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January's Meeting

The next S*T*A*R club meeting will be 8 PM Thursday Jan 4, 2007 at King of Kings Lutheran Church, 250 Harmony Rd. in Middletown.

Our program will be "Pirates of the Solar System Caribbean" by Daniel Kirby.

Editor's Notes

Thanks to Randy and Steve for sending in articles. For everyone else, please send in articles on any astronomy topics you like!

I hope you've been enjoying the Science Corner- I'm trying to think of new ways to structure the feature and relate it to current astronomy news.

February Issue

The deadline for the next edition of the *Spectrogram* is Monday, January 29th. Please email any contributions to Daniel_handlin@hths.mcvsd.org. As always, any and all contributions are welcome!



Venera 13 (Soviet Venus probe) Mockup Image Courtesy NASA

Calendar

Sep 7, 2006 - - Clif Ascraft -
"Restoring the Tuthill
Telescope"

5 Oct, 2006 - Dr. Kenneth
Kremer - "Exploring Mars and
the Search for Life"

2 Nov, 2006 - Dr. Sebastien
Lepine - "The Search for
Nearby Stars"

7 Dec, 2006 - Kevin Kilkenny -
"New Horizons' Journey to
Pluto"

4 Jan, 2007 - Daniel Kirby -
"Pirates of the Solar System
Caribbean"

1 Feb, 2007 - Gavin Warnes -
"Collimating your Telescope"

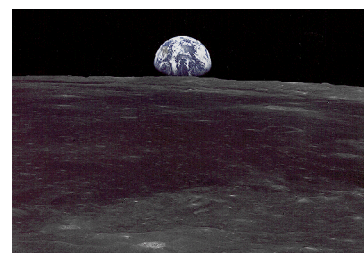
1 Mar, 2007 - David Britz -
"Motions of the Earth and
Moon"

5 Apr, 2007 - TBD

3 May, 2007 - TBD

7 Jun, 2007 - AGM Business
Meeting

Image Courtesy NASA



President's Corner

By Steve Walters

Happy New Year! Welcome to 2007! Hope you got some nice astro-goodies during the holidays! Now is the time to get out there and use them! The weather has been relatively mild but the warmth has brought high humidity, clouds and fog. But I'm sure this is temporary (isn't it always?) so just keep everything poised and ready to go! January normally brings some of the clearest skies with the best transparency of any time during the year. So if we do get a clear night, do get out and look at Orion or any other of your winter favorites. Just be prepared for cold though, clear skies bring cold temperatures.

The February program will be on collimating telescopes. Besides giving a presentation on the principles of collimating, there will be "hands on" collimating of both Newtonians and SCTs. If you want, bring your telescope along and learn how to collimate it yourself. Also bring along any collimating tools you have such as lasers or Cheshire eyepieces. If you don't have any of this stuff, you'll be able to try one at the meeting. So be sure and bring these things with you.

See you out there! Clear Skies!

Steve...



Astronauts on the ISS's P6 Solar Truss during the STS-116 mission

Image courtesy NASA



Spacewalking astronauts on STS-116

Image courtesy NASA

Space Weather for Air Travelers

By Dr. Tony Phillips

At a time when much of the airline industry is struggling, one type of air travel is doing remarkably well: polar flights. In 1999, United Airlines made just twelve trips over the Arctic. By 2005, the number of flights had grown to 1,402. Other airlines report similar growth.

The reason for the increase is commerce. Business is booming along Asia's Pacific Rim, and business travel is booming with it. On our spherical Earth, the shortest distance from Chicago to Beijing or New York to Tokyo is over the North Pole. Suddenly, business travelers are spending a lot of time in the Arctic.

With these new routes, however, comes a new concern: space weather.

"Solar storms have a big effect on polar regions of our planet," explains Steve Hill of NOAA's Space Weather Prediction Center in Boulder, Colorado. Everyone knows about the Northern Lights, but there's more to it than that: "When airplanes fly over the poles during solar storms, they can experience radio blackouts, navigation errors and computer reboots—all caused by space radiation."

In 2005, United Airlines reported dozens of flights diverted from polar routes by nasty space weather. Delays ranged from 8 minutes to nearly 4 hours, and each unplanned detour burned expensive fuel. Money isn't the only concern: Pilots and flight attendants who fly too often over the poles could absorb more radiation than is healthy. "This is an area of active research—figuring out how much exposure is safe for flight crews," says Hill. "Clearly, less is better."

To help airlines avoid bad space weather, NOAA has begun equipping its GOES weather satellites with improved

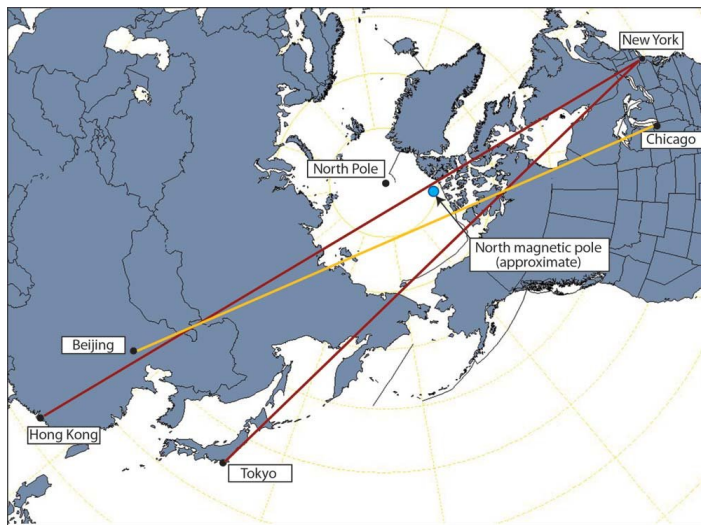
instruments to monitor the Sun. Recent additions to the fleet, GOES 12 and 13, carry X-ray telescopes that take spectacular pictures of sunspots, solar flares, and coronal holes spewing streams of solar wind in our direction. Other GOES sensors detect solar protons swarming around our planet, raising alarms when radiation levels become dangerous.

“Our next-generation satellite will be even better,” says Hill. Slated for launch in 2014, GOES-R will be able to photograph the Sun through several different X-ray and ultra-violet filters. Each filter reveals a somewhat different layer of the Sun’s explosive atmosphere—a boon to forecasters. Also, advanced sensors will alert ground controllers to a variety of dangerous particles near Earth, including solar protons, heavy ions and galactic cosmic rays.

“GOES-R should substantially improve our space weather forecasts,” says Hill. That means friendlier skies on your future trips to Tokyo.

For the latest space weather report, visit the website of the Space Weather Prediction Center at <http://www.sec.noaa.gov/>. For more about the GOES-R series spacecraft, see http://goespoes.gsfc.nasa.gov/goes/spacecraft/r_spacecraft.html. For help in explaining geostationary orbits to kids—or anyone else—visit The Space Place at http://spaceplace.nasa.gov/en/kids/goes/goes_poes_orbits.shtml.

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



Caption: *The shortest airline routes from the Eastern U.S. to popular destinations in Asia go very near the magnetic North Pole, where space weather is of greatest concern.*

Science Corner: Surviving in a Vacuum

By Daniel Handlin

This month’s column will be a bit of a departure from previous topics; here I’m going to talk about how long you might survive if you were dumped into the vacuum of space without a spacesuit. While this may not be the most pleasant thought, it’s actually a topic that carries a lot of misconceptions with it.

First, you would *not* explode. Your skin has sufficient strength to keep the 1 bar of pressure from causing you to burst. Scientists have found, both from tests on animals and accidental human exposure to vacuum in test chambers, that you could maintain consciousness for about 10-15 seconds and survive for around 90 seconds in a vacuum.

Your blood would not boil in a vacuum. Even in a vacuum, your blood pressure causes the blood’s boiling point to be significantly above your body temperature, so as long as your heart kept beating to maintain that pressure, you would not experience boiling blood. So in a vacuum, you would neither explode nor have your blood boil.

What *is* a significant problem is water vapor. The boiling of water in your body would, according to NASA, cause you to balloon up to twice your normal size (you still wouldn’t explode, but this would probably not be very comfortable). The air and water vapor in your body will rapidly exit through your mouth and nose; the evaporation of the water will also cool your body.

The empirical studies mentioned above have shown that if the person is revived within 60-90 seconds, there is usually no permanent damage, and the person can begin breathing again simultaneously.

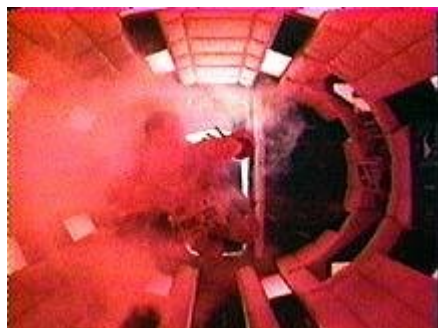
Perhaps the most dangerous part of decompression and exposure to vacuum is the decompression itself. If you were to hold your breath during the decompression, your lungs would burst, which would cause almost instant death. If your mouth is open but your lungs are still full of air, the rapid rush of air from your system could damage your respiratory system. Your ears would probably also be very severely damaged and tissue bleeding would start. Therefore, it would be important to exhale and keep your mouth open before an explosive decompression event. Generally, death in a vacuum ultimately occurs from a lack of air and failure of the circulatory system if one survives the initial decompression event.

So while going into a vacuum without a spacesuit is definitely not something you would want to try in real life, it is survivable provided you do not hold your breath and total

exposure time is less than about 90 seconds, and you could maintain consciousness for up to 15 seconds. Incidentally, the scene in 2001: A Space Odyssey, where the astronaut Bowman reenters his spacecraft without a helmet, is therefore not unrealistic.

Interestingly, on the STS-37 Shuttle mission, one of the astronaut's gloves was punctured during a spacewalk, and the astronaut did not notice until the EVA was over. The astronaut lost some blood into space with minor bleeding, but the blood clotted and prevented any further losses. The only damage was a painful scar that eventually went away.

For more information on this topic, visit the excellent page <http://www.sff.net/people/geoffrey.landis/vacuum.html>.



Astronaut Bowman tries to reenter his spacecraft without a helmet in 2001: A Space Odyssey

(Image from <http://www.sff.net/people/geoffrey.landis/vacuum.html>)

Moon Phases



January Celestial Events

By J. Randolph Walton (Randy)

Day	Date	Time (LMT)	Event
Wed	3	07:46	Moon Set
		08:57	Full Moon
		16:45	Moon Rise
		20:00	Quadrantid meteors peak (ZHR 120)
Sat	6	04:40	Jupiter Rises
		05:47	Mars Rises

		07:22	Sunrise
		16:50	Sunset
		18:10	Venus Sets
		19:50	Saturn Rises
		20:08	Moon Rise
Thu	11	07:45	Last Quarter Moon
		11:16	Moon Set
Sat	13	04:20	Jupiter Rises
		05:42	Mars Rises
		07:21	Sunrise
		12:06	Moon Set
		16:57	Sunset
		17:10	Mercury Sets
		18:26	Venus Sets
		19:20	Saturn Rises
Thu	18	16:25	Moon Set
		23:01	New Moon
Sat	20	04:00	Jupiter Rises
		05:37	Mars Rises
		07:18	Sunrise
		17:05	Sunset
		17:40	Mercury Sets
		18:42	Venus Sets
		18:45	Saturn Rises
		18:57	Moon Set
Thu	25	10:41	Moon Rise
		18:01	First Quarter Moon
Sat	27	03:40	Jupiter Rises
		05:37	Mars Rises
		07:13	Sunrise
		11:48	Moon Rise
		17:13	Sunset
		18:19	Saturn Rises
		18:20	Mercury Sets
		19:00	Venus Sets

Are you a S*T*A*R Member?

S*T*A*R is the proud owner of a **monstrous 25" Dobsonian Obsession reflector** – which YOU can gain access to as a S*T*A*R member! Meetings are the first Thursday of each month, except July and August, at 8:00 PM at the King of Kings Lutheran Church, 250 Harmony Rd. in Middletown. Meeting generally consist of lectures and discussion by members or guest speakers on a variety of interesting astronomical topics. S*T*A*R is a member of United Astronomy Clubs of New Jersey (UACNJ), the Astronomical League (AL), and the International Dark Sky Association (IDA).

Memberships: () Individual...\$25

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Make checks payable to: STAR
Astronomy Society, Inc. and mail to P.O.
Box 863, Red Bank, NJ 07701

In the Eyepiece

Here is a list of objects for this month. This is reproduced from www.skyhound.com with the kind permission of its creator and author of SkyTools Greg Crinklaw.

Object(s)	Class	Con	RA	Dec	Mag
M35 & NGC 2158	Open Cluster	Gemini	06h08m51.9s	+24°20'28"	5.6
M 38	Open Cluster	Auriga	05h28m39.4s	+35°50'24"	6.8
Sigma Ori	Multiple Star	Orion	05h38m44.8s	-02°36'00"	3.8
M37	Open Cluster	Auriga	05h52m22.3s	+32°32'40"	6.2
The Trapezium	Multiple Star	Orion	05h35m16.5s	-05°23'23"	5.1
NGC 2017/HR 1944	Multiple Star	Lepus	05h39m16.2s	-17°50'58"	6.4
Beta Mon	Multiple Star	Monoceros	06h28m49.1s	-07°01'59"	3.8
NGC 2112	Open Cluster	Orion	05h53m52.2s	+00°23'32"	9.1
IC 418	Planetary Nebula	Lepus	05h27m28.2s	-12°41'50"	10.7
NGC 1931	Open Cluster	Auriga	05h31m24.8s	+34°15'12"	10.1
IC 2149	Planetary Nebula	Auriga	05h56m23.9s	+46°06'17"	11.2
NGC 1893 & IC 410	Open Cluster in Nebula	Auriga	05h22m41.1s	+33°23'49"	7.8
M 50	Open Cluster	Monoceros	07h03m12.3s	-08°19'28"	7.2
Crab	Diffuse Nebula	Taurus	05h34m30.0s	+22°01'00"	8.4
NGC 2022	Planetary Nebula	Orion	05h42m06.2s	+09°05'10"	12.4
Hubble's Variable Nebula	Diffuse Nebula	Monoceros	06h39m12.0s	+08°44'00"	--
H 3-75	Planetary Nebula	Orion	05h40m44.8s	+12°21'16"	13.9
IC 421	Galaxy	Orion	05h32m14.8s	-07°55'01"	12.3
NGC 1999	Diffuse Nebula	Orion	05h36m24.0s	-06°43'00"	--
Focus on The Horsehead	Diffuse/Dark Nebula	Orion	05h41m00.0s	-02°27'00"	--
Abell 12	Planetary Nebula	Orion	06h02m21.4s	+09°39'07"	13.9
IC 443	Diffuse Nebula	Gemini	06h17m48.0s	+22°49'00"	12.0
Focus on the Cone Nebula	Open Cluster	Monoceros	06h41m03.2s	+09°53'07"	4.1
NGC 2242	Planetary Nebula	Auriga	06h34m07.4s	+44°46'37"	15.2
K 2-2	Planetary Nebula	Monoceros	06h52m28.4s	+09°58'17"	12.5