CONSTELLATION

Spring 2011, No. 1

MAPS Conference 2011 May 4-7, 2011

Upper Dublin School District Planetarium in Dresher PA

TEACHING IN THE DARK

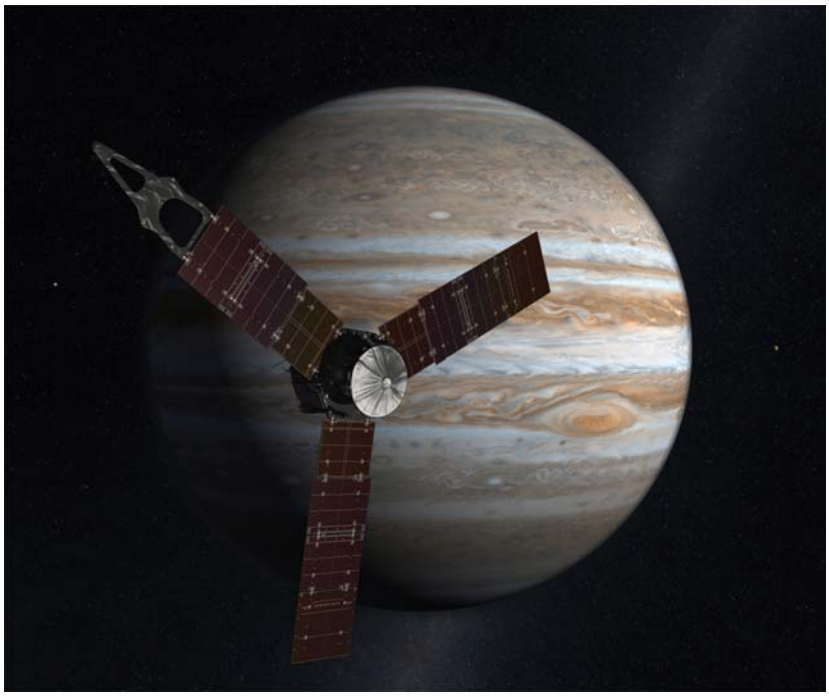
You are cordially invited to a MAPS first: a conference hosted by three separate facilities in southeastern Pennsylvania and South Jersey, May 4-7, 2011.

Since all three host planetariums are part of a school, we chose the theme "Teaching in the Dark." If you've found a new way to entice children—and adults!—to learn in your dome, using new formats or old, why not let us see it? We all have creative methods to share. And we're all educators!

One of the featured speakers will be Dan Hooper of the Kavli Institute for Cosmological Physics at the University of Chicago.

(Continued on page 12)

Close Encounters with Jupiter



The Juno mission, arriving at Jupiter in July 2016, will help to solve the mystery of what's inside the giant planet's core.

by Dr. Tony Phillips

Jupiter and Earth just had a close encounter—and it was a good one. In late September 2010, the two worlds were 31 million km (about 19 million miles) closer than at any time in the past 11 years. Soaring high in the midnight sky, Jupiter shone six times brighter than Sirius and looked absolutely dynamite through a backyard telescope.

Planetary scientist Scott Bolton of the Southwest Research Institute isn't satisfied. "I'd like to get even closer," he says.

Bolton will get his wish in July 2016. That's when a NASA spacecraft named "Juno" arrives at Jupiter for a truly close-up look at the giant planet. Swooping as low as 5,000 km (about 3,000 miles) above the cloud tops, Juno will spend a full year

(Continued on page 2)

JUNO

(Continued from page 1)

orbiting nearer to Jupiter than any previous spacecraft.

The goal of the mission is to learn what lies inside the planet.

Astronomers have been studying Jupiter since the invention of the telescope 400 years ago, but in all that time the planet's vast interior has remained hidden from view. Even the Galileo probe, which dived into the clouds in 1995, penetrated no more than about 0.1% of Jupiter's radius.

Technicians lift NASA's Juno spacecraft onto a dolly prior to the start of a round of acoustical testing. Image Credit: NASA/JPL-Caltech/ LMSS

"Our knowledge of Jupiter is truly skin deep," says Bolton, Juno's principal investigator. "There are many basic things we just don't know—like how far down does the Great Red Spot go? And does Jupiter have a heavy core?"

Juno will improve the situation without actually diving into the clouds. Bolton explains how. "Juno will spend a full year in close polar orbit around Jupiter, flying over all latitudes and longitudes. We will thus be able to fully map Jupiter's gravitational field and figure out how the interior is structured."

But that's not all. Researchers have good reason to believe that much of Jupiter's interior is filled with liquid metallic hydrogen, an exotic metal that could form only in the high-pressure, hydrogen-rich core of a giant planet. Jupiter's powerful magnetic field almost certainly springs from dynamo action inside this vast realm of electrically conducting metal.

"Juno's magnetometers will precisely map Jupiter's magnetic field," says Bolton. "This map will tell us a great deal about planet's inner magnetic dynamo—what it's made of and how it works."

Finally, Juno will probe Jupiter's atmosphere using a set of microwave radiometers. "Our sensors can measure the temperature 50 times deeper than ever before," says Bolton. Researchers will use that information to figure out how much water is underneath Jupiter's clouds. "Microwave measurements of Jupiter's water content are particularly exciting because they will help discriminate among competing theories of the planet's origin."

Now *that's* a close encounter. Stay tuned for Juno.

Find out more about the Juno mission at www.nasa.gov/mission_pages/juno. Play the new Solar System Explorer super game, which includes the Juno Recall mini-game at spaceplace.nasa.gov/en/kids/solar-system. It's not just for kids!

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

BOSTON — On February 13, 2011, the Museum of Science, Boston officially unveiled New England's most technologically advanced digital theater. Planetarium Systems Coordinator **Darryl Davis** begins a show at the newly transformed Charles Hayden Planetarium. The Planetarium uses the latest in high definition, immersive video, and digital acoustic technology to transport viewers not only to distant times and places in the universe but also inside the blood stream or swimming next to dolphins in the ocean.

An audience enjoys a scene from the Museum's new astronomy show, *Undiscovered Worlds: The Search Beyond Our Sun*.

Visitors observe the state-of-the-art Zeiss Starmaster.

All images © Michael Malyszko 2010.

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President's Message

My second go 'round as MAPS President is coming to a close. I can't believe how fast two years can transpire. Many of the goals that I set out to achieve have been reached and I am proud of the accomplishments that MAPS has made during this time.

At the conclusion of the Business Meeting during the upcoming Spring conference, Patty Seaton will take over the reigns for MAPS and I am sure that she will do an excellent job. I am also sure that Patty has some ideas that will enhance the roll of MAPS and benefit our membership.

I would like to thank the members of the MAPS Board for their efforts these past two years, in particular: Patty Seaton, Gloria Villalobos, Lee Ann Hennig and Paul Krupinski for volunteering to serve with me on the Strategic Planning Committee. The initial work of this committee is almost complete, however, we must continue to evaluate how MAPS, as an organization, can best serve its members. Long term planning and short term goals and objectives will allow MAPS to continue to grow and prosper.

The Spring conference will be held May 4 – 7 in Fort Washington, PA and preparations are being finalized by Keith Johnson, Kim Small and Don Knapp, our conference hosts. As far as I can determine, this is the first time MAPS has had three conference hosts and we will be visiting all three for papers, vendor demos, programs and other activities. Please try to attend the conference this Spring, as it promises to highlight several new innovations and will focus on educational endeavors for the planetarium. Information about the conference and registration materials can be found on the MAPS website – www.mapsplanetarium.com

Speaking of the MAPS website, Janet Cullen, a professional webpage designer with an interest in planetariums has made major improvements to our site and has given it a professional look and designed it to be easily navigated. We are still working with her to make further additions and improvements. If you haven't visited the site recently, please take a little time and check it out.

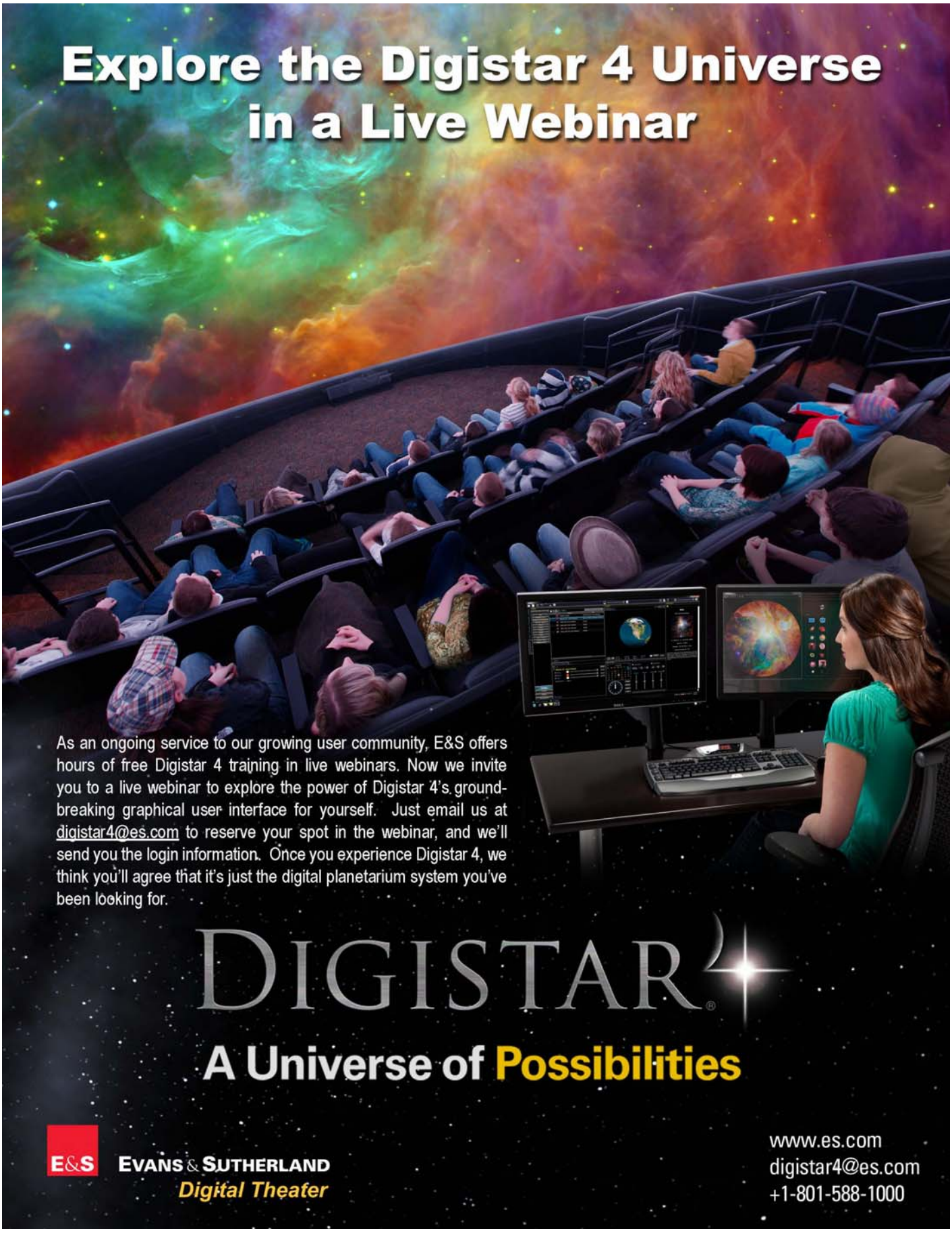
We are currently discussing the possibility of going digital with a couple of important components of the organization. We hope to come up with ways to electronically register for future conferences as well as holding elections for MAPS Officers and Board Members on line. More about these items will be announced during the Business meeting at the conference.

It has been a distinct honor and pleasure for me to serve as your President a second time. I have been with MAPS for over 30 years and have served as a Board Member, Officer or conference host for 25 of those years. It has been extremely rewarding. I encourage new members to the organization to consider serving as an officer, board member or committee chair. Vitality and success comes with new people with new ideas and your commitment and input would be greatly appreciated.

Sincerely,

Steven Mitch

Steven Mitch, President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Saving Arlington's David M. Brown Planetarium

By Harold Geller

On February, 25 2011, there appeared an article in a Washington, DC local paper called the Sun Gazette. The article by Scott McCaffrey was titled "Superintendent Plans Reprieve for Planetarium." This article was picked up by the local NBC affiliated station. There was however, much more to this story.

In 2009, George Mason University was contracted to write an assessment report about the Arlington David M. Brown Planetarium. An assessment report was finalized in the summer of 2009. Shortly thereafter, the superintendent of Arlington Public Schools announced his plan to close the David M. Brown Planetarium. There were many letters written to the superintendent and the local school board by members of the community and from those outside the community requesting the superintendent to keep the planetarium open. The superintendent, Dr. Patrick Murphy, said that the only way he could keep the planetarium open was if the community raised some four hundred thousand dollars. This led to the development of a grassroots organization to save the planetarium.

The Friends of Arlington's Planetarium was officially incorporated within the Commonwealth of Virginia on May 10, 2010. The organization received 501(c)3 status from the IRS on July 21, 2010. As of the writing of this article, the organization has been able to raise $289,411. This was accomplished by using a multi-pronged approach to fundraising, with special events, public pleas, selling of seats, and seeking foundation funds from numerous non-profit organizations located within the county of Arlington.

Although the final requested amount has yet to be achieved, at the Board of Education meeting on February 24, 2011, Superintendent Dr. Patrick Murphy informed the board that the school system will "be able to move forward here with a renovation."

While it appears that the Arlington David M. Brown Planetarium has been saved for the time being, this does raise the issue of the fate of planetariums across the country in this time of economic distress. A science teacher from Houston, Texas, told a friend that her board of education was looking into closing all science laboratories as a cost saving device. This would indeed be a major paradigm shift in the teaching of science in general.

So what can planetariums do to try to sustain their own existence? The largest ones are self sustaining and don't rely on any individual educational institution for their survival. However, there are many planetariums across the country inexorably linked to K-12 bureaucracies or higher education institutions. These planetariums may wish to do a self assessment, in the context of their relevancy to the curriculum within which they find themselves. In Virginia, we have what is known as the Standards of Learning (SOL). Among other things, the SOLs set the goals and objectives for science educators in the K-12 arena. One portion of the GMU assessment report of the Arlington David M. Brown planetarium was an examination of the linkages between the programs provided in the planetarium to the SOLs set by the state.

The future of many planetariums is in question. Many of us recall when the space race and the fear of communists was the impetus for the thrust in science education. Today, with different views of science and technology, and a different type of enemy facing the country, we may need to find new venues for saving our planetariums.

More information can be obtained about the Friends of Arlington's Planetarium online at saveplanetarium.org/ . The Sun Gazette article can be found online at www.sungazette.net/articles/2011/02/25/arlington/news/nw83s.txt . The NBC 4 web announcement about the saving of the planetarium, can be found online at www.nbcwashington.com/news/local/DC-Arlington-Planetarium-Saved-117014038.html .

MAPS Fellow Award – Criteria for Nomination

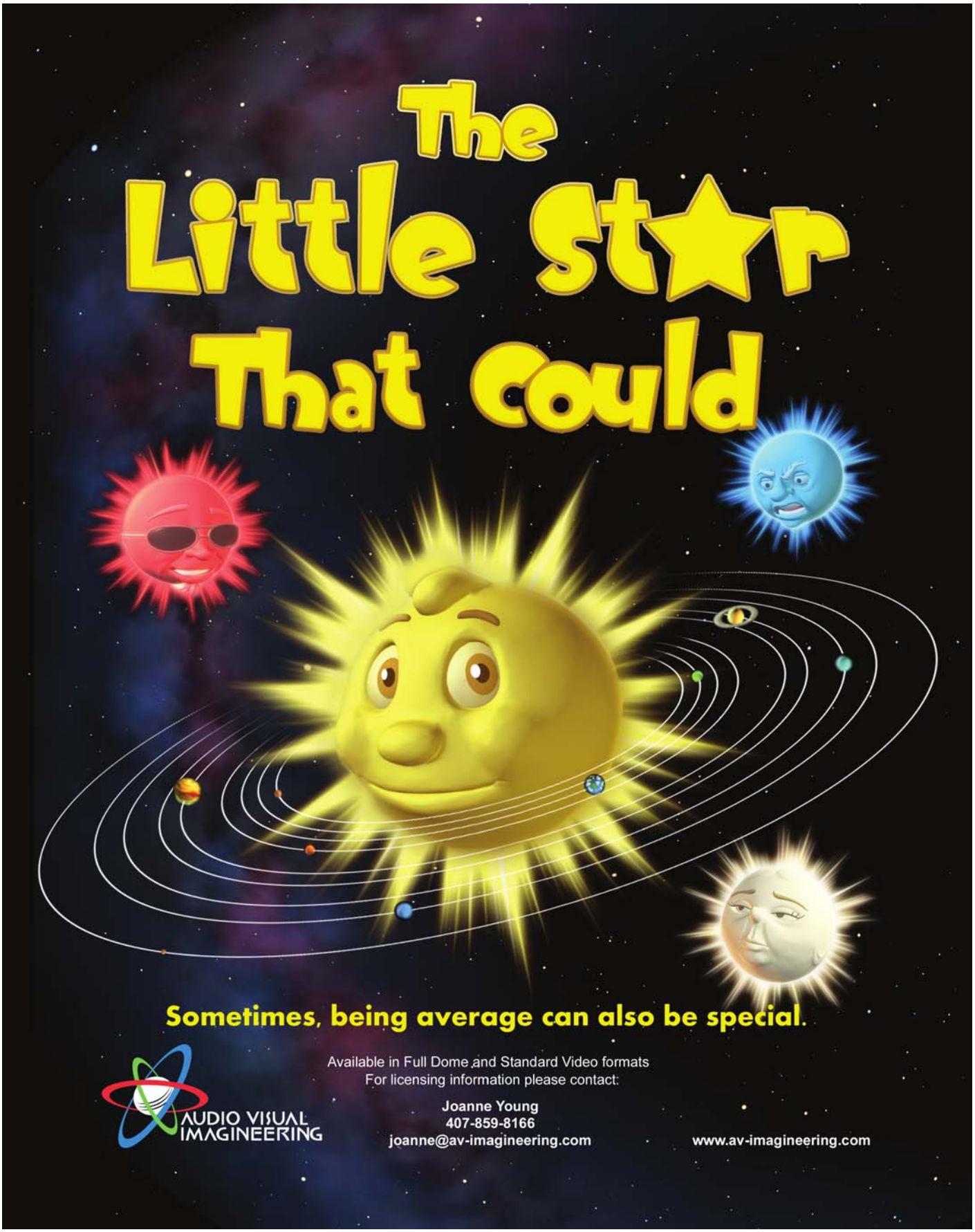
At the October 11, 2008 Board meeting, a proposal to establish a MAPS Fellow Award was presented to the Board. The motion to accept the proposal was approved. It was first announced during the business meeting at the Spring conference.

The purpose of the award is to recognize those members of the organization who maintain an active membership status of a minimum of 7 consecutive years and at least one of the following criteria:

- Held an elective office or served on the MAPS Board
- Served as a conference host
- Provided significant service to the Middle Atlantic Planetarium Society
- Made a significant contribution to planetarium methodology, technology or education.

A MAPS member can nominate another member or herself/himself for the award by completing the MAPS Fellow Award Nomination Form and submitting the form to the MAPS Awards Committee Chair. After review by the MAPS Board, those nominees completing the requirements will be given the award at the Middle Atlantic Planetarium Society Annual Conference.

The **Nomination Form** is available on the MAPS website: http://www.mapsplanetarium.org/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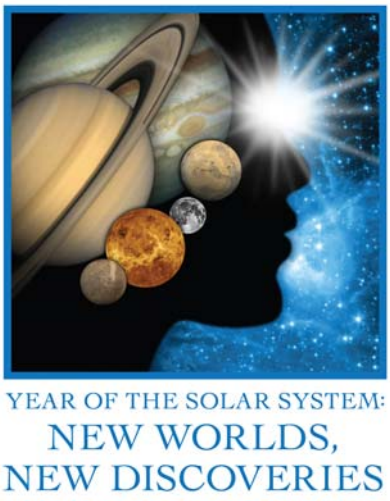


Equinox 2011

How appropriate that my birthday falls on March 20, Equinox time! I suppose that means I should be able to be balanced on my head without tipping over!!!! If you are not aware, 2011 is the 'Year of the Solar System', and what better venue than the PLANET-arium to showcase all the amazing discoveries being made by MESSENGER at Mercury, OPPORTUNITY (among others!!) at Mars, and CASSINI at Saturn, with NEW HORIZONS on the way to Pluto. Below are several different methods which can be used to 'scale' the Solar System. Get those visitors & students involved! As always, members are encouraged to submit lessons & activities to jscala@lvhs.org for submission to the 'Constellation'.

A) For a large playground area: Select someone to be the Sun and place them near the edge of the play area. Space your "planets" as follows:

Mercury	4 feet away from Sun
Venus	7 ½ feet away from Sun
Earth	10 ½ feet away from Sun
Mars	16 feet away from Sun
Jupiter	55 feet away from sun
Saturn	99 feet away from sun
Uranus	210 feet away from sun
Neptune	306 feet away from Sun
Pluto*	340 feet away from Sun

B) For a Football Field (complete with yard markings): Select someone to be the Sun. Place them at one goal line.

Mercury	1.1 yards away from Sun
Venus	2.5 yards away from Sun
Earth	3.5 yards away from Sun
Mars	5.1 yards away from Sun
Jupiter	18 yards away from Sun
Saturn	33 yards away from Sun
Uranus	68 yards away from Sun
Neptune	at goal line PLUS 2 more yards
Pluto*	at goal line PLUS 40 more yards

C) Within the School building (preferably a L-O-N-G hallway): Using a roll of TOILET PAPER, and counting each "square" as being ONE MILLION MILES:

Mercury	36 squares along the roll
Venus	a total of 57 squares
Earth	a total of 93 squares
Mars	a total of 141 squares
Jupiter	a total of 483 squares
Saturn	a total of 886 squares
Uranus	a total of 1,783 squares†
Neptune	a total of 2,793 squares
Pluto*	a total of 3,675 squares

†At this point, assuming a standard roll of toilet paper has 1,000 squares you will need three more rolls to finish!

EXTENSION: at the scale of one square of toilet paper per million miles, you can also reasonably demonstrate the scale of the SIZES OF THE PLANETS:

Mercury: a hole made by a single end of a STAPLE
Venus: the thickness of a SMALL paper clip end
Earth: the thickness of a LARGE paper clip end
Mars: a sewing needle (thinner than the small paper clip)
Jupiter: the hole in the center of a LP Album (remember those???)
Saturn: the thickness of a standard yellow #2 pencil
Uranus: the size of a lace hole on a pair of sneakers
Neptune: Same as Uranus

PLANETARIUM NEWS

The **North Museum of Natural History & Science Planetarium** (Lancaster, Pennsylvania) started offering live theater as a result of a three-year National Science Foundation called STEPS (Science Theater Education Program System). The grant established a partnership between the Space Science Institute, Astronomical Society of the Pacific, SETI, ASTC and eight museums nationwide, among other institutions.

The STEPS collaboration created three theatrical stories on astrobiology (Planet Hunter, Extrem-O-What? and Mars Interrupted) while creating an innovative way of combining live actors, digital characters, science, audience participation, and high definition quality visuals in a museum setting. For more information regarding the project, visit www.stepsproject.org.

New national Science Standards

Lee Ann Hennig was one of only a few persons selected from a very large pool of applicants nationwide to participate in the development of the New National Science Standards as a Primary Reviewer for the draft copies.

Hayden Planetarium, 1960

Arlington Planetarium

The **Arlington (Virginia) Planetarium** was threatened with closure following the 2009 school year. Since the last update in the Planetarian, they have received a $100,000 donation to help keep the planetarium open. See page 6 for an update.

Four New Planetariums

Spitz, Inc. was recently involved with the installation of four new planetariums (St Vincent College, Latrobe, Pennsylvania; Broughal Middle School, Bethlehem, Pennsylvania; Mary Hooker Environmental School, Hartford, Connecticut; Robinson Nature Center ("NatureSphere", Columbia, Maryland). Three additional planetariums (Lebanon High School, PA; Lincoln University, Lincoln University, PA; Montour High School, McKees Rocks, PA) are scheduled for new construction later this year.

Fernbank Science Center

Fernbank Science Center is gearing up with programs for their areas schools which are aligned with the science performance standards for that grade. In February Fernbank worked with Brownie Scouts on their Science Wonders Try-It. April Whitt will be giving a teacher workshop for the Georgia Association of Science Teachers. Focus is on the MESSENGER craft going into orbit around Mercury this Month (March), and the New Horizons on its way to Pluto. The Fernbank Science Center also produced a new family program for Black History Month Stories of Africa" that features on animals telling stories about the stars.

MAPS CONFERENCE

(Continued from page 1)

Note: The pre-registration deadline is April 6, 2011; to avoid a late registration fee, mail your registrations before then. You must be a MAPS member to attend. If you are not a current member for 2011, include a membership fee of $25 in your registration.

Registration fee is $200; this covers Wednesday reception, breakfast and lunch on Thursday and Friday, the Friday banquet, and continental breakfast on Saturday.

See the MAPS website for a preliminary schedule and complete registration packet: www.mapsplanetarium.org

CONFERENCE DEADLINES

Pre-registration: April 6
Presentation Proposals Due: April 15

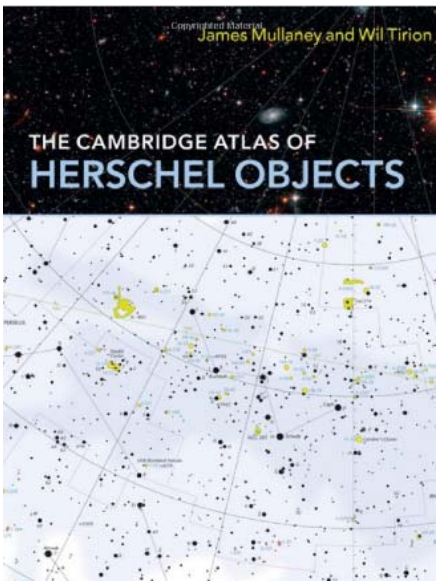
HOTEL

The conference hotel is the Holiday Inn Fort Washington: www.fwholiday.com

Call 800-339-0209 for reservations. The room rate for conference attendees is $99 per night.

PLANETARIUM NEWS

IN PRINT



Jim Mullaney, fromer Director of the DuPont Planetarium at the University of South Carolina, has a new book the *Cambridge Atlas of Herschel Objects*. It has just been released and features the amazing celestial cartography of Wil Tirion. It is intended as a companion volume to an earlier work, *The Cambridge Double Star Atlas*. Both are available from Cambridge University Press.

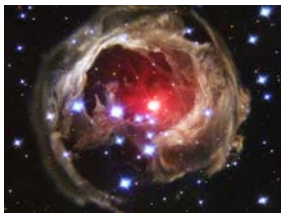
During 33 years of teaching astronomy, long-time member **Tom Konvolinka** always felt that the textbooks he was required to use were never written at the appropriate level for his students. Many times he thought that he should just write his own textbook. Now he'd done just that: *A Guide to Everyday Astronomy*. This astronomy textbook on CD is designed for beginning astronomy classes. It teaches the basics of astronomy while explaining how it applies to everyday life experiences. It is written in an easy-to-understand style for both experienced and inexperienced astronomy teachers. The text will guide students to complete 17 hands-on planisphere exercises. For complete information, go to: www.konvolinkamedia.com

IN MEMORIUM

Mary Rogers, 93, of Mansfield, CT passed away December 2, 2010. Mary was a professor at Eastern Connecticut State University. She taught Physical Science at the University starting in 1963, serving in various positions including Department Chair for Physical Science, as well as Director of the Planetarium. She retired in 1989. For a complete obituary see: tinyurl.com/49t9drh

Claire Carr was a long time member of MAPS. She and her late husband Quent Carr ran the Herkimer BOCES Planetarium for many years. Claire passed away September 12, 2010, at the age of 88. For a complete obituary see: tinyurl.com/4mmn9k8

We also remember **Stan Repine** who worked at Spitz as a Computer Scientist/Technician for many years. He passed away on Monday, March 14, in PA, at the age of 78.



SCHOLARSHIP FUND SEEKS APPLICANTS

The Hamilton Planetarium Scholarship Fund is now seeking applicants. The purpose of the fund is to provide scholarships to students interested in gaining employment in the planetarium field as professionals. These scholarships are open to all United States citizens attending accredited educational institutions in the United States or possessions.

For more information and application form, see: planetariumscholars.webs.com

CONSTELLATION DEADLINES

The Constellation is published quarterly near the equinoxes and solstices. Please keep in mind the following deadlines:

Cover Date	Deadline
June 2011	Friday, June 3, 2011
September 2011	Friday, Sept. 2, 2011
December 2011	Friday, Dec. 2, 2011

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