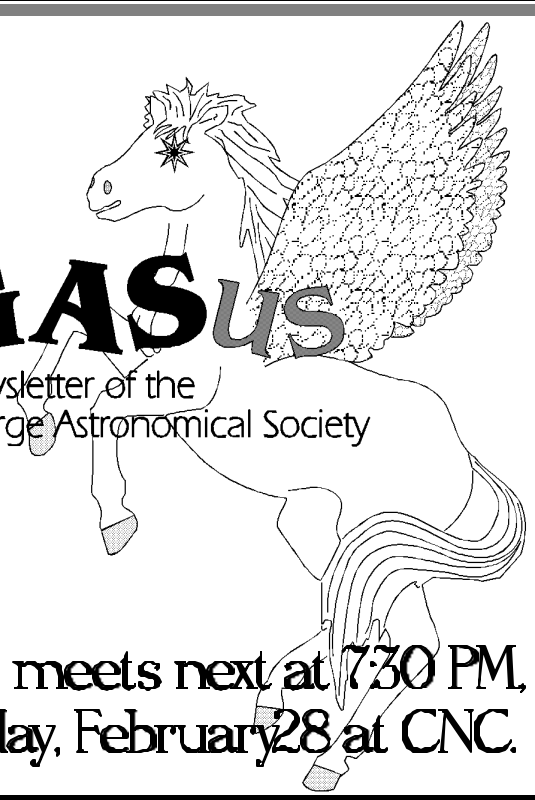
1996 FEBRUARY Issue #63

the PeGASus

Newsletter of the
The Prince George Astronomical Society



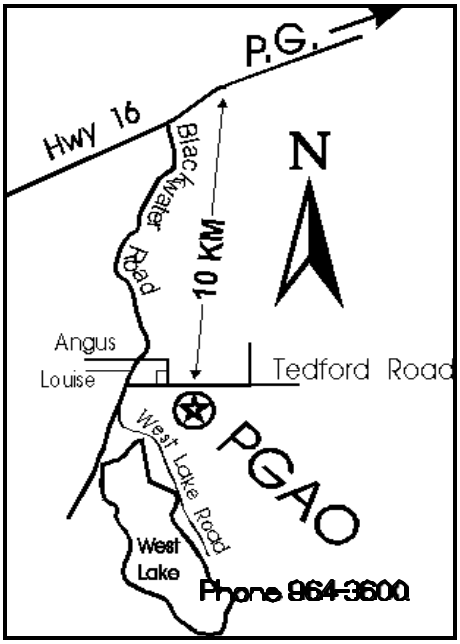
The PGAS meets next at 7:30 PM, Wednesday, February 28 at CNC.

INSIDE :

the PeGASus is published monthly by the *Prince George Astronomical Society*. Contributions to the newsletter are welcome.

Deadline for the next issue is March 15.

Send correspondence to
The PGAS
3330 - 22nd Avenue
Prince George, BC, V2N 1P8
or
aaquist@cnc.bc.ca
phone: 964-9626
fax: 561-5816



Prince George Astronomical Society Executive, 1995/6

President
Jon Bowen
563-9869

Vice President
Bob Nelson
562-2131/563-6928

Secretary
Brian Potts
562-8113

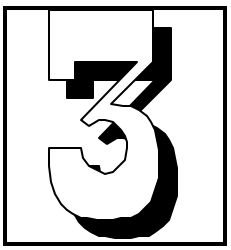
Treasurer
Barb Hansen
962-7477

Members at Large
Gil Self 964-7279
Eric Hansen 962-7477

Appointed Directors

Technical
Bob Nelson
*
Program
Gil Self
*
Observing
Jon Bowen
*
Promotional
Jennifer Whitman
*
Building
Mike Hansen
*
Financial
Dave Sundberg

Editorial



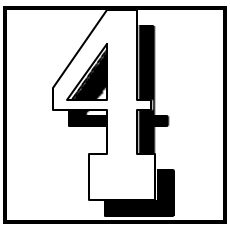
by Orla Aaquist

At the age of 46, the desire to learn how to play the piano has beset me. Thirty years ago, I was beset by a similar desire to play the guitar. I was never a very good, but I learned to play well enough to periodically release the artistic side of my soul into the world for a quick romp. I have no desire to become any better at the piano than I am at the guitar, because I know that it is not necessary to be excellent at something in order to enjoy it.

There are three requirements for becoming excellent at something: you must have a knack for it, you must have a passion for it, and you must have the willpower to spend a considerable part of your life doing it. At one time I wanted to be excellent at physics, but after three years at university, I discovered that I was too confused about life and girls in order to be a good physicist. Moreover, I discovered that I could enjoyed physics without being very good at it; I knew enough physics to think about atoms, time, and gravity without slipping into total fantacy; I had learned enough mathematics so that I could calculate the time for an asteroid's free-fall from Pluto to the earth; I knew how to create the natural numbers and where to find zero; and I could cruise the surfact of Hilbert's cube. After three years of university, someone tried to teach me tensor calculus, quantum mechanics, and the general theory of relativity. I came to understand that I knew very little physic; the tunnel was too long, so I decided to take up skiing instead.

I never did learn how to ski very well, but I learned to ski well enough not to kill myself on the mogles. I also enjoy golf, swimming, hanggliding, falling in love, writing an occasional poem and setting it to music, editing a newsletter, talking to kids about science, teaching physics, writing computer programs, grinding telescope mirrors, cannoing, windsurfing, scuba diving, and changing the oil on my car. I knew that if I were to become excellent at physics, I would not have had time to become mediocre at many other things.

It is never too late to become mediocre at something. You do not need to know a lot of astronomy in order to enjoy looking at the stars. Yet, I feel that we do not give new members this impression. When someone new comes to a meeting, they see a small group of eager amatures talking about telescope clutches, digital setting circles, exposure times, right ascensions, occultations, conjunctions, greatest elongations, light curves, visibility, fund raising, and using other scary terminology which have nothing to do with what attracts people to astronomy in the first place, such as black holes, red giant stars, and telescopes. If we want to attract and keep new members, we have to examine our prime directive? .... **to be continued**.



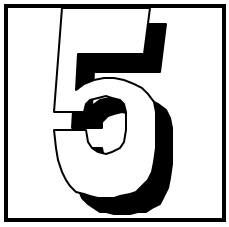
Coming Events

If you are involved with any astronomical or otherwise scientific activity on behalf of the PGAS, please list the activity here.

Feb 28	PGAS meeting at CNC. Orla Speaks on the distance to Planetary Nebulae.
March 1	**Observatory opens for public viewing .**
March 20	Spring Equinox
March 27	Monthly meeting at CNC or Observatory (TBA)
April 3	Total Lunar eclipse visible in eastern Canada.
April 7	Daylight savings time begins (spring forward)
April 20	Astronomy Day at the Observatory!
April 21	Lyrid meteors peak
April 24	PGAS meeting
May 29	PGAS meeting
June 19	Gallilean satellites dance across Jupiter (watch upcoming newsletters for more information)
June 22	PGAS picnic at Observatory
June 27	RASC General Assembly in Edmonton
June 29/30	PGAS participation with Canada Day.

The Night Sky

by Alan Whitman



VENUS AND THE CRESCENT MOON

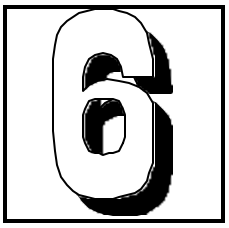
The close conjunction of brilliant Venus and the pretty three-day old crescent moon during the early evening of February 21st will be one of the more memorable sights in the skies of 1996. It will look much like 'the star and crescent' featured on the flags of many Islamic countries. It will also be fairly easy to see Venus in the daytime--the nearby moon will make it easy to spot Venus well before sunset.

Either object is striking by itself. Venus has been dominating the western sky for several hours after sunset since the first of the year and will continue to do so until the end of May. The three-day old crescent is the prettiest lunar phase, bright and high enough to dominate the twilight sky and yet a narrow enough crescent that the night side of the moon is plainly visible by earthshine, light reflected from the nearly 'full earth' in the lunar skies. The dark lava plains which make 'the man in the moon' are visible on the earthshine-lit portion with binoculars and sometimes even with the unaided eye if the sky is transparent enough.

On the 21st the moon's orbital motion will be obvious as it closes on Venus between sunset at 5:31 PM and moonset at 9:38 PM. Just before moonset the two brightest natural objects in the night sky will be separated by only 2 moon diameters (one degree) as the moon passes below Venus. The West has the best view on the continent but in Hawaii they will see the dark edge of the moon occult (eclipse) Venus.

The next evening, the 22nd, the crescent moon occults a magnitude 4.5 star at about 8:03 PM. Any small telescope will show the ghostly earthshine-lit limb of the moon approaching the star. The star will seem to pause right on the limb for several seconds and then suddenly disappear. There is no fading; the star is there and then, instantaneously, it is gone. Then on Sunday the 25th binoculars will show the first quarter moon drifting through the Hyades star cluster during the late evening. A small telescope will probably show several Hyades stars being occulted although the first quarter moon will be more troublesomely bright than the crescent of three evenings earlier.

While February's is the closest moon-Venus conjunction this year,



there will be one each month. Watch again on March 22nd when the two luminaries will pass within five degrees of each other (five degrees is the distance between 'the Pointers', the two Big Dipper stars which point to Polaris).

Mira, the famous long-period red giant variable star reaches maximum on March 11th, conveniently placed in the western early evening sky. Mira is marked on any star chart, in the constellation Cetus.

On Astronomy Day, April 20th, the beautiful three-day old crescent will slip through the Hyades with the Pleiades, Venus, and Mercury all part of the scene!

A warning to readers of Astronomy magazine: the February issue incorrectly gives the 25th as the date of the Venus-moon conjunction in two places (they got it right as the 21st in two other places). On the otherhand, the same issue of Astronomy has a short piece by Edmonton's Alister Ling extolling the incredible seeing at last summer's Mount Kobau Star Party.

Here are a few extra little tidbits picked up on the net:

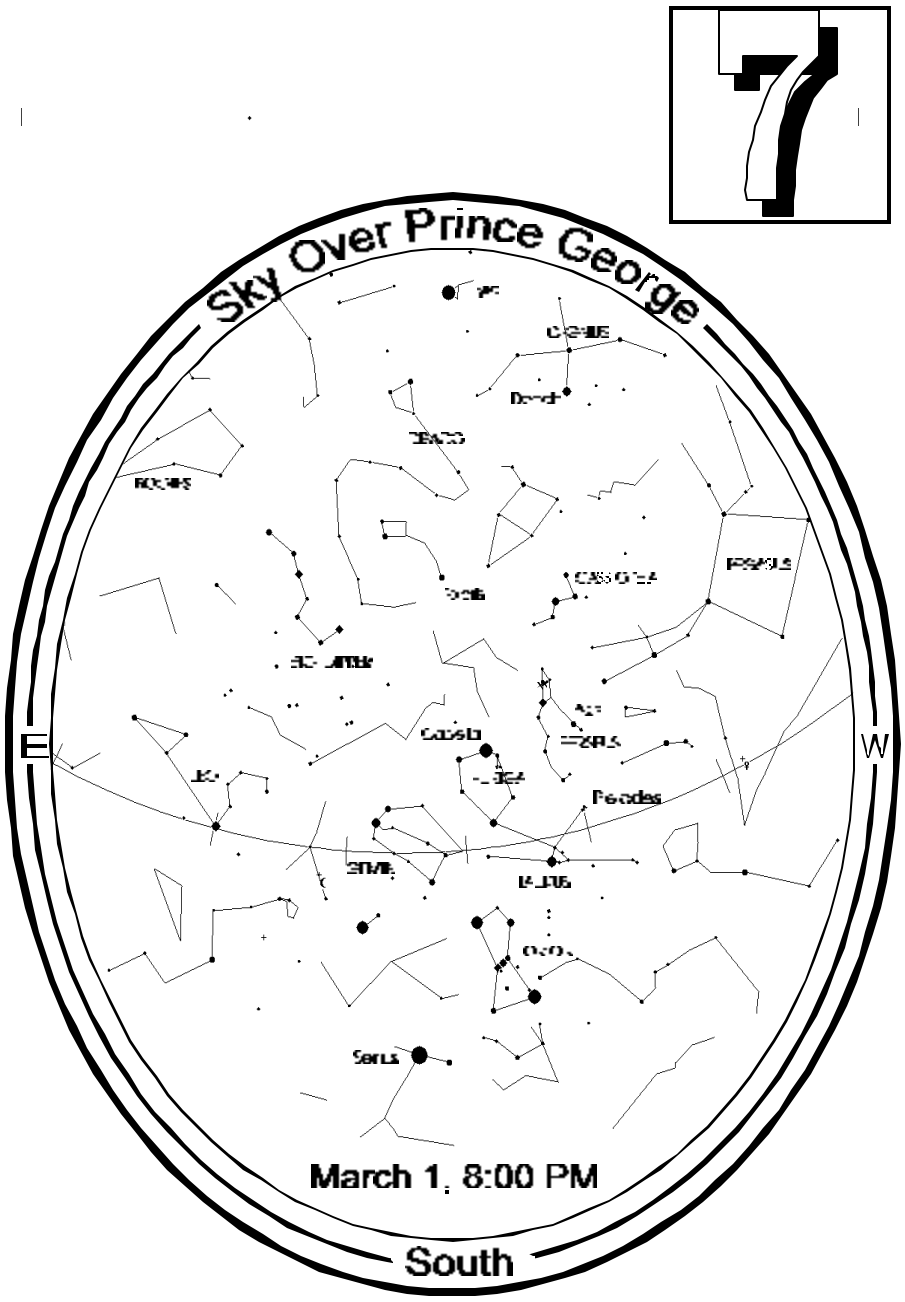
You can say good-bye to the current series of passages through the plane of Saturn's rings. The last crossing occurs February 11th, at which time we'll once again be viewing the system's sunlit face. Saturn is currently low in the southwest after sunset.

Comet Hyakutake (C/1995 Y1), discovered in December, is near 8th magnitude and can be seen low in the southeast before dawn. Perihelion will not occur until February 24th, but right now is about the brightest it's likely to get. Here are coordinates for 0 hours Universal Time:

February	10	17h 46m	-3.7 dg
	12	17 57	-2.3
	14	18 7	-0.6

For updated locations, call Orla.

A BRIGHT COMET AT LAST? Japanese observer Yuji Hyakutake has visually discovered his second comet in six weeks using giant 25 x 150 binoculars. This find came before dawn on the morning of January 31st. Within days, it became obvious that the comet is destined to put on quite a show at the end of March, perhaps reaching 1st magnitude as it streaks near the north celestial pole just 15 million km away under favorably moonless skies. No comet has been this bright since Comet West in 1976. S&T Contributing Editor John Bortle is cautiously optimistic: "If this comet is as intrinsically bright as it first


Sky Over Prince George
E
W
Pleiades
March 1, 8:00 PM
South

Public Viewing Starts Again

The observatory is open to the public every Friday evening from 7:30 PM to midnight during the following months:

March, April, May
August, September, October

Astronomy Screen Saver

If you are interested in obtaining an astronomy screen saver which shows constellations, planets and more, call Charles Smith at 564-3035.

PeGASus Article Gets Media Attention

At 5 minutes to 8 o'clock on the morning of February 2, Alan Whitman was intervied on the CBC radio about *Sundogs, Halos and Glories*. You may remember that this was the title of his article in last month's issue of this newsletter. On February 10, the same article appeared in the P.G. Citizen. **Good work, Alan!**

Telescope Donated to PGAS

Thanks to Dave and Linda Pugh for donating a 60 mm Tasco refractor to the PGAS. The telescope will be put to good use during our public nights.

Thanks to Tom Laing

Tom Laing (*Tom's Auto Repairs)* is our neighbour at the PGAO. During this winter he kindly cleared snow from your driveway and parking area. To show our appreciation, he has been added to our list of contributers.

FOR SALE

Omcom 813 5-inch reflector with single eyepiece and Omcom equatorial mounting

$400 or best offer.

Call Dave Staples at

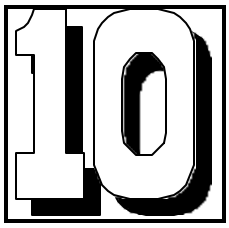
1-604-383-4495 (home) or 1-604-387-0195 (work).

Who Reads the PeGASus?

I am doing a survey to see how many people read this newsletter. If you do (members and non-members), please give me (Orla) a call at 964-9626. Leave a message if I am not at home. The results will be published in the next issue of *the PeGASus.*

Membership Dues

If you have not paid you membership dues yet, we would really like you to do so as soon as possible. By now you should have received a telephone call from someone reminding you of your unpaid dues. If you have not, then either you have paid your dues or we were not able to get a hold of you for one reason or another. Unpaid members will be deleted from our mailing list in March or April.



Astronomy on a Shoestring

by Alan Batten
(Copied from January 1996 SkyNews, Newsletter of the RASC Victoria Centre)

Most of us, when we stop to give it a thought, are concerned about the plight of so many of our fellow human beings in developing countries. Although we may differ in our assessment of the causes of their misfortune and the possible remedies, we all feel some compassion. I think we can most easily put ourselves mentally in their position by comparing familiar details of their lives and ours. For example, one needs to spend only a few days in India or China to realize what a luxury it is to turn on a tap that gives cold water that you *know* is safe to drink. But we are astronomers and we can perhaps best imagine what life in a developing country is like by comparing ourselves with people there who are, or who could like to be, astronomers, too.

We immediately find that many amateur astronomers on this continent have better telescopes, libraries, and more opportunities to talk to people with the same interests than do professionals in many of the countries that I have visited. Of course, we use the term "developing countries" to describe a wide variety of nations and economies. Astronomers in India, for example, have access to many instruments in their own country fully comparable to those to be found on Canadian soil, and are part of a large astronomical community; There are several Asian and African countries, however, where the professional astronomers are few in number, cannot afford to subscribe even to one journal, and have access to no instruments with which they can hope to do useful research.

In some ways, their geographical isolation must be even worse -- e-mail is no solution for people who live in countries where there are hardly any PCs and telephone connections are unreliable. We have become so used to being able to call (almost) anywhere in the world from our own homes, that we tend to forget that there are countries in which phones are scarce and not always working. Two years ago I was attending an UN-sponsored conference in Nigeria. My family needed to get in

touch with me urgently, but it took three days for a fax from Victoria to reach me! Despite that, there were hopes then of soon bringing Nigeria on the Internet; I suspect that, instead, the situation has deteriorated.

In many developing countries amateur astronomy is virtually unknown -- few could afford to buy even a modest telescope of their own. In some countries such as China, schools or local clubs can afford a telescope, so amateurs can pursue their hobby with such instruments; but in other countries even that kind of limited amateur involvement is not possible. This is why the RASC gift of a small telescope to Vinh University in Viet Nam is so significant and will provide many Vietnamese with their only opportunity to see some of the celestial wonders that we have come almost to take for granted. I know that Victoria Centre helped to pay the cost of transporting that gift. Two years ago, I saw nothing in Viet Nam of more than about 10 cm aperture -- and that not very good. The C8 that the RASC sent represented an incredible increase in the ability of Vinh University to teach the observational side of astronomy.

Most recently, the Japanese have presented 40 cm and 10 cm telescopes to Hanoi Pedagogical University. Meanwhile a French astronomer (actually a Vietnamese ex-patriate) brought a simple radio interferometer with him to observe last October's total solar eclipse and left it behind so that his former compatriots can learn a little about radio observations. I know these gifts are much appreciated, because they were acknowledged repeatedly during the short meeting we had in connection with the eclipse. The RASC, in particular, was thanked by name. So it is possible to make a tremendous difference to those struggling to revive or to introduce astronomy in developing countries at a very small cost to ourselves. Viet Nam is by no means the only such country.

AstroSurfing

Details of the Science News posted here are available on the astronomy forum on the Prince George Free-Net.

According to Juan Collar, stellar-collapse neutrinos may have played a role in biological extinctions on Earth in past eras, notwithstanding their very weak interactions with ordinary matter.

The deepest, most detailed optical view of the universe ever obtained, called the Hubble Deep Field (HDF), shows a narrow "keyhole" view stretching to the visible horizon of the universe. Gazing into this small field, Hubble uncovered a bewildering assortment of at least 1,500 galaxies at various stages of evolution.

A new Hubble image of planetary nebula NGC 7027 shows remarkable new details of the process by which a star like the Sun dies. New features include: faint, blue, concentric shells surrounding the nebula; an extensive network of red dust clouds throughout the bright inner region; and the hot central white dwarf, visible as a white dot at the centre. The photo reveals that the initial ejections occurred episodically to produce the concentric shells.

A new Hubble image of a warped disk around the star Beta Pictoris may indicate the presence of a planet around the star. A new Hubble image reveals the first direct image of a star other than the Sun. Called Alpha Orionis, or Betelgeuse, it is a red supergiant star marking the shoulder of the winter constellation Orion the Hunter. The image reveals a huge ultraviolet atmosphere with a mysterious hot spot on the stellar behemoth's surface. **A new Hubble image** of the Egg Nebula shows a pair of mysterious "searchlight" beams emerging from a hidden star, criss-crossed by numerous bright arcs. This image sheds new light on the poorly understood ejection of stellar matter which accompanies the slow death of Sun-like stars.

Last October, a planet circling the star 51 Pegasi about 40 light years distant, was discovered and unofficially dubbed Bellerophon. Recently, two new planets were found around the stars 70 Virginis in the constellation Virgo, and 47 Ursae Majoris, in the Big Dipper or Ursa Major. Both stars are visible to the naked eye, but the planets are too small and dim to be seen against the glare of their parent star. These new discoveries are important because they spawn a new subfield of astrophysics, the study of planetary systems. Unlike Bellerophon, which is about half the mass of Jupiter and orbits its star in 4.3 days -- so close it is baked to 1000C -- the two new planets are several times the mass of Jupiter and orbit their stars at a distance typical of our own solar system.

The first comet discovery of 1996 was made on January 16th by Victoria and Robert Jedicke using the Spacewatch telescope on Kitt Peak in Arizona. But don't reach for the binoculars just yet -- Comet Jedicke is a dim 17th magnitude now, with a short tail 5 to 6 arcminutes long. A very preliminary orbit suggests that the comet (designated 1996 A1) is inbound and will be

about 2.5 astronomical units from the Sun at perihelion in April 1997.

After a month's delay, scientists have released early results from the Galileo probe, which plunged into Jupiter's hydrogen-dominated atmosphere on December 7th. The probe found that, by mass, only one-sixth of the gas was helium -- about half the expected value. The helium may not be missing, but merely separating from the hydrogen and "raining" toward the core deeper down. The amount of oxygen and carbon in the Jovian atmosphere also fell short of predictions.

It seems hard to believe, but 10 years have passed since the Space Shuttle Challenger disintegrated in a fireball 73 seconds after liftoff on January 28, 1986, and killed its crew of seven.

MACHOS (massive compact halo object) may make up a considerable fraction of dark matter in our galaxy's halo, a new study shows. The MACHO group finds MACHOS by taking pictures of 9 million stars every night and looking for telltale light enhancements. The event sample is not very large, but the researchers are so confident of their events that they use the number to estimate a value of at least 50% as the likely contribution of MACHOs to the dark matter believed to be lurking in the halo.

Major new accelerators in the U.S. are too costly, so some particle physicists hope to shift their operations into space. SLAC has proposed building the $100- million Gamma Large Array Space Telescope (GLAST), which would view gamma rays with stacks of silicon microstrip detectors, some 50-100 times more sensitive than the detectors used in the present Gamma Ray Observatory. Meanwhile, Sam Ting of MIT plans to build to the Alpha Magnetic Spectrometer (AMS), a $20-million device to be mounted on Space Station Alpha. AMS would use a powerful permanent magnet to sort antiparticles from particles, the goal being to search for antimatter in the universe and for the decay of dark matter particles.

Computer brains, an electronic inner ear and the spacecraft equivalent of a cardiovascular system have been successfully installed into NASA's Cassini spacecraft bound for a launch to Saturn in 1997.

With a final weld on the module that will house astronauts aboard the international Space Station, over 80,000 pounds of flight hardware have been manufactured and the exterior structures of the U.S. components are now complete.

Expanding on the success of the Shuttle-Mir program, NASA and the Russian Space Agency have agreed in principle to extend Shuttle-Mir activities into 1998.

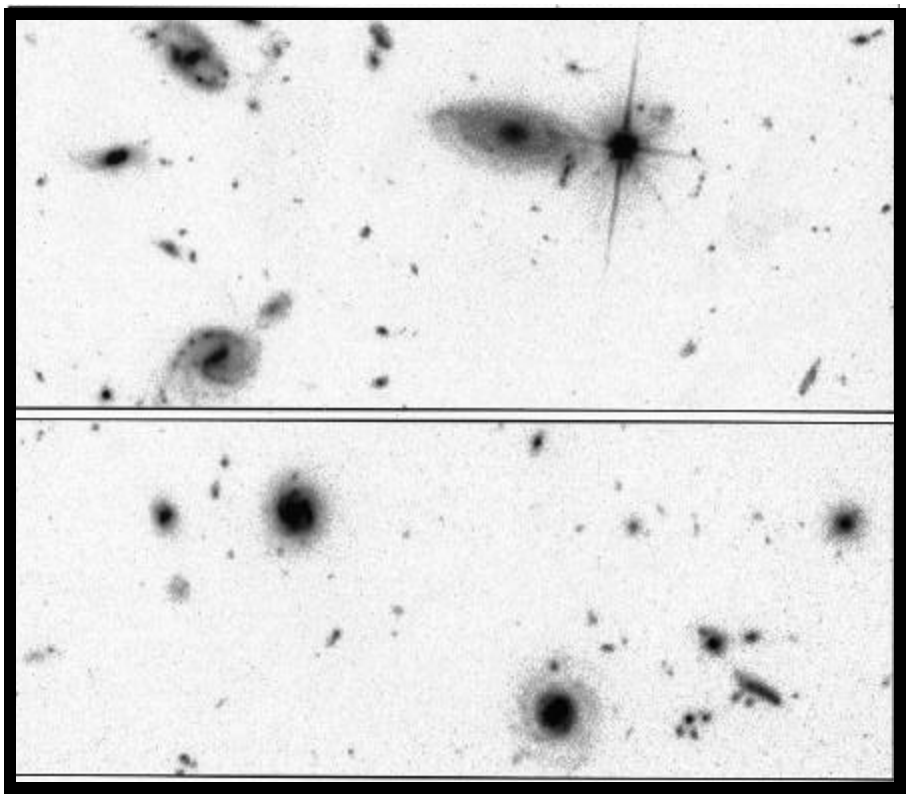
A new super lightweight external tank for the Space Shuttle has taken an important first step toward flight.

One of the world's most popular photo collections -- images of the planets produced by the U.S. space program -- goes online in a central location today as part of a joint project between NASA and the U.S. Geological Survey (USGS). Addresses for the new NASA Planetary Photojournal are:

http://www-pdsimage.jpl.nasa.gov/PIA

14 Image Gallery

These two images below represent select portions of the sky as seen in the Hubble Deep Field observation-- the "deepest-ever" view of the universe, made with NASA's Hubble Space Telescope. Besides the classical spiral- and elliptical-shaped galaxies, there is a bewildering variety of other galaxy shapes and colors. The never before seen dimmest galaxies are nearly 30th magnitude. Representing a narrow "keyhole" view stretching all the way to the visible horizon of the universe, the image covers a speck of sky a tiny fraction the diameter of the full Moon. This is so narrow, just a few foreground stars in our Milky Way Galaxy are visible and are vastly outnumbered by the menagerie of far more distant galaxies. The images will provide important clues to understanding the evolution of the universe. Some of the galaxies may have formed less that one billion years after the Big Bang.



PGAS CONTRIBUTORS

The PGAS would like to thank the following individuals, corporations and government agencies who, since 1991, have donated money, goods or services to the construction and operation of the Prince George Astronomical Observatory.

Ministry of Adv. Ed. Training and Tech	$25,000
BC Science Council	16,000
BC Lotteries	3,900
Helmar Kotsch (Acme Mas.)	1,932
Northwood Pulp and Timber	1,665
Electrical Services Ltd	1,583
Royal Bank of Canada	1,500
Regional District of Fraser-Fort George	1,000
The Pas Lumber Co	750
Canfor Polar Division	744
A.V. Jay Roofing	600
Xerox Canada	500
Russelsteel	465
Lakeland Mills Ltd	460
Canfor Clear Lake Division	270
Lutz Klaar	200
Canfor Netherlands Division	200
Carrier Lumber Ltd	160
Tom's Auto Repairs	150
Pine Drilling	150
Cloverdale Paint Inc	100
Claus Schlueter	100

The greatest contributors to the construction and operation of the observatory are from PGAS members who have generously contributed their time to this project. The value of their contribution surpasses all external contributions.

The PGAS is a non-profit organization dedicated to the advancement of astronomy and science in general in Prince George and the neighboring northern communities. Donations of money or materials to the society are greatly appreciated and tax deductible.

This newsletter is printed courtesy of Spee-dee Printers.
We thank you for your support.