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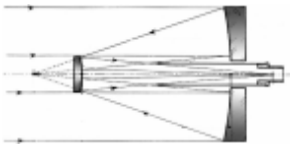
PETERBOROUGH ASTRONOMICAL ASSOCIATION

THE REFLECTOR



Volume 6, Issue 3 March 2007

Editorial

I don't know if many of you read the Toronto Sun, but they recently had an article about Earth's possible "doomsday." It's called Apophis, and this asteroid will have a 1 in 45 000 chance of actually hitting the Earth on April 13th, 2036! (Don't worry, if you thought that might be a Friday the 13th, it's not, I already checked.) Scientists are already working on ways to save our Earth. So far, the favored plan is to send out a spacecraft that would use gravity to alter the asteroid's course. It's an interesting plan. For the Earth's sake, I hope it works!

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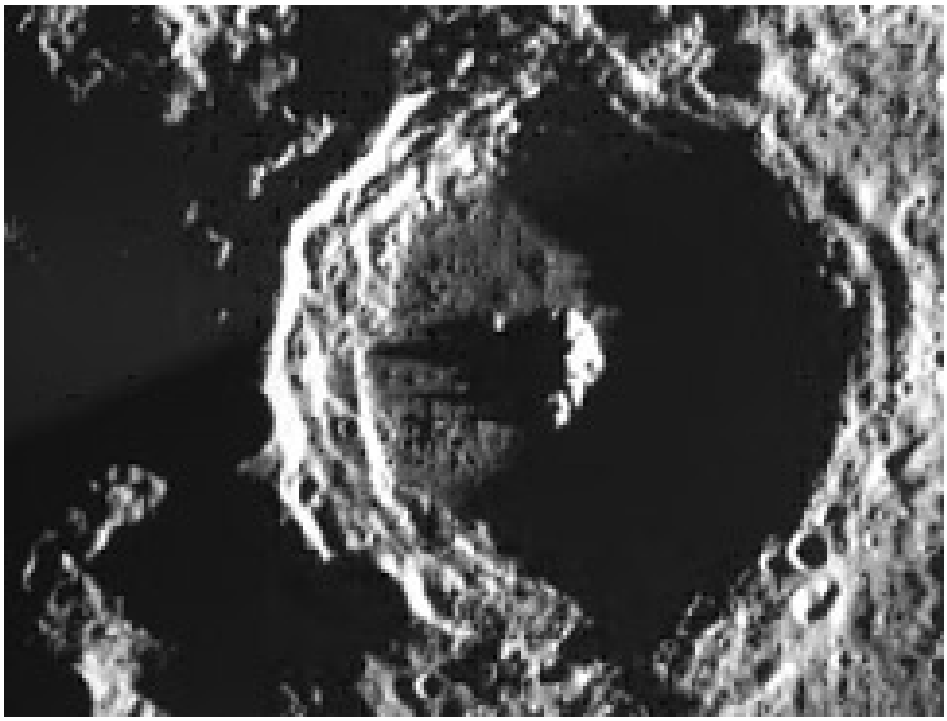
Possible Site For Future Lunar Base

This mysterious land is called Luna Incognita, and we couldn't even see it until probes sent back images of the farside of our Moon! So far, Plaskett Crater seems to be the favorite for building a lunar base. It's 109 km in diameter and is located near the Moon's north pole, at the edge of Luna Incognita.

Plaskett Crater would be ideal for preparing to journey to Mars, because the Earth would not be visible except for a few days of the year. Scientists could study the effects of Earth-deprivation in a controlled way. This would truly test your home-sickness!

SMART-1 was the probe that investigated the edges of Luna Incognita. It was launched by the Europeans on September 27th, 2003, and was their first successful spacecraft to the Moon.



This image, taken by the advanced Moon Imaging Experiment (AMIE) on board ESA's SMART-1 spacecraft, shows crater Plaskett on the Moon. SMART-1 was in a polar orbit, at an altitude of 3000 kilometers over the surface.
Image credit: ESA/Space-X (Space Exploration Institute)

SMART-1 was unique in that it was the first to use an ion engine (solar electric propulsion) for interplanetary travels, in combination with gravity assist maneuvers. Using future deep-space communication techniques for spacecraft was among even more of the technologies SMART-1 tested.

The probe was initially supposed to operate for 6 months, but was given a extension. It's mission did, however, end on September 3rd, 2006 when it was deliberately crashed into the Moon.

For more information, go to:
www.esa.int

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Inside This Issue

From Cool Spots On The Sun To Fire In Our Sky

It may be difficult to imagine, but our Sun is the reason we have aurora, or as most people call them, the northern lights. To understand the dancing lights of the northern sky we have to start a few hundred million kilometers away – with the Sun.

The Sun is a gargantuan ball of helium and hydrogen gas – about one million times larger than Earth. It rotates completely in about 27 days. The rotation creates magnetic fields within the Sun. Some of these magnetic areas breach the Sun's surface and we see them as Sunspots. They are visible to us because they are a balmy 4500C compared to 6000C for the Sun's surface.

Sunspots are also quite unstable and when one of them bursts, it sends charged particles radiating out from the Sun. If the Sunspot is aimed towards Earth when it bursts, the particles race towards us on what is called the Solar Wind. Thankfully it's not like the wind we experience here on Earth because the solar wind streaks across space at nearly 4 million km/h. Now that would muss your hair!

It takes about a day and a half for the charged particles from the burst Sunspot to reach us. Along the way they spread out like the blast from a shotgun. The blast's pattern can be larger than the Earth so the particles interact with our North and South Poles giving us Northern and Southern Lights at the same time.

The color of the northern lights depends entirely on what elements in our atmosphere they encounter and at what altitudes the particles encounter them as they stream down our poles. The display can vary from red and green shimmers to bright white spikes that rise up from the horizon and meet straight overhead. But that's the pretty side of the Northern Lights. They also have an ugly and dangerous side, too.

The northern lights can happen at any time of year. All we need is a burst from the Sun to get things going. To learn more about the northern lights, visit : www.spaceweather.com. Photo by John Crossen.

At their least dangerous they can play havoc with cell phone reception. And at the opposite end of the scale, the great power out in Quebec that rendered the east cost of Canada and the US powerless was the result of one of these cosmic blasts. Satellites orbiting Earth as well as any astronauts or cosmonauts out for a space walk are also at risk. It is a little-known fact that one of the Apollo missions to the Moon narrowly missed being in the line of fire when a gigantic solar flare blasted across the Moon's surface. Had the astronauts still been on the lunar surface, they all would have died due to the radiation. Happily they had just arrived back on Earth where our magnetosphere and our atmosphere protect us from such events.

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181 Things To Do On The Moon

If you woke up tomorrow morning and found yourself on the moon, what would you do? NASA has just released a list of 181 good ideas.

Ever since the end of the Apollo program, "folks around the world have been thinking about returning to the moon, and what they would like to do there," says Jeff Volosin, strategy development lead for NASA's Exploration Systems Mission Directorate. Now, NASA *is* going back; the agency plans to send astronauts to the Moon no later than 2020. "So we consulted more than 1,000 people from businesses, academia and 13 international space agencies to come up with a master list of 181 potential lunar objectives."

For example, the moon could be a good location for radio astronomy. A radio telescope on the far side of the Moon would be shielded from Earth's copious radio noise, and would be able to

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observe low radio frequencies blocked by Earth's atmosphere. Observations at these frequencies have never been made before and opening up a window into this low frequency universe will likely lead to many exciting new discoveries.

The moon would also be an excellent place to study the high-energy particles of the solar wind, as well as cosmic rays from deep space. Earth's magnetic field and atmosphere deflect many of these particles, so even satellites in low-Earth orbit can't observe them all. The moon has virtually no atmosphere, and it spends most of its 28-day orbit outside of Earth's magnetosphere. Detectors placed on the moon could get a complete profile of solar particles, which reveal processes going on inside the sun, as well as galactic cosmic radiation from distant black holes and supernovas.

Bonus: These particles are trapped by lunar regolith, the layer of crushed rock and dust covering the moon's surface. This means that lunar regolith contains a historical record of solar output: core samples could tell us about changes in solar output over billions of years. "We believe that the moon's preservation of this solar record is unique and can provide us with insights on how past fluctuations in the solar output have affected, for example, the history of life on Earth," says Volosin. In particular, it could shed light on the extent to which solar variability and galactic cosmic radiation influence climate change.

But the moon would be far more than just a platform for scientific instruments gazing into space. The moon itself is a scientific gold mine, a nearby example of planetary formation largely unaltered by the passage of time. Some scientists call it "a fossil world." The moon is a small, non-dynamic planetary body and its interior state is largely preserved since the early days of solar system history. Studying its interior would tell scientists a lot about how a planet's internal layers separate and solidify during planetary formation.

Even something as simple as establishing the dates when various craters on the moon were formed can provide us

A radio telescope on the moon uses a crater to support its giant primary dish. Artist's concept by Pat Rawlings.

with a unique picture of how the flux of meteoroids in the vicinity of Earth has changed over time. (For more information see Science@NASA's "The Moon is a Harsh Witness.") This impact history is lost on Earth by the constant renewal of the crust but on the moon it is intact, rich with clues to periods in the past when an increase in bombardment may have affected the climatic history of Earth and even the evolution of life.

Science accounts for only about a third of the 181 objectives, however. More than half of the list deals with the many challenges of learning to live on an alien world: everything from keeping astronauts safe from radiation and micrometeors to setting up power and communications systems to growing food in the airless, arid lunar environment.

"We want to learn how to live off the land and not depend so much on supplies from Earth," says Tony Lavoie, leader of NASA's Lunar Architecture Team (Phase 1) at the Marshall Space Flight Center.

Astronauts would face the same problems on a manned mission to Mars, so much of the experience gained on the moon would carry over when NASA eventually sends people to the Red Planet.

The moon could also provide some creative commercial opportunities: lunar power from solar cells, protected data archives, mining of lunar metals, and research under conditions of low gravity and high vacuum, to name a few. In fact, mining the moon may eventually yield rocket propellant that could be sold to commercial satellite operators to access and service their satellite assets in Earth orbit. Beyond charging space tourists for a chance to visit the moon, lunar entrepreneurs might host special television events from the moon to boost publicity, or place a remote-controlled rover on the moon. People back on Earth could pay to take turns controlling the rover from their Internet-connected computers, letting them take a virtual drive across the moon's crater-pocked surface. In short, let your imagination be your guide!

Continued...

Not all of the ideas on the list will necessarily happen. From the master list of 181, NASA currently is selecting the a smaller number of high priority goals for its initial return to the moon. Other goals could be considered by other space agencies or private entrepreneurs who have an interest in exploring the moon. NASA continues to receive input from scientists at space agencies and universities around the world, the list itself is still evolving and expanding.

Submitted By: Mark Coady
Author: Patrick L. Barry
Credit: Science@NASA

PAA's 6-inch Dob Is Back On Line After Brief Encounters With Drills, Saws, And An Iron

Our 2nd loaner scope is back from the spa. Well OK, my work shop. While there its old helical focuser was exchanged for a nice new rack & pinion unit that is much easier to use. The old focuser now resides in BC at a boy's school where is will find use in their astronomy club. The new focuser necessitated drilling (a.k.a. Swiss-cheesing) the scope's optical tube because the original screw holes didn't match up with the new focuser. However, once installed, it looked great.

Back from the spa and ready for a night under the stars. The club's loaner Dob received a new focuser, ground-board, fresh counter-weights, a good optics cleaning, and final collimation.

Unfortunately looking through it was now the problem. It seems that the eyepieces wouldn't come to focus because the new focuser didn't have enough back travel. The solution was to order up an extension tube so that we could get enough back focus to bring the eyepieces to sharp focus. It worked.

From the top of the scope, my attention now swung to the ground-board which caused the scope to be very balky when moved in azimuth. The answer was to buy a 8' x 16"plank of shelving that was covered on both side with melamine. I cut a 16" chunk off so that I now had a 16" square piece. Out came the drill to put a hole in the centre of the ground board, then I bolted it to the bottom of the Dob box using a lock washer so that the box could be rotated smoothly on its furniture sliders. The new melamine surface was much smoother than the old acrylic one and the contact between it and the furniture sliders was just enough to allow smooth, but not loose rotating of the scope. Yet another problem was solved – almost.

Because the ground-board nearly touches the ground, dew and moisture could soak into its three exposed sides, causing it to eventually split or warp. That's where Deb's iron came into play. I picked up a roll of iron-one edging (the heat melts the glue) and covered over the exposed surfaces.

Thinking that I was done I put the scope back into the Dob box, hooked up the side springs and watched the rear of the scope slowly drift down until the optical tube pointed straight up. Hum…looks like the new focuser weighs a lot less than the old one.

Out came my stack of curtain weights, a roll of duct tape, and our old friend, Mr. Velcro. I selected a small stack of the weights (usually found in the bottom of curtains so that they hang straight), sat them on the front of the optical tube until it balanced nicely. Then I taped them together and velcroed the whole unit to the optical tube.

Of course during the process of all this, the scopes mirrors were carefully cleaned and collimated. The trick Steve Dodson showed us using the dentist's mirror worked very nicely and on our last clear night, I hauled the revamped Dob out for a look at the stars. The images were nice and crisp and I pronounced the scope ready for action.

Fred and Pat Smallman are first in line for the scope, but if you'd like to try it, I'll be happy to put your name on my waiting list.

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Aloha#11 – UH 2.2 Meter Telescope

Next stop on our tour at the top of Hawaii is at the University of Hawaii 2.2 Meter (88 inch) telescope. This

Continued...

The protrusion coming from the dome is actually to facilitate a 20-ton crane, which allows the movement of heavy equipment in and around the dome.

The dome is starting to open, as it prepares for another night of research. For scale, a van similar to our tour van is located at the bottom of the image.

optical infrared telescope saw first light in 1970. Its mirror is the same size as the Hubble Space Telescope. Think of your own telescope for a size comparison, for the UH 2.2 has a focal length of 22,600 mm and a focal ratio of f/10. It is located at the 13,824 ft. level (4,213 m), making it the highest location of almost all the observatories on Mauna Kea (same as Gemini North). This telescope was the first large-scale telescope built on Mauna Kea (I guess that is how you get the prime location). We think nothing of it today, but this facility was a pioneer in high altitude telescope construction. This Telescope helped sell the world on Mauna Kea and the remote control systems to run telescopes of this kind.

Looking at these pictures, you may have noticed an odd shape to the dome of this telescope facility? The protrusion is actually to facilitate a 20-ton crane, which allows the movement of heavy equipment in and around the dome. The first image (previous page) shows the distinctive "horn" of the dome as I saw it looking west. The image above shows the dome opening a short time later ("horn" is opposite this opening). These images are the closest of the observatory images I captured on my tour of the summit because we parked right beside this dome at the summit.

Though showing it's age, this facility is still an active part of the Mauna Kea telescope complex. This telescope was used to discover the first Kuiper Belt Object (not counting Pluto) in 1990. Since 2000, the UH 2.2 has helped discover 60 new moons around the gas giants of our solar system (Jupiter, Saturn, Uranus and Neptune). This telescope has been used in many studies of the Kuiper Belt (beyond Neptune), as well as comets and asteroids. When the 16 million pixel infrared CCD camera was installed it was the largest of this type in the world (That's a lot of pixels!).

The controls for this telescope are physically located to the east, down in Hilo (42.2 km away) at the University of Hawaii's "Kukahau'ula" Institute for Astronomy.

There is a Visitor's Gallery in this facility that is opened from 10 till 4 from Monday to Thursday, in case you are ever planning a visit. We were not there in time during our tour, which was closer to sunset, so we never got inside. We were there however, to see the dome turn and start to open, as it prepared for another night of research. That was neat in and of it's self.

The controls for this telescope are physically located to the east, down in Hilo (42.2 km away) at the University of Hawaii's "Kukahau'ula" Institute for Astronomy. This makes for much nicer operating conditions for the researchers, but they are missing the view.

For more information on the UH 2.2 see:

http://www.ifa.hawaii.edu/88inch/

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NASA Space Place

Even Solar Sails Need A Mast

by Patrick L. Barry

Like the explorers of centuries past who set sail for new lands, humans may someday sail across deep space to visit other stars. Only it won't be wind pushing their sails, but the slight pressure of sunlight.

Solar sails, as they're called, hold great promise for providing propulsion in space without the need for heavy propellant. But building a solar sail will be hard; to make the most of sunlight's tiny push, the sail must be as large as several football fields, yet weigh next to

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nothing. Creating a super-lightweight material for the sail itself is tricky enough, but how do you build a "mast" for that sail that's equally light and strong?

Enter SAILMAST, a program to build and test-fly a mast light enough for future solar sails. With support from NASA's In-Space Propulsion Program to mature the technology and perform ground demonstrator tests, SAILMAST's engineers were ready to produce a truss suitable for validation in space that's 40 meters (about 130 feet) long, yet weighs only 1.4 kilograms (about 3 pounds)!

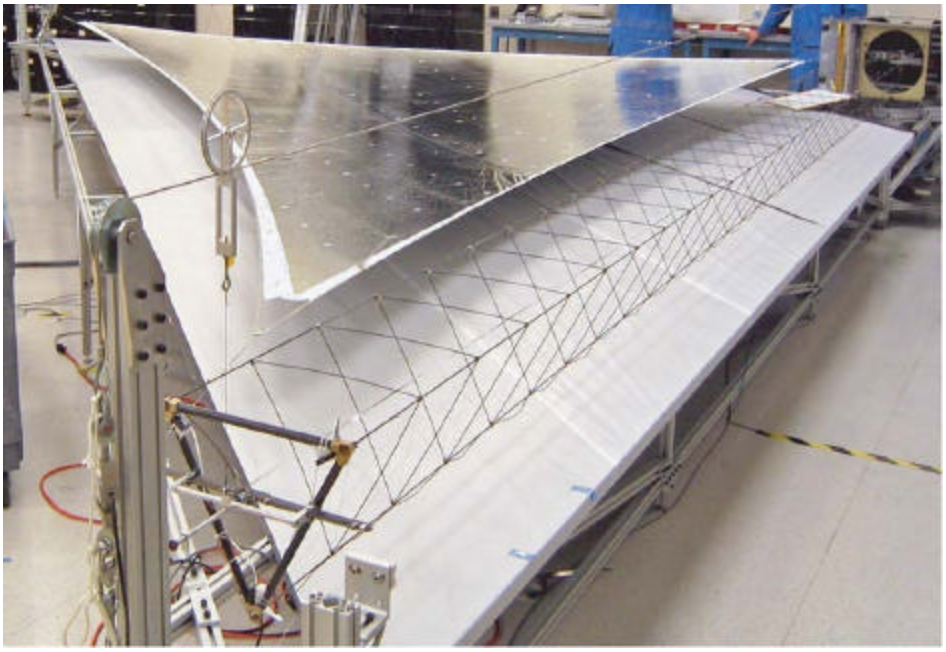
In spite of its light weight, this truss is surprisingly rigid. "It's a revelation when people come in and actually play with one of the demo versions—it's like, whoa, this is really strong!" says Michael McEachen, principal investigator for SAILMAST at ATK Space Systems in Goleta, California.

SAILMAST will fly aboard NASA's Space Technology 8 (ST8) mission, scheduled to launch in February 2009. The mission is part of NASA's New Millennium Program, which flight tests cutting-edge technologies so that they can be used reliably for future space exploration. While actually flying to nearby stars is probably decades away, solar sails may come in handy close to home. Engineers are eyeing this technology for "solar sentinels," spacecraft that orbit the Sun to provide early warning of solar flares.

Once in space, ST8 will slowly deploy SAILMAST by uncoiling it. The truss consists of three very thin, 40-meter-long rods connected by short cross-members. The engineers used high-strength graphite for these structural members so that they could make them very thin and light.

The key question is how straight SAILMAST will be after it deploys in space. The smaller the curve of the mast the more load it can support. "That's really why we need to fly it in space, to see how straight it is when it's floating weightlessly," McEachen says.

It's an important step toward building a sail for the space-mariners of the future.



SAILMAST is the thin triangular truss in front of the picture. It is attached to a section of a silver foil solar sail section shown here in a laboratory test. The mast in the picture is 2m (6 ft) long. The Space Technology 8 mission will test the SAILMAST, which is 20 times longer.

Find out more about SAILMAST at nmp.nasa.gov/st8. Kids can visit spaceplace.nasa.gov/en/kids/st8/sailmast to see how SAILMAST is like a Slinky® toy in space.

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

By: Patrick L. Barry

Earth Has A Ring Around It – A Deadly Ring Of Space Junk

It ranges in size from the bits and pieces that have fallen off space craft, to dead satellites and spent rockets still orbiting Earth. The current count of objects 4-inches in size or larger is around 10,000.

You might think, so what space is virtually endless. But unfortunately the most important chunk of space to us Earthlings is the near-space just above the atmosphere that hugs our planet. It is home sweet home for hundreds of commercial, military, and weather satellites. Cell phone calls, television programs, and pager messages are beamed down from these celestial spheres as they whistle around Earth at thousands of km/h or sit silently in geosynchronous orbits a few hundred miles up.

The problem is what happens when one little chunk smashes a bigger chunk into more chunks and they in turn smash into more large chunks, and...well, you get the idea. The eventual cascade will multiply the thousands into millions and beyond, turning near space into chaos for hundreds of years.

In the past ten years, scientists have determined that the number of junk chunks has reached critical mass. They call it critical spatial density. It is the

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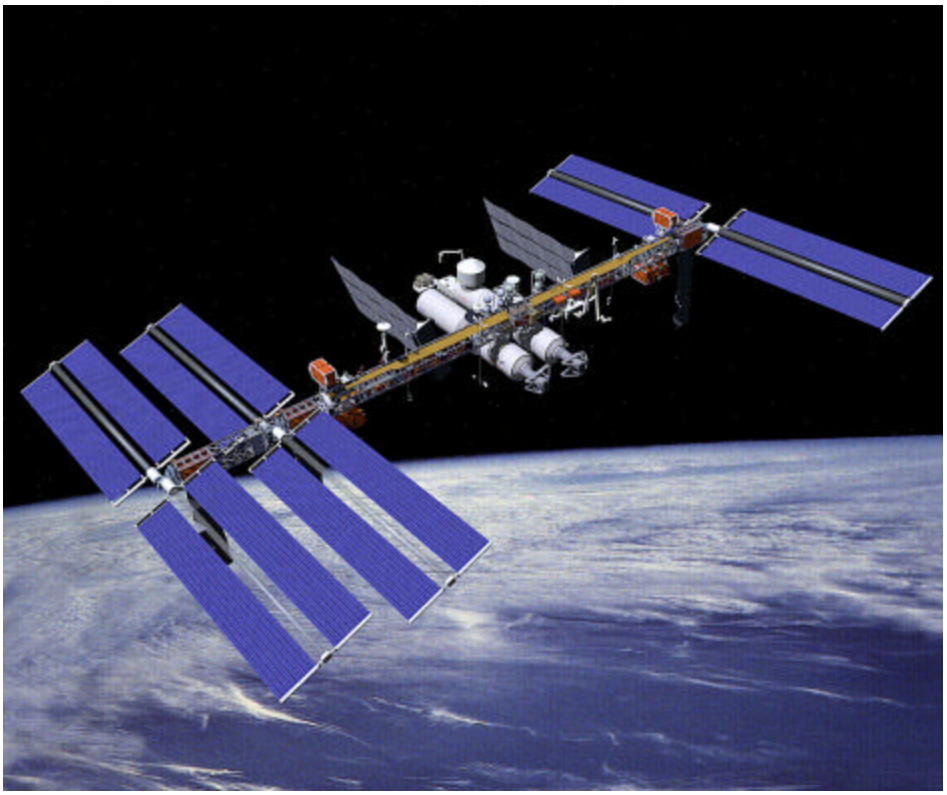

If NASA's predictions are correct, satellites like this will become the target and the fodder for an increasing amount of dangerous space shrapnel.

point at which a chain reaction (cascade effect) becomes inevitable. That's not an "if", but a "when."

On January 11th, 2007 the Chinese military pushed ("when") a bit closer by firing a rocket at a dead satellite and blowing it to pieces. How many pieces? Current count is 800 and is expected to surpass the 1000 mark as space cameras and radar continue to monitor the situation. Prior to their stunningly idiotic creation of still more space junk, America held the record for trashing space when a fuel cell on an abandoned rocket engine exploded breaking the craft into 713 pieces of debris large enough to be detected.

So what's the problem? After all, they're just little bits of junk…little bits traveling at upwards of 20,000 kilometers per hour. At that speed a fleck of paint would puncture an astronaut's spacesuit. A bolt would rip through the side of the space station like a bullet through Reynolds Wrap. And a chunk of space debris the size of a baseball would put a multi-million dollar satellite out of commission while shattering it into a thousand more whirling chunks of spinning space shrapnel.

Difficult as it might be to think of outer space as being crowded, certain orbital paths have already reached the critical density to sustain a chain reaction. As far back as 1978 two NASA scientists wrote an article in the Journal of Geophysical Research proposing that the continued creation of junk in space would girdle the planet with a deadly debris belt that would threaten future satellites, and orbiting research labs.

Is there were a happy ending to this story? The next meeting of the Inter-Agency Space Debris Coordination Committee will be held in April – ironically in Beijing.

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A Star Is Born (In Scorpius)

The month of February has turned out to be a pretty special month for astronomers and especially those of us in the Peterborough area.

It was on February 6th that Professor Dawson, of the University of Trent Physics Department, gave a lecture on white dwarf stars, neutron stars and black holes (see article in this month's Reflector). Meanwhile, on February 4th, two Japanese astronomers independently discovered a new star in the constellation Scorpius. Nova Scorpii 2007 (or technically V1280 Scorpii) is the name given to this new discovery.

Nova, means "new" in Latin and even though this "new" star was already there, for who knows how long, it just now appeared to grow bright enough to be noticed, as this white dwarf's larger binary star companion (probably a red giant) transferred matter to it in a nuclear chain reaction. This will last for only a matter of days and then it will fade again to renew the process in the future. This process of energy transfer that increased the brightness of the white dwarf started about 400 years ago, but it has taken its light from that explosion all this time to reach us, traveling at the speed of light (300,000 km/sec).

The brightest this nova got was about magnitude 3.8 (naked eye visibility), on February 16th. By the time I made the image (following page) on the morning of February 21st, it had dimmed to about magnitude 5.5. I needed binoculars to see this nova on both the 20th and 21st when I was out looking for it. The image I captured here is cropped from a larger over all image of the whole constellation of Scorpius, with Jupiter nearby. A four mega-pixel camera piggybacked on a Meade ETX 90 telescope captured this image in a 43 seconds exposure at 100 ASA. I have closed in on Epsilon, the fifth brightest star in Scorpius (mag. 2.3; 65 ly away), as a reference star for locating the nova. If you compare this to any

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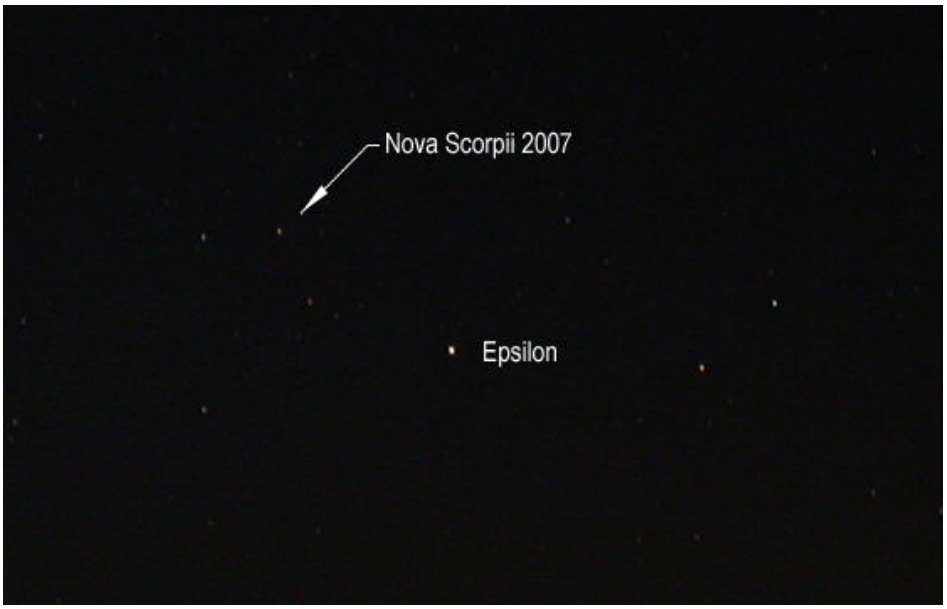

The nova in the constellation Scorpius. Taken on February 21st, it had dimmed to about magnitude 5.5.

star chart or atlas of Scorpius you will be able to locate the nova for yourself.

Then this same week, there is a reported possible second nova in Scorpius, about 3 degrees south of this first one. Now that is a lot of nova activity in one constellation. I never saw or recorded this one although I was out imaging on the 21st, when it was to have been discovered. It should be noted that a nova is not the same as a supernova. In the case of supernova, relatively large stars (more than 8 times the size of our Sun) eventually use up their nuclear fuel and they collapse in on themselves and then explode outward, shedding their outer layer. This will only happen once in a stars life (as it dies).

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Mark And Susan Coady Get A New Telescope – With Brains

After fiddling around for the last couple of years with yard-sale scopes and a couple of decent-but-nothing-special sky-peepers from E-Bay, Mark and Susan Coady have finally landed a full-tilt boogie telescope. On Friday night, February 24th we tested it in -15 degree weather at Buckhorn Observatory. Forget the nippy temperature because it was clear for the first time in weeks. And that made breaking out the scopes a maximum priority. Ditto the parka and mittens.

But, first things first. The telescope is an 8-inch Orion Intelliscope. The Intelliscope part means that it has what used to be called digital setting circles. One set is for the RA (Right Assention) and the other is for the DEC or Declination. The two terms are celestial versions of the more familiar terrestrial terms, Latitude and Longitude.

All the novice astronomer needs to do is point the telescope so that the two coordinates read the same as those charted for the desired Messier or NGC object and look through the eyepiece. Bingo, right on target. If you can read numbers, you can find stuff – even without looking through a finderscope. There is a bit of a dance to setting the scope up and getting it ready for a night's observing, but this is just about as simple as it gets. And it's fun.

With an 8-inch aperture, the scope delivers beautiful low-power views of deep sky objects. And thanks to its excellent f6 optics, you can crank up the power and view objects such as the Moon and planets in superb detail. All and all, this is one of the nicest medium-aperture telescopes I have had the pleasure of looking through. Mr. Orion (aka Synta), you make good telescopes!

For the Coady Clan, this is an ideal telescope. It is small enough to fit easily in the hatch of Mark's compact car with room leftover for accessories. It has enough aperture to make deep sky views bright and rewarding, as opposed to the "dim and dimmer" puffballs a smaller scope yields. And at just a tickle over 6.5 hundred second hand, the price was also easy to handle.

Congratulations Mark and Susan. Your new scope is superb. Now let's work on the weather.

John Crossen
JohnCstargazer@aol.com

Mark's face is a smiling puddle of contentment as he poses behind his new Intelliscope. Susan is still recovering from leg surgery and wisely decided to remain indoors where it is both warm and a bunch more comfortable. Next time, Susan!

The Sky This Month

MERCURY

Mercury is at greatest elongation west on March 21. It will be visible in the eastern sky just before sunrise. It begins the month in Capricornus and moves into Aquarius on March 14.

VENUS

Venus is now a brilliant "evening star" just after sunset in the western sky. It starts the month in Pisces, but on March 16 moves into Aries.

MARS

It spends the whole month of March in Capricornus. It is visible low in the southeast just before sunrise. It will be too small to show much detail in a telescope until summer.

JUPITER

Jupiter is now prominent in the morning sky. It will be in the constellation of Ophiuchus for most of the year.

SATURN

Saturn is now a month past opposition and is visible most of the night in the western part of Leo.

URANUS

Uranus is too close to the Sun to be readily observed.

NEPTUNE

A telescope is usually necessary to view the most distant planet in the solar system, but is also too close to the Sun to be readily observed.

METEOR SHOWERS:

There are no major meteor showers this month.
For details, see http://comets.amsmeteors.org/meteors/calendar.html.

NASA Fact

www.nasa.gov

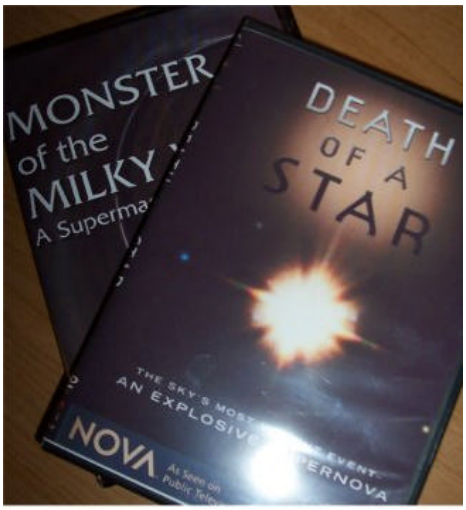
- NASA's Environmental Research Aircraft and Sensor Technology program (known as "ERAST") develops pilotless airplane technology. It also works on making science instruments very small so that they can be carried on remote-controlled aircraft.

Two New Movies Join The PAA DVD Library

Who knows what evil lurks in the hearts of galaxies? Astronomers do, and it ain't pretty – it's a black hole. Own Milky Way Galaxy is suspected to be playing host to a gigantic black hole with well over a thousand solar masses. So will it eventually suck us all in? What will happen to the black hole when our galaxy and the Andromeda galaxy collide? Do black holes grow by merging?

The answer to all these questions and more are answered in the NOVA DVD *Monster of the Milky Way*. Produced with top-notch computer graphics and interviews with prominent astronomers who are experts on the subject, this DVD tells all in a manner that is both entertaining and educational. Plus, you don't have to be a rocket scientist to understand it.

Joining our "monster" is yet another NOVA DVD, *Death of a Star*. While this type II supernova event takes place in a near-by galaxy called the Large Magellanic Cloud, the story has a very Canadian thread running through it. That thread goes by the name of Ian Shelton. At the time of the super nova's discovery, Shelton was doing some research at the Las Campanas Observatory in Chile. He and his telescope assistant were the first people to witness the event. Shelton photographed it, but



at the time didn't realize what he had captured on the plate. Hours later he was hustling to send a telegram to the International Astronomical Union to confirm the sighting and claim his prize (international recognition) for bagging the supernova.

It's an exciting story that will take you back to Supernova 1987A, ancient technology such as telegrams, and one of the most important discoveries in recent astronomical history. It's also a great evening's entertainment, and well worth viewing.

As is the case with all NOVA productions, the quality is superb, and it is put together in a manner that is accessible to everyone from the curious novice to an experienced amateur astronomer.

We'll be adding more titles to the library in the near future, so I urge you to give our librarian, Joanne Stockton, a call or email to reserve one of the titles for delivery at our next meeting. You'll find her email address and phone number in the club's latest address list and on the PAA website:

(www.peterboroughastronomy.com)

Our library is one of the finest that any amateur club can boast, and you're missing an excellent resource if you don't visit it in cyberspace and check out what awaits you. There's a lot more to this club than the monthly meetings!

John Crossen
JohnCstargazer@aol.com

Meeting Notes

February 2, 2007

If I could just have 10% of our guest speaker - Talmon Firestone's - enthusiasm and then instill it in our membership, we'd have the busiest, most fun-to-belong-to astronomy club on the planet. What an amazing guy! But hold the horses, I'm jumping ahead of myself.

Rick Stankiewicz called the meeting to order and then passed the gavel over to Mark Coady who gave us an update of wife Susan's condition (home and doing well) and the current state of our Astronomy Day activities. Rick also added his 2 cents worth regarding the raffle – we have the grand prize and are just awaiting city approval on our application for a license. Mark also donated a new book on mankind's lunar exploration to the club library.

John Crossen introducing two new movies to the club's DVD collection – Death of a Star and Monster of the Milky Way. Both are NOVA products and Marina Bedard snapped them up the moment they hit the table – ya gotta be fast guys.

Peterborough Astronomical Association

The Reflector is a publication of the Peterborough Astronomical Association (PAA). Founded in 1970, the PAA is your local group for astronomy in Peterborough and the Kawarthas.

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Guest speaker Talmon Firestone at the Feb. 2nd PAA meeting.

Peter Lanskail of the York Simcoe Amateur Astronomers joined us as a guest for the night.

Rick Stankiewicz then did the honor of introducing Talmon Firestone to the assembled clubbies. Mr. Firestone is a graduate of Ryerson in Toronto with a degree in marketing management. So you'd probably expect to find him crunching numbers on product launches for GM, IBM, or one of the world's other corporate biggies. Not so.

The launches Mr. Firestone is interested in are those provided by rockets built and designed by private enterprise.

During the course of his talk, Mr. Firestone introduced us to a number of newly-formed companies that are dedicated to pushing back the frontiers of space travel in the interests of private industry. So just like the Hudson's Bay Company helped open up Canada to an influx of new citizens, private industry will be taking us into space, and bringing home the bacon in the form of space tourism and harvesting resources for use back here on Earth.

For those of us with limited budgets, there is currently a company that is taking people on parabolic (up and down dips) flights that will let you experience zero gravity for up to a combined total of 10 minutes. And it doesn't cost any more than a trip to Mexico or one of the islands.

It was a particularly fascinating talk, but my favorite comment was the fact that low-orbit parcel and passenger delivery systems could have things (and people) arriving yesterday! Think about that for a moment.

Pat Smallman was on hand to pickup the club's newly-refurbished 6-inch loaner scope which she and husband Fred will enjoy if we ever get a clear night. And as usual, out thanks to Joanne and Bob Stockton for bringing the club library to the meeting.

That was the night that was. The club thanks Rob Fisher for arranging the talk by Mr. Firestone, and a standing ovation to Talmon for such an inspiring presentation. Book my ticket for a stay on the Lunar Hilton immediately…well, immediately after a win the club's 50/50 draw.

John Crossen
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J O K E ! J O K E ! J O K E ! J O K E !

After intensive investigation on both the Soviet and US parts, spokespersons from both space agencies have determined the cause for the accident which has placed the station and its resident personnel in jeopardy. In terse statements at a recent press conference, Soviet and US space agency spokespersons said Thursday We have concluded joint investigations concerning this potentially tragic accident and each nations' team, separately, has arrived at identical conclusions for this incident. The accident was caused by one thing and one thing only...

OBJECTS IN MIR ARE CLOSER THAN THEY APPEAR

! J O K E ! J O K E ! J O K E ! J O K E

ARTICLES

Submissions for *The Reflector* must be received by the date listed below. E-mail or "sneaker-net" (i.e., floppy disk) submissions are preferred (Microsoft Word, ASCII and most graphics formats are acceptable). Typed or hand-written submissions are acceptable provided they are legible (and not too long). Copyrighted materials will not be published without written permission from the copyright holder. Submissions may be edited for grammar, brevity, or clarity. Submissions will be published at the editor's sole discretion. Depending on the volume of submissions, some articles may be published at a later date. Please submit any articles, thoughts, or ideas to this address:

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or via e-mail at:
Shawna.mi@sympatico.ca

Please contact me first if you are sending a large file.

NEXT ISSUE'S DEADLINE IS
Mar. 15, 2007
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MEETINGS

The Peterborough Astronomical Association meets every first Friday of most months at the Peterborough **Zoo Orientation Centre** (Next to the PUC Water Treatment Plant) at **8:00 pm**.

CALENDAR OF EVENTS

March 2, 2007	**General Meeting—** Speaker - Guy Nason on "Asteroid Occultations"
April 20, 2007	**General Meeting—** To Be Announced

Moon Phases

Full Moon	**March 3, 2007**	**April 2, 2007**
Last Quarter	**March 11, 2007**	**April 10, 2007**
New Moon	**March 18, 2007**	**April 17, 2007**
First Quarter	**March 25, 2007**	**April 24, 2007**