



StarFest 1999



9908a14.jpg Barndoor Type I Tracker - 28mm F2.8 20 minute exposure tracking every 15 seconds on M31 (on the right) & Cassiopeia (on the left) - Kevin Kell

StarFest in July?

Who could have thought. Hot! It was Hot! If it wasn't for plentiful shade being available we would have had more than just one case of heatstroke.

These photos and more are available on our web site (centre info, picture album, set#4)

Most evenings were complete clouded over washouts with one exception... and here are two photos of that night.



9908a12.jpg Sagittarius 28mm f2.8 no tracking for 10 minutes - Kevin Kell



9908a00.jpg Wednesday at StarFest99 - Kevin Kell

Reminder: Friday November 12: Annual Elections and General Meeting

Kim Hay, our Secretary, is stepping down, and Brenda Shaw, our Librarian, has resigned. No other current Executive member has made their intentions to run known at Press Time.

As always, all positions are open for elections subject to the Kingston Centre Bylaw #1

<http://members.kingston.net/rasc/bylaws97.htm>



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 (Corel WP7 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>

1999 Officers and Executive Council

President: Doug Angle

Vice President: Laura Gagné

Secretary: Kim Hay

Treasurer: John Hurley

Editor: Kevin Kell

National Council Rep: Susan Gagnon

Librarian: Brenda Shaw

Honorary President:

David Levy

Committee Chairs:

Observing Group: Tom Dean

ATM Group: Kendra Angle

Youth Group: Brenda Shaw

Astronomy Day: Peggy Hurley

Publicity: Kim Hay

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: <listserv@astrotech.stmarys.ca>

In the body of the message put:
subscribe raslist Your Human Name (Center Affiliation)

Centre 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 September 10 Denise Sabatini -
Archaeoastronomy - civilization to be announced later

* **Friday October 01** (thanksgiving Mon 11th)
Roger Hill - How to build an observatory for \$500

Friday November 12 Annual Elections and
General Meeting

Saturday November 27th Annual Christmas
Awards Dinner at the Travelodge Lasalle Motor
Inn (Outer Princess Street between Sydenham
Road and Highway 38, beside Chapters)

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).

Regulus is published 6 times per year. Views and opinions expressed herein do not necessarily reflect the official position of the Royal Astronomical Society of Canada or its officers and members.

Subscriptions: Members of the Kingston Centre receive Regulus as a benefit of membership. Advertisements are free to members of the Centre. Commercial advertising is \$10/quarter, \$20/half page, \$50/ full page and should be in electronic format. Contributions are more than welcome. Submitted material may be edited for brevity or clarity. Copyright 1999. All rights reserved. Permission is granted to other publications of a similar nature to print material from Regulus provided that full credit is given to the author and to Regulus.



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:

New Members:

Ted Roach, Selby, Ontario, Canada,

Change of address:

★Kim Hay's web site has moved to:

<http://members.kingston.net/kimhay>

★Jim Towgood: Delta, BC

★W.L. Sue Knight Sorensen, Kingston, Ontario

Regulus is now available online in adobe acrobat .PDF format. This allows you (with a free viewer) to see the identical content and format of the newsletter without paper.

IF YOU WISH, you can request that the paper copy stop being mailed and read the online version. I don't see a lot of people taking this option as even with the electronic version they may print off a paper copy anyway, and people like to have paper copies on their shelves. But it is an option.

Changes to the Web Site in the last 2 months <http://members/kingston.net/rasc>

We've gone from a straight text to a table based to a frames based page system in the last couple of months.

- ★ 4 years of Back Issues of Regulus are now available in Adobe Acrobat .PDF format
- ★Space & Astronomy headline news now linked from our home page
- ★Speaker and topic list from the last decade
- ★A Buy, sell and Trade page has been added
- ★ An Adobe Acrobat Library has been added, including copies of our Getting Started Brochure, Centre Bylaws, 1997 GA Handbook, and Barndoor Type I instructions. If you have any other ideas for

content, please contact me and we'll go from there. Some ideas already passed on are one page info sheets on such topics as: collimating optics, solar system info, cleaning optics, etc.

Our Librarian, Brenda Shaw, is headed off to University any time now and has resigned from the Executive. The "off-line" collection of library materials will be, if not already, moved from her home to a new storage location, temporarily, until a new Librarian is appointed for the remainder of the term. Then the elections kick in at the November meeting with the new Executive taking their place in January.

From The Prez

From some scribblings dictated in the dark:

- Check out the website as many current events are listed there and it is updated on a weekly basis.
- Come out and volunteer with some of the public observing sessions we hold monthly
- National office is now handling our memberships... expect to see your renewal in the mail soon!
- If you are having any troubles with anything, please contact us!

From The Secretary

Good Morning RAScals!!

I would like to announce that the RASC has a new Promotional Item that is now available at the National Office.

Planispheres. The cover 40-50 degree latitudes. They measure 10 x 8.5 inches. Are plastic coated, easy to read and work well with red flashlights. For a picture please visit the website at <http://www.rasc.ca/promo/promo.htm>
Cost: \$12.00 each shipping and taxes included.

If you or your Centre is interested in ordering this fine product, please email <orders@rasc.ca>



If there are any questions, or suggestions for new Promotional ideas please contact Kim Hay at <kimhay@kingston.net>

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>

National Council Meeting July 1, 1999. Susan Gagnon, Kingston National Rep

There is always a lot of housekeeping done at the National Council Meetings and this July was no exception. I have spared you most of the dull stuff, I think! I hope that some of you find these details somewhat interesting. I did not mean to focus so much on financial issues but since we pay the bills perhaps it is appropriate.

Randy Atwood reported that CASCA wishes to have closer ties with RASC to implement a Astronomy Outreach program. So far the scheme proposes that RASC helps support CASCA speaker travel to astronomically challenged areas i.e. areas that lack university based astronomy programs.

The Executive Committee has met 3 times since March mostly to try to deal with computer system cost over run. The committee took some responsibility for increase costs in consultant hours charged by tweaking the system as the process continued. Another contributing factor sited was the fact that much of the running of the business is being revamped at the same time, as well as problems of transfer of the U of T database.

The committee was questioned by council members with extensive computer skills and were made aware that members beyond the executive should have been consulted in an effort to keep costs in line. The bottom line was that although the

problems were understood the management of those problems was not to everyone's liking.

The Journal will be looking for a replacement for Dave Turner who has expressed a desire to hand off the Editor's hat. It is expected to be separated into 2 jobs, one of Managing Editor and the position of Associate Editor may cover the vetting of scientific papers only. The Publications Committee was to meet before the end of July to work out a plan of action. Anyone with the qualifications to vet scientific papers and a thick skin should inquire.

There was a presentation at the end of the meeting by the Toronto Centre asking for money to support the building of their observatory. The presentation was very detailed and was a good model for anyone thinking of asking the National Council for a grant. They showed what they had accomplished to date (building permits and plans) and how they proposed to maintain the property with a financial plan including a scheme with user fees. There was an ad hoc committee formed consisting of the Treasurer and two other members to review the request and provide the committee with a recommendation at a later meeting. The request was for \$10,000.

Here is a brief rundown of changes in the Standing Committees.

Exec: Kim Hay, Secretary

Historical: Chair David Orenstien

Library: Chair Colin Haig (call him if you are interested in this)

Membership and Promo: Chair Kim Hay!
(accompanied by various trouble makers).

Special Committees

Computer Use: Chair Colin Haig

Observing Certificate: Chair Roland Dechesne

Committees not mentioned have not had a change of chair of which I am aware.

Our Leo Enright and David Orenstien of Toronto will be providing an outline for the next Annual Meeting on Public Education. It was



decided that a permanent Public Ed Committee was not appropriate without a plan for what they could actually coordinate at a national level. Leo and David are to find a third person for the team that has a 1 year term.



Terry Dickinson accepts the Michael Smith Award at the 1999 GA in Toronto - *S. Gagnon*

The General Meeting was relatively uneventful with the by-law changes passed as circulated. Kingston Centre members sent 5 proxies and there were a total of 77 in all. Toronto Centre tried to stop the abolition of the fixed membership year, but were unsuccessful. As your National Rep I would like

to encourage you to get into the habit of using your proxy.

Roy Bishop is not getting any comments about the Handbook. He would like opinions, he would like to know how to improve the book.

The new calendar is beautiful and will go fast.

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.



AstroDay May 1999 at the Frontenac Mall - *S. Gagnon*

Observing Group News

July's session at Steven Manders's was great! August's session at Mark Kaye's was cloudy, rainy and had

few slides from attendees!

1999 Observing Group Schedule

Contact Tom Dean for Directions or check the secure web site for more info.

Saturday 1999 September 11th

The home of Tessa Clark (Kingston Mills)

From Highway 15 and the 401. Go north on 15 cross over the 401 and over the CN rail and turn left (weest) onto Kingston Mills road, then right (north) on canal drive. xxx Watch out for chickens and rabbits!

October: Saturday October 11th

The home of Peggy and John Hurley (Sharbot Lake) .

From Kingston & the 401 Highway. Head north on Highway #38 for approx 65 km. Go through Harrowsmith, Hartington, Parham and Tichbourne. Go past Crow Lake Road (on your right), go past St. George Lake (on your left), go past Shibley Road (on your right). You are very close now. Xxxxxx

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 September 14th

Tuesday October 12th

Tuesday November 16th

Tuesday December 14th

ATM Group News

★The 25" blank has moved outdoors (into the garage) with the mirror grinding machine. The subdiameter tool has been matched to the mirror! There is an online graph of the latest measurements at

<http://members.kingston.net/rasc/atmstatus.htm>

★The 8" scope is nearing completion (still!). The final coat of paint has been applied to the feet and base.

★Equatorial table - on hold

★Mark II Barn door trackers - on hold

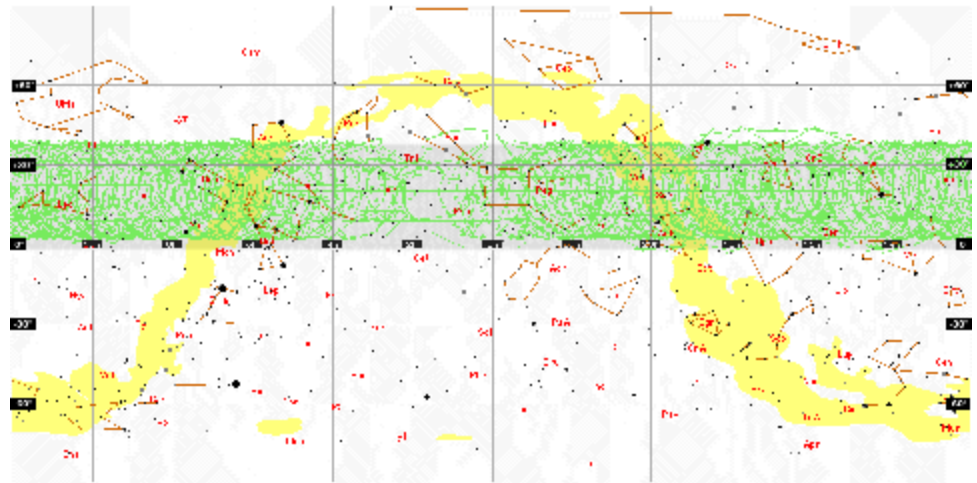
★Raffle scope - on hold

The on hold projects are just begging for manpower and volunteers! Contact the ATM Chair, Kendra Angle, if you are interested!



Education Group

The Teacher's Handbook for the new Ontario Grade 9 Science Curriculum, Astronomy component is near its completion. Drafts are being proofread, and changes will be made by the time you read this newsletter article. The book is about 150 pages in length and offers teachers background information, summaries of the seminars we will be conducting for them, activities to do in the classroom and outside, and a list of valuable resources for teaching astronomy. The next big step for the education committee will be putting the actual seminar together. There will be workshops for telescope use and maintenance, software program use, celestial motion and observing, and activities to do in class. The date for the seminar is to be determined by the Limestone district board of education, but we expect it will be early October. The teachers would like to do some observing in the evening of the seminar, so if you are interested in providing technical support (ie. your telescope/binoculars and yourself), then please contact Laura Gagne <xxx@xxxxxxx.xxx> xxx-xxxx). You can also contact me if you think you would like to help conduct the seminar. We have speakers already arranged, but can always use people to help set up, etc. We have the opportunity here to really make a difference in our community by providing valuable educational support. The next few months will be very exciting for Kingston Centre. Thanks to all who have helped so far, and all who are about to help in our major centre project of the year.



This is a map of the sky and the area that is currently being scanned by the SETI-at-Home project. Over 1 million users have signed up!

Laura Gagné
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>

From Previous Issues of Regulus

Many thanks to Ian Levstein (ex-President for life) for copies of the 1990 and 1991 newsletters. We have made 3 copies and put them into the paper archives (see <http://members.kingston.net/rasc/regulus.htm>).

Some interesting tidbits to come out of those issues: The 1989 refurbishing of the 25 cm Douglas telescope cost \$270 (of which \$135 came from a National Grant). The 32mm Koenig eyepiece was purchased in October of 1990 and the Telrad in



July of 1991.

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 32nd in the world in the Clubs group/team with about 125 members on the team. Come join us! Put those spare CPU cycles to good use!

How to select a telescope – a different perspective

Part IV - Mounting the Mirror 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. As I’ve made this choice a couple of times, I will give my perspective on the issue. So far, we have looked narrowed our choices to building our own Newtonian reflector, as large as we can manage. The next thing to consider is mounting the finished mirror into a telescope. Supporting the mirror can be a complicated subject, so we will devote an article to that subject alone.

The simplest method of mounting is to glue the mirror directly to the cell using 3 small pads of silicon adhesive. This is fine for smaller sizes, but has limitations in larger sizes. The most serious of these is that the mirror will flex under its own weight enough to ruin the figure. Traditionally, the solution to this is to maintain the thickness of the glass at 1/6th the diameter or more. For even modest size mirrors, this gets pretty heavy. Thick glass is also difficult to produce, and so much more expensive.

Diameter (inches)	Thickness (inches)	Weight (pounds)
6	1.0	2.3
8	1.3	5.5
10	1.7	10.8
12	2.0	18.7
16	2.7	44.3
20	3.3	86.5
24	4.0	149.5
30	5.0	you've got to be kidding!

We can afford to use thinner glass, if we use more points to support it. Unfortunately, to get very far, we have some issues to deal with:

Each support point must carry the same amount of weight.

They must be positioned in exactly the right places. The calculations to do this properly are extremely complex.

It is mainly because of the difficulty in doing the calculations that the 1:6 rule persisted so long. Now, a technique called finite element analysis or FEA is used. A mathematical model of the mirror is created where the disk is divided into elements – usually triangles – each representing the deflection of a small section of the mirror. Typically, there are hundreds or thousands of elements, each represented by a set of equations, so the calculating power needed to resolve them is not trivial.



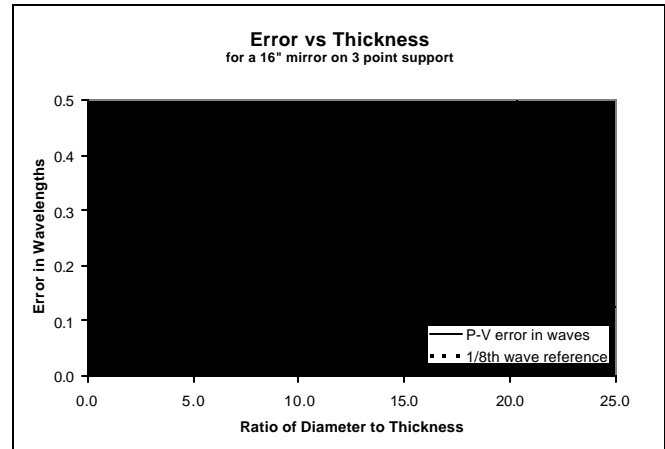
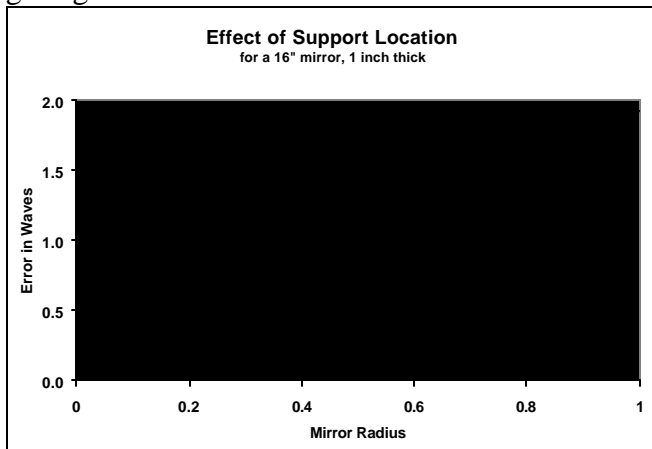
However, there are now PC based FEA programs that make life a LOT simpler. I used one of these, PLOP (for PLate Optimization Program) to look at different options.

First, where do we locate the supports?

Traditionally, this has been at 70% of the mirror diameter. However, using FEA, it has been found that, while our carefully figured parabola is bending under it's own weight, it bends mostly into another parabola. By using this effect, we find that the best location is more like 40% of the mirror diameter.

We adjust for the difference in the new parabola by a slight shift in focussing.

Now, with the supports fixed at 40% of the mirror diameter, we can calculate what happens at different thickness'. Although the actual point at which the deflection exceeds the 1/8th wave limit is more like 1:11, the 1:6 ratio does give some margin for error in figuring, and turns out to be a pretty good guideline after all.



But wait, can't we simply use more supports, and then thinner glass? There are two considerations in this strategy:

1) The supports must float. The mirror will rest evenly on 3 points. If a 4th is added, there will likely be an uneven load, giving much more than the predicted error. The solution is to mount 3 triangles on the points of a larger triangle, with each support allowed to swivel freely. This complicates the construction, but can be done.

2) The calculations become even more difficult. Below are listed the deflections for a 16" mirror, 1" thick on different kinds of supports:

Number of supports	P-V error (mm)	P-V error (waves)
3	1.586E-04	1/ 3.5
6	2.32E-05	1/ 24
9	3.46E-05	1/ 16
12	4.90E-06	1/ 113

While 27 and 81 point systems are possible, the calculations require more than the 32 MB of memory I have available. Also, the accuracy of the calculations drops as the need for more calculations increases. At the same time, the accuracy *needed* goes up quite a bit. For complicated systems, the properties of the particular glass used will need to be accurately measured. The practical limit for the



amateur is probably the 9 point system, although the 6 point actually gives better results. This will allow reducing the thickness as much as half of the conventional 1:6 ratio. My 16" blank is 1.6" thick, for a 1:10 ratio. It weighs 27 lbs, instead of the 44 a full thickness glass would weigh.

Next: The Optical Tube Assembly and Mount

From: AndyTjr@aol.com
Date sent: Mon, 23 Aug 1999 11:43:32 EDT

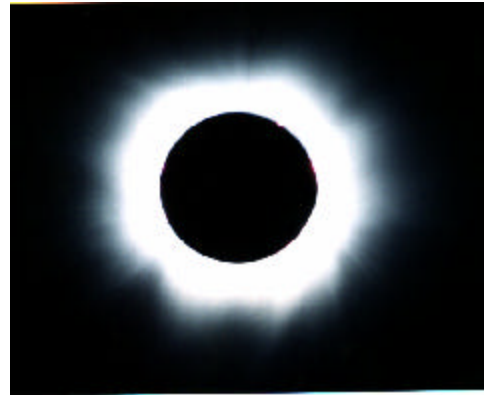
I've been a member of RASC since the mid-seventies and joined the Kingston Centre when the option was presented during the anniversary year.

I was fortunate to be on a ship on the Black Sea on August 11 to see the total solar eclipse. I have attached an image I made of the corona using ISO 200 film through a 1000 mm focal length Celestron C-90 scope at 1/4 second. The conditions were perfect. Not a cloud in the sky and the sea was amazingly calm.

If you can use this to fill some space in Regulus, feel free to do so.
 Andy Telesca

FORSALE

4" Vixen 102 Fluorite OTA (T-9), Great Polaris Equatorial mount, 2" Televue star diagonal (in addition to the 1.25" original diagonal), RA Motor, Dec motor, Dual axis drive controller Manual slow motion clutch (RA), manual slow motion clutch (Dec), full aperture glass solar filter, giant carrying bag, extra large tripod case. This superb telescope is in mint condition and only 12 months old (all original packaging). Philip Harrington, author of star ware, refers to this instrument as the undiscovered jewel of the telescope world. Am selling this package for \$2,700 (original cost was \$5,000). Buyer pays shipping from Atikokan, Ontario <xxx@xxxx.xxx> Joseph Marohnic



News from the Net

Aug. 16, 1999

RELEASE:
 99-93
 BALLOON-

BORNE INSTRUMENT COLLECTS ANTIMATTER

It almost sounds like a science-fiction movie: NASA launched a 60-story-high balloon to the upper fringes of Earth's atmosphere to collect precious particles of some of the rarest stuff in the Universe -- antimatter -- and, just possibly, evidence that entire anti-galaxies exist.

It wasn't science fiction, but cutting-edge science. Carrying a Japanese-built instrument, NASA's largest balloon -- 39 million cubic feet in volume -- lifted off from Lynn Lake, Manitoba, Canada, at 9:22 a.m. EDT Aug. 11 for a 38-hour flight more than 20 miles above Earth. The 5,000-pound instrument was recovered Aug. 12 and will be prepared for another flight next year. The BESS project (Balloon-borne Experiment with a Superconducting Solenoidal magnet), led by Prof. Shuji Orito of the University of Tokyo, is sponsored in the U.S. by NASA and by Monbusho in Japan.

Antiparticles are rare forms of matter that have electrical charges exactly the opposite of their ordinary "sister" particles. For example, a proton has a positive charge and an electron has a negative charge. An antiproton, though, has a negative charge and an antielectron has a positive charge. Scientists study antimatter to understand structure and energy processes in the Universe.

"We have collected excellent data, which should contain several hundred antiprotons among a hundred million cosmic-ray particles that passed through our detector," said Dr. Orito, who was at Lynn Lake for the launch with researchers from Japan and the United States.

Although many theorists believe that the entire Universe is made of "ordinary" matter, some speculate that antimatter galaxies exist. However, no evidence of these galaxies has been found. Previous balloon flights have detected numerous anti-protons, but these can be produced by collisions of "ordinary" particles in interstellar space.

If BESS were to find a more sophisticated form of



antimatter, such as molecules of anti-helium, it would provide evidence that antimatter galaxies exist. Unlike antiprotons, anti-helium is virtually impossible to create by collision and would have to come from some other source.

"The discovery of anti-helium would be stunning," said Dr. Orito. "That is why we search for such exotic objects, although there exist no compelling reasons to believe that anti-galaxies do exist. We have actually found no anti-helium in data taken during the five flights from 1993 to 1998, while we have detected three million helium nuclei. This fact provides the most direct evidence that the Galaxy and the nearby part of the Universe are made solely of matter, not antimatter."

Aug. 5, 1999 RELEASE: 99-88
ASTEROID MYSTERY IN DEEP SPACE:
SIBLINGS, OR PARENT AND CHILD?

NASA's novel Deep Space 1 spacecraft not only passed a technology milestone when it successfully flew itself past an asteroid last week, it gave scientists a deep-space "family tree" mystery to ponder.

Deep Space 1 flew within an estimated 16 miles (26 kilometers) of asteroid 9969 Braille on July 29. The spacecraft's infrared sensor confirmed that the small asteroid is similar to Vesta, a rare type of asteroid and one of the largest bodies in the main asteroid belt, which lies between Mars and Jupiter.

"This clear link between Vesta and Braille is an important finding," said Dr. Laurence Soderblom of the U.S. Geological Survey, team leader for Deep Space 1 experiments using the spacecraft's integrated spectrometer and imaging instrument.

Scientists are now wrestling with a thorny question: Is the near-Earth asteroid Braille a chip off Vesta's old block, or are the two asteroids siblings which originated elsewhere,

perhaps thrown off a larger body that has long since been destroyed?

Iridium Declares Bankruptcy

In a move that was not totally unexpected, troubled satellite phone company Iridium announced late Friday, August 13, that it was filing for bankruptcy.

The decision to declare bankruptcy, which comes two days after the company defaulted on over \$1.5 billion in loans, should not affect Iridium's operations of its 66-satellite constellation while the company restructures itself, officials said.



Apres AstroDay 99 dinner - S. Gagnon



DDO - Toronto GA July 1999 - S. Gagnon