in lieu of

The Ground Wave

December 2008

December Membership Meeting
& Holiday Party!
(everyone welcome)
Members Plz Bring Treats if Possible
Friday, December 5th, 2008
7:30 p.m. - Socializing 7:00 p.m.
Room 155 Murray-Herrick Campus Center

Program: Brian C. Hart, Ph.D. (NØTXR): Galaxy Clusters: Giants of the Universe

Clusters of galaxies are the largest gravitationally-bound objects in the Universe, measuring roughly 6 to 9 million light-years across. A light-year is about six trillion miles. The shapes (morphologies) of a sample of clusters of galaxies stretching at distances ranging from 1.25 billion light-years to more than 8 billion light-years away were measured. Change in the shapes of clusters as the Universe ages was seen, adding more support for current theories of how the Universe formed.

Our story is told by data from AXAF, a small, X-ray remote sensing satellite orbiting a shining, blue planet in the outskirts of a small galaxy...

Told with a "Star Wars" motif...

Brian C. Hart, Ph.D. (NØTXR), son of SPRC member, **Gary Hart (NØAGH)**, graduated with the Ph.D. in Astrophysics from the University of California, Irvine, where he studied astronomy using data collected by the currently-orbiting AXAF satellite, otherwise known as the Chandra X-Ray Observatory. Brian obtained the Masters Degree in Physics from University of California, Irvine, and in 2002 graduated Cum Laude with a

B.A. in Physics and Mathematics from Hamline University. Dr. Hart is originally from Fridley and has been attending SPRC meetings all during his formative years. Out of love for country and just wanting to help out, Dr. Hart will be volunteering to be an active-duty U.S. Army Air Defense Artillery or Engineering branch officer just after Christmas. Hart says he wants to make Army his lifelong career.

Received from Brian later (11/24/08): I am going into Army Reserve, having accepted an offer to work as a civilian rocket scientist with the Army at their Space Missile Defense Command Technical Center in Huntsville, Alabama, and as part of the preparation for my new assignment I will upgrade my Amateur Radio license from Technician to Extra class.

Directions to Meeting: Take the Cretin-Vandalia exit from I94 and take Cretin Avenue six blocks south to the St. Thomas campus. Murray-Herrick Campus Center (MHCC), site of the meeting, is off of Cleveland Ave. South, which is two blocks east of Cretin. Enter the parking lot from Cleveland Avenue South, between Ashland and Portland Avenues. Go in the door at the end of the parking lot and turn right after the second set of double doors, then around through an open area to Room 155, on the 1st floor. Parking permits for the red and yellow lots on campus are not enforced after 6 p.m. on Fridays.

For a map to the meeting, go to www.stthomas.edu/campusmaps/stpaul.asp and download the campus map. The color version is easier to read but takes longer to download than the black and white version. MHCC is # 5 on the map. Room 155 is in the round section of the building, in the north end.

Be sure to monitor the club repeater, KØAGF, for talk-in help. 145.310 - no tone needed.

From Jay Maher, NJØM, Refreshment Chair:

Just a reminder that the club will provide an expanded assortment of treats for the holiday meeting. We'll have some small sandwich fixings, assorted fruit and punch, along with the normal coffee and soda. Please feel free to bring treats to share.

Remember the St. Paul Radio Club **Annual Auction, January 16, 2009.**

Attention **Washington Middle School** radio class volunteers and potential volunteers: December classes are 12/8 and 12/15 (Mondays, 2:45 – 5:00 p.m.) with activities of soldering and radio contacts. Classes will resume after the holiday break. FFI, contact Allan Klein (WØNLY), education<at>stpaulradio.org or Jay Maher, (NJØM), jay<at>umn.edu (use @ sign).

Circuit Builder Forum NOOZ

The Circuit Builder Forum changed its name to Circuit Builder Group somewhere along the way. Must've happened inadvertently when Jake set up the yahoo group for us (SPRCCB). I'm changing it back to Circuit Builder Forum (CBF).

The holiday season and winter are the slowest time of year for the CBF. Last winter, the lab was opened at certain times if there was a demand. Two keycard holders did open the lab one time for themselves but that was the only demand all winter. We may not be able to use the lab this season from January – May while Tom Sturm, NØBGO is on sabbatical leave.

But we can look at ideas and maybe even begin to implement them in a small way. Here are ideas that I have heard so far:

1) PSK31 warbler (Small Wonders Labs) / Learning more about PSK31

2) SW+ CW transceiver (Small Wonders Labs) with accompanying course http://epic.mcmaster.ca/~elmer101/ (check it out). *****

3) Put time and resources into learning surface mount technology.

4) Finish SDR radios. Jake did a fine job of setting this up. Some have finished their SDR radios. There are two dozen people on the SPRCCB group list, although not all were building SDR radios, so I don't know how many people still have unfinished radios.

Possible for the CBF for the winter season is/are one or more small group projects with several people getting together informally to work on things. An example is PSK31. Various people have told me that they want to learn how to do PSK31and/or build a computer-radio interface (we would need an Elmer for this, if starting from scratch). I have a PSK31 meter kit to build, having seen one that somebody else in the CBF built (the meter shows what a person's tx signal looks like), also a computer program which shows where PSK31 is going on in the world. We could have a PSK31 seminar once a week or so during the winter if there is interest.

*** Jay Maher (NJØM)** just mentioned that he will be implementing his idea (# 2 above) in January and is interested in having others join him. Here is his write-up:

> I'd like to revive an older project some club members worked on several years ago as part of the Elmer 101 class. For the web-based class, group members built the SW+ 40 meter CW transceiver from Small Wonder Labs. A link to the Small Wonder Labs transceiver follows this article. The Elmer 101 project provided support materials (link follows) that detailed the construction and testing of the SW+, pointing out the function of each component and stage. The site has a good deal of other supporting information as well. Even though the kit has been around for quite a while, I

think it is an excellent educational resource. The SW+ 40 is $55.00 (w/o enclosure) from Small Wonder Labs. Be warned that there is a backlog and it takes about two months to get a kit. I have purchased one and plan on beginning the project some time in January. If anyone is interested in building along, or just sharing the testing and following along without buying a kit, please contact me: Jay Maher, NJ0M, my email is jay@umn.edu.

Link to Small Wonder Labs SW+ transceivers
http://www.smallwonderlabs.com/swl_swp.htm

Link to Elmer 101 class materials (see Elmer 101 FAQ for course outline)
http://epic.mcmaster.ca/~elmer101/

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Plz contact me (Orcy) (circuitbuilders@stpaulradio.org) if you think of other ideas or are interested in a PSK31 group.

The lab may be open after the SPRC club breakfast Dec. 20th. If so, I'll send out a notice to the yahoo group, SPRCCB.

73 de Orcy WØQT
Circuit Builders Chair

Chasing the Balloon

by Orcy WØQT

Attendees at the SPRC November meeting will remember the presentation about near-space exploration, by James Flaten, Ph.D., who is Director of a NASA-funded program head-quartered at the U.of Minnesota. The purpose of the program is to acquaint people with near-space exploration. Physics students send experiments attached to weather balloons into near-space (80,000 – 90,000+ feet up), a less expensive endeavor than exploring space further up. A weather balloon will pop when it reaches the 80 – 90+ K altitude, then gradually drift to earth, slowed by a little parachute when thicker air is reached on the way down.

The last balloon flight of the year took place on a mostly cloudy weekend in November. The balloon was launched near Hinkley and drifted southeast to a point about 17 miles north of Menomonie,WI. I met two other chasers, **Dan Meyer, NØKFB** and **Dawn Holmberg, WXØZ**, just off the Forest Lake exit of 35W. In two vehicles, we went east on Hiway 8 to follow the balloon. It crossed over Hiway 8 and we likely would have been able to see it if not for the cloud cover.

I had my laptop on the passenger seat, using a PCIMIA Aircard to pull in the Internet. A small magmount antenna on top of my car connected to the Aircard. My mobile 2m radio is a Kenwood TM D700A with built-in TNC. Having the Kenwood set on APRS meant I had to use an HT to communicate with Dan and Dawn, helped by a magmount 2m meter antenna on the roof of my car, in addition to the 2m mobile antenna (three magmounts on the car).

The payload of the balloon contained an APRS transmitter hooked to a tiny 2m dipole, which sent out a signal sufficient to reach digipeaters (no obstacles in the air.) It did lose the signal once for awhile on its way down, perhaps with the antenna getting behind or above another part of the payload. I was watching www.aprs.fi on my laptop to track the balloon. Dan and Dawn were using an iPod to occasionally pick up wireless Internet from businesses along the way.

Dan and Dawn zoomed ahead of me and we weren't in good touch for awhile. We went through a hilly area and our radios' signals were noisy. Cell phones worked somewhat better but not always. I have a magmount cell phone antenna but hadn't put it on my car because I didn't think I would need it.

Shortly before reaching Rice Lake on Hiway 8, we went south on Hiway 25. We had been driving east and south in local traffic and speed zones. Meanwhile, James Flaten sat in his office at the U, tracking the balloon on his computer. When he saw about where it was going to land (south of where it was predicted to land), he dashed east on I94 and got to the touchdown area before we did, even though we had been driving an hour or so longer. Thus we observed an example of "work smart not hard."

The physics students also arrived into the area, in a maroon U. of M. van. They had been tracking the balloon using RF. James called me on my cell while I was still on Hiway 25 and asked what altitude I had tracked the balloon to. The students had tracked it to 10,000+ or 20,000+ feet altitude, I've forgotten which. My last reading on aprs.fi was 1545 ft. I gave James the GPS coordinates from the aprs.fi website. James relayed the coordinates to the students and we all ended up near the balloon's landing spot.

The balloon was in a mowed cornfield, near Hiway 64 a little west of Hiway 25, close enough to a road so that the attached siren could be heard when the wind was not blowing. We could actually see the orange parachute from the road. Everyone but me tromped through the field after the balloon. No one had been home at a nearby house to give permission to walk on the farmland, so I stayed back in case the farmer came along and wanted to know what the heck we were doing in his field. I would have had to explain this. (The farmer never showed up).

I have my Kenwood mobile set up to digipeat received APRS signals. I'm sure I could have picked up the balloon's signal directly when it was on the ground and I was in its vicinity, and digipeated the signal to be picked up by a node, if Kenwood radio had been working. I later discovered that my radio had inadvertently been knocked off frequency; that's why it didn't work. I would like to have seen 0 ft. altitude and gotten the exact coordinates of the touchdown, not that it mattered here with the balloon so close to the road. The students picked up the RF signal once the balloon was on the ground, but

RF signals don't give coordinates like APRS and the Internet do. I'm looking forward to spring, when I can chase another balloon and do it right, not to mention having another day of fun.

Dawn took some nice photos of picking up the balloon and sent digital copies to James Flaten. See photo below (James Flaten is on the far right; the others are physics students.)

Photo by Dawn Holmberg, WXØZ