

NOVAC

THE NEWSLETTER OF THE NORTHERN VIRGINIA ASTRONOMY CLUB

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Astronomy Observatories at Mason

By Harold Geller

Few people are aware of the fact that George Mason University (Mason) had two astronomy observatories years ago. The first officially opened 6 October 1975. In fact, work on the first observatory began in 1972. The observatory was called the Herschel Observatory by the Department of Physics, but that name was not officially accepted by the university. It was built by students John Whalan, Chipper Peterson, and Bob Veenstra, under the supervision of Professor Bill Lankford.

Menas Kafatos took over the supervision of the Herschel Observatory when he came to Mason in the fall of 1975. The location of the Herschel Observatory was the pig shed adjacent to the Mallory House, across Route 123 from the main campus. The pig shed was torn down to make way for the Field House, and a second observatory was built in what is now an athletic field. Unfortunately, this second observatory suffered vandalism, which ultimately led to its demise. By 1980 it was torn down completely.

There have been plans for a new observatory for Mason ever since. Mason was to have an observatory on the top of Science and Technology I, Science and Technology II, and Academic IV (now known as Innovation Hall). In 1983 a graduate student (me) circulated a petition on campus that was acknowledged by then-President Johnson, supporting the building of a new observatory for Mason. Over the years, faculty involved in plans to obtain a new observatory have included professors Lankford,

The spring schedule for public observing sessions at Mason is now online at <http://physics.gmu.edu/~hgeller/observing.html>

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MESSAGE FROM THE PRESIDENT

Greetings NOVAC Members!

2008 is behind us; let's take a look at a review of last year. Spring of 2008 brought us a wonderful Astronomy Day at Sky Meadows Park. We had a great member and public turnout. NOVAC sponsored its first Almost Heaven Star Party, AHSP in 2008. AHSP was a HIT with many positive participant reviews and an awesome review by noted amateur astronomer Rod Mollise. A super job done by all who volunteered and supported the event. A special thanks goes to the AHSP coordinator Phil Wherry for a super job. NOVAC's annual Star Gaze was also an awesome event, a field full of members with scopes and another great turnout by the public. All of our annual events for 2009 are in the planning stages.



The NOVAC board and I look forward to a great 2009 as it is the International Year of Astronomy. As with our other events, we're in the planning stages.

The year 2008 was rough for many. It was even rough for NOVAC's Roboscope; it experienced a number of technical "snags." These issues are currently being worked out and they should be resolved as soon as possible.

I look forward to a stellar year ahead in 2009 for NOVAC!

*Ed Witkowski
NOVAC, President*





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Astronomy Observatories at Mason

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Kafatos, Lieb, Ellsworth, Ehrlich, Becker, Wallin, Geller, and Dworzecka. Administrators who have been advocates for an observatory included Provost Stearns, former Vice-Provost Hill, former Dean Struppa, former Dean Kafatos, and Dean Chandhoke. Each time financial concerns interfered with the construction of an observatory. However, in August of 2004, Mason began construction on a new building dedicated to research. It was originally scheduled to be completed in December 2005. It was named Research I, and it is hoped to be renamed whenever a sufficient donor comes forward. On the top of the tower portion of this building, the administration placed a small astronomical observatory, capable of supporting a good-sized optical telescope. Like its 1975 counterpart, the new observatory is expected to see a lot of use for public outreach events. As Menas Kafatos said in 1978 in an interview with Jodi Musolino of Mason's student newspaper *Broadside*, the observatory will be "taken advantage of by many members of the community, such as, Boy Scout and other youth groups." Mason's own students will

also find the observatory an aide in the learning of astronomy.

The Research I observatory was officially opened in January 2007. A 32-inch Ritchey Chretien telescope is due to be delivered sometime in 2009, although originally promised for 2008 (the vendor is ObservatoryScope and the mirror maker is Star Instruments). Meanwhile, the observatory is home to a 12 in. Meade SCT LX200 and two telescopes from Mason's original observatories. We also hope to take delivery on a NOVAC SIG modified 16 in. Meade OTA, which was donated by the brother of an amateur astronomer from Middleburg, Virginia, Dwight Strickland.

Astronomy is now a major at Mason. This year (2009) is only our sixth year with an undergraduate major in astronomy. However, not only astronomy majors will benefit from the observatory. About 1200 students each semester take some astronomy course. Most do so to meet their general education requirements at Mason. Some do so as an elective. These students currently can observe the night sky on campus



Mason's first observatory was built by students John Whalan, Chipper Peterson, and Bob Veenstra, and was officially opened in 1975. ©1975 JOHN WHALAN

only during one of the public observing sessions that Joe Weingartner and I run on campus during the school semester.

The new observatory will not only allow students to enjoy the night time sky from a better vantage point from the roof of the building, but it will also give them an opportunity to see how a professional telescope facility is operated and maintained. The College of Science hopes to make telescope operation available to all Mason astronomy students via the World Wide Web, for their astronomy laboratory projects. Currently, the college is working to get its radio telescope, which sits upon the roof of Science and Technology I, also moved to Research I, as new cellular

transmission support systems have made it impossible for the operation of the radio telescope at Science and Tech I.

When it comes to astronomy laboratory sessions, students now rely on computer simulations for their laboratory data. When the observatory is completed, students will enjoy the thrill and excitement of operating a professional grade telescope and analyzing the data they obtain from it. There are lots of discoveries in astronomy today, particularly in the search for extra-solar planets. While astronomers at Mason are involved in related research projects from the nearby planets to the most distant galaxies, it is hoped that Mason's observatory will bring the knowledge of

the stars closer to the students themselves. After all, as Carl Sagan used to say, "we are all made of star stuff." That is, all of the chemicals from which we humans are made, originally formed in the interior of progenitor stars and their explosions, long before our own Sun was born.

Again, the main purpose of the observatory is to meet the educational needs of Mason's students; however, it will also be a special place shared with our Washington D.C. community. Evenings "under the stars" each month will be offered to the region's residents. Science teachers, parents, and the interested public are invited to join us in observing the stars at Mason. ★



PHOTO CREDIT: BARBARA GELLER

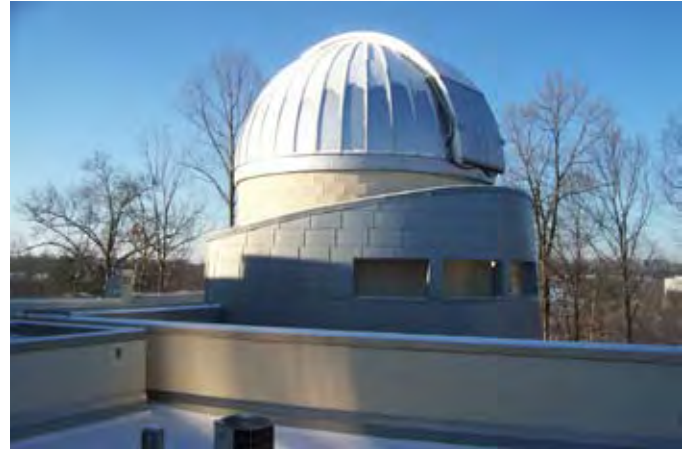


PHOTO CREDIT: HAROLD GELLER



PHOTO CREDIT: HAROLD GELLER

GORT Bags a Burst

By Phil Plait, <http://blogs.discovermagazine.com/badastronomy/>

No, this isn't a Day the Earth Stood Still reference. Kinda.

GORT (http://gtn.sonoma.edu/gort/technical_parameters.php) in this case is the GLAST Optical Robotic Telescope; it's a semi-automated 36 centimeter telescope in northern California operated out of the NASA Education and Public Outreach Group at Sonoma State University. That's the outfit I was part of for six years! We built the telescope to supplement observations by the Fermi gamma ray satellite (which was called GLAST at the time, hence the G in GORT; and in fact we dreamed up the name to match the classic movie robot).

Figure 1 shows the image of the gamma-ray burst (GRB) seen by GORT. The left side is an image taken years ago as part of the Digitized Sky Survey, and the GORT image is on the right, with the gamma-ray burst marked.

It looks rather ordinary, doesn't it, just your everyday star. But that's no star. It used to be one, a huge one, maybe even 100 times as massive as the Sun. It ran out of fuel, and its core collapsed. A black hole formed in the very heart of the star, and the forces at play were vast and violent. Twin beams of unbridled fury roared out of the dying star, each containing enough energy to vaporize the Earth a hundred million times over. They screamed across the Universe, losing energy as they spread out... and eventually touched us here on Earth, so hugely diminished that it took a telescope to notice them at all. Whole planets may have been destroyed by those beams in their home galaxy, but here, on Earth, the amount of energy we received is less than that generated by the beating of a mosquito's wings.

That energy swept over the Earth just before sunrise on December 3. The gamma rays from the beams were detected by the Swift satellite, which promptly determined the burst's position and sent the coordinates to Earth. Sent out via

the Internet (srsly), telescopes across the planet responded to the call, and in northern California GORT swung its eye to the position of the gamma-ray burst. Within minutes of Swift's detection of the burst, GORT began taking its images. The picture above was from just 7 minutes after Swift triggered.

I'm very pleased to say that this is the first GRB GORT has imaged; we tried for a long time while I was there to nail one, but irritatingly they were always poorly placed in the sky, or below the horizon, or it was cloudy, or or or. I wished we could have bagged one while I was still at SSU, but I'm still pretty chuffed the system worked!

GRB081203A (named thus because it was the first burst seen on 2008 Dec. 3) is about 10.5 billion light years away, and according to GORT got to about magnitude 12, which is actually pretty bright for a GRB (though about 1/100th as bright as the faintest star you can see with your unaided eye). Imagine something that far away — 100 sextillion kilometers away — that you can see with a small telescope!

GORT is a nice setup, but it's literally made from off-the-shelf components. You could have a similar observatory yourself in your own yard, though it'll set you

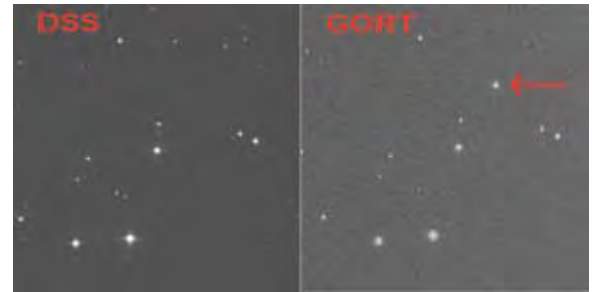


Figure 1. GORT image of GRB081203A

back a few dozen grand. Still, it's not like a major institutional observatory costing tens of millions of dollars. This kind of thing is affordable by practically any University, and there are a lot of amateurs who have even slicker setups (retired lawyers and doctors have time, money, and interest). Telescopes like GORT are in many ways the equal of much larger telescopes from decades ago. The technology these days is amazing.

My thanks to Kevin McLin at SSU EPO for sending me the images and answering a couple of lingering questions I had about GORT. Also my congrats to him, Lynn Cominsky (the EPO lead) and all the others in the group. Very cool, and well done! ★

This content distributed by the American Association of Variable Star Observers (AAVSO) Writer's Bureau.

Phil Plait, the creator of Bad Astronomy, is an astronomer, lecturer, and author. After ten years working on Hubble Space Telescope and six more working on astronomy education, he struck out on his own as a writer. He has written two books, dozens of magazine articles, and 12 bazillion blog articles. He is a skeptic, and fights misuses of science as well as praising the wonder of real science. His latest book is *Death from the Skies!* You can see an interview with Dr. Plait at <http://astrocast.tv>.



Roboscope Update—February 2009

By Bron Gervais

In mid-October the Roboscope team got approval from the board to replace the ageing and hot-running dual-Intel P3 CPU Windows 2000 box with the failed power supply, one of the two computers used to provide the complete Roboscope functionality. The requirements were for the new box to be low power, to reduce the heat buildup in the equipment bay that had plagued the earlier Windows 2000 system. The other computer, a SUSE Linux box, was based on low power ASUS hardware that had not been affected by the heat. Bron Gervais ordered the parts and assembled a new system based on an Intel Atom 230 low power CPU, running XP Pro. Craig Tupper did his magic by reinstalling all of the telescope control and imaging software, upgrading to newer versions as he went.

Another challenge faced and overcome was the lightning-damaged Astrophysics hand controller, which Craig returned to AP for repairs. Everything was coming together by mid-December when Hans Schenk, the long-time generous host of the Roboscope at his Lovettsville, VA, property had to ask use to leave. Hans has

horses, and needed to expand for boarding business, and that regrettably meant no more room for Roboscope. We had to find a new home.

Craig appealed to the general NOVAC e-mail list on 9 January, asking if anyone was willing to be the new host for the Roboscope, and several offers were made. Craig, Pete Johnson, Arlen Raasch, and Bron, visited several of these locations in late January and early February, weighing their merits. The team is in the process of narrowing down the choices, and is working to select the next site for the Roboscope.

We had to respect Hans' wishes and get moving, so Craig again went to the NOVAC list on 12 February, this time asking for able-bodied people who were daring enough to try lifting the Roboscope onto the back of Mike Mills' pickup truck. A group of about eleven volunteers converged at the Roboscope site in Lovettsville on the morning of Sunday, 15 February. Many hands made for an easy lift, then three shovelers had the pier dug out in record time. A patch of stomped earth, oh, and a few muddy ruts, are the

only traces we left. A seven car caravan followed Mike's truck the 35 miles, weaving like a procession down the narrow streets of Waterford, onward to a temporary roost at Pete's place in Centreville.

Thanks to Craig for organizing the move. I didn't get all of everyone else's names, but you know who you are, and I hope you know how grateful we are for your help and enthusiasm in literally moving us along, so we can continue to evolve a remote imaging capability for the club. Thanks to Pete for graciously hiding the Roboscope in his back yard, again, in what must seem like *déjà vu*.

The interesting presentation on the Goddard Robotic Telescope (GRT) that Takanori Sakamoto gave at our December meeting mentioned the influence of the NOVAC Roboscope on their design, which also uses a dual-computer architecture. Like the Roboscope, a Linux system performs process control, evaluating weather and sensors to actuate the dome, while a Windows box controls the telescope and imaging. Bron Gervais will be contacting Takanori to find out what can be learned from their implementation.



Volunteers helping to disassemble and move the Roboscope



Digging out the pier



The caravan through Waterford



The temporary location in Pete's back yard



A view of the new Windows XP box, sitting on top of the old one.

All photos by
Bron Gervais

Book Review By Ronald Bashion

Universe 8e

The past few decades have witnessed spectacular advances in astronomical visioning, as well as a virtual second Copernican Revolution in information. Fortunately, we now have integrated text/internet/review question educational packages to meet this need.

A top choice is *Universe 8e*, (2008) originally published by William J. Kaufman (1942-1994, renowned Ph.D. astrophysicist and educator), and now very capably continued by Dr. Roger A. Freedman (UCSB). *Universe 8e* is the text for Astronomy 113 at George Mason University, in which I am happily enrolled. I know the book well.

To describe the many fine educational features of this text would take too many words—so go to www.whfreeman.com/universe8e, and create your own log-on for

free. Access includes flash cards, quizzes, active media modules, current investigational web sites, and more.

Universe 8e itself is highly comprehensive, and provides both examples and real-life applications of mathematics (e.g. Newtonian mechanics, Kepler's Laws, Wien's Law, Stefan-Boltzman law, diffraction-limited angular resolution, etc). It is written clearly, has excellent graphics and photos (RIVUXG spectra). I have thus far found no typos or errors. Each chapter closes with key words, key ideas, questions (some answers provided), Web/E-book questions, and Starry Night related exercises. Again, don't take my word for it—go to www.whfreeman.com, click on astronomy and physics, then Introduction to Astronomy, then *Universe 8e*. Click

on Preview to view Chapters 17 and 19 without charge.

Many package options are available—click just below the Preview link. Additionally, one may purchase the EBook alone (Companion Web Site link, further down) for as little as \$51 for 6 months. The entire text with Ebook availability lists at \$120. However, these packages are not available from online or commercial vendors. You need to call the MPS Virginia warehouse, at 1-888-330-8477 and specify the ISBN number for your chosen package.

If you, or an eager student, really want to learn current astronomy, this is a comprehensive and exciting option for you. ★

Early Results From South Pole Neutrino Telescope

by Dr. Harold Geller | <http://astrocast.tv/blog/?p=646>

The sub-atomic particles called neutrinos are not easy to detect because they interact with matter very weakly. Thus, neutrino telescopes are rare and found in the most unusual places, such as abandoned mines in Canada and Japan. An international group of astronomers have joined in the construction of a neutrino telescope which will be the largest yet built. The telescope array itself will be a cubic kilometer! The location is even more remote than any other neutrino telescope, being located at the South Pole! Completion of the total instrument array is not scheduled until 2011. However, a portion of the array has been completed and tested. The results from this initial test of the IceCube neutrino telescope were presented in a paper originally presented at an astronomical conference in Europe last year. These results are now available online at http://xxx.lanl.gov/PS_cache/arxiv/pdf/0901/0901.1049v1.pdf The article provides a good summary of the interest in neutrinos and a preliminary mapping of neutrino source locations on the celestial sphere. ★

Astrocast.TV Astronomy Webcast

Astrocast.TV, the first-of-its-kind webcast for anyone interested in learning about our universe, was launched on March 24, 2008. Featuring a visually-rich format, it is hosted by NASA/JPL Solar System Ambassadors Greg Piepol and Greg Redfern, and Astrocast Special Advisor Dr. Harold Geller. The webcast is produced by Midnight Rider Productions LLC.

"To observe, and to help others observe"

NOVAC is a non-profit, all-volunteer organization chartered to advance amateur astronomy in Northern Virginia. Members benefit from:

Access to dark sky observing sites:

NOVAC maintains agreements that provide club members with year-round access to observing sites away from city lights

Monthly meetings

Monthly meetings are held at 7 p.m. on the second Sunday of each month in Room 80 of the Enterprise Building on the campus of George Mason University. Each meeting features a lecture on an interesting topic by a local expert. See the web page or future newsletters for a schedule of speakers.

Bimonthly newsletter

The NOVAC newsletter provides information specifically for NOVAC members, as well as general interest articles on such topics as observing reports, equipment reviews, upcoming events, ATM projects, and more.

High-quality telescopes to borrow

NOVAC members may borrow one of the clubs several "loaner" telescopes at no charge. Members may choose from among three 6 in. reflectors, two 10 in. f/6 reflectors, an 8 in. SCT, and a hydrogen-alpha solar scope. Binoculars are also available for loan.

Club website

Up to date information about club events and activities is maintained on the club website at www.novac.com.

Large club library

NOVAC maintains a well stocked library that members may borrow from by contacting John Deriso (olgazer@verizon.net). A full list of titles is available from the club website.

Private email listserv

Members keep up with current club information by subscribing to the NOVAC email list, without fear of flame wars or spam emails.

Public outreach opportunities

Several times each year, volunteers from NOVAC present astronomy programs to schools, churches, Scout troops, and other public groups.

Membership in the Astronomical League

Through NOVAC's membership in the Astronomical League, NOVAC members gain access to the AL's newsletter, services, and observing programs.

Discounts on astronomy magazines

Subscriptions to *Sky & Telescope* and *Astronomy* magazines are offered to club members at a considerable discount. Contact Kent Allingham (see contact info at right).

Mentor Program

Young or old, new or experienced, this program is for everybody. If you would like to meet with a mentor, or think you would like to be a mentor, or have any questions about the program, write to: mentor@novac.com.

See your Membership Guide for more details.



The NOVAC Newsletter is the official publication of the Northern Virginia Astronomy Club and is published six times per year. The NOVAC Newsletter is sent to members of NOVAC as a regular membership benefit.

Membership

Membership in the Northern Virginia Astronomy Club is \$25.00 per year and is open to anyone interested in astronomy or the sciences. Additional memberships at the same address without additional copies of the newsletter are \$5.00 per person. Membership in the Astronomical League is an additional \$7.50 and includes the *Reflector* magazine plus access to their Observing Awards
Contact:

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Change of address

All notices of change of address should be sent to Kent Allingham. Please include both old and new addresses.

Advertising

NOVAC does not knowingly accept advertising for products of inferior quality nor does it accept responsibility for the quality of advertised products.

Submissions to the newsletter

NOVAC members are invited to submit articles for publication in the NOVAC Newsletter. The editor reserves the right to edit all materials submitted. Send article submissions to the Editor, Tim Nicholson, at newsletters@novac.com. The deadline for submissions is March 15, 2008 for the March/April 2009 newsletter.

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Upcoming Meetings

March 8, 2009 • 7 p.m.

Speaker: Tom Finkenbinder

Tom Finkenbinder will be presenting a live tour of the Gamma Ray Burst site maintained on Yahoo Groups. Gamma Ray Bursts are cosmic phenomena attracting great interest among a global audience in the academic and professional astronomy communities studying evolution of the early universe.

April 19, 2009 • 7 p.m.

Speaker: TBA

May 17, 2009 • 7 p.m.

Speaker: TBA

General membership meetings are open to the public, and are held at Enterprise Hall, room 80, on the campus of George Mason University (see www.novac.com for directions) in Fairfax, Virginia. The meeting hall is in the basement floor of the building. Since Parking Lot B is now closed, you should park across the street in the far reaches of the Patriot Center's parking lot, then walk up the path to the rear of Enterprise Hall.

2009 Astronomy Events

May 2, 2009

NOVAC Astronomy Day

Sky Meadow State Park

Delaplane, VA

www.novac.com

Date TBA: 2009

Almost Heaven Star Party

The Mountain Institute

Spruce Knob, WV

www.ahsp.org



c/o Kent Allingham, Membership Director
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