



CONSTELLATION

Spring 2016, No. 1

2016 MAPS Conference!

See you in Maryland for MAPS 2016!

Exciting plans are underway for the 2016 MAPS Conference hosted by the James E. Richmond Science Center in Waldorf, MD, July 27-30. Conference information and registration information was sent out in mid-March and can be found online at www.MAPSplanetarium.org. Conference registration is again \$150, and registration materials are due by June 10th.

Several exciting talks have already been lined up to take advantage of the conference's location relatively close to Washington, D.C. and NASA's Goddard Space Flight Center. Invited speakers will present about NASA's ability to explore our solar system, using educational materials from NASA in and out of your planetarium, updates from New Horizons just over a year after its flyby of Pluto, and more!

Already-scheduled workshops include "Getting Ready for the 2017 Total Solar Eclipse" presented by Charles Fulco, a representative from the International Astronomical Union's working group on solar eclipses. This year's Margaret Noble Address will be presented by Steve Russo, Director of the East Kentucky Science Center and Planetarium in Prestonsburg, Kentucky.

We encourage you to join us for MAPS 2016 and to share your knowledge and experiences as a Paper Talk, a Poster Presentation, a Workshop, or a Panel Discussion. If you have attended a MAPS conference before, you know that contributions from MAPS members are an important part of what makes these conferences useful and successful. If you have never attended a MAPS conference, this year is the perfect time to take the opportunity to meet, learn from, and share with your colleagues and to talk to vendors to learn about the latest offerings in planetarium technology and content.

This year's conference theme is "Innovate, Imagine, Inspire – Taking a New Approach." We invite you to join us for what promises to be an exciting, information packed, and of course fun conference!

Kevin Williams
MAPS Program Committee Chair



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President's Message

Happy Equinox. I hope everyone is having a good year. Summer is just around the corner and I expect your plans are pretty solid. I know the schedule for our 2016 conference at the James E. Richmond Science Center in Waldorf Maryland is all set and I hope to see you there in July. It looks to be a great gathering of members and vendors at a wonderful new facility. If you haven't done so already, please submit your paper or poster proposal soon. The more the merrier!

When I started working in a planetarium back in the 70's, we had little to visually show or talk about concerning Cosmology. The Big Bang Theory was taking hold but we still included the Steady State Theory in textbook chapters. Boy have things changed in 40 years! Back in February of this year it was announced that Gravitational Waves were detected from two Black Holes that merged. The Laser Interferometer Gravitational-Wave Observatory (LIGO) made the discovery on September 14, 2015. Einstein of course predicted the existence of gravity waves. Yet another piece of the puzzle of how our Universe works. Along with LIGO there is eLISA, BICEP2 and the Einstein Telescope that are either in operation or planned to go online soon. Detecting gravity waves is even bigger than when astronomers first detected radio frequencies from space. These waves move at the speed of light but are not part of the electromagnetic spectrum. This is a whole new field of study and a new way to understand the Universe. I can't imagine what the next 40 years will bring us!

In the December Constellation I mentioned that my small town of 900 people (metro 6,000) was planning a first annual Winter Solstice Walk. It was held on December 21 of course and turned out to be a great success. Over 1,900 people participated. The 3-mile walkway along our small river was packed with creative adults and children carrying their handmade LED lit lanterns. Most were around the size of a toaster oven but some were bigger than a person. ALL were very unique. The picture I include here gives you a small idea of what it was like. Imagine over 1,500 lanterns in a long, slow moving, somber, line through the woods just after dusk. It was truly magical!



See you in July.

Jerry Vinski, Maps President
Hillsborough, NC

Old Maps

From "The Constellation, Fall/Winter 1990, a special double-issue edition.

President: Tom Stec, President Elect: Steve Mitch, Secretary: Joyce Towne, Treasurer: Sam Storch, Editor: Don Knapp, News Editor: Steve Russo.

Board Members: Jon Bell, Lee Ann Hennig, Fred Stutz.

1991 Conference Plans Announced The feature article of this issue was about the upcoming conference to be held at the Fels Planetarium in Philadelphia on May 2-4, 1991. The hotel was to be the new Korman Suites with room prices ranging from \$90-\$130 per night. Conference activities were promised to be numerous and varied. Side trips would take participants to Spitz and Edmund Scientific. The conference host was providing a large space for vendors and the cost for exhibitors was only \$75! The Fels Planetarium was described to have a 65' dome with 330 seats, a spice automation system and a Digistar Projection system. A large facility with 8 full time employees, the Fels hosted more than 250,000 visitors per year. The Franklin Institute, Fels host museum, had also just completed a \$71 Million expansion called the "Futures Center." The article ends with the hope that the entire MAPS membership will attend. After all, "The success of the conference depends upon people, their fresh ideas, and ambitious sharing."

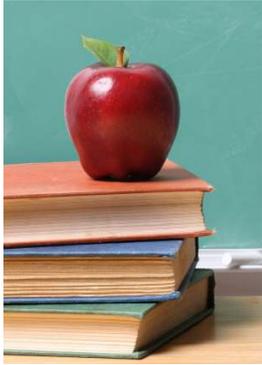
IPS in Borlange, Sweden The second major feature was about the previous summer's IPS meeting in Borlange, Sweden. President Elect, Steve Mitch described the honor of being asked to present the "State of the U.S. planetarium community." He said it felt like carrying the flag at the Olympics! Eighteen MAPS members were present at the conference of more than 300 delegates from 22 countries. There were two full pages devoted to describing the conference's offerings, which ranged from Cinema 360 films to papers and workshops to comedians to portables to planetarium show premiers! A rousing success seems to be the overall tone regarding the Borlange conference.

The issue rounded out with several short news items:

- Steven Berr was a semi-finalist for a Teacher of the Year Award in Pennsylvania.
- The Vanderbilt Planetarium on Long Island was in financial trouble with its board cutting staff from 8 to 2 full time employees.
- MAPS President Tom Stec found his planetarium under the ax as well when school board members closed his planetarium at Central Bucks District Schools.
- John Scala, of the Lenape Valley Regional High School Planetarium, presented an astronomy workshop for elementary teachers at the New Jersey Science Teachers meeting in October. The session was at capacity with 30 participants and was a hit of the meeting.

In the time it took the light to travel from Fomalhaut to your eyes, these stories surfaced from the past to the present. 'Til next time when we time travel again. . . .

John T. Meader, MAPS Archivist/Historian Northern Stars Planetarium 15 Western Ave., Fairfield, Maine 04937 207-453-7668 jtmeader@myfairpoint.net www.northern-stars.com



REPORT FROM THE MAPS EDUCATION COMMITTEE

How reassuring it is to see Orion and his entourage dominate our early evening skies. It is a little sad for me to find him slowly approaching the western horizon as the winter gives way to spring. This seasonal transition is beautifully demonstrated by the myths connecting Leo with Orion and his fellow travelers. The promise of Spring with its themes of rebirth, renewal and reawakening is paralleled in our contributions from the Education Committee in this issue.

- Below Susan Button Reynolds previews a 90 minute workshop at the upcoming MAPS 2016 conference called “**Flip Your Dome**”- a little bit of all three themes: rebirth, renewal and reawakening!
- On the next page Francine Jackson shares a few winter highlights for our “Stories in the Stars” – an awakening to the connection of our myths to the patterns and cycles in the sky.
- Mark Percy has a follow up from his September article on New York State’s adoption of the NGSS standards - perhaps a rebirth of the process.
- Patty Seaton presents a poetic perspective of a planetarian - a renewal of our dedication to our audiences and ourselves (see page 16).

We will continue with another “Questions that Lead to Lessons” episode in the June Issue of the *Constellation*. The Education Committee encourages you to contact us with any ideas you may have for workshops, and contributions to our articles on any topic.

Lee Ann A. Hennig, Chair
MAPS Education Committee
lahennig@verizon.net

Flip Your Dome

At the upcoming **MAPS 2016 conference** Susan Reynolds Button will be presenting a 90 minute workshop called “Flip Your Dome.” She explains, “I know what you are thinking, I usually represent portable domes and “flip your dome” is a term frequently use by portable dome directors, especially if a fire marshal asks us to demonstrate a second method of egress!”

“Well that is not what this workshop is all about. We will be exploring an interactive way to turn things upside down, to refresh lessons for you and your students. You can set up unique scenarios that challenge students to be more observant, solve problems and demonstrate that they have a real working knowledge of the topic you are teaching.”

Stories in the Stars

In Like a Lion...Out Like a Lamb Francine Jackson

We have many indicators that the month of March marks a change of season. The first was last month, with the appearance of Punxsutawney Phil, the forecasting groundhog. Although some really put a lot of stock into his predictions, the real story is that Phil's day is actually in the middle of the season of winter, one of the year's cross quarter days. Therefore, whether he sees his shadow or not, there is still about six weeks worth of winter, but, it does signal the beginning of the thought of springtime.

In the sky, we are also seeing the constellation marked as the "sign of spring." We've all heard the old adage that the season of spring, the month of March, comes, "in like a lion..." Rising out of the eastern horizon is Leo, the Lion, the scourge of the tiny village of Nemea. Apparently, this lion was so big, every step down of his paw would crush a house. Hercules was charged with getting rid of this beast. His way of doing so was not very nice to any cat lovers, but suffice it to say he did kill the lion, then swung him into the sky so the Nemean residents would know they didn't have to worry anymore.

Leo rises head first out of the eastern horizon this time of year. You can easily see this, by looking for a backwards question mark, with a rather bright dot. The circular part is his beautiful head and mane, while the brighter dot star, located where his front paws should be, marks his heart - our ancestors weren't very well-versed in anatomy. This star's name is very easy to remember. If we recall that one name for a lion is the King of Beasts, his heart star Regulus translates to "King." Notice the root word Rex.

Following the head and mane will be a triangle of stars, his back legs. If you draw a line from one of the head stars to his legs, you can actually see this constellation shape. And no, Leo has no tail; in fact, the stars that are often seen as the tuft is another constellation, Coma Berenices, Berenice's hair. This queen so loved her king that she promised if he would come back from war alive, she would sacrifice her hair to the gods. He did; she did. Although it isn't very bright, this set of stars can still be seen in city skies.

The best star to connect the two parts of Leo's body is Algieba, Gamma Leonis. Through even a small telescope, this star breaks into two, of almost the same brightness. Because of this, some people have nicknamed this double "the headlights."

Although Leo is rather easy to find by its shape, if you are having problems looking for it, there is a great marker. The Big Dipper, part of the Big Bear - Ursa Major - that can be seen in all types of skies, sits directly above the lion. Therefore, all you have to do after finding the Big Dipper is to pretend that it's been in the sky so long that the bottom's starting to rot out, and, if so, where will the water inside it go? Right on to Leo's back. So, if you can't see Leo, find the Big Dipper, turn it into the Big Dripper, and watch the water drip right onto the lion's back.

Going back to our old adage, it ends with, "...and out like a lamb." And what is that? Aries, the Ram, famous in astrological circles. A story for another time.

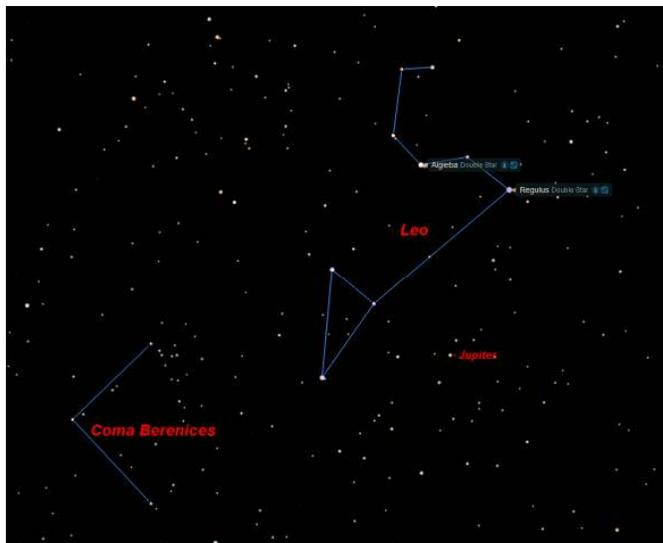


Image: Starry Night

NGSS in NY – Spring 2016 Update

Mark Percy

The pendulum swings back and forth in education. New York has just witnessed one of the fastest and most dramatic changes yet. Less than a year ago, we were told that 50% of teacher evaluations would be based on standardized tests this year, period, no discussion allowed. There was massive parent pressure and a revolt against CCLS (Common Core Learning Standards) standardized testing. Now, our Board of Regents has postponed use of those tests (grades 3 – 8 ELA [English Language Arts] and Math tests) in evaluations until 2019-20. Similar dramatic and quick change of direction seems to have happened with the NGSS (Next Generation Science Standards) as well. Rather than tearing the NGSS apart and re-working it, the state proposes to use NGSS as written with a few additions. Furthermore, most of the additions are minor. This table lists New York's additions:

New York State Additions to the Next Generation Science Standards

Pre-K Level

- P-PS1-1. Ask questions and use observations to test the claim that different kinds of matter exist as either solid or liquid.
- P-PS2-1. Use tools and materials to design and build a device that causes an object to move faster with a push or a pull.*
- P-PS4-1. Plan and conduct investigations to provide evidence that sound is produced by vibrating materials.
- P-LS1-1. Observe familiar plants and animals (including humans) and describe what they need to survive.
- P-LS1-2. Plan and conduct an investigation to determine how familiar plants and/or animals use their external parts to help them survive in the environment.
- P-LS3-1. Develop a model to describe that some young plants and animals are similar to, but not exactly like, their parents.
- P-ESS1-1. Observe and describe the apparent motions of the Sun, moon, and stars to recognize predictable patterns.
- P-ESS2-1. Ask questions, make observations, and collect and record data using simple instruments to recognize patterns about how local weather conditions change daily and seasonally.
- P-ESS3-1. Plan and conduct an investigation to determine the effect of sunlight on Earth's surface.

Kindergarten Level

- K-PS1-1. Plan and conduct an investigation to test the claim that different kinds of matter exist as either solid or liquid, depending on temperature.

Grade 3 Level

- 3-ESS2-3. Plan and conduct an investigation to determine the connections between weather and water processes in Earth systems.

Middle School Level

- MS-PS1-7. Use evidence to illustrate that density is a property that can be used to identify samples of matter.
- MS-PS1-8. Plan and conduct an investigation to demonstrate that mixtures are combinations of substances.
- MS-PS3-6. Make observations to provide evidence that energy can be transferred by electric currents.

High School Level

- HS-PS1-9. Analyze data to support the claim that the combined gas law describes the relationships among volume, pressure, and temperature for a sample of an idea gas.
- HS-PS1-10. Use evidence to support claims regarding the formation, properties and behaviors of solutions at bulk scales.
- HS-PS1-11. Plan and conduct an investigation to compare properties and behaviors of acids and bases.
- HS-PS1-12. Use evidence to illustrate that some chemical reactions involve the transfer of electrons as an energy conversion occurs within a system.
- HS-PS3-6. Analyze data to support the claim that Ohm's Law describes the mathematical relationship among the potential difference, current, and resistance of an electric circuit.
- HS-PS4-6. Use mathematical models to determine relationships among the size and location of images, size and location of objects, and focal lengths of lenses and mirrors.
- HS-LS1-8. Use models to illustrate how human reproduction and development maintains continuity of life.
- HS-ESS1-7. Construct an explanation using evidence to support the claim that the phases of the moon, eclipses, tides, and seasons change cyclically.
- HS-ESS2-8. Evaluate data and communicate information to explain how the movement and interactions of air masses result in changes in weather conditions.

There was a comment period and survey to review the additions which closed in early February. The apparent move toward adoption is a welcome change from previous signals from the Board of Regents. However, there is no timeline for implementation. Each school district in NYS will need to review and re-align its curriculum to the new standards after the final NYS version of the NGSS is approved. Stay tuned!

East Kentucky Science Center and Planetarium

By Steven LJ Russo, Director

We had a pretty busy Fall and early Winter here at the Science Center.

In September, my staff and I spent a day at the Hummel Planetarium at Eastern Kentucky University. We exchanged ideas with them and viewed some shows. Many of you remember this planetarium from years ago. Over the years it hit some hard times, but new life has been breathed into it with a new director, a new staff and a Sky Skan Definiti Full Dome System. This is still one of the largest planetariums anywhere, with a dome diameter of just under 70 feet and a 27 degree tilt!

Our Floyd County Early Childhood event in October, brought in over 200 people for hands on science activities and planetarium shows for pre-school kids. We held two special Halloween events during that same month; a night time Frightlight Laser show and an all-day Halloween event that attracted 150 people for “spooky science activities” and planetarium shows.

Our annual regional science fair in November attracted over 125 students and parents. For the Christmas Season we had a brand new (new for us) show; Season of Light from Loch Ness Productions. Our old Christmas show, which was the only one produced “in-house” was 12 years old, and by today’s standards, too long. Running at a length of 55 minutes, there was no time to do a “live” night sky session, and that is something we do after all of our shows, including our laser shows.

In January, we had a visit from the staff of the Hummel Planetarium. Since we went there in September, they came out to see us. The two staffs have decided to try to work together and help each other out with programs, and one of their staff is going to be a guest speaker at a conference we are holding in April.

March opened up with an interesting event; A Buddhist Monk, Tsering Phuntsok, doing a talk about Compassion, in our Planetarium. Residing in the foothills of the Himalayan Mountains in Dharamsala, India, Phuntsok’s home is less than a minute walk from the temple and residence of the H.H. Dalai Lama.

The event was held by the college, but at the last minute there were no rooms available for the event so it was held in the planetarium. Before his talk, we showed him the night sky and some full dome trailers. He started his talk by saying that this was the first time he ever gave a talk in a building that was devoted to teaching about science; especially Astronomy.

As of my writing this at the beginning of March, plans are under way for a Girls STEM Collaborative conference in April, Astronomy Day in May, and Summer Camps in June, which already has kids registered. It’s going to be a busy next few months here in the mountains.



For more Planetarium News, see page 15

Pre-Conference STEAM Exhibit Design Workshop

Bowen Technovation will host an extensive exhibit technology design workshop in Waldorf, MD on Wednesday, July 27th from 9 a.m. to about 3 p.m. at the Hilton Garden Inn. This is being held prior to the MAPS Conference. The conference will be hosted by one of the newest and biggest planetarium installations – the James Richmond Science Center.

A terrific group of internationally acclaimed presenters has been assembled for this workshop. Read details at: bowentechnovation.com/Bowen-Pre-MAPS-Exhibit-Design-Workshop-July-27/

You do not need to be a MAPS member to attend. And lunch and breaks are provided free.

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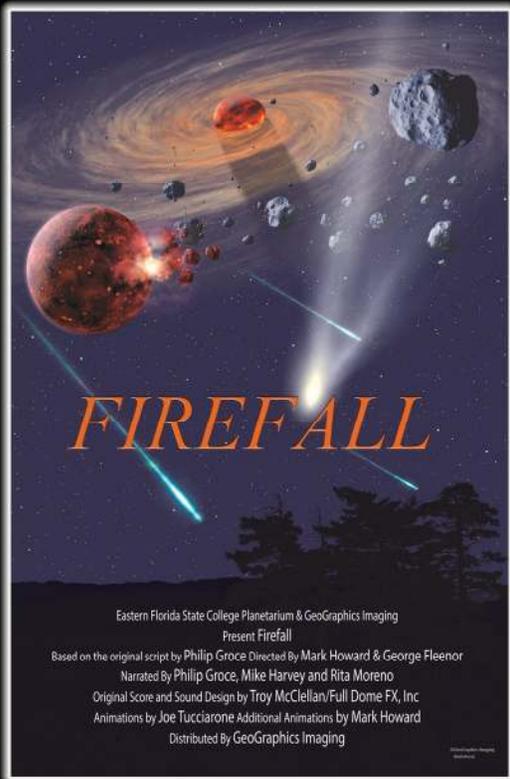
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Throughout Earth's violent history, impacts from comets and asteroids have mercilessly shaped its surface.

The ancient barrage continues today; from harmless meteors - those brilliant streaks in the night sky, to mountain sized boulders wandering perilously close to Earth.

Terrifying and majestic, these invaders from space are capable of utter destruction yet they have delivered life-giving water and most of the organic materials necessary for life.

Life on Earth owes its very existence to these denizens of the solar system, yet it could all be wiped out in an instant.

This ceaseless Firefall is our only tangible connection to the universe beyond and is an ever-present reminder of our own humble beginnings in the hostile environment of space.

It's not a matter of if, it's a matter of when...

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Again and Again

Some years ago, an advertisement similar to this one announced installation of the world's first GOTO CHRONOS HYBRID planetarium, at the College of San Mateo near San Francisco, California. It was a fantastic system that for the first time, brought the perfect synchronization of a state of the art opto-mechanical planetarium projector with a full-dome digital video system. Instructors Darryl Stanford, Mohsen Janatpour and astronomy technician Dean Drumheller loved working with the system to teach college astronomy courses and to inspire visiting school students.

Then the unthinkable happened. Only a few weeks after the planetarium's dedication, the fire suppression sprinkler system in the new building accidentally went off, flooding the entire planetarium with water! The CHRONOS HYBRID equipment was ruined. But Darryl, Mohsen, Dean had enjoyed working with the system so much that they immediately ordered another one.

Fast forward to today, when funding became available to add upgrades to many of the college's science facilities. Since the planetarium was so tremendously successful in not only educating but also inspiring current and future students, the decision was made to once again continue investment in the planetarium. And once again, the choice was GOTO.



So in January 2016, Darryl, Mohsen, and new astronomy technician Justin Stevick began using a brand new system. The new system includes a second generation CHRONOS II, which replaces earlier incandescent lamps with new high-output, high-efficiency LED illumination, and brings even more reliability. Dean says that the new CHRONOS II stars, sun, moon, and planets are so much brighter he actually has to dim them down a bit for some scenes. And Justin will never have to replace another burned-out lamp.

The full-dome video system was updated with new computers and software, and video projector resolution was improved from 2K to 4K. The full, synchronized system continues to be controlled by the HYBRID manual control console, which makes teaching live lessons easy, accurate, and fun.

So yet again, a new GOTO state-of-the-art planetarium is in place, and ready to go. And the College of San Mateo becomes the first planetarium in the world to have had three (3!) GOTO HYBRID systems installed!



"Planetarium Tech Justin Stevick and instructors Darryl Sanford and Mohsen Janatpour (l. to r.) beam almost as brightly as their CHRONOS II HYBRID."



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Luzader Observatory Dedicated

The late Bill Luzader was honored recent by the STEP (Science and Technology Education Partnership) Foundation in Plymouth, MA. A small dome housing a 10-inch telescope was installed at a local camp and dedicated to his memory, fulfilling his vision for a local observatory.

The observatory can be remote controlled by local schools.



Warren Phillips and Mike Petrasko of the STEP Foundation with Camp Bournedale Director Armie Gerson stand next to the observatory. Wicked Local photo/Rich Harbert



York County Astronomical Society



The York Learning Center Planetarium

The York County Astronomical Society is starting its 10th year running the York Learning Center planetarium. This year we received a grant from the UPS Foundation for the purchase of a *One World, One Sky* license to go with our other full dome children's programs. We now show three children's programs on a Saturday afternoon, followed that evening by three programs for older family members and/or a "How to buy a Telescope" presentation.

One World, One Sky is a huge hit in the local community and we are proud to be able to share the love of astronomy with all ages.

Todd Ullery
Planetarium Director
York Learning Center Planetarium
York County Astronomical Society
www.ycas.org

Volunteers nestle the telescope into its home dome at Camp Bournedale in Plymouth, MA.

Wicked Local photo/Rich Harbert

Don't Take Me Out of the Picture

a saga of the automated planetarium operator
by Patty Seaton (17 April 2002)

*Push a button, watch it go
That is all I need to know.
I sigh and lean back in my chair
Sometimes I look to see what's there.
A bulb is out? Then call the tech.
I don't care where spares are kept!
No time for questions that I don't know –
We kick out the audience for the next show!
Oh, the audience is happy, the show was "fun!"
Only 10 more minutes 'til the next one runs.
The visuals are awesome, fast-paced, zoom-zoom!
But what's that machine in the center of the room?
I think that it puts up the stars,
But check out that video pan of Mars!
The work's a cinch, the pay is bad.
The easiest money I ever had.
I don't have to talk or teach
I never know who has been reached.
Sometimes I sleep, sometimes I read,
Chat on the phone if I feel the need.
I'm out of the picture; I never speak
Easily replaced if I leave next week.
Thus is the story of my life
No training, no learning, no pain, no strife.
I've penned this whether or not I should.
Have I offended you? Then, good!*

No.

However, I believe every facility can benefit from some sort of live interactive programming. Your audiences LIKE to be engaged. Your audiences LIKE to provide input. Sure, maybe some people are looking for a 20-minute place for a brain break/nap. Let them choose one of the other programs!

All theaters, traditional and digital, can develop these programs. And if you need some ideas on how to implement these sorts of programs, I highly encourage you to participate in the Live, interactive Planetarium Symposium. Their next gathering will be August 10-12, 2016 at Chadds Ford, PA. See their website for details:
lipsymposium.org/LIPS/

You won't be disappointed.

An American in Italy

Congratulations to Stephen Case, Assistant Professor & Director of Strickler Planetarium at Olivet Nazarene University (Bourbonnais, Illinois), who has been selected as the winner of this year's contest! He will travel to Italy in the spring of 2016 to present his lesson "How Do We Know What We Know about the Stars?" Students will learn to identify stellar properties of distance, mass, and chemical composition; discover the meaning of the terms parallax, binary stars, and spectroscopy; discuss the methods of scientific discovery used in stellar astronomy and also enjoy some of his storytelling expertise. His proposed teacher presentation is called "Observation and Evidence in the Stars: A Tool for the Scientific Method and History of Science"

Meanwhile, we will be looking for applications for 2017. Start planning now; remember the deadline is 15 September 2016! For information about the American in Italy Contest go to: ips-planetarium.org/?page=portablecom ("An Astronomical Experience in Italy for an American Planetarium Operator") See also: astrofilibresciani.it/Planetari/Week_in_Italy/Winner_Week_Italy.htm

Okay, am I just a bitter old dinosaur, stuck in a facility that can't afford to upgrade to digital, who doesn't see the value of a digital projection system? Was I fourteen years ago, when I penned the above poem?

No and no.

My issue then, as it is now, is not that the planetarium theater should not be used to display wonderful full dome animations and movies that don't even have to be educational. My issue was/is that the planetarium theater should not EXCLUSIVELY be used for such things. If so, we miss out on what made the planetarium profession so exciting and wonderful in the first place... interacting with our audiences. In many levels, many ways.

Yes, I am influenced by the fact that my planetarium is part of the public school system and my mission is to develop educational programs for the students to enhance and supplement the astronomy curriculum and beyond. By beyond, I refer to my 7th grade program which supports the reading/English language arts poetry curriculum. We use the stars and astronomical images to inspire poetry writing! The nature of my facility leans towards live interactive educational teaching. So do I believe that every facility should look like mine?

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This program is funded in part by the Gordon and Betty Moore Foundation.



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Background is First-Light photograph of starfield by Konica Minolta's GEMINISTAR III projected onto 18.3 m dome at Vanderbilt Planetarium, Centerport, NY, USA

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