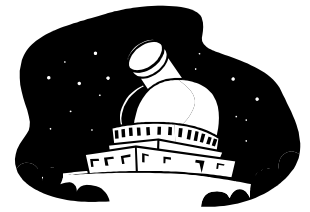


SKYWATCHER

THE NEWS LETTER OF THE GUILDFORD

ASTRONOMICAL SOCIETY

<http://www.guildfordas.org/>



FROM THE EDITOR.....

Good evening to you all, well what can I report to you this month?

First of all I would like to thank two members for sending in articles, one on the Galileo Satellite, and the other on street lighting, I have now placed them in this issue of Skywatcher, thank you **Joy Tapping** and **Dr Phil Rice**.

Well that's a good start for this issue, but I would like to hear from more of you, please remember that this newsletter is for you, the members to place adds and other articles in for other members to read so lets all try a little harder please.

Now that is out of the way, what else have I got to say, well we had some great nights over the last week or so, I was unable to make up the heath but did do some naked eye observing in the back garden and it was great, I hope some of you did the same?

One more thing to remind you all about, and that is that **ASTROFEST** is back at Kensington town hall 3/4 Feb..

**Well that's it from me
Clear skies to you all!!**

**Neil Ross
Editor**

Neilross758@aol.com

07841 130231

CfDS

Contact Details

For more information and literature about the **BAA Campaign for Dark Skies**, please do not hesitate to contact us. You can contact either the co-ordinator **Bob Mizon** via post or email...



info @ dark-skies.org



The Coordinator, CfDS
Bob Mizon
38 The Vineries
Colehill
Wimborne
Dorset BH21 2PX

Forthcoming Meetings

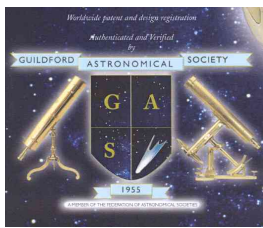
Tonight's Meeting

Latest results from Cassini

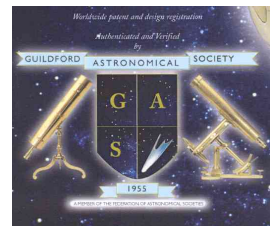
Dr Andrew Coates from MSSL

2 March

Martin Lewis, West of London AS
“ Getting the best from your Telescope-
Dealing with Thermal Effects
and Dewing”



GUILDFORD ASTRONOMICAL SOCIETY 50th ANNIVERSARY



For those of you who have not read the email that John Axtell sent out about the 50th Anniversary I have placed a copy below.....

Those of you who attended the meeting on 1st December will already be aware of a very important date - Friday 10th February 2006. This is the date of our GAS Golden Jubilee Dinner - well, we call it a dinner, and indeed there will be food, but the idea is that it should be a social event. The venue will be The Treetops Room, Wates House, University of Surrey, Guildford GU2 7XH. I anticipate that we'll make it a 7.30 for 8 p.m. start (like our meetings) but I've extended the bar opening till midnight! This is for members and family - and if you know of any former members you'd like to bring along, please do.

We will need to collect the money in advance, with a cut-off date set at Friday 3rd February (coincidentally the 1st day of Astro Fest). Costs haven't yet quite been finalised, but I anticipate that the ticket price will be between £16 - £18. I plan to have tickets on sale at the January and February meetings, so please bring along cheque books and/or cash. I already have a list of approx 30 who signed up at December's meeting, so please could everyone else drop me an email to let me know how many tickets you need - it will help me to be able to give approx. numbers to the venue, and for general planning.

The Menu is as follows:

Carbonade of Beef / Mushroom Strogonoff / Grain Mustard Mash
Cold Roast Chicken with a Light Curry Mayonnaise
Bouquetiere of Fresh Salad / Fragrant Cous-Cous / Pasta Salad with Peppers
Freshly Baked Rolls
Chocolate Bavaois
Coffee

Brian Shorter is our unofficial Society Historian, and will be producing an exhibit of our first 50 years. We'll be having background music during the meal and first part of the evening, but after that our own resident DJ will be running a disco - John Bushell! I understand that his range extend beyond "The Planets Suite" and I'm personally hoping it includes "Astronomy Dominie", "Space Oddity", "Rocket Man", "Life on Mars", "War of the Worlds", "Eye to the Telescope", etc. Let's test his CD collection with some other Astro-related requests!

I'll keep you posted as and when we nail down the last few details, such as bus transport and parking.

John Axtell

How to build space satellites out of iPods

By Malcolm Moore and Roger Highfield (Filed: 29/12/2005)

A company formed by a small team of boffins in Guildford yesterday launched the first Galileo satellite, beating a rival consortium of three of Europe's technology giants.

As the rest of the country tucked into leftovers, the scientists at Surrey Satellite Technology (SSTL) celebrated the launch of Giove-A from the Baikonur Cosmodrome in Kazakhstan.

SSTL has now launched 26 satellites successfully, and expects to have a turnover of £30m this year, with pre-tax profits of around £1.5m. The company has grown by 25pc a year since it was spun out of Surrey University in 1985.

Yesterday, Sir Martin Sweeting, the chief executive, said the company's small size had helped it vault ahead of Alcatel, EADS and Thales, who have formed a consortium to provide infrastructure for the £2.5billion Galileo project.

The consortium, Galileo Industries, originally tendered at five times the price quoted by SSTL, but their satellite is still in testing and not expected to launch until mid-2006.

"We specifically make low-cost and quick satellites," he said. Giove-A, which weighs 600kg, has gone from drawing board to launch in 30 months. "What we do is to take advantage of terrestrial technologies, such as mobile phones and DVD players. The consumer market has been leading the investment in technology.

"We take these components out of iPods and so on, and work out whether we can fly them in our spacecraft. Sometimes they will, and sometimes they will not."

Sir Martin said conventional components can take up to 15 years to test, by which time they may be obsolete. "Imagine if you bought a PC that was 15 years old."

Turning gadgets into satellites became a necessary way of doing business after Lady Thatcher cancelled the national space programme in 1987, he added.

"We realised that there was no money in the UK and we had better set up a company to sell our wares and live by our wits. It is very easy to spend other people's money. If you spend money you earn yourself you tend to be a lot more innovative and it lasts longer."

The group's success will give the European Space Agency a headache, as it tries to decide who will make the 30 satellites which will eventually orbit under the Galileo banner.

The project, which has been described as "the biggest, whitest elephant ever to become weightless" will create an alternative navigation system to the American GPS technology. Eventually, drivers will be able to switch between the two.

The Galileo Industries consortium has been embarrassed by both the speed and the economy of SSTL, but thanks to European politics, the giants are still likely to win the lion's share of the future contracts.

SSTL will not be building the next four Galileo satellites, but will tender for some of the others. If it is successful, the project could transform the size of the company and attract hundreds of millions of pounds of investment.

"What we have got to keep in mind is that we do not lose what makes us successful. We are quite small, at 200 staff, and clean and lean. We do not want to become like a large elephant," said Sir Martin. He added that managing the company's current growth spurt was "difficult".

However, he is considering a change in the ownership of the group in order to reduce the 80pc stake held by Surrey University. The rest of SSTL is half owned by the staff, and half by SpaceX, a US rocket-maker. SpaceX is the latest venture by Elon Musk, the entrepreneur who sold his PayPal internet payment technology to Ebay for \$1.5billion.

Sir Martin said he may consider a public offering, but investors may not be brave enough to snap up shares in SSTL. "Space is a very risky business. We've launched 26 satellites and not lost any of them, but the odds are against us. The markets would probably be very nervous about that," he said.

SSTL is also active in providing satellites that map the earth's terrain. One set of satellites, called the Disaster Monitoring Constellation, is designed to help co-ordinate aid efforts in the wake of calamities such as the Asian tsunami.

However, the initiative has raised eyebrows in the US, which complains that SSTL is passing satellite-building secrets to the Chinese, who have two probes in the Constellation.

Sir Martin dismisses the charge. "There are concerns with parts of the US who see their space superiority being eroded by the Chinese and others. There is no real technology that is being transferred. We are teaching them how to build satellites, but the technology is already available."

Nevertheless, for SSTL to be on the radar when it comes to the likes of NASA, the upstart boffins in Guildford must be on their way up.

The following was in a local newspaper, one of our members posted it to me, so I have retyped it out for every one to have a read, I have the original so if anyone would like to have a look, please let me know!

My thanks to Dr Phil Rice letting me have this!

Council sets agenda for improved lighting plans

Scheme goes ahead despite criticism over priorities

PAPER DATE WAS JAN 19 2006

A total of £500,000 has been set aside to replace all street lights across the borough, despite councillors fears that the money could be better spent else where. Surrey County Council will start a £5.5million major redevelopment scheme of all street lighting in the county during September. That money will be divided between the eleven boroughs in surrey, meaning Elmbridge will have £500,000 to spend.

Conservative councillor Mike Bennison has set up a sub-committee to ensure the money is spent wisely and that conservation areas and street lights of architectural importance, such as those along the Parade in Claygate, are not removed. Coun. Bennison said: "Although the replacement of street lights might not be the biggest problem we have in Elmbridge, it is important that now county council has decided to spend all this money, it is spent wisely.

"One of my closest friends was killed after crashing into a badly positioned street light. That wasn't an uncommon event so we need to make sure we get our fair share of the money and get it right.

“ The Sub-committee will make sure we’re the first borough to come up with a detailed plan of what we need. “ This is something people care about and we need to make sure we get things right in terms of light pollution, position of lights and even protection of ones people are fond of. But I do question why the money is not being spent elsewhere.

“ Potholes are a huge problem in Elmbridge. We have an area 40ft by 15ft at the end of Telegraph Lane and St Leonard’s Road in Claygate that is full of patches and holes. “ There’s another area on Leigh Hill Road in Cobham with 50 or 60 patches. These are real concerns”

The plans were discussed on Tuesday at a Surrey County Council meeting.

There is an email address if you would like to send in your views on this, it is as follows...
bmcloughlin@london.newsquest.co.uk

Low-Mass Exoplanet

By Robert Naeye

January 25, 2006 | Three international groups have teamed up to discover what is probably the lowest-mass exoplanet ever found around a normal star. The planet's mass is between 3 and 11 times that of Earth, with a most likely mass of 5.5 Earths. The [previous record-holder](#), which orbits the red-dwarf star Gliese 876, contains about 7.5 Earth masses. The only known exoplanets with lower masses are [four objects orbiting a pulsar](#) — the collapsed core of a massive star that went supernova.

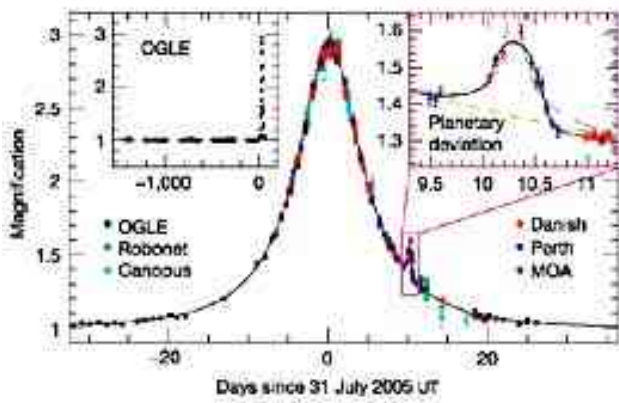
The newfound planet was the third exoplanet discovered by [gravitational microlensing](#) — an effect predicted by Einstein's general theory of relativity that occurs when two objects line up almost perfectly with Earth. In this case, a foreground red-dwarf star passed in front of a background star and acted as a gravitational lens. The red dwarf's gravity redirected some of the background star's light toward Earth, causing the background star to brighten threefold and then fade over the course of 1½ months.

A planet orbiting the red dwarf acted like a secondary lens, causing a slight additional brightening and fading that lasted about 30 hours.

[The OGLE group](#), which is led by Andrzej Udalski (Warsaw University Observatory, Poland), first noticed the brightening of the background star on July 11, 2005. OGLE alerted two other groups, [PLANET](#) and [MOA](#), and all three began monitoring the star continuously with telescopes around the world. They detected a characteristic brightening that peaked on July 31st. As the background star was fading on August 9th, the teams observed a 30-hour brightening and fading caused by the planet, which has been named OGLE-2005-BLG-390Lb. The PLANET group, led by Jean-Philippe Beaulieu (Paris Astrophysical Institute), made the most sensitive and critical observations on August 9th and 10th.



Astronomers have no direct information about the composition of the newly discovered exoplanet OGLE-2005-BLG-390Lb. But based on its low temperature and its mass, the planet probably consists mostly of ice and rock with a thin atmosphere. This artist's rendering depicts the planet as an overgrown version of Pluto. Click on the image for a larger view. Courtesy European Southern Observatory.



This light curve combines photometry data from three different groups. It shows a background star brightening until it reached a peak on July 31, 2005. This brightening was caused by the gravitational lensing effect of an intervening star. About 10 days later, the background star suddenly brightened and faded over the course of 30 hours, due to the gravity of a low-mass planet in orbit around the lensing star. Click on the image to view a larger version. *Courtesy Jean-Philippe Beaulieu, et al. / Nature*

"This planet is pretty clearly real. It's seen in multiple datasets from multiple observatories," says Scott Gaudi (Harvard-Smithsonian Center for Astrophysics), who studies gravitational microlensing but was not involved in the discovery.

Unfortunately, the microlensing method detects the host star and planet only through their gravity. About all that can be said right now is that the system is roughly 22,000 light-years away in the direction of the galactic center, the planet lies roughly 2.6 astronomical units from the star (which would put it in the asteroid belt in our solar system), and it probably takes about 10 years to complete one orbit.

Since the star radiates only about 1 percent the energy of the Sun, the planet must have a surface temperature of about -220°C (-364°F), which is almost certainly way too cold for life.

"While the other two microlensing planets have masses of a few times that of Jupiter, the discovery of a 5-Earth-mass planet — though much harder to detect than more massive ones — is a strong hint that these lower-mass objects are very common," says Beaulieu.

"If Jupiter-like planets were as widespread, the microlensing method should have found dozens of them by now," adds PLANET team member David Bennett (University of Notre Dame). This discovery probably means that low-mass stars like red dwarfs generally have lower-mass planets than stars like the Sun. This conclusion falls perfectly in line with predictions of theorists who model planetary formation.

Microlensing is the only current technique that can find Earth-mass planets. "The strength of microlensing is not finding planets that you can go study," says Gaudi. "The strength of microlensing is that it allows astronomers to get statistics of planetary systems, and allows us to detect planets that we would never have been able to detect otherwise. It tells you something about the frequency of planets."

The discovery paper is published in the January 26th issue of *Nature*. The three microlensing teams include a total of 73 astronomers working in 12 nations. The previous exoplanet discovery using microlensing involved the [direct participation of amateur astronomers in New Zealand](#). This discovery, however, was made entirely with professional data. But as Gaudi notes, "This event could have been monitored by amateurs; it was fairly bright."

Twin Mars rovers still exploring after two years

BY SPACEFLIGHT NOW

Posted: January 24, 2006



This synthetic image of Spirit on the flank of "Husband Hill" was produced using "Virtual Presence in Space" technology. Credit: NASA/JPL-Caltech

With a longevity unthinkable even to the humans that built them, NASA's remarkable Mars rovers remain hard at work after two years on the Red Planet's surface.

Spirit and Opportunity reached the Red Planet on January 3 and 24, 2004, beginning planned 90-day missions to uncover proof that water once flowed on the Mars surface. Today, both motorized robots are still going strong in their continued scientific pursuits.

"We take every day as if it could be our last day and we really push hard to keep driving, keep going," said rover mission manager Beth Dwell.

With Spirit working within the vast Gusev Crater and Opportunity exploring on the other side of Mars in Meridiani Planum, both rovers found evidence that Mars was wet in its ancient past.

"Putting all the clues together -- the mineral, chemical and textural clues -- we have found good evidence that there was ground water," said project scientist Joy Crisp.

Answering the water question is critical in the broader quest to determine if life ever arose on Mars. The two rovers aren't equipped to answer the life questions, however. Future missions will try to do that.

Spirit and Opportunity have driven a collective eight miles, crawling in and out of craters, climbing tricky terrain and beaming home pictures by the tens of thousands of never-before-seen territory and breath-taking vistas.

"With the rovers we've actually been able to go look and pick the things we wanted to see whether it was up on top of hills or whether it was down inside the craters, you name it," said Jim Erickson, rover project manager.

But it hasn't been all smooth sailing for the craft. Spirit's rock-grinding tool is no longer usable because the diamond-tipped teeth have worn away. Opportunity's front right wheel steering motor stopped working eight months ago, although the rover can still drive with its other steerable wheels.

And a motor at the shoulder joint of the Opportunity's instrument-laden arm has a broken wire.

"As they age, we learn how to deal with the symptoms of old age whether it's the equivalent of arthritis in our joints or senility in our memory," Erickson said.

Tuesday marked the second anniversary of Opportunity's landing. A special celebration at the Jet Propulsion Laboratory, where the rovers are controlled, included speeches and remembrances of the past two years. U.S. Rep. David Dreier presented JPL officials with special certificates from Congress for each rover.

NASA Administrator Mike Griffin wasn't in attendance. But he offered these thoughts in a taped message to the rover team:

"As both the NASA administrator and an alumnus of JPL, I am delighted to add my voice to those saluting NASA's Mars rover team for your dedicated contributions to one of the grandest achievements in the annals of planetary exploration. By demonstrating that the spirit of robust scientific inquiry is alive and well at NASA, you have brought honor to this agency. I am extremely proud of what you have accomplished.

"In the summer of 2003 we launched the twin Mars rovers with the hope that at least one would safely reach its designated landing site and roam the surrounding Martian terrain for three months. Now, 24 months and over 700 sols (Martian days) later having both successfully and dramatically bounced to their duty posts, both Spirit and Opportunity and the people who operate them continue to astound the world.

"To be certain, there were logical reasons for supposing the rovers would have a more limited life span. A combination of the planet's cold temperatures and dust building up on the rovers' power-providing solar panels were expecting to bring their scientific missions to a swift end. However, your ability to find creative ways to work around problems and the dynamic character of the Martian environment -- the very thing we came to study -- helped to extend the rovers' missions well beyond anyone's wildest imagination.

"Last March, for example, a whirlwind in the Martian atmosphere blew the dust off Spirit's solar panels, allowing it to regenerate its batteries and its mission could continue.

"And last April, we had a different sort of problem with Opportunity, which gave the rover team a chance to prove that you are not only lucky but very, very good. When Opportunity's wheels dug into a dune, members of the team did their best to replicate the dune's soil conditions by clearing out the stock of swimming pool filter material from several home supply stores in the San Gabriel Valley and trying out various soil combinations in JPL's in-situ instrument lab's sandbox.

"I'm certain that in the history of NASA procurement we've never pulled off that feat before. And I'll bet there is some auditor, somewhere, still scratching head about this one.

"Fortunately, the confidence we gained from operating the test rover in the simulated Martian sand paid off handsomely. Despite wheel slippage exceeding 99 percent several days in a row, the team persevered and gave Opportunity renewed life.

"Because you have kept at your work with unbridled enthusiasm in the past year, we have added to the rovers' already impressive scientific findings concerning the presence of water in Mars' ancient history. Spirit's extended mission has allowed time for the rover to explore the Columbia Hills and find clues to a complex history in the bedrock that included some periods with enough water to alter some of the rocks. Additionally, Spirit was able to capture from the summit of Husband Hill those stunning images of dust devils swirling out on the plains below -- a dramatic vista of an active planet.

"As mission principal investigator Steve Squyres said about Spirit, every time we turn a corner, every time we go over a ridge, it seems like there is something new. All of that diversity, all of those discoveries were really enabled by the extraordinarily long life of the rovers.

"Also with its extended time on the surface, Opportunity was able to reach what appeared to be higher and younger layers at Merdiani Planum that demonstrated a record of alternating wet and dry conditions. As it continues its work, Opportunity is headed for a deeper crater where the layers exposed could extend the geological record to an earlier time.

"In summary, I'm convinced that when the history of the 21st century is written the exploits of the Mars rovers and the team that operated them will be recognized for heralding a great age of exploration and discovery as NASA took the first steps of implementing the Vision for Space Exploration. For this accomplishment, I salute you."

The rover engineers and scientists know that someday Spirit and Opportunity will succumb. No one knows when or how. But losing the craft is something the team thinks about.

"Everybody knows that eventually we will die. They are metal. They are machines. So sooner or later the tool will break," Erickson said.

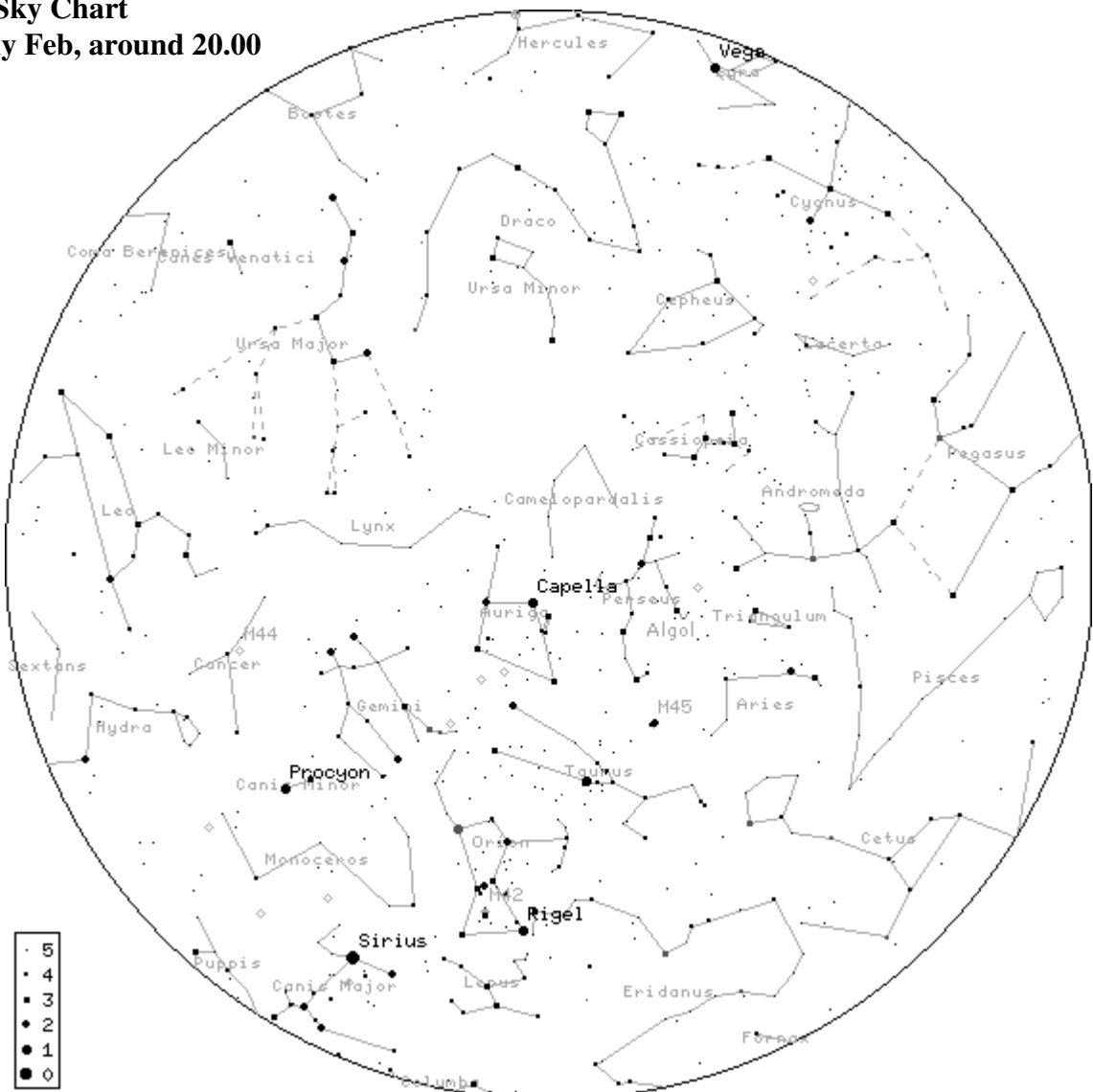
"Despite the fact that it continues to this day, well in excess of anything we ever expected, it will still be incredibly painful when the two vehicles cease to function," said mechanical systems engineer Chris Voorhees.

"It will be a sad day for all of us when we have to actually let go of these rovers. They have become such a large part of our lives at this point," added Dewell.

"There's going to be quite a period of mourning once we lose one, just one. We know these creatures, these robotic creatures on Mars, pretty well now. It is going to take some digesting to get used to them not being there everyday," said deputy project scientist Albert Haldemann.

"The whole point is keep it running as long as you can, get as much data as you can, using it until it breaks because that is the best thing you can do for it. And when it finally breaks you say 'we did a job, we did a great job, the vehicles helped us do that, let's go celebrate,'" Erickson said.

All-Sky Chart Early Feb, around 20.00



Guildford AS Library Stock

Guildford AS Library Stock January 2006

Title	Author	Author	Publisher	Year of Publication	Date Purchased	Cost £	ISSBN Number
BOOKS							
The Mariner 6 and 7 pictures of mars	Stewart A.	Collins		1971			
The Backyard Astronomers Guide		Dickinson & Dyer					
Surface of the moon: Its structure and origin	V.A.	Firsoff		1961			
Govemment Support for Beagle 2.	House of Commons	Science & Technology Committee		Nov 04			
Frozen star, of Pulsars, black holes and the fate of stars	George	Greenstein		1984			
Observing the Universe (A new Scientist Guide)	Nigel	Henbest (editor)		1984			
100 billion suns, the birth, life and death of the stars	Rudolf	Kippenhahn		1983			
Skywatching	David	Levy					
The Universe		Life Nature Library		1970			
Larousse Encyclopedia of Astronomy		Larousse		1966			
The Modern Universe	Raymond A. Lyttle	Lyttleton		1957			
1973 Year Book of Astronomy	Patrick	Moore		1973			
1975 Year Book of Astronomy	Patrick	Moore		1975			
1976 Year Book of Astronomy	Patrick	Moore		1976			
1979 Year Book of Astronomy	Patrick	Moore		1979			
1980 Year Book of Astronomy	Patrick	Moore		1980			
1982 Year Book of Astronomy	Patrick	Moore		1982			
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1995 Year Book of Astronomy	Patrick	Moore		1995			
1996 Year Book of Astronomy	Patrick	Moore		1996			
1997 Year Book of Astronomy	Patrick	Moore		1997			
A textbook of Astronomy, Facts and feats	Patrick	Moore		1979			
Earth Satellite, The new satellite projects explained	Patrick	Moore		1955			
Moon Flight atlas	Patrick	Moore		1970			
Travellers in Space and time	Patrick	Moore		1983			
1989 Year Book of Astronomy	Patrick	Moore		1989			
Guide to Astronomy	James	Muirden		1972			
Analysis of Apollo 10 photography and visual observations		NASA		1971			
ATLAS of surveyor 5 Television data		NASA		1974			
Guide to Lunar Orbiter Photographs		NASA		1970			
The Moon as viewed by lunar orbiter		NASA		1970			
Answer book of astronomy	Iain	Nicholson		1975			
Lonely Hearts of the Universe	Dennis	Overbye		1991	Oct 04	gift	
Concise Encyclopedia of Astronomy	A. and H.	Wigert & Zimmermann					
ITALY in Space before and after SIRIO				1978			
Moon, Mars and Venus. A concise guide in colour				1976			
Messier Objects: A Beginner's Guide	Kathy & Sue	Machin & Wheatley	Astronomical Leagu	1997	6 Feb 2004	£5.00	none
Tum Left at Orion: 100 objects to see in a small telescope	Guy & Dan	Consolmagno & Davis	Cambridge UP	2000 3rd ed	6 Feb 2004	£15.00	0-521-78190-6
Caldwell Card	Sky & Telescope	Sky & Telescope	Sky & Telescope	2001	6 Feb 2004	£3.00	not applicable
Messier Card	Sky & Telescope	Sky & Telescope	Sky & Telescope	2003	6 Feb 2004	£3.00	not applicable
Astronomy Encyclopedia	Gen: Patrick Moore		Phillip's	2002	6 Feb 2004	£30.00	0-540-07863-8
Moonwatch			Phillip's	2003	6 Feb 2004	£12.99	0-540-08543-X
Webb Society Deep-Sky Observer's Handbook - Star Atlas (#1)	Webb Society		Webb Society	2002	6 Feb 2004	£15.00	0-904824-05-5
Webb Society Deep-Sky Observer's Handbook - Star Atlas (#2)	Webb Society		Webb Society	2002	6 Feb 2004	£15.00	0-904824-05-5
Philips Planisphere 10" Lat 51.5° North	Springer Verlag						
Observational Astronomy: A Plan for the Beginner	S J	Lubbock	Fed of Astro Soc	1987 rev 2001	4 Feb 2005	£2.20	
Exploring Mars: An Astronomy Now Guide	Neil	English	Pole Star Publicatoin	2004	4 Feb 2005	£8.99	

If interested in any of the above books please speak to Matthew Mallinson