Southern Skies

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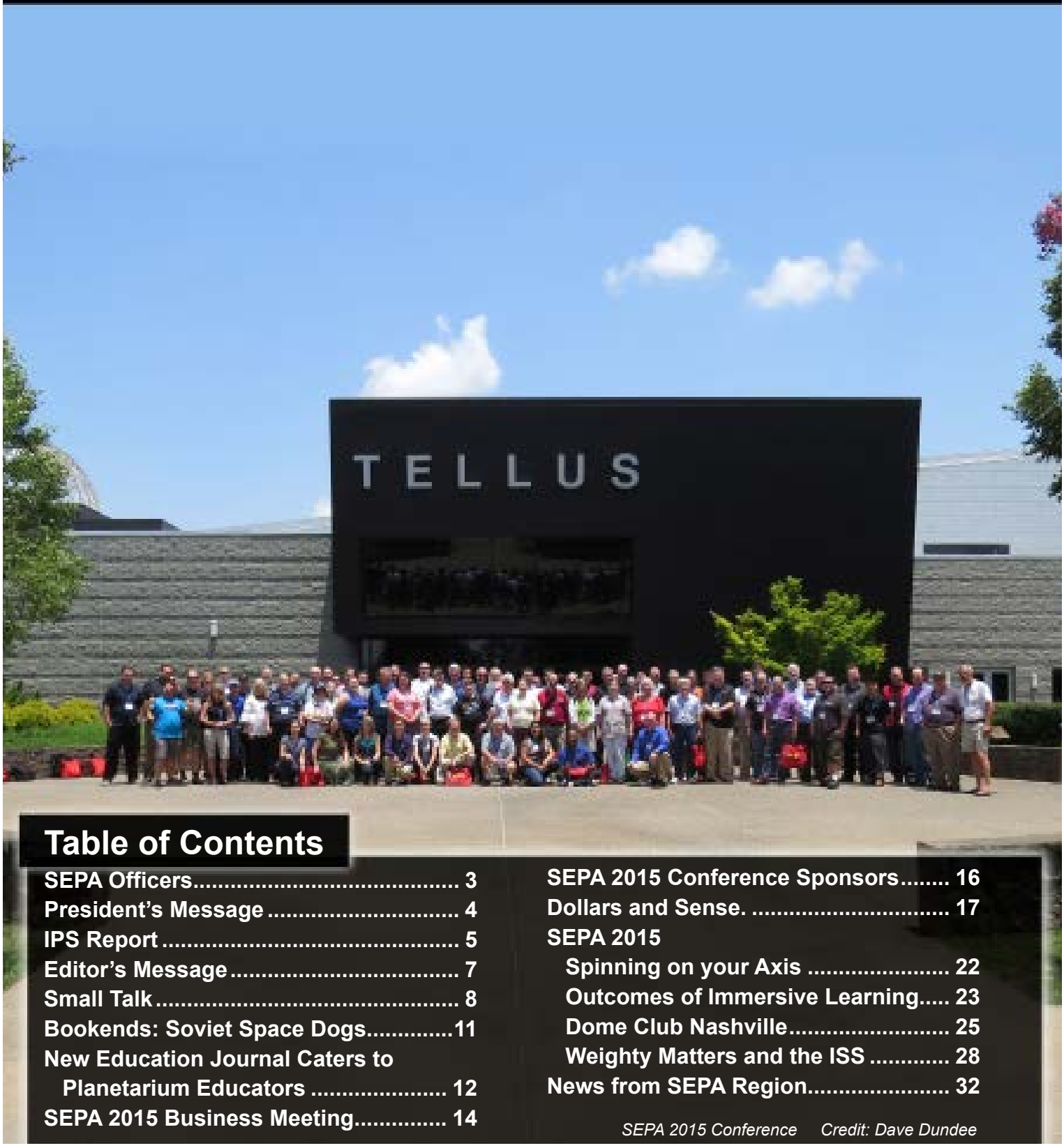

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SEPA 2015 Conference Credit: Dave Dundee

Officers of the Southeastern Planetarium Association

Editorial Staff of *Southern Skies*

Southern Skies is the quarterly journal of the Southeastern Planetarium Association published for the purpose of communicating association news, reports, reviews, and resources to its members.

Ken Brandt
Robeson Planetarium
Lumberton, NC

"How lucky we are to live in this time…when we are in fact visiting other worlds" -Carl Sagan

Pluto and its system are being unveiled to us for the first time. *New Horizons* has done splendidly, and she continues on into the depths of the Kuiper belt, then on into interstellar space. She will become our fifth *starship*. I love to show kids a particular graphic that gives the trajectories of *Pioneer 10 & 11, Voyager 1 & 2,* and *New Horizons*. Pointing out of course, that only one nation thus far has this capability is the United States. I also point out that all of these ships were launched from the same place: Cape Canaveral, FL. This fact is definitely a point of SEPA, and national pride.

SEPA was founded during the age of *Apollo*, in a little planetarium named Robeson. It came of age during the time of V*ikings, Voyagers,* and *Veneras.* Most of us have taught about the orbits of *Cassini,* and the rolling, and rolling, and ROLLING, of the Martian rovers! Of course, *Dawn* and *New Horizons* are making headlines and reinventing what we know about Pluto and Ceres.

We are completing our first reconnaissance of the solar system, and the penultimate thing we've learned is that we know precious little. But, and this is an important but - we get to teach it! We are a way for the cosmos to explain itself to others who would also be its eyes and ears.

Of course, the pale blue dot reminds us of the most important thing we have learned: Earth is a place, and it's smaller, and more fragile than we ever thought possible. I also tell kids that no matter their belief system, we are all remanded to be good stewards of the Earth.

I'm going to suggest a new mode of communication: a once-monthly president's update on Youtube. This will require SEPA making a youtube page, for which I will request council's approval. This provides more of an active, versus future perfect, flavor to the events of the day. We are also in discussion about a Google hangout that would be open and run by Derek, so members can communicate, and we can communicate what's going on in the 'hallows' of council.

Dave Maness suggests that we take advantage of our local connections to visit local planetarians who aren't current SEPA members. Derek is developing a new member advantages flyer, touting the benefits

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IPS REPORT

John Hare
ASH Enterprises
Bradenton, FL

I will attend this year's IPS Council meeting in Montreal, Canada, representing SEPA. Upcoming IPS conferences will be the topic of much of the meeting. Also, one extra day has been added to the agenda for in-depth discussions regarding another topic. *Vision 20-20* is an initiative whose purpose is to look at the future of IPS and chart a path for the growth and future purpose of the Organization. You'll no doubt hear more about this soon after the Council meeting as well as in the pages of *The Planetarian* and *Southern Skies*. Stay tuned!

IPS 2016
The IPS Council has met twice in former Soviet Bloc countries, but the upcoming 2016 IPS conference, to be held in Warsaw, will mark the first IPS conference in that region. The dates for IPS 2016 are June 19 to June 25.

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If you haven't had the opportunity to visit that part of the world, you're in for a treat. Warsaw is typical of the rennaissance that has swept the region. Travel options thruout Eastern Europe are diverse and inexpensive.

Follow this link for information for the conference, http://www.ips-planetarium.org/?page=ips2016home

You must be an IPS member to attend the conference. Membership runs on a calendar-year basis and is $65 for single year, or $100 for a 2-year membership.

You can obtain membership forms from IPS Treasurer, Ann Bragg at ann.bragg@marietta.edu, myself at johnhare@earthlink.net, or at the IPS Website, www.ips-planetarium.org

IPS 2018
The sole bidder for IPS 2018 has withdrawn their

Paul Campbell Fellowship Award Nomination Form

Nominees must have been a member of SEPA for at least ten years, and they must display qualities in each of five areas, as represented by the five-pointed star shaped award: integrity, friendship, service, knowledge, and vision. Please submit this form to any SEPA Council member.

Nominee's Name: _____

Qualifications: _____

_____

_____

_____

_____

Editor's Message

James Sullivan
Buehler Planetarium & Observatory
Davie, FL

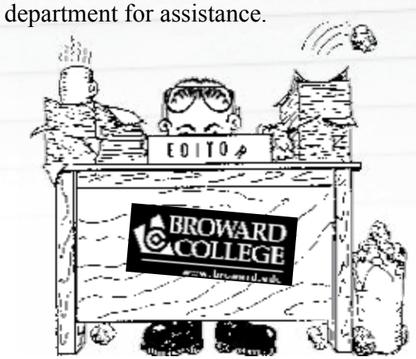
I want to start off this column by thanking Betty Wasiluk for her hard work on *Small Talk*. As an editor, I understand that the journal is only as good as the people who contribute to it. Betty's faithful contributions have enriched every issue of ***Southern Skies*** that I've ever edited, and was a column that I looked forward to reading long before that. Betty, you have no idea how much we are going to miss your column.

By the way, my planetarium employment has turned into volunteer work due to "workforce reduction." I still love working at the planetarium, but I do like the freedom to say no.

We can receive electronic files in most any format. Also, graphics can be received electronically or in hardcopy, including slides or photos, and will be converted to digital with sufficient resolution.

Submission deadlines: January 1 (Winter), April 1 (Spring), July 1 (Summer), October 1 (Fall).

Thanks to Broward College and its wonderful printing department for assistance.



SEPA Membership Form

Please send your check to SEPA, c/o Patsy Wilson, 140 Lyn Road, Salisbury, NC 28147
_____One Year, $25 ($15 outside SEPA geographical region)
_____Two Years, $40
Name _____
Organization _____
Planetarium _____
Address _____
City _____
State / Zip Code _____
Voice Phone _____
Fax Phone _____
Email Address _____
Staff Position _____
IPS Member? Yes _____ No _____
Contribution to Scholarship Award Account: $_____

Small Talk

Elizabeth Wasiluk
Berkeley County Planetarium
Hedgesville, WV

As I write this, summer has yet to start calendar wise, but school ended for us, June 10, 2015.

I have spent my days going over the physical science curriculum that I will be teaching come August.

No offence, but it is really boring. No wonder kids do not think science is interesting, if they have to sit through this crap. The curriculum meanders aimlessly and doesn't seem to go anywhere. I find it extremely boring. You might ask yourself, why I am doing this? Why don't I just go elsewhere?

The answer is that I tried. I tried to get a job advertised in dome-l about "Russell Planetarium" in Mesquite, TX.

After reading the description, I thought the job was perfect for me. I contacted Donna Pierce, from the planetarium named after herself in Highland Park, TX. She told me that it was a wonderful facility, with a 364 seat auditorium that the Northern Dallas Astronomical Society use to meet. There was a secretary and custodian who work in the place and over 15,000 kids a year visit and the planetarium facilitator would do all of the programs themselves. That is over 200 shows a year, and that is in a planetarium that is not open to the general public. They had a Sci-Works planetarium projector from Spitz with seventy five directional seats as well as a thirty foot dome...

So, I applied for it. Friends told me that if I got it, I did not have to take it. I got an interview over Easter Break. I was to Skype it and they asked me to put together a power point on either phases of the moon or seasons. I did both. The day of the interview arrived, I did it in the planetarium and the people who interviewed me could not see the visual from the planetarium, but I managed to send them a screen shot of me and I did the interview using audio only. I thought it went well, and a few weeks later, the job was mine.

But as I was consulting with a certified financial planner, a consultant for the teacher's retirement center and the benefits consultant for the Mesquite Independent School System in Texas, then the awful realization came home to me. I can retire from here in two years, however, I could not work long enough to qualify for retirement in Mesquite, with a "your age + years of service = ninety" requirement. I would also lose, 347 sick days. If I stay, I can convert the sick days to either years of service and/or health insurance. So that sold it, right there. Goodbye to dream job in Russell Planetarium. (Did I say I would be getting $7000.00 more if I took the job?") I would have to have financed the biggest move I have ever made, and I never seemed to want to move to Texas anyway since I hate the heat.

So I am back here trying to work on teaching Physical Science come August. In the meantime,

I am waiting until the teacher who is in the room I am supposed to move to, moves out, which has not happened yet. I am feeling kind of bad, since the woman I am replacing, does not have certification and has been let go of. She has been doing an excellent job here. She organized our science fair. I hate having to replace her when I really suck as a teacher, especially of physical science to ninth graders.

So I have been packing up stuff in my overcrowded

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BOOKENDS

Robin Byrne
Northeast State Community College
Blountville, TN

Soviet Space Dogs
by Olesya Turkina

For a change, my book up for review is a NEW book! "Soviet Space Dogs" is written by Olesya Turkina and was published in 2014. The author is a Senior Research Fellow at the State Russian Museum, specializing in the history of astronomy and space, so she knows what she's talking about.

The dogs that travelled into space touched people's hearts in ways that no human ever did, and Turkina begins her story with that phenomenon. Around the globe, tributes have been made to the canine pioneers, even in the face of opposing political ideologies. And it was not just strangers at a distance, but the scientists who worked with the dogs who were so attached, many of their subjects ultimately became their pets. Why the Soviets chose to use dogs is not entirely clear, although the research by Pavlov demonstrated that dogs were easy to work with. All of the dogs used were exclusively female, because the cramped quarters would not permit a male dog to raise his leg when nature called. The rumor that the dogs were strays is, indeed, true, but they were put through training and testing before being flown. Some dogs were not used because of their disposition. Others flew on more than one mission.

The first dogs used were not the celebrities we first think of. Starting in 1951, dogs were shot up in rockets to high altitudes. Although Tsiolkovsky was tasked with developing rockets to deliver warheads, his personal goal was to send men into space. As such, he tested his rockets with canine passengers to see how they withstood the g-forces and vibrations. For almost every test, dogs were sent up in pairs. This redundancy was to correct for any individual problems a dog may encounter that had nothing to do with the flight itself. The first pair to go up in a rocket were Desik and Tsygan, reaching an altitude of 62 meters. Both returned safely.

The most famous of the space dogs has to be Laika, since she was the first living creature to go into Earth orbit. She also was the only dog to go on a flight without some form of companion. Her flight was largely pushed for propaganda purposes. After the success of Sputnik 1, Khrushchev wanted another space coup to coincide with the 40th anniversary of the Bolshevik Revolution. This gave the engineers less than one month to make the launch date of November 3 1957. That rush made it impossible to even consider a mission that would bring Laika back alive, and ultimately ensured that she would die within hours of launch due to faulty protections from heat and radiation. Although the official word was that Laika survived for one week in orbit and was humanely euthanized, the true story was released after the Soviet Union became more open. Laika's death sparked protests around the world. That negative reaction led to even more secrecy surrounding the Soviet space program so that only successful stories were released.

After Laika, more rocket tests were conducted,

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New Education Journal Caters to Planetarium Educators

Tim Slater
University of Wyoming
Laramie, WY

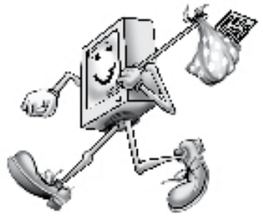
Have you been looking for a place to read about scientific research studies conducted in the unique planetarium learning environment? Or, have you been looking for a respected, peer-reviewed journal to publish your own scholarly work? The newly established *Journal of Astronomy & Earth Sciences Education* – JAESE.org – might be exactly what you are looking for. International in scope, JAESE publishes research studies across the broad field of Earth & space sciences including the disciplines of astronomy, climate education, energy resource science, environmental science, geology, geography, agriculture, meteorology, planetary sciences, and oceanography education. Edited by Professor Tim Slater from the University of Wyoming and the CAPER Center for Astronomy & Physics Education Research, JAESE uses a double, blind-peer review process to insure the scholarly quality of the astronomy education research studies published.

Planetarium educators have long been interested in using the space under the dome to better understand how people learn. But recently, there has been a tremendous uptake in the quantity of good scholarly work being done. This spring, Plummer, Schmoll, Yu & Ghent published an extensive article in this spring's *Planetarian* outlining how to conduct systematic educational research in the planetarium. Also published this year, Stephanie Slater and her colleagues published an updated and expanded second edition of their book, *Astronomy Education Research*. Together, these documents provide a step-by-step pathway for educators to better investigate how the planetarium visitors' underlying, mental mechanisms work to enhance learning in the planetarium. In short, it is fascinating stuff!

Now in its second year of publication, JAESE is also seeing a surprisingly large number of submissions from planetarium educators trying to understand more deeply—and systematically—how learning works in the planetarium. Yu, Sahami, Sahami & Sessions documented how in a controlled, quantitative study, positive impacts on student achievement could be measured when seeing visualizations in a planetarium. As another example, Eric Hintz and his colleagues at BYU carefully studied how head-mounted displays dramatically improve the planetarium experience for deaf students. And, in the same issue, Aaron Price and his colleagues synthesized a decade's worth of research on how stereoscopy best supports science learning.

I would expect in the next few years of regional planetarium conferences that we will also see an upswing in the number of scholarly planetarium education research studies presented. As a community, it will be important to hold each other to rigorous—or at least overwhelming—evidence for claims. The temptation to evaluate simply to show "how great our planetarium is" will be hard to resist; however, what our community would most benefit from is an honest look at what works, and what doesn't work so well. Instead of "my planetarium is better than your planetarium" studies, we should insist on studies that reveal the underlying reasons for why some things work well, and other things do not. Adopting this perspective is perhaps the best way our planetarium education community can make progress together.

One way to become more deeply involved in and better informed about the growing wave of astronomy education research is to volunteer at the JAESE.org website to serve as a peer-reviewer. Not only will you get to see a variety of "great" and "not so great" studies, you will also get to peak inside ongoing research studies long before they are published to the wider community.



SEPA Business Meeting

Cartersville, FL - June 26, 2015

April Whitt / Jon Bell

President Ken Brandt called the meeting to order at 3:35 pm with a quorum present, He introduced the officers

Minutes of the 2014 business meeting were distributed and approved. (Linda Hare/David Dundee).

The treasurer's report for mid-year 2015 were distributed and approved. (Phil Groce/April Whitt). The current balances are as follows: Interest bearing checking, $42,188.60; Operating, $12,077.29 and Professional Development Fund, $9,671.06.

Membership Committee: Dave Maness reported on discussion that took place at the 2014 conference regarding ideas to promote membership. "Each one, Reach one" is a suggested idea that encourages current members to talk about SEPA to professionals in their area through email and phone calls. Professional Development guidelines have been revised to make support easier for new members. Dome Dialogues & a SEPA Facebook page have been developed. New members in attendance were introduced.

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SEPA Business Meeting (Continued from page 13)

Professional Development: Committee: Chair, Linda Hare introduced the committee – April Whitt, Dave Maness & Patsy Wilson. Six applicants were reviewed, but two withdrew. Four members were given assistance totaling $1,904. Brandt announced revisions to the application process that have been approved by council. They are: $500 maximum award amount, members can apply every year, applicants must meet all award criteria or forfeit the opportunity to apply for three years. Hare asked the council to reconsider the $500 maximum since the cost of conference varies yearly.

IPS Report: John Hare reminded the group of the benefits and cost of IPS membership. Shawn Laatch has been appointed IPS President to fill an unexpected vacancy. Joanne Young, SEPA member, is the new President-Elect. The 2016 conference will be in Warsaw, Poland. A site for the 2018 conference will be determined at the IPS Council meeting in August. Hare took a straw vote of members present on the site options: Arlington, TX-10; Edmonton, Canada-12; Rio de Janeiro, Brazil-3; Toulouse, France-6. Jon Elvert, chair of IPS 2020 initiative reported that they are looking at the organization and how it will meet the needs of members in 5-10 years.

2016 Conference, Montgomery, AL: Rick Evans gave an update on conference plans. This is the first time that SEPA will meet in Alabama. The dates, May 31st-June 4th, have been set to avoid conflicts with IPS. Embassy Suites will be the conference hotel. It is on the riverfront and downtown, about 5 miles from the W. A. Gayle planetarium located in Oak Park. A shuttle will be provided to transport delegates between venues.

2017 National Conference Proposal, St. Louis, MO: Derek Demeter introduced the idea of a multi-regional conference involving all US regions. The facility in St. Louis can set up to 300 with ample meeting space in the museum. All regions would provide seed money and absorb any losses. The proposed dates (to try to accommodate GLPA) are October 10th-14th. Members raised concerns about the dates due to school holidays and fall breaks that bring visitors into facilities. Also university planetariums are in the middle of their semester. Derek asked for email feedback from members so that council can address concerns and make an informed decision. A straw poll was taken with 18 indicating they would attend and 9 against.

Eclipse Initiative: Phil Groce reported that SEPA has engineered a contract with Lake Barkley State Park in Land Between the Lakes, KY to reserve the entire campus for the 2017 eclipse in August. Area hotels are charging between $500-$1000 per night for rooms, but this facility is owned by the state and cannot raise prices. It is near the interstate, is on the center eclipse line and has a variety of housing options. SEPA will pay a deposit to hold the rooms, but any rooms not booked by July 28, 2017 will be released. SEPA members in good standing through 2017 will be the only persons allowed to reserve the rooms. This is another way to serve current members and reach out to those who haven't yet joined.

Parliamentarian: Dave Hostetter has served in this position for 15-20 years and asked to be replaced. Ken thanked him for his service and recommended Jon Bell to assume the duties of the position. (Bridget Collins moved, Dave Maness seconded) Approved.

New Business:

Linda Hare asked when standing committee members would be appointed. Ken reported that would happen Saturday morning at the scheduled session.

A question was raised about other bids for 2017 if a national conference doesn't happen. Some sites are in discussion, but no formal offer has been made at this time.

April Whitt mentioned that Don Tuttle, retired planetarian from Elgin, IL has made a lap quilt for each state. She has the one for Georgia and asked who had them for the other SEPA states. No one present had knowledge or possession of a quilt.

Ken asked that experienced members offer their

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SEPA Business Meeting (Continued from page 14)

services as mentors to new members This is a way to fulfill our statement of purpose.

Announcements:

Drew Gilmore thanked council and Janet Stearns for support and development of the revamped SEPA website.

Liz Klimek announced the upcoming CAPE (Carolina Association of Planetarium Educators) meeting at the SC State Museum in Columbia on August 24th & 25th.

Mel Blake invited SEPA members to a statewide conference for the Alabama Academy of Sciences in February. He will be the host.

With no further business or announcements, the meeting adjourned at 4:43 pm. (April Whitt/Jon Bell)

IPS (Continued from page 5)

invitation. The Clarke Planetarium in Salt Lake City was to have hosted that year's conference.

A call for additional bids was distributed and 4 sites responded!

One of the following will have been chosen by IPS Council by the time you read this.
Arlington, TX, USA
Edmonton, Alberta, Canada
Rio de Janeiro, Brazil
Toulouse, France

IPS 2020
Are you interested in hosting an IPS conference? The IPS Council is currently soliciting bids for 2020. Interested parties should submit their invitations to IPS no later than the 2016 conference. The site will be chosen at the 2017 IPS Council meeting.

Thank You to our Generous 2015 Conference Sponsors

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Sudekum Planetarium	**www.sudekumplanetarium.com**
Museum of Science, Hayden Planetarium	**www.amnh.org**
Digital Projection	**www.digitalprojection.com**
Dome 3D	**www.dome3d.com**
University of Toledo, Ritter Planetarium	**www.utoledo.edu/nsm/rpbo**

Patsy Wilson
Salisbury, NC

2015 Mid-Year Financial Report – SEPA

Submitted by Patsy Wilson
June 23, 2015

All funds are held at Branch Banking and Trust Company

Balances:	(as of 6/23/15)
Operating	12,077.29
Savings	42,188.60
Scholarship	9,671.06
Total	63,936.95

Operating Account (as of 1/1/15) **8,154.84**

Income:		
Full Membership	1420.00	
Associate Membership	285.00	
Journal Ads	1,260.00	
Monies from 2014 Conf.	2,027.77	
Transfer from PD Fund-Awards	702.50	
PD Fund Donations	70.00	
Total Income		5,740.27
Total credits		**13,895.11**

Disbursements:		
Website Maintenance	1,400.00	
Conference Registration - 3 PD Awards	375.00	
Paypal fees	42.82	
Total Debits		(1,817.82)
Balance (as of 6/23/15)		**12,077.29**

Savings Account (as of 1/1/15) **42,162.44**

Income	
Interest earned	26.16
Balance (as of 6/23/15)	**42,188.60**

Professional Development Fund
(as of 1/1/15) **10,373.56**

Disbursements:	
PD Awards for Registration - Conference 14	327.50
PD Awards for Registration - Conference 15	375.00
Total Debits	(702.50)
Balance (as of 6/23/15)	**9,671.06**

Small Talk (Continued from page 8)

planetarium office, worrying on what they will do to the planetarium, destroy it? I hate to see it sit and collect dust while I do a job I am not qualified for and really hate while I wait two years to retire.

I have signed up to go to two planetarium conferences, SEPA as well as WAC. I wonder why? I will not be able to use anything I learn there in my new role as a physical science teacher. Perhaps it is just a way to take a break from a dismal life and career gone belly up and remember when life was somewhat better and happier.

James has asked me to stay on and continue writing this column, saying I have twenty-eight years of experience to work on. However, with my new role as physical science teacher, I will be so busy with overcrowded classrooms and teaching myself the new material, and correcting papers, that I will have no time and nothing new to write about, so if you feel you can take over the "Small Talk" column.

Feel free to send James a note and explain to him how you can talk to the small planetaria in our community. I will miss you all very much.

Book Review (Continued from page 11)

some successful, some not. The next attempt to put dogs in orbit was on July 28 1960. The two dogs on board were Lisichka and Bars. They never made it to space due to their rocket exploding during launch. A month later, Belka and Strelka rocketed to fame with one day in orbit and a safe return to Earth. Their life after space was very much a preview of what their human counterparts would experience: endless television and radio appearances, magazine articles, personal appearance tours, and much more. Their survival was important, but even more noteworthy was when Strelka later had puppies, proving that space travel didn't affect her reproductive ability. One of her puppies was even given to President Kennedy's daughter, Caroline.

Leading up to Yuri Gagarin's flight, two missions involved a single dog flying with a mannequin, dubbed Ivan Ivanovich, for single orbits. The cavity of the mannequin housed various experiment packages. When the first of these flights landed unexpectedly in Tartarstan, the people discovering the mannequin body thought he was a dead spy.

After men successfully flew in space, the need for canine pioneers was not as urgent. The last of the dog missions occurred in 1966 to test the effects of long duration in space. Ugolyok and Veterok spent 22 days in orbit. Although they survived, and both later had a litter of puppies, their flight was not without problems. Their health deteriorated enough to cut the flight short. Upon landing, they were found to be severely dehydrated and suffering from bed sores. Still, they were treated as heroes.

In addition to the stories of the missions the dogs flew, Turkina also puts their flights in the context of popular culture of the time. The dog flights inspired books, children's stories, cartoons, films and endless collectible souvenirs. Every page of the book contains pictures, mostly of collectors' items. Figurines, wind-up toys, postcards, stamps, matchboxes, pins, first day cover envelopes, posters, chocolate boxes and even cigarettes were all produced to commemorate the various dogs in space. The hardest part of reading the book was staying focused on the writing and not just looking at the pictures. I found that I had to read, without looking at the pictures, until I finished a chapter. Only then could I go back and enjoy all of the photographs and their captions.

"Soviet Space Dogs" is a quick, enjoyable read. Even the most ardent space buff will learn about missions and events they had never heard of. This is one book I can highly recommend.

Soviet Space Dogs **by Olesya Turkina. Published by Fuel, 2014.**

President's Message (Continued from page 4)

of joining SEPA. These include access to the professional development fund, our journal, member mentors, and preferred reservations at the Land of Lakes State Park in KY, to take part in the Solar eclipse of our lifetime - the path runs right through the park!

Ah, SEPA 2015! Who can forget that wonderful day trip to Marshall SFC, and the Von Braun planetarium? David-well done. This conference was the best attended in five years, with over 120 delegates and vendors registered. I knew it would be first-rate. Well done, Tellus museum's staff!

Speaking of conferences, next year's SEPA is a first time thing: Alabama! Montgomery, and the W.A. Gayle planetarium. Dates are May 31st -June 4th.

One final thought: to give an example of the opening quotes' relevance: As of two weeks ago(June 14th, EDT), the ESA Philae lander awoke from its energy-starvation, and sent back data! What will it show, and what data will it still collect? And what was all that white/silvery schmutz on Ceres, anyway? By the time you read this, you'll know - and so will your audiences!

SEPA 2015

Spinning on your Axis: Bringing Motion into your Planetarium

Kortnee Crumpler
The Children's Museum of South Carolina
Myrtle Beach, SC

Have you ever been teaching a lesson and realized how unbelievably bored you were? Well, I'm sure you have at some point and that happened to me in February 2015 when I was teaching a lesson inside our Digitalis Planetarium to a group of fourth grade students. I realized that, although I was enthusiastic about what I was teaching, I was just talking and asking the students questions and receiving little enthusiasm from the students. I was teaching the lesson the way I had been trained but felt that the lesson could be taught in a way that matched my personal teaching style as well as better correlate with The Children's Museum of South Carolina's mission of promoting and stimulating self-discovery through interactive learning experiences that would enhance every child's understanding of his or her global community. Using my experience in early childhood teaching as well as elementary grades, I began to brainstorm how I could make our Digitalis Planetarium more fun for everyone, myself included.

The idea of incorporating movement into educational lessons is a trend that has gained more popularity in the last several years than it had previously. During the original lesson, students seemed to have a difficult time sitting still and focusing. The only students that were moving during the lesson were the seven volunteers during the entire 50 minute program. The movement of the seven volunteers was when we were talking about the Earth's movement; the halfway point of the lesson and there was always an upset child because of not being chosen. When trying to make our Digitalis Planetarium lesson more fun for all, the decision to incorporate whole class movement was my first choice for trying to enhance the educational value and increase the excitement of the students. Now, instead of only seven students rotating to show the Earth's movement, all of the students do. At times it does become crowded but it is a great way for the students to get some of their wiggles out as well as better understand how our Earth moves. To make sure the new way of teaching did not come at the cost of the lack of educational value, I decided to create a simple experiment to confirm that incorporating whole class movement during the lesson added educational value to the Digitalis Planetarium program. Six classes were chosen to take part in the experiment without any knowledge of the experiment. Three classes were taught with minimal movement using several volunteers and three classes with whole class movement. At the end of each session, students were asked the same three questions and they wrote their answers on paper. The chosen classes had not started their units of study about space. My findings were as expected: the percentage of correct answers for the class that experienced whole class movement was 97% and the percentage of correct answers for the class with minimal movement with several volunteer with 83%. The results of the experiment confirmed that the incorporation of movement held more educational value than the previous lesson and the students seemed to enjoy the whole class movement more than minimal movement.

As educators, it is easy to get stuck in our own ways of doing things and forget that there is always room for improvement. It is important to question how we do things to make sure that the information we are presenting is easily understood by our students. Through our outreach programs at The Children's Museum of South Carolina we meet thousands of children that may not find space or Science exciting. I believe that it is important to do more than hit the educational standards of our state by making an effort to inspire children to want to learn by adding fun moments to all of our lessons.

"Tell me and I forget. Teach me and I remember. Involve me and I learn." - Benjamin Franklin

SEPA 2015

Outcomes of Immersive Learning

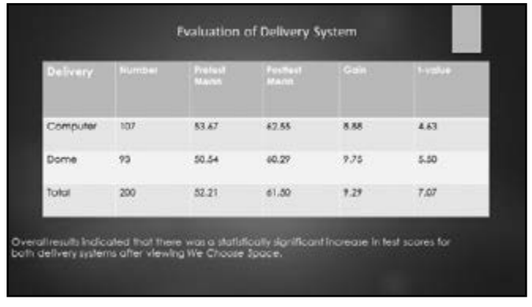
Jon Elvert
Lousiana Art and Science Museum
Baton Rouge LA

In 2009, a NASA grant was awarded to the Louisiana Art and Science Museum, the Houston Museum of Natural Science and Rice University for the purpose of developing two planetarium shows and interactive games for a portable Discovery Dome. *We Choose Space* (2012) and T*he Great Planet Adventures* (2014) were produced and created by HMNS, Home Run Pictures, Tietronis and LASM to enable the general public to envision the future following the Shuttle program. The two shows address the possibility and feasibility of returning to the moon, as well as possible future missions to solar system destinations and what astronauts' work/play on these other worlds might look like. A provision of the grant was to assess and evaluate comprehension and retention of the primary scientific content in W*e Choose Space*.

This paper is the summary of the external evaluation of student assessment conducted by Laurie Zimmerman and Stacia Spillane (both from the Houston Independent School District), and research performed by Dr. Carolyn Sumners (HMNS) and Dr. Pat Reiff (Rice University). The outcomes compare the student learning about space in digital and computer environments. Show content was reviewed by NASA scientists and engineers. Questionnaires were developed both by the production team and by teachers at Rice University using science standards. Multiple-choice questionnaire instruments were administrated to students in both formal (public school) and informal (museum/planetarium) settings.

In both formal and informal environments, a total of 370 students ages 11-17 participated by taking a pre-and post-test and viewing the show *We Choose Space*. The informal group consisted of 104 students, while the formal group consisted of 200 students. The evaluation instrument had 16 multiple-choice questions. The middle school students who participated were primarily underserved minorities (African American, American Indian, Asian, Hispanic, and White). Each student took the instrument prior to viewing the show. The same instrument was administrated as a post-test. Each group of students took both the pre- and post-tests on the same day.

Overall results from the informal and formal educational settings indicated that there was a statistically significant increase in test scores for students who viewed We Choose Space in both delivery systems - the dome environment as well as with the computer monitor at school. However, the mean gain of these test scores was higher for the students who watched the show in the planetarium.

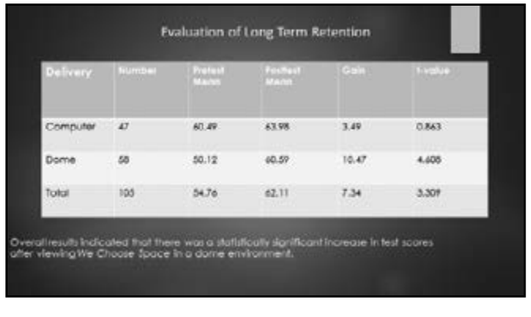


To evaluate long-term retention of concepts presented in the show, the identical post-test questionnaire was given to both groups of the same students six weeks after viewing the show. The mean gain

(Continued on page 24)

Elvert (Continued from page 23)

results of the post-test was higher for the students who watched the show in the planetarium than on the computer. In general, test score improvement six weeks after learning in the dome was essentially the same as the post-test immediately after viewing the show, demonstrating virtually no loss of gained information in the six week interval. Whereas those students who viewed the show on a computer scored lower six weeks after viewing the show. Numbers in the chart are based on a score of 100. Statistical significance with t- and p-values are not discussed in this presentation, but are given in the handout, or upon request.

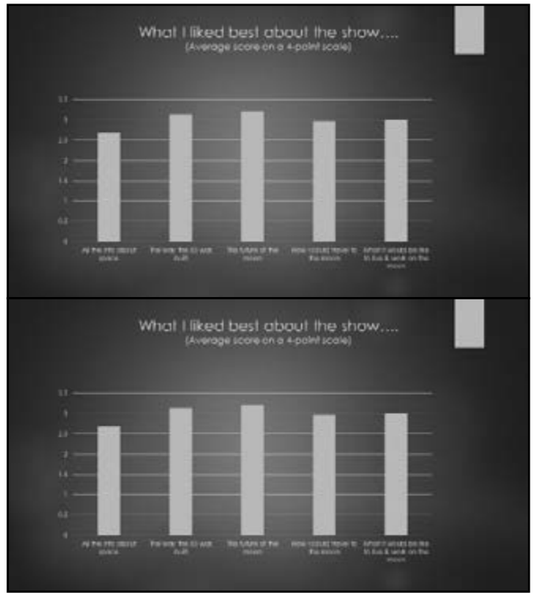


Test results show that the mean increase in test scores for learning in the informal environment was 10.47, indicating a significant retention of show material.

In conclusion:

- There was a statistically significant increase in post-test scores for students who viewed the show in both formal (school lab) and informal (dome environment) setting. (9.2%)
- Long-term retention of science concepts by students who viewed the show in the immersive environment had a statistically significant increase in test scores over those who viewed the show on a computer. (7.34%)
- Test results were virtually the same after six weeks as they were just after viewing the show in the dome (students who watched the show on a computer retained less after the six week interval).
- The planetarium experience is more memorable and better remembered than a comparable classroom experience.

To assess their attitude about the experience of watching the show, students were asked to respond to the following questions.



The bar chart summarizes what students liked best about the show based on a 4-point scale where 1 was Little and 4 was Great.

NASA identified space science education as a method for engaging students in the pursuit of STEM careers with astronauts as role models for students of all ages. They recognized that career choices would be built on experiences that could only happen if students became aware of the programs available and engaged in explorations, either real or virtual. Both these shows were designed to motivate youth to wanting to become astronauts and/or solving challenges for the next generation of scientists and engineers.

About half the students who viewed the show were asked what career they were most interested in pursuing. Out of 198 responses, 102 selected STEM related careers; 68 selected non STEM careers (musicians, professional athletes, law enforcement, and lawyers), and 28 students had no preference.

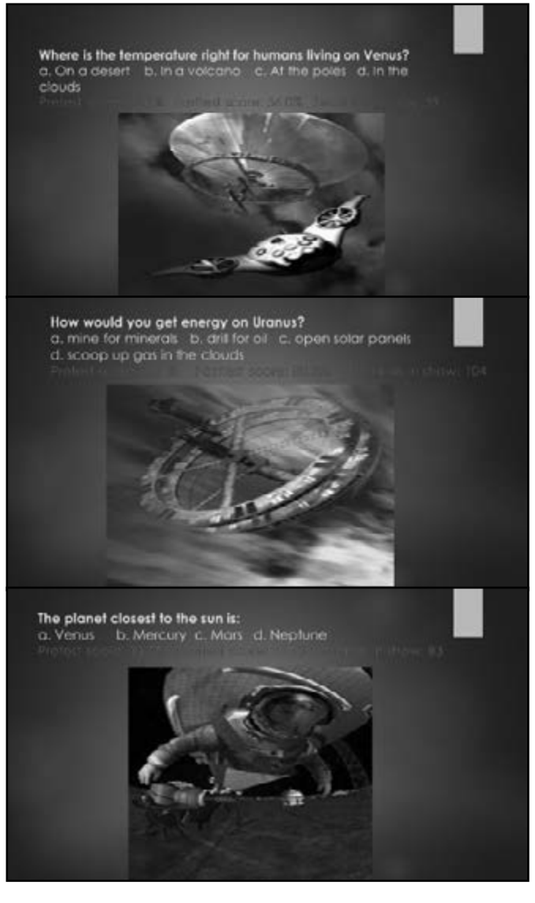
The second show produced, T*he Great Planet Adventures*, was completed in late 2014. Unlike *We Choose Space*, the GPA did not have an external

(Continued on page 25)

Elvert (Continued from page 24)

evaluation to compare student learning. Instead, Dr. Sumners delivered an evaluation instrument to students viewing the show in 2015.

The GPA learning objective is to immerse students in 10 environments, with habitats, weather, surface features, and activities consistent with what astronauts would experience on each world. Students also watched astronauts engage in a favorite sport at each destination. Of the 12 destinations in the show that students were asked to respond to, three of the destinations, represented in screen shots below, depict off-world environments – Venus, Uranus, and Mercury. All pre- and post-questions asked regarding the GPA focused on what students learned in the planetarium environment. The results are highly significant for the whole test with correct answers correlated with the time spent in each environment (indicated on each image).



SEPA 2015

Dome Club Nashville

Celeste Holliman
Sudekum Planetarium
Nashville, TN

Last year, the Sudekum Planetarium launched Dome Club Nashville. After suggestions were made to play standard movies on the dome, it seemed a perfect time to suggest fulldome, evening programing instead. Many issues arise when trying to present programing to a new audience. For instance, who IS the audience? We love science and are located within a science center. Can Dome Club be a place for exploring advanced topics that aren't appropriate for daytime audiences? Nashville's art scene is thriving, so perhaps there is an audience for the art / beauty of science.

Building an audience is just one facet to the challenges facing Dome Club Nashville. We want to allow the umbrella to include a variety of programs, so it is important to try to not set limitations while defining Dome Club. It seems that the planetarium staff all have different answers to "What is Dome Club Nashville?" We do all agree that the content should be immersive! An interactive experience for our visitors, including their feedback, will hopefully help us cater to demand as the audience continues to build. Fractals brought a full house, so it is easy to see that a second showing is a viable choice.

The Fractal segments which were presented at Dome Club are from Fractal Foundation in Albuquerque, NM. Within their history on the fractalfoundation.org site, you will find that they "have taught fractals to over 24,000 children and 15,000 adults." Not only are the fractal segments visually stunning, but also they have the ability to connect the visual learner with mathematical formulas. National standards in the US, as we all know, are all below many other countries in the world. Alternative teaching methods have the potential for creating more interest in learning subjects such as mathematics and science.

The fractal program also creates a perfect platform for local participation within Dome Club Nashville. Fractal generating software is widely available at little or no cost. Perhaps

(Continued on page 26)

Holliman (Continued from page 25)

Dome Club Nashville can continue to grow beyond just fractal submissions into a showcase including local artists. To ensure the survival of the planetarium, why not show our community the beauty of all sciences? We all want to continue to present the night sky and the wonders of the universe. A balanced dose of diversity can lead to successful interaction within many segments of our communities.

What do these programs all have in common? They use the entire space of the dome to create the immersive experience. Fill the dome in a creative manner instead of stretching video in alternate formats. Many IMAX productions simply abuse the amazing space of the dome. Layer and use material and assets creatively, as in **Cosmic Dance**. The backgrounds are not necessarily representational of reality, but an experience is created which is unlike any other. The images are "dancing" unrealistically above an ancient observatory, yet it creates an interestingly artistic effect. In our fast paced world, it is increasingly more difficult to hold attention. If we don't learn to process multiple ideas simultaneously, we fall behind. There is no canvas superior to the dome for a complete immersion within space; don't forget that it is also perfect for showing the beauty of an idea, thought, message, or even to just relax.

"Dome Club provides a venue for alternative planetarium programs, including artistic cinema or visualization projects, dance, games or concerts…anything that takes advantage of the fulldome environment," said Kris McCall, director of the Sudekum Planetarium. "Most importantly, Dome Club is a place to connect and enhance the lines between the art of science and the science of art."

What might one find at Dome Club Nashville?

Science, Space, Local Artists, Music, Mathematics, Environment, Dance, Theater, Art, Design, Puppets!
What else?
Only time will tell...

A few of the programs that have been shown for Dome Club Nashville:

Coral
Rekindling Venus
Imagine global co-operation for a global problem. Imagine corals as the barometer of climate change. Imagine we are the pivot point. Imagine rekindling Venus.
- Lynette Wallworth

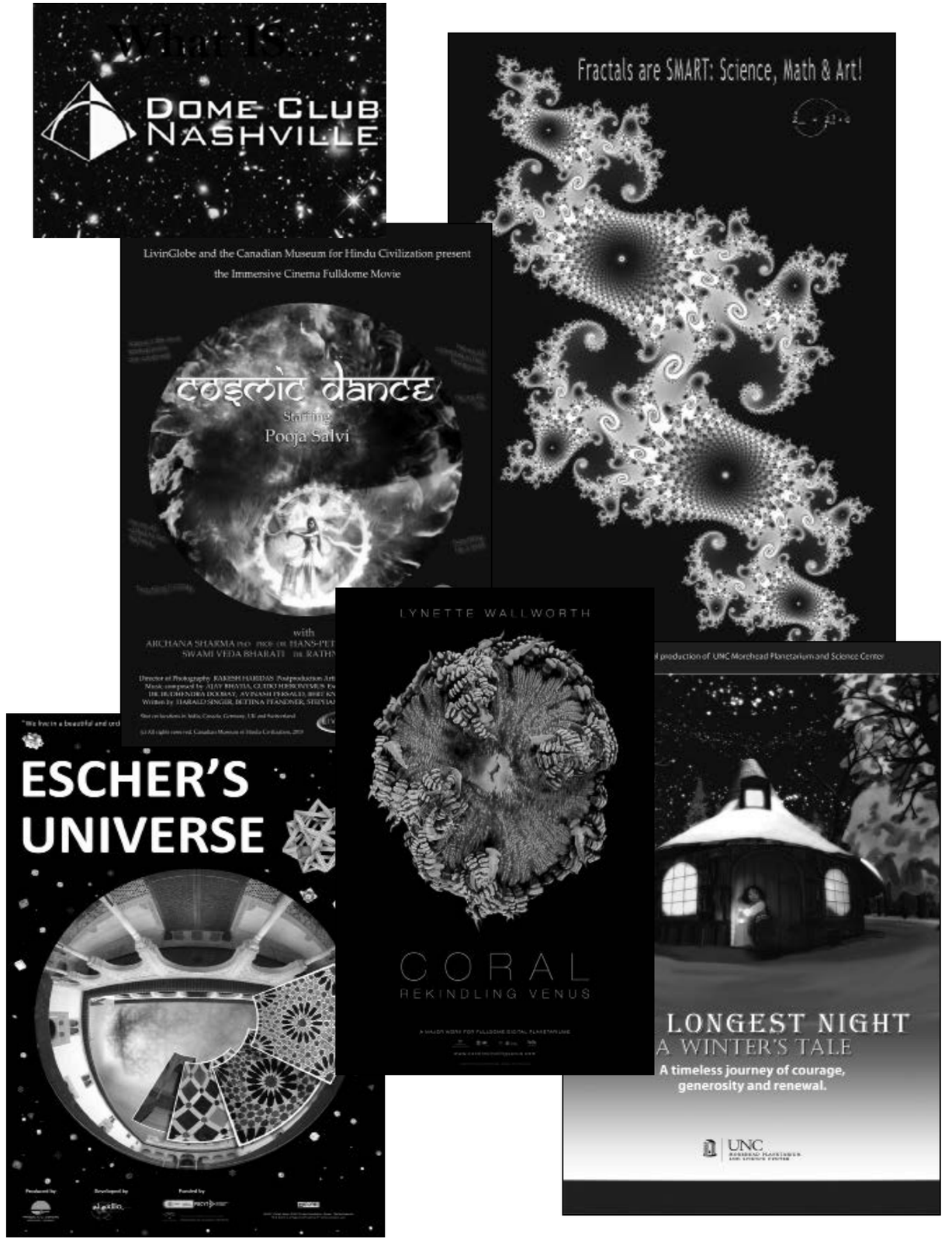
The Longest Night: A Winter's Tale
On a cold, dark, winter's night, a young girl must embark on a quest to save her family. Along the way she discovers a dragon's nest, a way to help her village, the meaning of courage and generosity, and the importance of renewal.
Morehead Planetarium/UNC – Chapel Hill
Paperhand Puppet Intervention.

Cosmic Dance
This program provides a feast for your eyes and an inspiration for your mind where Hindu faith, modern science, and universal thinking are united in one reality.

Escher's Universe
Was Maurits Cornelis Escher an artist, an astronomer, a mathematician, a traveler? From within his studio, Escher's most iconic works eloquently demonstrate the interrelationship between Science and Art.

The Wall (rated PG)
Using Pink Floyd's concept album as the foundation, Aaron McEuen and Starlight Productions of Salt Lake City, UT, have created a dramatic, immersive, and sometimes abstract visual environment. Whether you are familiar with the music or not, prepare to experience this rock opera like you never have before.

Wish You Were Here
Welcome to the Machine, a.k.a. the Sudekum Planetarium, to experience this Pink Floyd album in a unique way through the visual creativity of Aaron McEuen and Starlight Productions of Salt Lake City, Utah. Abstract imagery and fanciful worlds await those who want to shine on.
Starlight Productions



SEPA 2015

Weighty Matters and the ISS

Darlene Smalley
DuPont Planetarium, USC
Aiken, SC

NASA Administrator Bolden evokes a barrage of questions when he tells students, "You are part of the space generation! Every moment that you have been alive, there have been people in space."

"Where in space are they? What are they doing? How did they get there? and How do people use the bathroom in space?" are frequently asked questions.

Charles Bolden at USC Aiken in January 2015. Photo by Aiken Standard reporter Cindy Kubovic

The DuPont Planetarium's new show, Engineering the International Space Station, addresses all of these questions and some that students don't think to ask, particularly, "Why are astronauts weightless on the International Space Station (ISS)?"

No one asks this question because they think the answer is simple: astronauts are weightless because there is no gravity in space. To dispel this common misconception, a portion of our ISS show is dedicated to demonstrating relationships between mass, weight, gravity and speed.

We introduce the difference between mass and weight with the **Weighty Matters Rap**. Two recent graduates of USC Aiken performed the rap for our show, and our audio-visual master, Keith Pierce, added fun special effects to make the rap engaging. The audience is encouraged to "sing-along" on the 3rd repetition of the rap.

The Weighty Matters Rap
by Darlene Smalley

Weight is a force that depends on g.
Mass is the matter inside of me.

Weight will change if I leave the Earth.
Mass depends on an object's girth.

Units of weight are Newton and pound.
Mass is in grams; slugs are rarely found.

"Rapper" Shelby Green "leaving Earth"

To further understanding of mass and weight, our student London stands on a scale and shows that he weighs 180 pounds on Earth. Then, we pretend that London goes to the Moon where he would weigh 30 pounds. We remind the audience that weight is a force that depends on g, the acceleration due to gravity, and gravity changes with the size and mass

(Continued on page 29)

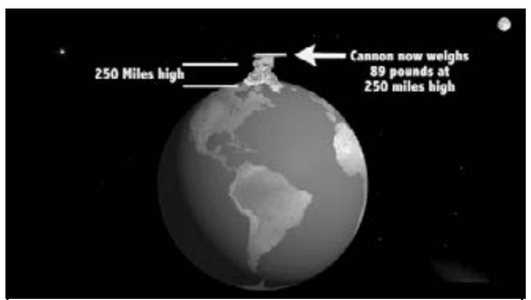
Smalley (Continued from page 28)
of the celestial object.

Next, we measure London's mass by "shrinking him" enough to place him in a balance. We show that it takes the same number of kilograms to balance him on the Moon as it does on the Earth because his mass wouldn't change much during the trip to the Moon. Similarly, astronauts arriving at the ISS have the same mass as when they left Earth.

Still from animation by Keith Pierce

"I get it," says a student named Sydney. "Astronauts have mass on the ISS because mass is a property of a body, but they have no weight on the ISS because there is no gravity in space."

"Not quite," says London, "gravity at the altitude of the ISS is actually 89% of gravity on the Earth's surface." He demonstrates via animation that a cannon that weighs 100 pounds on Earth's surface would weigh 89 pounds on top of a mountain 250 miles high, the height of the ISS.



Still from animation by Keith Pierce

Additional animations show that the pull of Earth's gravity on an object in space can be overcome if the object is moving fast enough. Since the horizontal speed of the ISS balances the rate at which gravity pulls the spacecraft toward Earth, the ISS stays in orbit and the astronauts inside experience a state of weightlessness, similar to perpetual free-fall. We give the audience a taste of this experience as Digistar II imagery simulates falling into a bottomless hole.

To further dispel the misconception that there is no gravity in space, we end this section of the show with an animation that depicts gravity as the force that keeps the ISS in orbit. London concludes, "Without gravity, a spacecraft moving at 28,000 kilometers per hour would rapidly fly off into space!"

Still from animation by Keith Pierce

I plan to present this basic science portion of Engineering the International Space Station at the SEPA conference in Cartersville in June 2015. All will benefit from discussing how to dispel the misconception that there is no gravity in space, and feedback from fellow educators will help improve our programs at the DuPont Planetarium. We want the "Space Generation" to be well equipped to continue exploring the majesty of the heavens!

News From SEPA Region

FLORIDA

contact: George Fleenor
GeoGraphics Imaging and
Consulting, Bradenton, FL
Jetson1959@aol.com

Florida Planetarium Association
(FLORPLAN)

Contact George Fleenor for details.

Miami Space Transit Planetarium
Patricia andPhillip Frost Museum of Science
Miami, FL

Claudia Hernandez reports: As we near the closing of our current dome events have ramped up and kept us so busy that we have even missed the last SEPA update! Our most notable event of the season was hosting the 4th Annual Underwater Film Festival. It was a wonderful planetary salute to Jacques Cousteau and others who have promoted the conservation of our oceans. We continue to run a public show schedule seven days a week and of course our monthly laser show night, Fabulous First Fridays. Our new museum and planetarium are developing well; you can see updates at www.frostscience.org/blog/future. And there you have it SEPA-ians, a short update as promised. Keep looking up!

Buehler Perpetual Trust Planetarium
Seminole State College of Florida
Sanford, Fla.

Derek Demeter reports: The Buehler Planetarium at Seminole State College hosted a very successful Venus/Jupiter conjunction event which saw over 600 people on the Sanford/Lake Mary campus. The event featured the expertise of both the planetarium and the Central Florida Astronomical Society as well as Jeremiah's Ice who featured their food truck to provide guests with ice cream, gelati, and italian ice. Planetarium Director Derek Demeter was also asked by Bryce Canyon National Park to give a Keynote talk during their annual Astronomy Festival during the month of June. Over 1,200 people were in attendance for the event and the talk was well received, Derek has been asked to present at the Great Basin Astronomy Festival in September of this year. Planetarium Michael McConville was awarded a grant to fund the purchase of clickers to be for our new Planetarium Interactive Response System (PIRS) project, which will revolutionize our school STEM curriculum and allow us to track student retention, as well as open up brand new avenues for audience participation.

Additionally we worked with a local puppet company Michelee Puppetry to fabricate a puppet for use in our new live interactive preschool level show "Zodiac Zoo". The photo featured is Derek Demeter holding our new puppet staff member, Zeke, an alien zoo-keeper who attends to all the animals of the Zodiac. The show is expected to be released Spring 2016.

GEORGIA

contact: David Dundee
Tellus Museum
Cartersville, GA
DavidD@tellusmuseum.org

Planetarium
Tellus NW GA Science Museum
Cartersville, GA

David Dundee reports: We had the honor of hosting the 2015 SEPA conference. We had a wonderful conference, 124 attendees including 25 vendors. We had 27 papers, 9 new planetarium shows, 6 workshops and 5 meal lectures from local astronomers, plus a trip to the Rocket and Space Center in Huntsville and a visit to the Verner Von Braun Planetarium and observatory. We had our keynote speaker NASA scientist Mark Kochte talk to us about the New Horizon Mission to Pluto. Mark also spoke on the Messenger program to Mercury earlier in the day. Dr. Harold McAllister spoke about the Georgia State University Multiple telescope project in Arizona. We had NASA scientists talk to us about the NASA solar research going on and also another NASA scientist spoke on the NASA Fireball camera network. We had four planetarium projectors installed in our planetarium including our own. We premiered "Can you bluff the planetarians?" a new SEPA game show. We had workshops on live planetarium shows, Go-Pro cameras, Meteorite identification and developing educational materials. It was a whirlwind week and so much fun to see all of my SEPA friends.

Smith Planetarium
Walker County Science and Technology Center
Chickamauga, GA

Jim & Shirley Smith report: Our Congratulations and Appreciation goes to David Dundee and his Tellus staff for a very good SEPA annual conference. Informative workshops and sessions, good food, well displayed vendors, efficient facility, great timing etc. etc. etc. made for an enjoyable and informative conference. We enjoyed and were so very proud to hear several of our former students as featured speakers. THANK YOU David and Tellus!!!

Some exciting changes are in the works for the Smith Planetarium. Not wanting to reveal changes until definitely completed, details will be in the next issue of "Southern Skies"!

KENTUCKY

contact: Steve Russo
East Kentucky Planetarium
Prestonsburg, KY
srusso0002@kctcs.edu

East Kentucky Science Center & Planetarium
Big Sandy Community and Technical College
Prestonsburg, KY

Steve Russo reports: After a terrible winter which caused the cancellation of many programs, Spring arrived and the groups started to roll in and normal programming resumed. The EKSC had NANO Days activities at the end of March, highlighting how NANO Technology is used in our everyday lives.

Astronomy Day was celebrated on April 25th with over 100 people in attendance. There were hands-on activities, NASA hand-outs, and the debut of our new Planetarium show, SUNSTRUCK, from the Michigan Science Center.

Also just in time for Astronomy day, our IRIS Active Earth Monitor arrived. This interactive computer kiosk teaches people about Earthquakes.

In May, our Super Science Saturday had the folks from Alltech (makers of Kentucky Bourbon Barrel Ale and Town Branch Bourbon), at the Science Center talking about crop science, algae, and yeast. Over 130 children and adults got to extract DNA from Strawberries.

As I write this at the end of June, our Summer camps are under way. The nine camps will cover the topics of animals, Polymers, space exploration, rocketry, Astronomy, engineering, water, and robotics.

A big thanks for Dave Dundee and his crew at the Tellus Science Museum for an excellent SEPA conference. It was wonderful seeing my SEPA colleagues that I haven't seen in many years, and having a background in NASA history and technology, the trip to Marshall was a big highlight for me

As a side note, in April I celebrated my 60th Birthday with a surprise birthday party with friends, family, and community leaders. For my commitment to teaching science to the community, The Mayor of Prestonsburg presented me with the "Key to the City", and the Governor of Kentucky commissioned me as a "Kentucky Colonel"; the highest title of honor bestowed by the Commonwealth of Kentucky. I now join this list of honored folks which include, Bob Hope, Roy Rogers, Harland "Colonel" Sanders, and John Glenn, just to name a few.

And remember my Bluegrass State colleagues, I am the contact person, so please send me news about your events. E-mail me at srusso0002@kctcs.edu or slrtts@suddenlink.net

Until next time, "look to the Skies!!!!"

LOUISIANA

contact: Jon Elvert
Baton Rouge, LA
jelvert1@gmail.org

Irene W. Pennington Planetarium
La. Art & Science Museum
Baton Rouge, LA

Jon Elvert reports: I no longer work at the Pennington Planetarium. The planetarium's producer, Josh Peebles, also recently resigned. David Kors, technical director, is currently the planetarium's contact person. My email address: jelvert1@gmail.com Before leaving however, I lined up the remainder of 2015's show schedule including the North American premier of *Super Solar Storms, New Horizons for a Little Planet, Magic Tree House, Hitchhiker's Tour through the Universe,* and *Back to the Moon for Good*. We also produced an in-house photo exhibit of Hubble's 25th anniversary – selecting our favorite 25 HST images, which is on display through August.

Lafayette Planetarium
Lafayette Science Museum
Lafayette, LA

Dave Hostetter reports: The staff at the Lafayette Science Museum is hoping for another good summer, perhaps with more attendance than last summer when we saw the best attendance in years. In fact, we are off to a good start this year with the highest June attendance in the history of our Museum! One of the programs in the planetarium will be our live, in-house program, *New Horizons to Pluto*, running throughout July and August. Although our planetarium is isolated from the Internet, technician Paul McCasland is writing software to allow us to use our Sky-Skan control system to operate a separate projector and computer with access to the New Horizons web site as part of the program. Light leaks from that projector will be controlled with a wooden box and a classic unveiler that Paul created using our 3D printer, and the control system will operate the unveiler with electronics built in-house. This may ultimately allow us to control traditional special effects projectors through the Sky-Skan system if that is needed. During the spring one of our public programs was the free *CosmoQuest* program *Cosmic Castaways*, with a brief live introduction to galaxies and galaxy interactions that we created ourselves. We got a good response from the audience for such an esoteric subject. We also ran the live program *Colors from Space*, a full dome version of the program of the same name from the Lawrence Hall of Science. Our annual lunchtime solar viewing has started, and will happen every clear Wednesday from June through August. We're planning our 2nd annual planetarium marathon for late July, three days of back to back programs without repeating ourselves except for our regularly scheduled afternoon constellation program. Over 600 people attended last year and we hope to have that kind of good response this year. Like many others, we are also getting ready for the prime time lunar eclipse on September 27 and hoping for good weather that night!

NORTH CAROLINA

contact: Bob Hayward
Pisgah Astronomical Research Institute
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Morehead Planetarium
Morehead Planetarium and Science Center
Chapel Hill, NC

Amy Sayle, Richard McColman & Mickey Jo Sorrell report:

Historical marker for astronaut training

In March 2015, a historical marker was installed in front of Morehead Planetarium to recognize Morehead's role in astronaut training. From 1960 to 1975, NASA sent its astronauts to Morehead Planetarium, on the campus of the University of North Carolina at Chapel Hill, to train in celestial navigation. Over the course of Morehead's astronaut training program, 62 astronauts—including eleven of the twelve men who walked on the moon—trained in the planetarium dome. The astronauts learned to recognize stars, constellations, and other celestial objects from the perspectives they would use during flight.

Historical Marker Celebrates Morehead Planetarium's Training of Early Astronauts

This program served the Mercury, Gemini, Apollo and Skylab missions. Americans were captivated by the "space race," and astronauts were some of the biggest celebrities of the era. To avoid undue attention and disruptions during the training days, Morehead protected the privacy of the astronauts and did not publicize their visits. Instead, staffers used the code name "Cookie Time" to identify when the astronauts would be on site, referring to the snacks available to astronauts during breaks.

The astronaut training program was developed by Morehead director Anthony Jenzano. Morehead instructors operated the planetarium's equipment so that the astronauts would see simulated stars in the proper position along their virtual flight paths. Technicians developed special "orbital line projectors" and other equipment needed for training assignments. Different missions required different equipment. For example, the Mercury missions used a Morehead-modified flight simulator known as a Link trainer, originally a World War II fighter pilot trainer. The Gemini missions used a Morehead-custom-built training simulator with openings that corresponded to the size and shape of the spacecraft windows; the simulator was mounted on a modified barber chair that could be rotated by

Morehead technicians to different angles to represent different yaw positions of space flight. Spacecraft pitch and roll simulations were accomplished using the Zeiss projector's diurnal and latitude motions. The Apollo missions also used a custom-built training simulator, but that simulator replaced the spacecraft window openings with an optical star sighting device.

Ed White and Jim McDivitt of the Gemini 4 crew, with Morehead's Zeiss II in the background.

Astronauts used their Morehead training to navigate using celestial objects, "sighting the stars" routinely to correct for periodic drift inaccuracies that would creep into the spacecraft navigation system's guidance platform. Morehead astronaut celestial navigation training also proved critical in at least two emergency space mission situations. Near the end of the Mercury-Atlas 9 flight on May 16, 1963, a cascading power failure disabled nearly all of the spacecraft on board systems, including the navigation system. Despite the fact that most Mercury program engineers thought it impossible to do so, astronaut Gordon Cooper used his Morehead training while manually operating the maneuvering thruster valves to establish and maintain proper spacecraft attitude throughout the retrofire and subsequent 3000-degree F. atmospheric reentry. Amazingly, he was able through his training to accomplish the most accurate landing of the entire Mercury program, splashing down in the Pacific within immediate sight of the prime recovery ship!

Morehead's training also helped save the second lunar landing mission. On November 14, 1969, rain pelted the launch site at Cape Kennedy as the countdown of Apollo 12 ticked down to its final minutes. Wanting to not miss the very brief lunar launch window for November, lest they be forced to delay the flight to the corresponding lunar phase in December, launch officials consulted the Cape's meteorologists who indicated that they should be able to safely launch under the rainy conditions. Unfortunately, the weather guys didn't take into account the massive electrical differential that could be caused by the Saturn 5 rocket ascending through the rain clouds. Within the first half-minute of launch ascent, this electrical buildup was released in two massive lightning bolts through the vehicle, down through the rocket's exhaust trail and to the launch pad, knocking the command module's systems offline temporarily, including its guidance platform. (Fortunately, the Saturn 5 had its own separate systems, and those were unaffected by the lighting discharges.) Once in orbit, the spacecraft systems were brought back online and tested, and Command Module Pilot Dick Gordon aligned the guidance platform using his Morehead star recognition training. The crew and spacecraft then went on to fly a successful lunar landing mission and later returned safely to Earth.

One of Morehead's former staff and astronaut trainers, Dick Knapp, was able to attend the historical marker dedication with his family, despite his ill health. He passed away within weeks after the dedication, but fortunately, was able to see his, and Morehead's accomplishments recognized before he passed away.

Staff changes

Morehead's Education Internship program is starting its fifth year. Our newest intern in the GSK Fulldome Theater and the Science Stage is Caroline O'Neill. Caroline is a May 2015 graduate from UNC-Chapel Hill with a degree in Arab Cultures and Language, with dual minors in Latin and Anthropology.

Caroline O'Neill is Morehead Planetarium's intern in the fulldome theater and science stage

Our most recent intern, Nick Eakes (who some of you may remember from the 2013 CAPE conference), recently began a position with Morehead's PLANETS program. He will be taking all of Morehead's planetarium programs, packaged for a portable dome, to schools, libraries, hospitals, camps, and almost anywhere with a 13-foot ceiling, across North Carolina. Nick is the second of our interns to make this transition to a full-time permanent position.

Celebrating Pluto

Morehead is celebrating the New Horizons mission to Pluto in several ways this summer. Throughout the summer, Morehead educators are presenting "Peek at Pluto," a 20-minute interactive live show, in the Science Stage. On July 17, NASA/JPL Ambassador Tony Rice will present a program on the science that New Horizons will gather during the fly-by period. Additionally, Morehead is presenting live shows in the fulldome theater that focus on Pluto and New Horizons.

Robeson Planetarium and Science Center
Lumberton, NC

Ken Brandt reports: We are wrapping up another great run of summer programs, which saw our attendance numbers swell, due to an aggressive local marketing campaign by Joy Ivey and me. Cleveland Oxendine completed another year of flawless driving of our activity bus, as well as beautifully maintaining the yard our building sits on. But wait, there's more! He also cleans the building's insides! So far, he hasn't shared his high-energy secret.

Our sidewalk has been freshly painted, and it looks good. Note that there are two scales presented here:
1. Earth's diameter=10 cm.
2. The edge-of-Sun to Earth distance=1 Meter

The most excellent thing that happened this summer was that four of the Mars One 'Mars 100' semifinalists celebrated a day of STEAM and a night of Mars August 8th. They worked with about 200 4H students from the Sand hill region, and also gave

Lumberton Sidewalk.

an evening panel discussion in either Lumberton or Fayetteville (as of this writing that detail is still being ironed out). Leila Rowland Zucker, M.D.; Dan Carey, Oscar Matthews, and Sonia represented their mission well, and have great futures in front of them-either here, or on Mars.

If, I say, IF Mars One is successful, I would love it if these four were the prime crew!

Of course, we have the pix autographed, just in case (eat your heart out, Russo).

PARI (Pisgah Astronomical Research Institute)
Rosman, NC

Bob Hayward and Christi Whitworth report: Not to be outdone by Ken (above) we also did some sidewalk (and parking lot) painting at PARI…and for a similar project. We have long had our Galaxy Walk which starts outside the main building and ends at the Kuiper Belt up a nice steep hill. The planets are, of course, spaced out proportional to their actual distances from Ol' Sol and the sizes are based on a ten centimeter Sun.

In trying to explain to students and other visitors why we see Venus and Mercury only at sunset or sunrise while we can see Mars at midnight we came up with the scheme of painting these orbits in appropriate colors on the accessible portions of

the sidewalk and adjacent parking lot. Now, we can choose volunteers to be Mercurians, Venusians and Martians and have them stand or move on their respective orbits to explain such esoteric terms as greatest elongation, opposition, etc. It has worked very well.

In the picture below I count two Mercurians, five Venusians, three Earthlings, two Martians and one NEO wandering between Earth and Venus.

PARI Sidewalk

PARI is in the middle of two sessions of Duke TIP Field Study in Astronomy and will host a total of 60 high school researchers. Look for the team posters, about 20 of them, to be published in the PARI Student Research Proceedings in September.

PARI will be leading a 3D Planets workshop at the NC Estuarium in Washington, NC in August for middle school girls. Another session of 3D Planets is scheduled for Hands On! In Hendersonville, NC in January 2016. This program builds 3D models of Mars and the Moon for use in science museum educational programs and displays. This program has been selected by Oceanside Photography and Telescope (OPT) as the recipient of the raffle proceeding from the Southern California Astronomy Expo in Oceanside, California, in July. This will open the Burroughs Wellcome Fund funded program to facilities outside North Carolina to host the program at no cost to the science museum hosting it. If you would like to host a 3D Planets workshop, please contact Christi Whitworth at cwhitworth@pari.edu.

PARI has received a NC Space Grant to host a New Horizons celebration in collaboration with the Pisgah Field School and the Cradle of Forestry. This event will take place June 14 and will offer outreach at the Cradle and at PARI simultaneously.

PARI has received another NC Space Grant for teacher professional development using the MAVEN Curriculum. Ken Brandt, MAVEN Ambassador (and other great titles), has agreed to lead this training on Saturday, November 7, 2015. Registration and agenda will be available at www.pari.edu by the time this publishes.

PARI will host a star party October 8-11, 2015. The program will be led by the Catawba Valley Astronomy Club. Please share this with your local clubs.

SOUTH CAROLINA

contact: Gary Senn
DuPont Planetarium, Aiken, SC
SennG@sc.edu

DuPont Planetarium
Ruth Patrick Science Ed. Ctr., USC Aiken
Aiken, SC

Gary J. Senn reports: The DuPont Planetarium at the Ruth Patrick Science Education Center (RPSEC) on the campus of the University of South Carolina Aiken (USCA) had a mostly successful National Astronomy Day on April 25 when it hosted what is called, "Earth & Sky Night" for 203 people. The skies were mostly cloudy, it sprinkled for a bit, but we still had a good group of interested people. Since National Astronomy Day is usually close to Earth Day, we combined the two into one celebration, although the astronomy side is certainly the highlight and the driving force behind the event. A variety of hands-on activities were available from 6:30 - 9:30 PM to help people understand the wonders of earth and space science. The Astronomy Club of Augusta (ACA) had a number of telescopes available for viewing the night sky and the Bechtel Telescope housed in the Ruth Patrick Science Education Center Observatory was also available. Our visitors very much enjoyed the activities.

The same weekend was the second annual South Carolina State Wide Star Party. The focus of the event was on April 24-25, and the DuPont Planetarium held its session on April 25.

In May, we began our summer hours in the planetarium by presenting shows an hour later at 8:00 and 9:00 PM to accommodate the use of the observatory after sunset. The planetarium presented the *Larry Cat in Space* from Lochness Productions and *To the Moon and Beyond*, which is a local production. In June, we showed, *In My Backyar*d from the Calgary Science Centre and *More Than Meets the Eye* from Lochness Productions. In July, we featured our newest show, *Engineering the International Space Station*, which is a local production; and *Digistar "Laser" Fantasy*, which is also a local production. E*ngineering the International Space Station* is an interactive show that describes how 15 nations worked together to create the International Space Station (ISS). A rap and animations explained how weight, mass, gravity and speed are related, and why astronauts are weightless on the ISS even though there IS gravity in space. Benefits of the ISS to humanity were also discussed.

We are looking forward to September 19 when we will join the Astronomy Club of Augusta to celebrate International Observe the Moon Night (InOMN). This annual event has been a good one for us, and we recommend that you become involved as well. http://observethemoonnight.org/

TENNESSEE

contact: Kris McCall
Sudekum Planetarium
Nashville, TN
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Bays Mountain Planetarium
Kingsport, TN

Adam Thanz reports: As usual, we're busy here at Bays Mountain. School groups, public shows, etc. keep us moving. Our two student interns, Julie Vaughn and Kayla Jenkins, are doing great in the theater. Giving programs, both live and playback, with aplomb.

Jason and I just came back from the SEPA conference in Cartersville, GA. Dave Dundee and the museum staff did a great job! Much praise is due for much work. At the conference, both Jason and I were active in participating. Jason gave a great paper on music formats. There a lot of formats out there and it is confusing understanding their differences. Jason simplified its daunting nature enough for all of us to understand.

I held the GoPro workshop. A huge thanks goes out to the SEPA Council for approving the funding for such an undertaking. About forty were in attendance. Twenty-five of which paid the $100 fee and received a GoPro Hero4 Black camera kit with accessories for their facilities! The goal was to get planetarians out there and create their own content to use in their theaters. I have seen a major decline of in-house show production over the past number of years. Yes, it is difficult to create content using full-dome systems. But, it's not hard if you don't consider making a complete, 3D animated show. Create a cool pan, shoot some video, capture some wide-angle vista views and use them in your live shows. Or, make a full show, but in a much simpler fashion. I'm hopeful that these cameras will not only help, but be the first step to get folks back into this time-honored tradition.

We're also gearing up for our annual astronomical convention, StarFest, held on Oct. 23-25, 2015. This year marks our 32nd anniversary and we have a great event planned. The theme is "What Does Human Space Exploration Mean?" As such, our speakers will each highlight a different way one can interpret this. The idea is that space exploration can be a manned mission, a probe that is sent out, or use a space or earth-based telescope. Each of these methods, and many variants therein, can be considered human space exploration. Our speakers are: John Charles, Carrie Nugent, Paul Lewis, and Rob Landis. John is from JSC and will speak on the effects of spaceflight on the human body and its challenges. Carrie is from Caltech and will

speak on NEOWISE and its relation to asteroidal research, or even help determine a future manned mission. Paul is from UT-Knoxville and will speak on the history of manned spaceflight to show where we have come from. Rob is part of NASA HQ and will be our binding force. He will speak on the challenges of a Mars mission and what the NASA view is at this time for man in space.

The event is three days of astronomy, fun, presentations, planetarium programs, observing, a commemorative shirt, a place to sleep, and all meals all included for one very low cost. Go to our website for all the details! http://www.baysmountain.com/astronomy/astronomy-club/?GTTabs=4 Send me your e-mail address if you want to be notified about this great event. Don't miss it!

Our main show through August is "Exploring New Horizons." The show looks at the New Horizons mission, Pluto, planetary discovery in our Solar System, and the scientific method. The great thing about the show is that it is not dated. You add a live update at the end to let folks know the status of the mission and Pluto. We produced the show in-house and is now in world-wide distribution. Many theaters are now showing it. It has been really well received by the public at our theater and other planetarian's have expressed their praise as well.

Our alternative programs at 2 p.m. this summer are "Back to the Moon - For Good" and "Appalachian Skies." "Back to the Moon" looks at the Google X-Prize and highlights the importance of STEM education. "Appalachian Skies" is our feature-length live tour of the current night sky.

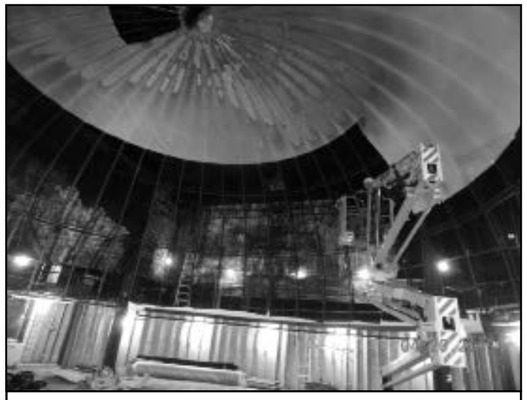
Sharpe Planetarium
Memphis, TN

Dave Maness reports: As I write this, I am thinking back on the great conference that David Dundee conducted in Cartersville, Ga. I personally treasure the fellowship and the sharing with peers is invaluable. The talks were informative. The shows were great. And the workshops gave us tools to improve our job skills which will benefit our visitors as we teach them about the universe. What more could you ask for? It was good to see many of you there.

GoPro Workshop

If you missed it, well, you missed a lot! Here is one of my first photos (un-retouched) with my GoPro Hero 4 camera at the GoPro workshop. (There should be one or two more conference photos at the end of this article.)

The Sharpe Planetarium doors are still closed while renovations continue. The old dome was removed



Above: Dome demolition
Below: Sawzall use

surprisingly fast. Apparently the most effective tool for the job was a "Sawzall". It was brutally efficient in dismantling the damaged dome.

There is a lot happening behind the scenes, too. Astro-tec is busy manufacturing our new dome, which should be installed this autumn. Also decisions are being made on sprinkler system repair, smoke detector installation, sound insulation, uninterruptible power supplies, final room layout, and the relocation of some questionable dome support anchors. While that is going on, the empty room awaits the activity that will soon begin.

Empty room

While we wait for construction to begin again, we continue to offer a "window" to the universe through our flat-screen program called ***Wonders of the Universe***. This takes place in our under-used Mansion Theater. The program currently includes showing the summer version of ***Seasonal Stargazing*** from Loch Ness. This is followed by a look at the current night sky using the **Starry Night Podium** software.

Part time employee Kelsey Moody left us in May for Texas to help her boyfriend take care of his parent's house for the summer. After that she plans to join him in Montreal, Canada, as he finishes his degree at McGill University. I will miss her knowledge, interpretive skill, and reliability. I wish her luck wherever she goes and hope she might find some opportunities to keep active in astronomy, maybe at the Montreal Planetarium. Kelsey's departure left a big hole in my department, so I looked into hiring a promising former volunteer, Richard Townley. He was a very able volunteer as a High School student. Now he's a sophomore Physics major at Christian Brothers University. I hope he will be able to start work later this summer and continue through the school year and beyond.

Lastly we ended the month of June with a guest speaker: Dr. Harold Kozak. He is an Author, Astronomy Professor at Wagner College, and a NASA Solar System Ambassador. He also happens to be the father of our newest local NBC affiliate's Weatherman, Andy Kozak. He spoke on topic **Extra-Solar Planets: The Search for Life**. The talk was well attended and enjoyed by all.

SEPA Conference Trip to Huntsville

VIRGINIA

contact: Kelly Herbst
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Chesapeake Planetarium
Chesapeake, VA

Dr. Robert Hitt reports: The Chesapeake Planetarium is about to add full dome digital planetarium projection by Spitz. The new projection system will be installed in the existing building but will be relocated when the new Planetarium/Science Center is built several years from now. The new science facility will be located in a dark sky location in the city of Chesapeake and will include an observatory and observation space for amateur astronomers to use their own telescopes.

Abbitt Planetarium
Virginia Living Museum
Newport News, VA

Kelly Herbst reports: Summer's here, and that means lots of shows, and tons of kids for summer camp!

Currently in the theater we're offering ***The Zula Patrol: Under the Weather*** for the preschool set, and the kids always get a kick out of it. ***Noisy Neighbors: A Frog Story*** continues to play well to our audiences, providing a wonderful pairing to our **Frogs: A Chours of Colors** exhibit. Our live show, Virginia Skies, of course always does well, and rounding out the planetarium offerings is a new in-house produced show called ***The Pluto Show,*** which has been popular indeed as New Horizons approaches that distant world. Our final show of the day is always given over to lasers in the summer, with ***iPop*** being featured in June, ***Spirit of America*** in July and ***ElectroPop***, a new show from AVI, coming in August.

Summer camps are always well underway, and thank goodness we've got a team of lovely ladies helping us out this year! Our summer planetarium staffer is Christiana Hoff, my goddaughter (I'm so proud!) and a student at Virginia Tech (geochemistry) and we have two astronomy interns this summer as well: Kaela Gosdzinski, a student at Mary Washington and former astronomy volunteer with us, and Laura Raciborski, a student at William and Mary (biology) and Noyce Scholar. They've been working hard presenting shows and teaching lots of kids all about space and science. We once again ran our famous **Science Myth-teries** camp where we follow in the steps of two guys you might have seen on the Discovery Channel – testing myths, applying scientific principles to strange ideas, and generally setting a lot of things on fire. It's always a fun time.

Before we know it, summer will be rolling into Fall, and we'll be closing for September for our annual maintenance month. See you then!

Any Virginia planetarian with news to share with SEPA should contact Kelly Herbst at kelly.herbst@thevlm.org or 757-595-1900 ext. 256

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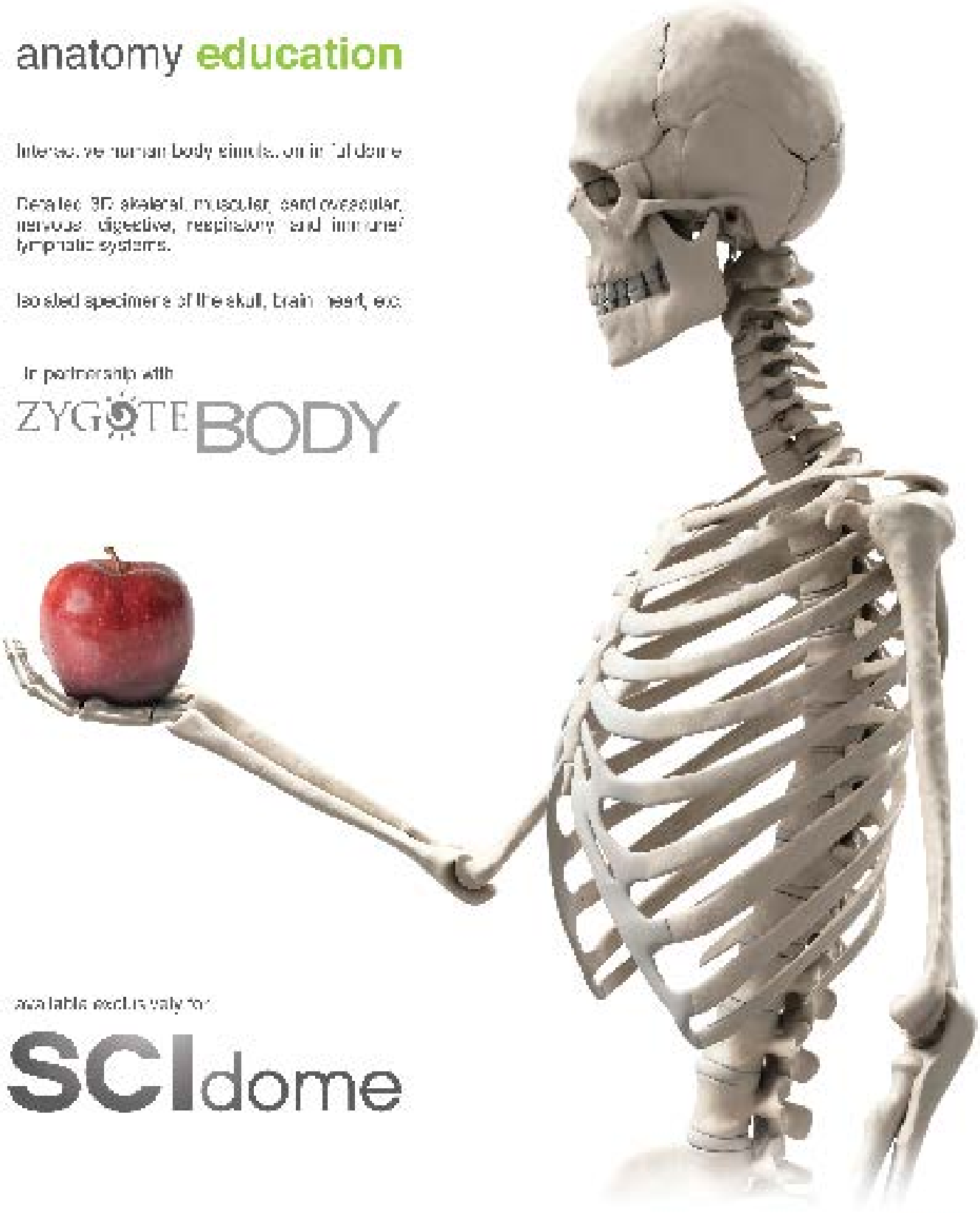

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