



# The Sidereal Times

## Southeastern Iowa Astronomy Club

A Member Society of the  
Astronomical League

### Club Officers:

**Executive Committee**

President Jim Hilkin  
 Vice President Libby Snipes  
 Treasurer Vicki Philabaum  
 Secretary David Philabaum  
 Chief Observer David Philabaum  
 Members-at-Large  
 Claus Benninghoven  
 Duane Gerling  
 Blake Stumpf

**Board of Directors**

Chair Judy Hilkin  
 Vice Chair Ray Reineke  
 Secretary David Philabaum  
 Members-at-Large  
 Frank Libe  
 Blake Stumpf  
 Jim Wilt

**Audit Committee**

Dean Moberg (2012)  
 JT Stumpf (2013)  
 John Toney (2014)

**Newsletter**

Karen Johnson

### Minutes March 19, 2015

Vice President Libby Snipes called the meeting to order at 6:33 pm with the following members in attendance: Carl Snipes, Paul Sly, Chuck Block, Claus Benninghoven, Duane Gerling, Bill Stewart, Ray Reineke, John Toney, and Dave & Vicki Philabaum. Lavon Worley from the conservation board was also in attendance. John moved to approve the minutes as

published, Bill seconded, and the motion passed. Vicki gave the Treasurer's report stating that the current balance in the checking account is \$1,914.04. She also stated that she will be sending out notices reminding people when it is time to renew their memberships. Dues remain \$20 per year for a single membership and \$30 per year for a family member-

ship. Payment can be made at a club meeting or by mailing them to PO Box 14, West Burlington, IA 52655. John moved to approve the Treasurer's report, seconded by Chuck, and the motion passed. Dave reported that the only groups on the schedule at this time are the county Dark Wings camps this summer. Libby reported that she had been contacted

(continued on page 3)

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### FYI

~ Dues are due in April~ \$20 single, \$30 family  
 ~ Nominations for officers will take place at the April meeting

~ Election of officers will take place at the May meeting  
 ~ April meeting is on the 17th at the Witte Observatory

~ Deadline for articles for the May newsletter is May 6th



## The Sidereal Times

### The Cold Never Bothered Me Anyway

By Dr. Ethan Siegel



For those of us in the northern hemisphere, winter brings long, cold nights, which are often excellent for sky watchers (so long as there's a way to keep warm!) But there's often an added bonus that comes along when conditions are just right: the polar lights, or the Aurora Borealis around the North Pole. Here on our world, a brilliant green light often appears for observers at high northern latitudes, with occasional, dimmer reds and even blues lighting up a clear night.

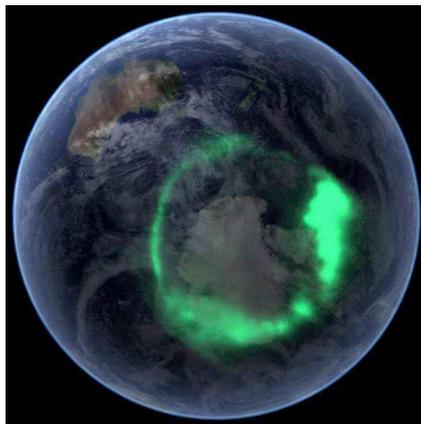
“They’re energetic enough to knock electrons off atoms and molecules...”

We had always assumed that there was some connection between particles emitted from the Sun and the aurorae, as particularly intense displays were observed around three days after a solar storm occurred in the direction of Earth. Presumably, particles originating from the Sun—ionized electrons

and atomic nuclei like protons and alpha particles—make up the vast majority of the solar wind and get funneled by the Earth's magnetic field into a circle around its magnetic poles. They're energetic enough to knock electrons off atoms and molecules at various layers in the upper atmosphere—particles like molecular nitrogen, oxygen and atomic hydrogen. And when the electrons fall back either onto the atoms or to lower energy levels, they emit light of varying but particular wavelengths—oxygen producing the most common green signature, with less common states of oxygen and hydrogen producing red and the occasional blue from nitrogen.

But it wasn't until the 2000s that this picture was directly confirmed! NASA's Imager for Magnetopause-to-Aurora Glob-

al Exploration (IMAGE) satellite (which ceased operations in December 2005) was able to find out how the magnetosphere responded to solar wind changes, how the plasmas were energized, transported and (in some cases) lost, and many more properties of our magnetosphere. Planets without significant magnetic fields such as Venus and Mars have much smaller, weaker aurorae than we do, and gas giant planets like Saturn have aurorae that primarily shine in the ultraviolet rather than the visible. Nevertheless, the aurorae are a spectacular sight in the evening, particularly for observers in Alaska, Canada and the Scandinavian countries. But when a solar storm comes our way, keep your eyes towards the north at night; the views will be well worth braving the cold!



Auroral overlays from the IMAGE spacecraft.

Image credit: NASA Earth Observatory (Goddard Space Flight Center) / Blue Marble team.

Minutes (continued from page 1)

about the club having the observatory open for the Youth Jamboree to be held on Saturday, May 9<sup>th</sup> from 9:00am - 2:00pm. It was decided that the club would have the observatory open for the event. Ray reported that he is working on the end plates for the Ealing scope to enclose the new clutch motors and the encoders for the ArgoNavis system. Libby reminded everyone that nominations for club offices will be held at the April meeting and elec-

tions will be at the May meeting. Most current office holders cannot run for another term in their current position. She encouraged everyone to consider serving on the board. Future dates for activities were discussed. The next club meeting will be at the observatory on April 17<sup>th</sup> at 7:00 pm. Also the first and third Friday night viewing sessions have resumed. Dave gave the Observer's report. With no other business to discuss Ray

moved to adjourn, Vicki seconded, and the meeting adjourned at 7:10 pm. Following the meeting Libby showed some of the images she has recently taken.

Respectfully submitted,  
Dave Philabaum



**Did You Know?**

Hans Lippershey is credited with inventing the first telescope. He was a German spectacle maker who applied for the patent on September 25, 1608



Jim Hilkin and Jim Wilt removed the remainder of the bushes and stumps on March 31, 2015

## The Sidereal Times



### Looking Back in the Sidereal Times 25 Years Ago—April 1990

The latest news is the plaque dedicated to the Witte Observatory is now in Huston awaiting final confirmation to be included aboard the space shuttle Discovery when it transports the Hubble Space Telescope to its orbit. If you will remember, Dan Carlson provided and engraved a plaque which, if all goes well, will journey into space and then be returned to us

to be displayed in the classroom at the observatory. The launch is scheduled for April 12 at 9:21 am CDT. Keep your fingers crossed. *(The plaque and a letter from NASA stating that it was flown on the space shuttle are on display in the classroom. Hubble's launch was originally scheduled for October 1986. But on January 28, 1986, the Space Shuttle Challenger exploded*

*just over a minute into its flight. Shuttle flights ceased for two years. On April 24, 1990, Hubble finally launched into orbit aboard the Space Shuttle Discovery. The telescope carried five instruments: The Wide Field/Planetary Camera, the Goddard High Resolution Spectrograph, the Faint Object Camera, the Faint Object Spectrograph, and the High Speed Photometer.)*

### Looking Back in the Sidereal Times 10 Years Ago—April 2005

#### Did You Know?

NASA envisions submarines eventually exploring Kraken Mare, a liquid methane lake on Titan.

The April 2005 newsletter contained a composite image of Titan taken by the Cassini spacecraft. Initial results from the Huygens probe that landed on Titan revealed a complex surface with channels and lakes but it was not known if there was currently any liquid on the surface. The surface consisted of mainly dirty water ice and hydrocarbon ice and

was darker than expected. Evidence of methane springs on the surface was also found. *(Subsequent results have found that the surface of Titan has the consistency of soft wet sand with a thin crust on top, somewhat like snow with a crust of ice on top. Huygens also kicked up fluffy dust-like material, most likely organic*

*aerosols that are known to drizzle out of Titan's atmosphere, indicating that the surface was mostly dry when Huygens landed. The Cassini mission had been extended until 2017.)*



(Source: <http://www.usatoday.com/story/news/nation-now/2015/02/17/nasa-submarine-explore-saturn-titan-kraken/23559075/>)

### Treasurer's Report



SIAC Treasurer's Report March 2015			
2/28/2015		Beginning Balance	\$1,864.98
<b>Deposits</b>			
3/9/2015		Dues	\$80.00
3/30/2015		Dues	\$90.00
<b>Total Deposits</b>			<b>\$170.00</b>
<b>Expenses</b>			
	Check	Payee	
3/13/2015	462	MTC Technologies	\$30.94
<b>Total Expenses</b>			<b>\$30.94</b>
3/30/2015		Ending Balance	\$2,004.04
		General Fund	\$1,843.15
		Grants	\$160.89
<b>Total in Checking Account</b>			<b>\$2,004.04</b>

Observer's Report for April/May

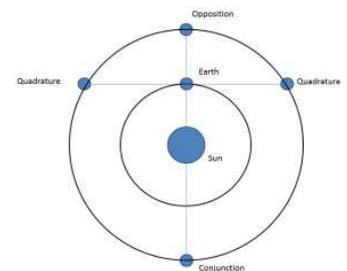
**Mercury** is in Aries just above the western horizon 30 minutes after sunset in mid-April. On April 19<sup>th</sup> look for Mercury 6°WSW of the 1.5 day-old crescent Moon very low in the west shortly after sunset. A low western horizon will be needed and binoculars will help. Also on this date, Mercury reaches perihelion, only .3075 AU from the Sun. Mercury climbs quickly up in the western sky and moves into Taurus on April 27<sup>th</sup>. On May 1<sup>st</sup> it is less than 2° to the left of M45 shining at magnitude -0.2. It reaches greatest elongation east of the sun on May 6<sup>th</sup> at 21°. By mid-May it has faded some to magnitude +1.3 but still sets more than one hour after the Sun. This is the best evening apparition of Mercury this year. **Mars** is dropping lower into the twilight. In mid-April it sets 90 minutes after the Sun and by mid-May that time has been cut in half. On April 19<sup>th</sup> look for Mars 4° to the right from the young crescent Moon along with Mercury. On April 21<sup>st</sup> and 22<sup>nd</sup> it is just over 1° to the left of Mercury. Mars is only

1/10 as bright as Mercury. Both planets are 26° below and slightly right of brilliant Venus. **Venus** is in Taurus shining at magnitude -4 in mid-April. It is climbing higher into the western sky and shows a disk 15" wide and 73% illuminated. On May 1<sup>st</sup> it is between Beta and Zeta Tauri, the tips of the bulls horns, and less than 4° north of M1. On May 8<sup>th</sup> it crosses into Gemini and is less than 2° to the right of M35 and is 32° above the horizon 30 minutes after sunset. On May 16<sup>th</sup> it is less than 1° to the right of 3<sup>rd</sup> magnitude Epsilon Geminorum. Venus is almost 800 times brighter than the star and shows a disk 19" wide that is 61% illuminated. It is now almost midnight before Venus sets. **Jupiter** is in Cancer moving slowly eastward among the stars. In mid-April it is 64° up at the end of evening twilight showing a disk 39" wide and shining at magnitude -2.2. By mid-May it is only 40° up at the end of twilight, its disk has shrunk to 36", and it has dropped to magnitude -2.0. Jupiter reaches eastern quad-

rature on May 4<sup>th</sup> making it a good time to watch for eclipses of the Galilean moons. On April 26<sup>th</sup> only Europa and Ganymede will be visible from 00:03-01:25 with Io's shadow transiting from 00:23-02:40, and the Red Spot will be centered at 01:08. On May 3<sup>rd</sup> once again only Europa and Ganymede will be visible from 22:22-01:57 with the Red Spot centered on the disk at 22:17. Other times when the Red Spot will be centered on Jupiter's disk include: 4-28 22:38; 5-5 23:28; 5-10 22:38; 5-13 00:17 and 5-15 21:47. Look for all four moons on the east side of the planet on 4-25, 4-28, 5-2, and 5-12, They are all on the west side on 4-22. The last of the major mutual events of the Galilean moons include 4-17 Callisto occults Ganymede at 20:28; 4-18 Europa eclipses Ganymede at 23:59; 4-20 Io eclipses Europa at 22:43, and 4-28 Io eclipses Europa again at 00:58. As the orbital plane of the moons becomes less edge on the events become less pronounced. The next series of mutual



Note:  
All times given  
in this report are  
CST using a  
24-hour clock



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### Observer's Report (continued from page 5)



#### Did You Know?

The Lyrid meteor shower is caused by debris left behind by Comet Thatcher. It passed Earth in 1861 and will pass again around 2277.

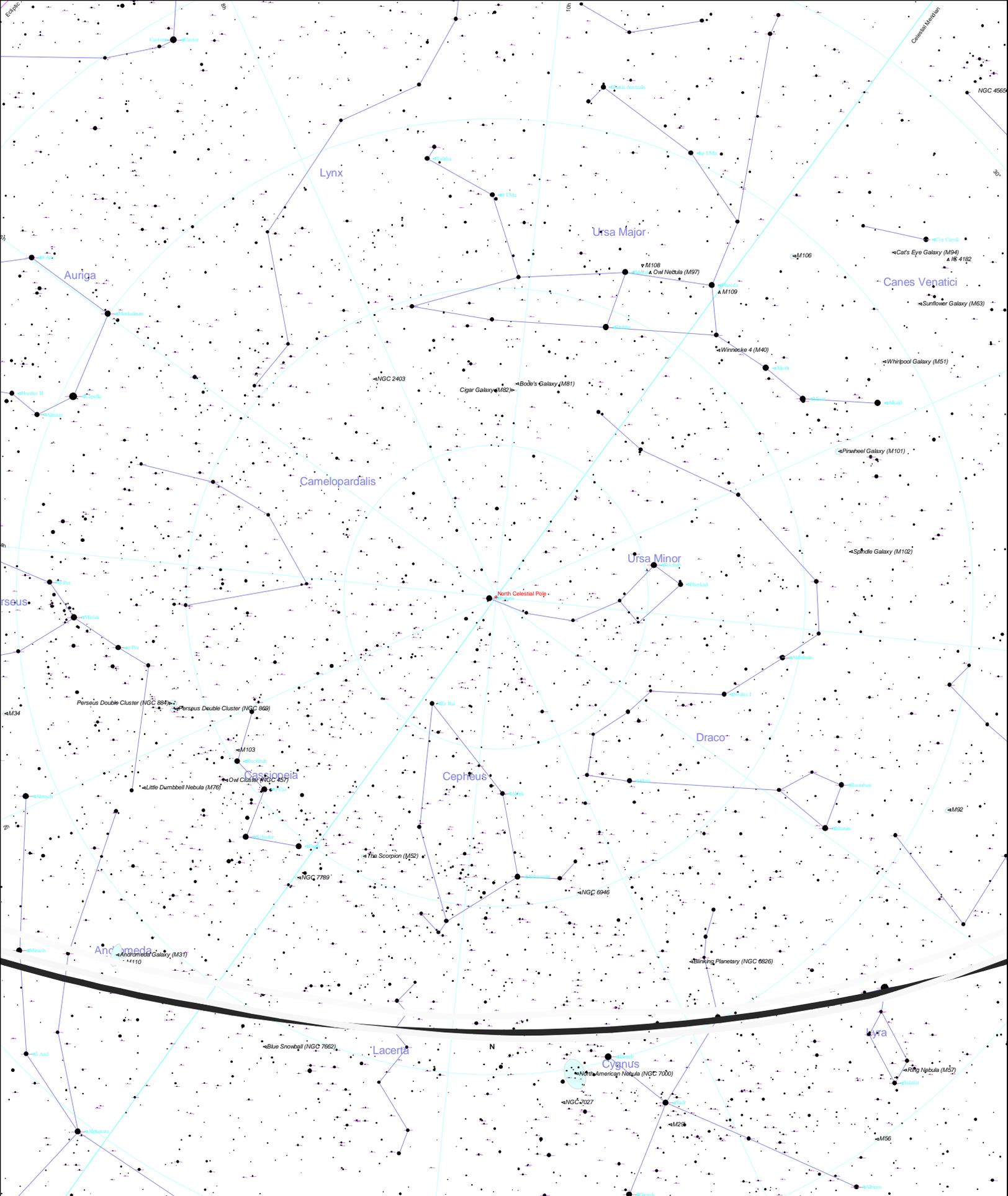
events will be in six years when Jupiter is on the other side of its orbit. **Saturn** is in Scorpius about  $1^\circ$  northwest of Nu Scorpii in mid-April shining at magnitude +0.2, rising a little before 23:00. The rings are tilted almost the maximum contributing to its brightness. Saturn is moving west and enters Libra on May 13<sup>th</sup>. Look for Iapetus on the west side of Saturn during the first part of May when it will be at its brightest, just a bit fainter than 10<sup>th</sup> magnitude. Don't confuse it with a 10<sup>th</sup> magnitude star between May 7<sup>th</sup> and May 9<sup>th</sup> as Saturn passes just north of it. Saturn will be north of the star on May 10<sup>th</sup>. Look for Titan north of the planet on April 18<sup>th</sup> and May 4<sup>th</sup>. It will be south of the planet on April 26<sup>th</sup> and May 11<sup>th</sup>. By mid-May Saturn has brightened to almost magnitude 0 and is rising at 20:30. **Pluto** is in the Teaspoon asterism in Sagittarius, just over  $1^\circ$  due north of Omicron Sagittarii. By mid-May it is  $28^\circ$  up at the start of morning twilight. This is about as high as Pluto will be above the horizon although in an-

other month it will be transiting well before twilight begins. **Neptune** is in Aquarius and rises about three hours ahead of the sun in mid-May. It may start to become visible then when it is  $13^\circ$  above the horizon at the start of twilight. **Uranus** is in Pisces,  $1.5^\circ$  southwest of Zeta Piscium and rises during morning twilight in mid-May and is not visible. The **Moon** phases are: new on 4-18 at 13:57; FQ 4-25 at 18:55; full 5-3 at 22:42; LQ 5-11 at 05:36. The 3.6 day old Moon occults 5.5 magnitude SAO94227 at 21:51 on April 21<sup>st</sup>. Four days later the first quarter Moon is just over  $3^\circ$  west of asteroid 3 Juno. On May 12<sup>th</sup> the third quarter Moon occults 5.4 magnitude Rho Aquarii. Comet **Lovejoy (C/2014 Q2)** is in Cassiopeia moving north and moves into Cepheus on May 3<sup>rd</sup>. It is about 7<sup>th</sup> magnitude as of April 4<sup>th</sup> and continues to fade. On March 16<sup>th</sup> a magnitude 6 nova was discovered in the teapot of Sagittarius. It brightened to magnitude 4.3 on March 22<sup>nd</sup> then faded about one magnitude

by March 25<sup>th</sup> then slowly brightened to about 4.5 on April 4<sup>th</sup> where it remained until April 6<sup>th</sup> when it dropped about two magnitudes in two days. At this time it is uncertain what is causing this behavior. The Lyrid meteor shower peaks on the night of April 22<sup>nd</sup> when 15-20 meteors per hour can be expected. However the peak occurs about 18:00 for us so we probably won't see that many.

Calendar for April/May

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
12 (April) Yuri's Night	13	14	15 Neptune 4° south of Moon	16	17 SIAC Meeting and Public Viewing 7pm at observatory Moon at perigee	18 New Moon
19	20	21 Venus 7° north of Moon Lyrid meteor shower	22 Lyrid meteor shower	23	24	25 First Quarter Moon Astronomy Day
26 Jupiter 5° north of Moon	27	28	29 Moon at apogee	30	1 (May) First Friday Public Viewing	2
3 Full Moon	4	5 Saturn 2° south of Moon Eta Aquarid meteor shower	6 Eta Aquarid meteor shower	7 Mercury at greatest elongation	8	9 Youth Jamboree at Big Hollow 9-2, the observatory will be open
10 	11 Last Quarter Moon	12 Neptune 3° south of Moon	13	14 Moon at perigee	15 SIAC Meeting and Public Viewing 7pm at observatory Uranus 0.2° north of Moon	16
17	18 New Moon	19 Mercury 6° north of Moon and appears stationary	20	21 Venus 8° north of Moon	22 Saturn at opposition	23



Viewing from Burlington, United States Long: -91° 08' 07" Lat: 40° 48' 52"  
 2015/4/17 9:00:00 PM (Local)  
 Looking: north (40° above horizon)  
 FOV: 100°  
 Limiting Magnitude: 7.1





## Southeastern Iowa Astronomy Club

P.O. Box 14  
West Burlington, IA 52655

WE'RE ON THE WEB

[HTTP://  
WWW.DMCOUNTRY.COM  
/INDEX.ASPX?NID=516](http://www.dmcountry.com/index.aspx?nid=516)

### Dues

\$20	Individual
\$30	Family

## A Brief History

The idea for the observatory was conceived by the members of the Southeastern Iowa Astronomy Club. Through a cooperative agreement between the Des Moines County Conservation Board, The Burlington Community School System, and the Southeastern Iowa Astronomy Club, the idea became a reality. A substantial grant from the John H. Witte, Jr. Foundation provided the funding for materials, with nearly all the construction being done by members of the club. Work began in the spring of 1985 and the observatory was dedicated in May 1987. In the years since the dedication, thousands of people have climbed the ladder to peer through the eyepiece of the beautiful 1937 Alvan-Clark brass refractor.

In 1996 a second observatory, the Prugh-Carver Observatory, was added through a grant from the Carver Foundation. Dedicated to Burton Prugh, a Burlington businessman, it stands as a reminder of his devotion and support to the Southeastern Iowa Astronomy Club. It houses Mr. Witte's personal telescope—an 8" Fecker refractor, as well as several smaller scopes.

Dedicated on September 17, 2004, the new Stone-Kelly Observatory houses the 16" Cassegrain that was formerly on Burlington High School off Roosevelt Avenue.

Volunteer club members, after passing a training and apprenticeship program, operate the observatory for public and private groups.

The observatory complex is open to the public on the first and third Fridays of every month, weather permitting.



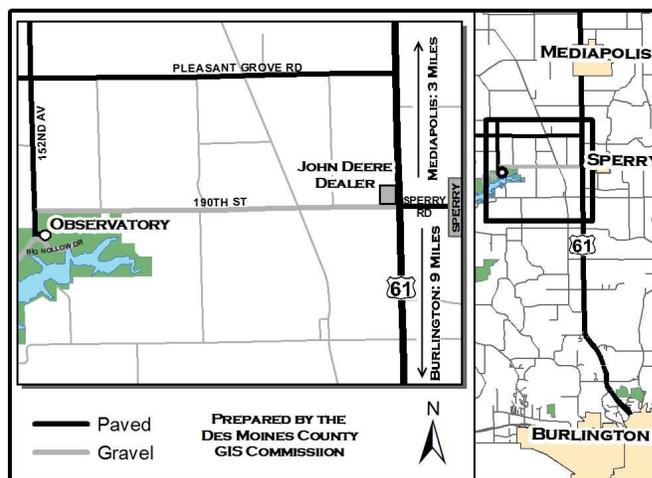
## About Southeastern Iowa Astronomy Club

The Southeastern Iowa Astronomy Club meets on the third Friday of each month at the Witte Observatory at 7 pm.

The purpose of the club is to provide astronomy opportunities to the local area, mainly through the use of the facilities at the John H. Witte, Jr. Observatory. During monthly meetings, information is provided about upcoming events and items of interest locally, nationally, and worldwide. The meetings allow members to share their experiences and expertise with each other, as well as providing a forum for questions. The public is wel-

come to share in the meetings, and they are followed by a public viewing session (weather permitting).

Additional benefits to members include our monthly newsletter, The Sidereal Times, voting rights for club activities, and membership in the national Astronomical League. The Astronomical League membership provides a quarterly newsletter, discounts on certain astronomy-related products, special training/skill building programs, and other great benefits.



### Travel directions to the Witte Observatory Complex.

The observatory complex is located at 18832 152nd Avenue, Sperry, Iowa in Big Hollow Creek Recreation Area approximately 12 miles north of Burlington, Iowa.