



The Custer Comment

★ For The Curious ★

February, 2005

Volume XXXV, Issue 2

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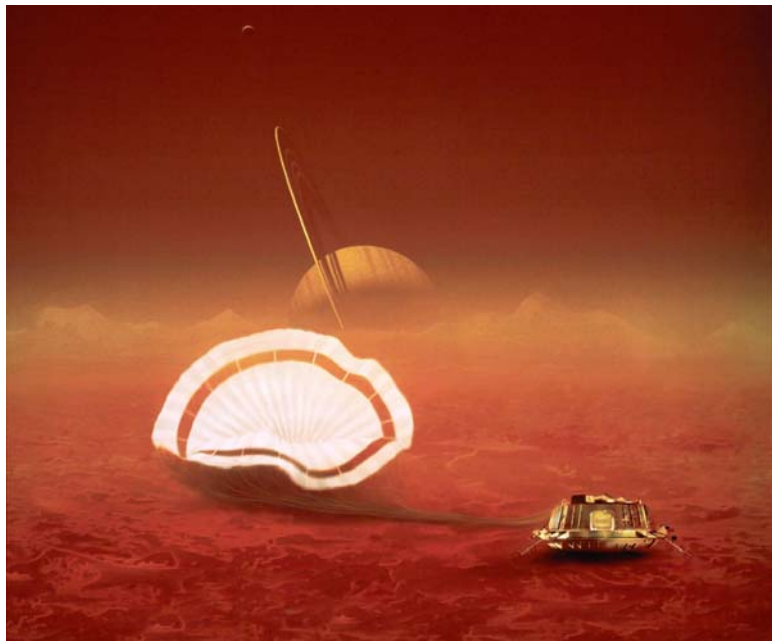
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HUYGENS ON TITAN! SUCCESS!



Artist's impression of the Huygens probe on Titan

Image, courtesy European Space Agency

First Color Image from the Surface of Titan!



This is the first *color photo* from the surface of an alien moon! The first image returned from the surface was a black and white, grayscale image. Spectral data returned from the probe was integrated into that grayscale image to create this color view. The colors are what would be seen by a visitor standing on Titan's surface. The sky really is orange and the surface is a muddy orange-brown, consisting mainly of water and hydrocarbon ice. To establish a size and distance reference frame, the objects in the foreground are approximately 1 meter from the camera and range in size from 9 to 15 cm. Unfortunately, this is the only view from the surface as the camera was fixed; where ever the probe landed, that would be the final view as there was no way to reposition the camera.

Image, courtesy ESA/NASA/JPL and the University of Arizona

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Announcements & General Interest

Custer in receipt of repaired C14 mount

Thanks to Custer member Kurt Massey, the CGE-14 has been remounted on the newly refurbished mount. 'First Light' date to be announced.

6 Week 'Astronomy 101' Course

We're already beginning the 3rd week of a 6 week course entitled 'Astronomy 101' offered by Custer member and Planetarium professional David Cohn. Classes began Wednesday evening, January 19th at 7:30 PM and will conclude on Wednesday, February 23rd, the final class. For those who still wish to attend, please come out to Custer for the next class.

Custer takes delivery of Satellite Internet and Television Service

Well, we have it! Broadband internet and television via satellite is now at Custer! The 1 meter elliptical, satellite dish was successfully installed on January 7th. Dan Geraghty and Clifford Wolff of Earthlinks Professional Satellite installers completed the installation during the waning hours of Friday, January 7th. The installation, which I supervised, was first-class and professional. Both gentlemen were in attendance for my program on the 15th. Thanks Dan and Cliff! As a general request, please DO NOT change the physical location or configuration of the Television satellite receiver, broadband modem or soon-to-be-installed networking components. One advantage of the new DirecTV satellite television service is that NASA television is carried as part of the basic service, the service that Custer is subscribed to.

Custer takes delivery of HDTV Flat Screen Television, Hi-Fidelity Multi-media System and VHS compatible Video Recorder

Custer now has a large-screen, high-definition television and companion hi-fidelity multi-media system. Included with the HiFi system is a matched set of loud speakers including a subwoofer. In addition, we have a brand-new, VHS compatible video recorder suitable for recording live programs or other noteworthy events at Custer.

New Refrigerator and New Kitchen and Bathroom Tile

Custer has a new look! Brand-new kitchen and bathroom tile have been installed at Custer. And thanks to Custer member and benefactor, Ruth Makofske, for our new, full-size refrigerator. Thanks Ruth!

Custer now has a presence on Yahoo!

If you would like to be "in the loop" on all the daily happenings at Custer such as last minute schedule changes, telescope maintenance, observers reports from the eyepiece and more, browse to <http://groups.yahoo.com/group/custerobservers> and sign up!

Board and Membership Meetings; Program and Movie, Sat, February 12th

Board meeting, 3:30 PM;

Membership meeting, 6:30 PM;

Program: update on the Custer astronomical image archive grant and project;

Movie: Apollo 17 lunar mission.

Editor's Column

Tom Madigan, Editor

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Cutoff for submissions is the 15th of the month preceding publication

Visit the new Custer Website at
<http://www.custerobservatory.org>

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I wish to extend a heart-felt *thank you* to all those who came out to attend my program '*Huygens Mission to Titan, a Landmark in Unmanned Space Exploration*' that was presented on Saturday evening, January 15th. Amid much preparation and anticipation, the program was a lively one that was fairly well attended. Following the main talk that featured a PowerPoint presentation interspersed with ad-hoc questions, answers and discussions, those in attendance were treated to a video replay of the ESA press conference immediately following the Huygens landing and reception of the first telemetry from the probe. Please refer to my 'Huygens Highlights' and 'Huygens Science Packages at a Glance' further on in this issue.

If you missed the program but are interested in listening to it in its entirety, you'll now be able to do so as the program was recorded with Custer's new VHS compatible video recorder. In addition, copies of the PowerPoint presentation used during the program are also available; just let me know how many copies you need. On Friday, January 21st, a last press conference was held by ESA and carried on NASA television. One week after Huygens' brilliant success, the team leaders of the various science packages aboard Huygens were able to announce some preliminary findings and release additional images. A copy of the ESA press conference video used during the program and this last one will be made and will become part of Custer's permanent archive.

Last month we had 2 Custer members switch to electronic delivery. Let's keep the trend going. All you have to do is to drop me an email at my email address, above, with 'Switch Custer Comment to Electronic Edition' in the subject and I'll take care of the rest.

Best,
Tom

Tom Madigan, Editor

HEAVENLY EVENTS TO WATCH FOR February, 2005

“ There where he moved the rocks to plow the ground
And plowed between the rocks he couldn't move,
Few farms changed hands; so rather than spend years
Trying to sell his farm and then not selling,
He burned his house down for the fire insurance
And bought the telescope with what it came to. “

- Robert Frost

Both MERCURY and VENUS have virtually dropped from sight in the dawn sky. Mercury will make a good appearance in the evening sky in mid-March, but you'll have to wait until sometime in May to catch a glimpse of Venus low in the west after sunset. MARS spends February in Sagittarius and can be found rising in the southeast about an hour before daybreak - around 4 AM by month's end. JUPITER spends February retrograding slowly westward past the 4.4

magnitude star θ (Theta) Virginis. Rising in the east by 10 PM at midmonth, Jupiter reaches due south (culminates) around 3:30 AM. The lone planet in the evening sky at nightfall, SATURN culminates at the same time Jupiter rises during the month, and sets in the west-northwest around daybreak. While enjoying Saturn by telescope later this month, drop about one degree to the south to find NGC 2392, the Eskimo Nebula.

2 Jupiter, now at -2.2 magnitude, begins to retrograde westward in Virgo as the Earth starts to catch up with it in our respective orbits.

5 Mars follows the waning crescent Moon up in the southeast at dawn.

8 New Moon this evening, just a day after its perigee. Tides may be greater than normal, especially in the event of a winter storm.

15 Algol, β (Beta) Persei, is in mid-eclipse at 11:48 PM, and again at 8:37 PM on the 18th.

19 Saturn chases the waxing gibbous Moon across the sky tonight, gaining on it until they set around daybreak. Tomorrow night the Moon will pursue Saturn.

23 Full Snow Moon tonight.

26 Now it's Jupiter's turn to chase the waning gibbous Moon after they rise late this evening. Tomorrow night Jupiter will rise first, with the Moon in pursuit.

Mar 3 Around 2:21 AM this morning the 3.1 magnitude star σ (Sigma) Scorpii will suddenly appear from behind the dark upper-right limb of the third quarter Moon, quite close to the lunar north pole. But the best occultation of the year is less than 4 hours away! Note that the 1.2 magnitude red star Antares, α (Alpha) Scorpii, isn't far to the Moon's left. Around 6:13 AM, in the gathering light of dawn, Antares will suddenly blink out behind the sunlit left limb of the Moon. And it will just as suddenly pop out from behind the invisible right limb of the Moon around 7:30 AM, well after sunrise. (That should be faintly visible through a telescope, using low power.) Unfortunately, the bright blue sky will almost certainly make it impossible to see the reappearance of the 5.5 magnitude companion star Antares B, which will occur about 5 seconds before Antares reappears.

Prepared by Robert Chapin

Editor: Serendipity, if ever I've seen it! About 2 weeks after publishing January's Custer Comment, I received an email from the author whose poem Bob referenced by way of excerpt in last month's column. As we all know, Bob uses famous sayings or poems to open his monthly column. Well, Lucille Ruga, the author of Bob's choice for last month, contacted me and was delighted that her work had found the light of day. The title of the full poem is 'Star Struck' and was featured in Sky and Telescope for March of 1979, page 245, under 'Letters'. While Lucille was enrolled at St. Petersburg Junior College in 1978, she was taking creative writing and Astronomy concurrently. Her fascination with the stars compelled her to write the poem that we have the pleasure of reading today. Her Astronomy professor, Philip Stern, after reading her work, suggested she submit it to a professional journal for possible publication. The rest is history! To this day, she still looks up at the sky and wonders. Congratulations, Lucille, Mr. Stern would have been proud!

Gift Corner & Classifieds

<p>WE HAVE METEORITES.</p> <p>Great sets mounted in beautiful display cases. Perfect for gifts.</p> <p>Custer coffee mugs, only \$4.</p> <p>Do you have <i>yours</i> yet?</p>	<p>The Gift Shop still has a dwindling number of copies of <i>ASTRONOMY FOR ALL AGES</i>, by Philip Harrington & Edward Pascuzzi, just \$20. As an added bonus, copies are signed by Ed Pascuzzi. We also have copies of <i>PARALLAX</i> by Alan W. Hirshfeld, guest speaker at the 2003 Jamboree. Quantities are limited so hurry and add this well-written and informative volume to your collection while supplies last.</p>	<p>We have Susan Harder's patented & dark sky friendly PARSHIELD® OUTDOOR FLOODLIGHT SHIELDS for PAR 38 type bulbs. Controls glare, reduces light trespass & allows you to direct the light where you need it. Two shields per box in your choice of Off White or Bronze finish for \$20.00, tax incl.</p>
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GOLDEN AGE OF AMATEUR SOLAR ASTRONOMY

THE ROCKLAND ASTRONOMY CLUB
IS PROUD TO PRESENT THE

2005 SECOND ANNUAL NEAF SOLAR STAR PARTY

APRIL 16 AND 17, 2005

At Rockland Community College, Suffern, NY

NEAF attendees are invited to observe the Sun with attitude, through a variety of Hydrogen-alpha and sunspot solar filters.

Join us, for two days of solar observing at NEAF 2005. No star party entrance fee or registration required.

Bring a piece of clear sky to share with vendors and fellow photon-deprived amateur astronomers.

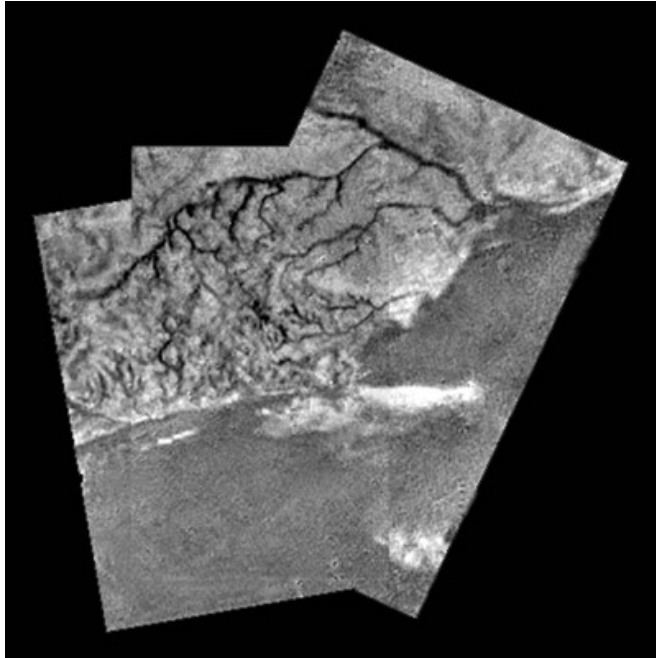
The 2005 Second Annual NEAF Solar Star Party will continue at the Rockland Astronomy Club Summer Star Party and Family Camping Vacation. The Summer Star Party is held from July 29 to August 7, 2005, at the private Shady Pines Campground, in Savoy, MA.

For further information check our web site: <http://www.rocklandastronomy.com>, call 201-768-6575, or send email to SummerStarParty@RocklandAstronomy.com.

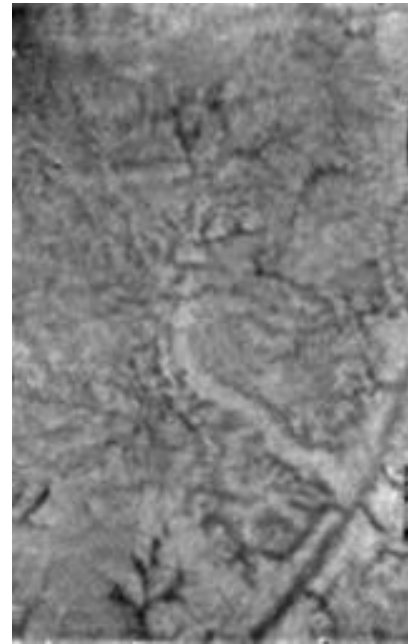
(Barlow) Bob Godfrey

<http://www.sungazer.net/field.html>

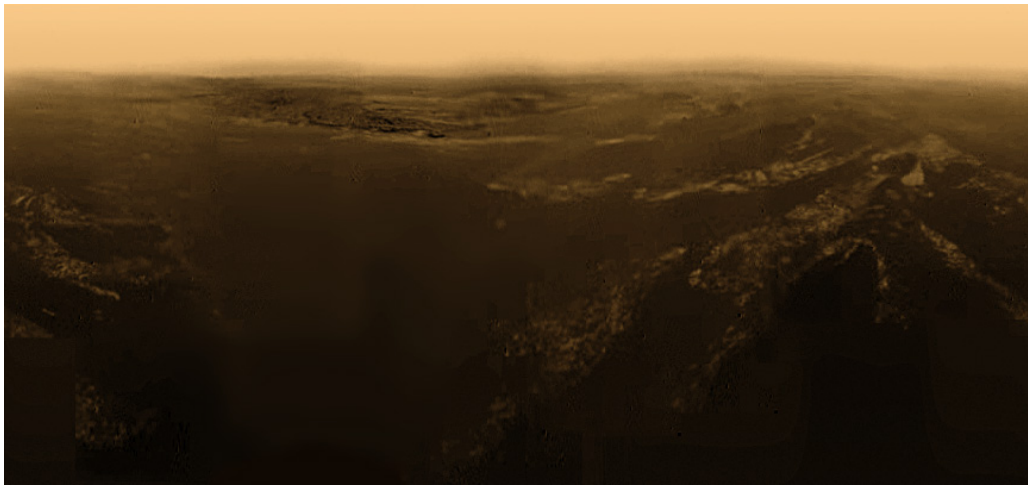
Huygens Highlights



Mosaic of Titan's surface as seen by the descending Huygens probe from a height of 16 kilometers. Evident in this image is the shoreline of a Methane sea with what may be Ethane or Methane clouds hovering above it. This image is replete with many features common to river outlets and deltas on Earth. Take note of the obvious channels, no doubt formed by recent fluvial activity.



A bright linear feature suggests an area where water ice may have been extruded onto the surface. Also visible are short, stubby dark channels that may have been formed by 'springs' of liquid methane rather than methane 'rain'.



This side-looking panoramic view from the descending Huygens probe was produced by a mosaic of images obtained from a height of 8 km. Top center in this image we can see the 'shoreline' visible in the 16 km view, above. As with the color image on the front page, the color was added with spectral data obtained from the probe. With this image, a real sense of height, depth and position can be obtained, much like the view from the side window of an aircraft flying at 25,000 ft (8 km).

All images on this page and in this article, courtesy NASA/JPL/ESA. The images on this page were obtained with the DISR, the Descent Imager-Spectral Radiometer, one of the 2 NASA science packages aboard the Huygens probe.

Huygens Science Packages at a Glance

DISR, Descent Imager-Spectral Radiometer

The DISR is one of the 2 NASA science packages aboard the Huygens probe and was primarily responsible for all the imaging. There were 3 separate cameras, a High Resolution Imager, a Medium Resolution Imager and a Side-looking Imager. A few hundred meters above the surface, the 20 watt lamp was switched on in the event of extreme low-light levels and to obtain spectra of the surface material. This spectra obtained by the DISR allowed imaging scientists to add color to the already spectacular images.

GCMS, Gas Chromatograph Mass Spectrometer

The was the 2nd of the 2 NASA science packages aboard Huygens. The Gas Chromatograph and Mass Spectrometer (GCMS) will measure the chemical composition of Titan's atmosphere from 170 km altitude (approx. 1 mbar) to the surface (approx. 1.5 bar) and determine the isotope ratios of the major gaseous constituents.

ACP, Aerosol Collector and Pyrolyzer

The Aerosol Collector and Pyrolyzer (ACP) is designed to collect aerosols in Titan's atmosphere for chemical composition analysis.

HASI, Huygens Atmospheric Structure Instrument

The Huygens Atmospheric Structure Instrument is a multi-sensor package designed to measure the physical properties of Titan's atmosphere. HASI will measure the temperature, the pressure, the turbulence, the atmospheric conductivity and will search for lightning.

DWE, Doppler Wind Experiment

This experiment would have been one of the victims of the 'Channel A' anomaly had it not been for the resourcefulness of Radio Astronomers, worldwide. Not only was the experiment executed flawlessly, as were all 6 onboard experiments, it was replicated by the ingenious integration of data from the worlds major radio telescopes that were 'listening' to Huygens. Further, the telemetry uplink from Huygens to Cassini was also monitored and recorded by some of the worlds major radio telescopes, notably the Robert C. Byrd radio observatory in Green Bank, West Virginia, albeit not at the reception power required to reconstitute the lost images that were part of the Channel A failure. This experiment measured relative winds at different altitudes in Titan's atmosphere.

SSP, Surface Science Package

The SSP contains a number of sensors designed to determine the physical properties of Titan's surface at the point of impact, whether the surface is solid or liquid.

Updates on the mission as well as the latest images and data can be found at <http://saturn.jpl.nasa.gov> (NASA) and <http://saturn.esa.int> (ESA).

M 45 in Taurus

Open Cluster

Messier 45

Position:

RA 03h 47m

Dec 24° 08'

Visual Magnitude 1.6

Distance 390 LY

Size 2°



The Pleiades quite striking in binoculars, I have often gazed for prolonged views at this delicious object. In telescopes of 5 inches or so you can just begin to see the nebulosity around the brightest stars. In fact the nebula surrounding Merope (23 Tau) is often visible in larger binoculars on a clear still night. Larger telescopes allow you to see deeper inside the cluster where more than 300 stars travel through space together.

M45 is more familiarly known as the Pleiades Cluster or the Seven Sisters. The Pleiades has been known and observed since ancient times. The ancient Egyptians named them Chu to represent the Goddess Net “divine mother of heaven”. The Japanese call them Subaru or “those gathered together”, an interesting side note here – if you examine the logo of the car maker Subaru, you will see the Pleiades stars in the design. The Hindus call them the flames of Agni god of fire. The Romans called it the Spring Virgins. The Aztecs named them Tianquiztli – “The gathering place”. Perhaps the most ancient of all astronomical references is of the Pleiades in ancient Chinese text of more than 4000 years ago naming them Kimah.

The Pleiades was born perhaps 20 Million years ago and consists of a variety of young stars. It is located approximately 400 million years distant and is traveling at some 5.5 arc seconds per century per second to the SSE. This corresponds to 25 miles per second actual space velocity relative to the sun. They are receding from us at the rate of 4 miles per second.

Pleione is also known as BU TAU is a variable star of irregular type. It has ejected several shells of gas in the past century and has been studied for X-ray emissions, which seem to indicate it may have a dwarf companion star. For Variable star observers, this object is of particular interest as it represents a particular class of stars called Be-Shell Stars. This is a star of spectral type *B* which has *e* emission lines of Hydrogen in its spectrum. This indicates that a shell of Hydrogen surrounds the star and is being excited by the energy of the star to emit light in the particular “Hydrogen Emission Lines” of color. This shell of gas seems to be caused by enormous stellar winds, explosive events in the stars and rapid rotation, often as much as 300 miles per second. These are huge stars 3-10 times the diameter of the sun and many times the sun's mass.

The Pleiades is an easy object to photograph. From a 50mm lens on a 35mm camera to wide field telescopic CCD imaging, The Pleiades is one of the most beautiful objects to image.

Located 12° NW of the Hyades star cluster in Taurus.

Suggested Instruments:

Binoculars

Finderscope

2+ inch refractor

3+ inch reflector

3+ inch plus catadioptric

Copyright, 2004 Charles A. Cardona III. This page is an excerpt from his upcoming book ‘Star Clusters for the Amateur Observer’; reproduced with permission.

Hubble in Jeopardy

Not only are any future, manned servicing missions to the Hubble likely to be scuttled, the Hubble mission, itself, is in jeopardy. In their FY'06 budget, the Bush administration has proposed cutting all funding for the vaunted space telescope, including SM-4. What's so odious about this latest attack on the HST, is that NASA administrator O'Keefe first cancelled SM-4 ***one day*** after President Bush announced his "moon/mars" initiative, and also immediately after HST unveiled, ironically, the Ultra-Deep Field images. What can be surmised is that the administration asked O'Keefe to find a paltry \$1B within NASA to 'kick off' the moon/mars initiative, and, as a bean counter would, he took it from HST - or tried to. The outrage was like the shot heard round the world. The bipartisan house and senate resolutions to restore SM-4, and the most recent National Academy Report (<http://www4.nationalacademies.org/news.nsf/isbn/0309095301?OpenDocument>) resound from that echo - but President Bush, interested in a specific militaristic agenda for future US space initiatives and Sean O'Keefe, a political hack and member of the good o'l boy club, feigning 'safety concerns', both turn a deaf ear. The safety argument is superfluous, and those who have actually studied that, know that.

The next page contains a generic letter suitable to be copied and mailed to your Senate and Congressional representatives. Please send out your letters soon. Following the last paragraph on this page are the URLs for the US House of Representatives and the US Senate. In addition to contacting your own representatives, please contact Senator Barbara Mikulski (D-MD), the ranking Democratic member of the Senate Appropriations subcommittee that oversees NASA's budget. She represents the Maryland constituency that is home to two major Hubble facilities, the Space Telescope Science Institute in Baltimore and NASA's Goddard Space Flight Center in Greenbelt. In addition, please contact US Representative Sherwood Boehlert (R-NY) from NY's 24th congressional district. He has just been reelected as the Chairman of the House Science Committee for the 109th Congress and would be very interested in hearing from New Yorkers and their concerns for the HST.

When contacting congress, the contact priority is regular mail, phone, fax, and finally, email. Email correspondence, although the safest, is, ironically, relegated to a low-priority. Make sure you sign your letter and have your return address clearly indicated in the heading. Congress really DOES listen. We have to act soon before HST is slammed into the Pacific with WFC-3 and COS still sitting in a warehouse in Maryland. For additional information or to make a contribution, please visit Save the Hubble at <http://www.savethehubble.com> .

Capitol Switchboard: (202) 224-3121;
United States House of Representatives: <http://www.house.gov> ;
United States Senate: <http://www.senate.gov> ;
Senator Mikulski: <http://mikulski.senate.gov> , (202) 224-4654 (Voice)
Rep. Boehlert: <http://www.house.gov/boehlert> ,
(202) 225-3665
(202) 225-1891 (fax)

Honorable _____

RE: Funding for the Hubble Space Telescope

Dear _____,

Reuters reported on Sunday, January 23rd that on February 7th the Bush administration will announce a proposal to cut funding for the Hubble Space Telescope. As you know, the Hubble Space Telescope continues to provide unprecedented advances in our understanding of the universe while, at the same time, providing breathtaking images of the cosmos, images and data only attainable from its vantage point in space. The impact of this proposed cut would not only be devastating to universities, astronomers and scientists here in the US, it would be international in scope, as many universities, scientists and astronomers from many different countries use the Hubble Space Telescope.

While the proposed funding cut would end the Hubble mission and prematurely bring to a close an unprecedented chapter in discovery, astronomy and science, it would also preclude any attempt at a servicing mission to repair / upgrade the vaunted space telescope.

While the new state of the art Wide Field Camera 3 (WFC-3) and the Cosmic Origins Spectrograph (COS) lie dormant in a Maryland warehouse, awaiting delivery to the HST to continue the telescope's unprecedented legacy of science and discovery, the fate of the HST is being decided.

As you're probably aware, bipartisan house and senate resolutions to restore funding for the 4th servicing mission and the most recent National Academy Report, concluding favorably for a manned mission to service the HST, have broad popular support, the administration and NASA administrator O'Keefe are pressing ahead with their plan to see the HST prematurely slam into the Pacific in the very near future. [As your constituent,] I respectfully ask you to protect funding for the Hubble Space Telescope, and ultimately keep alive the possibility of a servicing mission.

Regards

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