CONSTELLATION

December 2006, No. 4

"There will be no other till the twenty-first century of our era has dawned upon the earth, and the June flowers are blooming in 2004. When the last transit occurred the intellectual world was awakening from the slumber of ages, and that wondrous scientific activity which has led to our present advanced knowledge was just beginning. What will be the state of science when the next transit season arrives God only knows."

— William Harkness

(US Naval Observatory astronomer, after observing the Venus transit of 1882)

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Martian Devils

by Dr. Tony Phillips

Admit it. Whenever you see a new picture of Mars beamed back by Spirit or Opportunity, you scan the rocks to check for things peeking out of the shadows. A pair of quivering green antennas, perhaps, or a little furry creature crouched on five legs…? Looking for Martians is such a guilty pleasure.

Well, you can imagine the thrill in 2004 when scientists were checking some of those pictures and they *did* see something leap out. It skittered across the rocky floor of Gusev Crater and quickly disappeared. But it wasn't a Martian; Spirit had photographed a dust devil!

Dust devils are tornadoes of dust. On a planet like Mars which is literally covered with dust, and where it never rains, dust devils are an important form of weather. Some Martian dust devils grow almost as tall as Mt. Everest, and researchers suspect they're crackling with static electricity—a form of "Martian lightning."

NASA is keen to learn more. How strong are the winds? Do dust devils carry a charge? When does "devil season" begin—and end? Astronauts are going to want to know the answers before they set foot on the red planet.

The problem is, these dusty twisters can be devilishly difficult to catch. Most images of Martian dust devils have been taken by accident, while the rovers were looking for other things. This catch-as-catch-can approach limits what researchers can learn.

No more! The two rovers have just gotten a boost of artificial intelligence to help them recognize and photograph dust devils. It comes in the form of new software, uploaded in July and activated in September 2006.

(Continued on page 7)

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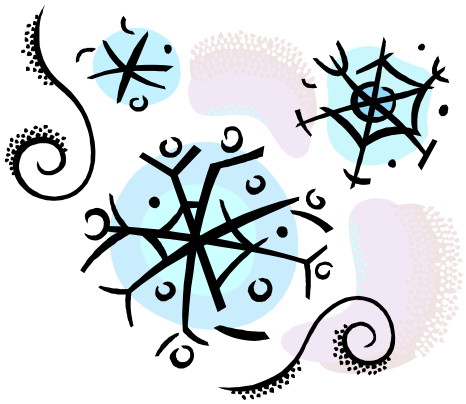

Solstice Reflections

Celebrate the Sun
Guide its movements in the sky
When it stands still we ask him to stay high in the sky
When it stands again we turn him back
Northward, the true course only forgotten.

Solstice. A time to “stand still”. A time to ponder and reflect. I’ve found myself doing this a lot the last six weeks. Dealing with a major loss causes you to turn inward and search for peace. And then I look up to the stars. Breathe in the glorious, crisp, December air. And there is peace. And wonder. I turn outward, and discover I am still on the “true course only forgotten”. I’m on the same path as the ancient sun-watchers before me, my planetarium brethren today, and the space travelers of the future. Our job is an awesome one, my friends. We connect not only ourselves, but others, to the stars. We become enablers of dreams, hopes, reflections. And instead of being overwhelmed by this responsibility that we have undertaken, we can stand still. And celebrate.

Patty

Patty Seaton,
President

Demonstrating Astronomical Scintillation (Twinkling) in the Planetarium

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One of the most common questions we get in the planetarium is; "*why do the stars twinkle?*" It is such an obvious part of people's experience of the night sky. But in most of our planetaria the stars appear unnaturally still.

I co-direct a 60-seat planetarium at a liberal arts university. We offer public shows three or four times a semester. One of my favorites was our *Cosmic Question Show*. Here the public was asked to submit their questions and we then prepared a show around a selection of the best submissions. Last semester I received a question asking why the stars twinkle. I produced a short PowerPoint presentation complete with animations but it was incomplete and somewhat inconsistent with the experience in the planetarium. The presentation stood in glaring contrast to the un-twinkling stars the audience would see from our Spitz A4 star projector. To address this shortcoming I devised the following demonstration.

In the PowerPoint presentation I explained to the audience that twinkling – or astronomical scintillation – is caused mostly by turbulence in the earth's atmosphere. Like the weather the amount of twinkling can change from minute to minute, day to day and from place to place. Related to scintillation is the distortion of extended astronomical objects by the earth's atmosphere – for example the blurring of planetary images. The amount of distortion is often referred to as "seeing". A good (and somewhat common) analogy is that looking at the stars from the surface of the earth is like bird watching from the bottom of a swimming pool. The clarity of the birds you see will depend on how calm or turbulent the surface of the water is.

I then took a blank sheet of overhead transparency film to further demonstrate the phenomenon. Try not to use the cheaper brands since they are more brittle. With the stars on, I then turned up the cove-lights, walked to the center of the dome and held the transparency up to the audience.

I suggested that the earth's atmosphere is, for the most part, a clear layer of gases – not unlike a sheet of transparency film. I then told the audience that the 'calm' state of the atmosphere (i.e. laminar flow) is like the flat unwrinkled transparency film (see Figure). Under this kind of atmosphere our view of the stars is relatively undistorted and so the stars do not appear to twinkle as much. At this point you may want to talk about where on the earth this kind of atmosphere is most common – for example in the middle of the ocean or high off the ground. You may also want to explain how astronomers are always seeking these kinds of places for their observatories in order to get the sharpest views of the stars and planets. The ultimate location with the best seeing is of course in outer space.

I then told the audience that when the atmosphere is turbulent it mixes layers of warmer and colder air together. This mixed-up atmosphere is made of countless little cells of warmer and colder air. These little air cells act as lenses that bend the starlight as it passes through our atmosphere.

At this point I crushed the overhead transparency with my hands. It's good to lower your voice and pause just before you do this to add a little drama to the demonstration. I then carefully opened the crushed transparency and revealed to the audience the folds and ripples. I explained that the air's turbulence acts like little ripples in the atmosphere and these ripples will distort the images of the stars and planets. As the wind carries these ripples in front of the stars the starlight will appear to scintillate or twinkle. At this point I turned off the cove lights and carefully placed the wrinkled transparency in front of the star ball of the Spitz. Again to add to the theatrical quality of the demonstration I climbed a ladder to reach the star ball. I then gently waved the transparency in front of the projector and the stars on the dome twinkled.

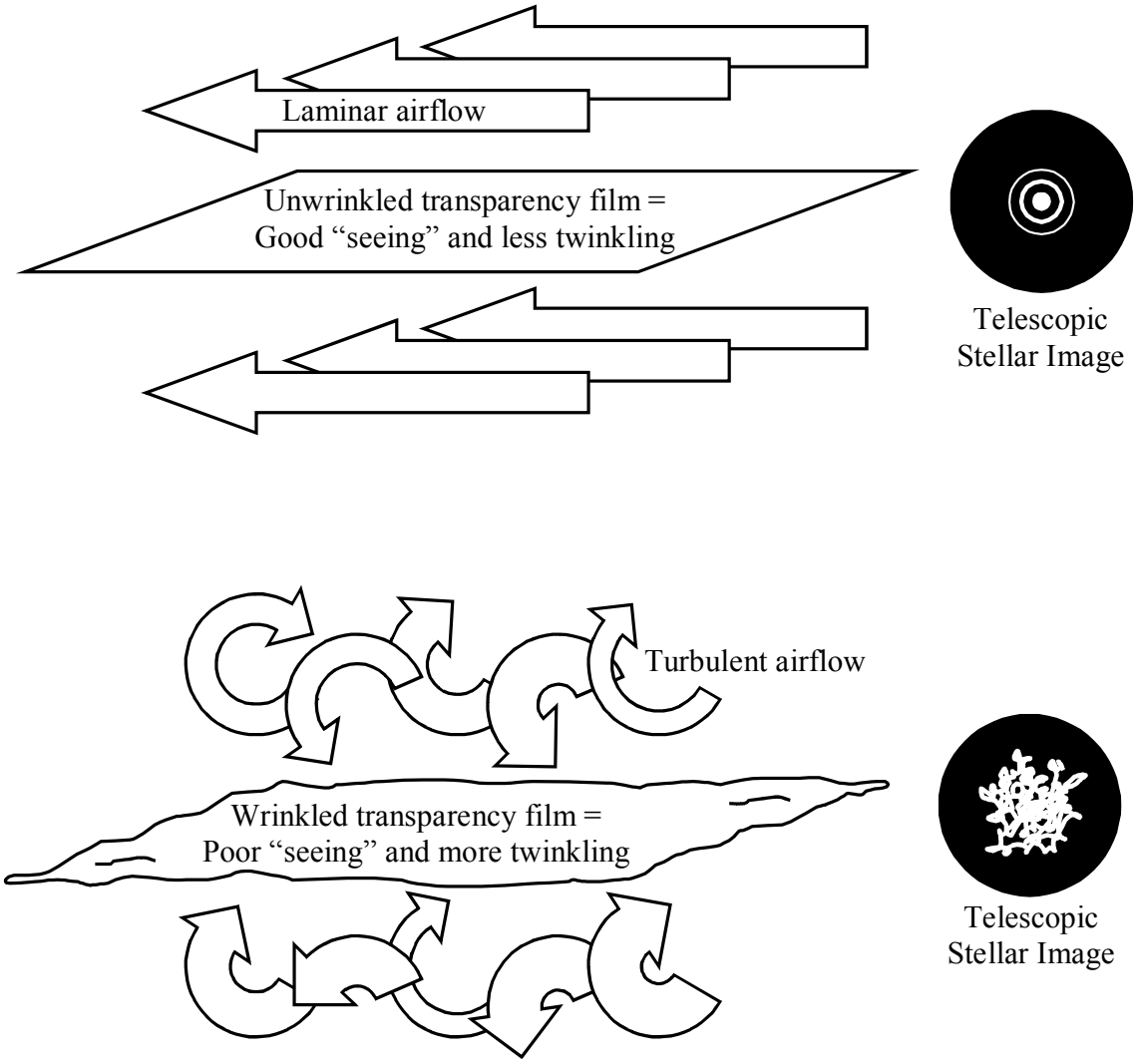

Figure 1: The top schematic illustrates laminar airflow which is simulated by an unwrinkled overhead transparency. The schematic to the right represents an idealized and highly magnified image of a diffraction limited star - an image seen under excellent "seeing" conditions when scintillation is also reduced. The lower set of schematics illustrates turbulent airflow which is simulated by the wrinkled transparency film. The turbulence produces poor "seeing" and thus increased twinkling and is illustrated by the corresponding stellar image.

MIDDLE ATLANTIC PLANETARIUM SOCIETY
MINUTES OF THE MAPS BUSINESS MEETING OF MAY 19, 2006

The meeting was called to order by President Patty Seaton at 4:45 PM.

Announcements: Patty welcomed everyone to the conference and thanked Gloria Villalobos and her staff for a wonderful event. It was announced that the MAPS Board was reviewing the committee structure and some changes would be announced later this year. Patty proposed that committees should have dedicated time during the conferences for members to interact, plan, and promote the work of the committees. Ted Williams will be joining Don Knapp to upgrade and improve the MAPS website. New features will be implemented to improve committee news and communication as well as areas for MAPS business, for example, posting the Minutes of the general meetings.

Treasurer's Report: Tony Villano presented the financial report:
Closing Balance of 2005.....$38523.38
Net Assets as of May 16, 2006.....$41883.10 (not including conference monies)

Tony stated that close review of conference expenses and organization operation procedures have contributed to a reasonable financial situation. The Board will consider proposals on effective utilization of some of the resources to improve member benefits and services.

Membership Committee: Tony reported that membership is now at 207. He also reminded everyone of the availability of Certificates of Attendance for Professional Development. The Treasurer and Membership Reports were approved.

Secretary's Report: Lee Ann Hennig presented Secretary Sam Storch's report in his absence. (Sam was attending the graduation of one of his sons on Friday). The Minutes of the May 27, 2005 Business Meeting were distributed, read, and approved.

Conference Report: Steve Mitch updated the membership regarding the Triple Conjunction Conference for GLPA, MAPS, and SEPA at Oglebay, Wheeling, West Virginia. The dates are October 9-13, 2007. The registration fee will be in the range of $140-$180, based on an attendance of 200-300 people. Rooms are being held until August 9, 2007, after that deadline there is no guarantee of occupancy at the resort. Guest speakers (David Levy and others), and a day at the Buhl in Pittsburgh are among the highlights of the conference.

Patty announced that there is one tentative proposal for 2008 (Steve Russo's facility), but we will await a formal invitation. In the meantime, the MAPS Board is seeking hosts for future conferences. Since the 2007 conference will be in the fall, regional meetings are encouraged for the spring of 2007. Watch for further information regarding these local meetings in the Constellation and on the MAPS website.

Jon Elvert, Director of the Pennington Planetarium at the Louisiana Art and Science Museum is considering hosting a 7-region meeting in Baton Rouge, La. A show of hands from MAPS members indicated interest in the details of such a conference. Patty will follow up on this discussion with Jon.

Awards Committee: Wendy Ackerman reported that the Distinguished Service Award will be presented at the Banquet on Friday. Exceptional Service Awards will also be presented during the Saturday session. Wendy encouraged members to forward names of nominees to her.

Publications Committee: Kevin Conod reported that the Proceedings for 2005 were completed and in the process of being formatted for CD publication. The Constellation has been successful in the electronic format as well as hard copy, and submissions have increased. Please send 2006 conference materials (presentations as well as labeled photographs) to Kevin so they can be included in the Constellation as well as on our Website.

Education Committee: Francine Jackson reviewed some of the plans for action involving the committee: a review of Starry Night; grant information posted on the web; pre/post visit evaluation tools posted on the web; lesson plans posted on the web; improve communication among committee members; contact non-MAPS member planetarians to get them involved; copies of Under Roof, Dome and Sky is still available.Kristen Chon, will be the point person for improving the visibility of material on the website.

IPS Report: Patty announced that Lee Ann Hennig, who is IPS Secretary, will hold the proxy for MAPS at the 2006 IPS Conference in Melbourne Australia. Lee Ann reported on the 2005 IPS Beijing Council Meeting, updated membership on the benefits of IPS membership, and announced that the 2008 Conference will be in Chicago at the Adler Planetarium. She introduced Steve Mitch, IPS Elections Committee Chair, and Susan Button, IPS President-Elect, who encouraged members to participate in the nominations of officers and to become active members of IPS. Susan emphasized that astronomy/education as they pertain to IPS activities and publications is a priority in her vision of the organization. IPS President Martin George's message of IPS for 2006 will be available for viewing on Saturday and on the web.

Elections/Audit Committees Report: Audit Chair Steve Russo reported on the 2006 MAPS Board election results. He thanked all the nominees and announced the new Board: Kevin Conod, Lee Ann Hennig, and Ted Williams. The next election will be in January of 2007, and nominees for the offices of President Elect, Treasurer, and Secretary are now being accepted. Jerry Vinski is Chair of the Elections Committee, so if you are interested in running for office or have someone to nominate, please forward that information to Jerry.

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Schenectady Planetarium Reopens

After being closed for a month, the Suits-Bueche Planetarium at the Schenectady Museum re-opened on October 28th.

The latest renovation had the old Spitz A3P removed, and a new GOTO Chronos installed in the planetarium. This was the second part of a renovation that began in 2003 with the addition of a new East Coast Control Systems automation system, room lighting, sound system and new projectors.

Planetarium Manager Steven LJ Russo and Planetarium Educator Megan EN Dominguez behind the console.

The $200,000 for the 2003 renovation, and the $400,000 for the 2006 renovation was all done with private grants and donations.

To see the renovation and the grand re-opening party go to:
www.look-to-the-skies.com/suits.htm

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Martian Devils

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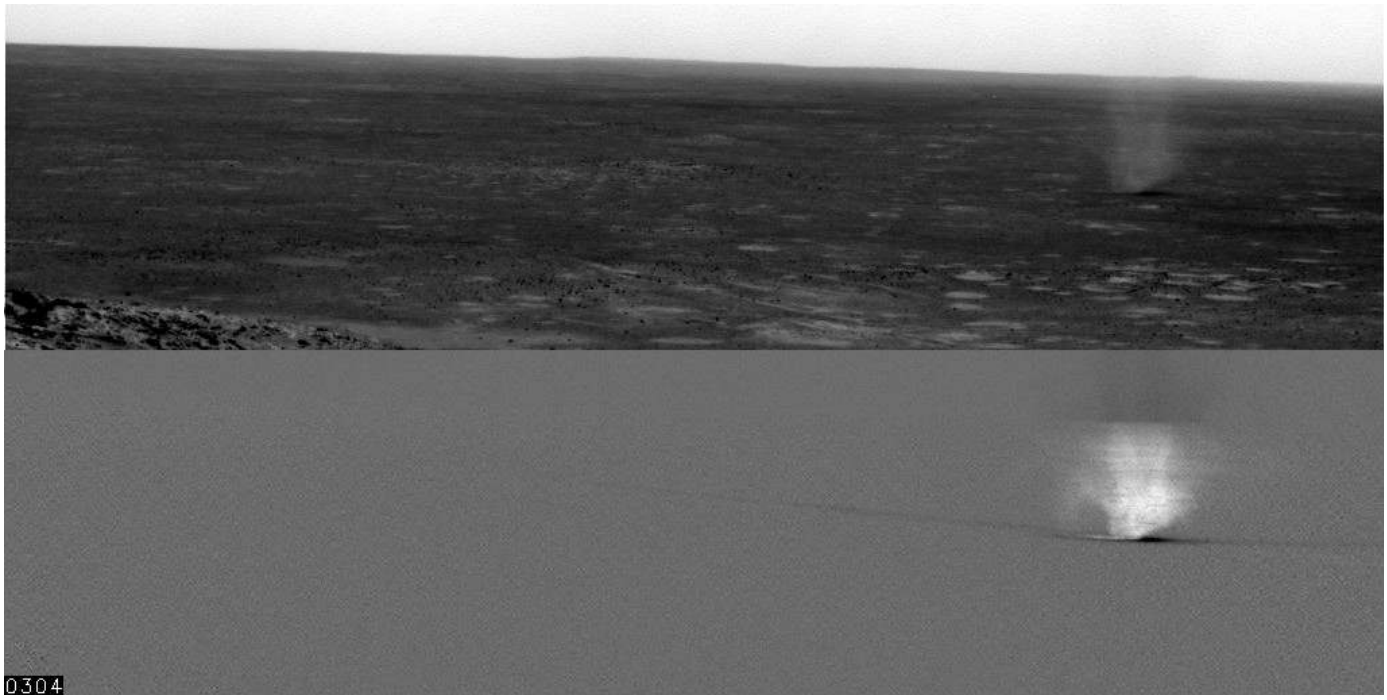
"This software is based on techniques developed and tested as part of the NASA New Millennium Program's Space Technology 6 project. Testing was done in Earth orbit onboard the EO-1 (Earth Observing-1) satellite," says Steve Chien, supervisor of JPL's Artificial Intelligence Group. Scientists using EO-1 data were especially interested in dynamic events such as volcanoes erupting or sea ice breaking apart. So Chien and colleagues programmed the satellite to notice change. It worked beautifully: "We measured a 100-fold increase in science results for transient events."



The top half of this image is part of a series of images of a passing dust devil on Mars caught by Spirit. In the bottom half, the image has been filtered to remove everything that did not change from one image to the other. Notice the faint track left by the dust devil. Credit NASA/JPL/Mark T. Lemmon, Univ. of Arizona Lunar and Planetary Laboratory.

Now that the techniques have been tested in Earth orbit, they are ready to help Spirit and Opportunity catch dust devils—or anything else that moves—on Mars.

"If we saw Martians, that would be great," laughs Chien. Even scientists have their guilty pleasures.

Find out more about the Space Technology 6 "Autonomous Sciencecraft" technology experiment at nmp.nasa.gov/st6/TECHNOLOGY/sciencecraft_tech.html, and the use of the technology on the Mars Rovers at nmp.nasa.gov/TECHNOLOGY/infusion.html. Kids can visit spaceplace.nasa.gov/en/kids/nmp_action.shtml and do a New Millennium Program-like test at home to see if a familiar material would work well 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.

Triple Conjunction
October 9-13, 2007

Steve Mitch
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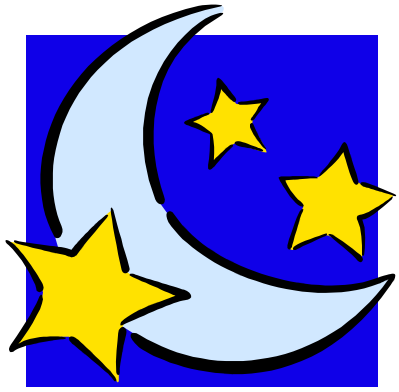
Here is some preliminary information for the October Triple Conjuction Conference at Oglebay. I am sure that this will be added to and changed a bit before the conference.



Conference dates are October 9 through October 13, 2007. An extra day has been added due to the size of the conference. Well, at this time all of the conference speakers have made a commitment. David Levy will be the speaker on Wednesday, Oct. 10, James Kaler will be on Oct. 11 after dinner, James Schweitzer will be the banquet speaker on Friday, Oct. 12 and Chuck Wood is going to be the luncheon speaker on Friday, Oct. 12.

On Thursday, Oct. 11, we will board motor coaches around 10:15 a.m. to travel to Pittsburgh and the Carnegie Science Center (about an hours trip). We will have sessions at the Science Center through 5:00 or 5:30 p.m. We will then board the coaches to a short trip over to the Carnegie Museum of Natural History for dinner and Jim Kaler's Astronomy Update talk.

I am working with Jon Bell on two fronts. The first will be the "Astropardey" game show on Wed. eve, Oct. 9. Contestants from each of the 3 regions will compete against each other for bragging rites. Jon and I are working out a way to do the Constellation Shootout as well (don't know at this time when that may be).

Sue Button is also organizing a Portable Planetarium session during the conference. I will have more on this later.

Sessions and workshops will most likely be concurrent due to the size of the conference.

Room rates will be: $99.00 per night plus taxes (13%). These are what are known as the standard rooms. Upgrades to an Intermediate room can be had for $129.00 per night. Cottage (cabin) rates are $325 per night for 4 bedrooms and 1 bath. One bath will probably create some problems with hot water and time schedules if everyone tries to get ready for the day at the same time. The cabins are not attached to the main lodge. They are less than a mile away however.

IMPORTANT: The cutoff date for a guaranteed room for the conference is Thursday, August 9, 2007. After that date, the reservations department begins releasing rooms to other guests.

Other hotels in the area include a Hampton Inn (4 miles away), a Best Western Inn, 7 miles away and a Super 8, 10 miles away.

The conference is an extra day, therefore registration, still being worked on, will most likely come in around $200.00 to $225.00 (not guaranteed at this point), which will include meals consisting of breakfast on Wed., Thurs., Fri., and Sat.; Wed, Thurs, and Fri. lunches; (Thursday will be a box lunch to eat while on the coach); Thurs. dinner and Fri. banquet; Wed. dinner is on your own. Also, the Tuesday evening reception.

Oglebay Resort & Conference Center

Of course, if the vendors are in a generous frame of mind, the registration should go lower.

Check in is at 3:00 p.m. for the lodge, 4:00 p.m. for the cabins and checkout for both is at 11:00 a.m.

The nearest airport is the Greater Pittsburgh International Airport, 60 miles away. Wheeling Airport Limousine is your best bet for travel to Wheeling. Wheeling does have a small airport for small planes, but not jet service.

The rates for this service varies according to how many make the trip at the same time. The "maxi-van" will make 4 trips to the airport for pickup throughout the day. Times will be worked out later. The max-van can transport 10 persons plus luggage. The rate is $21.50 per person, one way. Smaller vans are also available which can hold up to 5 persons plus luggage. The rate for this type of van is: One person -$65.00, 2 people-$45.00 per person, 3 people is $33.50 per person, all one way. The number to call for reservations is 800-326-2907.

Of course, the airport has every kind of car rental service.

Information about the conference will go online sometime in late February, I hope.

DUES REMINDER

It will soon be time to renew your MAPS dues...renewal notices will be mailed shortly. Please pay your dues in a timely manner - this helps the organization with its pre-conference expenses. Thank you!

SURF THE WEB

Have you visited the MAPS website lately? There's a new design and some new content as well. New Board Member Ted Williams has been hard at work! There's a *Featured Planetarium* section and check out the *MAPS Education Mentoring Network!*

www.maps-planetarium.org

MINUTES OF THE MAPS BUSINESS MEETING OF MAY 19, 2006

(Continued from page 5)

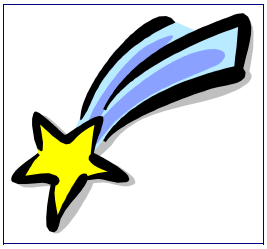
Old Business: Patty reviewed the Board decision regarding a statement on Intelligent Design and Creationism. After reviewing membership feedback regarding whether MAPS should have a position statement, the Board decided to take the following action:

Posted on the MAPS website and in the Constellation:
"The Board of the Middle Atlantic Planetarium Society endorses the statements already made by the American Astronomical Society, the International Planetarium Society, the American Physical Society, the American Association for the Advancement of Science, and the American Association of Physics Teachers with regard to intelligent design. After review and careful evaluation we find that these statements already reflect the view of our membership and Board, therefore no additional statement need be made."

Hot links to statements of the organizations cited in the quote above are included in the posting.

New Business: Jan Russo has been appointed chair of the Constitutional Review Committee and will oversee an evaluation of our current By Laws and Standing Rules.

The meeting was adjourned at 5:35 PM.
Respectfully submitted,
Lee Ann Hennig for Sam Storch



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