



SKYWATCHER



THE NEWS LETTER OF THE GUILDFORD

ASTRONOMICAL SOCIETY

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

FROM THE EDITOR.....

Well what can I say, not much has happened in the last month, due to the weather.

So this is probably going to be the shortest “from the editor” article in Skywatcher history, and that’s that. Told you??

Neil Ross

Editor

Out of The Ashes

No doubt many of you will have noticed that one of our favourite websites has ceased operation. This was UK AstroAds, run as an entirely non-profit making service by an amateur called Chris Heapy. It was a no-frills listing service for buying and selling used astro equipment. I used to scan it daily and found several bargains via this excellent and most useful site. It seems that Chris just got fed up with spammers and whingers, and the site folded in December to the great disappointment of many UK amateurs.

This site has now been subsumed into a new site – UK Astronomy (www.astronomy-uk.co.uk). This has been in operation since Jan 20th and is gradually building up a portfolio of adverts (indeed one of our own members, John Slinn, has posted several adverts already).

This site is run by Tommi Worton, from Norwich Astronomical Society and a regular at the Equinox Star Parties; Chris Heapy remains involved as a moderator. The site is divided into For Sale and Wanted, then further subdivided into Telescopes, Mounts, Eyepieces, CCD Cameras, etc.

There is another site that purports to be British, UK Astro Buy and Sell. This is actually not British, being run from Canada and has attracted a fair amount of criticism from the uk.sci.astronomy newsgroup. I urge you to patronise the real British article, and support this new venture.

John Axtell

Forthcoming Meetings

March 3rd

James Wilhelm
“Radio Astronomy for Amateurs”

April 7th

Greg Smye-Rumsby
“The Craig Telescope”

Space shuttle program poised for return in May

BY WILLIAM HARWOOD

STORY WRITTEN FOR CBS NEWS "SPACE PLACE" & USED WITH PERMISSION

Posted: February 18, 2004

NASA managers today set May 15 as the target launch date for the first post-Columbia shuttle mission, saying they are confident remaining technical issues, an independent review and a mountain of paperwork can be closed out in time for flight. Launch director Michael Leinbach said the processing schedule includes about 12 days of contingency time to handle unexpected problems between now and then and "we feel good about that date."

The current schedule calls for engineers to attach Discovery's redesigned external fuel tank to a pair of already assembled solid-fuel boosters around Feb. 25 and for Discovery to be bolted to the side of the tank March 18.

The assembled spacecraft then will be hauled to launch pad 39B on March 25 and the tank will be loaded with supercold liquid oxygen and liquid hydrogen rocket fuel April 7 in a test that will serve as a dress rehearsal for launch.

Commander Eileen Collins and her six crewmates plan to strap in aboard Discovery on April 29 for a practice countdown and if all goes well, the actual countdown will begin May 12 for a launch around 3:50 p.m. on May 15.

Columbia's launch window extends to June 3, based on the orbit of the shuttle's destination - the international space station - and because of a self-imposed requirement to not only launch the first two post-Columbia flights in daylight but also to ensure external tank separation in sunlight for photo documentation.

If NASA can't get Discovery off the ground by June 3 or thereabouts, the flight will slip to mid July. But Leinbach is optimistic it won't come to that.

After the tanking test is done, the remainder of the pad flow is very standard to us," he said. "And so I'll just tell you, this date feels real good to me."

Fifteen of the 29 recommendations made by the Columbia Accident Investigation Board must be completed before Discovery's return to flight. As of today, only seven of those 15 have been fully addressed to the satisfaction of an independent panel charged with monitoring NASA's implementation of those recommendations.

But on Thursday, panel co-chairman Richard Covey, a Boeing executive and former shuttle commander, said he saw no major roadblocks to closing out the remaining items before the board ends its work March 31. William Readdy, NASA's associate administrator for space operations agreed and told reporters today "we have every expectation we are going to close all of them."

"We have a continuing dialogue with the three panels that they have," he said. "At this point, we really don't see any show stoppers, that's been their commentary all along, so we expect to close all of them."

"Major technical questions remain, however, including work to determine how much damage the shuttle's wing leading edges and heat-shield tiles can withstand before repairs are needed.

The Spaceflight Leadership Council, co-chaired by Readdy, met today at the Kennedy Space Center and approved plans to test three rudimentary tile and leading edge repair techniques during Discovery's mission. But those techniques will not be certified before launch and as such would only be used in a true emergency.

Readdy said any repair techniques would have to be tested in space before certification and in any case, the kind of external tank foam debris blamed in the Columbia disaster has been eliminated. Other potential weak spots have been addressed as well.

"Given the depth of inspection that we've gone into in each and every last subsystem and element of the program, I'd be very, very surprised if we had any kind of damage as a result of debris shedding," he said. "We just heard ... a very thorough debrief on the analysis they have conducted. That analysis continues, but I think it should give everyone tremendous confidence that we have done what we needed to to eliminate critical debris from the external tank and other sources on the solid rocket motors." Combined with efforts to fully characterize the strength of the thermal protection system and improvements in other systems, "we'll be flying much more safely than we ever have before."

Walter Cantrell, deputy chief engineer for NASA's new Independent Technical Authority and co-chairman of the agency's Spaceflight Leadership Council, said the Return to Flight Task Group chaired by Covey and Thomas Stafford has participated in the engineering discussions and understands the processing schedule.

Regarding the open items in the RTF recommendations, Cantrell said "we have received from the Stafford-Covey group their expectations that, if satisfied by us, they could be comfortable in saying that their assessment would be that we have complied with the intent of the CAIB recommendations. Some of them are obviously harder than others because of timing, given that the Stafford-Covey group wants to be able to give its recommendations to the administrator at least one month before return to flight.

"We're in careful contact with them and know what we think we need to do and we know what they think we need to do," Cantrell said. "A significant number of their members participated today, not only listened but actually provided comments during the Spaceflight Leadership Council (meeting), so we're all tracking the same things.

"Our sense of it, and the last sense that we have from them, is there are no show stoppers, we're in very tight agreement on the schedule for closure. Anything can happen, but we do not anticipate that being a problem."

He said NASA had set higher standards "in almost every case" than the CAIB recommendations required and "we're holding ourselves to that raised bar."

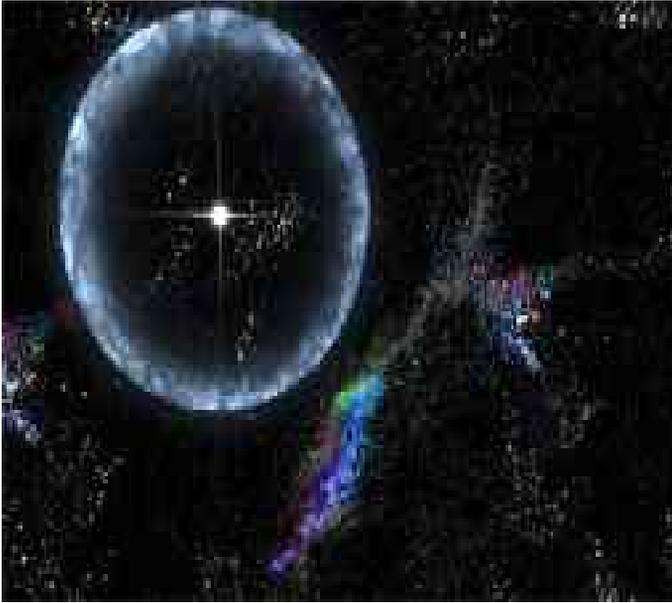
"Obviously, we're going to comply with what Stafford-Covey is looking for and what the CAIB is looking for," he said. "But we are the ones who accept the risk and we've set that standard where we think it should be."

Blast affected Earth from halfway across the Milky Way

CENTER FOR ASTROPHYSICS NEWS RELEASE

Posted: February 19, 2005

Forget "Independence Day" or "War of the Worlds." A monstrous cosmic explosion last December showed that the earth is in more danger from real-life space threats than from hypothetical alien invasions.



Artist's conception of the December 27 gamma ray flare expanding from SGR 1806-20 and impacting Earth's atmosphere. Credit: NASA

Gaensler headed one of two teams reporting on this eruption at a special press event today at NASA headquarters. A multitude of papers are planned for publication. The giant flare detected on December 27, 2004, came from an isolated, exotic neutron star within the Milky Way. The flare was more powerful than any blast previously seen in our galaxy.

"This might be a once-in-a-lifetime event for astronomers, as well as for a neutron star," said David Palmer of Los Alamos National Laboratory, lead author on a paper describing space-based observations of the burst. "We know of only two other giant flares in the past 35 years, and this December event was one hundred times more powerful."

NASA's newly launched Swift satellite and the NSF-funded Very Large Array (VLA) were two of many observatories that observed the event, arising from neutron star SGR 1806-20, about 50,000 light years from Earth in the constellation Sagittarius.

The gamma-ray flare, which briefly outshone the full moon, occurred within the Milky Way galaxy. Even at a distance of 50,000 light-years, the flare disrupted the earth's ionosphere. If such a blast happened within 10 light-years of the earth, it would destroy the much of the ozone layer, causing extinctions due to increased radiation.

"Astronomically speaking, this explosion happened in our backyard. If it were in our living room, we'd be in big trouble!" said Bryan Gaensler (Harvard-Smithsonian Center for Astrophysics), lead author on a paper describing radio observations of the event.

Neutron stars form from collapsed stars. They are dense, fast-spinning, highly magnetic, and only about 15 miles in diameter. SGR 1806-20 is a unique neutron star called a magnetar, with an ultra-strong magnetic field capable of stripping information from a credit card at a distance halfway to the Moon. Only about 10 magnetars are known among the many neutrons stars in the Milky Way.

"Fortunately, there are no magnetars anywhere near the earth. An explosion like this within a few trillion miles could really ruin our day," said graduate student Yosi Gelfand (CfA), a co-author on one of the papers.

The magnetar's powerful magnetic field generated the gamma-ray flare in a violent process known as magnetic reconnection, which releases huge amounts of energy. The same process on a much smaller scale creates solar flares.

"This eruption was a super-super-super solar flare in terms of energy released," said Gaensler.

Using the VLA and three other radio telescopes, Gaensler and his team detected material ejected by the blast at a velocity three-tenths the speed of light. The extreme speed, combined with the close-up view, yielded changes in a matter of days.

Spotting such a nearby gamma-ray flare offered scientists an incredible advantage, allowing them to study it in more detail than ever before. "We can see the structure of the flare's aftermath, and we can watch it change from day to day. That combination is completely unprecedented," said Gaensler.

Headquartered in Cambridge, Mass., the Harvard-Smithsonian Center for Astrophysics (CfA) is a joint collaboration between the Smithsonian Astrophysical Observatory and the Harvard College Observatory. CfA scientists, organized into six research divisions, study the origin, evolution and ultimate fate of the universe.

Guildford AS magazine

David Reynolds

Surface Brightness of Galaxies

I was discussing with John the reasons why he had trouble seeing the large galaxy M101 in Ursa Major, even in a large telescope. Readers might be interested in the explanation and a few facts and figures.

Messier 101(NGC 5457) in Ursa Major is a very large face on spiral galaxy. I think this is one of the hardest of the Messiers to see along with M74 (galaxy in Pisces), if not the hardest. Transparent skies are required to see it at all in my experience. I have checked Uranometria (second edition) for some information about M101.

Uranometria quotes M101 having a magnitude of 7.9 and surface brightness of 14.9. In contrast, M51 The Whirlpool Galaxy in Ursa Major (also a face on spiral), is 8.4 and 12.9. So although M51 is fainter it is much easier to see because it has a much higher surface brightness. The reason for this is related to the size of the objects. M101 is much larger at 29' x 27' whereas M51 is 11' x 7'. So the light from M101 is spread out over a much larger area, hence the 'light density' - called surface brightness - is much much lower. As with magnitude, the larger the number the fainter (lower) is surface brightness.

I would guess that on 50% of occasions here in the southeast, I can't see M101. But I have seen it almost naked eye in mid France, and it was very easy with binoculars. A good sky transparent sky is more important than the instrument you look through for this object.

I have checked through Uranometria, and M101 has the lowest surface brightness of all the NGC galaxies on that page (~50 galaxies). An SB of 14.9 is typical of a UGC or MCG galaxy, although M101's magnitude is much higher than galaxies in those catalogues of course.

David Reynolds
Woking

Resupply ship rockets to the International Space Station

BY JUSTIN RAY
SPACEFLIGHT NOW
Posted: February 28, 2005



A cargo vessel stuffed with much-needed repair kits, food, water and rocket fuel for the International Space Station launched from Baikonur Cosmodrome in Kazakhstan today, beginning a two-day trek to the high-flying laboratory.

The Soyuz rocket topped by the Progress 17P ship was erected on the Baikonur launch pad over the weekend. Credit: Energia

The Russian-made Progress M-52 spacecraft, known as Progress 17P in the ISS assembly matrix, was successfully delivered into orbit atop an unmanned Soyuz booster. Liftoff occurred on schedule at 1909 GMT (2:09 p.m. EST).

The ship achieved its preliminary altitude, unfurled twin power-generating solar arrays and deployed a suite of navigation and communications antennas. A series of orbit raising maneuvers to reach the station begin later today, setting the stage for docking to the Zvezda service module's rear port around 2015 GMT (3:15 p.m. EST) on Wednesday. Loaded with over two tons of supplies, the Progress' cargo includes 2,932 pounds of equipment, experiment hardware and life support system gear, 1,071 pounds of water, 386 pounds of propellant and 242 pounds of oxygen and air. The delivery of 86 food containers will provide more than 160 days of additional provisions, according to NASA.

Notable items being ferried to the station are highlighted by spare parts for the space complex's toilet and oxygen-generating and carbon dioxide-scrubbing units. Also, a new heat exchanger device for the cooling of U.S. spacesuits in the Quest airlock module is headed to the station to replace a faulty unit that forced all recent spacewalks to be performed from the Russian side of the outpost. In preparation for the space shuttle return-to-flight mission in May, the digital cameras and lenses that station residents will use to photograph Discovery's thermal tiles in the search for damage are being brought up, too.

Expedition 10 commander Leroy Chiao and flight engineer Salizhan Sharipov are four months into their planned six-month mission. Last week, they packed trash and other unneeded items into the Progress 16P craft before it undocked from the station at 1606 GMT (11:06 a.m. EST) Sunday, freeing up the docking port that the 17P vehicle will use.

The discard Progress, which was launched in December, conducted two engine firings to depart the station's neighbourhood. Russian flight controllers will execute engineering tests on the freighter before it re-enters the atmosphere and burns up on March 9.



Astronomy Picture of the Day

A year to the day of the meeting?

2004 March 3

**Opportunity Rover Indicates
Ancient Mars Was Wet**

Credit:

**Mars Exploration Rover Mission,
JPL, NASA**

Explanation: Was Mars ever wet enough to support life? To help answer this question, NASA launched two rover missions to the red planet and landed them in regions that satellite images indicated might have been covered with water. Yesterday, mounting evidence was released indicating that the Mars Opportunity rover had indeed uncovered indications that its landing site, Meridiani Planum, was once quite wet. Evidence that liquid water once flowed includes the physical appearance of many rocks, rocks with niches where crystals appear to have grown, and rocks with sulfates. Pictured above, Opportunity looks back on its now empty lander. Visible is some of the light rock outcropping that yielded water indications, as well as the rim of the small crater where Opportunity landed. The rover will continue to explore its surroundings and try to determine the nature and extent that water molded the region

Astronomers measure mass of smallest black hole

OHIO STATE UNIVERSITY NEWS RELEASE

Posted: February 22, 2005

A group led by astronomers from The Ohio State University and the Technion-Israel Institute of Technology have measured the mass of a unique black hole, and determined that it is the smallest found so far.

Early results indicate that the black hole weighs in at less than a million times the mass of our sun -- which would make it as much as 100 times smaller than others of its type. To get their measurement, astronomers used NASA's Hubble Space Telescope and a technique similar to Doppler radar -- the method that meteorologists use to track weather systems.

The black hole lies 14 million light-years away, in the centre of the galaxy NGC 4395. One light-year is the distance light travels in one year -- approximately six trillion miles.

Astronomers consider NGC 4395 to be an "active galaxy," one with a very bright center, or nucleus. Current theory holds that black holes may literally be consuming active galactic nuclei (AGNs). Black holes in AGNs are supposed to be very massive. NGC 4395 appears to be special, because the black hole in the center of the galaxy is much smaller than those found in other active galaxies, explained Ari Laor, professor of astronomy at the Technion, in Haifa, Israel, and Brad Peterson, professor of astronomy at Ohio State.

While astronomers have found much evidence of black holes that are larger than a million solar masses or smaller than a few tens of solar masses, they haven't found as many midsize black holes -- ones on the scale of hundreds or thousands of solar masses.

Black holes such as the one in NGC 4395 provide a step in closing that gap.

Laor and Peterson and their colleagues used the Doppler radar-like technique to track the movement of gas around the center of NGC 4395. Whereas radar bounces a radio frequency signal off of an object, the astronomers observed light signals that naturally emanated from the center of the galaxy, and timed how long those signals took to reach the orbiting gas.

The method is called reverberation mapping, and Peterson's team is among a small number of groups who are developing it as a reliable means of measuring black hole masses. The method works because gas orbits faster around massive black holes than it does around smaller ones.

Peterson reported the early results Saturday at the meeting of the American Association for the Advancement of Science in Washington, DC.

Two of the team members -- Luis Ho of the Observatories of the Carnegie Institution of Washington, and Alex Filippenko of the University of California, Berkeley -- were the first to suspect that the black hole mass was very small. Filippenko and Wallace L.W. Sargent of the California Institute of Technology first discovered the black hole in 1989.

This is the first time astronomers have been able to measure the mass of the black hole in NGC 4395, and confirm that it is indeed smaller than others of its kind.

Peterson and Laor emphasized that the results are very preliminary, but the black hole seems to be at least a hundred times smaller than any other black hole ever detected inside an AGN.

The astronomers want to refine that estimate before they address the next most logical question: why is the black hole so small?

"Is it the runt of the litter, or did it just happen to form under special circumstances? We don't know yet," Peterson said.

NGC 4395 doesn't appear to have a dense spherical nucleus, called a galactic bulge, at its center; it could be that the black hole "ate" all the stars in the bulge, and doesn't have any more food within reach. That would keep the black hole from growing.

Team members are most interested in what the black hole measurement can tell astronomers about AGNs in general. Any new information could help astronomers better understand the role that black holes play in making galaxies like our own form and evolve. To that end, the team is also studying related data from NASA's Chandra X-ray Observatory and ground-based telescopes.

"It's these extreme types of objects that really allow you to test your theories," Peterson said.

Moon

New	10 th	1 st Qtr	17 th	Full	25 th	Last Qtr	3 rd
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Events:

14th Occultation δ Arietis by dark limb of crescent Moon (21.28 hrs. reappears at 22.15)

14th Libration good for Mare Australe

19th Libration good for Moon's southern polar area

20th Vernal Equinox

Planets:

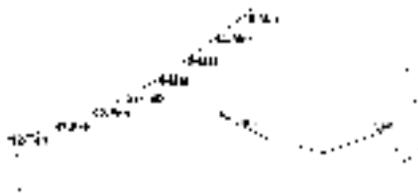
Mercury	Now an evening object, best seen between 2 nd (83% phase) and 22 nd (8% phase) Mag -1.1 to $+2.4$. Greatest elongation on 12 th , 18° from Sun
Mars	Rises about 05.00 hrs, low in morning sky at Mag $+1.4$ in Scorpius
Jupiter	Nearing opposition, apparent diameter 44.2'' by end of month. Mag -2.5
Saturn	Slowing its retrograde motion in Gemini, well placed for late evening and early morning viewing. Culminates at 21.00 at start of month, but about 19.00 at end as it draws away with its magnitude fading from -0.3 to -0.1

Close Encounters

6th	Mars 5.5° north of Moon at 02.00 hrs.
11th	20hr old Moon just 3.5° south of Mercury
19th	Saturn 4.5° south of Moon
20th	Mars 45' north of M75 (open cluster) in Capricornus
26th	Jupiter 1.5° north of Moon

Comet

Comet 2004 Q2 (Machholz), is still visible through binoculars, passing Polaris early in the (diagram courtesy of Lee Macdonald).



month

Constellations:

The following are well placed:

Auriga, Taurus, Orion, Lepus, Monoceros, Canis Major, Gemini, Cancer, Leo, Sextans, Hydra, Coma Berenices

Deep Sky Objects

M35 (Gem), M44, M67 (Cnc), M46, M47 (Pup), M48, M68 (Hya), M50 (Mon), M65, M66, NGC3628, M95, M96, M105, NGC2903 (Leo), M81, M82 (Uma), NGC4361 (Cor), NGC4565 (Com)

Sources:

FAS Astro Calendar 2004/2005, *Astronomy Now (Mar)*, *Sky & Telescope (Mar)*, *Popular Astronomy (Jan-March)*, *Deep-Sky Observer's Year (Privett & Parsons)*