

# The Custer Comment

★ For The Curious ★

July 2006

Volume XXXVI, Issue 7

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## **June's Strawberry Moon Rises Over Custer**



Image, courtesy Tom Madigan

In this view looking east, the June or Strawberry moon looks down warmly on a peaceful Southold field adjoining Custer Institute's southern border with Custer's radio telescope dish visible in the foreground. This evening, complete with observing through the newly-installed 16" telescope and amid song and merriment that featured the music of *Dreamer*, was the finally and culmination of Custer's annual meeting and barbeque. For those interested in the legend and lore surrounding the moon and its significance throughout history, specifically what name is associated with it for each month of the year, please navigate to the Farmers Almanac at <http://www.farmersalmanac.com/astronomy/fullmoonnames.html>. The "Strawberry Moon" was universal to all Algonquin tribes and was named as such to signify the relatively short Strawberry harvest season that occurs during the month of June.

### **Highlights for July 2006**

- Summer Skies and Summer Seas, July 15<sup>th</sup>
- New York State's Marine Life, July 22<sup>nd</sup>
- The Moon: A New Look at an Old Friend, July 29<sup>th</sup>

For these events and other exciting programs at Custer, please see inside.

## **Table of Contents**

July 2006	Volume XXXVI, Issue 7	1
Executive Board		1
<b>PRESIDENT</b>		1
<b>VICE PRESIDENT</b>		1
<b>TREASURER</b>		1
<b>SECRETARY</b>		1
<b>FINANCE CHAIR</b>		1
<b>DIRECTORS</b>		1
June's Strawberry Moon Rises Over Custer		1
Table of Contents		2
Editor's Column		3
Long Island High School Seniors Excel		4
Patchogue-Medford High Honored by Senator Charles E. Schumer		4
2006 Vail Scholarship Awards		4
The Tyranny of Indifference		5
How Inaction Allows Special Interests To Prevail and Fails the Common Good		5
Announcements & General Interest		7
Training Program For Use Of Custer Equipment		7
Custer Institute Election Results		7
Heavenly Events To Watch For July 2006		9
Highlights for July 2006		10
Kayak U, With Pam and Stu: Summer Skies and Summer Seas, July 15 <sup>th</sup>		10
New York State's Marine Life, July 22 <sup>nd</sup>		10
The Moon: A New Look at an Old Friend, July 29 <sup>th</sup>		10
First Image Obtained Through Custer's 16" LX-200		11
Richard Olson, Ash Manufacturing President, Replies		11
Dr Carolyn Porco and the Imaging Team at CICLOPS Pay Tribute to Paul McCartney on The Occasion of his 64 <sup>th</sup> Birthday		12
Annual Membership Meeting, Barbeque and Concert were a Day to Remember!		13
ASLI Hosts H. Philip Stahl, PhD, Senior Optical Physicist		14
Hubble in the News		14
Possible Restoration of Hubble SM4		14
Hubble Reveals Two Dust Disks Surrounding Beta Pictoris		15
Message from Dr Carolyn Porco		16
SATURN'S FAINT RINGS SHARE SOME OF THEIR SECRETS		17
Pluto's Two Small Moons Christened Nix and Hydra		19
An Urgent Request for Assistance from Dr Carolyn Porco		20
In An Independence Day Fireworks Display to Trump all Others, STS 121 Roars into Orbit Under Clear, Blue Florida Skies!		21

## Editor's Column

### Tom Madigan, Editor

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Cutoff for submissions is the 15<sup>th</sup> of the month preceding publication

Visit the new Custer Website at

<http://www.custerobservatory.org>

Custer Comment Archive:

<http://www.tommadigan.net/custer>

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*"I have loved the stars too fondly to be fearful of the night."*

*Sarah Williams*

Summer is finally here! The hot, humid, balmy days of July and August are upon us and weather and sky conditions permitting, a great opportunity to take in the rich splendor of the Summer Milky Way. Placed prominently, high in the south-southeast at mid-evening, the Summer Triangle consisting of Vega, Deneb and Altair can be seen and if you're favorably located away from light-polluted skies, the full, ethereal beauty of the center of our galaxy, complete with the Scutti Star Cloud, can be seen in all its glory running though Sagittarius and Scorpio. Antares, the heart of the Scorpion, is prominent and favorably placed on the meridian after midnight at this time of year.

Best,

Tom

*Tom Madigan, Editor*

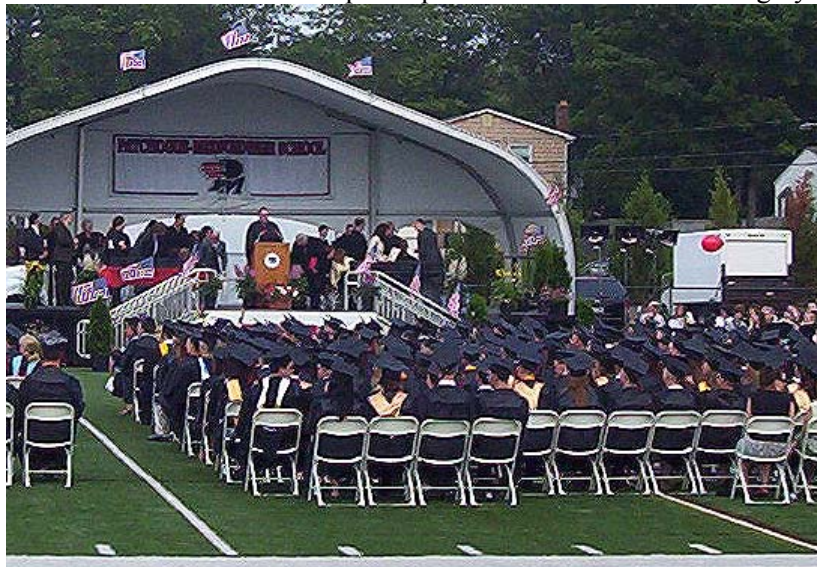
"To the youngsters of today, *I say believe in the future*, the world is getting better; there still is plenty of opportunity. Why, would you believe it, when I was a kid I thought it was already too late for me to make good at anything."

*Walt Disney*

## **Long Island High School Seniors Excel**

### **Patchogue-Medford High Honored by Senator Charles E. Schumer**

Amid cheers from 688 graduating seniors gathered on the football field and their parents gathered in the bleachers, Senior United States Senator from New York, Charles E. Schumer, delivered the keynote Commencement Address at the Patchogue-Medford High School graduation ceremonies. This editor was one of those proud parents in the bleachers that gray and threatening day on June 23<sup>rd</sup>.



Having just completed the Keynote Commencement Address for the graduating class of 2006 at Patchogue-Medford High School, Senator Charles Schumer can be seen in the center of the image, wearing a gray suit and speaking to one of the school officials. Also present at the ceremony was Brookhaven Town Councilman Tim Mazzei. Patchogue-Medford High School Principal, Jay Matuk, affirms the senator's remarks to the assembled seniors

Image, courtesy Tom Madigan

While ineligible to receive Custer's Vail scholarship, the editor's son, Patrick, is to be commended and recognized for his outstanding academic achievements during his 4 years at Patchogue-Medford High School. During his junior year, he received a 95% in Advanced Placement World History, earning him 3 college credits. In his senior year, those achievements included an overall final grade-point average of 95%, a 98% in Honors Mathematics, a 98% in College Earth Science, the highest grade in the class and one that earned him 4 college credits, the Henry P. Read Scholarship and acceptance to SUNY Stony Brook. Patrick will begin his college studies at Stony Brook in the fall as a Mathematics / Earth-Space Science double major. Congratulations, Patrick!

### **2006 Vail Scholarship Awards**

Each year, Custer Institute gives an award to students graduating from area high schools. Students are selected on the basis of having distinguished themselves in their study of science (preferably astronomy). This year, the amount of the award was increased to \$200 per student, in addition to a complimentary Custer membership. The 2006 award recipients are:

- Elyse Kroll, Mattituck High School;
- Sam Notaro, Southold High School;
- Alison Wells, Greenport High School;

Custer's Board of Directors would like to congratulate these students, as well as extend their best wishes for continued success in their college studies and future careers. The Board would also like to thank all those who assisted in the award process, especially Bill Bogardus, George LoMaga, and Colin VanTuyl.

**Editor:** The Vail Scholarship is restricted to deserving students who graduated from Mattituck, Southold and Greenport High Schools. Possibilities are being explored that may allow Custer to expand its financial recognition to include other school districts.

## ***The Tyranny of Indifference***

How Inaction Allows Special Interests To Prevail and Fails the Common Good

By Tom Madigan

The forefathers of this country knew well of tyranny and framed our constitution such that all would have a voice in government regardless of economic standing, demographics, population density or influence. Unfortunately, the dysfunctional leadership in Albany is tone deaf when it comes to the notion that in our system of government, a Constitutional Republic, the aggregate will of the people is determined by their elected representatives in the Legislature, not by wealthy and influential power brokers. They listen to who has the loudest voice and wields the most influence. In theory, or at least at the time it was designed, our government was a participatory one, participatory more out of necessity than of choice: your life depended on who represented you and how well they did their job. This sense of participation in government is all but lost today.

For the 3<sup>rd</sup> year in a row, the Healthy, Safe and Energy Efficient Outdoor Lighting Act (2005 — A7404/S4474) has been tabled without being passed on for action by the governor who, the last time he had an opportunity to sign the bill, vetoed it. Having been passed by the Assembly in 2005, the bill started this year in Assembly Rules and was discharged from there to the floor on February 18th. The bill passed the Assembly on May 10th, 99 to 32, and reached the Senate floor, where it completed the required "third reading" on May 22nd.

Enter the New York *City* Department of Transportation (<http://www.nyc.gov/html/dot/home.html>) and to a lesser extent, the New York State Conference of Mayors ( <http://www.nycom.org> ), 2 agencies, among other entities that include the Energy Association (<http://www.energyny.org>), who brought their considerable influence to bear on the Senate Majority. Until you understand how the political game is played in Albany, it beggars reason why a bill's sponsor wouldn't do everything in their power to see to it that the bill receives every consideration and that it, at least, is put out on the floor for a full vote.

Excoriating individual senators for not listening to the occasional fax, letter, email or phone call would do little good and would be misguided. From their point of view, the merits of our cause notwithstanding, we didn't make a strong enough case and didn't garner sufficient support to overcome the considerable influence of those who aren't convinced that our view is the correct and proper one and in the best, long-term interests of the entire state. In short, those who advocate for a sensible, efficient and dark-sky friendly approach to outdoor lighting didn't have the loudest voice and *that* is no one else's fault but their own. The current majority party is more inclined to listen to who wields the most influence and has the loudest voice and that is a political reality. Having said that, one is inclined to ponder: Which is worse, the ***Tyranny of Influence*** or the ***Tyranny of Indifference***? Without indifference, the effects of inappropriate or untoward influence would be short lived and that should be the lesson learned. The NY State Legislature has now recessed for the summer and will reconvene in the fall. HSEEOLA will, again, come up for consideration. The time to prepare and strategize for that eventuality is now. With the possibility of the political landscape changing by the time the Legislature reconvenes,

combined with sufficient grass-roots support, the Healthy, Safe and Energy Efficient Outdoor Lighting Act could become law. Let us not squander this opportunity to regroup.

Citing maintenance issues of some 333,000 (that's *three hundred and thirty three thousand*) luminaires currently installed in the 5 boroughs of New York and *non-binding* uniformity standards published by the Illuminating Engineering Society of North America (<http://www.iesna.org>), the NYCDOT was one of several entities that successfully lobbied Albany lawmakers to table the bill. In their opposition letter, they claim that the full cutoff fixtures will require the installation of additional luminaires due to the zero-uptight, 100% downlight quality of the full cutoff luminaire, thereby negating any environmental benefit. SELENE-NY (<http://www.selene-ny.org>) has empirically demonstrated that a particular make and model full cutoff luminaire meets or exceeds the IESNA standards that NYCDOT claims to require for Manhattan streets. The Opposition Letter went on to state that they've just retrofitted 60,000 of the existing 333,000 luminaires with 250 Watt HP Sodium Vapor lamps, replacing the 400 Watt lamp of the same designation. With HSEEOA in place and using the luminaire specified in SELENE-NY's demonstration, *it is conceivable* that they could replace the *remaining* 400 Watt lamps with 250 Watt lamps, almost cutting in half the bill New York City taxpayers currently pay to Consolidated Edison to light up the night sky. This savings would amount to a monthly *savings* of **\$3,147,000** and the concurrent reduction of greenhouse gas production in the amount of **20752 tons per month!**

HSEEOA failed to become law for 3 reasons:

- 1) the successfully lobbying by powerful agencies and business concerns who leveraged the general ignorance of lawmakers, eager to maintain the status quo and not rock the boat;
- 2) a problematic legislature and; most significant,
- 3) the inability to mount a compelling and persuasive argument in support of HSEEOA's passage.

While NYCDOT should be taken to task for ignoring or disregarding SELENE-NY's recommended solution, the real reason for HSEEOA's failure is widespread apathy and the ***Tyranny of Indifference!***

While not specific to streetlight *installation*, per se, but for their repair, the following story speaks to what is possible when money, power and influence are allowed to creep into public institutions *unopposed*:

[http://www.selene-ny.org/index.php?module=announce&ANN\\_user\\_op=view&ANN\\_id=24](http://www.selene-ny.org/index.php?module=announce&ANN_user_op=view&ANN_id=24):

*“According to the NY Times, on March 3rd, the FBI raided the offices of Brian M. McLaughlin, President of the New York City Central Labor Council. The FBI stated that the raid was part of their investigation into whether Mr. McLaughlin had received improper payments from electrical contractors and whether he had played a role in a scheme to fix bids for City streetlighting contracts”;*

<http://select.nytimes.com/gst/abstract.html?res=F50B12FF3F550C708CDDAA0894DE404482>

(this is an abstract; anyone who would like the full article, please send me an email and I will send it to you).

Based on the stated number of luminaires installed in the 5 boroughs of New York with 250 Watt High Pressure Sodium Vapor lamps installed in each, the following are some interesting statistics:

- the City of New York consumes 83.2 MW of power to light up the night sky;
- this power consumption produces:
  - **492,840 tons** of CO<sub>2</sub> (Carbon Dioxide) per year;
  - **3230.1 tons** of SO<sub>2</sub> (Sulfur Dioxide) per year;
  - **1969.8 tons** of NO (Nitrogen Oxide) per year;
  - **\$75,527,730** is paid to Consolidated Edison per year by the taxpayers of the City of New York.

**Note:** These calculations are based on all 333,000 luminaires containing 250 W lamps. In actuality the values are greater. Only 60,000 of the 333,000 luminaires or 18% contain 250 W lamps; the remainder contains 400 W lamps.

A related Op-Ed appeared in Newsday ([http://www.newsday.com/news/opinion/ny-vpref034805210jul03\\_0\\_4371304.story?coll=ny-editorials-headlines](http://www.newsday.com/news/opinion/ny-vpref034805210jul03_0_4371304.story?coll=ny-editorials-headlines)) for July 3<sup>rd</sup>, 2006, entitled: **Reform in Albany?** The following is an abstract from that Op-Ed: “*Last year, under pressure from voters tired of Albany's chronic dysfunction, lawmakers developed a sudden appetite for reform. This year, they lost it - especially the Republican Senate - and failed to reach consensus on changes in the way the state budgets, borrows, elects and deliberates. That's too bad. Albany is still too secretive and too subject to the influence of money to assure a fair hearing for all but the rich and powerful few.*”

**Editor:** Any opinions expressed in this article are the private opinions of the author and may not reflect the official position of Custer or its Board of Directors. The author is a member of the International Dark Sky Association (<http://www.darksky.org>) and SELENE-NY (<http://www.selene-ny.org>), the NY State affiliate of IDA, and has been a long-time advocate for a sensible, efficient and dark-sky friendly approach to outdoor lighting.

## **Announcements & General Interest**

### **Training Program For Use Of Custer Equipment**

At their May 20, 2006 meeting, Custer's Observatory Committee decided to initiate a new program involving the use of the observatory's equipment. Any Members wishing to use the equipment must undergo a training program. In exchange for this instruction and access to the equipment, trainees will be required to commit to serving as volunteer Observatory Staff a minimum of four Saturday evenings per year (or some mutually agreed upon equivalent). For further information, contact Observatory Director, Jeffrey Katz ([katz@scientific-consultants.com](mailto:katz@scientific-consultants.com) or 631-696-3333).

### **Custer Institute Election Results**

The election is complete with the following **changes** in effect. The full slate of officers is available on the front page of every issue of the Custer Comment.

- Chuck Cardona retained as Custer's President;
- Kurt Massey, Vice President, replacing Bob Vanson;
- Brian Andrews, Esq., added to the Board of Directors, replacing Kurt Massey.

## Gift Corner & Classifieds

**We Have Meteorites!**

**Great sets mounted in beautiful display cases. Perfect for gifts.**

**Custer coffee mugs, only \$4.**  
Do you have yours yet?

**Custer Dome Assembly and Raising DVD \$15.00**

2 Payment Options:  
1) Mail a check or money order, payable to Custer Institute, to this editor's address with a note indicating how many copies you would like; 2) Paypal to [CusterPaypal@yahoo.com](mailto:CusterPaypal@yahoo.com) followed by an email to this editor indicating the number of copies ordered and shipment instructions. Before shipment, I will confirm with Barbara that payment has been made. All my contact info is always published on page 3.

### An Evening With John Dobson

VHS or DVD format, \$15.00, \$3.75 S & H

On September 17, 2005, noted sidewalk astronomer and cosmologist, John Dobson, visited Custer. He presented his classic cosmic slide show, packed with information and delivered with inimitable wit; he shared stories about his life as a monk, secretly grinding mirrors, making telescopes and introducing the public to the wonders of the night sky. Board member, Rich Huber, filmed this memorable event and has made copies on VHS and DVD. Running time is approx. 90 minutes. The cost: \$10 with 25% of the proceeds going to John Dobson's San Francisco Sidewalk Astronomers Association and a nominal \$3.75 for shipping and handling. You can pay for your tape using Paypal by sending \$13.75 to [CusterPaypal@yahoo.com](mailto:CusterPaypal@yahoo.com) or by sending a check or money order (made payable to *Custer Institute*) to: Dobson at Custer, P.O. Box 1204, Southold, New York 11971. Please specify whether you would like VHS or DVD. If you have any questions, please contact Donna McCormick at [mccormick@scientific-consultants.com](mailto:mccormick@scientific-consultants.com).

### Custer T-Shirts



Image, courtesy Tom Madigan

The editor's daughter, Kaitlin, sporting a Custer T-Shirt at Horton Point Lighthouse on Jamboree '05 night! The shirts are 100% heavy-weight cotton, machine-washable, and are available in adult sizes S-M-L-XL-XXL. The cost is \$15 plus \$3.75 S & H and the shirts are available only while supplies last. Custer would also like to *thank the East End Shirt Company* in Port Jefferson for their generosity and for having done an excellent job in producing such fine quality shirts on such short notice.

We have Susan Harder's patented & dark sky friendly **PARSHIELD®**

### Outdoor Floodlight Shields

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By  
*Phil Harrington & Ed Pascuzzi*

The Gift Shop still has a number of copies of this latest volume by Phil Harrington with co-author Ed Pascuzzi. Get your copy while supplies last. At just \$20, this is a real bargain! As an added bonus, copies are signed by Ed.

### PARALLAX

By  
*Alan W. Hirshfeld*

We also have a limited number of copies of this excellent volume by 2003-Jamboree guest speaker Alan Hirshfeld. Quantities are limited so hurry and add this well-written and informative volume to your collection while supplies last.

## Heavenly Events To Watch For July 2006

“ On a rubbish heap  
the soft light falls  
on a sofa spring ;  
changes a gaudy gilded vase  
to a priceless thing .

Moonlight gleams  
on the twisted shape  
of an old beer can ;  
tints with silver  
the dented chrome  
of a wrecked sedan.

How strange the alchemy of night  
when grime and grease  
dissolve to make  
this rusted stove  
a museum piece ! “

Jean Conder Soule

will join Mercury in the dawn sky in Scorpius on December 10 and 11, the closest clustering of three planets in the first half of this century! Binoculars and a clear sky just above the southeast horizon will be needed to see it.

10 Full Buck Moon tonight.

17 Around 2:12 AM this morning the 4.5 magnitude star  $\epsilon$  (Epsilon) Piscium will suddenly appear from behind the dark right edge of the Moon, which is approaching third quarter phase.

20 As the waning crescent Moon rises in the early morning hours this morning, it will be in the company of the Pleiades star cluster, and several of the brightest Pleiads will already be occulted behind the Moon's disk. Around 3:28 AM the 3.0 magnitude Alcyone,  $\eta$  (Eta) Tauri, will also disappear behind the lighted top-left edge of the Moon, and it will reappear along the dark top-right edge around 4:09 AM. Meanwhile, around 3:38 AM Merope, 23 Tauri, will pop out from the dark upper-right edge. Finally, in brightening dawn skies, at 4:57 AM we might glimpse Atlas, 27 Tauri, emerge from the Moon's (probably invisible) right edge.

20 On July 20, 1976, 30 years ago, Viking 1 soft-landed on Mars' Chryse Planitia, and began to test its soil and return the first images of and from Mars' surface.

22 After daybreak the crescent Moon is directly above the rising Venus low in the east-northeast.

22 Using binoculars, find Mars sharing the same field of view with and setting directly above the slightly brighter star Regulus, very low over the west-northwest horizon an hour after sunset.

28 Early morning observers might spot a few faint meteors rising out of the southeast or south. These are likely to be South Delta Aquarids, with a couple Piscis Austrinids mixed in. No moonlight!

In July we can find VENUS bright and perky over the hazy east-northeast horizon after daybreak. The evening sky includes JUPITER, well down in the south-southwest sky by nightfall, and setting soon after midnight. This month Jupiter stops its (apparent) retrograde motion and starts moving back eastward through Libra. As July begins MARS and SATURN can be spotted with binocular help very low in the west-northwest an hour after sunset, and MERCURY is virtually lost along the horizon beneath Saturn. Saturn itself is lost by midmonth, and Mars too is gone by month's end.

1 Saturn is  $7^\circ$  below and to the right of Mars very low over the horizon after sunset.

2 At 1 PM: Exactly half a year before the ball drops at Times Square.

3 At a distance of about 94.5 million miles, the Earth reaches its farthest distance from the Sun today. It's at aphelion.

5 Jupiter is the crown jewel atop the waxing gibbous Moon tonight.

6 Retrograde motion ends for Jupiter in the western reaches of Libra. Now it will be moving eastward, or prograde, just north of the ecliptic path for the rest of the year. Mars is already enroute eastward; and the two planets

*Prepared by Robert Chapin*

## **Highlights for July 2006**

Kayak U, With Pam and Stu: Summer Skies and Summer Seas, July 15<sup>th</sup>

Come tour the Universe with us by kayaking the waters at Orient State Park, followed by a tour of the night sky presented by Custer Institute Staff. We'll meet at Orient State Park at 12:30 PM. Custer Members, Pam and Stu Selkin, certified kayaking instructors and Board Members of the North Atlantic Canoe and Kayak club (<http://www.getthenack.org>), will provide a comprehensive, hands-on course that emphasizes water safety, kayaking fundamentals and fun. Then, under their watchful eye, we'll paddle along some of the most exquisitely beautiful shoreline that Long Island has to offer. Plan on getting wet, so wear a bathing suit, bring a towel and a change of cloths. Following our Kayaking adventure, all are welcome to visit Custer, enjoy a BBQ and learn about the night sky from Custer Staff.

When: 12:30 PM, sharp;  
Where: Orient Point State Park;  
Cost:

- Kayak U: **\$40\*** for Custer Members, **\$50\*** for Non-Members. This includes a \$20 equipment rental fee, paid to The Eagle's Neck Paddling Company, for everything that you'll need:
  - Kayak;
  - Spray skirt;
  - Flotation vest and paddle;

The remaining proceeds are for the exclusive benefit of Custer Institute;

- BBQ: \$12 extra;
- Per-car fee to park at Orient State Park: \$8 (we'll help arrange car-pooling);

Rain date: July 16<sup>th</sup>;

For more information or to pre-register, call (631) 692-7362 and ask for Pam or email Stu at [skydoc@prodigy.net](mailto:skydoc@prodigy.net). Pre-registration by July 8<sup>th</sup> is a must.

New York State's Marine Life, July 22<sup>nd</sup>

Learn about New York State's marine mammals and sea turtles from the Director of the only rescue program in New York State. Robert DiGiovanni is a Custer Member and the Director and Senior Biologist of The Riverhead Foundation for Marine Research and Preservation.

When: 7:30 – 9:00 PM;  
Suggested donation: \$10, Custer members; \$13, non-members. Half of the proceeds will go directly to The Riverhead Foundation.

The Moon: A New Look at an Old Friend, July 29<sup>th</sup>

Dr. Mike Inglis will present a fresh look at the lesser orb of our skies, often the subject of myth and lore, by discussing it's ancient and violent past, the present and what eventualities may befall it in the distant future;

When: 6:00 – 7:30 PM;  
Live concert to follow at 8:00 PM. Details to be arranged.

**Editor:** \* ==> July 4<sup>th</sup> special!

## **News and Noteworthy**

### First Image Obtained Through Custer's 16" LX-200



Image, courtesy Tom Madigan

This image of Jupiter was obtained on June 10<sup>th</sup>, 2006 by Tom Madigan using axial eyepiece projection through a Kodak 2.1 MPixel digital camera. Eyepiece projection is otherwise known as the Afocal method. Evident in the image are some of Jupiter's more prominent bands with 2 of the 4 Galilean satellites to the left. Adobe Photoshop, v 7.0 was used for some modest image enhancements.

### Richard Olson, Ash Manufacturing President, Replies

Good morning Mr. Madigan,

Thank you very much for the great links and all the photos. I will pass the information along to our guys. I am fortunate to have people working here (not the most polished) that genuinely take pride in their work. Jim and John just returned from SDSU Mt. Laguna, Ca.

Brian and Dave are in Athens, Greece setting a dome similar size as to Custer's Ash-Dome. Please thank all the people involved in making the construction of our dome at Custer Institute a success. Yes, our dome. Even though you (Custer) owns it, it is still belongs to Ash. Ha.

Have a great holiday and it is hoped you get many years of service from you're new Ash-Dome.

Thank you again.

Yours truly,  
Richard Olson - pres.  
Ash Mfg. Co.

Dr Carolyn Porco and the Imaging Team at CICLOPS Pay Tribute to Paul McCartney on The Occasion of his 64<sup>th</sup> Birthday

MEDIA RELATIONS OFFICE

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Preston Dyches (720) 974-5859  
CICLOPS/Space Science Institute, Boulder, Colo.

Image Advisory: June 18, 2006

A SATURNIAN MUSICAL CELEBRATION TO HONOR PAUL MCCARTNEY

On the occasion of Paul McCartney's landmark 64th birthday, the Cassini Imaging Central Laboratory for Operations (CICLOPS) is releasing today an 8-minute movie as a birthday gift to the former Beatle. Sixty-four of the most dramatic and spectacular images taken by NASA's Cassini spacecraft, including one mosaic from the European-built Huygens probe of the surface of Titan, are composed together in a cinematic voyage through the Saturn system and put to the music of the Beatles.

"In their creation of new musical forms and directions, and in their expansive vision of the art of popular music, the Beatles reached heights of achievement in their brief time together that nobody has been able to surpass", said Carolyn Porco, Cassini imaging team leader and the producer/director of the movie. "And being a major element in that incredible story makes Paul McCartney, in my mind, one of planet Earth's brightest stars. It makes me very happy to be able to celebrate him in this way. I hope he likes our movie."

The movie 'Sixty-four Sights from Saturn' is available today on the home page of <http://ciclops.org>. High resolution versions may be obtained by emailing [cpcomments@ciclops.org](mailto:cpcomments@ciclops.org).

The Cassini imaging operations center (CICLOPS) is based at the Space Science Institute in Boulder, Colo.

-end-

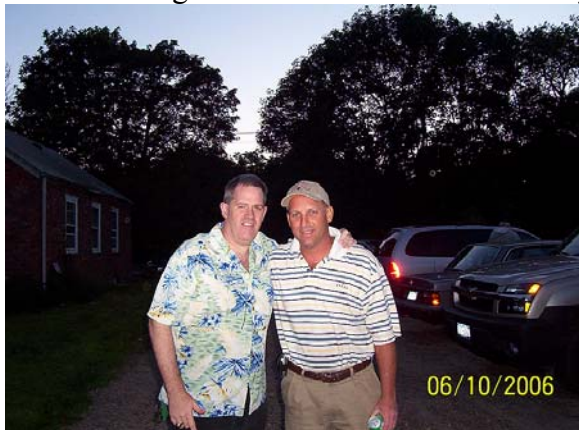
**Editor:** Since this Press Release, the Cassini Imaging Team has pulled the original production and will be producing a new and improved version in the near future. If anyone is interested in a copy of the original tribute, drop me a note and I'll send you a CD for a modest \$5.00.

## Annual Membership Meeting, Barbeque and Concert were a Day to Remember!

Every year Custer Institute holds its annual meeting and Barbeque where the membership gets to choose the President, the Board of Directors and other officials charged with managing the day-to-day affairs and operations of Custer. This necessary event is then followed by a sumptuous barbeque. This year's event was the same with one notable exception. Following the barbeque, Custer Institute was proud to host Charlie Ward and the musicians of Dreamer. Dreamer consists of 3 members, Charlie and Virginia Ward and Pamela Clarke, a very engaging and talented musician from Liverpool. Ironically, this issue of the Custer Comment contains a tribute to other notable musicians from Liverpool, musicians who took the United States by storm during the 1960s.

Custer Institute's Board of Directors would like to express their heartfelt thanks to Charlie Ward and Dreamer for the concert they performed for Custer's benefit at Eastenders. We are truly grateful for the publicity and financial support such events provide. *Thank you, Dreamer!*

The following are some memories from this year's meeting and festivities:



The author with AOS and Custer member Jeff Johns.

Note: all images on this page courtesy, Tom Madigan



In this view looking east, the Strawberry moon rises over the tree line adjoining Custer's property to the southeast with the AOS observatory in the foreground.



Kurt Massey aligns Custer's new 16" LX-200 as June's Strawberry moon shines warmly through the open slit of Custer's new Ash dome.



Dreamer performs in Custer's lecture hall on the evening of June 10<sup>th</sup>. From left to right are Virginia Ward, Pam Clarke and Charlie Ward.

## ASLI Hosts H. Philip Stahl, PhD, Senior Optical Physicist



Image, courtesy of Northrop-Grumman

Full-scale model of the James Webb Space Telescope

operational by 2013, will have an initial mission lifetime of 5 – 10 years and will cost \$4B in current dollars. Its primary aperture is 6.5 meters, more than double the size of the HST, thus providing 7x the light-gathering capacity of the HST. It will be orbiting at 1.5 million KM at Earth's L2 Lagrangian point and because of this very high orbit, there will be no practical way to service the telescope if something should go awry, emphasizing the need for redundant system tests and strict quality control. To deploy an instrument of this size and have all systems operational will be no small engineering and logistics miracle. The primary mirror, composed of 18 hexagonal mirrors, will have to be folded together for launch and unfurled once the required orbit has been achieved. The launch vehicle containing the telescope is 80 ft long and 21 ft wide with a launch weight of 20 metric tons. For more information, please visit the Northrop-Grumman home page for the JWST:

<http://www.st.northropgrumman.com/capabilities/space/science/jwst.html>

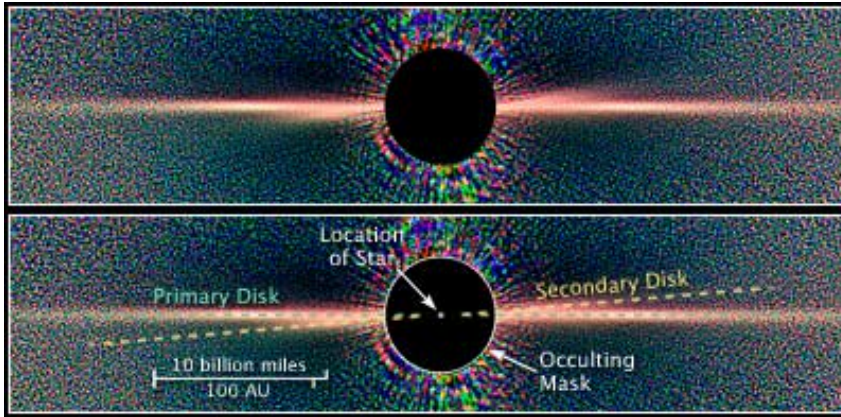
### ***Hubble in the News***

#### Possible Restoration of Hubble SM4

Expectations are high that the 4<sup>th</sup> and final servicing mission for the Hubble Space Telescope will be reinstated and preparations are proceeding apace accordingly for a possible launch date in late 2007 or early 2008. Please navigate to <http://hubble.nasa.gov/missions/intro.php> for further details.

On June 28<sup>th</sup>, to a standing-room only crowd, the Astronomical Society of Long Island was host to H. Philip Stahl, PhD, the Senior Optical Physicist at NASA's Marshall Space Flight Center. Dr. Stahl spoke to those gathered at Shure Hall, New York Institute of Technology, about NASA's James Webb Space Telescope, currently in the development phase. The James Webb Space Telescope will succeed the Hubble Space Telescope when that vaunted orbiting observatory is permanently brought off line. This JWST, otherwise known as the NGST or Next Generation Space Telescope, is slated to be

## Hubble Reveals Two Dust Disks Surrounding Beta Pictoris



Image, courtesy NASA / JPL

This HST view clearly shows the 2 dust disks surrounding Beta Pictoris viewed edge on with the star itself occulted.

In a spectacular confirmation of what has long been suspected, the Hubble Space Telescope has provided unequivocal proof that Beta Pictoris, a bluish white main sequence dwarf star of spectral and luminosity type A5 V, harbors not one, but 2 circumstellar disks, providing tantalizing evidence of the presence of at least one Jupiter-sized planet.

The secondary disk extends to at least 18 billion kilometers from the star and is tilted roughly 4 to 5 degrees from the primary disk. For additional details, please navigate to <http://hubblesite.org/newscenter/newsdesk/archive/releases/2006/25/image/a>.

## Hubble Reveals 2 Additional Satellites Orbiting Pluto

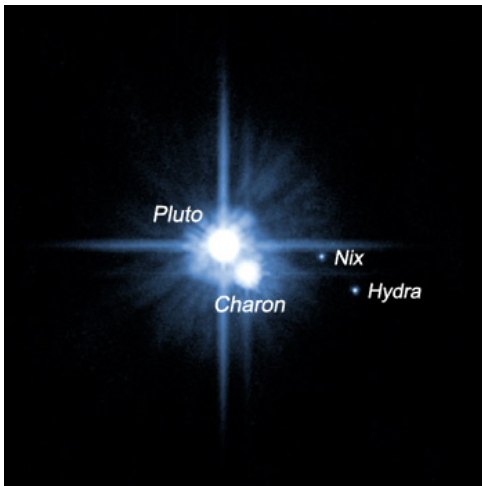


Image courtesy NASA / STSCI / JPL

The discovery image of Hydra and Nix, obtained with the Hubble Space Telescope and showing Pluto, Charon and the 2 new family members.

Hubble never fails to amaze! In a stunning discovery, the HST has revealed 2 additional satellites orbiting the lone sentinel of the outer solar system and the last stop before the Kuiper Belt and Interstellar Space, Pluto. It is thought that these newly discovered moons, Nix and Hydra, are captured Kuiper Belt objects. They're orbiting between 2 and 3 times the distance from Pluto's frozen surface than Pluto's principal satellite, Charon, discovered in 1978, and are roughly 5,000 times fainter than Pluto. For additional details, please navigate to

<http://hubblesite.org/newscenter/newsdesk/archive/releases/2006/29/image/a>

## Message from Dr Carolyn Porco

July 5, 2006

Dear Friends and Colleagues,

While there has been a great deal of activity surrounding Cassini's results on Saturn's icy moons, Titan, and its main rings, the Cassini imaging team has also been quietly examining images of the fainter rings surrounding Saturn -- namely the G ring which sits about 27,000 km outside the F ring, and the more distant and broader E ring in which the active moon Enceladus is embedded.

Today, we are releasing newly processed images and movies showing these rings, and the structures within them, in greater detail. These visual findings support the notion that Enceladus' geysers are the main supply for the E ring, and confirm a ring arc, orbiting on the inner edge of the G ring, to be of the type found orbiting the planet Neptune.

Check out ...

<http://ciclops.org>

... for the latest.

Also, please find below a press release that went out a moment ago on this subject.

Enjoy,

Carolyn Porco  
Cassini Imaging Team leader  
Director/CICLOPS  
Space Science Institute  
Boulder, CO

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CASSINI IMAGING CENTRAL LABORATORY FOR OPERATIONS (CICLOPS)  
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[media@ciclops.org](mailto:media@ciclops.org)

Preston Dyches (720) 974-5859  
CICLOPS/Space Science Institute, Boulder, Colo.

For Immediate Release: July 5, 2006

## SATURN'S FAINT RINGS SHARE SOME OF THEIR SECRETS

NASA Cassini spacecraft images of Saturn's diaphanous G and E rings are yielding new clues about their structure and formation.

A sequence of recent Cassini images, which has been made into a brief movie, shows an arc of bright material looping around the inside edge of the G ring, a tenuous 7000-kilometer-wide (4,400 miles) band of dust-sized icy particles lying beyond the F ring by 27,000 kilometers (16,800 miles). Cassini passed between the F and G rings during its insertion into orbit in June 2004.

The G ring arc is the same feature identified in images of this ring taken in May 2005. "We have seen the arc a handful of times over the past year," said Dr. Matt Hedman, Cassini imaging team associate working at Cornell University in Ithaca, New York. "It always appears to be a few times brighter than the rest of the G ring and very tightly confined to a narrow strip along the inside edge of the 'normal' G ring."

Imaging team members now believe this feature is long-lived and may be held together by resonant interactions with the moon Mimas of the type that corral the famed ring arcs around Neptune. "We've known since the days of Voyager that we had Jovian-type and Uranian-type rings within the rings of Saturn," said Cassini imaging team leader Dr. Carolyn Porco in Boulder, Colo., who was the first to work out the dynamics of the Neptunian arcs in Voyager observations. "Now it appears that Saturn may be home to Neptunian-type rings as well. Saturn's rings have it all!"

The researchers do not know exactly how the bright arc formed. One possibility is that a collision between small, perhaps meter-sized icy bodies orbiting within the G ring set loose a cloud of fine particles that eventually came under the influence of Mimas. But this new observation suggests that the remainder of the G ring itself may be derived from particles leaking away from this arc and drifting outwards. Future Cassini imaging observations are being planned to take a closer look at the G ring arc.

Results from Cassini's previous encounters with Enceladus indicated its south polar geysers as the primary source of the E ring particles. Now, images of the E ring with finer resolution than has ever been obtained before show telling details that appear to confirm this relationship.

The new images, taken when Cassini was in the ring plane and consequently showing an edge-on view, reveal a double-banded appearance to the ring, created because the ring is somewhat fainter close to the ring plane than it is 500-1,000 kilometers (300-600 miles) above and below. This appearance can result if the particles comprising the ring circle Saturn on inclined orbits with a very restricted range of inclinations. (A similar effect is seen in the Jupiter's gossamer ring and in the bands of dust found within the Sun's asteroid belt.)

This special condition might arise for two reasons. First, the particles being jettied out of Enceladus and injected into Saturn orbit may begin their journey around Saturn with a very restricted range of velocities and therefore inclinations. Second, the particles may begin with a large range of inclinations but those orbiting very close to the ring plane get gravitationally scattered and removed from that region.

Future studies of the E ring, including observations and dynamical models, should decide this issue. Cassini imaging team member Dr. Joseph Burns, also of Cornell, said, "We'll want images from a few other vantage points to be sure of the structure, and then we can test several models to see why these ring particles end up in such a distinct configuration."

Images accompanying this release are available at <http://ciclops.org>, <http://saturn.jpl.nasa.gov> and <http://www.nasa.gov/cassini>.

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The Cassini-Huygens mission is a cooperative project of NASA, the European Space Agency and the Italian Space Agency. The Jet Propulsion Laboratory (JPL), a division of the California Institute of Technology in Pasadena, manages the Cassini-Huygens mission for NASA's Science Mission Directorate, Washington. The Cassini orbiter and its two onboard cameras were designed, developed and assembled at JPL. The imaging team consists of scientists from the U.S., England, France, and Germany. The imaging operations center and team leader (Dr. C. Porco) are based at the Space Science Institute in Boulder, Colo.

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-end-

***Editor:*** Reproduced with permission

## Pluto's Two Small Moons Christened Nix and Hydra

The names Nix and Hydra have been approved for the two small satellites of Pluto discovered in May 2005. The International Astronomical Union (IAU), the internationally recognized authority for assigning designations to celestial bodies, approved the names this week.

A team of researchers from Southwest Research Institute (SwRI) in Boulder, Colo., the Johns Hopkins University Applied Physics Laboratory (APL) in Laurel, Md., the Space Telescope Science Institute in Baltimore and Lowell Observatory in Flagstaff, Ariz., used Hubble Space Telescope images to make the discovery in support of NASA's New Horizons mission to Pluto and the Kuiper Belt beyond.

"We're very pleased with the decision of the IAU," says Alan Stern, co-leader of the discovery team and the New Horizons principal investigator from SwRI. "You're going to be hearing a lot more about Nix and Hydra in coming years — astronomers are already applying for telescope time to study their orbits and physical properties. And when New Horizons flies by Pluto in the summer of 2015, each will be mapped in detail."

Click here for the full story, or visit  
<http://www.jhuapl.edu/newscenter/pressreleases/2006/060622.asp>.

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New Horizons is the first mission to Pluto and the Kuiper Belt of rocky, icy objects beyond. Principal Investigator Alan Stern, of the Southwest Research Institute (SwRI), leads a mission team that includes the Johns Hopkins University Applied Physics Laboratory, Ball Aerospace Corporation, the Boeing Company, NASA Goddard Space Flight Center, NASA Jet Propulsion Laboratory, Stanford University, KinetX, Inc., Lockheed Martin Corporation, University of Colorado, the U.S. Department of Energy, and a number of other firms, NASA centers and university partners. For more information on the mission, visit <http://pluto.jhuapl.edu>.

## An Urgent Request for Assistance from Dr Carolyn Porco

The following is a draft letter from Dr Porco. She is requesting as many letters as possible be sent to the Senate Science Appropriations Committee, consisting of the following US Senators:

Senator Mikulski (<http://mikulski.senate.gov/contactme/mailform.html>)

Senator Bill Nelson (<http://billnelson.senate.gov/contact/email.cfm>)

Senator Richard Shelby ([senator@shelby.senate.gov](mailto:senator@shelby.senate.gov))

July XX, 2006

URGENT: HELP NASA'S SCIENCE

Dear Senator YYY,

As the NASA budget is being deliberated now in the Senate, I would strongly urge you to work to restore the cuts to NASA's Research and Analysis category by increasing the overall NASA budget to accomodate this restoration. These are the dollars which fund the scientific community. The planetary science community has been polled and voted these funds to be of the HIGHEST PRIORITY, before any particular spaceflight missions.

However, whether the overall NASA budget is increased or not, it would be self-defeating to put in either language or earmarks for any specific NASA missions, such as a Europa mission. It is not at all clear at this time that Europa is the next place to go. While this moon is an exciting destination, it may be that Enceladus is the better target of astrobiological interest. It is imperative that we study BOTH possible missions to see which would be more productive.

So, I also urge you NOT to put language in the Senate's version of the NASA bill that specifically calls out a Europa mission. It would be far better to increase the NASA budget to accomodate studies of missions IN GENERAL to the outer planets for astrobiological purposes.

This way, the scientific community will be in a far better position to make an informed choice.

Thank you for your attention to this matter, and for your service to our nation's space program.

Sincerely,  
Name  
Address

**Editor:** Time is of the essence here. Advice and consent is a major component of our system of government, typically used to describe the relationship between the Legislative Branch of Government and the Executive Branch. In that spirit, the general population is not exempt from participating, in fact is encouraged, to advise the congress, in turn, as to our wishes and correct thinking in matters where the congress wouldn't necessarily claim a specific competence, i.e.: Science, Astronomy and Space Exploration. The senate is currently debating NASA's budget and they need to hear from those of us who would want the most science per dollar spent.

***In An Independence Day Fireworks Display to Trump all Others, STS 121 Roars into Orbit Under Clear, Blue Florida Skies!***



In a thrilling Return to Flight Launch, one year after the previous Return to Flight Mission, STS-114, Space Shuttle Discovery, STS-121, roars into orbit in this stunning series images. The primary objective of this mission is to deliver supplies and equipment to the International Space Station (ISS), Expedition 13; to fulfill existing commitments to ISS; to perform maintenance to the ISS; to evaluate, through exhaustive and ongoing imagery starting at launch, the results of extensive repairs and modifications to the launch vehicle and Discovery itself and, finally; the transport of ESA Astronaut Thomas Reiter for a 6-month visit to the ISS.



All images on this page, courtesy NASA

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