

CANOPUS

The Astronomical Society of Southern Africa

Johannesburg Centre

Monthly Newsletter for June 2004

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**The Sir Herbert Baker Library, 18a Gill Street, Observatory, Johannesburg
P.O.Box 412323, Craighall, 2024**

Editorial

Winter is now firmly ensconced with its attendant pros and cons. The former are those wonderful clear nights with brilliant pin-point Stars and easy to find observing favourites. The cons - well that's the bit where you have to dress up with extra layers so as not to turn into a human Popsicle.

...and talking about brilliant pin-points, Venus has now disappeared from the evening sky as it prepares to scoot between ourselves and the Sun on the 8th on June. I hope that like your editor, you are all going to do some serious observing on that particular day. Make sure that you're set up before sunrise so that you can catch the whole show, which lasts from about 07:00 to a little after 13:00. Remember, this event really is a once-in-a-lifetime showpiece unless you're prepared to move to the middle of the Pacific for the next one in about 8 years time....of course, our Sister Planet becomes the "Morning Star" in a couple of week's time.

The Saturn/Jupiter evenings were well-attended and provided us with interesting information about both of the Gas Giants - **Brian Fraser** and **Dave Gordon** doing the honours with some great images and statistics. Jupiter is still high in the evening sky and looks magnificent, even though it's angular size is now somewhat smaller than it was at our closest approach a couple of months back.

Our Chairman **Dave Gordon** chats about the Astronomical delights in store for us over the next little while and **Alec Jamieson** responds to Dave's article in the April issue with some more cosmological notions of his own. **Brian Fraser** provides the tables of heavenly happenings for the next couple of months and **Chris Stewart** has submitted an article about an amateur rocket which has reached the edge of Space. Your editor has gleaned some articles from the Space Agency websites as well as one about a private, piloted rocket which looks as if it may just be the one to lift the X-Prize for the first private venture to place a crew in space and safely return them to Earth. *Good luck to Burt Rutan and his partners.*

Lastly, if **You** have any editorial aspirations, and would like to try your hand at editing and producing the Canopus, please contact the Committee, as your current editor will be retiring from his post later this year.

The Editor

chris@penberthy.co.za

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Notice of Monthly Meeting

The Monthly Meeting of the Johannesburg Centre of the Astronomical Society will be held in the Sir Herbert Baker Library, 18a Gill Street, Observatory, on Wednesday, 9th of June, 2004 at 20:00.

Archeo-Astronomy of the Ancient Mayans.

By: **Dave Gordon**

Beginners Class

Starts at 19:00 on the same evening as the Monthly Meeting

Topic: **Coordinate Systems in Astronomy.**

By: **Jerome Jooste**

Call **Jerome** on 072 447 2588 or 011 465 3402 or email me on *jjooste@mgee.co.za* or *ena@mgee.co.za* for info concerning the beginners class.

Telescope Making Classes

Would you like to make your own telescope?...or finish off a partially completed one? Well here's your opportunity. Join the Telescope Making Class being held under the guidance of Brian, Vince and Chris.

Contact Chris on (011) 763-3301 or email *cstewart@alcatel.altech.co.za* if you are interested.

ASSA Lists

ASSA Jo'burg Centre:- To subscribe to the new ASSA announce list, send a blank mail to:
assajhb_subscribe@yahoogroups.com.

You will receive instructions by return mail. ASSA Jo'burg centre members are strongly advised to subscribe to this list to receive late-breaking announcements (e.g. venue changes for meetings).

Amateur Telescope Making:- *assaatm_subscribe@yahoogroups.com*

Imaging:- *assaimaging_subscribe@yahoogroups.com*

and finally, a periodic digest of general news relating to astronomy and space exploration
Zastro_subscribe@yahoogroups.com

Public Viewing (weather permitting)

Public viewing nights are held subject to suitable weather conditions on the Friday nearest First Quarter, and are held at the Old Republic Observatory, 18a Gill Street, Observatory, Johannesburg. Starting time around 19:30. See the ASSA event calendar for the proposed viewing dates. Please check with **Constant** on 717-1397 or email- *tabbie@icon.co.za* to ensure that viewing IS taking place on the specified evening.

ASSA Jo'burg Centre - Calendar of Events

Month	Day/ Date	Event	Details
Jun	Mon 7	Committee Meeting	
	Wed 9	Monthly Meeting	Archeo-Astronomy of the Ancient Mayans - Dave Gordon
	Fri 11 to Sun 13	Annual Swinburne Star Party	For costs/bookings contact Ed Finlay on 083-449-1103
	Fri 25	<i>Public Viewing</i>	
Jul	Mon 12	Committee Meeting	
	Wed 14	Annual General Meeting	Watch "The Planets"
	Thu 15 to Sun 18	Extreme Dark Sky Excursion to Lady Grey	For costs/bookings contact Dave Gordon on 702-1219
	Fri 23	<i>Public Viewing</i>	
Aug	Mon 9	Committee Meeting	
	Wed 11	Monthly Meeting	Stars & Dust in Galaxies Dr Barbara Cunow
	Fri 20	<i>Public Viewing</i>	
Sep	Mon 6	Committee Meeting	
	Wed 8	Monthly Meeting	Archaeoastronomy of the Great Zimbabwe - Richard Wade
	Sun 5 to Sun 12	Trip to Port Elizabeth, the Garden Route, Little Karoo and Sutherland	For details contact: Etienne van Zyl on 622-4564.
	Fri 17	<i>Public Viewing</i>	
Oct	Mon 11	Committee Meeting	
	Wed 13	Monthly Meeting	T.B.A.
	Thur 14 to Fri 15 Sat 16	ASSA Symposium 2004 at the Military History Museum Symposium continues at HartRAO	For details contact: Brian Fraser on 016-366-0955 or email brian.fraser@macsteel.co.za
	Sat 16	Symposium continues at HartRAO	
	Fri 22	<i>Public Viewing</i>	
Nov	Mon 8	Committee Meeting	
	Wed 10-	Monthly Meeting	T.B.A.
	Fri 19	<i>Public Viewing</i>	

Reminders

2004	Centenary: Sir Herbert Baker Library Building <i>Johannesburg Centre to host 2004 ASSA Symposium</i> June 8: Venus Transit
2006	March 29: Total Solar Eclipse

Welcome to new Members

Harvey & Abigail Tuckett	Michael Kirchmann	John Barnes
Michael Caine	W.R. Doepel	Mr Zwicky
Mr & Mrs Brook	Mr Semers	Mr Trengove
Mr & Mrs Christopher	Miss I.F. Fourie	Petrus Kahl

We wish you clear skies and many happy years of observing

Chairman's Chat - May 2004

Astronomically Exciting Times

This is one of the most exciting times to be involved in astronomy that I can remember. We have so much to look forward to in the coming months that I can hardly keep the balance between work and my hobby in check. My diary is crammed full of ASSA events and astronomical firsts.

By the time you read this, you will be in the throes of your final preparations for deciding the logistics of how you will spend the first and last time in your life watching our sister planet relentlessly charging across the face of our home star. I can unashamedly confess to sacrificing an income-generating work opportunity in favour of enjoying the complete 8 June Venus Transit. I guess it boils down to me finally practicing what I preach in my time management courses: place the big rocks (events) in your life first before adding the tiny grains of sand that make up our daily forgettable grind.

Then, on 11 June my personal baby begins its adventure at destination Saturn – the Cassini-Huygens Probe. I have been keeping tabs on this one since its launch on the back of a Titan IVB Centaur Rocket on 15 October 1997. Since then, I have been receiving email alerts from the JPL Cassini Probe web site on a regular basis. I recall my amusement in December 1997 when Greenpeace had a frothy about the probe's close (12000km) gravity assist flyby of Earth due to it carrying a battery-load of power-generating plutonium. I also recall my concerns when receiving emails about malfunctioning equipment, late booster burns and communication glitches. The emails regarding the transit journey through the asteroid belt read like a Agatha Christie on steroids; the pursued brilliantly outwitted the pursuers.

Oh yes, June 11 and Cassini's 2000km flyby of Saturn's most distant Moon, Phoebe. What treasure-trove of photographs of this obscure and rocky outpost await? The craft is so close now that the high resolution camera cannot get the entire mother planet and its rings in one frame.

Then, on July 1st at 01:12 UT, Cassini will perform the critical Saturn Orbit Insertion burn sequence. The craft will perform the long-awaited ring plane crossing and pass between the large but tenuous F- and G-ring gap. When this happens, the craft will be 158 500 km from Saturn, but it will be just one hour 52 minutes away from its closest approach to the gas giant – 18000km! Cassini will continue to coast above the rings for 1 hour and 44 minutes before its descent back through the ring plane.

Just a few hours before you awake to open your Christmas presents this year, the Huygens probe will separate from Cassini and begin its 22 day journey to the only atmosphere-enveloped moon in our solar system – Titan. Then, on 14 January 2005, the probe will begin its 2½ hour descent to the mysterious surface of Titan, during which time we will receive 1100 images and a truck-load of data from five other instruments. What surface will Huygens land on: hard, rocky, sludge, a marsh of hydrocarbons ... a sea of methane? There is no way of knowing for certain. This is exploration into a new world at its most exciting and unpredictable.

This explorer is on its own and a very distant 1.4 billion kilometres away from help. One-way light travel time is 1 hour 20 minutes. If something goes awry, it's probably going to be too late to help. I hold thumbs that JPL Mission Control have all their mathematical ducks aligned and that there will be no imperial-metric rivalry.

So, what else do we have in store for you this year? The Swinburne Star Party, The Brass Monkey Star Party near Lady Grey, Excursion to Sutherland, Astronomy and Telescope Day at the Rosebank Rooftop Market ... and the 2004 ASSA Symposium, hosted this year by the Johannesburg Centre.

My astronomical diary continues to creak and groan under the glorious burden.

Dave Gordon

Cosmology Notions

Dear Chris,

Attached is my response to the Insomniac Cosmologist article by Dave Gordon in the April 04 issue of Canopus.

Alec Jamieson.

I was very interested to read Dave Gordon's Insomniac Cosmologist article in the April 2004 issue of Canopus. Taking notice of what goes on in the sky by way of an interest in astronomy is what leads us on to more questions and more understanding of the universe that we find ourselves living in.

The Insomniac Cosmologist article covered several issues, each of which provide food for thought and will perhaps draw separate responses. This response is confined mainly to the dissatisfaction expressed in the article with the big bang theory and the concern that it may be ideologically motivated.

I think that many people including cosmologists, who support the big bang theory, are not entirely happy with it. A consequence of being at the frontier of knowledge is that there are sometimes perplexing gaps in that knowledge. The gaps in a theory are not necessarily fatal flaws; they just have to await new ideas while progress is made in other areas of the theory.

Forget the galaxies. Cosmologists have yet to account for the observed masses of the elementary particles of nature formed in the big bang. This requires very intricate mathematical analysis to guide the thinking in a physics environment that is totally alien and unfamiliar to our everyday experience. Along the way, interested lay observers of these efforts get a bit left behind by simplified descriptions of the work being done.

Normally, something that explodes exists before the explosion, and then it explodes, throwing debris outward. Trying to visualize the progress of an explosion from a starting point of zero size is quite a slippery concept.

Other features of big bang cosmology like the beginning of time (presumably there could be no countdown to the big bang), expansion of space, and the presence of the background microwave

radiation are all phenomena that make a difficult mix of concepts for anyone to grasp.

The moral so far is that astronomy should keep astronomers awake at night, but the loose ends of big bang cosmology should not!

In defence of the scientists who are grappling with the innermost workings of big bang theory, I would like to give an illustration of how far back they are attempting to push the curtain of time towards the instant of the big bang.

From the first ten thousandth of a second (10^{-4} s) after time zero they have a pretty good handle on things. The problem is to account for what happened, and why, from the first 10^{-4} second back to time zero. Theoretical work has been going on down to a scale of 10^{-33} metre and 10^{-43} second after time zero, known as the Planck length and the Planck time respectively. The Planck length is derived from the gravitation constant, Planck's constant and the speed of light. The Planck time is the time it takes light to travel the Planck length. In layman's terms these tiny values of distance and time leave very little room or time for any physics to happen.

Just as the light-year masks the vast distances between the stars, the exponential notation used above masks the enormity of the extrapolation downwards from the physics of our familiar world to the conceptual world of the Planck length and the Planck time where the origin of the big bang is being sought. A comparison of the Planck length with a proton, the nucleus of a hydrogen atom, helps to put these large exponent numbers into perspective. If a Planck length object (10^{-33} m) is magnified to the size of a mote of dust a thousandth of a millimeter in diameter (10^{-6} m) it would have to be magnified 10^{27} times. If the same magnification were applied to a proton with diameter of about 10^{-15} m, the magnified proton would have a diameter of 10^{12} metres. That is a diameter of a billion km, which is roughly the diameter of the asteroid belt between the orbits of Mars & Jupiter.

With this fantastic microscope of imagination and mathematics, theoretical physicists and mathematicians are searching for extended theories of physics that will stand up to mathematical scrutiny at the scale of a dust mote beside a proton a billion km across.

This gives an indication of how drastically the conditions of our physical world could differ from the conditions thought to prevail near the time of the big bang, and how great is the effort that it takes to increase understanding in this branch of cosmology. In view of the huge collective effort that is the price paid for present knowledge, and human nature being what it is, I believe that there is very little possibility of ideologically preferred ideas obscuring truth for very long.

In 1948 the steady-state theory was put forward. Subsequent observations from radio astronomy on the distribution of extragalactic radio sources conflicted with a basic principle of the steady state theory, which holds that all large-scale properties of the universe must be constant in time. The discovery of the microwave background radiation, which in principle is slowly fading, also conflicted with the basic concept of a steady-state universe.

The accumulation of evidence and theory is nudging us in the direction of the hot big bang model of the origin of the universe. Getting a classical camel through the classical eye of a

needle is an enterprise doomed to failure, but with help from the speed of light, the theory of relativity and some quantum tunneling, who knows what may emerge from this brew of exotic physics.

As the frontier of time and space is pushed back towards absolute zero, it may be that physics will have to be stripped to its most basic element in order to co-exist with the extreme constraints of space and time close to absolute zero. Perhaps, at time zero it will be found that all of physics and cosmology is reduced to a single photon of such great energy that it can give rise to all particles, all forces and all history in the universe to be.

It seems fitting that the big bang event that we have been speculating upon is not the first or the last. Like intersecting ripples from raindrops falling on water, we may one day understand effects in our universe that give hints of other big bang events in a greater Universe that is infinite in both space and time.

Alec Jamieson.

An Amateur rocket reached the edge of Space May 17

18 May 2004 - 09:56

Rocket Carrying Ham Radio Payload Reaches Space!

NEWINGTON, CT, May 17, 2004 -- An amateur rocket carrying a ham radio avionics package reached the edge of space on May 17 2004. Launched from Nevada's Black Rock Desert, the 21-foot <http://www.civilianspace.com/> Civilian Space Xploration Team (CSXT) GoFast rocket quickly attained the 100 km altitude to make Amateur Radio and amateur rocketry history. Two earlier CSXT attempts to reach space -- the last almost two years ago -- were unsuccessful. A jubilant Avionics Team Leader Eric Knight, KB1EHE, called the successful launch "a phenomenal experience."

"It just roared off the pad and flew into space," said Knight, who lives in Unionville, Connecticut. "Everything went like clockwork this morning, and it was an awesome experience. We're all kind of on an adrenaline high right now."

The GoFast vehicle--named for one of the project's commercial sponsors--lifted off from the desert floor at approximately 11:20 AM PDT. The CSXT team, plus observers from the Federal Aviation Administration, were up and at the launch site several hours beforehand, however, and Knight said the rocket crew -- which includes several radio amateurs -- did a "dress rehearsal" prior to the actual countdown and launch.

Knight said several West Coast hams who learned about the rocket launch from ARRL news accounts showed up to assist in locating the vehicle, which was estimated to have returned to Earth some 26 to 30 miles downrange from the launch site. Knight said Monday evening that the rocket had not yet been recovered, but the ham radio telemetry package was continuing to transmit.

"We have a telemetry beacon telling us where it is--that it's alive and waiting to be found," Knight said. The rocket transmitted telemetry on the 33-cm amateur band and color Amateur TV pictures

on 2.4 GHz. An HF special event station, K7R (for "rocket") didn't get much airtime, Knight said, "because we've been really focused on the mission."

"Everything came together very well," Knight said. His avionics crew includes eight Amateur Radio licensees, most of whom also were involved in the 2002 launch attempt. Former

Hollywood stunt man--Ky Michaelson of Minnesota, directs the 18-person CSXT team.

<http://www.arrl.org/news/stories/2004/05/17/100/?nc=1>

Submitted by **Chris Stewart**.

Cassini-Huygens Mission Status Report

28 May 2004

The Cassini spacecraft successfully performed a critical six-minute trajectory correction maneuver May 27 to put it on course with its first encounter, Saturn's outermost moon Phoebe, set for June 11. The spacecraft is operating normally and is in excellent health.

"The maneuver is very critical for getting us into Saturn orbit because it is the first checkout of the bipropellant pressurization system after nearly five years of dormancy," said Todd Barber, propulsion engineer for Cassini at NASA's Jet Propulsion Laboratory, Pasadena, Calif. "It sets the stage for Saturn orbit insertion on June 30."

During the course of its trip, Cassini has traveled 3.4 billion kilometers (2.1 billion miles). "We couldn't have asked for a smoother ride," said Robert T. Mitchell, program manager for the Cassini-Huygens mission at JPL. "All the instruments are performing well, and for almost seven years we have traveled without any major hitches. The excitement is building as we are getting ready to put Cassini in orbit around the ringed planet." The orbiter has relied on three radioisotope thermoelectric generators to power all the electrical components, including the 12 science instruments. The European-built Huygens probe on board Cassini carries six instruments.

"If the road to Saturn were a highway, the Cassini orbiter would have passed the sign along the road that says 'Saturnian County line,'" said Jeremy Jones, chief navigator for the Cassini-Huygens mission at JPL. "The next exits are Phoebe, 9 million kilometers (5.4 million miles) ahead, Saturn 19 million kilometers (12 million miles) ahead."

Phoebe is an oddly shaped moon with a dark surface. It orbits in the opposite direction from the motion of most other bodies in the solar

system. The backwards-revolution leads scientists to believe that it is an object captured from the distant Kuiper Belt, making it an interesting target. "The Phoebe flyby may offer the first glimpse of what the frigid bodies at the edge of the solar system look like," said Dr. Bonnie Buratti, scientist on the Cassini-Huygens mission at JPL. "These bodies, which include Pluto and its satellite Charon, are believed to be remnant objects left over from the formation of the planets 4.5 billion years ago."

After the Phoebe flyby, Cassini will be on course for Saturn. On June 30 (July 1 Universal Time), Cassini will become the first orbiter around Saturn. "The two Voyager and Pioneer spacecraft flew by the planet and saw it from a distance two or three days at a time. With Cassini, we will be in the city limits for four years," said Dr. Dennis Matson, project scientist for Cassini at JPL. "The difference is like driving by the Grand Canyon versus stopping, getting off and enjoying the sights for a while."

On arrival, Cassini will begin a 96-minute burn designed to put the spacecraft into Saturn's orbit. As part of getting the spacecraft into orbit, Cassini will twice cross between known gaps in the rings. As a precautionary measure, the spacecraft will use its antenna as a shield to protect it from tiny particle hits.

A prime target for Cassini and the piggyback Huygens probe built by the European Space Agency is the smoggy moon Titan. "In the 350 years since the discovery of Titan we have come to see it as a world with surprising similarities to our own, yet located almost 1.5 billion kilometers (900 million miles) from the Sun," said Dr. Jonathan Lunine, Huygens interdisciplinary scientist and professor of planetary science and physics at the University of Arizona, Tucson.

"With a thick, nitrogen-rich atmosphere and possible hydrocarbon seas, Titan may harbor organic compounds important in the chain of chemistry that led to life on Earth."

Six months after reaching Saturn, Cassini will release the wok-shaped Huygens probe towards Titan on Dec. 24, 2004 (Dec. 25 Universal Time). The event will be by far the most distant descent of a robotic probe on another object in the solar system. On Jan. 14, 2005 (Jan. 15 Universal Time), Huygens will enter Titan's atmosphere, deploy its parachute, and begin its scientific observations of Titan.

The Cassini-Huygens mission is a cooperative project of NASA, the European Space Agency, and the Italian Space Agency. The Jet Propulsion Laboratory, a division of the California Institute of Technology in Pasadena, manages the Cassini-Huygens mission for NASA's office of Space Science, Washington, D.C. JPL designed, developed and assembled the Cassini orbiter.

For the latest images and more information about the Cassini-Huygens mission, visit

<http://saturn.jpl.nasa.gov>.

EVIDENCE OF METEOR IMPACT FOUND OFF AUSTRALIAN COAST

NASAnews@hq.nasa.gov

RELEASE: 04-159

13 May 2004

An impact crater believed to be associated with the "Great Dying," the largest extinction event in the history of life on Earth, appears to be buried off the coast of Australia.

NASA and the National Science Foundation (NSF) funded the major research project headed by Luann Becker, a scientist at the University of California, Santa Barbara (UCSB). Science Express, the electronic publication of the journal Science, published a paper describing the crater today.

Most scientists agree a meteor impact, called Chicxulub, in Mexico's Yucatan Peninsula, accompanied the extinction of the dinosaurs 65 million years ago. But until now, the time of the Great Dying 250 million years ago, when 90 percent of marine and 80 percent of land life perished, lacked evidence and a location for a similar impact event.

Becker and her team found extensive evidence of a 125-mile-wide crater, called Bedout, off the north-western coast of Australia. They found clues matched up with the Great Dying, the period known as the end-Permian. This was the time period when the Earth was configured as one primary land mass called Pangea and a super ocean called Panthalassa.

During recent research in Antarctica, Becker and her team found meteoric fragments in a thin claystone "breccia" layer, pointing to an end-

Permian event. The breccia contains the impact debris that resettled in a layer of sediment at end-Permian time.

They also found "shocked quartz" in this area and in Australia. "Few Earthly circumstances have the power to disfigure quartz, even high temperatures and pressures deep inside the Earth's crust," Becker said.

Quartz can be fractured by extreme volcanic activity, but only in one direction. Shocked quartz is fractured in several directions and is therefore believed to be a good tracer for the impact of a meteor.

Becker discovered oil companies in the early 70's and 80's had drilled two cores into the Bedout structure in search of hydrocarbons. The cores sat untouched for decades. Becker and co-author Robert Poreda went to Australia to examine the cores held by the Geological Survey for Australia in Canberra. "The moment we saw the cores, we thought it looked like an impact breccia," Becker said. Becker's team found evidence of a melt layer formed by an impact in the cores.

In the paper, Becker documented how the Chicxulub cores were very similar to the Bedout cores. When the Australian cores were drilled, scientists did not know exactly what to look for in terms of evidence of impact craters.

Co-author Mark Harrison, from the Australian National University in Canberra, determined a

date on material obtained from one of the cores, which indicated an age close to the end-Permian era. While in Australia on a field trip and workshop about Bedout, funded by the NSF, co-author Kevin Pope found large shocked quartz grains in end-Permian sediments, which he thinks formed as a result of the Bedout impact. Seismic and gravity data on Bedout are also consistent with an impact crater.

The Bedout impact crater is also associated in time with extreme volcanism and the break-up of Pangea. "We think that mass extinctions may be defined by catastrophes like impact and volcanism occurring synchronously in time," Becker said. "This is what happened 65 million

years ago at Chicxulub but was largely dismissed by scientists as merely a coincidence. With the discovery of Bedout, I don't think we can call such catastrophes occurring together a coincidence anymore," she added.

For information and images about the research on the Internet, visit:

<http://beckeraustralia.crystal.ucsb.edu/>

For information about NASA's Astrobiology research on the Internet, visit:

<http://astrobiology.arc.nasa.gov/>

Private spaceship completes its third test

SpaceShipOne soars beyond 200,000 feet in altitude



Chalk up another booming flight of the privately backed SpaceShipOne, the piloted rocket plane designed to soar to the edge of space and glide to a runway landing.

With pilot Mike Melvill at the controls — following release from the White Knight turbojet-powered launch aircraft high above California's Mojave Desert — SpaceShipOne punched through the sky Thursday boosted by a hybrid propellant rocket motor.

Scaled Composites of Mojave, Calif., is the builder of SpaceShipOne, an effort led by aviation innovator Burt Rutan. The financial backer of the project is Microsoft co-founder Paul Allen. (MSNBC is a Microsoft-NBC joint venture.)

In a post-flight statement from the company, the SpaceShipOne team reported that their space plane flew to 212,000 feet altitude, almost 41 miles. NASA awards astronaut status to anyone who flies above 50 miles in altitude.

"This flight marks an additional milestone for Paul G. Allen, Burt Rutan and the innovative aerospace design team in their ongoing efforts to complete the first non-government manned space flight. The test is part of Scaled Composites' Tier One program, funded by Allen, Microsoft co-founder and CEO of Vulcan Inc.," according to the statement.

Thursday's flight builds upon a progression of 13 shakeout tests, mostly unpowered drop glides along with two engine-thrusting runs. The White Knight took off with SpaceShipOne at around 10:30 a.m. ET with the rocket plane landing on the ground a little after noon.

"The SpaceShipOne team will announce the results of this test flight once it has completed an analysis of the data," explained the Scaled Composites release, adding: "The future's looking up ... way up!"

Hot pursuit

SpaceShipOne's first powered mission took place last Dec. 17, with the hybrid motor firing for 15 seconds. A second powered flight occurred on April 8. In that trek, the motor burned for 40 seconds. A major contractor for the hybrid motor used in the rocket plane is SpaceDev of Poway, Calif.

Routine recording of multiple video streams on board White Knight and on SpaceShipOne are expected to help in pilot and engineering evaluation of the flight.

Ecliptic Enterprises Corp. of Pasadena, Calif., provides the critical camera gear. They are also supplier of the RocketCam line of onboard video systems used on rockets, spacecraft and other remote platforms.

* * * **Wanted** * * *

Telescope wanted

Looking for a second hand 4.5" - 6" reflector on EQ mount WITHOUT motor drives/computer etc.

Had **Meade 4500**, want bigger.

Contact **Johan Schoeman**

0842997784

(Pretoria, Monument Park)

~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~

Books

on telescopes & telescope making.

Contact **Chris Stewart**

(011) 763 3301

The Sky this Month

June 2004

dd hh	dd hh
3 04 FULL MOON	17 14 Moon at apogee
3 13 Moon at perigee	17 17 Mercury 2.7 S of Moon
7 06 Neptune 5.3 N of Moon	17 20 NEW MOON
8 09 Venus in transit	18 21 Mercury in superior conjn.
8 19 Uranus 4.3 N of Moon	19 06 Saturn 4.8 S of Moon
9 20 LAST QUARTER	20 09 Mars 3.7 S of Moon
10 21 Uranus stationary	21 01 Solstice
11 12 Pluto at opposition	24 00 Jupiter 3.5 S of Moon
13 00 Mercury 1.3 N of Venus	25 17 Venus 2.0 N of Aldebaran
14 18 Mars 5.6 S of Pollux	25 20 FIRST QUARTER
16 17 Venus 4.8 S of Moon	26 21 Mercury 2.1 N of Saturn
17 00 Mercury greatest brilliancy	29 15 Venus stationary

July 2004

dd hh	dd hh
1 12 Mercury 4.9 S of Pollux	15 03 Venus greatest brilliancy
1 22 Moon at perigee	16 19 Saturn 4.8 S of Moon
2 11 FULL MOON	17 11 NEW MOON
3 19 Venus 1.2 N of Aldebaran	19 02 Mars 3.9 S of Moon
4 13 Earth at Aphelion	19 15 Mercury 4.9 S of Moon
4 15 Neptune 5.0 N of Moon	21 14 Jupiter 3.0 S of Moon
6 03 Uranus 4.0 N of Moon	25 04 FIRST QUARTER
8 17 Saturn in conj. with Sun	26 04 Mercury 1.6 S of Regulus
9 08 LAST QUARTER	27 02 Mercury greatest elong. E(27)
11 03 Mercury 0.1 N of Mars	30 06 Moon at perigee
14 00 Venus 7.7 S of Moon	31 19 FULL MOON
14 23 Moon at apogee	

LOCAL TIMES of RISE and SET for the MAJOR PLANETS, 2004

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				
Jun 09	6.52 17.22	5.57 16.37	6.47 17.19	9.12 19.42	12.02 23.33	8.37 19.10
Jun 19	6.55 17.23	6.58 17.21	5.39 16.23	8.57 19.32	11.26 22.58	8.03 18.36
Jun 29	6.57 17.26	7.50 18.16	4.46 15.39	8.41 19.22	10.50 22.25	7.29 18.03
Jul 09	6.56 17.30	8.18 19.02	4.12 15.07	8.24 19.12	10.15 21.52	6.55 17.29
Jul 19	6.54 17.34	8.25 19.32	3.53 14.45	8.06 19.02	9.40 21.20	6.20 16.55
Jul 29	6.50 17.39	8.13 19.43	3.43 14.32	7.47 18.52	9.06 20.49	5.46 16.22