



GUIDESCOPE

**B.R.A.S.
Officers
President:
Mike
Harkey
Vice-
President:**

**Dave Lengyel
Treasurer: John Reising
Secretary: Dave Gulyas**

Editor: Barb Hubal, hubalbd@netzero.net

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Coming UP!!

Black River Meetings

- * **September 23rd - Nielson (8:30-10:30pm) Welcome to the Fall Sky**
- * **October 5th - Carlisle Visitor Center (7pm) - John Reising - Mars Opposition**
- * **October 7th - Nielson (8-10pm) October Skies**
- * **October 13th - BRAS Board Meeting**
- * **October 28th - Nielson (8-10pm) Halloween Astronomy**
- * **November 2nd - Carlisle Visitor Center (7pm) - Astronomical Show and Tell**
- * **November 4th - Nielson (7-9pm) Mars at Opposition**
- * **November 10th - BRAS Board Meeting**
- * **December 2nd - Nielson (7-9pm) Venus and Mars**
- * **December 7th - (7pm) Holiday Dinner Meeting**
- * **December 15th - BRAS Board Meeting**

Other Events & Meetings

Hidden Hollow 2005 - Sept. 30-Oct. 2nd Richland Astronomical Society's Warren Rupp Observatory near Mansfield, Ohio - NorthSStar Concessions (24 hrs), Vendors, Door prizes - Guest Speakers include Barb Hubal: From the Black River Astronomy Society, Barb holds an BS in Chemistry and a MS in Polymer Science and a Masters in Library & Information Science. Her love is studying the planets and astrophotography. Her presentation will be on "Safe Solar Viewing" and "The Venus Transit".

See their website: www.wro.org/hiddenhollow2005.htm for more details.

Sat. October 29th - Brunswick Astronomy Club at Plum Creek (Medina County Parks)

IMPORTANT LOCATIONS

Nielsen Observatory - 13630 Diagonal Road, LaGrange, OH at the Lorain County Metro Parks Carlisle Equestrian Center

Carlisle Visitor Center - The Lorain County Metroparks Visitors Center is on Nickel Plate-Diagonal Road in Carlisle Township.

Club News

ELECTIONS - Elections for Board members will be at the October 5th Regular meeting. Anyone wishing to nominate, please see the form at the end of the newsletter. Terms will be ending for the following board members: Tim Hornbeck, Jim Lengyel and John Reising

Make-It-And-Take-It Solar Filters - Barb & Ken Hubal hosted a make it-and-take it workshop on solar filters at the August meeting. Participating club members owe the club the following amounts (to cover the cost of materials):

Janus - \$11.84	Garretson - \$21.05	Cunningham - \$3.37
Lumpkin - \$11.84	Gulyas - \$47.36	Erickson - \$0.49
Bodzash - \$7.58	Plas - \$3.37	
Kreja - \$23.10	Cox - \$5.16	
Lengyel - \$7.58	Dunkel - \$5.26	

Please pay John Reising at your earliest convenience.

B.R.A.S. Star Party on Sept. 10th

Black River hosted its annual OTAA Star Party on Sept. 10th. The weather was great, although a bit wet. We had H-alpha solar viewing, compliments of Ken Hubal who set up the Blue Lady. It just so happens that there was lots of solar activity to be seen. Those who hung around until about midnight were treated to an aurora, thanks to the recent solar activity. Grilled hot dogs and hamburgers were again at the party, thanks to Tim Kreja, Barb Hubal, Tom Janus - and Dave Lengyel's contribution of the charcoal (and lighter fluid!).

Due to Tim Hornbeck's diligent efforts, the door prizes were great! Jim Cunningham won the 80mm equatorial scope, and promptly "raffled it off" to the kids in attendance. The pint-sized winner was duly impressed (as was her big brother), and greatly appreciative. Dave Lengyel's entertainment was great, as usual. Even the College football game was available, thanks to the large-screen TV in the hall!

To the "No-Shows" - you missed a great time!

Spaceweather.com issued an **aurora watch** for the night of Sept 10th, and Star Party attendants were rewarded with the appearance of one. In fact, the website stated that "At its peak on Sept. 11th, the storm sparked Northern Lights as far south as Arizona in the United States." It was sparked by a strong geomagnetic storm activated by sunspot 798. **Which leads us to the article of the month...**

Article of the Month: Sunspots and Auroras

What are sunspots? A sunspot is a dark part of the sun's surface that is cooler than the surrounding area. It turns out it is cooler because of a strong magnetic field there that inhibits the transport of heat via convective motion in the sun. The magnetic field is formed below the sun's surface, and extends out into the sun's corona. Magnetic pressure may be a tough concept to grasp. You can feel magnetic pressure when you take two magnets and take the ends of the same polarity and try to put them together. They just don't quite want to go together. That's magnetic pressure.

Why are sunspots cooler? Well, think of a sunspot as a bubble of magnetic pressure, surrounded by the gas pressure of the photosphere. For the sunspot to exist, the total pressure must be in balance between the region inside and the region outside of the sunspot. Outside a sunspot, you have only gas pressure, which depends on the temperature. In the sunspot you have both gas pressure and magnetic field pressure combined. Since the pressure must be in balance, magnetic pressure inside the sunspot allows the gas pressure (and thus the temperature) to remain lower than the areas outside of the sunspot.

The sun is by far the largest object in the solar system, containing more than 99.8% of the total mass of the solar system (Jupiter contains most of the rest). The sun is made of about 75% hydrogen and 25% helium by mass, with tiny trace amounts of metals and other compounds. Over time, the nuclear fusion reactions that fuel the sun are converting hydrogen into helium in its core, changing the ratio of the two elements.

The energy produced by nuclear fusion in the core of the sun is carried outward by convective motions in the outer 20-30% of the sun, called the convection zone. Convection is the process by which hot gas from the center of the sun rises to the surface, and cooler gas, which comes to the surface and radiates its heat away, sinks back towards the center. The sun is so large and so dense that it takes about 50,000,000 years for energy produced at its core to make its way to the sun's surface! Sunspots appear as tiny spots on the sun--but an average-sized sunspot is as large as the earth.

The sun, like the earth, generates a magnetic field that permeates the surface and extends out into space. The sun's magnetic field moves and changes over time, fluctuating in intensity in different areas of the sun's surface. The sun's magnetic field is thought to be produced by fluid motions within and just below the convection zone. However, the ultimate source of the sun's magnetic field - and the reasons for its fluctuations - is not well understood.

The energy that is produced in our sun is produced in the center. That energy has to be transported out. Most of the way out, that energy is transported by diffusion of radiation, as one molecule radiates energy to the next, which absorbs it and radiates it on to the next. But at a certain point...in the outer 20% or so of the radius of the sun, the energy starts to be transported by convective motion, this buoyancy of bubbles of gas that carry excess energy up to the surface, and then cooler portions of gas, which have come to the surface and radiated, drop back down. So there you have mechanical motion, and that mechanical motion is involved in generating the magnetic fields that cause sunspots.

As well as being a darker area on the sun, a sunspot is an area that temporarily has a concentrated magnetic field. This magnetic force inhibits the convective motion, which ordinarily brings hot matter up from the interior of the sun, so the area of the sunspot is cooler than the surrounding plasma and gas (about 4,000 degrees, as opposed to 5,7000 degrees - still rather toasty!).

Sunspots are made up of two parts: a dark, roughly circular central disk called the umbra, and a lighter outer area called the penumbra. The term "umbra" means "shade" in Latin, "penumbra" means "almost shade." The granular appearance of the area outside of the sunspot is the result of convection. The center of each granule is hot material rising from the sun's interior, while the edges are cooler material sinking downward.

Sunspots have an indirect but significant impact on life here on earth. As early as the nineteenth century, scientists noticed that high levels of activity on the sun, like flares and sunspots, were followed shortly by strong fluctuations in magnetic instruments on earth. They wondered what caused these changes.

The sunspot itself, the dark region on the sun, doesn't by itself affect the earth. However, it is produced by a magnetic field, and that magnetic field doesn't just stop, it comes to the surface and expands out above the surface...." Hot material called plasma near a sunspot interacts with magnetic fields, and the plasma can burst up and out from the sun, in what is called a solar flare. Energetic particles, x-rays and magnetic fields from these solar flares bombard the earth in what are called geomagnetic storms. When these storms reach earth, they affect us in many ways.

Ordinarily, the earth's own magnetic field protects the earth from most of the sun's emissions. But during periods of intense sunspot activity, which coincide with solar flares and coronal mass ejections, the geomagnetic flow from the sun is much stronger. These magnetic storms produce heightened, spectacular displays of the Aurora Borealis and the Aurora Australis, otherwise known as the Northern and Southern Lights.

These energetic electromagnetic bombardments can also disrupt power grids and radio transmissions on earth. Both the flow of electric current in wires and the transmission of radio waves through the air can be interfered with by the energetic magnetic radiation from the sun. Often, these storms produce surges in the power grid and static on the radio, and if the waves of energetic particles are strong enough, power grids can be overloaded, and radio signals drowned out.

This information is compliments of astrophysicist Dr. David Dearborn (Lawrence Livermore National Laboratory). All this information - and much more - can be found at "the Exploratorium's Sunspots Resource" (<http://www.exploratorium.edu/sunspots/>).

**BLACK RIVER ASTRONOMICAL SOCIETY
MONTHLY BOARD MEETING NOTES
Sept. 15, 2005 (7pm) at the Blue Sky Restaurant**

At 7:04PM Mike Harkey called the meeting to order with J. Cunningham, J. Reising, T. Kreja, M. Plas, D. Lengyel, B. Hubal, K. Hubal, G. Cox and D. Gulyas present.

August minutes: The August minutes were approved.

Treasures Report: - sent to members separately

Guidescope: Guidescope to be published to web page and link sent along with Board meeting minutes to online members. Hard copies sent to all others.

Instrumentation: Additional in-focus is needed on Unitron refractor. Removing set screw on collar may provide fix. Boy Scout camp OK with wasps on door as usual. The Blue Lady has been cleaned up,

Planning: October 8th meeting at Lorenzo's at 12:00 to schedule first half of 2006 Nielsen dates.

Programming:

October: John Reising - Mars opposition.

November: Show and Tell

December: Holiday dinner

January: Video about the Earth's magnetic field

February: Video, TBA

March: Ken Hubal, Solar flare monitoring

Public observing dates:

October 05, 2005: 7:00PM - Regular monthly meeting: Carlisle Visitors Center.

October 07, 2005: 8:00 - 10:00PM - Nielsen Observatory: October Skies (Rocket Boys)

October 08, 2005: 12:00PM - 2006 Nielsen planning: Lorenzo's in Oberlin.

October 13, 2005: 7:00PM - Regular monthly board meeting: Blue Sky Restaurant, Amherst.

October 28, 2005: 8:00 - 10:00PM - Nielsen Observatory: Halloween Astronomy.

Old Business:

Hinges at Nielsen Observatory to be repaired on October 23rd at 7:00PM prior to public observing. D. Lengyel made the motion; seconded by K. Hubal for D. Gulyas to purchase 100 solar viewing glasses with Black River Astronomical Society printed on them for no more than \$150.00. All in favor. J. Reising made a motion seconded by K. Hubal for D. Lengyel to purchase the domain name "blackriverastronomy.org" for no more than \$25.00 All in favor.

New Business:

2006 will be the 25th anniversary of our OTAA. T-Shirts, a major speaker and other items were discussed so as to make it a memorable occasion. T. Hornbeck is to be asked if he wants to send out door prize requests. M. Harkey volunteered if he does not want to. D. Gulyas offered to help whom ever accepts the responsibility.

Jim Cunningham made the motion to adjourn with a second by J. Reising at 8:37PM.

Respectfully submitted,

Dave Gulyas
Secretary, Black River Astronomical Society

**OCTOBER 5, 2005 REGULAR MEETING
Elections For 3 New Board Members Will be Held**

**If you would like to be nominated as a board member
Please put your name on this form**

PLEASE PRINT YOUR NAME

NAME _____

Return to Jim Cunningham Email: jamescunn@alltel.net

James Cunningham
1701 South Abbe Rd.
Elyria, Ohio 44035

phone: 440-365-0902

Terms Will End For:

Tim Hornbeck
Jim Lengyel
John Reising