# Regulus

**Issue 1999-04** **Newsletter of the RASC Kingston Centre** **1999 July/August**

## Astronomy Day Report


Astronomy Day '99 has come and gone. This year we were at the Frontenac Mall as the Cataraqui Town Centre was undergoing massive renovations and wouldn't allow us in. Holding it later in the year (May vs June) also gave us better weather. This year we tried solar and evening all week before the Mall Display and had excellent weather and results! On Saturday... it clouded over! We'll have to remember this for next year!

**The Official Astro Day Report from Peggy Hurley**

Astronomy Day was held on May 22nd this year in an attempt to have clear skies for evening observing. Well, the thought was nice... however, our Observing Chair, Tom Dean, saved the week by arranging public observing throughout the week prior to Astronomy Day and every night was clear. We were at the Frontenac Mall this year and had displays of photographs, telescopes, quizzes, eclipse models, space ship models and lot's of neat stuff. Many people stopped to talk with us, filled out ballots for Astronomy Magazine's draw for four free subscriptions and eight books that were door prizes. Many thanks go to Astronomy Magazine for their generous support again this year. Sky and Telescope also sent their booklet on getting started in Astronomy. Thanks to all who attended and to those who provided display materials. We just can't do Astronomy Day without you. Hope to see you all next year! Clear Skies,

Peggy Hurley

PS. Astronomy Magazine was making the draw for the subscriptions but we made the draw for the books. The lucky winners were Duke Pierce (A Concise Dictionary of Astronomy ), Steven Jackson (Eight Easy Observing Projects), Barbara Vance (Cosmos), Brenda Shaw (Stars and Galaxies), Peggy Hurley (Where Next, Columbus? ), David Hasmon (Through the Eyes of Hubble) and Alex Moore (Atlas of the Moon ). Congratulations to all.



# The Kingston Centre

The Newsletter of the Kingston Centre of the Royal Astronomical Society of Canada
**Newsletter Submission Info:** The deadline is the Friday before regular meetings in odd numbered months. The preferred method is E-MAIL, then disk, lastly paper.
E-mail: <***kell@cliff.path.queensu.ca***>
Fax: 1-613-533-2907 (with cover page to Kevin Kell)
Post: Box 2033 Kingston Ontario K7L5J8 Canada
ascii or most major word processors (WP6.1 for windows preferred) via E-mail or 3.5" DOS floppy disk
Our NEW Web page can be found at:
***http://members.kingston.net/rasc***



To Send E-mail to all members of the Kingston Executive, address it to: **<*rascexec@cliff.path.queensu.ca*>**
To join the Kingston Centre Email Chat List, send a note to <***kell@cliff.path.queensu.ca***>
To join the National E-mail List, send a message to: <***listserver@astrotech.stmarys.ca***>
In the body of the message put:
subscribe rasclist Your Human Name (Center Affiliation)

**Cntre Location**: RASC - Kingston Centre, PO Box 1793, Kingston, Ontario K7L 5J6 Canada
Approx Lat: 44 deg 14 min N Long 76 deg 39 min W

# Events for 1999

Friday July 9 Speaker: Kendra Angle Topic: TBA ; GA Reports

Friday August 13 Annual BBQ Meeting at the home of Mark Kaye (no regular university meeting)
Friday September 10 Denise Sabatini - Archaeoastronomy - civilization to be announced later
* Friday October 1 (thanksgiving Mon 11th) Roger Hill - How to build an observatory for $500
Friday November 12 Annual Elections and General Meeting
Friday December 10 TBA
* special meeting dates one week early due to holiday Fridays

Where: Regular Meetings of the Kingston Centre are held on the 2nd Friday of each month (unless noted otherwise) at 20:00 local time in **Room B-201, Mackintosh-Corry Hall** at Queen's University (parking available off Union Street at Frontenac).



# From The Editor

Changes/corrections of address received (I pass any I receive on to the Centre Treasurer who passes them on to UTP) since the master March list was published:

**Change of address:**
leo brodeur <leo_brodeur@hotmail.com> can be reached in Germany for the next few years

**Changes to the Web Site in the last two months:**
We've had to move from one machine at the ISP we use to another and the URL has changed slightly. The new home page address is:
**http://members.kingston.net/rasc**
no www1 and no ~~~~~'s before rasc.

We've gone from a straight text to a table based to a frames based page system in the last couple of months.
★Expanded on the Education Group page to include items like a Canadians in Space Page
★More historical information about the Kingston Centre has gone online (membership lists for the 1990's)
★Speaker and topic list from the last decade

Check out the Brockville Astronomy Club at:
http://www.geocities.com/CapeCanaveral/Lab/7855
Contact: Kevin Fetter

Due to the absolute insanity and business of the summer many submission did not get in before the publication deadline.
Look forward to reports from the Lemoine Point The Sky Is the Limit Festival which we are setting up a booth with mirror grinding and solar observing; reports and photos from Starfest 99, held a month early to allow the organizers to go and chase eclipses in August; a list of new members from the last few months; minutes from the general meetings of the last few months, and more.

# From The Prez

No Report this month

# From The Secretary

No Report this month

# National News

The National Address & contact info:
Royal Astronomical Society of Canada
Bonnie Bird, Executive Secretary
136 Dupont Street Toronto, Ontario, Canada M5R 1V2
Voice: 416-924-7973 Fax: 416-924-2911
***email: <rasc@rasc.ca>***

# Youth Group News

The group has gone on a summer hiatus for reorganization and a bit of a break. Stay tuned this fall for more.
A telescopic observing session was held Saturday June 19th but it was pretty well clouded out.

# Observing Group News

May's session was clouded out
June's session was one of the clearest nights in months

## 1999 Observing Group Schedule

**Contact Tom Dean for Directions.**
**July:** Cancelled due to Starfest
**August**: At the home of Mark Kaye in conjunction with the August meeting and BBQ
**September:** TBA

# Public Observing Sessions

at Murney Tower Museum park (King & Barrie Sts) on Kingston's waterfront. We are committed to having a public session once a month about 1 week after the new moon, WEATHER PERMITTING. Contact Tom Dean for Details
We need 2 or 3 scopes and people to man them and just talk to the people wandering in. We normally set up at or about sunset. The next scheduled dates are:
**Tuesday July 20th**
**Tuesday August 17th**

# ATM Group News

★The 25" blank has moved outdoors (into the garage) with the mirror grinding machine. A 22" tool has been cast and ceramic tiles are being applied as we write. We are in the final stages of rough grinding the 25" and will be starting fine grinding soon. A sanding disc was used for a short while and made a great deal of progress.
★The 8" scope is nearing completion (still!).
The 8" is almost finished and I hope to be completing it shortly. We now have a focuser for the 8" that was made by Doug Angle. There is only some assembly left to complete.
★And we have had a donation of a 16" glass blank. The ATM group hasn't decided what to do with this yet in terms of scheduling. Any ideas? Send them in!
★Equatorial table - on hold
★Mark II Barn door trackers - on hold
★Raffle scope - on hold
The on hold projects are just begging for manpower and volunteers! Contact the ATM Chair, Kendra Angle, if you are interested!

# Education Group

Submitted by Laura Gagné

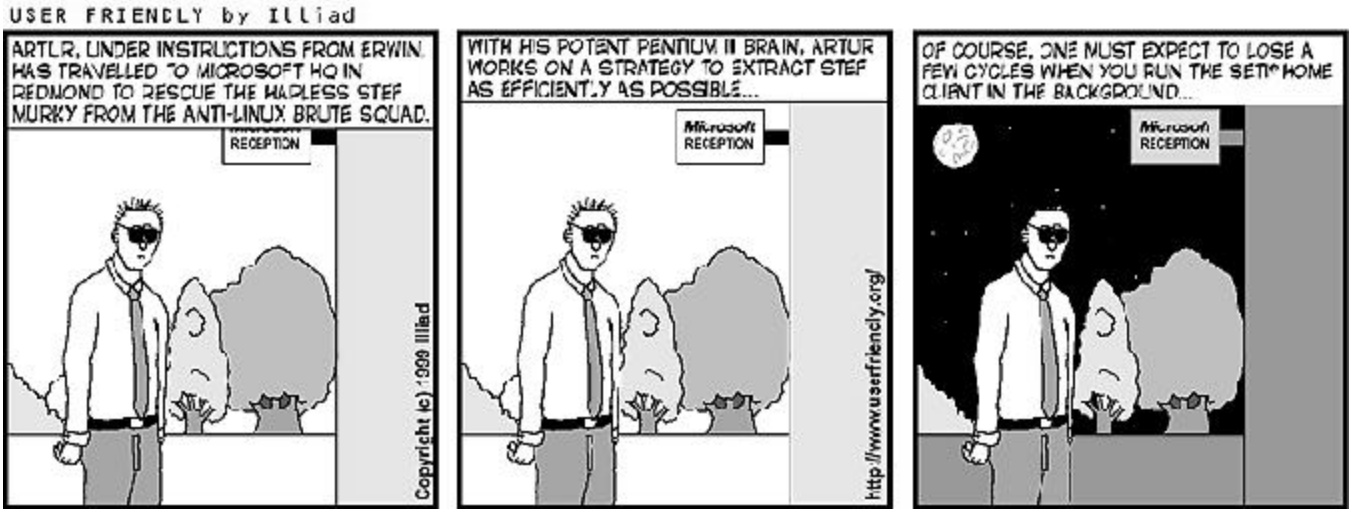
The centre president, Doug Angle, and myself met with the heads of the science departments of Limestone District (Kingston's school board) to offer them a one-day seminar, including materials, to help grade 9 teachers with the astronomy component of Ontario's new curriculum. The teachers were very excited about the idea and requested that we hold the seminar for the afternoon and evening so that they can do some observing. We agreed (of course!). The seminar will be held in the end of September or possibly October. We are producing a 20-30 page booklet and set of activity sheets to give to the teachers. It will include explanations of such things as tides, seasons, moon phases, solar system debris (comets, meteors, etc). It will also contain observing activities and school-based activities such as comet-making, that are sadly lacking in the textbook that Limestone District has chosen.
I am in the process of writing the booklet as I type this for the newsletter. I would like members to submit photographs (copies you don't need back, please) to illustrate the book as well as a few constellation shots for observing tips and a constellation activity. If anyone has a photograph of the coathanger cluster it would be especially appreciated. Photographers will be given credit, so be sure to write your name on the back of the photo. Also, if anyone has any brilliant ideas for activities for grade 9 students, please send them along too!

Submissions should be sent to:
Laura Gagne 3524 Accommodation Rd. Joyceville, Ontario K0H 1Y0
Thank you. I will keep you posted as things progress.
Laura Gagne Chair - Education Committee

# Fireball Group

Submitted by Tom Dean

Fireball Report Line: 533-6000 ext 77608.
Fireball Web reporting form:
http://www.astro.queensu.ca/~irwin/fireballs/ fbhome.html



# Submissions from Members

## SETI@Home

***http://setiathome.ssl.berkeley.edu/***

SETI@home is a scientific experiment that will harness the power of hundreds of thousands of Internet-connected computers in the Search for Extra-Terrestrial Intelligence (SETI). You can participate by running a screensaver program that downloads and analyses radio telescope data. There's a small but captivating possibility that your computer will detect the faint murmur of a civilization beyond Earth.

The latest wrinkle is the concept of a Team or Group. The RASC has set up a group and running in competition with hundreds of other groups in the world for data processing. Currently we are about 15th in the world in the Clubs group/team with about 75 members on the team. Come join us! Put those spare CPU cycles to good use!

## How to select a telescope – a different perspective
## Part III - what size? *by Doug Angle*

In this series of articles, we are looking at the considerations in acquiring a new telescope. Perhaps you have outgrown binoculars or been stricken with "aperture fever". But there are so many confusing choices, and not always clear choices. I've made this choice a couple of times, I will give my perspective on the issue. In this issue, we will look at what size is best.

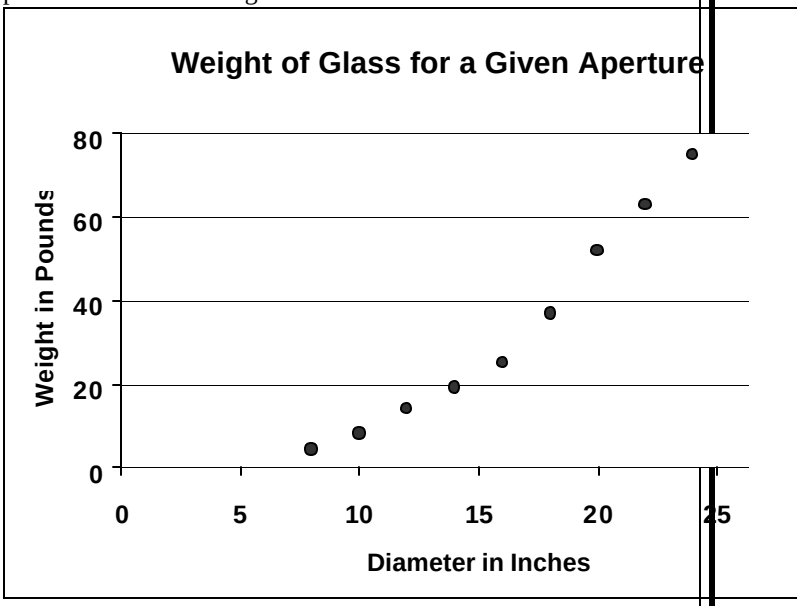
Traditionally, a 6" mirror has been the recommended first time telescope. The logic is that a 6 inch takes less time, and is less difficult that larger ones. The dedicated builder can then work up to an 8", 10", before tackling a 12".

This does have some merit, as it allows a person to gain confidence and experience along the way. However, if you really want a large telescope, I offer a different approach. What is it that makes it difficult anyway? All of the grinding and polishing requires no special skill, only some patience and elbow grease. When grinding, the abrasive acts like a lubricant, so it doesn't take much strength. I am currently building a 16", and it hasn't been any harder to push than the 8" the center's atm group did. The mirror does drag during polishing, however, and I think this is what sets the upper limit on size for hand work. In my view that is 16" in most cases, slightly less for the timid; a little more for the strong, macho or stubborn. The center's grinding machine can only handle up to about 12 inch, so it won't help for making a larger instrument either.

Mostly the decision about size is going to be made on the basis of 3 things:

How much will it cost?
Will it fit in my car?
If it fits, will I be able to lift it anyway?

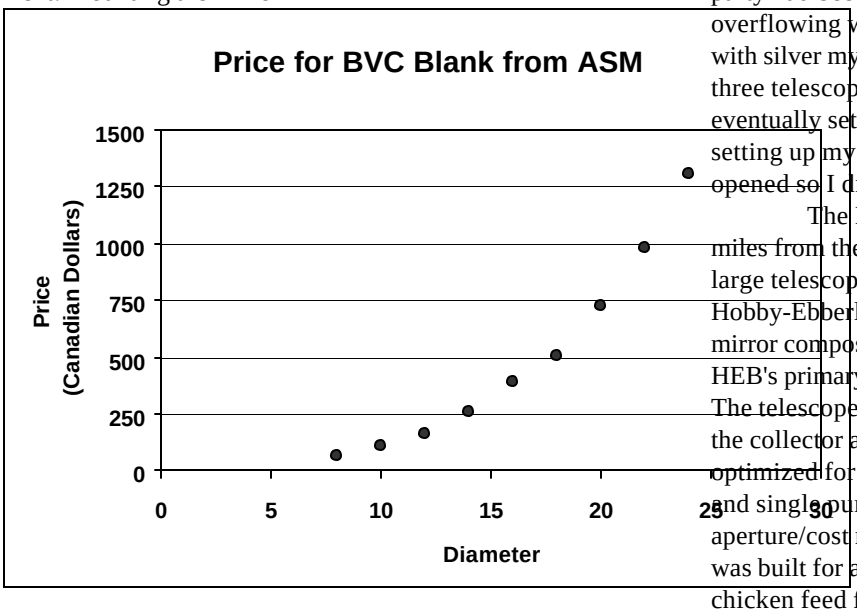
These tend to be personal decisions, so I can't give too much advice here. The following two graphs show the weight and price for different size glass blanks:




All you have to do now is decide how much you can lift, and what you can afford, then look up the diameter in the charts. For me this came out to 16", for which I paid $430 (US). The blank is 1.6" thick, and weighs 27 pounds. You will also spend at least $200 on aluminizing, focuser, secondary mirror and other incidentals. Note that a finished mirror will cost 2 or 3 times the cost of the blank. In smaller sizes, it probably doesn't pay to grind your own, but there are considerable savings in larger sizes.

The next consideration is focal length. A long focal length can give higher magnifications, but this can also be achieved with eyepieces if necessary. Long focal length also means the finished scope is physically longer, and so won't fit the car as easily, and be more difficult to carry and mount. Focal ratio's below about f/5 become progressively more difficult to make, and really don't perform well without expensive eyepieces. Still, even if you decide that

you want that 16" monster after all, at f/5 it's going to be nearly 7' up to the eyepiece.
Next: Mounting the mirror




## The Texas Star Party
## John D. Baker xxx@xxx.xxx May 1999

The Texas Star Party (TSP) is one of the oldest annual star parties. It was started by a small band of deep sky observers 21 years ago. Over the years the TSP has steadily grown into one of the world's major star parties. The main reasons for TSP's success will be familiar to real estate agents: location, location, location. The TSP is held every year on the Prude ranch near Fort Davis Texas. The Prude ranch is located in the Davis mountains of West Texas. The ranch combines good elevation, (over 1 mile high), a dry climate, and freedom from the bane of gazers everywhere: light pollution. The nearest city, Odessa Texas, is over 180 miles away.

Furthermore, because of the nearby McDonald Observatory, the small town of Fort Davis has the most enlightened attitude toward light pollution I have encountered. All the town's street lights are dim, full cutoff, low pressure sodium lamps. When you are on the Prude ranch you can't see a trace of Fort Davis which is five miles away behind a mountain ridge. On my second night at the TSP I stood on a small hill and reveled in a uniformly dark sky: no light domes, no security lights, no cars, no aircraft. The only light reaching my eyes came from the stars and the Milky way which looked like a bright cloud as it swept from horizon to horizon. We all need some DST (Dark Sky Therapy) and the TSP is great place for it.

I arrived at the TSP on Thursday afternoon. The party had been in full swing since Sunday and the ranch was overflowing with fields of tents, RVs and telescopes covered with silver mylar. Before checking in I walked around the three telescope fields to select a good camping spot. I eventually settled for the field beside the lama corral. After setting up my tent I had a few hours before registration opened so I drove up to the McDonald observatory.

The McDonald observatory is located about ten miles from the Prude ranch. It's home to a collection of large telescopes. The largest is the recently commissioned Hobby-Ebberly (HEB) telescope which has an 11 meter mirror composed of meter sized hexagonal elements. The HEB's primary mirror can be rotated but has a fixed altitude. The telescope can track objects for a few hours by moving the collector at the prime focus. This unusual telescope is optimized for spectroscopy. Because of it's unique design and single purpose mission the HEB has the highest aperture/cost ratio of any major optical telescope on earth. It was built for around ten million dollars: chicken feed for big telescopes.

Returning from the observatory I registered at the star party. I read over the program for the first time and was delighted to find that David Levy, of Shoemaker-Levy 9 fame, was one of the keynote speakers. I was also intrigued by the various TSP observer programs. By observing a list of objects you could earn a nifty TSP lapel pin. There were programs for binocular observers, CCD people and large DOB'ers. The focus this year was on planetary nebulas. Some people were sporting a tee shirts that celebrated the main TSP theme: Twenty Stinking Planetaries.

After registering I returned to my tent with the idea of eating a few sandwiches and waiting for sundown. On the way I met my next tent neighbors: a young couple from Dallas. For years they had talked about getting into amateur astronomy so last Christmas the lady went out and bought a good 8 inch telescope for her husband. I liked her style. The fellow camping beside the couple was a medical doctor from Kansas. He arrived in his BMW with three large telescopes, an arsenal of top of the line eye pieces, cute gadgets like image intensifiers and CCD cameras, two computers, and a

small satellite dish for remote internet access. Everything worked except the satellite internet connection: server problems

This fellow was, oddly, not at extreme case at the TSP. The typical TSP party goer is a middle aged male with a fairly high income. Spending many thousands of US dollars on telescopes, accessories and travel is not a problem for the TSP crowd. At one of the dusk get togethers someone asked how the hobby could broaden its appeal beyond its traditional demographic base. Fresh from ballroom dance classes I suggested holding dances on cloudy nights.

I went to diner with my tent neighbors in a small hotel in Fort Davis. The food was excellent and far better than the peanut butter sandwiches I had planned on. After diner we returned to the ranch and waited for sundown. My first night at the TSP was not great. The sky cleared but a low level dry haze persisted until I went to bed at 3 am. Despite the mediocre observing three things impressed me. How warm it was at night, the total lack of mosquitoes and Omega Centauri. I'm used to freezing and feeding swarms of Ontario mosquitoes when I'm out at night. It's a real treat to be able to breathe without inhaling insects. As for Omega Centuari, it's the largest and brightest globular in Earth's skies. It's at least three times the angular size of M13. Despite the mediocre conditions and being close to the southern horizon this cluster was still impressive in binoculars. On my second night, when it was very clear, I saw this cluster through a 20 inch DOB. Eat your heart out!

I knew the second night was going to be good because I spent most of the daylight hours hiking in the hills around old Fort Davis. The air was very clear. Details on mountains thirty miles away could be easily seen. After hiking above Fort Davis I walked from the Prude ranch to one of the VLBI, (Very Long Baseline Interferometer) radio telescopes two miles away in an elevated valley. I underestimated the distance to the telescope and had to carefully navigate around a few herds of long horn cattle. By the time I crossed the barren sun blasted valley where the telescope was located I was hot and thirsty. Still it was worth the trip.

There were two staff astronomers at the telescope. They were extremely friendly and gave me a great tour of the facility. The VLBI is the largest astronomical instrument on Earth. It has stations spanning a 5,000 mile distance from Hawaii to Puerto Rico. The long baseline allows the VLBI to achieve angular resolutions orders of magnitude better than the Hubble space telescope. The VLBI runs 24 hours a day; observations were underway when I visited. Each VLBI station is equipped with an atomic clock, cryogenic receivers and an automated weather station. All the stations are linked together with a dedicated high speed computer network which is controlled from the NRAO center in Soccorro New Mexico. The precision of this instrument is impressive. VLBI staff are the first to detect shifts in the Earth's crust. The distance between the stations is so accurately known that tiny submillimeter movements can be detected. Hawaii is usually the culprit. The tectonic plate



it's riding on is scooting away from North America and the VLBI is routinely recalibrated to account for its movements.

After visiting the VLBI station I hitched a ride back to the ranch returning in time for David Levy's dusk talk. It seemed like all 600 TSP attendees crowed into a modest ranch hall for David's talk. His talk was primarily an appreciation of the life and work of Gene Shoemaker. We listened to David and watched video clips. I have seen David's multimedia presentations before. Sometimes he can over do it. This time he found a good balance between speaking and video. His presentation was well received. We all stood, applauded and then filed out into the night.

My second, and last, TSP night started out with partly overcast skies but within a few hours the skies cleared and conditions were great. I spent most of the night hanging out with an El Paso police officer that just happened to have a some buddies with large DOBs. By Friday night most serious observers were exhausted from a week of looking for their obscure twenty stinking planetaries so they were perfectly happy to slum around the sky looking at easy bright and spectacular objects. On this night I saw the polar caps of Mars, Omega Centauri, M13, M51, M87, the Sombrero galaxy, The Veil, The Owl nebula, some great edge on NGC galaxies and a lot more. Despite the excellent seeing and dark contrasty sky what I enjoyed the most was standing on a hill and letting the soft light of the Milky Way soak my retinas. Dark Sky Therapy at it's best.

### Stamps!

Submitted by our own postmaster dude, Hank Bartlett.

Interested in petitioning Canada Post to issue some astronomical or space related stamps? Take a look at the CPC website:

**http://www.canadapost.ca/CPC2/menu_01.html**

This is where to write to suggest or submit stamp designs:

The Honourable Andre Ouellet
Chairman of the Stamp Advisory Committee
2701 Riverside Drive Suite N1250
Ottawa On K1A 0B1

## News from the Net

**June 8, 1999 RELEASE: 99-68**
**FUSE SPACECRAFT WILL SEARCH FOR 'FOSSILS' OF THE BIG BANG**

Scientists will soon have a new tool to search for the "fossil record" of the Big Bang and uncover clues about the evolution of the universe. Scheduled to launch June 23, NASA's Far Ultraviolet Spectroscopic Explorer (FUSE) will observe nearby planets and the farthest reaches of the universe and will provide a detailed picture of the immense structure of our own Milky Way galaxy.

The FUSE mission's primary scientific focus will be the study of hydrogen and deuterium (a different form of hydrogen), which were created shortly after the Big Bang. With this information, astronomers in effect will be able to look back in time at the infant universe.

Among the cosmic questions FUSE will tackle are:

-- What were conditions like in the first few minutes after the Big Bang? Will studying the "fossil remnant" deuterium change current theories of the Big Bang?

-- How are the elements dispersed throughout galaxies, and how does this affect the way galaxies evolve?

-- What are the properties of the interstellar gas clouds out of which stars and planets form?

-- Does the Milky Way have a vast galactic fountain that gives birth to stars, spews hot gas, circulates elements and churns out cosmic material over and over?

Information on the FUSE mission and NASA's Origins program can be found at:
http://fuse.pha.jhu.edu
http://fusewww.gsfc.nasa.gov/fuse/
http://origins.jpl.nasa.gov/

**May 27 1999 RELEASE: 99-66**
**FIRST GLOBAL 3-D VIEW OF MARS REVEALS DEEP BASIN AND PATHWAYS FOR WATER FLOW**

An impact basin deep enough to swallow Mount Everest and surprising slopes in Valles Marineris highlight a global map of Mars that will influence scientific understanding of the red planet for years.

Generated by the Mars Orbiter Laser Altimeter (MOLA), an instrument aboard NASA's Mars Global Surveyor, the high-resolution map represents 27 million elevation measurements gathered in 1998 and 1999. The data were assembled into a global grid with each point spaced 37 miles (60 kilometers) apart at the equator, and less elsewhere. Each elevation point is known with an accuracy of 42 feet (13 meters) in general, with large areas of the flat northern hemisphere known to better than six feet (two meters).

MOLA topographic images may be viewed at the following web address:
http://pao.gsfc.nasa.gov/gsfc/spacesci/pictures/mola/mars3d.htm

More details about the MOLA instrument and science investigation can be found at:
http://ltpwww.gsfc.nasa.gov/tharsis/mola.html

**May 25, 1999 RELEASE: 99-65**
**HUBBLE COMPLETES EIGHT-YEAR EFFORT TO MEASURE EXPANDING UNIVERSE**

The Hubble Space Telescope Key Project Team today announced that it has completed efforts to measure precise distances to far-flung galaxies, an essential ingredient needed to determine the age, size and fate of the universe.

"Before Hubble, astronomers could not decide if the universe was 10 billion or 20 billion years old," said team leader Wendy Freedman of the Observatories of the Carnegie Institution of Washington. "The size scale of the universe had a range so vast that it didn't allow astronomers to confront with any certainty many of the most basic questions about the origin and eventual fate of the cosmos. After all these years, we are finally entering an era of precision cosmology. Now we can more reliably address the broader picture of the universe's origin, evolution and destiny."

For the past 70 years astronomers have sought a precise measurement of Hubble's constant, ever since astronomer Edwin Hubble realized that galaxies were rushing away from each other at a rate proportional to their distance, i.e. the farther away, the faster the recession. For many years, right up until the launch of the Hubble telescope -- the range of measured values for the expansion rate was from 50 to 100 kilometers per second per megaparsec (a megaparsec, or mpc, is 3.26 million light years).

The team measured Hubble's constant at 70 km/sec/mpc, with an uncertainty of 10 percent. This means that a galaxy appears to be moving 160,000 miles per hour faster for every 3.3 light-years away from Earth.

- end -

## *Rocking rocketeers*

We were flattered that your reporter came all the way to Washington DC just to catch a performance by our rocking and scientifically literate a cappella group, the Chromatics (Feedback, 9 January, p 96). Teachers, planetarium staff and other worthies among your readers might be interested in our educational project, "AstroCappella", especially as we have free stuff to give away.

The AstroCappella music CD contains six upbeat astronomically correct songs, written, performed and professionally recorded by our eight-member group, most of whom work at the NASA Goddard Space Flight Center.

The songs cover radio and X-ray astronomy, the Doppler shift, the Sun, the Hubble Space Telescope and the nearest stars. The CD comes with a book containing classroom activities and other information for each song, written in collaboration with high school teacher Kara Granger.

Did we mention that they're free? The project is funded by outreach grants, and thus the AstroCappella CD and activity book are available at no cost to teachers and other educators while supplies last. E-mail us at astrocappella@athena.gsfc.nasa.gov, or check out our website at www.pagecreations.com/astrocappella/.

ALAN SMALE AND PADI BOYD
NASA Goddard Space Flight Center, Greenbelt, Maryland

**Sudbury Neutrino Observatory**
**Wednesday, June 9,1999**

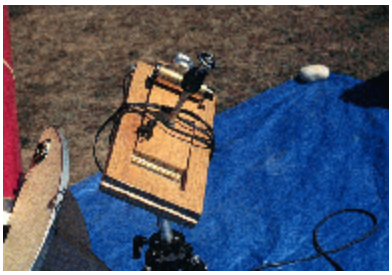
An international team of scientists, research associates and graduate students associated with the Sudbury Neutrino Observatory are celebrating the first detection of neutrinos at this one-of-a-kind underground observatory.

Among its first images are stunning examples of the pools of light formed by the interactions of neutrinos that began life in the sun or in the atmosphere on the opposite side of the Earth.

"This is tremendously exciting," says Art McDonald, Queen's professor and SNO Institute Director. "After all the hard work which has been devoted to the SNO project, to see such clear examples of neutrino interactions within days of finally turning on the full detector was a real triumph for the entire SNO team."

Located 6,800 feet underground, SNO is part of a world-wide effort to understand neutrinos, the basic building blocks of the universe. The results from the SNO experiments are expected to help answer questions about the nature of matter at the smallest scales and provide insight into the structure of the stars and the Universe as a whole.

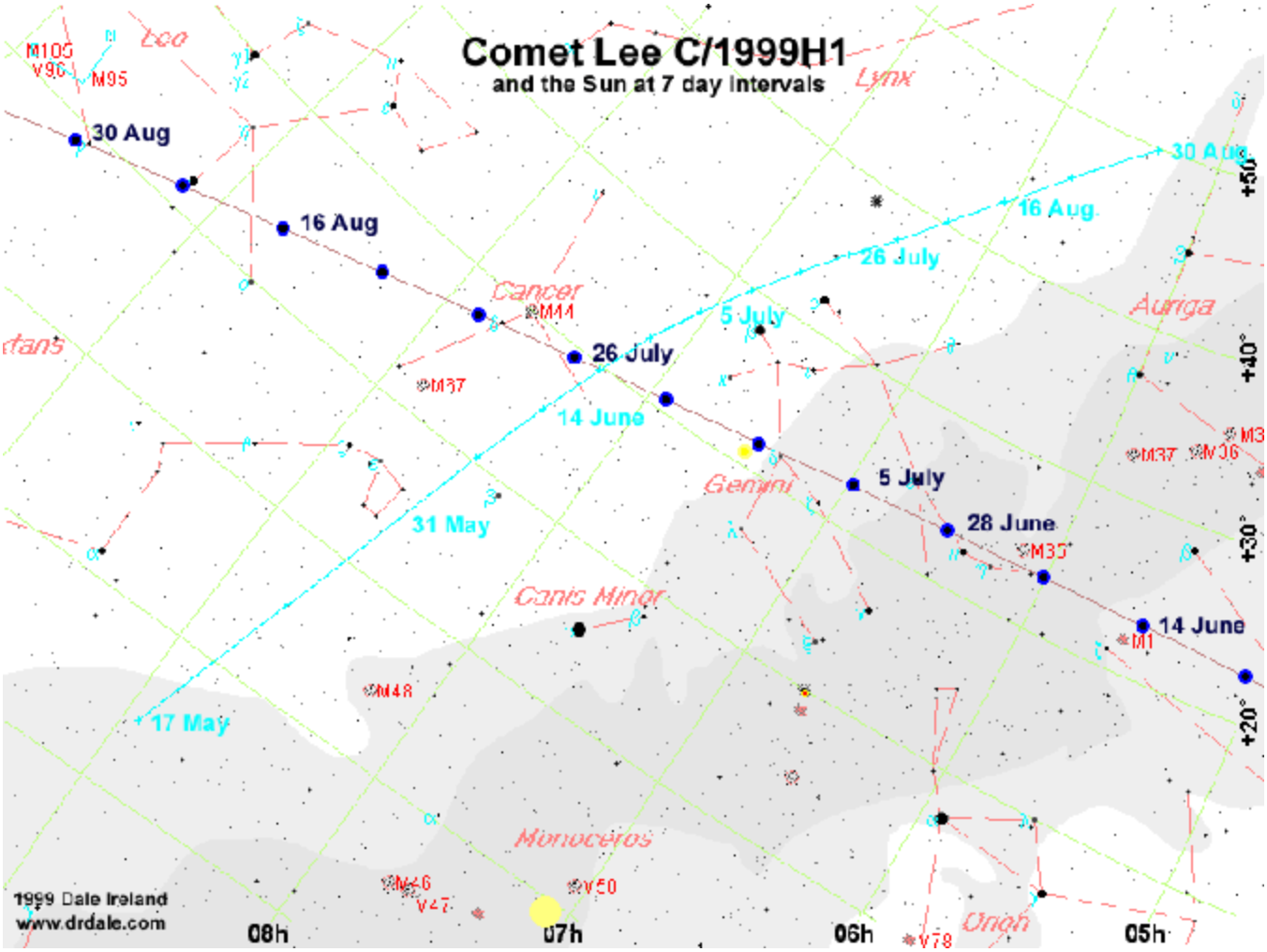
"This is the most exciting physics experiment of this decade," says George Ewan, emeritus professor at Queen's University and first Canadian spokesman for the SNO project. "It is a dream come true. Now we can do the exciting experiments we started discussing in 1984."



A double arm barn door tracker design from StarFest '98. One of the designs we are looking at using on the Mark II Barn Door Tracker project.

SNO is a collaboration of nearly 100 scientists from 11 universities and laboratories in Canada, the US and the UK. To obtain images of the SNO detector and a neutrino signal, visit the SNO Website at: http://www.sno.phy.queensu.ca

# Comet Observing




IAU Circular 7144 (April 16, 1999) reports the visual discovery of a comet by Steven Lee on April 16.5 UT. The comet was discovered at a star party near Mudgee, New South Wales. The comet is described as 9th magnitude, diffuse and no tail. Gordon Garradd (Loomberah, Australia) gives m2=13.9 - 14.2. He states that the comet has a 3' coma and is slightly elongated towards the north.

Orbital elements and an ephemeris published in MPEC H06 and IAUC 7147 (both 4/19/99) indicate that this is a long period comet with a perihelion date of July 11.4 at a distance of 0.71 AU. Unfortunately, the comet will be on the other side of the Sun and solar conjunction (thus, not visible) around perihelion. The comet will move rapidly north in May and it will brighten to m1=7.0-7.5 before being lost in solar glare. The comet should be visible from both hemispheres in the evening sky by mid-May. (Currently, the comet is only visible from the Southern Hemisphere.) After perihelion, the comet will emerge from the solar glare in mid-August at m1~7.5-8.0 to become a Northern Hemisphere circumpolar object in September (dec reaching nearly +60). The comet will slowly fade.