonian telescope. Scott, who was at the time a telescope dealer out of Kalkaska, had connections with the amateur telescope world, that John Dobson, father of the Dobsonian mount was an interesting speaker and could be enticed to come here at a reasonable price, basically travel, food and having a place for him to spend the night. He didn't like hotels. He stayed with the Anttila's and then at the Kuschell's.

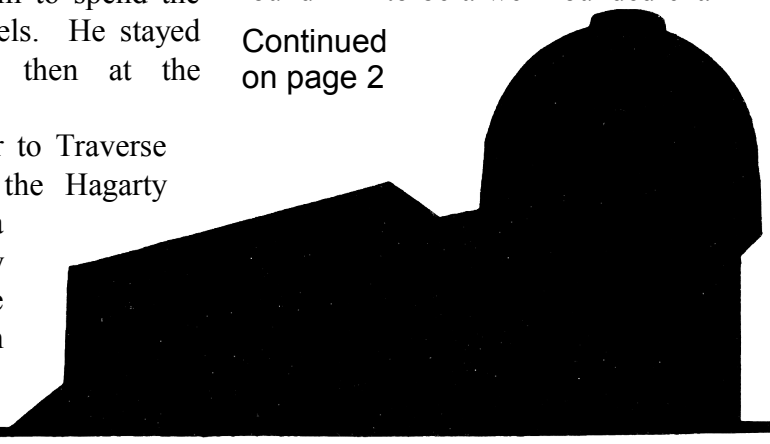
Scott brought him over to Traverse City to give a talk at the Hagarty Center. That was a Saturday night the pay event we hoped to raise money for our own Dobsonian telescope. On Sunday night he came out to the observatory for a free get together with GTAS members, where he autographed some of our Dobsonian mounts, including mine. On Monday I took him out to the Leelanau School in Glen Arbor for a presentation, and after lunch we went out to the Lanphier Observatory where he sat in on an astronomy class and decided to stay for an English class both taught by Norm Wheeler. He was a great contributor to both. We were then in time to head back to Traverse City and take him to Richard and Susan Kuschell's home. Here are their recollections.

Richard: "Susan and I hosted John overnight at our house. My daughter, Sarah, covered his appearance at Delta Collage for the Bay City Times and was enthralled. We all had dinner together.

"Although born in China, he did not eat rice, not enough nutritional value; he was a bit of a picky eater but from California so… He did pour on the salt, more than I've seen anyone use; evidently without harm. We watched a video on his life and the San Francisco Sidewalk Astronomers. Although a little apprehensive about hosting someone I'd never met, he was disarming, captivating, and a great story teller. I regret I didn't have a dobsonian telescope for him to autograph."

Susan: "Having John Dobson as an overnight guest was quite a delightful. I found him to be a well rounded charming

Continued on page 2



John Dobson and Telescopes (Continued from page 1)

man who was even a little flirty; a humble minimalist and story teller that led a life of wonder."

I had heard John one more time. It was last year I believe on NPR. I could tell he has slowed down in speech. He wasn't quite the sprightly fellow that visited us at age 92 when he hopped on and off the low stage at the Hagerty Center. Check out the Wikipedia page on John Dobson about this remarkable man.

Telescopes

No other piece of equipment is identified with astronomy than the telescope. But as many new telescope owners can attest, telescopes can be hard to use. Christmas is a time that many telescopes are acquired, and around northern Michigan is the time of year least amenable to their use, due to cold and clouds.

Most telescopes today have pretty good optics, at least the main optical component, the objective or lens for refracting telescopes or the primary mirror of reflecting telescopes. It's the diameter of that optical component which determines the capability of the telescope. It is the diameter or aperture that gives the telescope its two powers: light gathering and resolution.

Light gathering power is obvious, the bigger the objective the more light gets in to see fainter objects. Resolution is the telescopes ability to deliver finely detailed images, so more magnification is possible without delivering fuzzy images. The last is due to a property of light itself. That's why telescopes are built with greater and greater diameters.

Magnification or "Power" is a quantity determined by the focal length of the objective divided by the focal length of the eyepiece, so on any given telescope is variable depending on the eyepiece being used. We amateurs generally use the lowest power 90% or the time. Except for the planets objects in the sky are generally not that small, but they are faint. There are more considerations than that, but they will be explored during the Telescope Clinic on February 7th.

Telescopes also need a finder telescope or device. Nowadays a reflex finder is often used to place a dot on or circle around the object it's pointed to when it's looked through. In any case that finder must be aligned with the telescope to be useful. This must be checked every time the telescope is set up.

Telescope mounts are something else again, which inexpensive telescope makers tend to skimp on. I'll leave it to the Telescope Clinic to explain.

Having problems with your telescope? Bring it down to the Telescope Clinic or any meeting of the GTAS for the help you need.

Get the Stellar Sentinel in your email inbox

Postage rates are going to rise again soon, so your editor has been working to digitize the *Stellar Sentinel* and put it into Adobe Acrobat (PDF) format to read and print using the free Acrobat viewer on your computer to save money and forestall dues increases.

To get this we need your email address. Please send your email address along with your name from the label of your current *Stellar Sentinel* to info@gtastro.org. Many issues will contain extra material which due to postal rates and printing costs cannot be included in the paper copy.

Society Events

Check http://www.gtastro.org for late breaking events.

February

7 Friday **Board of Directors Meeting** – 7 p.m. - NMC Rogers Observatory

General Meeting – 8 p.m. - NMC Rogers Observatory

Program: ***Telescope Clinic***

Bring us your new, your old telescopes yearning to see the stars.

- Apologies to Emma Lazarus

Star Party: 9 p.m. - 11 p.m. - NMC Rogers Observatory

March

7 Friday **Board of Directors Meeting** – 7 p.m. - NMC Rogers Observatory

General Meeting – 8 p.m. - NMC Rogers Observatory

Program: ***Star Bowl NMCAC vs. GTAS***

Star Party: 9 p.m. - 11 p.m. - NMC Rogers Observatory.

22 Saturday **Star Party:** 9 p.m. - 11 p.m. - NMC Rogers Observatory.

---------- Star Parties ----------

Rogers Observatory star parties for 2014: 1/3, 2/7, 3/7, 3/22, 4/4, 4/26, 5/2, 5/10, 6/6, 6/21, 7/11, 7/19, 8/1, 8/16, 9/5, 9/20, 10/4, 10/18, 11/7, 11/15, 12/5. Eclipses: 4/15 lunar a.m., 10/8 lunar a.m., 10/23 solar p.m.

Sleeping Bear Dunes star parties for the rest of 2014: 4/25, 5/9, 6/7, 7/26, 8/9, 9/13, 10/21. Eclipses: 4/15 lunar a.m., 10/8 lunar a.m., 10/23 solar p.m.

---------- Some of the best objects for public viewing in February ----------

Planetary Object(s): Jupiter

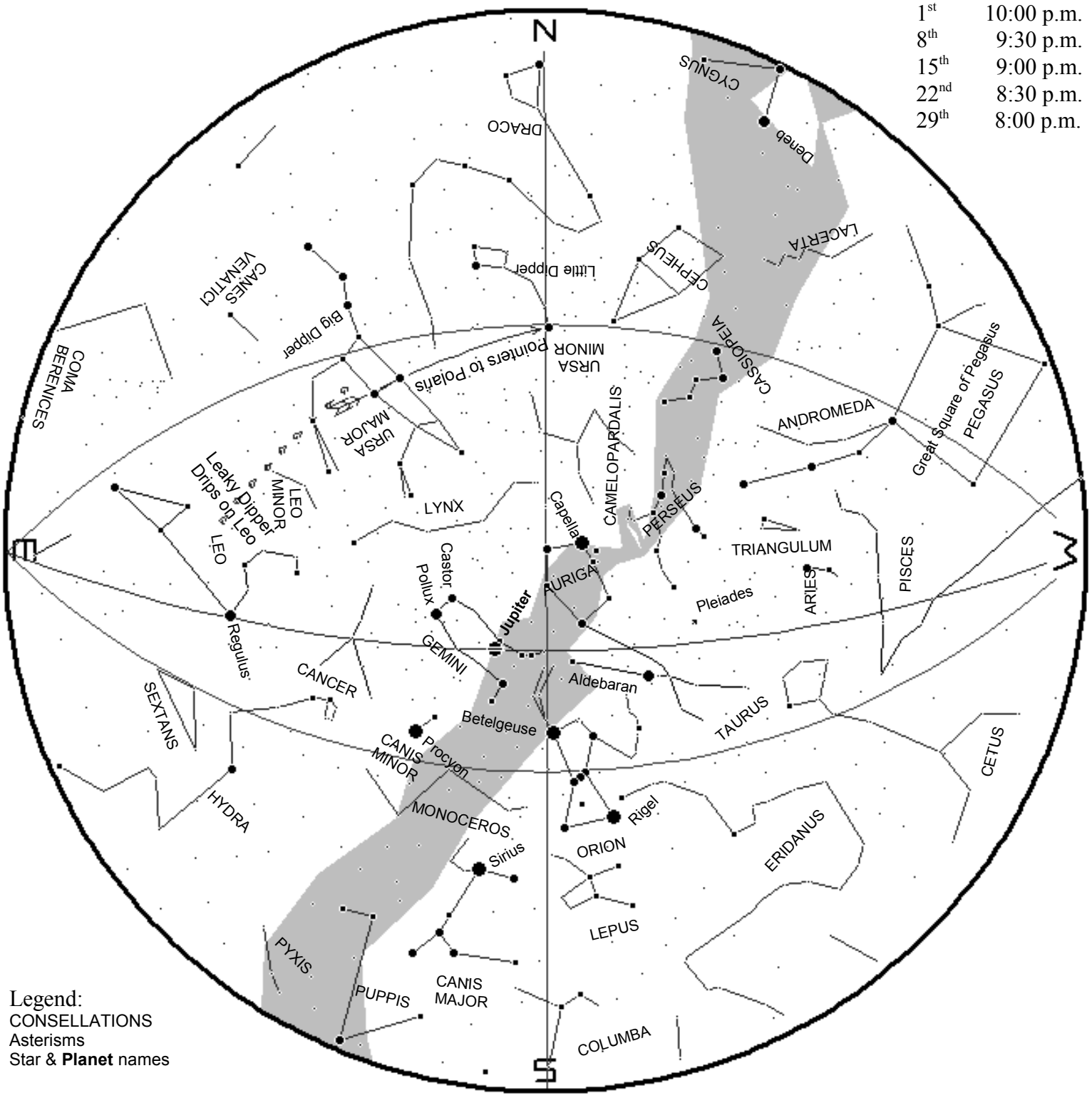
Deep Sky Object, description, constellation, distance	**Rt. Asc.** **hr. min.**	**Declin.** ° ′
M 31: Great Andromeda Galaxy, And, 2.3m l.y.	00 42.7	+41 16
M52: Rich open cluster, Cas,5.5k l.y.	23 24.2	+61 35
Almach (γ Andromedae): Yellow and greenish-blue double star, And, 260 l.y.	02 03.2	+42 17
χ & h Persei: Double Cluster, Per, 7k l.y.; χ Per, 8.1k l.y.	02 20.0	+57 08
M 45: Pleiades open cluster - use finder or binoculars, Tau, 410 l.y.	03 47.0	+24 07
M 1: Crab Nebula (supernova remnant), Tau, 6.3k l.y., July 5, 1054 AD	05 34.5	+22 01
M 42: Great Orion Nebula, Ori, 1.5k l.y.	05 35.4	- 05 27
M 35: Open cluster, Gem, 2.8k l.y.	06 08.9	+24 20
β Monocerotis: Triple star, Mon, 150-200 l.y., angular separation = 7.4" & 2.8"	06 28.8	- 07 01
M 41: Open Cluster, CMa, 2.3k l.y.	06 46.0	-20 44
M 44: Beehive or Praesepe open cluster, best seen in finder, Cnc, 525 l.y.	08 40.1	+19 59
M 67: Open cluster, very old, Cnc, 2.7k l.y.	08 50.4	+11 49
M 81: Sb Galaxy, M 82 nearby, UMa, about 12m l.y.	09 55.6	+69 04
M 82: Ip Starburst galaxy, companion of M 81, UMa, about 12m l.y. *** Supernova SN 2014J exploded in mid-January. Should be the brightest star superimposed on the glow.	09 55.8	+69 41

The Stars and Planets for February 2014

By Bob Moler

Planets are plotted for mid month. The star positions are correct for:

1st	10:00 p.m.
8th	9:30 p.m.
15th	9:00 p.m.
22nd	8:30 p.m.
29th	8:00 p.m.



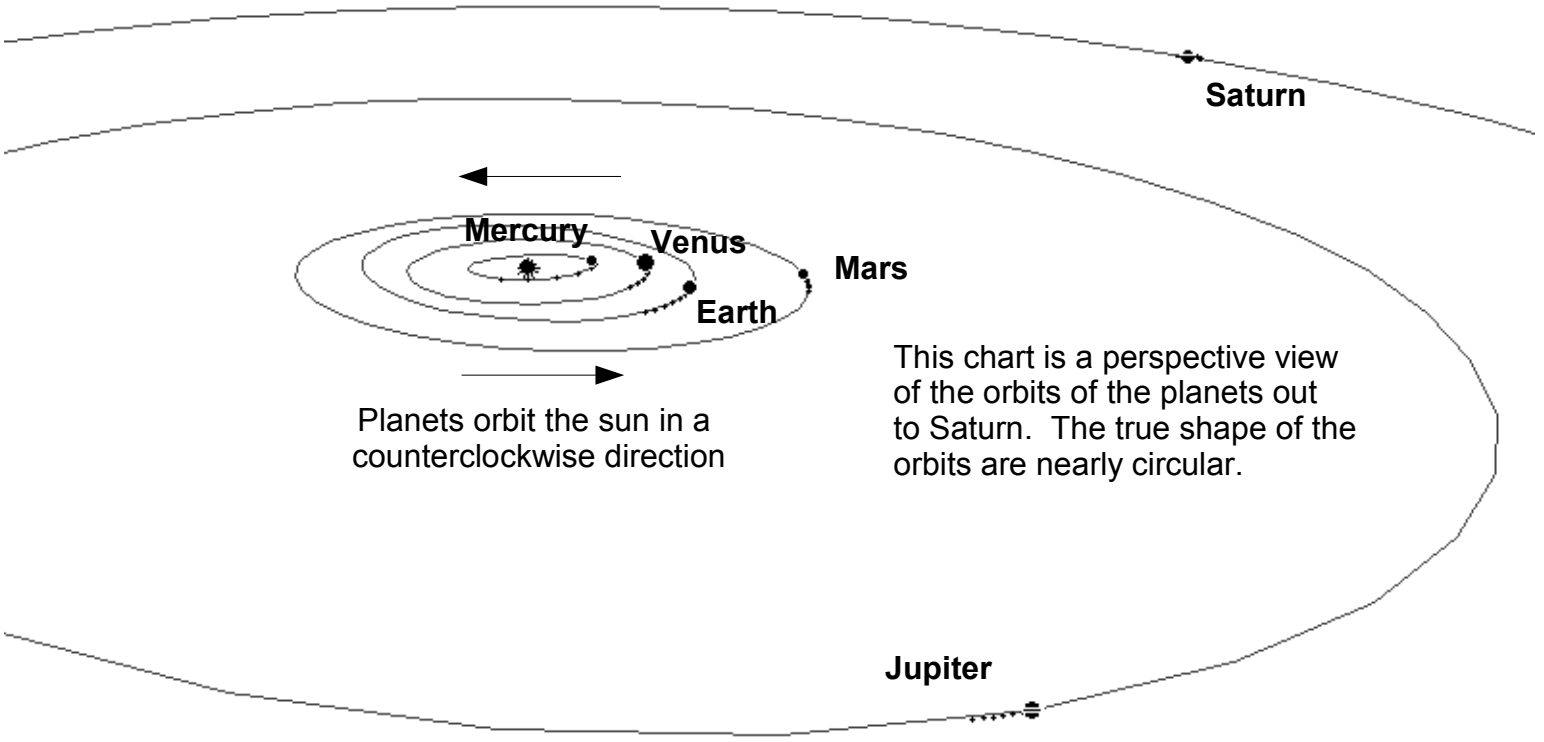
Legend:
CONSELLATIONS
Asterisms
Star & **Planet** names

Orion, the central constellation of winter is now centered in the south, and is surrounded by his entourage of other constellations containing the bright stars of the winter circle. The Winter Circle consists of Capella at the top. Moving clockwise there is Aldebaran, Rigel, Sirius, Procyon and Pollux with Jupiter the interloper this year, and Betelgeuse in the center. With the coldest days and nights here, its comforting to see the constellations of spring just rising The Big Dipper is in the northeast, and Leo the lion in the east hint that spring will soon arrive. February 2nd is Ground Hog Day, a Cross Quarter day near the midpoint of winter.

For more information on planets and stars each month:
http://ephemeris.bjmoler.org

The Naked Eye Planets

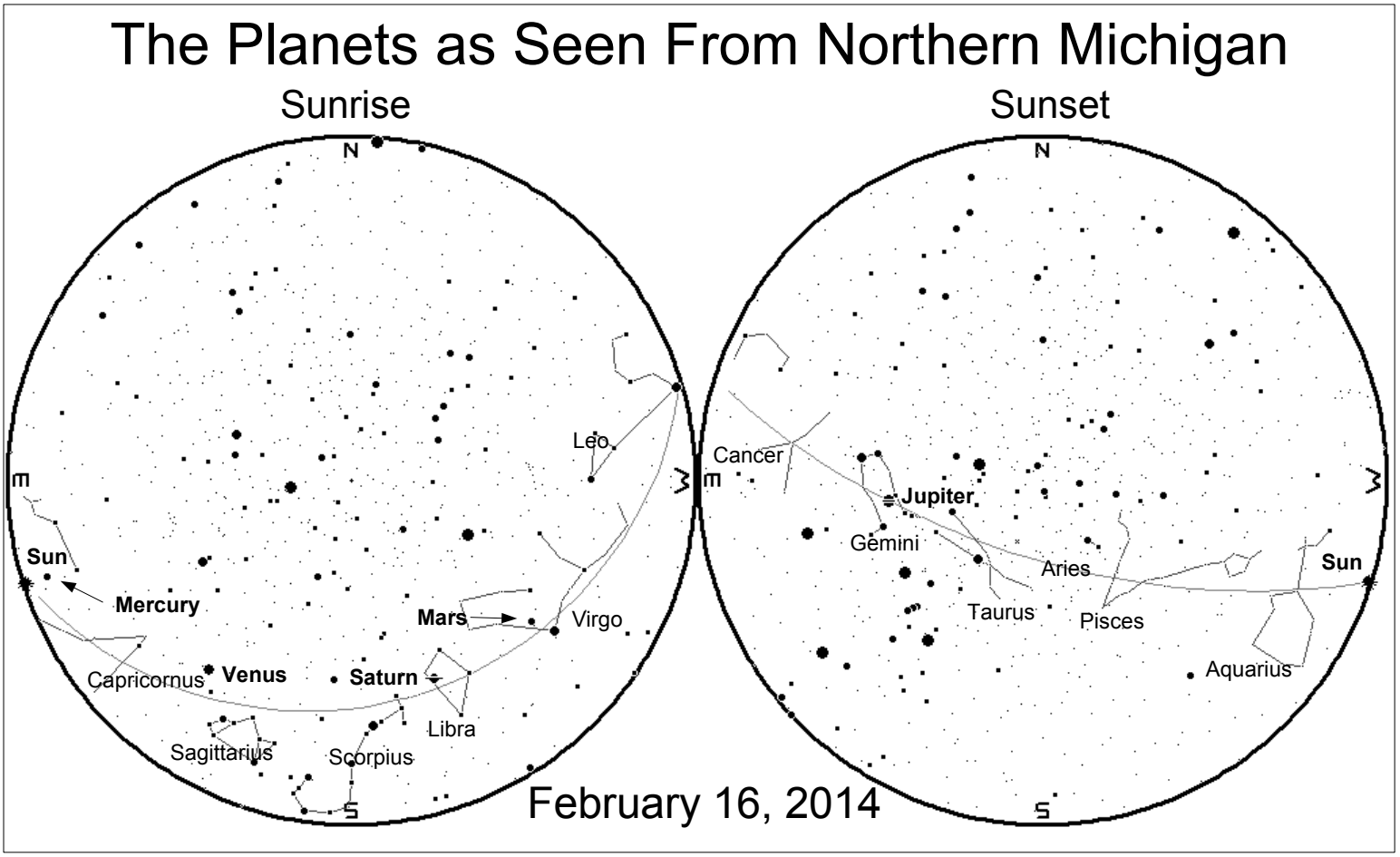
February 1st, 6th, 11th, 16th, 21st, 26th, & March 3rd



Planets orbit the sun in a counterclockwise direction

This chart is a perspective view of the orbits of the planets out to Saturn. The true shape of the orbits are nearly circular.

The Planets as Seen From Northern Michigan



February 16, 2014

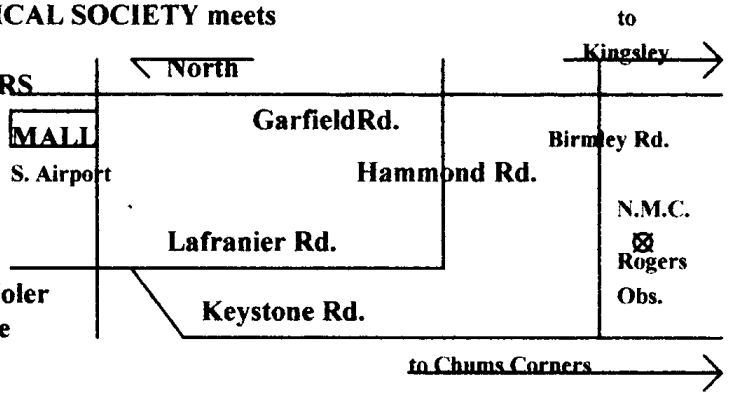
CELESTIAL CALENDAR

February 2014 EST

01 2:07 a.m. Mercury 4.1°S of Moon
02 3:27 p.m. Mars 4.4°N of Spica
03 7 p.m. Mercury at Perihelion
05 7:41 a.m. Moon at Descending Node
06 9:30 a.m. I.C. Elem. 5th grade GTAS & SSA talk on seasons & Moon
06 2:22 p.m. FIRST QUARTER MOON
07 8:00 p.m. GTAS Meeting – Telescope Clinic
07 9:00 p.m. Star Party & Telescope Clinic continued.
08 9:41 a.m. Aldebaran 2.3°S of Moon
11 1:10 a.m. Jupiter 5.0°N of Moon
12 12:09 a.m. Moon at Apogee: 406232 km
14 6:53 p.m. FULL MOON
15 5:40 a.m. Regulus 5.1°N of Moon
15 3 p.m. Mercury at Inferior Conjunction
19 9:54 a.m. Spica 1.6°S of Moon
19 6:59 p.m. Mars 3.1°N of Moon
19 10:28 p.m. Moon at Ascending Node
21 5:39 p.m. Saturn 0.3°N of Moon: Occn. For Chile & Argentina
22 12:15 p.m. LAST QUARTER MOON
23 12 p.m. Neptune in Conjunction with Sun
26 12:23 a.m. Venus 0.4°S of Moon: Occn.
27 2:52 p.m. Moon at Perigee: 360439 km
27 4:24 p.m. Mercury 2.9°S of Moon

Calendar of Astronomical Events Courtesy of Fred Espenak, www.AstroPixels.com

The GRAND TRAVERSE ASTRONOMICAL SOCIETY meets on the first Friday of each month at the NORTHWESTERN MICHIGAN ROGERS OBSERVATORY at 8 p.m. The public is invited to attend all Society functions as our guests. We are a non-profit group dedicated to the study of astronomy and the sky above us. If you would like more information on GTAS, please call Bob Moler at 946-8649, or write to the address on the last page of this publication.



Ephemeris of Sky Events for NMC Observatory

February, 2014 - Local time zone: EST

Date		Sun			Twilight*		Moon			Illum
		Rise	Set	Hours	End	Start	Phase	R/S**	Time	Fractn
Sat	1	08:01a	05:51p	09:50	07:31p	06:21a		Set	08:34p	7%
Sun	2	08:00a	05:52p	09:52	07:32p	06:20a		Set	09:47p	13%
Mon	3	07:58a	05:54p	09:55	07:34p	06:19a		Set	10:58p	22%
Tue	4	07:57a	05:55p	09:57	07:35p	06:18a		Set	12:05a	32%
Wed	5	07:56a	05:57p	10:00	07:36p	06:17a		Set	01:10a	42%
Thu	6	07:55a	05:58p	10:03	07:37p	06:16a	F Qtr	Set	02:11a	52%
Fri	7	07:53a	05:59p	10:06	07:39p	06:14a		Set	03:07a	62%
Sat	8	07:52a	06:01p	10:08	07:40p	06:13a		Set	03:59a	71%
Sun	9	07:51a	06:02p	10:11	07:41p	06:12a		Set	04:46a	79%
Mon	10	07:49a	06:04p	10:14	07:42p	06:11a		Set	05:28a	86%
Tue	11	07:48a	06:05p	10:17	07:44p	06:10a		Set	06:06a	92%
Wed	12	07:47a	06:06p	10:19	07:45p	06:08a		Set	06:39a	96%
Thu	13	07:45a	06:08p	10:22	07:46p	06:07a		Set	07:10a	99%
Fri	14	07:44a	06:09p	10:25	07:47p	06:06a	Full	Rise	06:15p	100%
Sat	15	07:42a	06:11p	10:28	07:49p	06:04a		Rise	07:15p	99%
Sun	16	07:41a	06:12p	10:31	07:50p	06:03a		Rise	08:15p	96%
Mon	17	07:39a	06:13p	10:34	07:51p	06:02a		Rise	09:17p	92%
Tue	18	07:38a	06:15p	10:37	07:52p	06:00a		Rise	10:19p	85%
Wed	19	07:36a	06:16p	10:40	07:54p	05:59a		Rise	11:23p	77%
Thu	20	07:34a	06:18p	10:43	07:55p	05:57a		Rise	12:27a	68%
Fri	21	07:33a	06:19p	10:46	07:56p	05:56a		Rise	01:31a	58%
Sat	22	07:31a	06:20p	10:49	07:58p	05:54a	L Qtr	Rise	02:34a	47%
Sun	23	07:30a	06:22p	10:52	07:59p	05:53a		Rise	03:33a	36%
Mon	24	07:28a	06:23p	10:55	08:00p	05:51a		Rise	04:27a	25%
Tue	25	07:26a	06:24p	10:58	08:01p	05:49a		Rise	05:15a	16%
Wed	26	07:25a	06:26p	11:01	08:03p	05:48a		Rise	05:58a	8%
Thu	27	07:23a	06:27p	11:04	08:04p	05:46a		Rise	06:36a	3%
Fri	28	07:21a	06:29p	11:07	08:05p	05:44a		Rise	07:11a	0%

* Astronomical Twilight

** Moonrise or moonset, whichever occurs between sunset and sunrise

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Grand Traverse Astronomical Society – Membership Application 2014

___ I am interested, please send me more information about the next GTAS meeting.

___ I'll join, payment enclosed Email Address:_____

___ Membership renewal **Newsletter Delivery: ___ Email ___ Mail**

Interests: _____

Name: _____ Telephone: _____

Address: _____

Street City State ZIP

Dues: ___ Single Membership $25.00/yr

___ Family.....$30.00/yr

___ Student (up to 18 years age)....$15.00/yr

Addl: ___ Sky & Telescope Magazine.....$32.95/yr

Mail check to: G.T.A.S.
Gary Carlisle, Treasurer
1473 Birmley Road
Traverse City, MI 49686

WANTED: Astronomers interested in working with Project ASTRO POLARIS.
Willingness to work with K-12 students and teachers. Visiting classrooms and conducting experiments, discussing astronomy interests and events. Sharing your love of astronomy with others. Will provide; training, materials, instuctionals and support.
Please contact: Jerry Dobek Site Coordinator Project ASTRO POLARIS NMC Science & Math 1701 East Front Street Traverse City, MI 49686 email jdobek@nmc.edu phone 946-1787 obsv. 223-4545 home

The Stellar Sentinel
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GRAND TRAVERSE ASTRONOMICAL SOCIETY
GTAS

Stellar Sentinel Extras for February 2014

- Supernova in galaxy M82
- NASA Space Place Article: *Surprising Young Stars in the Oldest Places in the Universe*
- Favorite Deep Space Objects (DSOs) for Dave

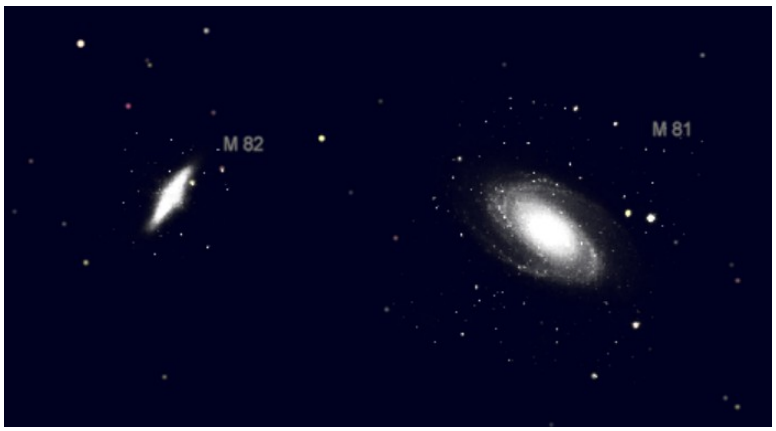
Supernova in galaxy M82

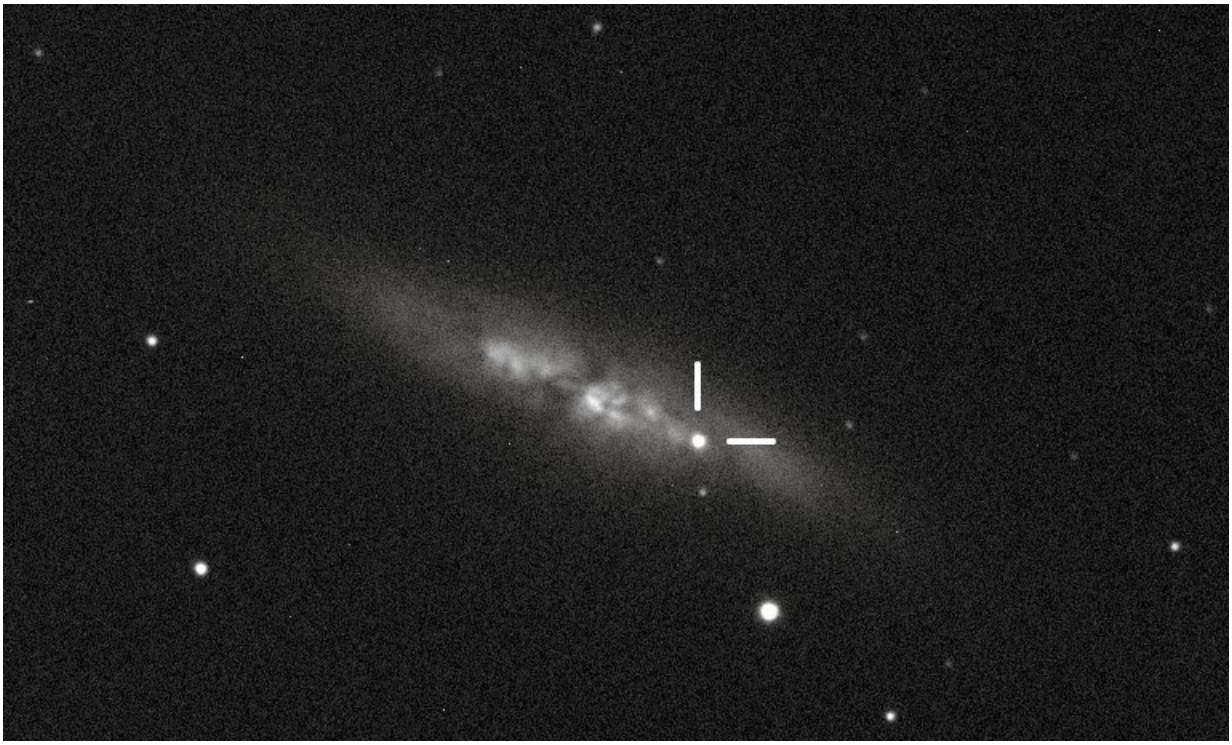
By Bob Moler

There is a new supernova in our skies. It's designation is SN 2014J and it's pretty close as these things go, but not in our galaxy. It's in another galaxy M82 off the front of the bowl of the Big Dipper, and 12 million light years away. It's the closest supernova since supernova 1987A, which appeared on the last days of February 1987 in a companion galaxy to us the Large Magellanic Cloud which was 160 thousand light years away. While the latter was visible to the naked eye, this will stay a binocular object at best. I have a finder chart and more information in bobmoler.wordpress.org for those that may need it. This is a special type of supernova that's used for distance measurement in the universe called a type 1a and this will be a good time to fine tune the calibration.

To theleft is a finderr Chart for M82 and M81. Actual time is around 9 p.m. looking to the northeast. Created using Cartes du Ciel (Sky Charts)

Below is the field of M81 ans M82 in a low power telescope. The spiral arms on M81 will not be visible.





Discovery image of SN 2014J. Credit: UCL/University of London Observatory/Steve Fossey/Ben Cooke/Guy Pollack/Matthew Wilde/Thomas Wright.

Let's talk more about our new supernova in galaxy M82 off the bowl of the Big Dipper. Of course new and nova used in the same sentence is a bit redundant because Nova is Latin for Stella Nova or new star. It is thought that tiny massive white dwarf stars near the end of their life are involved in some way. Type 1a supernovae all seem to explode with about the same brightness so it's thought that they accrete matter from a nearby giant star until their mass gets to about 1.44 times the sun's mass. That that point they explode. The explosion of 1.44 solar masses is what gives them the common brightness. The 1.44 of the sun's mass is called the Chandrasekhar limit discovered mathematically in 1930 by the Indian-American astronomer of the same name.

Check here for the Wikipedia article on astrophysicist Subrahmanyan Chandrasekhar and the Chandrasekhar limit.

Chandra, as he was know was honored four years after his death with the naming of the Chandra X-ray Observatory, one of NASA's Great Observatories launched in 1999 and still operating.

The ext for this article was based on the postings of January 29 and 30, 2014 at bobmoler.wordpress.com.

Surprising Young Stars in the Oldest Places in the Universe

By Dr. Ethan Siegel

Littered among the stars in our night sky are the famed deep-sky objects. These range from extended spiral and elliptical galaxies millions or even *billions* of light years away to the star clusters, nebulae, and stellar remnants strewn throughout our own galaxy. But there's an intermediate class of objects, too: the *globular star clusters*, self-contained clusters of stars found in spherically-distributed halos around each galaxy.

Back before there were any stars or galaxies in the universe, it was an expanding, cooling sea of matter and radiation containing regions where the matter was slightly more dense in some places than others. While gravity worked to pull more and more matter into these places, the pressure from radiation pushed back, preventing the gravitational collapse of gas clouds below a certain mass. In the young universe, this meant no clouds smaller than around a few hundred thousand times the mass of our Sun could collapse. This coincides with a globular cluster's typical mass, and their stars are some of the oldest in the universe!

These compact, spherical collections of stars are all less than 100 light-years in radius, but typically have around 100,000 stars inside them, making them nearly 100 times denser than our neighborhood of the Milky Way! The vast majority of globular clusters have extremely few heavy elements (heavier than helium), as little as 1% of what we find in our Sun. There's a good reason for this: our Sun is only 4.5 billion years old and has seen many generations of stars live-and-die, while globular clusters (and the stars inside of them) are often *over 13 billion years old*, or more than 90% the age of the universe! When you look inside one of these cosmic collections, you're looking at some of the oldest stellar swarms in the known universe.

Yet when you look at a high-resolution image of these relics from the early universe, you'll find a sprinkling of hot, massive, apparently *young* blue stars! Is there a stellar fountain of youth inside? Kind of! These massive stellar swarms are so dense -- especially towards the center -- that mergers, mass siphoning and collisions between stars are quite common. When two long-lived, low-mass stars interact in these ways, they produce a hotter, bluer star that will be *much* shorter lived, known as a *blue straggler star.* First discovered by Allan Sandage in 1953, these young-looking stars arise thanks to stellar cannibalism. So enjoy the brightest and bluest stars in these globular clusters, found right alongside the oldest known stars in the universe!

Learn about a recent globular cluster discovery here: http://www.nasa.gov/press/2013/september/hubble-uncovers-largest-known-group-of-star-clusters-clues-to-dark-matter.

Kids can learn more about how stars work by listening to The Space Place's own Dr. Marc: http://spaceplace.nasa.gov/podcasts/en/#stars.

Globular Cluster NGC 6397. Credit: ESA & Francesco Ferraro (Bologna Astronomical Observatory) / NASA, Hubble Space Telescope, WFPC2.

Favorite Deep Space Objects (DSOs) for Dave

This is a list used in the Stellar Sentinel as some of the best objects for public viewing which sits at the bottom of the Society Events page. However in busy summer months the list is severly limited or omitted all together. So here's the list in roughly right ascentson order.

Deep Sky Object, description, constellation, distance	Rt. Asc.	Declin.
	hr. min.	o '
M 31: Great Andromeda Galaxy, And, 2.3m l.y.	00 42.7	+41 16
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M 81: Sb Galaxy, M 82 nearby, UMa, about 12m l.y.	09 55.6	+69 04
M 82: Ip Starburst galaxy, companion of M 81, UMa, about 12m l.y. *** Supernova SN 2014J exploded in mid-January. Should be the brightest star superimposed on the glow.	09 55.8	+69 41
Al Geiba (γ Leonis): double star, Leo, sep 125 a.u., 90 l.y.	10 19.4	+19 54
M 97: Owl Nebula (planetary), UMa, about 3k l.y.	11 14.8	+55 01
M 66: Sb galaxy in a group of galaxies, Leo, 29-38m l.y.	11 20.2	+12 59
M 87: E1 galaxy-richest part of Virgo Cluster, Vir, about 42m l.y.	12 30.8	+12 24
NGC 4565: Edge-on Sb galaxy, Com, about 20m l.y.	12 36.3	+25 59
M 104: Sombrero Galaxy (edge-on Sa), Vir, about 40m l.y.	12 40.0	- 11 37
M 3: Globular cluster, CVn, 35-40k l.y.	13 42.2	+28 23
M 51: Whirlpool Galaxy (Face-on Sc), CVn, 35m l.y.	13 29.9	+47 12
M 5: Globular cluster, Ser, 26-27k l.y.	15 18.6	+02 05
M 8: Lagoon Nebula (Emission Nebula) with cluster NGC 6530, Sgr, about 5K l.y.	18 03.8	-24 23
M 16: Cluster and Eagle Nebula, Ser, 8k l.y.	18 18.8	- 13 47
M 17: Swan Nebula (a.k.a. Horseshoe and Omega), Sgr, 5.7k l.y.	18 20.8	- 16 11
M 22: Bright, large globular cluster, Sgr, 10.6k l.y.	18 36.4	- 23 54
M 13: Great Hercules globular cluster, Her, 21-25k l.y.	16 41.7	+36 28
M 57: Ring Nebula (planetary), Lyr, 1500 l.y.	18 53.6	+33 02
Alberio (β Cygni): Gold and blue double star, Cyg, 160 l.y., actual separation = 400b miles	19 30.3	+27 43
M 11: A great open (galactic) star cluster, Sct, 5.5k l.y.	18 50.0	- 06 16
M 27: Dumbbell nebula (planetary), Vul, 900 l.y.	19 58.8	+22 43
M 2: Globular cluster, Aqr, 50k l.y.	21 33.5	-00 49
M 15: Compact globular cluster, Peg, 34-39k l.y.	21 30.0	+12 10
NGC 7009: Saturn Nebula (planetary), Aqr, 3.9k l.y.?	21 04.2	- 11 22