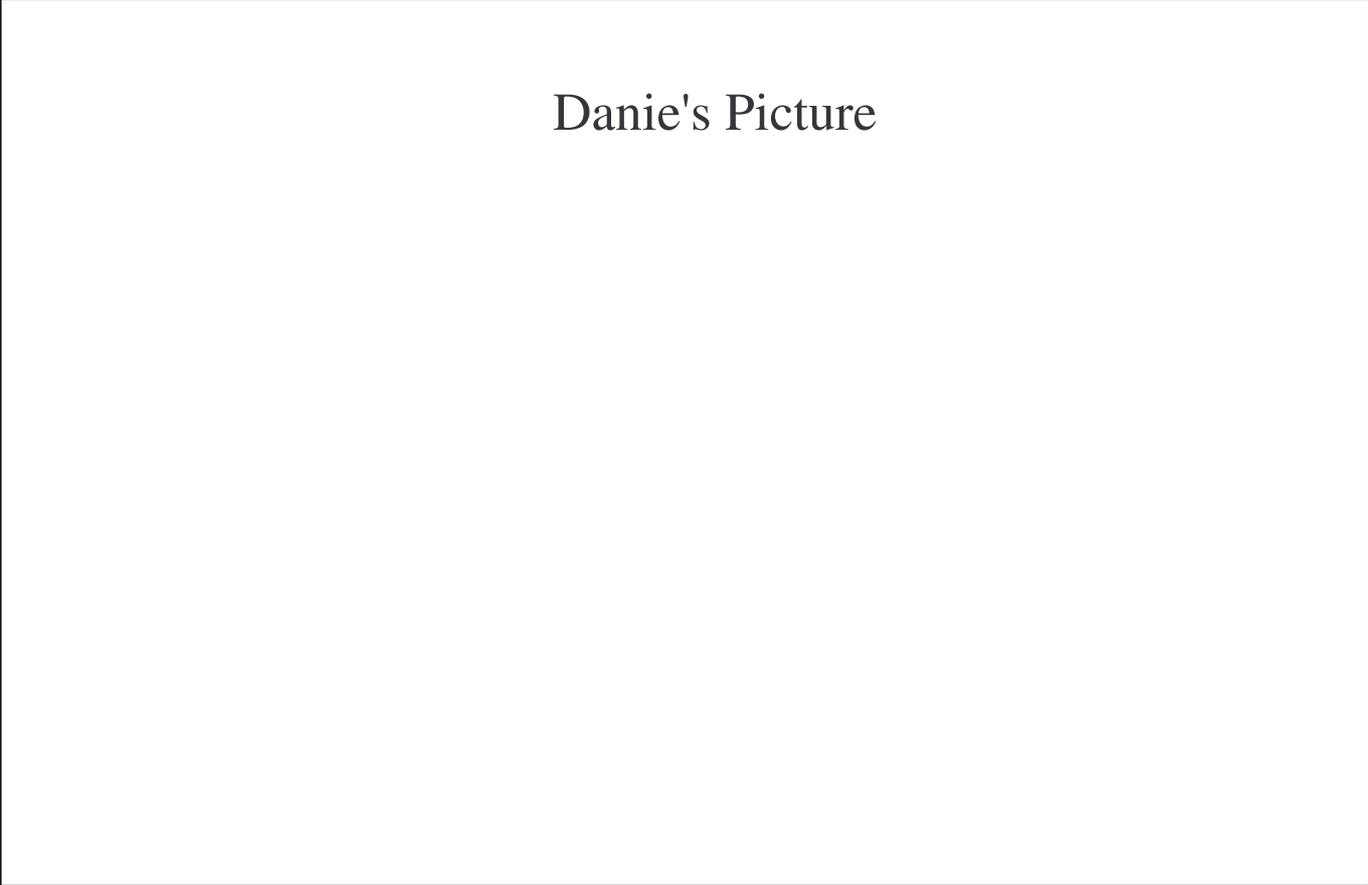


CANOPUS

Danie's Picture



The Astronomical Society of Southern Africa

Johannesburg Centre

Monthly Newsletter for December 2000

Another picture

Contents:

Editorial

Notice of Meeting

Minor-Planet Overbeek.....	Brian Fraser
More on Minor-Planet 5038 Overbeek	Brian Fraser
The Jacobs Telescope and Dome	Frans van Nieuwkerk
Venus Transit 2004	Trevor Gould
Extreme Ultraviolet Light Mission comes to an end	NASA News
SA unveils infrared telescope.....	Richard Davies
Endeavour for next ISS service flight	NASA News
Mir to be de-orbited.....	Spaceflight Now
Iridium satellite constellation saved	Spaceflight Now
Public Viewing Nights	Melvyn Hannibal
Spacecraft once more unto the Breach	Andrew Bridges
STARDUST gets Arc-Eye	Stardust email List
More Moons for Saturn and a new stellar neighbour	ESO-EPR
In The Sky This Month	Brian Fraser

The Sir Herbert Baker Library, 18a Gill Street, Observatory, Johannesburg
P.O.Box 93145, Yeoville, 2143

Editorial

Minor Planet 5038 Overbeek - now there's a fitting name if there ever was one. What a wonderful surprise for all of us, *including Danie*, when Brian Warner presented him with the plaque after Brian Fraser's description of the part played by the Franklin-Adams telescope in the discovery of some minor-planets.

However, enough from me on the subject - you will be reading a word or two regarding the above event and presentation in the pages that follow. We have tried to present you with a bumper issue of Canopus this month and hope you will agree that, although a little late this month, the finished article has been worth the effort put into it's production.

We have a quick look at public viewing evenings courtesy of Melvyn, and articles on refurbishing the Jacobs Dome, and Sunspot counting, from Frans. Several articles have been gleaned from the NASA web site(s) and these will hopefully be of more than passing interest to you our readers.

Brian has supplied the tables of the state of the heavens, and as we did last year, the January issue will contain a comprehensive listing of events for the whole year. He has also supplied some additional tables and ephemeris and these will also be adapted for use on the website. These additional tables include Sun and Moon data (Moonrise and Moonset) for the year as well as Sidereal Time, Julian day Number, Solar Transit, and Nutation.....all sorts of interesting stuff that we haven't supplied to our members before.

And, to finish this last Canopus editorial of the 20th century, your committee wishes you all the very best over the Festive Season. May the worst of the next millennium, be better than the best of the last.

NB. Don't forget our Year-end Star Party - "Under the Full Moon" - which will held at our physical address in the grounds of the Old Observatory, Gill Street, Observatory, Johannesburg. We will be lighting the fires at around 17:30 and hope that all of you will be there to enjoy the evening.

Committee of the Johannesburg Centre of the ASSA for 2000/1		
Chairman	Tom Budge	484-4740
Vice Chairman	Chris Stewart	763-3301
Secretary & Treasurer	Constant Volschenk	972-6038
Librarian	Ed Finlay	616-3202
Curator of Instruments	Frans van Nieuwkerk	609-8158
P.R. and Media Liaison	Wolf Lange	849-6020
Viewing Officer	Constant Volschenk	972-6038
Members	Evan Dembskey	680-9304
	Melvyn Hannibal	435-6007
Editor of CANOPUS	Chris Penberthy	793-7480
Our Web Address is www.aqua.co.za/assa_jhb.htm Send e-mail to assa_jhb@aqua.co.za and fax us at (011) 339-2926		

Notice of Star Party

The **December** meeting of the Johannesburg Centre of the Astronomical Society will be held at the Old Observatory, 18a Gill Street, Observatory, on Saturday the 9th of December 2000.

Time:- 17:00 onwards

The meeting will take the form of a Bring 'n Braai

Please note the different day of the week and earlier starting time.

Future Meetings

January 10th **T.B.A.** T.B.A.

A detailed list of the next few meetings will be presented here in the next issue of Canopus.

Are there any subjects that you would like to hear at one of the monthly meetings? Contact your local friendly committee member and ask her/him to discuss it in committee.

Dark Sky Viewing

On the Saturday nearest New Moon at Tom Budge's Farm in the Magaliesberg. Remember that this is by arrangement only as most observers will be following specific viewing programmes and if you don't have your own 'scope, you should contact one of the observers (e.g. at the monthly meeting) to arrange some viewing time with them.

The new Millennium dark sky dates will be published in the January 2001 Canopus

Dark Sky Viewing

The new Millennium public viewing nights will also be published in the January 2001 Canopus

Jo'burg Centre Outings for 2000/1

Your Committee is making arrangements for several outings during the year. Amongst these are some old favourites as well as a couple of new ones which should prove interesting.

Swinburne was visited, and an article has been promised for the next issue of Canopus.

Boyden has been cancelled due to lack of availability of the 60" but we'll attempt to plan a visit again next year.

We will also be looking at the possibility of arranging visits to other ASSA Centres (e.g. the Pretoria Centre) during the year - and also try to see if we can organise some joint ventures.

Haartebeeshoek - Wolf Lange is attempting to organise a visit, as well as a visit to the Suikerbosrand Nature Reserve.

Tswaing Crater - still trying to set up a day visit under the guidance of Prof. Reimold

Telescope Making Classes

Would you like to make your own telescope?...or finish off a partially finished one? Well your opportunity has arrived (once again). Join the Telescope Making Class being held under the guidance of Brian, Evan and Chris. Contact Brian on 803-8291 if you are interested.

Urban legend does the rounds again

The next time someone says the Apollo lunar landings were faked, point them to this Web site:

<http://www.badastronomy.com/bad/misc/apollohoax.html>

Minor Planet "Overbeek"

The Minor Planet Center announced on Nov 11th 2000 that they have accepted the proposal to name Minor Planet (5038) 1948 KF "Overbeek" in honour of the South African amateur astronomer Danie Overbeek.

The citation reads

Michiel Daniel Overbeek

Born September 15th 1920.

Prolific South African observer of variable stars and occultations.

A past president of the Astronomical Society of Southern Africa and director of its occultation section, he is actively involved in fostering amateur astronomers in Southern Africa.

Danie Overbeek, who recently celebrated his 80th birthday, is an active amateur astronomer who has amassed over 250,000 variable star observations, mostly from his home in Edenvale. He has also contributed to astronomy through observations of occultations of stars by the moon as well as monitoring the disappearance of stars when minor planets pass between them and the Earth. In addition he monitors the state of the earth's magnetic field with a homemade magnetometer and also studies solar flares with a SID/SES radio receiver.

He has been president of the Astronomical Society of Southern Africa on two occasions, a rare feat, and has been honoured by various astronomical bodies around the world, including the American Association of Variable Star Observers (AAVSO), ASSA, and the Astronomical Society of the Pacific.

At a special meeting of the Johannesburg Center of the Astronomical Society held at the old observatory in Johannesburg on Saturday Nov 11th, Professor Brian Warner of UCT presented Danie with a plaque commemorating the nomination. The audience gave Danie a standing ovation when the surprise announcement was made.

How do these things happen?

What you do is this. You have a look at the list of minor planets discovered in Johannesburg and you find that there were 146 of them. When you study their names you find out that there are 4 of them that never received names. This usually comes about because the asteroid doesn't receive official recognition until it's orbit has been fully determined and this could take years to do as some of these little rocks get lost soon after discovery. So then you make enquiries with the Minor Planet Centre

(MPC) about the procedure and find out that if the discoverer fails to name a minor planet within 10 years of discovery then he loses the right to name it and it is "open game" for anyone to name it. It is very easy then to put forward a proposal, which has to be done in a certain way, and wait for approval. If your nomination is relevant and serious and honours a prominent figure, like Danie Overbeek, then it is formality for the committee to approve your idea.

Then your problems start. How to keep it a surprise and arrange a function where you can make an announcement? Firstly you have to get your timing right. The MPC make their monthly announcements at Full Moon. So your function HAS to be on that day, otherwise the whole world gets to hear about it before you can pop the surprise. Then you have to get a prominent speaker who is available on the day and who better than Prof Brian Warner. So your number one choice of speaker agrees to attend. All you then have to do is raise some money and motivate a couple of people to help you, invite some spectators and, hey presto, you have a magnificent function!!

It's a piece of old tacky.

Brian Fraser

Minor Planet 5038 - Overbeek

Minor planet (5038), given the name "Overbeek" (MPC 41567) on 2000 Nov. 11 in honour of South African amateur astronomer Danie Overbeek (on the occasion of his eightieth birthday), was originally discovered by E. L. Johnson at the (then) Union Observatory in Johannesburg on 1948 May 31.

Then having the designation 1948 KF, the object was observed on five nights over the course of a month (MPC 170). It was then lost until 1983, when Ted Bowell identified (MPC 8209) it with 1983 HP, an object observed by him at the Lowell Observatory, Flagstaff, on 1983 Apr. 18 (MPC 7929) and May 7 (MPC 8199).

With the availability also of observations made at the Oak Ridge Observatory on eight nights from late 1984 to early 1992 (MPC 9410, MPC 16530, MPC 19440, MPC 19631), the object was given the number (5038) on 1992 Feb 18 (MPC 19658), on the basis of an orbit solution, computed by Brian Marsden at the Minor Planet Center in Cambridge, Mass., from the 21 available observations.

The orbit of (5038) is quite eccentric (0.28) and moderately inclined (11 deg) to the ecliptic, with the object varying between heliocentric distances 1.66 and 2.96 AU with an orbital period of a little over 3.5 years, perihelion passages occurring in (for example) August 1948, September 1983 and April 2001.

The absolute magnitude of 14.1 corresponds to a size of some 4 to 9 km, the size being uncertain because of the object's unknown albedo. Sixty-four observations have so far been reported since the object was numbered, these having been made at the oppositions in mid-1997, late 1998 and early 2000. Observations will next be convenient during the second half of 2001, with opposition in September and the object then about magnitude 16.

Brian Fraser

The Jacobs Telescope and Dome.

The Jacobs Telescope is a 12 inch Newtonian long focus Telescope donated to the society by Gill Jacobs's father.

Eben van Zyl, Don Michie and Clive Winskill were the main builders of the observatory building and also moved the dome to its present location. The steel dome had to be cut in half to fit on the lorry to transport it. They then rewelded it and put on top of the observatory building. It was a huge undertaking including building the concrete pier for the Telescope and mounting the telescope thereon.

For the last couple of years it was not used and a sign was on the mount which said "Do not use the Telescope, the drive is faulty".

First I cleaned the observatory and the dome inside. The cobwebs were hanging like curtains. After that, I found that all the controls worked beautifully although it was nearly impossible to rotate the dome. There are 6 steel wheels running on a flat rail. I replaced all the bearings with new sealed bearings, and put large flat washers against the one side of the wheels to improve the thrust of the wheel against the bracket. The dome turns much better now but the whole structure is a bit skew due to the cutting and welding. The next step is to find a way to repair it so that the dome can be rotated with one hand and with the motor.

Six of the eight listed eyepieces are still in good condition in the safe. We will have to find the other two - it seems that they are being used on the Franklin-Adams Telescope. All the Trees around the observatory are cut down which opens up the horizon - but also increases the light pollution.

The building is sound and the Telescope in good order.

We really have magnificent equipment at the observatory.

Frans van Nieuwkerk
Curator of Instruments.

Venus Transit - 2004

The following email was addressed to Trevor Gould in connection with the proposed cooperation between a Swiss Amateur Astronomical group and ourselves to observe the Venus 2004 transit.

Dear Trevor,

First, please let me introduce myself: My name is Walter Bersinger and I preside an astronomical society that runs a small public and school observatory near Zurich (see web link below - unfortunately available only in German, but nice pictures!). I have been asked by my friend and president of the neighbouring Society of Astro-Amateurs Zurich, Andreas Inderbitzin, to maintain English correspondence with our South African fellow astronomers concerning the Venus Transit 2004 project, and am pleased to comply.

I would like to give you a brief account of the first meeting held on 26th October 2000:

An encouraging number of 20 participants have turned up and another 9 who were prevented from coming have expressed interest in the project by mail/phone. They are from all over Switzerland and members of various astronomical societies. They contribute to the projects with a variety of professional and scientific backgrounds.

Andreas expressed his wish that this project be a combination of both fun and serious research. Through this project we would like to learn how the scientists of the 18th c. carried out their experiments to find the astronomical unit, how they traveled in those days and how they evaluated the data. It is intended to be an interesting revival of a remarkable historical feat with the present-day means of amateur astronomers.

After Andreas' introduction, Rény Montandon gave a brief overview about the most important historical British and French expeditions of the 18th century dispatched to observe the transit from various viewing locations.

Guido Wohler, renowned for his craftsmanship, presented an admirable device that he places on the glass of an overhead projector that casts the solar disk onto the screen and traces two Venus tracks across the face of the sun. The sophisticated mechanism showed up some geometrical problems that will need to be taken into account in 2004.

Heinz Blatter then explained some math relating to the transits of Venus. Andreas finally asked each participant in which topic he/she wanted to collaborate and a team leader was assigned. Following are the topics and the persons in charge:

- 1 History:
Andreas Verdun:-
andreas.verdun@aiub.unibe.ch
- 2 Kinematics: Fredy Messmer:-
fmessmer@bluewin.ch
- 3 Instruments and observation methods:
Marc Eichenberger
m.eichenberger@web.de
- 4 Evaluation and results:
Hugo Jost hujo@bluewin.ch
- 5 Contacts, communication:
Andreas Inderbitzin
inderbitzin.a@bluewin.ch

The next meeting is scheduled for Friday, 6th April 2001 and each group has been requested to meet at least once before that date so they can work out an agenda of activities and present it to the plenary meeting. We are all looking forward to a pleasant and fruitful collaboration with our friends in South Africa and, needless to say, are excited to learn about your own plans to observe the transit from sunny South Africa.

Walter Bersinger

Verein Sternwarte Rotgrueb Rümlang
(Society of the Rotgrueb Observatory
Rümlang)
<http://ruemlang.astronomie.ch/>

Obermattenstrasse 9
CH-8153 Rümlang
Schweiz/Switzerland

Tel. Priv. +41-1-817 28 13
Mobile +41-79 668 24 88
Tel. Office +41-1-382 07 73
Fax Office +41-1-382 10 60

EXTREME ULTRAVIOLET LIGHT MISSION COMES TO AN END

From: NASAnews@hq.nasa.gov

RELEASE: 00-181

After eight years in orbit, more than twice its planned lifetime, NASA will terminate operations of a bantam astronomy explorer in December that returned unprecedented results.

The Extreme Ultraviolet Explorer (EUVE) spacecraft surveyed the universe by observing extreme ultraviolet (EUV) light. "We opened a new window on the cosmos with EUVE," said Dr. Alan Bunner, Science Director for the Structure and Evolution of the Universe program at NASA Headquarters in Washington, DC. "No one had thoroughly explored the heavens in the extreme ultraviolet before, and EUVE filled significant gaps in our understanding."

Eventually, aerodynamic drag on the 7,000-pound spacecraft will cause it to reenter the Earth's atmosphere. Current predictions put EUVE's reentry sometime in late 2001 or early 2002. Unlike the Compton Gamma Ray Observatory, which had a propulsion system to allow for its controlled reentry earlier this year, EUVE has no method for directing its impact to a specific entry point. However, extensive analysis by NASA reveals the amount of debris likely to survive reentry is extremely small and will likely fall harmlessly into the ocean.

EUVE was launched on July 7, 1992, aboard a Delta II rocket from Cape Canaveral, FL. EUVE was originally slated for three years of science observations, but NASA twice extended its mission.

Operated at NASA's Goddard Space Flight Center, Greenbelt, MD, during its early years, EUVE mission operations are now conducted by the University of California at Berkeley.

EUV light is invisible to the human eye, and is more energetic than ordinary ultraviolet light. Before EUVE was launched, many scientists feared it would not see much, because they believed the thin gas between the stars, known as the interstellar medium, would block extreme ultraviolet light. Just as only the closest streetlights are visible through a thick fog, only the closest and brightest EUV-emitting objects were expected to be seen

through the absorption caused by the interstellar medium. However, EUVE demonstrated the nature and density of the interstellar medium was different from what most expected; patches of it were ionized (electrons were removed from atoms, mostly hydrogen) rendering it transparent to extreme ultraviolet light. The transparent areas riddle the interstellar medium, like holes in Swiss cheese, and in some directions even remote EUV objects outside our galaxy can be seen.

"EUVE opened up one of the last frontiers of astronomy, closing the crucial gulf between the two probed regions of electromagnetic radiation, Gamma-ray and X-ray at the high energy end and far-ultraviolet to visible light, infrared and radio at lower frequencies, thus making our view of the cosmos more complete," said Dr. Yoji Kondo, Project Scientist for EUVE at Goddard.

Rather than seeing only a couple dozen nearby objects as many expected, EUVE observed more than 1,000 sources, including more than three dozen objects outside our galaxy. EUVE observed the superheated, multimillion-degree outer atmospheres, or coronae, of stars. Astronomers studied various kinds of stars to determine how active and bright their coronae are; how hot, dense and variable they are; and what elements they are made of. Astronomers were able to compare these observations with detailed observations of the corona of the closest star, our Sun. This enabled them to obtain new insights into the processes that form coronae and cause these gases to be superheated. While no mission is currently planned to replace EUVE, Bunner said the Chandra X-ray Observatory, launched in July 1999, is capable of making observations of some of the same phenomena as EUVE, such as stellar coronae, X-ray binaries and active galactic nuclei.

More information on EUVE can be found on the Internet at:

<http://www.cea.berkeley.edu/>

SA unveils infrared telescope

Richard Davies

15/11/2000 09:24 - (SA) –Cape Town - A new telescope capable of peering into the depths of our own and neighbouring galaxies to see how stars are born was officially opened at the South African Astronomical Observatory (SAAO) site near Sutherland on Wednesday.

The R18-million InfraRed Survey Facility (IRSF) is the result of an international partnership between Japanese and South African scientists, and will be the second-largest telescope at the observatory, 16km outside the tiny Karoo town. Utilising a 1,4-metre diameter mirror, the facility will be able to "see" infrared radiation and record images on a specially-built R7-million camera.

Infrared radiation has the power of penetrating haze and dust clouds, which scatter ordinary visible light. "We can't see infrared radiation, but we may feel it as heat," said SAAO director Dr Bob Stobie. "At these wavelengths we can see through dust clouds to regions otherwise hidden from our view." "Infrared light is also ideal for studying cool stars that radiate most of their energy at wavelengths too long for the eye to see," he said. Major funding for the project comes from Japan's ministry of education. Nagoya University built the infrared "Sirius" camera, and the institution's staff worked with an optical company in Kyoto to build the telescope itself, which uses Russian optics. SAAO senior astronomer Dr Ian Glass told a media briefing in Cape Town that infrared observations made to date had been very shallow, and the time was ripe for a deep survey. The IRSF's main targets would be the two galaxies nearest to our own – the greater and small Magellanic Clouds - and the central region of our own Milky Way galaxy.

The man in charge of the Japanese side of the project, Dr Tetsuo Hasegawa of the University of Tokyo, said the unveiling of the IRSF at Sutherland was the realisation of a long-standing dream for astronomers in his country. "The centre of the Milky Way galaxy can only be seen at an angle of 25 degrees above the horizon in Japan." The observatory at Sutherland was much better positioned to study this portion of the night sky. Hasegawa said data from an infrared study of the Magellanic

Clouds and our own galactic centre would give astronomers a better understanding of how stars were formed. "With the Sirius camera, stars 100 times fainter than those seen before can be photographed." Astronomers knew that in the Magellanic Clouds, stars were born in clusters or groups, while in our own Milky Way galaxy they appeared to be formed individually. Data collected from IRSF over the next few years would enable researchers to explain this difference, and to construct a scientific model explaining star formation. Results could also be compared with data obtained from radio telescopes, he said. In each infrared photographic exposure made at Sutherland, an area of the sky - a square about one quarter as wide as the full Moon - will be simultaneously recorded in three different infrared wavebands. According to Hasegawa, the new facility will be "taking pictures within a matter of weeks".

National Research Foundation president Dr Khotso Mokhele, who presided over Wednesday's opening ceremony, said the IRSF ushered in an exciting new era for infrared astronomy.

The opening of the IRSF follows hot on the heels of a groundbreaking ceremony at the Sutherland site two months ago to mark the start of construction on the Southern African Large Telescope (Salt). Costing R100-million to erect over the next five years, Salt will be the biggest telescope in Africa and powerful enough to detect a light source the size of a candle flame as far away as the moon, or to resolve the shape of an object the size of a two rand coin at a distance of ten kilometres.

Observers believe the work - specifically the Salt and IRSF initiatives - being carried out in the heart of the Karoo over the next five years will place South Africa on the cutting edge of international astronomy. Scientific spin-offs from the Salt project alone are expected to have a huge impact locally in the fields of optics, mechanical design, robotics, data reduction, computer networking and cryogenics, among others. – Sapa

Submitted by **Brian Fraser**

ENDEAVOUR READY TO HELP INTERNATIONAL SPACE STATIONS SPREAD ITS WINGS

NASA News - RELEASE: 00-182

Space Shuttle Endeavour and its five-member crew are set to soar into orbit on a mission of space-flight firsts, including the task of adding a pair of giant solar wings to the International Space Station (ISS).

The launch of the shuttle is set for Thursday, Nov. 30. Endeavour's liftoff from NASA's Kennedy Space Center, FL, on mission STS-97 is targeted for 10:06 p.m. EST, in a launch window that will be less than five minutes long.

"This mission will assemble the heaviest, largest and most complex piece of the International Space Station to date," Space Shuttle Program Manager Ron Dittmore said. "Every shuttle flight for the next year carries its own set of firsts. But this mission, unfolding solar arrays of historic proportions, will make the challenge and grandeur of this entire venture more apparent than will any other single flight. It's a great mission to complete a very safe and successful year for the Space Shuttle team coast to coast."

Endeavour will carry aloft a 17-ton package of immense solar arrays and their associated batteries, electronics and cooling equipment. Once deployed on ISS, this first set of solar sails will measure 240 feet, tip-to-tip, and will provide enough electricity to run 15 average-sized homes.

Veteran astronaut Brent Jett (Cmdr., USN) will command the mission. Michael Bloomfield (Lt. Col., USAF) will serve as pilot. They will be accompanied by Mission Specialists Joe Tanner, Carlos Noriega (Lt. Col., USMC) and Canadian Space Agency astronaut Marc Garneau.

Astronauts Tanner and Noriega will perform space walks during the mission to install the giant solar panels and prepare for the arrival next year of the American-made space laboratory Destiny. Once in orbit, the Destiny module will be the most sophisticated science laboratory ever launched into space.

Endeavour also will be the first shuttle to visit the Expedition One crew, currently working in orbit on ISS. Along with the technical equipment needed to attach the solar panels to ISS, the crew of STS-97 will drop off supplies and equipment for the three-person station crew, led by American Commander Bill Shepherd and two Russian cosmonauts, Pilot Yuri Gidzenko and Flight Engineer Sergei Krikalev. The Expedition Crew arrived at the space station Nov. 2 and will work onboard ISS for nearly four months.

For more information on the next flight of the space shuttle and the ISS, visit:

<http://www.spaceflight.nasa.gov/>

RUSSIA DECIDES TO DUMP MIR

newsalert@spaceflightnow.com

The Russian government has decided to deorbit the Mir space station, according to reports from Moscow. "The government has agreed that [Mir] be taken out of orbit and brought down into the Pacific Ocean in a pre-determined area off Australia between February 26 and 28," Russian space agency chief Yuri Koptev told reporters. For more information, see:-

<http://spaceflightnow.com>

IRIDIUM SYSTEM SAVED

newsalert@spaceflightnow.com

A U.S. bankruptcy court Wednesday approved the bid of a company called Iridium Satellite LLC to purchase the Iridium mobile telephone satellite system. The company said it plans to re-launch affordable satellite communications services within 60 days. For more information go to:-

<http://spaceflightnow.com/news/n0011/16iridium/>

Our nearest star, the Sun.

After 10 years absence I started again with the daily Sunspot count from the middle of June weather permitting. But also time is needed during the day. That is why I think there are so few Sunspot observers around. It is the perfect job for the Amateur who is on pension or who works shifts, and also those who work from home.

I use a Herschel wedge which is very safe to use and is not widely known surprisingly. It is best to use on a Refractor. That is the only instrument I used all the time. If you want to use a Reflector for Sunspot counting it is better to put a Mylar sheet over the tube's front opening. I am not sure if the secondary mirror can survive the heat from the concentration of the Sun's rays before it is directed to the eyepiece.

Next time I will explain how a Herschel wedge works.

Here is some data of Sunspots as seen from Edenvale in Gauteng S.A. with a Refractor of 50mm aperture (2 inch). June 2000 beginning on the 18th, with 9 groups and 76 spots, seeing conditions were not too bad. It was fairly steady during the rest of the month with the highest count on 29 June, 12 groups and 66 spots. The lowest count was on 24 June, with 8 groups and 36 spots.

July 2000 was at times wild. First count on 3 July 10 groups and 42 spots. 7 July the spots count went up dramatically with 6 groups and 106 spots. The highest count of the month was 22 July with 13 groups and 162 spots! The lowest was 31 July with 7 groups and 31 spots.

When you count Sunspots, you first make a drawing of the disc on paper and then draw with a pencil the spots according to what you see on the sun. I use a little notebook one page

after the other so you can see nicely how the spots grow and disappear as well as the rotation of the Sun. It also helps you to look for spots in places where there is at first nothing to be seen but the day before there were spots. There is than more moisture in the air above with the seeing not too good. After a little bit of good looking it is amazing how the spots are suddenly seen.

August 2000 was a bit more modest with on 1 August 8 groups and 29 spots. The highest count was 7 August with 14 groups and 58 spots. Lowest count was 22 August with 4 groups and 19 spots.

September 2000 started off with 7 groups and 31 spots on the 2nd of September. Highest count for the month was 24 September with 6 groups and 134 spots. In the middle of the disc was one huge group with 74 spots alone. Left of this group another with 39 spots. The lowest count for the month was 11 Sept. with 1 group and 2 spots. But the seeing on that day was poor so there could have been more.

October 2000 I only managed to take 7 counts. 6 October started with 7 groups and 30 spots. Highest was 13 October with 8 groups and 60 spots. Lowest count was on 14 October with 4 groups and 31 spots. Here we see a dramatic change in spot numbers in one day. The change is due to the Sun rotation, changing seeing conditions and also spots disappearing and spots appearing.

The picture is never the same - it stays interesting, one always wondering what next is to be seen.

Happy observing till next time.

Frans van Nieuwkerk.

Rules for Cats

If you have to throw up, get into a chair quickly. If you cannot manage this in time, get to an Oriental rug. Shag is good!

Determine quickly which guest hates cats. Sit on that lap during the evening. He won't dare push you off and will even call you "nice kitty." If you can arrange to have cat food on your breath, so much the better.

For sitting on laps or rubbing against trouser legs, select colors which contrast with your own.

Public Viewing

I have been asked to write an article on Public viewing. There are two types of "public" viewing supported by members of the Jhb centre.

When the weather is kind, and there is no bright moon, the Centre opens their observatory to the public. Anyone who is interested enough to arrive will be treated to sights which can only be seen with optical aid. Regrettably, our current environment does not invite people to venture out at night any more. This is the more common meaning of "public viewing".

The other type of "public" viewing is not quite so public. As the owner of a reasonably portable telescope, I sometimes asked to attend Star Parties. (love my 'scope, love me!) These evenings are generally organised by bird clubs, or similar organisations, schools, or

individuals. Over the years, I've had many people looking through my 'scope, and what pleases me most, is when some arrogant little brat swaggers up, puts his/her eye to the eyepiece, and utters an awed whisper "Oh! Wow!". There is nothing like a view of God's creation to put our universal position into perspective. Then there are those who look and see, and would like to know more, but don't have the depth of desire to actually do something. I think that most people do actually enjoy looking at celestial bodies. How many actually appreciate what they are seeing is another matter.

Personally, I prefer to have a small number of keen viewers with whom one can discuss the object, rather than a long queue of generally indifferent hoards.

Melvyn Hannibal

Spacecraft Once More Unto the Breach

By Andrew Bridges

space.com - 20 November 2000

PASADENA, Calif. - The annual Leonid meteor shower can be a not-so-gentle reminder of how small cometary particles can cause trouble for Earth-orbiting spacecraft.

But for a small flotilla of missions already or soon under flight, there will be no shying from the peril. Instead, the spacecraft will soon head straight into the breach.

What volleys will meet the four U.S. spacecraft - Deep Space 1, Stardust, Deep Impact and CONTOUR - as they fly by a half dozen comets, remains unknown.

"It's not like going by an asteroid or a planet, which are quite benign, because comets are actually throwing things at you," said Donald Yeomans, a cometary expert at NASA's Jet Propulsion Laboratory (JPL).

Full story here:

http://www.space.com/scienceastronomy/astronomy/probe_hazards_001120.html

More rules for Cats

Always accompany guests to the bathroom. It is not necessary to do anything. Just sit and stare.

For guests who say, "I love kitties," be ready with aloof disdain, claws applied to stockings or a quick nip on the ankles.

Do not allow closed doors in any room. To get one open, stand on hind legs and hammer with forepaws. Once the door is opened for you, it is not necessary to use it. You can change your mind. When you have ordered an outside door opened, stand half in and half out and think about several things. This is particularly important during very cold weather or mosquito season.

STARDUST Spacecraft is 'Temporarily Blinded' by Solar Flare

Stardust email list
November 21, 2000

Between Wednesday evening and Thursday morning (9 - 10 November 2000), a powerful proton solar flare about ~100,000 times larger than normal hit the STARDUST spacecraft. Stardust was only 1.4 AU (130 million miles) from the Sun, and on its way back toward Earth for a gravity assist early next year. The solar wind's stream of high-energy protons impacted the spacecraft, and its two CCD area array star cameras. These proton hits to the CCD impart a charge to the pixels, producing star-like images. During a single star camera readout, hundreds of these star-like images inundated the star camera processor so that the star camera could not recognize its position in space.

The star camera image processing uses the 12 brightest images to try to match their pattern to its star catalog. The 12 brightest images were not actually stars but proton hits. After many minutes of unsuccessful attempts to match star patterns using star camera A to maintain spacecraft's attitude control, the spacecraft entered safe mode. In safe mode, when the spacecraft stays in stand-by mode, the spacecraft tried again to determine its attitude in space from star camera A, but without success. Then the spacecraft swapped sides, and activated star camera B. But it had the same problem: of hundreds of bogus star-like images. It also failed to lock onto a certain star pattern. After a few more side swaps from side A to side B but still failing to achieve a lock on the stars, the spacecraft began rotating with its solar panels pointed toward the Sun and waited for the flight team to communicate with it.

The flight team, when confronted with the spacecraft not communicating as planned on Thursday morning, understood that the solar flare most likely caused safe mode entry. They immediately began communications with the spacecraft. Telemetered fault history data substantiated the theory that the proton burst had caused outages in the star camera. The proton stream was diminishing over the next few days but still a represented threat. Therefore the spacecraft was left in its spin attitude state, keeping the solar panels pointed toward the Sun.

On Saturday 11 November, star camera A was reset and powered on. With the spacecraft attitude under IMU control, star images were processed and stellar acquisition was achieved with 5 star matches. The last star camera A image, taken on Thursday morning before spinning up the spacecraft in safe mode, was played back to Earth. Hundreds of false star images were seen in the picture - the brightest images were all proton hits, causing safe mode entry. Also, only the camera uses a circular area, 256 pixel in radius. The other outer pixels are masked to light. The protons penetrated even this masked area, giving star-like images in the CCD, though it was never used for imaging. The good image taken days after the solar flare subsided, shows many bright objects, all identified as stars or Saturn. The camera had completely recovered from the proton hits at this time.

The safe mode entry causing failure to acquire signal during our scheduled pass on last Thursday morning is now well understood. The actions taken by the flight team, to immediately communicate with the spacecraft instead of waiting 24 hours for the spacecraft to communicate with Earth, were commendable. The team did a perfect job of predicting exactly what the environment was while the spacecraft was not in communications with Earth. All commanding decisions gave minimum risk to the spacecraft but with maximum return to the flight team!

On Monday, the STARDUST spacecraft was commanded to exit safe mode with the star camera A controlling the orientation. It has been working flawlessly. Additional fault and memory dumps were performed to ensure the entire spacecraft was free of proton events.

High praise must be given to the flight team at Lockheed Martin the STARDUST spacecraft operations. Their professionalism in working as a team within LMA and with JPL to quickly understand the spacecraft's state, and then take control of the situation within hours of knowing we had not acquired a signal was to be commended. Appreciation is also given to our fellow planetary missions who worked with

us to obtain additional communication time if needed. By quickly understanding the cause of our problem and the state of our spacecraft, the STARDUST team was able to minimize its impact to other missions and their planned tracking.

The spacecraft performed as designed and recovered quickly after the proton stream subsided, demonstrating again the robustness of the spacecraft and flight team.

More Saturnian Moons and a Very Nearby Star

The ESO-EPR Department.

Based on observations made with telescopes at ESO (including the VLT) and elsewhere, the group of astronomers that recently announced the discovery of four new moons of Saturn (see ESO Press Photos 29a-c/00), has now found two more, designated S/2000 S 5 and S/2000 S 6. They both move in "irregular" orbits around the giant planet.

Another international team of astronomers, by means of observations within the DENIS programme at the ESO 1-m telescope at La Silla and the 10-m Keck I telescope on Hawaii, has discovered a faint, nearby star, only 13 light-years distant from the Solar System. It is of low mass, probably a Brown Dwarf.

News about observations with ESO telescopes are published at irregular intervals at:

<http://www.eso.org/outreach/info-events/esoobsnews/>

The current page includes weblinks to sources of information about the above mentioned discoveries.

As before, information from the VLT is published at a special "VLT Information" site:

<http://www.eso.org/outreach/info-events/ut1fl>

Even more rules for Cats

If one person is busy and the other is idle, sit with the busy one. For book readers, get in close under the chin, unless you can lie across the book itself.

For ladies knitting, curl quietly into lap and pretend to dose. Then reach out and slap knitting needles sharply. This is what she calls a dropped stitch. She will try to distract you. Ignore it.

For people doing homework, sit on the paper being worked on. After being removed for the second time, push anything movable off the table -- pens, pencils, stamps -- one at a time.

Get enough sleep during the daytime so that you are fresh for playing at night between 2 & 4 a.m.

Telescopes for Sale

MEADE ETX-125EC ASTRO TELESCOPE
MEADE ETX AUTOSTAR
RIGHT ANGLE VIEWFINDER 8 X 25MM
LENSES: 12.4mm + 26mm

PRICE: R10 000.00 VALUE: R17 000.00

CONTACT: C VAN WYK AT 083 326 8800
Or 832-1961 (O/H)

* * * * *

4 colour filters 1.25"

Red (80A); Green (8); Yellow (25A); Blue (58)

Price R95.00 each

Contact: *Leon Greenfield* 082 777 4740

* * * * *

Celestron C8 Telescope

Eyepiece colour filter set 1.25"
Plossl ocular 26 mm
Meade T-ring for Nikon Bayonet
Meade Series 4000 Super plossl 6.4 mm
T adapter
Vixen 2x Barlow lens
Tele extender
Porro prism
Star diagonal
Yamaha PA 5 external AC power adapter
MD 6 Quartz driver
Skysensor 3
+ original accessories

Price R20,000.00

Contact: *Joel Dumont* (014) 736 3240
Mokopa Reptile Park

The Sky this Month

Diary of Astronomical Phenomena:- 2000

December 2000

dd hh	dd hh
1 00 Moon at apogee	18 01 LAST QUARTER
2 01 Uranus 2.2 N of Moon	20 07 Mars 4.3 S of Moon
4 04 FIRST QUARTER	21 13 Solstice
4 13 Pluto in conj. with Sun	23 21 Venus 1.4 S of Uranus
9 16 Mercury 4.7 N of Antares	25 18 NEW MOON <i>Eclipse</i>
9 18 Saturn 1.9 N of Moon	25 18 Mercury 2.7 S of Moon
10 08 Jupiter 2.8 N of Moon	25 18 Mercury in superior conjn.
11 01 Mars 3.7 N of Spica	28 07 Neptune 2.0 N of Moon
11 10 FULL MOON	28 16 Moon at apogee
11 20 Venus 2.6 S of Neptune	29 10 Uranus 2.3 N of Moon
13 00 Moon at perigee	29 22 Venus 1.8 N of Moon
13 01 Mercury 10.9 S of Pluto	

January 2001

dd hh	dd hh
2 22 FIRST QUARTER	24 13 NEW MOON
3 05 Earth at Perihelion	24 15 Neptune 2.0 N of Moon
6 01 Saturn 2.0 N of Moon	24 17 Moon at apogee
6 14 Jupiter 3.1 N of Moon	25 14 Jupiter stationary
9 20 FULL MOON <i>Eclipse</i>	25 15 Saturn stationary
10 09 Moon at perigee	25 19 Uranus 2.3 N of Moon
13 18 Mercury 2.2 S of Neptune	26 03 Mercury 3.0 N of Moon
16 13 LAST QUARTER	26 03 Neptune in conj. with Sun
17 06 Venus greatest elong. E(47)	27 05 Mercury greatest brilliancy
17 20 Mars 3.8 S of Moon	28 05 Mercury greatest elong. E(16)
22 18 Mercury 0.4 S of Uranus	28 14 Venus 6.4 N of Moon

LOCAL TIMES of RISE and SET for the MAJOR PLANETS, 2000

Site Location:- Long. **+28.0 deg.** Lat. **-26.0 deg.**

Local Time:- UT **+2.0 hrs.**

Date	Sun		Mercury		Venus		Mars		Jupiter		Saturn	
	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set
Dec 06	05.09	18.48	04.28	17.58	08.16	21.57	02.06	14.37	18.00	04.42	17.17	04.14
Dec 16	05.12	18.55	04.47	18.32	08.32	22.00	01.45	14.24	17.14	03.58	16.34	03.31
Dec 26	05.17	19.00	05.14	19.05	08.46	21.58	01.24	14.11	16.30	03.14	15.52	02.50
Jan 01	05.21	19.02	05.33	19.22	08.53	21.54	01.11	14.04	16.04	02.48	15.27	02.25
Jan 11	05.28	19.03	06.11	19.48	09.04	21.46	00.50	13.51	15.22	02.06	14.46	01.44
Jan 21	05.36	19.03	06.49	20.03	09.10	21.33	00.29	13.37	14.41	01.26	14.06	01.04
Jan 31	05.43	18.59	07.07	19.55	09.11	20.58	00.09	13.24	14.01	00.46	13.27	00.25