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Pictured is "Hector Vector the Star Projector", a Minolta Viewlex star projector that resided in Flandrau Science Center & Planetarium from 1975 to 2016. This year the planetarium celebrates 50 years.

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We are gathered together from all corners of this globe, inspired by the world and the universe we inhabit. Our society draws its strength from our predecessors and from the wide diversity of our present membership. Building on our past heritage, we are inspired to dream of future accomplishments, working together as a worldwide society.

IPS President Dave Weinrich
Welcome to the 2012
IPS Conference
Baton Rouge, Louisiana

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HELLO FELLOW PLANETARIANS!
A MESSAGE FROM THE PRESIDENT

Shannon Schmoll
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Momentum is building for the 2026 conference in Fukuoka, Japan. Registration is almost open (at least at the time of writing) for the conference, film festival, and post-conference tours. Check out www.ips2026fukuoka.com for more information. Our hosts are working hard on making a great experience for attendees and I look forward to seeing many of you there.

Our board is working hard on new initiatives to bring more opportunities and support to our members outside of conferences as well. Progress is being made on the strategic goals listed in my last letter. To help with that we also needed a membership committee chair. For too long our treasurer, Mike Smail, has been doing dual duty managing our finances and membership duties. I am happy to now welcome Amy Barraclough and Brian Koehler as co-chairs of the membership committee. Once fully onboarded, they will be able to support members with questions and find other ways to support our fellow planetarians.

As mentioned in my June 2025 letter, we also need to consider the financial health of IPS so we can sustain the work we do for our members and support new initiatives. As a result, the membership committee and board agreed to increase our member dues for the first time in 18 years to keep up with increasing costs. Those dues increase on December 8th, 2025. We have tried to keep the increase moderate and maintain an option of associate member that is free for anyone under financial hardship. Members are now 80 USD for Individual, 160 USD for Institutional, 300 USD for Corporate, 65 USD for Retired, and 40 USD for students. We also still offer a 2-year membership discount as before.

We have also been analyzing distribution of The Planetarian and the board has agreed to shift the journal to be primarily digital after the June 2026 issue. This has several net positives. Since it will be emailed to all members, everyone will get it at the same time. Our amazing editor, Shiloe Fontes, will also be able to make the new pdfs far more dynamic with hyperlinks and embedded videos. This will allow people to share resources in their articles more directly with readers. Finally, this will save IPS money that can be used toward its membership in other ways. Currently it costs on average 30 USD per copy to print and mail it to each member. Even the increased dues will not cover this annual cost for each person to get a mailed copy. We will maintain a print version that will be a paid addition to your membership at 120 USD per year that will be strictly cost-recovery.

Thank you for all your do and keep up the good work teaching the world the wonders of our universe!

♥

Shannon

P.S. UNSOLICITED BIRD FACT:

The national bird of Japan is the Green Pheasant, also known as Kiji. However, a very common bird you may see in Japan is the brown-eared Bulbul or Hiyodori. It is very cute and pretty chatty.

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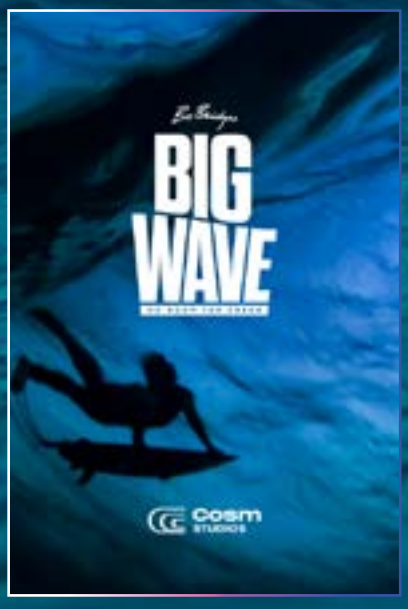

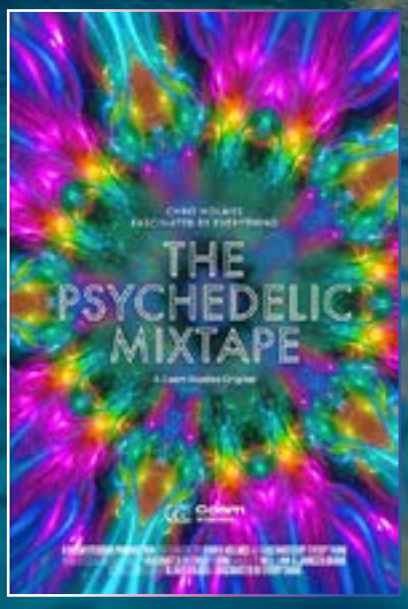

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50 YEARS OF FLANDRAU
IN FRONT OF THE CONSOLE

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If, like me, you've ever walked into the Flandrau Science Center & Planetarium and felt that spark of wonder - the kind that makes you look up and feel like anything is possible - then you're experiencing the result of a dream that's been growing in Tucson for half a century. This December, we're celebrating 50 years of inspiring future scientists.

The story starts back in the late 1950s and early '60s, when the University of Arizona was becoming a kind of cosmic powerhouse. Tucson skies were (and still are) some of the best on Earth, so astronomers flocked here - people like Bart Bok, Gerard Kuiper, Aden Meinel, and Tom Gehrels. Their work helped make the University one of the top places in the world for astronomy and planetary science; Tucson gradually earned the nickname "astronomy capital of the world."

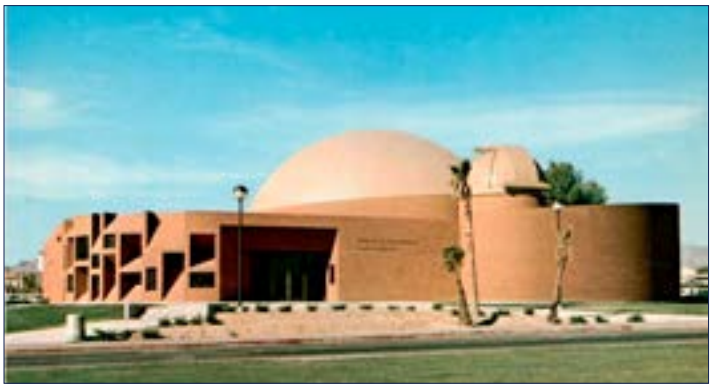
As these scientists built observatories and academic programs, another idea began to simmer: what if there were a place where the public could experience the wonder of the universe, too? Not a classroom, but somewhere built for curiosity, somewhere that made science feel big, beautiful, and accessible?

That idea took its first steps towards reality in 1972 when the university received a generous bequest from Grace H. Flandrau, an author who loved Tucson and spent her winters here. What could the University build that would honor her passion for storytelling and ignite curiosity in future generations? The answer - a planetarium, a place where science and imagination meet.

By 1975, construction was finished and the Grace H. Flandrau Planetarium opened its doors. Imagine it - the excitement of the very first visitors stepping inside, settling into their seats, and watching the desert sky bloom overhead in stars and color. At the time, Flandrau was part of the Department of Astronomy, tucked in close to the Optical Sciences Center and Steward Observatory - the perfect neighborhood for the brand-new home of space education. (and our close proximity to astronomy buildings has never changed! Lunar and Planetary Laboratory is to our east, NSF's National Optical-Infrared Astronomy Research Laboratory is to our north, Steward Observatory, HiRISE and OSIRIS-REx headquarters to our west and Optical Sciences and the Richard F. Caris Mirror Lab to our south!)

What happened next feels like a creative explosion. In the late '70s and '80s, the team at Flandrau wasn't just running shows - they were inventing new ways to make shows! Staff members wrote original programs, mixed soundtracks, developed slides, and even collaborated with other science centers on early immersive dome films. This was the "Cinema 360" era, when planetariums were experimenting with 35 mm fisheye projection, trying new tricks to make the dome feel more alive. Even by today's standards, it was pretty bold.

At the same time, Flandrau began expanding its focus. Instead of just astronomy, it introduced exhibits on optics, geology, space science, and more. School partnerships blossomed. Field trips became a rite of passage for thousands of Arizona students. It wasn't just a planetarium anymore—it was becoming Tucson's hands-on home for science.



Flandrau in 1975 on the University of Arizona campus in Tucson, Arizona.

By 1989, that evolution became official - Flandrau changed its name to the Flandrau Science Center & Planetarium, marking a shift from "one cool room with stars" to a full-fledged science center. The new structure created dedicated spaces for exhibits, planetarium programming, education services, and community events. The goal stayed the same - help people fall in love with science - but now the ways to do that multiplied.

Over the years, technology kept advancing, and Flandrau kept up. The most dramatic transformation came in the 2010s, thanks to support from community partners and foundations. The planetarium went fully digital, trading in slide projectors for state-of-the-art fulldome video systems that could fly audiences from Tucson's desert skies all the way to distant galaxies. The theater's sound system, lighting, seating, and accessibility features were all refreshed, culminating in the unveiling of the Eos Foundation Planetarium Theater in 2016. It was like stepping from the 1970s into the future in one leap.

And today? Flandrau is celebrating 50 years of inspiring curiosity. Millions of visitors have come through - kids on their very first field trip, families looking for something magical to do on a Saturday afternoon, university students taking a break between classes, and community members gathering for eclipses, meteor showers, and laser light shows.

Still, the most important part of the story is Flandrau's commitment to everyone. Year after year, tens of thousands of students from Title I schools visit through free or reduced-cost programs. Many are seeing a planetarium - or experiencing college life - for the first time. For some (like me), that spark of wonder becomes the moment they imagine themselves in science.

From Grace Flandrau's gift, to the dreams of early astronomers, to decades of innovation and the joyful noise of field trips, the heart of Flandrau has stayed the same - it's a place where the universe feels close enough to touch, and where curiosity is always welcome.

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The Marseille engineer François Ouvière is the author of twelve Cosmographs. He presented the first at the Universal Exhibition of 1855. The following year, the Cosmograph was installed in the courtyard of the Lycée Napoléon (Lycée Henri IV) and another in the annex of the Lycée Louis-le-Grand (Lycée Michelet in Vannes). From 1860, he installed ten Cosmographs on Esplanades in the South of France, including the one in Nice, on the Promenade des Anglais.

He also distributes miniature Cosmographs allowing you to learn about the discovery of the sky.

Little biographical data is available on François Ouvière (1807-1867). He only seems to be known by this instrument that he invented and called Cosmograph, accompanied by a booklet to explain its operation: *Cosmographe, Really Popular Observatory,* published by Victor Dalmont in Paris in 1855. The epitaph *« Indispensable to the populations of cities and seaports »* indicates the usefulness he saw for it in the great era of Cosmography. A graduate of the National School of Bridges and Roads, Knight of Ferdinand of Spain, he is best known for this invention. But how did it come to his mind ? This may be an introduction to Cosmography as part of his scientific engineering studies because, born in 1807, he was 23 years old when the teaching of Cosmography was instituted in 1830. Obviously, he seems to be passionate about knowledge of the sky, and for the dissemination of this knowledge to the public, by designing an original artistic work of popular science. While books must wait for readers to come to meet them, through his Cosmographe, he becomes a visual artist and sets out to meet passers-by through a work that challenges. An innovative approach at the time in public places. We must recognize his genius in designing this elegant and easy-to-access educational instrument for neophytes, unlike the classic armillary spheres. Before the invention of modern planetariums in 1923, it made it possible to visualize in three dimensions the fundamental planes and axes at the basis of this teaching which was often daunting for students and for most mathematics teachers, rarely inclined to study the sky.

The weekly magazine *Cosmos,* written by Abbé Moigno, presents a biographical evocation of Ouvière, met during the Exhibition of 1855. This is the first article in a series of four published in the form of a serial between July 1855 and the beginning of 1856. At the opening of this series entitled *The Open Skies,* Moigno begins by describing his reaction to the discovery of the instrument: *« In the garden of the Panorama, very close to the trellis which separates it from the Cours the Queen, we had often seen without looking at it a unique device of its kind, and somewhat similar to a giant armillary sphere... ».* However, he prefers the term Uranoscope to Cosmograph: *"We reject the name Cosmograph, because it is neither a question here of the world, χοσμοζ, nor of description, γραφω, and we will call it*

URANOSCOPE, ουρανοζ, sky ; σχοπιω, I see, because its object is to show us the sky".

AN INVENTOR, A COMMUNICATOR AND A BUSINESS STRATEGIST

The first Cosmograph was presented at the Universal Exhibition of 1855, from May 15 to November 15. According to the author's wishes, it is exhibited outside, facing the sky, on a stele in the southern garden of the Palais de l'Industrie, near the panorama rotunda and Cours la Reine, alongside the Galerie des Machines on the banks of the Seine.

Aware of its interest to the general public, Ouvière patented his device in 1859. His patent filing, lasting fifteen years, was registered under number 42333 on September 29, 1859 with the title *"Cosmograph, popular observatory"* . From then on, four years after its presentation at the Universal Exhibition of 1855, its intention of commercial distribution was clearly stated. It is no longer simply a question of presenting a new and ingenious device, but of disseminating it while retaining ownership of the invention.

An approach confirmed two years later, in 1861, when he requested the support of the astronomers of the Academy of Sciences, to validate its scientific usefulness. His expertise was carried out by Delaunay, Faye and Babinet and published in the *Comptes Rendus de l'Académie des Sciences* of August 5, 1861, which gave him new publicity in scientific journals.

To designate such an artistic work and popular science, today we would speak of a concept, through a set including the hoops and the metal rod, the four explanatory plaques, the cut stone stele and the wrought iron gate. surrounding the small monument.

HIS PRESENTATION AT THE ACADEMY OF SCIENCES AND IN SCIENTIFIC JOURNALS

This presentation to the Academy opens with a paragraph explaining the usefulness for the public: *« The cosmograph of which I am the inventor is a popular observatory. Observatory of public places. After long years of studies, applications and tests, my work is today complete in every way... »*. The report of this presentation triggered several articles in the scientific press. Thus, Abbot Moigno, extending his enthusiastic remarks from his series "*The Open Skies*" in 1855, echoes it again in Le Cosmos of August 9, 1861.

This endorsement from the Academy of Sciences favored the dissemination of the Cosmograph which truly began its commercial career at this time. Because Ouvière has developed a commercial strategy of formidable efficiency. Using regional industrial and agricultural exhibitions, extending the spirit of universal exhibitions on a regional scale, the 1860s saw him multiply the presentations of his Cosmograph in around ten cities around the Mediterranean. Then, at the end of the exhibition, he suggested that municipalities acquire the instrument designed specifically for the latitude of each city, and if necessary, to finance its move to install it in a place more suitable for discovering the sky.

His intervention during the Scientific Congress of France held in Aix-en-Provence in its session of December 18, 1866 is threefold interesting. Firstly because it presents an assessment of its action over ten years, providing the valuable information that its Cosmograph has already been erected in twelve cities and that it has received nine civic awards. Then through the expression of the feeling that his instrument *"does not seem to be appreciated at its true value"*. Hence probably his plan to accompany it with a *Treatise on Cosmography attractive to the people of the world*.

THE CENTURY OF COSMOGRAPHY

The 19th century is the century of Cosmography. In line with the French Revolution, scientists wanted to democratize the teaching of astronomy by integrating it into high school programs. Big names like Laplace or Delambre had formulated great ambitions with the integration of new notions of celestial mechanics. But the overly abstract content did not yield anything convincing from the mathematics teachers. We therefore had to start with more modest objectives. Before the advent of astrophysics thanks to photography and spectroscopy, the first half of the 19th century was still the great era of positional astronomy. From astronomy to cosmography, there is only one step, through the purely descriptive observation of the sky without notions of celestial mechanics. The teaching of cosmography was officially introduced into school programs in 1830 by the Ministry of François Guizot.

The term *Cosmography* is a feminine noun. From Antiquity to the Renaissance, it designates the theory on the origin and structure of the universe, including the geography of the Earth. In the 19th century, it qualified the subject taught in school programs. The *Dictionary of the French Academy* also reported it in 1932: Astronomical description of the universe. Cosmography course. As a direct consequence of this integration into teaching, cosmography manuals are flourishing in bookstores. Among several Cosmography courses, we can cite the *Leçons de Cosmographie* by Hervé Faye, published in 1854, the *Cosmographie des Gens du Monde* by Alphonse Gacogne, published in 1856, the *Leçons nouvelles de Cosmographie*, by Henri Garcet, published in 1852 and whose fourth edition in 1861 includes an engraving of Ouvière's Cosmographe at the opening, finally the *Cours de Cosmographie* by H. Fabre, published in 1879. This mid-19th century was also marked by popular books, such as *Le Ciel* by Amédée Guillemin, published in 1864, preceding the best-seller *Astronomie Populaire* by Camille Flammarion, published in 1880.

THE OUVIÈRE COSMOGRAPHERS

The Ouvière Cosmograph proceeds from a simplification of the armillary sphere, by keeping the two circles of the equator and the meridian (with external crowns graduated in degrees), and by removing the circles of the horizon and the ecliptic, as well as the polar circles and those of the

tropics. The polar circles are indicated by interior rods on the meridian, and the tropics by exterior rods which make it possible to identify the tropics delimiting the area where the Sun can be found on the celestial sphere, when the Sun reaches its maximum declinations and minimums (Summer and Winter Solstices). Two arc-shaped pieces are also sealed on the inner perimeter of the meridian circle. They occupy this space between the two tropics, on either side of the plane of the celestial equator, with the scale of degrees which limits the area of movement of the Sun in declination on the celestial sphere.

A small rod directed towards the zenith and originating from the center of the Cosmograph, locates the vertical of the location. It is located at the top of the meridian circle. Ouvière generally indicates the name of the city concerned.

The Cosmograph allows you to find two particular points: the intersections of the ecliptic circle and that of the equator. These are the vernal points of the equinoxes.

The axis of the World, axis of rotation of the Earth, is materialized by the right bar which crosses the Cosmograph passing through its center. A small rod, located in the center of the world axis, gives by its shadow cast on the graduations in the plane of the meridian, the declination of the Sun. This rod of the world axis measures almost two meters while the circles (of the equator and meridian) measure almost one meter in diameter. This ratio of single to double gives his instruments an elegant harmony and an attractiveness for the public that classic armillary spheres cannot provide.

As Ouvière developed his Cosmographs, he perfected them. His first instruments, at the Universal Exhibition of 1855 era, were quite succinct. They do not include many indications and are large (160 cm for the diameter of the meridian and equatorial circles) while his Cosmographs from the 1860s are smaller (90 cm in diameter for the circles), but more complete with more registrations.

His Cosmographes all use the technique of cast white iron, with the adaptation of the vertical of the named place, which makes each instrument a unique piece. The inscriptions are in gold engravings. They are delivered with a cut stone pedestal surrounded by a wrought iron grille. On this base, we can read the inscription : "*Cosmograph, truly popular observatory, fixed and precise orientator of lines, plans and celestial movements intended for institutions and educational establishments by François Ouvière, Marseille*".

HOW THE COSMOGRAPH WORKS

The booklet published in 1855 includes the explanations necessary for its use. Ouvière begins by emphasizing that it is designed to be used in the presence of heaven. The objective is to allow users to see and thereby understand for themselves, through the projection in the sky, the celestial pole and its elevation above the horizon determined by the extension of the axis of the world, generating or fundamental line to which all the movements of celestial bodies are linked. And likewise, see and understand the direction and trace, in the sky of the plane of the celestial equator, that of the meridian of the place of observation, the latitude, the solar declinations and of the stars in general, as well as their right ascension , the equinoxes, the seasons, the solstice points, and consequently the tropics, which they will no longer confuse with the ecliptic...

Ouvière takes care to indicate *"A few hours of study are enough for the observer to recognize that the so-called polar star is not perfectly at the north pole."* On the very hypothetical condition, however, that the said observers remain spending hours next to the instrument... In his booklet, he also mentions the gnomonic applications of his Cosmograph, with the reading of the time provided by the shadow projection of the rod representing the axis of the world on the graduated equatorial circle.Solar time is obviously given by the projection of the shadow of the world axis on the circle of the celestial equator.

For almost all of his Cosmographes, Ouvière uses the support of his steles for explanations engraved in golden letters on cast iron plates. In particular, we can see on one side a small sketch with the method for finding the Polar Star from the constellation Ursa Major, taking five times the distance from the guard line.

BROADCAST IN PARIS AND THE SOUTH OF FRANCE

We have at least two versions of his presentation brochure on a single sheet with Jahandier's drawing. These are advertising montages with what looks like the Château d'If in Marseille in the background and, in the foreground, a Cosmographe. We can see either a group of observers around the instrument. The white cast iron technique used to make his Cosmographs makes each of his instruments a unique piece.The cost was necessarily high with the adaptation of the vertical of the location to the latitude of each city concerned.It was also necessary to take into account the installation of the device on a stone stele surrounded by a wrought iron grille.

COSMOGRAPHERS IN THE PARIS REGION

Ouvière's first Cosmograph was presented at the Universal Exhibition of 1855, the first organized in France after that of London in 1851. At his request, it was installed in the garden, facing the sky. We also have a photograph of this Cosmograph by Disderi.

From March 1856, a Cosmograph was installed at the Lycée Napoléon (current Lycée Henri IV). Garcet, professor of Mathematics at the Lycée Napoléon and friend of Jules Verne, indicates in his *Leçons nouvelles de Cosmographie,* from its fourth edition in 1861: *"The first large model was given by Mr. Ouvière to the Lycée Napoléon in Paris and installed by him in one of the course of this establishment. Another adorns the terrace of the Lycée du Prince Impérial in Vanves"*. These instruments are still in place in the parks.

THE COSMOGRAPHS IN THE SOUTH OF FRANCE

From 1860, ten Cosmographs were presented at regional exhibitions, before being acquired by most cities in the south

of France, among Nice. Its Cosmograph is the one which had the greatest impact through its beautiful location on the Promenade des Anglais, at the top of the monumental staircase at the mouth of the Paillon, between 1865 and 1929. It is all the more clearly visible on postcards indicate that it is near the Casino de la Jetée-Promenade, built on the sea in the early 1880s and destroyed by the bombings of 1944.

LISTS OF ACHIEVEMENTS

We can draw up a chronological list of the twelve Cosmographs created by Ouvière:

1855 - Paris : Universal Exhibition

1856 - Paris Lycée Napoléon (now Lycée Henri IV)

Lycée Louis-le-Grand / Vanves annex (now Lycée Michelet)

1860 - Montpellier

1861 - Marseilles

1863 - Nimes

1864 - Sorèze

1864 - Aix-en-Provence

1864 - Draguignan

1865 - Nice

1865 - Bordeaux

1866 - Avignon

1867 - Carcassonne

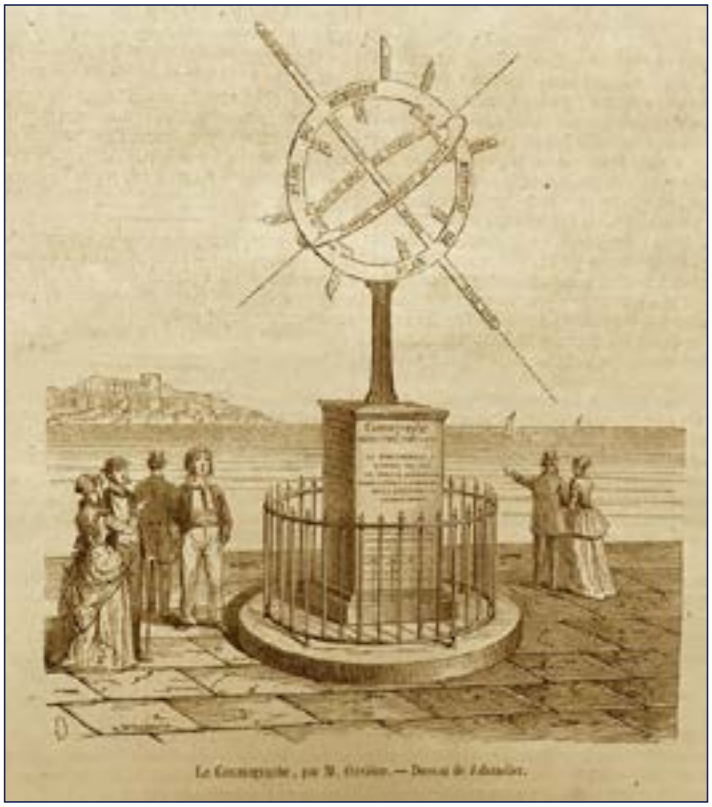
THE MINIATURE COSMOGRAPHS OF OUVIÈRE

Ouvière quickly designed miniature cosmographs with a height of 27 cm, adjustable and movable depending on the latitude, which gave them an additional educational dimension. They were on sale at Lamotte-Lafleur in Paris. Apart from a few specimens occasionally offered on the Internet, specimens are kept at the Musée des Beaux-Arts de Draguignan and at the Musée du Vieux-Nîmes.

CONCLUSION

Ouvière's commercial career is as rich as it is dazzling with the creation of these twelve Cosmographs. There is no doubt that he could have equipped most of the large cities and ports of France if his destiny had given him time. Only four remain facing the sky: two in the Paris region: Paris (Lycée Henri IV) and Vanves (Lycée Michelet), and two in the provinces: Montpellier and Sorèze. Jahandier's drawing bears witness to this: Ouvière had imagined his Cosmographe in Marseille by the sea, in front of the Château d'If. The people of Nice made his dream come true by giving him his most beautiful location on the Promenade des Anglais.

Beyond the specific ingenuity of his instrument on a scientific level, he had developed a commercial strategy of remarkable effectiveness, supplemented in the press by chronicles during celestial phenomena exposing the discovery of the sky with his Cosmographs. All of Ouvière's genius is there: combining his skills in masonry and metal processing, his knowledge of astronomy, his art of communication and his commercial sense to encourage people to discover the stars. His Cosmographs could have crossed the Atlantic, as evidenced by a laudatory article in Scientific American in 1877, ten years after his death, presenting his idea as « capital » for popularizing astronomical knowledge in public places...



Drawing by Jahandier with the Cosmograph in front of the Château d'If in Marseille. This is a montage because we can read "Paris" in the arrow indicating the Zénith. The Cosmograph's benchmarks :

- The large rod represents the axis of the world (axis of rotation of the Earth, directed towards the celestial poles). The circle of the equator is perpendicular to this axis.
- The circle of the meridian, passing through the Zenith, contains four external pins, materializing the tropics of Cancer and Capricorn. The interior pins represent the polar circle markers.
- The shadows cast by the two circles give the ground ellipses. The Sun passes the meridian at solar noon. It only illuminates the edge of this circle and the shadow gives a segment of north-south meridian. At the equinoxes, the Sun is on the equator. It only illuminates the edge of this circle and the shadow on the ground gives an east-west segment. The combination of the two at the equinoxes gives a cross

THE STAR OF BETHLEHEM
DEMONSTRATED BY ASTRONOMY

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The story of the star of Bethlehem has been part of western culture for two thousand years. It is a popular topic in planetaria, particularly at Christmas time. Christians accept the story as a matter of faith, but the discerning astronomer will view the claims of this Christian tradition with skepticism because it does not make sense. You cannot follow a star, because its movement is fixed at fifteen degrees of apparent movement per hour and stars never stop over a location as stated in the verse Matthew 2:9:

> "After they had heard the king, they went on their way, and the star they had seen when it rose went ahead of them until it stopped over the place where the child was.".[1]

Close inspection of the Biblical account quickly demonstrates that tradition has misunderstood and embellished the account recorded by the gospel writers, who were potentially eyewitnesses of this star. Therefore, any examination of the astronomy related to the star of Bethlehem must refer to the original records.

It is important to understand the context and to do this one has to go back in the Bible to the Book of Daniel. This book, written about seven hundred years before the time of Christ, details aspects of Daniel's life. He was a young man, transported to Babylon after the conquest and destruction of Israel by Nebuchadnezzar. Daniel was chosen, because of his intellectual abilities, to be educated in all the knowledge of the Babylonians[2]. Daniel was found to be one of the best scholars[3]. In time his abilities resulted in him being put in charge of the magi and the whole province of Babylon[4]. The magi were the professors of that world but were also of a priestly caste[5] and were considered king makers. The Bible states that God gave Daniel a vision of the future – a vision that gave the timing of the arrival of the Messiah[6]. The prophecy stated that four hundred and eighty-three years would pass between the order being passed to rebuild Jerusalem and when the Messiah would be anointed. The magi and/or their descendants would have been in Babylon when the order was given[7] and hence they would have started counting. Four hundred ad eighty-three years later was 28AD, the year that John the Baptist baptized (anointed) Jesus. To be a High Priest[8], Jesus had to be thirty years of age[9] and so the magi, at least thirty years before 28AD (i.e., in 3 to 2BCE), would have been expecting the birth of the Messiah.

Another prophecy, the prophecy of Balaam[10], associated a star with the Messiah. We know that the magi were astronomers. Some translators call them astrologers, which gives the wrong impression and they are clearly distinguished from astrologers in the Bible[11]. We know they kept meticulous and incredibly accurate astronomical records[12]. So, in the few years leading up to 3BCE the magi would have been examining the stars very closely for a sign.

There has been much debate over centuries as to the nature of the star of Bethlehem. Many scholarly authors have ruled out the possibility of a meteor, a comet, a supernova, or the conjunction of Jupiter and Saturn, so I will not re-iterate these arguments[13]. Others consider a miraculous star provided just for the occasion but do not go on to explain how the magi saw the star and understood its significance whilst apparently no-one else did. What most authors miss, by not examining the Biblical text closely, is that the star appeared twice. The Bible says that the magi came from the east of Israel and saw the star further as it rose (often translated as "in the east"). It also says that they saw the star again after they had arrived in Bethlehem[14]. Note that the star did not lead them to Bethlehem. The Bible states that they went to Jerusalem first and talked to King Herod but no-one knew anything about the birth of a king. The scribes looked up the scriptures[15] and said the Messiah would be born in Bethlehem. The magi went there because of the scriptures, not because they followed a star. When in Bethlehem, they saw the star again and that led them (and no others, apparently) to Jesus's location. As this was likely to be many months after the birth, Jesus was almost certainly home in Nazareth at the time of the magian visitation. They visited Jesus in a house, not where he was born[16]. The Greek word "paidion" reveals that He was an older child when they visited[17].

A stumbling block in the dating of Jesus's birth, has been the interpretation of the astronomy associated with Herod's death. The first century historian, Josephus, referred to a lunar eclipse shortly before Herod's death[18]. Traditionally this had been considered to be the partial eclipse of 13th March 3BCE but more recently many scholars have favoured the total eclipse (blood moon) of 10th January 1BCE, meaning that Jesus could have been born in the years 3 or 2BCE. This stumbling block has often led astronomers to look in the wrong years for the star of Bethlehem.

The only celestial phenomena to fit the Biblical description of the two "stars" of Bethlehem are the conjunctions of Jupiter and Venus. On 12th August 3BCE these two planets formed

a very close conjunction in the early morning sky as viewed from Mesopotamia.

- Venus rose at 3:19am and the illuminated portion of Venus was 93.4% i.e. virtually at its brightest. Brightness was -3.9.
- Jupiter rose at 3:20am and the illuminated portion of Jupiter was 99.9% i.e. at its brightest. Brightness was -1.8.
- Angular distance between Venus and Jupiter at 3:20am (just after their rising) was 14minutes 25.1seconds (about 21 times the width of Jupiter), so the two stars were quite close together.
- If the conjunction were still visible at its closest at 9.01am then the angular separation between the planets would have been 4 minutes 22.2seconds, about eight times the diameter of Jupiter i.e. very close.
- The sun arose at 5:01am making it harder to see the conjunction

As both Jupiter and Venus were near their brightest, the conjunction would have been seen as the brightest night "star" anyone had ever seen in their lifetime. But it was not visible for long because of the sunrise less than two hours later, in keeping with the Biblical record, which says the magi saw it "as it rose." The Greek words often translated as "the east" are "*te anatole*", which literally means "the rising". So why did they travel west? The magi were waiting for the Messiah to be born, the King of the Jews. It was logical, therefore, to go to Jerusalem, the capital of the Jewish nation and to talk to the King of the Jews (Herod). Another consideration was that the conjunction occurred in the constellation of Leo, which was associated with the tribe of Judah, the southern aspect of Israel. Interestingly, the Hebrew name for Jupiter, "zedek" was strongly associated with Jerusalem[19].

Having organised their travel party and probably having travelled by camel at walking pace, they magi would have arrived in Jerusalem some months later, well after the birth of Jesus. They were directed by the Herodian scribes to Bethlehem, where they would have suffered great disappointment in not finding Jesus. But we are told that a wonderful thing happened. They saw the star again[20]! On the night of 17th June 2BCE there was another alignment of Jupiter and Venus, again in the constellation of Leo. The two planets were even closer: they were 34.9 seconds apart (about the same angular diameter as Jupiter itself) so the two planets would definitely have been seen as one very bright star. Jupiter's illuminated fraction was at 99.6% and Venus's was 45.9%. The brightnesses were -1.8 and -4.3 respectively. Again, the conjunction would have been seen as the brightest night-time "star" ever seen and readily considered to be the same star as the magi saw some 10 months earlier.

This raises the question of how they then worked out how to find Jesus. A simple possibility is that they could have asked about a child born in Bethlehem in the previous August, but if it had been that simple then Herod's soldiers could have located Jesus as well. An interesting question is whether there was the possibility that Jesus's location was hidden in way that only learned astronomers would understand. Could the stars have shown the way to find Jesus?

If this had been possible then one "star" would need to be the conjunction but there would need to be another star. Regulus, as the brightest star in Leo would be the obvious candidate, however researching this possibility has been disappointing. Rho Leonis, known as Shir in ancient Persian times, is another candidate as the name means "Lion" and being within Leo (a symbol for Judah) it represents the "Lion of Judah" - a title given to Jesus in the Bible[21].

Navigation would require a direction of travel and a distance to travel. Calculating direction needs a reference point. In modern times, Polaris, being the closest visible star to the north celestial pole, would have been used as the reference star but two thousand years ago Kochab (Beta Ursae Minoris) was the closest bright star to the northern celestial pole. This is approximately an eight-degree difference.

For these three reference points, at the closest conjunction at 7:57pm on 17th June 2BCE, the following observations are found[22]:

- Angular separation (Shir to conjunction)– 1 degree 6 minutes 31.1 seconds
- Position angle with regards to the North Celestial Pole – 348 degrees 4 minutes 56.8 seconds.
- Correcting for the 8 degree difference gives about 356 degrees i.e. close to dead north.

The magi would have understood that every 97km of travel (along their latitude - approximately 31 degrees from Babylon to Jerusalem) resulted in a difference in stellar positions of one degree. The calculated angular separation would therefore represent a distance of 108km[23] . Nazareth is 110 km away from Bethlehem and almost due north. This seems too close to be a co-incidence. Even if the magi did not calculate this, they could have estimated that Jesus was not too far away and in the north.

This might seem fanciful to consider that the magi would use directions coded in the stars to find Jesus. The test of the hypothesis would be to look at the first conjunction, to see if the same thing happened:

- Angular separation (Shir to conjunction) – 13 degree 0 minutes 53.1 seconds
- Position angle with regards to the North Celestial Pole – 285 degrees 3 minutes 4.1 seconds
- Corrected by 8 degrees gives about 277 degrees

This equates to a distance of 1,262 km and gives a direction of almost due west. The point of origin would therefore have been near Ahvaz, the capital of Khuzestan Province in Iran. Being almost due east of Jerusalem is in keeping with the Biblical statement that the magi came from the east. Again, they did not need to make the calculations, they only needed


Sirius
NE
E
SE


Spica
W
NW

to see that they had to take a very long journey to the west. Jerusalem was a logical choice.

It remains to explain the verse in the gospel of Matthew 2:9:

> After they had heard the king, they went on their way, and the star they had seen when it rose went ahead of them until it stopped over the place where the child was." (NIV).

A problem for translators is that what they write must make sense, which means it has to fit with their current understanding. Not being astronomers, they would not have understood what happened. However, the last part of the verse can be translated as

> "[the star] showed them the way (while/when it was standing over) to where the child was".

On 17th June 2BCE the conjunction was visible in the western sky just after sunset. It remained visible for just over two hours until it set in the west. If facing north, the observer would have seen the conjunction "standing over" Shir. This position suggested a relatively short journey to the north, which would have brought them to Nazareth (108km if celestial calculations were used).

The two conjunctions of 3BCE and 2BCE fit exactly with what the Bible says, not that the "conjunctions" of Venus and Jupiter in Leo are rare. They occur about every fourteen years. About half are not visible because they occur during the day and almost all have such a high angular separation that the conjunctions are totally unremarkable. What was rare was the incredibly close "proximity" of these two planets making them appear as one incredibly bright star. Being the two brightest nighttime objects other than the moon, these two planets, when they appeared together during these two conjunctions, would have made a spectacular sight: a dramatic announcement of the birth of the Messiah, understood only by faithful magi who had followed the prophecy of Daniel and studied the stars with their predecessors for about seven hundred years! Potentially these two planets formed the brightest "star" ever seen in the night sky.

This is a wonderful topic for any planetarium because it captures the interest of participants and enables the explanation of stars vs planets, the motion of the planets and at the same time encourages people to look at source documents rather than relying on tradition.

CREDITS

The images were created by Stellarium, a free, open-source planetarium program created by Stellarium Astronomy Software: *https://stellarium.org/*

Calculations were performed using Cybersky v. 5.2.1., a planetarium program produced by Softonic: *https://cybersky.en.softonic.com/*

FOOTNOTES

[1]New International Version

[2]Daniel 1:3 to 7

[3]Daniel 1:20

[4]Daniel 2:48

[5]Cyropaedia (The Education of Cyrus) written in the 4th century BC

[6]Daniel 9:20 to 27

[7]Note that the prophecy does not start at the time the order went out to rebuild the temple of Jerusalem. The order to rebuild the walls of Jerusalem was given in the month of Nissan in the 20th year of the rule of King Artaxerxes (Neh 2)

[8]Psalm 110:4, Heb 4:14

[9]Numbers 4:3, 30 state that a priest could not start his ministry before 30 years of age

[10]Numbers 24:17-19

[11]Daniel 2:2

[12]The magi kept accurate records of the movements of these bodies. We know this because some of these records have survived the millennia and exist today as clay tablets inscribed with cuneiform script. The earliest known of these recorded the position of Mercury through the years 424 to 401BCE. Observations were made with considerable accuracy, for example the length of the synodic lunar month was calculated to be 29.530614 days (compared with the modern result of 29.530596 days)

[13]For example, Hoffman S., Star of Bethlehem - How to tell the astronomy correctly, The Planetarian, Vol.5, No. 3, 8-12, September 2021.

[14]Matt 2:9

[15]Micah 5:2-4

[16]Matt 2:11

[17]Matt 2:11

[18]Antiquities 17.6.4

[19]The Hebrew name for Jupiter was "zedek", a word which also meant "righteousness". This word often comes into association with Jerusalem: Melchizedek was the great high priest of early Jerusalem and Adoni-Zedek was an early king of Jerusalem. Zedekiah was the last king of Judah before the Babylonians captured it.

[20]Matt 2:9

[21]Revelations 5:5

[22]Calculations made using Cybersky 5.2.1

[23]1 degree 6 minutes 31.1 seconds is 1.108639 decimal degrees. Multiplied by 97 km gives 108 km.

(Left top) A view of the eastern sky just before sunrise as the magi saw it on 12th August 3BCE. The bright "star" in the centre is the conjunction of Venus and Jupiter; (Left bottom)The night sky as seen by the magi when the conjunction occurred again on 17th June 2BCE as seen from Jerusalem. The conjunction is the bright "star" seen in the centre. (*Images from Stellarium version 1.2.4*)

RECOMMENDED TRAVEL PLANS FOR JAPAN

IF YOU'RE TRAVELING TO JAPAN WITH IPS, HOW ABOUT THIS PLAN?

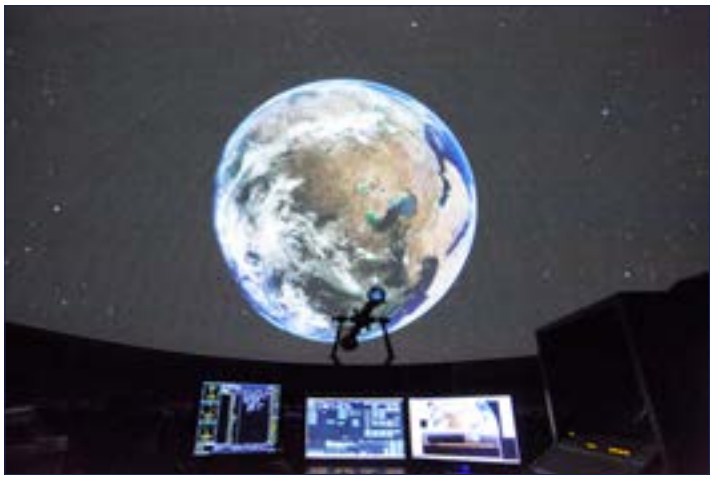
Takeshi Inoue, Isshi Tabe

LOC IPS2026 Fukuoka

The IPS meeting will be held in Japan in 2026, for the first time in 30 years. Since the last meeting was held in Osaka in 1996, some people will likely be visiting Japan for the first time in 30 years. Over those 30 years, various social systems have undergone major changes, as have methods of transportation and communication. While we'll leave that information to Japan tourism guidebooks, what should planetarium enthusiasts see and hear in Japan? By providing examples that may be helpful, we hope to help you plan your trip to Japan.

There are about 300 planetariums and nearly 400 public observatories in Japan. Many of these are located far from the Fukuoka City Science Museum, so it's difficult to introduce them all, but we'll introduce some must-see near facilities.

1. MUNAKATA YURIX PLANETARIUM



Munakata Yurix has traditionally been one of the most active planetariums in Kyushu, screening programs that it plans and produces themselves. This photo was taken by the author when it reopened after its renovation in 2011.

From Hakata Station, it takes about 40 minutes by JR to Togo Station. A 25-minute walk away is Yurix, operated by Munakata City. Its dome is located on the second floor and features a Zeiss ZKP4. The digital projection system uses a combination of AstroArts' Stelladome PRO and SCISS's Uniview, both popular in Japan. This is a unique setup even on a global scale. While the museum is closed on Mondays, it offers public projections at 3:00 PM and music projections at 4:00 PM on weekdays. On Saturdays, Sundays, and holidays, it offers children's projections at 11:00 AM and 2:00 PM, public projections at 1:00 PM and 3:00 PM, and music programs at 4:00 PM.

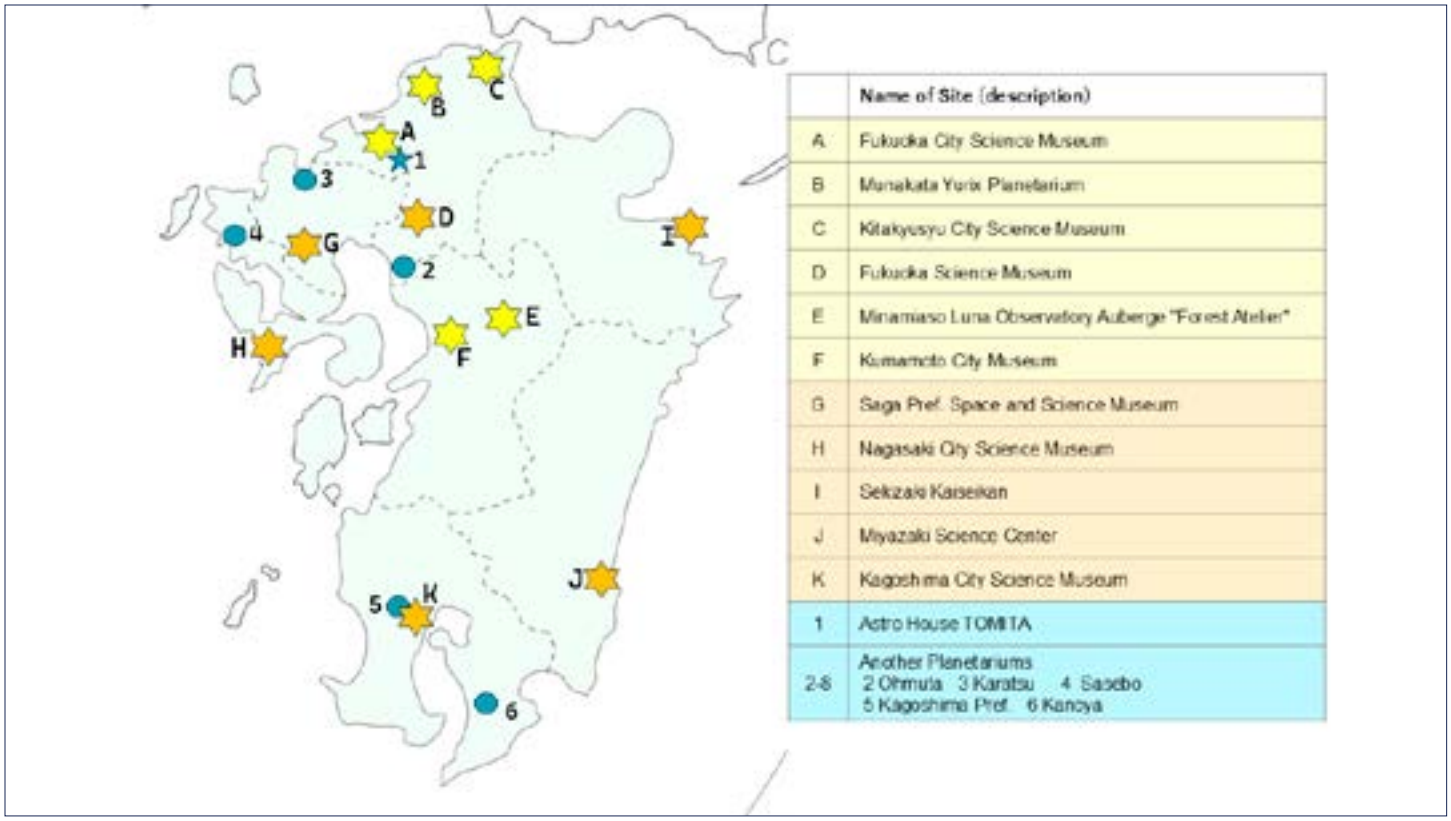
2. KITAKYUSHU CITY SCIENCE MUSEUM, SPACE LAB

Kitakyushu City Science Museum, Space LAB: Kitakyushu City had a 20m planetarium at its science museum that opened in 1970, but it reopened at its current location in 2022. It also has a wide range of astronomy exhibits, and a mid-conference tour is being planned for Munakata and Kitakyushu. Photo by author.

Kyushu's largest planetarium, boasts a 30-meter dome and the GOTO CHIRON III HYBRID. The new optical planetarium, Chiron III, opened in 2022, and the digital Virtuarium II are both available.

From Hakata, it's a 1 hour 13 minute local train ride to Space World Station, or about 57 minutes by Shinkansen. The science museum is just a few minutes' walk from the station. There are also souvenir shops and restaurants nearby. While the majority of the show features also video programs, the 3:00 PM show features a stargazing stroll. Saturdays at 6:30 PM offer a live planetarium experience, perfect for those who enjoy live commentary.

Before and after the IPS period, we are planning tours to also Bodaiji Temple, a Buddhist temple with a planetarium (8m, Mediaglobe III, 2011), and Suga Shrine, which is home to the world's oldest meteorite. For more details, please see the IPS2026Fukuoka website.



	Name of Site (description)
A	Fukuoka City Science Museum
B	Munakata Yurix Planetarium
C	Kitakyusyu City Science Museum
D	Fukuoka Science Museum
E	Minamiaso Luna Observatory Auberge "Forest Atelier"
F	Kumamoto City Museum
G	Saga Pref. Space and Science Museum
H	Nagasaki City Science Museum
I	Sekizaki Kaiseikan
J	Miyazaki Science Center
K	Kagoshima City Science Museum
1	Astro House TOMITA
2-6	Another Planetariums 2 Ohmuta 3 Karatsu 4 Sasebo 5 Kagoshima Pref. 6 Kanoya

Planetariums in Kyushu Island

3. OTHER PLANETARIUMS IN KYUSHU MAJOR CITIES IN KYUSHU HAVE PLANETARIUMS.

If you are traveling to Kyushu on your own, please refer to this map. There are many planetariums in Kyushu alone that will welcome you. The main planetariums use the latest equipment, as shown below.

- Fukuoka Science Museum (Kurume City) : 23m CHIRON III HYBRID (2017)
- Saga Prefecture Space and Science Museum: 18m Infinium II, Mediaglobe SE (2023)
- Kumamoto City Museum: 15m CHRONOS II HYBRID (2011)
- Nagasaki City Science Museum: 23m CHIRON II HYBRID (2014/2022)
- Sekizaki Kaiseikan: 6m Virtuarium II (2023)
- Miyazaki Science and Technology Museum: 27m SUPER-HELIOS (2004/2019)
- Kagoshima City Science Museum: 23m CHIRON HYBRID (2007/2017)

The map shows the large planetariums in Kyushu. A is the main site of IPS2026, B-F are facilities included in the tour, G-K are planetariums with large domes, 1 is a telescope shop, and 2-9 are planetarium facilities in regional cities.

4. POST-CONFERENCE TOUR:

At IPS 2026, we have prepared special tours that showcase Japan's planetariums, natural landscapes, and cultural heritage.

Minamiaso Luna Observatory: The observatory and hotel, where you can enjoy an extraordinary experience, are located in the midst of the natural beauty of Mount Aso.

AN OBSERVATORY IN A VOLCANIC CALDERA AND A PLANETARIUM IN A CASTLE"

1-Night, 2-Day Bus Tour/June 27 (Sat) – June 28 (Sun), 2026

Located less than two hours from Fukuoka by highway, Mount Aso features one of the world's largest volcanic calderas — a spectacular natural wonder that still emits smoke today. Within the caldera lies the Aso Volcano Museum, as well as the Minamiaso Luna Observatory,

where visitors can experience stargazing under one of Japan's clearest night skies. The abundant, pure water that flows from the caldera nurtures the region's rich natural environment and continues underground toward Kumamoto City.

This same water supports Kumamoto's prosperity and even contributes to the preservation of Kumamoto Castle, whose massive stone walls are among the largest in the world. Within the castle grounds stands the Kumamoto Castle Museum Wakuwakuza, which includes a planetarium designed by world-renowned architect Kisho Kurokawa (1934–2007).

This two-day, one-night post-conference tour includes visits to Mount Aso, the Volcano Museum, and the observatory within the caldera, along with an overnight stay at a hotel adjacent to the observatory. The program also features a star party, followed by a tour of Kumamoto Castle and its planetarium.

One of the authors, Isshi Tabe, will be joining the tour.

Kumamoto Castle is located in the center of the city, and the castle tower offers a panoramic view of the city. The museum is also located close by, and a special screening introducing Kumamoto is planned. Photo by Miwa SAITO-planetarium photographer

A SPECIAL VOYAGE ACROSS JAPAN'S PLANETARIUMS BY SHINKANSEN

2 Nights / 3 Days | June 27 (Sat) – June 29 (Mon), 2026

Embark on a unique post-conference journey that connects some of Japan's most remarkable planetariums and science museums, traveling comfortably aboard the world-famous Shinkansen bullet train.

Day 1 – Saturday, June 27: Akashi

Begin your voyage at the Akashi Municipal Planetarium, a museum dedicated to the themes of time and space. Standing directly on Japan's standard meridian, it opened in 1960 and houses a historic Zeiss UPP 23/3 projector — the oldest planetarium still in operation in Asia.

Day 2 – Sunday, June 28: Osaka →Nagoya

Visit the Osaka Science Museum, the first science museum in Japan to install a planetarium. Its original Zeiss Model II projector is still on display today, representing the dawn of Japan's planetarium history.

The museum now features a Konica Minolta planetarium that attracts a wide range of visitors with its dynamic and engaging full-dome programs.

Continue to the Toyota Commemorative Museum of Industry and Technology, where Japan's spirit of craftsmanship and innovation comes alive, followed by the Manten NAGOYA LED Dome, showcasing the next generation of digital planetarium technology.

Day 3 – Monday, June 29: Nagoya

Conclude your journey at the Nagoya City Science Museum, featuring one of the world's largest planetarium domes (35 m in diameter) and outstanding exhibits on astronomy and space exploration.

The planetarium is equipped with a Zeiss Universarium Model IX projector alongside a state-of-the-art digital projection system, offering visitors an exceptionally realistic view of the night sky.

One of the authors, Takeshi Inoue, will be joining the tour.

Akashi Municipal Planetarium, with its iconic clock tower. Photo: Courtesy of Akashi Municipal Planetarium.

5. IN THE CAPITAL TOKYO

After the tour, participants may choose to extend their stay to explore additional planetariums, observatories, and science museums in the Tokyo area.

In the Tokyo area, visitors can also see Galaxity (23 m digital planetarium, Mediaglobe SE), Minato Science Museum (15 m, Goto ORPHEUS HYBRID), and Yokohama Science Center (23m, Ohira-Tech Megastar).

Tokyo also offers numerous telescope shops, the National Astronomical Observatory (NAOJ)in Mitaka, and the Sagamihara City Museum—home to the latest Goto CHIRON III HYBRID system and the Institute of Space and Astronautical Science(ISAS).

(Continued on pg. 46)

DIGISTAR

Domecasting: Collaboration on a Planetary Scale

Domecasting unites domes around the world in a network of shared discovery. With Digistar, presenters can share live visuals, sound, and information in perfect sync. It's how communities, educators, and explorers come together under one sky.

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LEARN MORE

A WEEK WITH THE GDP IN GERMANY

Shawn Laatsch, Director

Versant Power Astronomy Center & Jordan Planetarium, University of Maine

- Visit dates: September 26 to October 4, 2025
- Host Location: Galileum Solingen – Solingen, Germany
- Host Team: Frank Lungenstrass, Sebastian Fleischmann, Antonio Buzza, Marcel Leonhardt, Dennis Neuhaus, Stephan Oster, and Moritz Epple

INTRODUCTION

The International Planetarium Society (IPS) provides several exchange opportunities yearly for planetarians from around the world. These include the longest running program of the Week in Italy for an American Operator which started in 1995, A Week with the GDP, and a Week in the United States. Each of these programs provide a unique opportunity for participants to have professional experience and gain cultural insight into the ways other planetariums and planetarians operate their facilities. I was privileged to take part in the Week in Italy in 2017, serve as a host for the Week in the US in 2023, and this year (2025) was selected to take part in the Week with GDP.

These have been such wonderful experiences, each one fostered new friendships and provided wonderful educational experiences for all participants. In these challenging times, they are a way to show we planetarians are all connected in our passion for sharing the sky. I highly recommend participating in these programs to all planetarians from those just starting in the profession to those who are veterans – each will gain "stellar" insights and grow personally and professionally. Applying for these programs is quite simple and well worth it!

On February 19, 2025, I received word from Tilo Hohenschlager that I was selected for the Week with GDP and that it would take place at the Galileum Planetarium in Solingen, Germany. After sharing some of the logistical items, he connected me to the team there to begin planning for the visit.

I met with the Galileum team on Zoom on March 9th to explore options for the visit that would work for both of our schedules, discussed a bit about the system they use and type of programming they offered, and a few other details. Antonio Buzza shared a video recording of his presentation about their RSA Cosmos digital system so I would have a bit of an idea of how their system was used in presentations. Plans were then made for me to visit from September 26 to October 4. This time was chosen as it was over the holiday of German Reunification on October 3 and that also corresponded with "Die Maus" a mouse cartoon character that teaches children how things work and shows them behind the scenes at different locations on that day. This meant it would be a chance to experience this cultural practice at the planetarium there.

We connected again in early August on Zoom to finalize travel details and make final plans for the visit.

BRIEF BACKGROUND ON GALILEUM SOLINGEN

The planetarium and observatory at Galileum Solingen is a facility staffed by volunteers with a long history in astronomy education and outreach. Originally it started as Solingen Observatory, which opened in 1924, offering a variety of adult education programs and astronomical observation with telescopes.

By the early 2000's the group had outgrown their facilities and started thinking about bringing a planetarium to Solingen. In 2007 serious planning began with visits to planetariums and a variety of suppliers.

It took roughly 12 years to raise the 8.5 million euro needed to build the facility which repurposed a 26-meter diameter gas storage tank. Galileum Solingen opened on July 5 of 2019 with a 12-meter level dome with 84 seats, housing a GOTO Cronus II star projector and a 4K digital RSA Cosmos system utilizing SkyExplorer software with two Sony laser projectors. The facility has 5.1 surround audio and multi-color cove lighting along with several auxiliary systems.

The spherical gas tank which houses the planetarium is connected to a seven-story tower that is home to offices, dome production areas, exhibit workshops area, library, kitchen, a multi-purpose room, rooftop observatory, exhibit area and giftshop/ticketing area. The facility is set up to handle all types of events from regular planetarium programs to catered events and much more.

The facility is self-sustaining, with all operational funding coming from tickets, group visits, special events and gift shop sales. They do not receive city or other government funding for operations. In 2024 they served around 42,000 visitors.

ACTIVITIES DURING THE EXCHANGE:

Friday, September 26th, I arrived in Solingen by train from Frankfurt airport. Frank Lungenstrass met me at the train station and we walked to Galileum Solingen. We did a quick tour, and he handed me keys to the building before I headed to the Kempe Comfort Hotel to drop off my luggage and get checked in. The layout was quite convenient with and easy to walk (about 10 minutes) to both locations. Following a quick dinner, I returned to the planetarium and had a chance to see their ticketing operations and see two programs – Galaxy: Journey through the Milky Way at 8pm and Space Rock Symphony at 9:30pm. The first show is one that we also do at our dome, and it was nice to see how another facility

model using tickets, group bookings, and gift shop sales to fund all operations.

On Sunday, September 28th I had to see Captain Schnuppe's Space Adventure, a children's program that featured a number of animal characters exploring the solar system. Other programs that day included From Galileum to the Universe, a completely live program similar to the Fascinating Universe one, but this was geared for adult audiences, and Queen Heaven a 90-minute music show. Typically, music shows in the US are around 50 minutes to an hour, but the audience was engaged the entire time and really enjoyed the longer mix of Queen's music set to visuals.

conducts the same content. The second show was a music one that I had not seen, and interesting to see audience reactions. The dome was filled for both shows, and it was great to see the crowd's enthusiasm for each show. Following the shows, Frank and I discussed the plan for the weekend and called it a day a bit after 11pm.

Saturday, September 27th, I assisted with setting up for a catered event in their multi-purpose room and had a chance to see three new programs at the planetarium. The program I enjoyed the most that day was a children's program called Fascinating Universe (Faszinierendes Weltall) which was a completely live program for children. It started out by having the presenter ask children and their families what they might like to see in the dome. From there the presenter took a number of answers from the audience and spun it into a unique trip in space. This was very impressive, given that the wide array of answers received, and meant one needed to know their system well to be able to pull many real-time visuals together and put it together in a cohesive story. Additionally, that day I was able to see their aurora show and another music show. Between shows I had a chance to talk with their staff about operations from ticketing and gift shop operations, as well as several other topics. One thing both of our facilities have in common is the financially self-sustaining

Monday was a closed day, like many museums and I had the day to do some sightseeing. I hopped the train to Cologne and toured the Cologne Cathedral (Kölner Dom) which started construction in 1248 AD and took over 600 years to finish. An impressive structure and I took time to see the treasury exhibits which featured the famous relics of the Three Kings (Magi). The cathedral was very impressive and I took time to climb the 533 steps to the observation tower to get a look over the city. Well worth the many steps to get such and impressive view of the city. Along the way I was able to take in the belfry as well. I spent close to 3 hours exploring all of the exhibits and beautiful architecture of this World Heritage site. Following my cathedral visit I enjoyed a nice lunch and spent some time walking around the open market area. I hope to get back for Cologne's famous Christmas Market in the future. Monday evening Frank and Sebastian took me out for a traditional German meal in the old town area. It was charming and the restaurant was quite special.

Tuesday was a prep day for my presetation about cultural astronomy and eclipses. Following a morning school group, I worked with Moritz from Galileum to import my images into the RSA Cosmos SkyExplorer software package and practice a few times. I also had a chance to get some basic training in their dome systems including the GOTO Chronus II star projector. It has been close to two decades since I've used an opto-mechanical projector, so it was a bit nostalgic for me to have a chance to do so again. The starfield was quite beautiful, and reminded me of what hooked me on being a planetarian back in the 1980's!

Wednesday, October 1st was my presentation day and I was able to do a fully live program for St. George's International School for students who were 9-10 years of age. I began with a night sky presentations and shared a variety of cultural constellations stories with the group. I included a few stories



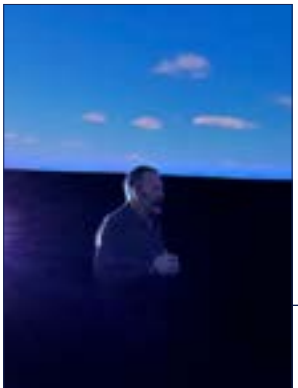

from Maine's Wabanaki Tribe that I have permission to share, along with some classical Greek stories, and showing the Hawaiian navigational starlines. Following this it was off to the visible planets and a bit about each of them. The upcoming total solar eclipse of 2026 rounded out my presentation starting with conditions for solar and lunar eclipses, and how we predict eclipses using our knowledge of the Sun-Earth- Moon System. I shared how to safely view eclipses, local conditions for Germany, options on where to see totality in Spain, encouraging them to travel to the path of totality if at all possible. The students had some great questions and following the show had lunch in the multi-purpose room. This allowed me some more time to circulate and talk with the teachers and students. Presenting live is still one of my favorite parts of working in the planetarium field and was one very special part of my time in Solingen.

That evening Tilo Hohenschlager who coordinates the Week with GDP along with Thomas Kraupe (former director of the Hamburg Planetarium, and former IPS President) arrived in Solingen. That evening we were able to take some photos and go out for a nice Greek dinner with Frank and Sebastian at Taverne Mykonos. It was wonderful to share conversations on numerous topics, not just planetarium items with this group.

October 2nd there were no groups, and Tilo and Thomas Kraupe took me to Schloss Burg. The name from what Tilo explained translates as "castle castle"! This was the historic estate of the Earls of Berg and dates to 1130 AD. Luck was on my side as the building was under renovations for the last 12 years and had just re-opened that week for visitors and we had perfect autum weather. It was an impressive fortress back in its time and of major importance to the area. The exhibitions inside gave insight into castle life from serf to royalty and were crafted in very engaging manners. I would highly recommend a visit to Schloss Burg as it is an amazing place.

Mouse day "Die Maus" was celebrated on October 3rd – German Reunification Day. A mouse cartoon character that started in the early 1970's teaches children about their world. On "Mouse Day" many places, including Galileum Solingen, have special behind the scenes opportunities for children to see how the facility works. At Galileum they did special tours for children and families. Children had a chance to "fly the dome" with an X-box controller, see inside the observatory, tour areas behind the dome (even entering a catwalk showing a bit of the walls of the gas tank), and ask questions about how things work. For me this was special as I remember my first experience at a planetarium when I was seven years old and having a chance to touch the controls inspired me, so seeing this done on a larger scale with children as part of this annual event is something I will treasure from my visit.

The final day of my visit, Saturday, October 4th I had a chance to assist with setting up a future exhibit in their display area. As with many exhibit set-ups it required a trip to the local hardware store. Antonio Buzza and Stefan Oster were setting up a large backlit display that was 2 meters tall by about 8 meters long. The frame required some modifications, but by lunchtime had come together. The exhibit Science and Science Fiction features a number of detailed models built by Stefan including a Starship Enterprize, The Prometheus, Mars Rover, Saturn 5 and Atlas rockets, and a 5 meter long James Webb Space Telescope. The exhibit will open in the near future, and I hope to get back to see the final results. That evening I was able to see a few more programs and wrap up my time having time with Frank to discuss a variety of planetarium operations – from funding and staffing, to program selection and their plans for the future.




REFLECTIONS ON THE EXPERIENCE:

I thoroughly enjoyed my experience at Galileum in Solingen, Germany and it was hard to say goodbye to the team there. For the entirety of my time there, I felt like a team member and colleague. While our facilities are different in some ways, we share so many things in common in our operations and philosophy in programming. It was so impressive to see their dedication and perseverance taking twelve years to go from an idea to a new facility, raising all the funding, and making this unique facility a reality. The team there is exceptionally dedicated, and it is amazing to see how they are able to serve over forty thousand visitors a year with a team of eight volunteers. Their passion shows through in all they do for their community.

Having German heritage made the visit meaningful in a variety of ways. Our similarities in operations spurred many conversations and shared ideas. I introduce them to ViewSpace as a possible exhibit, and to OpenSpace as a possible package for special presentations. We discussed possible collaborations, and I'm hoping some of the team members from Galileum will visit my dome in Maine in the future as well. If things work out, we might be able to meet up in 2026 either at the IPS conference in Fukuoka, Japan or possibly in Spain for the total solar eclipse. I look forward to returning to Solingen and visiting with them again in the future and reconnecting with these friends who made my visit so special.

I highly encourage planetarians to apply for one of the exchange programs IPS offers the community and to consider being a host for one of these exchange programs. The experience and insight gained reminds us that we all share the sky and encourages us to continue to explore the universe and share it with others.







FLORIDA MAN GOES TO ITALY

A TWO WEEKS IN ITALY ADVENTURE

Derek Demeter

Emil Buehler Planetarium at Seminole State College of Florida

PROLOGUE

Ciao! I am writing these words about one week after my return from the country of Italy and to this day I am still in awe of the experience. A whirlwind of adventure from ancient sites to meeting some of the warmest people I have ever met, it is a journey I wish everyone in the planetarium community can experience once in their life. I hope this report provides the inspiration you need to do such that. So? Where do we start? Well…I guess the beginning would make sense right? The American Planetarium Operator in Italy experience has been going strong since 1995 and I had the distinct honor to be its 30th winner of the program. The program provides a planetarian from the USA an experience to teach and connect with students and the public of various regions around the country of Italy. When I attended my first IPS conference in Baton Rouge from Susan Button, I knew I wanted to participate. For many years it was difficult to apply due to the timing of the program and then the recent pandemic made it difficult to pursue. In 2024, I finally made the decision to apply for the program. After working on the application for nearly a month and submitting it, I eagerly waited to hear back. Then in mid-October I saw a message from Susan Button, who coordinates the "Week in a Country" programs for the International Planetarium Society, to contact her ASAP. I gave her a phone call and she was delighted to announce that I have been selected to participate in the program for 2025. I was elated and ecstatic! I was going to Italy! A place I have always wanted to visit and the home to my ancestors (my mother was fully Italian). It would be a few months later when I heard from Loris Ramponi who oversees the operations of the program and provided me the dates of my travel and general itinerary of the places I would visit and who would be hosting me. Communication was mostly done via email due to the time difference. In this report I will share my experiences and my insights during the program and hopefully when reading this, I encourage you to work with PlanIT and IPS to partake in this unbelievable and enriching opportunity. Before I begin detailing the trip, I will share my lessons and why I chose them.

PREPARATION OF LESSONS FOR THE TRIP

When I was applying for the program, I was asked to create three lessons that I would present during my time in Italy. The lessons had to be appropriate for both the classroom and the planetarium. After much thought I decided on three: Galileo's Hammer and Feather Experiment, The Human HR Diagram, and an activity that connected Geology with the

James Webb Space Telescope. Galileo has always been one of the most inspirational scientists in my life, and I felt it was important to share that sentiment with the students. His work developing the scientific method was crucial to moving us into the scientific revolution and I felt the hammer and feather experiment was a great way of demonstrating how a simple experiment could lead to a monumental discovery that would allow us to launch rockets to space and expand our knowledge of the cosmos. The human HR diagram was something my colleague Justin Cirillo developed for us at the planetarium, and we presented this demonstration both at the 2019 Southeastern Planetarium Association conference and the Live and Interactive Planetarium Symposium. Justin left the planetarium in 2021 but I wanted to honor his contribution to our programming by providing this lesson in Italy. The activity uses balloons of different colors and sizes to represent various types of stars and it is up to the students to figure out where their star lies on the diagram. The last activity was something I felt defined me in a unique way. I have both a passion for Geology and Astronomy and one of my favorite hobbies is collecting minerals from locations around the world. In 2023, I had the opportunity to summit Mt. Antero in Colorado and collected aquamarine, which is a gem quality form of the mineral beryl. Beryl is a crystal habit of the element Beryllium, the key component of the mirrors of the James Webb Space Telescope (JSWT). I brought several specimens of beryl with me to share with the students with the goal of connecting the importance of using beryllium to maintain the integrity of the mirrors. While these three lessons seem very different from each other, they all connect in a wonderful way. Galileo's findings allowed us to understand gravity which in turn enabled us to launch rockets. This led to us to launch the James Webb from Earth

and placing it in the appropriate orbit around the Sun. The JSWT helps understand the evolution of stars in our universe which can be helped by using the HR diagram. The lessons could be done together or separately to the choosing of the host. Lastly since I was travelling abroad, I wanted to have lessons that could either be brought over easily or could be assembled using materials that the hosts had in Italy. I felt confident these lessons could represent what I do here in the USA, and I was ready to bring them to Italy to share with everyone. It's time to pack our bags and begin our journey across the ocean! Are you ready?

PART ONE: ALL ROADS LEAD TO ROME

My first stop was the City Eternal: Rome. My flight was overnight so when I arrived, I was pretty jet lagged and thankfully I had two days to recover before making my way to Perugia for my first set of lessons. When I arrived at the airport, I mainly stayed there until I got the notification that my lodging was ready, and I could check-in. I took the express train into the city and checked into my hotel and within fifteen minutes I was out and slept until the following morning.

Feeling completely refreshed I booked a 10-hour personal guide of Rome. His name was Luca and he runs a small personal guiding business in Rome. It wasn't the cheapest by any means, but the saying goes, "When in Rome!". It was wonderful and during my time I had the chance to see all the famous sites: Trevi Fountain, Pantheon, Forum, Circus Maximus, Coliseum, and we ventured outside of the city to walk the Apian Way which is the original road leading into Rome. I also got to visit the early Christian catacombs and see one of the largest remaining aqueducts in Italy. I captured 360 videos and photos of the whole experience so I could share them inside the planetarium for any courses that would be interested in them. The best part of a private tour is Luca took me to places where he knew I would be interested in and our last stop was a unassuming building. To most people, there would be nothing noteworthy about it, but to those who know, this site was the location of where Galileo Galilee was tried for heresy by the church for his writings and observations. This began a pilgrimage of sorts to see all the famous sites of Galileo throughout my trip. After the conclusion of the tour, Luca and I parted ways, and I finished my day eating at a small restaurant looking over the Coliseum. Not a bad way to end the day!

I had a partial day to explore Rome before heading on the train to Perugia, so I ventured out into the city to see some more off-the-beaten path sites. The first one was the crypt of the Capuchin friars. The site is home to thousands of bones of friars that have passed. Instead of burying their dead, they used the remains as art. It was both beautiful and creepy at the same time. On my way back I stopped at the Basilica of St. Mary of the Angels and of the Martyrs where an impressive meridian can be found. A meridian is a marker of the Sun as it transits at local noon every day of year. It was a way to keep time and signify both religious and secular events throughout the year. In the Basilica there is a camera obscura that projects a disk of the Sun on the ground. Each day, the Sun projection along the floor where it intersects a line at the meridian at local noon each day. Unfortunately, I didn't have a chance to wait for local noon as I needed to catch my train, but I did get to see the disk of the Sun on the ground and see its movement in real time. A cool experience! After my visit I proceeded to the Roma Termini and find my train that would take me to my first official destination of the program: Perugia. All aboard!

PART TWO: PERUGIA AND ASSISI

The train ride to Perugia was cramped. I was that silly person who packed way too much luggage, but I would be in Italy for over a month, and I had lots to bring. The train ride took me through spectacular canyons of the Apennine mountains, but it wouldn't be long until I saw Assisi off in the distance and then Perugia. When I debarked the train, a little lady dressed in a yellow jacket yelled my name. It was Simonetta Ercoli, my first host. What can I say about Simonetta, other than the embodiment of what Umbria is known for: kind, heartwarming, passionate, and full of energy. I know when I saw Simonetta and we started talking, we were going to get along very well. I loaded my things in her car, and we set off to her house. Her house is in the hills just outside of Perugia and what a view! We spent the afternoon getting to know each other and then for dinner we met with her friend Matteo and his family to a restaurant that served a local dish called torta al testo. My goodness was it good! It was essentially bread with a pocket of meat and cheese. What about that doesn't sound wonderful? Matteo works with Simonetta at the planetarium, which was currently closed and couldn't visit during my trip. Simonetta gave me a brief of what we would be doing for the next few days at the school, which included my lessons and a star party on one of the nights that looked the best.

The next day we woke up to cold, rainy, and windy conditions. Neither one of us wanted to be outside but we hopped into Simonetta's car and headed off to the school

Presenting the hammer and feather experiment

in Assisi. When we arrived Simonetta introduced me to Emanuele who was one of the teachers I would be working with. The lessons that I would do for the first day would be the hammer and feather and the James Webb program. In each class session, we would all work together to simulate the original Galileo experiment and report on our findings. I would also use the classes digital board to show the Apollo 15 hammer and feather experiment as well as a video done by Brian Cox inside the NASA's Space Power Facility in Ohio, USA. The students loved seeing the results of our experiments and enjoyed the interaction. The first day of classes were done and it was still not so nice outside, but we made the best of it.

Simonetta decided it was best to explore Perugia for the rest of the day, so we left Assisi and headed to Perugia. After ascending the hills, we made it to the medieval center of town, and it was my first official taste of a classical walled medieval city in Italy. Perugia was beautiful and the highlight of the visit was exploring the underground ruins of the city that were open for the public to explore. The underground tunnels featured ruins as far back as the Etruscan times. We also saw the original wall of the city that dates to Etruscan times. After our visit we went back to Simonetta's house to have dinner and relax for day two.

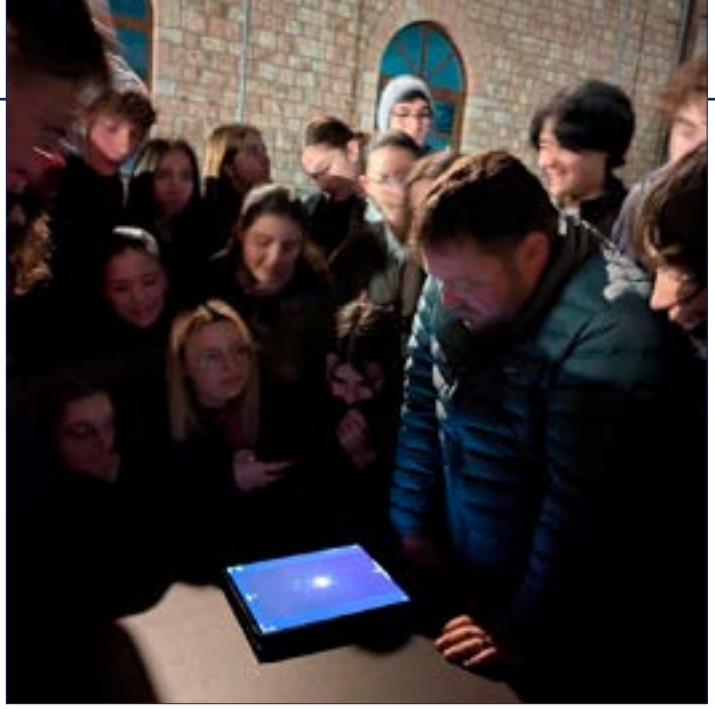
Day two we continued to provide some morning lessons which were the same as day one. Upon completing the morning lessons, the weather greatly improved so we decided to enjoy time in Assisi, a UNESCO town famous for the home of St. Francis. We started at the Monastery of St. Francis, where paintings along the walls and ceiling describe the life of St. Francis. Photos or words can't really describe just how beautiful everything is, and you will hear this again and again from me as I go on exploring other areas in Italy. We then had lunch and after we ventured up to the Castle at the top of the hill to get a great view of the town and the countryside. It was just breathtaking. After our exploration of the town, we decided to take a drive to the nearby Lago Trasimeno, a large inland lake. We watch the sunset and then enjoyed some lake codfish for dinner. Simonetta and I decided that the next day, the weather would be ideal for the star party, so this day was a chance to have a break and enjoy our time together.

Day three and my final day in Umbria was full of sunshine, classes, and astronomy. The lesson done this day was the human HR diagram and the students really enjoyed doing this one. Each student got a balloon and had to decide where on the diagram their star would be. We went over the HR diagram on the digital screen before they got up to create their own version of the diagram. The students did a great job figuring it out and loved the connection with the balloons and their relationship with the stars. The students that chose to make supergiant red stars got the opportunity to pop their balloon to simulate a supernova. The first time we did it had one of the teachers run in to see if there was an explosion, but we comforted him by saying it was simply a balloon popping. After this lesson we went outside to observe the Sun using some solar eclipse glasses and a sun spotter. There were some great sunspots on the Sun and the students enjoyed seeing the Sun through the

Simonetta and I at the top of the Castle in Assisi

glasses. After the lessons were completed, I had a few hours free, so Simonetta took me up Monte Subasio to see the home of St. Francis when he climbed the mountain. We also summited the mountain, and I even found some calcite crystals at the top. For those who know me, I enjoy doing some rockhounding, so this was a huge treat! After an early dinner and some gelato, we headed back to the school to get ready for the star party. I brought my SeeStar S50 with me to Italy and it was exciting to share the night sky this way with the students. I also helped Simonetta setup her reflector telescope to observe the Moon and Jupiter. With the SeeStar we were able to observe the Orion Nebula, M51, M101, Leo Triplet of galaxies, and the Pleiades. The students huddled around me and the iPad to get a glimpse of the first images sent back from the SeeStar. The star party would be my favorite part of my time with the students in Umbria. They were so inquisitive, and the questions never seemed to stop. Several students told me they wish to continue to university to learn astronomy and astrophysics and this made me so happy to see their passion for this subject. We only had so much time with them during the star party, but I didn't want it to end. I will truly treasure that evening and seeing such excitement from the students. I am very glad Simonetta and the school decided to host this evening and we had clear skies to enjoy it. When we finished, we headed back home for the conclusion of the last day in Umbria. The next day I said my farewells to Simonetta and that we would one day get together again. We both have a passion for exploring Egypt and we hope that one day we could explore there together

The Human HR Diagram demonstration



Students exploring the night sky with the SeeStar.

Holding the original writings of Galileo Galilei.

and told her to come back one day to the USA to see me. Now onward to the Florence!

PART THREE: FIRENZE AND GALILEO

From the mountains of Umbria to the bustling city of Firenze (Florence), I arrived and was greeted by Ruggero Stanga, who took me to the Planetarium at the Fondazione Scienza e Tecnica. We met with his students who assist him at the planetarium. Ruggero wanted me to talk about communicating science to audiences by using my lesson of the James Webb and the HR diagram. I quite enjoyed this one because it wasn't a simple lesson presentation but rather a dissection of the lesson and how it could be presented to several audiences. We had wonderful discussions and I even learned quite a bit from them and how they do their own presentations. They even offered me great recommendations on the HR diagram that I will use for the future. We toured the museum galleries which included an extensive collection of physics devices, fossils, and minerals. We finished the day with a tour of the planetarium and their Digistar 6 system.

Ruggero with his planetarium staff doing the HR diagram lesson.

My time in Florence was short and I deliberately kept the city a secret since my wife and I would return a few weeks later to enjoy the city, so I wanted to respect her and keep my first impressions of the city minimal until we visited together. However, there were two places that I could not resist and Ruggero and his team arranged what I believed to be one of the biggest highlights of the trip for me. I met up with Emmanuele, one of the student workers at the planetarium and we set course to visit the National Library of Florence for an unforgettable treat. Upon entering the library, we met up with one of the librarians who took us to his office and introduced us to the original writings of Galileo Galilei. Here it was, just lying there. I could not believe my eyes and the librarian said something that I thought I would never hear, "pick it up, look at it, smell the books". Yes, you heard me right, I smelled Galileo's books and both Emmanuele and I could not believe what we were doing. We got a chance to see the original handwritings of Galileo's discoveries. But what stood out to me the most was one book. It was an itemized receipt book of many of Galileo's purchases. The librarian moved to a page in the book that had all the items Galileo requested to purchase to produce his telescope. Within it, however, were common items like his favorite marmalade, sugar, beef tallow, and food. Here it was, the start of the scientific revolution but with a human touch to it, items that you and I would get. Who today is doing the same thing? Is there an Amazon list out there for someone who will be making a breakthrough discovery? There were moments during this time I teared up, knowing what a privilege this was and how thankful I am for having this experience. I captured the moment in 360 hoping I can share this experience with so many others. This will remain one of the

best moments of my life and Emmanuele and I could not stop talking about this experience for the rest of the day.

How do you follow such a monumental experience? By visiting more Galileo artifacts! We visited the Museo Galileo, and it was a treat to see so many historical artifacts such as globes, armillaries, telescopes, and event Galileo's middle finger! It was a wonderful time exploring the museum and Emmanuele and I parted ways, and I relaxed in the hotel until the next day where it was time to make my way to Ravenna.

PART 4: RAVENNA

A hot late spring day in Florence was soon greeted with a cold, windy, and rainy day in the coastal town of Ravenna. What was a cold day was warmed up by the heartfelt Paolo Morini, the president of the local astronomy society in Ravenna and my main host. We hopped into Paolo's car and headed to the planetarium which was setting up for its Sunny Sunday event. Unfortunately, the Sun didn't get the invitation, but things would begin to change for the better. Upon arrival, I was greeted by the director of the planetarium, Marco Garoni who showed me the Zeiss star projector, which was the same model originally found in the planetarium in Florence. The event featured many activities such as a solar oven experiment, school projects about the Apollo space program, my talk on the hammer and feature experiment, and of course views of the Sun. About that, it finally cleared up and Marco and Paolo rushed to setup their solar telescope to view the Sun and I setup the SeeStar for a view of the Sun as well. Mission accomplished! It was a great time and the students, and their parents had a wonderful time. At the end of the event, we headed into the city center for a lovely dinner at Ca' de Vèn, a medieval wine shop now turned restaurant. I got to try a local type of bread called piadina, which is made with flour and lard. I think I could eat that forever.

The next day Paolo took me to a local science high school where I would give a few morning talks on the James Webb Space Telescope. Most of the students were international or have studied English for a few years, so we were able to get into some great discussions about the observations James Webb has made and plans to make. The students had a lot of curiosity about exoplanets and the possibility of life and if we could one day contact another lifeform. The imagination and curiosity of the students made me very happy, and I can see many of them being astronomers or scientists that could one day help in making that possibility a reality. After my morning talks with the students, Paolo arranged a private guide to take me around to many of the early Christian churches in the area. Ravenna was the new capital of the Roman empire after the fall of Rome. Some of the most well-preserved paleo Christian churches in the world are found in Ravenna, featuring some of the most splendid mosaics ever created. My guide Roberta Merendi provided me with an amazing tour, telling the story of Theodoric conquering the city to the rise of the Byzantine period. One of the biggest highlights was seeing the mosaic of Justinian and Theodora in the Basilica of San Vitale and the mosaic of the three magi in the Sant'Apollinare Nuovo. I got a chance to take some 360 images for use in our Star of Bethlehem show in which we use a photo of this mosaic. After the tour, I met back up with Paolo, Marco, and fellow astronomy club member Fabio for a final dinner at a local seafood restaurant. Have I mentioned how good the food is here? No? Well, the food is good here! We said our farewells and now it was time to hop on a train to head to Brescia.

Paolo, students, and I during the "Sunny Sunday" activity; Justinian mosaic at the Basilica of San Vitale; Magi mosaic at the Sant'Apollinare Nuovo.

PART 5: BRESCIA AND LUMEZZANE

I could have stayed a few more days in this area of Italy, being so close to the Alps, but sadly this was one of the quickest stops during my time in Italy. The train ride to this area was a scenic one, with mountain views of the Alps. Loris Ramponi and his colleague Ivan greeted me at the train station, and we stopped by a local castle to admire the limestone and the view of Brescia from the top. Due to the limited time, we had, sightseeing on this part of the trip was minimal so we got into the car and headed up into the foothills of the Alps to the town of Lumezzane to the library where I would give my presentation. The lesson that was requested was the hammer and feather and the talk on the James Webb Space Telescope. Unfortunately, I didn't have a hammer available to use during this lesson. Ivan found a stuffed Earth globe that I used during the lesson and the students found it quite amusing when I dropped the entire world along with a sheet of paper. One of the more unique aspects of this presentation was that I had one of the local politicians come to give a speech, thanking me and the work of Loris and Ivan in the local community. It was great to see a local politician come visit and support the work being done by Loris and Ivan, knowing they are vital asset to the local community. After my lessons were completed, I was gifted a wonderful thank you card and a light up galaxy globe as a token of appreciation from the students. The care and gratefulness from the students have been so wonderful to experience and it has been an absolute pleasure working with them and hearing their enthusiasm for astronomy.

When the lesson presentation concluded, we made our way up to the planetarium in Lumezzane and got a special demonstration of the star projector. The planetarium is called the "Museo of Constellations" and is run by the team at the Serafino Zani Observatory. Seeing old optical/mechanical star projectors just brings me back to the times I visited planetariums with my father and how that inspired me to become the person I am today. The projector is controlled by a custom console that powers all the movements of the star ball. It was cool to see this thing in motion and you could tell Loris was very proud of

Students presenting me with gifts and a thank you card.

Museum of Constellations in Lumezzane

the preservation of the machine. After the demonstration we got back into the car and headed higher uphill to the Serafino Zani Observatory. The observatory conducts many international research projects aimed at the detection of minor planets throughout the Solar System. It also hosts many public astronomical events throughout the year. While we didn't get a chance to see the telescope in action, we watched a lovely sunset at the top and then headed down for what I believed to be one of the best pizzas I ever had! It was a short stay, and I enjoyed my company greatly and could have stayed longer, but it was time to finish my trip at the very far eastern border of Italy in Gorizia.

PART 6: GORIZIA

The final stop on this grand adventure took me to the farthest east you can go in the country before heading into Slovenia. Upon arrival at the train station in Gorizia, I was greeted by Franco who I learned also was into fossils and minerals. I knew at that moment we would get along very well, and we both shared some great conversations along our journey to the observatory and planetarium which was located near a vineyard. The last visits were situation in cities and towns, but this location was out in the country, which was nice and quiet. I was then introduced to Enrico Pettarin, who is the president of the local astronomy association that operates the Farra d'Isonzo Observatory and Planetarium. Like the observatory in Lumezzane, the observatory studies and observes minor planets in our Solar System, as well as hosting star party events for the public. The first night we had a community gathering of people to the observatory and planetarium. I was asked to present my hammer and feather lesson and Enrico even setup a little area with a proper hammer and feather! After the lesson I proceeded to the planetarium where I gave a planetarium program. This was the first time during my time here where I gave an official planetarium presentation, and it was lovely. I got to share the night sky and tour the planets of the Solar System, and

Farra d'Isonzo Planetarium

everyone enjoyed the live program. I was in my element. After the program we grabbed something for dinner and prepared for day two with students visiting from the local schools.

Day two was a mix of lessons and epic adventures! The first half of the day consisted of giving my hammer and feather lesson, solar observing through the observatory's hydrogen alpha solar telescope and my SeeStar using the solar filter, and finally a planetarium presentation. Luciano Bittesini operated the planetarium today and was recovering from illness, but it was nice to meet him and share the planetarium together. I will miss teaching Italian students because almost all of them had wonderful questions and discussion after the show, we spent almost another hour inside the planetarium simply answering questions and chatting about the wonders of astronomy. It was a huge treat and we all gathered out front of the planetarium after the program to take a group picture. After the conclusion of the morning program, we got in Enrico's car and headed into the country of Slovenia to visit the Škocjan Caves. This area of Slovenia we visited was the birth of spelunking and the word karst comes from the Slovenian language for this region. Words could not describe just how epic these caves were. If you have read or seen the Lord of the Rings movies, the closest description was the Mines of Moria and the area where the fellowship crosses the bridge where Gandalf faced the Balrog. Hundreds of meters in depth it was the most majestic cave I have ever been in, and I have explored many caves in the world. If you are ever visiting this region or the country of Slovenia, you MUST visit the Škocjan Caves. After our visit, we visited a local restaurant to enjoy some Slovenia food and after nightfall we headed back.

Day three saw a repeat of what I did on day two. We had another group of students come visit the observatory and planetarium and I gave my lesson on the hammer and feather and presented inside the planetarium. After the lesson Franco and Enrico and I headed to a unique village in the area, Aiello del Friuli or the Village of Sundials. Franco told us that is started out as a class activity with his students, but then overtime, the village created more and more sundials. Many of them were so elaborate and even had interactive components to it. Franco took us to the Sundial Museum which featured over 40 sundials. One of them included a geodesic soccer ball (football for the Europeans) that each area had its own sundial. A truly remarkable work of craftmanship! It was wonderful to just walk around and spot the sundials and see how they worked. I told Franco that he was the "Lord of the Sundials" for his achievement in starting this movement in his village. After our time at the Sundial Village, we headed back to the observatory and planetarium to present one final program for the community, which featured astronomical observations, a hammer and feather lesson, and a planetarium program. By the end of the night, I was exhausted, but it was a good exhausted, knowing you did great and wonderful fulfilling things.

My final day in Gorizia was a travel day but we still had time to do some more sightseeing before I headed to Venice. Enrico and Franco took me to the Roman port city of Aquileia. Throughout this city are ancient ruins featuring wonderful tile mosaics of sea life and images depicting daily life living by the sea. Ancient docks remained and I imagined people placing their boats on the docks and heading into the city to shop or conduct business. We also visited the Roman museum which featured amazing marble sculptures, jewelry, and pottery from ancient Roman times. I was having so much fun that day, that I decided to move my train ride to a later time so I could spend more time with my hosts. We then hopped into the car to head to the town of Grado, which was right off the Adriatic Sea. We enjoyed some amazing fresh seafood and gelato while walking alongside the sea. Before I knew it, it was time to head back to the train station in Gorizia and say my farewells. I can't believe that the time I had with everyone was ending! I took the train to Venice reminiscing about the incredible time I had the past two weeks and how fortunate and honored it was to be a part of this journey. While the Two Weeks in Italy program was ending, my time in Italy was not. Soon my wife would join me in Venice, and we would spend another week in Tuscany, exploring medieval towns, mountainous environments, and beautiful rolling hills.

EPILOGUE

What can I say? Should you participate in the Two Weeks in Italy program? Absolutely! One hundred percent! You will meet the most amazing and hospitable hosts in the world, who will take care of you and want you to have the greatest time of your life. I can't thank enough Simonetta, Ruggero and his team, Paolo and Marco, Loris and Ivan, and Enrico and Franco for all their time and energy in putting together such an amazing experience. I am very thankful to now call you all my friends and I look forward to seeing you all once more! This experience will forever be marked as one of the greatest experiences in my life. Was it all fun and games? No. You will be moving a lot and working a lot. You will have the greatest sleep of your life after those two weeks. The reward for your hard work will be that you have inspired and captivated many people throughout the

country of Italy. They will get a chance to see a different way of teaching and while it will take a few moments for them to open up, be ready for a flood of questions and interest at a level you may have not seen before. Will you see some incredible sights? Oh yes! The amount of history is unbelievable and to see it firsthand is truly astonishing. I was also asked in my report to put some recommendations for improvement for the program. There are only a few recommendations because I feel this program is solid, but I feel what I will provide will only strengthen already robust program. As IPS grows into a more international organization, while I was in Italy, I was thinking of several amazing planetarians that would benefit from this program, but they are not American. I would love to see if each alternate year, the program be offered to non-Americans. I think the students can benefit from learning from all of us around the globe and I strongly recommend the hosts to consider this an option for the future. My only other recommendation is to consider having more time in the planetarium for the lessons and that participants can use more digital opportunities. Gorizia was the only site where I got a chance to use the planetarium for my time here. Florence also has a digital dome and more planetarians are familiar with digital domes and their talents could be used more if there was a chance to operate digital domes during the program. As a planetarian that uses my dome primarily for teaching, I do believe the use for education should remain. To those reading this and interested in the program, I really recommend it and please don't feel intimidated by the application process. With proper time management it was not hard to put together and the reward for your hard work will pay off with one of greatest opportunities of your career. Italy calls for you!

Clockwise from top left: Me, Enrico, and Franco at the Škocjan Caves; Sundial Village Museum Sundial soccer (football). Reunited with my wife Lisa in Venice Solar viewing with the hydrogen alpha solar scope and SeeStar.

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A WEEK IN THE US
WYOMING AND LIPS IN COLORADO

Constanza Yovaniniz

Planetario USACH, Santiago, Chile

It was right at the beginning of 2025 when I found out that I was selected for the "A Week in the United States" program, where I would stay with Michele Wistisen from Casper Planetarium. Michele suggested I made the trip in July so I could attend LIPS in Boulder right after my Casper visit—I had never heard about LIPS before, but it looked really interesting!

After twenty-four hours and three different flights, I finally landed in Casper, Wyoming on Wednesday, July 16th. Michele was at the airport to pick me up, and I was so tired from the trip that we just had dinner and then I crashed immediately after.

On Thursday, after a wonderful breakfast with fresh raspberries from Michele's backyard, we were out on the town! First we went to the Tate Geological Museum at Casper College, which had some incredible exhibits. The giant mammoth skeleton is the most impressive one, but I really enjoyed looking at all the information about geological eras and minerals, and the illustrations that would go next to each fossil sample. After lunch Michele had to teach a coding class at The Science Zone, so I got some time to walk around and look at the exhibits. I really liked how kid-friendly everything was, and getting to read the stories of the animals that they were taking care of!

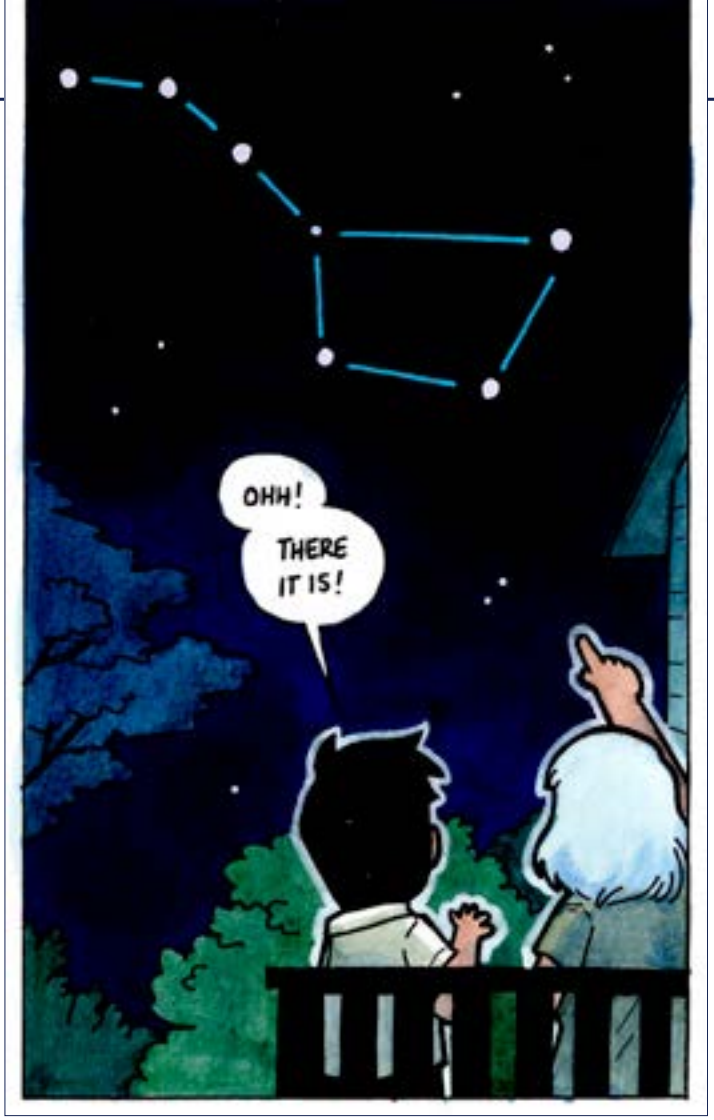
From there I walked to the Natrona County Library to prepare for my first talk, where I talked about the southern hemisphere skies and constellations. I struggled a little not having a dome to show what I was talking about in more detail, but overall it went well. I was also surprised to find my graphic novel at the library!

On Friday we got up early for a visit to Austin Engineering, where Lyle Harmon showed us how they make the gigantic mining truck bodies (they have a Guinness Record for it!). It was really interesting to hear about their incredible attention to quality control and continuous improvement!

From there we go to Casper Planetarium, where I get to meet Rod Kennedy and Chris Byrnes. They showed me how their Digitalis system worked, and I was IMPRESSED! Planetario USACH works with a Zeiss VI optical-mechanical, so seeing Rod control everything on the dome from an iPad was a huge contrast. I even got to zoom in on the Earth enough to see my house! The most interesting thing to me about this system were the Augmented Lessons--Rod kindly coded an Augmented Lesson for me to use on my talk, but if I was able to stay for a couple days longer I would have loved to learn to do it myself.

Then Michele, Rod, Chris and I went out for lunch at Little Shop of Burgers, where I had a burger with peanut butter and jelly...? It was messy, but delicious!

On Friday evening, Michele and I went to Casper Mountain, where I got to meet a group of girls who were camping there. Most of my nights in Casper were cloudy, so we didn't get to do much stargazing, but we painted some watercolors and then did one of the most important cultural exchanges—food! The girls taught me how to make my



first s'more (everyone was surprised that I had never had a s'more), and I showed everyone the "chilean hotdog" (which we usually call "completo italiano"), a hotdog with avocado, diced tomato and mayo.

On Saturday, Michele took me to Fort Caspar and the National Historic Trail Interpretive Center, where I got to learn more about the history of Casper, the trails, and the pioneers. I was in Casper for a very short time, and Michele did a great job in showing me as much of it as possible.

Saturday evening was my big public talk at Casper Planetarium! Rod helped me with the projector while I gave a talk about Southern Hemisphere constellations, and then chatted with the audience and answered questions. It went really well! And then, as we got home after the talk, the sky finally cleared!! Michele and I stay outside while I finally get a good look at the Big Dipper and some other northern constellations.

On Sunday I went for something completely different—Casper Comic-Con! Having a comic convention on the same weekend that I was there was a HUGE coincidence, and it was fun to look around and get some comics from local artists. After that I headed back to Michele's house to have dinner with her family and play board games, it was a nice chance to wind down at the end of the week.

Monday was my last full day in Wyoming. Michele and I went to Natural Bridge Park to do some watercolors, and then we headed back to Casper Planetarium for my last talk of the week--a talk about the Southern Skies and star formation for a group of high school students. It also went really well, it was a nice group with lots of questions! After the talk we went back to Casper Mountain, where I got to visit the Braille Trail and the waterfall at Rotary Park. I was trying to absorb all the views and nature as much as possible, I felt like I was missing them already.

On Tuesday, July 22nd, Michele drove me to Boulder for LIPS, which was starting the following day. It was a fun road trip, all the way to the parking lot of the Fiske Planetarium where I was supposed to meet John Keller...when I tripped as I got out of the car, fell to the floor and broke my arm. What was supposed to be a chill evening in Boulder ended up with Michele and John taking me to the ER, where luckily I managed to walk out with just a sling and painkillers. Also, it was covered by my travel insurance. To anyone else participating in these programs, or just traveling abroad in any situation: don't forget to get travel insurance!! You never know!!

Well, that whole situation didn't stop me from attending LIPS 2025 at the Fiske!! I still showed up—with an ice pack, a bottle of painkillers, and a wonderful conversation starter. Michele had really hyped me up for this conference, and I could quickly see why. All of the presentations were super interesting, and it's just great to share with an enthusiastic group of people who are really into making the planetarium experience the best it can be.

The three days of LIPS flew by—the days were packed with presentations and I attended all of them, so it was LIPS all day, dinner, sleep. Boulder was also a really nice place to walk around, though it was Summer break so it was a lot emptier than usual.

On Saturday, July 26, it was finally time to head home... that is, until my plane malfunctioned and we had to evacuate before takeoff, inflatable slide and everything! On Sunday, July 27, after a lot of rerouting, it was finally (finally) time to head home.

This trip was an incredible experience. It gave me the chance to share with other planetarians and get some perspective on what they're doing differently, but also what we have in common. It allowed me to meet a community of

(Continued on pg. 46)

5 REASONS TO DO A 'WEEK IN THE UNITED STATES'

Frederik Würtz Sørensen

Student Presenter at The Science Museums, Aarhus University, Denmark

Reading this article, I assume you, dear reader, have a general interest in both planetariums and expanding your professional horizons. With that in mind, here are five non-prioritized reasons why you should do "a week in the US!"

My host Brian Koehler and I pose in front of the beautiful façade of the Treworgy Planetarium. *Credit: Brian Koehler.*

REASON 1: YOU GET TO TRAVEL!

The "Week in the US" program allows a US planetarium to host an international colleague, offering capped travel reimbursement and room and board. This year, I was awarded one of two spots in the program and spent a week at the Treworgy Planetarium at Mystic Seaport Museum in Mystic, Connecticut. I was welcomed by my host, planetarium director Brian Koehler, and quickly felt right at home.

Mystic Seaport Museum offers guests an authentic 19th-century experience of a New England coastal town. Strolling the waterfront, you'll meet craftspeople - a blacksmith, woodcarver, and sailmaker - keeping maritime traditions alive. In the harbor lie many preserved historical vessels, and in the drydock, shipwrights are restoring magnificent wooden ships. Treworgy Planetarium was built with the same maritime intentions: preserving the art of celestial navigation. As I captain a small sailboat in my hometown Aarhus, Denmark, I was really looking forward to joining two of my favorite things - the sea and the sky!

REASON 2: YOU GET TO SOCIALIZE!

Sailing around Denmark after my stay in Mystic, I got to put my newly acquired understanding of celestial navigation to good use! *Credit: Frederik Würtz Sørensen.*

You probably know the feeling - meeting a new group and instantly knowing you'll fit right in. When Brian introduced me to his awesome planetarium staff, that feeling was all over me! Whether student presenters or full-time staff, all of us who work with planetariums found some non-linear path to the dome, and it's great to hear and share those stories.

Most planetariums with some years to them have that one volunteer who knows every corner of the building and every quirk of the machines. At Treworgy Planetarium, that man is Bill Michael. I realized this soon after shaking his hand and spent the day following him around, soaking up as much as I could - and I wasn't disappointed! I got a crash course in telling time with an astrolabe, learned how the Spitz A3P optical-mechanical star projector mechanically reproduces the axial tilt of the planets, and watched an animation of the grasshopper escapement in John Harrison's H1 clock. It's a joy to be around fellow geeks!

REASON 3: YOU GET TO LEARN!

Presenting in a planetarium, we all have our favorite stories, our go-to segues from one part of the sky to the next, and our trusty jokes that never fail. At my home planetarium, we've all been trained in the art of live presentations by the same person - and it shows! That's why attending a

planetarium show far from your home dome is so valuable. You gain new stories, yes, but also fresh approaches to welcoming audiences, interacting with guests, and retelling familiar tales.

It's funny how stepping away from home helps you better understand and evaluate your own practices.

As a bonus, I got to sit in on a special celestial navigation program for officers-in-training from the nearby Navy base. How do you actually go from an angle on a sextant to a line on a map? Listening to Brian's sublime explanations, it really was a 'lightbulb' moment for me! A few weeks later, I went on a sailing trip around Denmark - and though space is limited on a boat requiring sparse packing, I had to bring a sextant to try it out!

REASON 4: YOU GET A CHALLENGE!

Though I'd traveled halfway around the globe, I'd barely changed latitude, so the stars above Connecticut were familiar. I knew the constellations, the asterisms, and had my jokes ready. The only problem: many of them didn't land with my American audience!

I love using humor in my presentations, but it's one of the hardest things to master in a foreign language. Humor is deeply cultural, and timing is everything. So how do you adapt your material and style for a new audience? Luckily, the Marvel franchise has done a great job popularizing Thor, the Norse god of thunder, and his companions - so we titled my presentation "The Stars of the Vikings"! With this angle, I spent the week honing my material and connecting with the American audience.

REASON 5: YOU GET TO TEACH!

What do you do well at your home planetarium? What practices, workshops, or shows are you proud of? Traveling abroad professionally lets you bring all of that and share it. At the Science Museums, we strive to engage our audience - both in the dome and in hands-on workshops.

During my week in the US, I led our Sun-Earth-Moon workshop with a group of middle school summer campers.

(Continued on pg. 46)

What was important for your group, when you built your models of the earth, moon, or sun? Size, color, orientation? The models vary greatly, and it is important to share the thoughts behind the choices with the rest of the group. Credit: Brian Koehler (Actually one of Brians staff members) Come join us for the special planetarium show: 'Stars of the Vikings'! Credit: Frederik Würtz Sørensen; During the sun-earth-moon modelling workshop the students receive one of several conceptual challenges, they must demonstrate via their self-made model. Credit: Brian Koehler

MY EXPERIENCE HOSTING A WEEK IN THE U.S.

Brian Koehler

Associate Director of the Treworgy Planetarium at Mystic Seaport Museum, Mystic, CT USA

This past July, the Treworgy Planetarium at Mystic Seaport Museum (CT) served as a host institution for the International Planetarium Society's "Week in the US" program. Through this program, we were matched up with Frederik Sorensen, a planetarian from Aarhus, Denmark. Frederik spent ten days here in Mystic, and I have nothing but wonderful things to share from this entire experience!

Frederik and I met via Zoom three times over the course of the spring to plan his visit. It quickly became clear that he would fit right in, spending a week giving talks and shows in our dome. His familiarity with optical-mechanical projection equipment would surely translate well to our own Spitz A3P.

Frederik arrived on the evening of July 3. I'd like you all to imagine, just for a moment, how interesting his arrival through customs must have been. He was asked quite a few questions about the "Week in the US" program, and there is a specific TSA agent at Boston's Logan Airport who now knows more than he ever wanted to know about planetariums!

My museum is unique in that we have on-campus housing for a college study abroad program that happens in the fall and spring semesters, and this housing is open and available for use during the summer. This meant that Frederik was able to stay right where all of the action was!

Frederik spent the July 4 holiday weekend exploring the Mystic Seaport Museum, shadowing some of our public planetarium shows, and he even took a sailboat out on the Mystic River. It just so happens that he sails back home in Denmark! Did I mention that this guy was a perfect fit for our maritime history museum and planetarium?

During the week of July 7-11, Frederik dove in and delivered his special programming to audiences of all ages. We created special signs and screens to announce these "this week only" special shows, in an attempt to drive up our crowd numbers.

Frederik's live shows were amazing! He wove in some great Norse mythology and lore. He connected to characters that are familiar to American audiences (like Thor and Odin), but also introduced some shapes and stories that were new to our community.

Public shows were not Frederik's only contribution during his time here. He also spent time with our summer camp groups. We scheduled his "Week in the US" to coincide with an astronomy-themed week of summer day camp, and Frederik also co-presented a night sky program to our overnight sailing camp.

I genuinely appreciated Frederik's enthusiasm to fully immerse himself in this experience. Over the first few days, my staff operated our console while Frederik narrated his shows. As the week went on, he practiced our controls, and by the end of the week, he was able to fully operate the A3P and its accessories.

On his last full day here, Frederik shadowed a special navigation program that I get to lead every six weeks for officers-in-training from the U.S. Navy base in Newport, Rhode Island. He seemed to fully understand the importance of celestial navigation at our institution, and I would later learn that he brought quite a few navigation concepts home with him!

On the morning of July 12, it was time to bring Frederik to the Mystic Amtrak train station for a ride to the airport in Boston. It suddenly occurred to me that we never took the signature photo of host and visitor at the door of our planetarium! Thankfully, Frederik's housing was super close, so we were able to complete this task just before his departure. In the photo at the top of the next column, Frederik's suitcase is just outside of the frame!

This program was the ultimate win-win experience for both Frederik and myself. Our visitors were captivated by his stories, and his programs received rave reviews from everyone who attended. He provided some relief to our staff in the middle of our busiest season. And we picked up some fun new stories to include in our own shows about multicultural star lore.

Shortly after his return to Denmark, I got this message from Frederik:

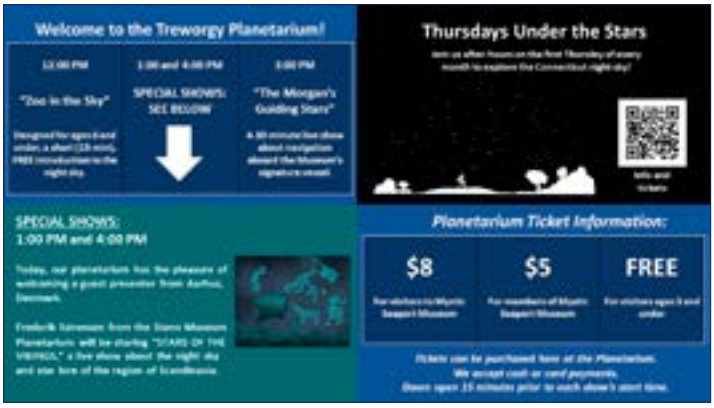
> "By the way, I brought a sextant for my sailing trip around Denmark and, using an online tool like the one the Marines did on Friday morning, shot our position to within 12 nautical miles!"

Slight military misnomer notwithstanding, that was really cool!

I will conclude with some photos of a solar system modeling activity that Frederik led for our "Space is the Place" summer day camp.

If you are considering hosting a Week in the US (and I would 1000% recommend it!), click HERE for more information.

You can also contact ME if you'd like to learn more about my hosting experience.



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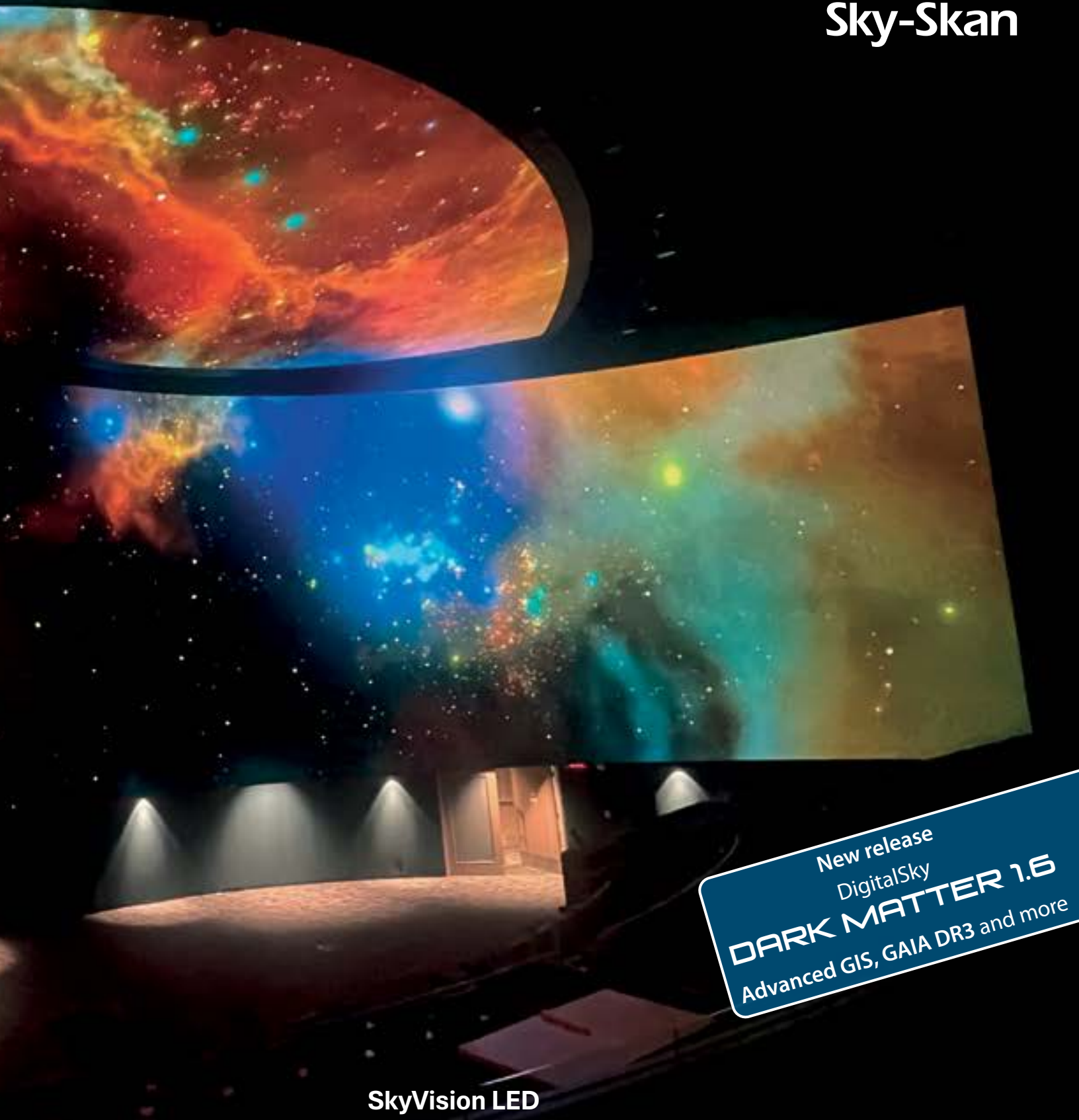

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IMPORTANT NEWS FOR THE PROGRAM "A WEEK WITH THE GDP"

The GDP and IPS in conjunction with the Society of Austrian Planetariums (GÖP), are thrilled to present our program „A Week With the GDP" for 2026. For the first, time the Austrian Colleagues of the Society of Austrian Planetariums are joining our efforts to provide a superb exchange programme for one international candidate in 2026. The Austrian Planetarium Association (GÖP) is a non-profit organisation based in Tyrol. The association's history dates back to 2001, while the current society exists since 2006. The purpose of the association is to promote collaboration and cooperation between Austrian planetariums, to provide educational and training opportunities for all age groups in the fields of astronomy, natural sciences and space sciences, and to carry out national and international projects in the field of astronomy and related fields of knowledge. Renowned members of the Association of Austrian Planetariums include the Judenburg Planetarium, YourDome Schwaz and the Mobile Planetarium Public Space in Vienna.

Following comes a message from the president of the GÖP, Peter Habison:

> "We warmly welcome our guests to the Austrian planetarium and cultural landscape. During the planned week, we want you to get to know some of the Austrian planetariums and work together to develop and present a presentation for a school class in the Mobile Planetarium 'Public Space'. The tour begins in Tyrol/Schwaz at the Your-Dome and leads through the spectacular 'Deep Space' of the Ars Electronica Center and the Star Tower in Judenburg to Vienna."

For more information, please use the following links:

- **Association of Austrian Planetariums:**
  https://planetarien-oesterreich.at/
- **Planetariums and museums:**
  Yourdome Tirol: *https://www.yourdome.tirol/*
  Ars Electronica Center Linz: *https://ars.electronica.art/center/en/*
  Star Tower Judenburg: *https://www.sternenturm.at/*
  Public Space: *http://publicspace.at/*
  Planetarium Vienna: *https://www.vhs.at/de/e/planetarium*

Don't miss out on a trip of a lifetime to Austria and learn about the incredible divers planetarium and cultural landscape. Applications open up on October, 1st 2025 until December 31st, 2025. For all the information and how to apply, please visit: *https://www.ips-planetarium.org/page/WeekwithGDP*

IPS professional development opportunities, titled "A Week in the United States," and "A Week with the Society of the German-Speaking Planetariums" are modeled after a long-running and successful program called "An Astronomical Experience in Italy for an American Planetarium Operator," also supported by the IPS. The IPS hopes that these initiatives will serve as models for other countries to follow and, as the years pass, evolve into a broader cultural and professional development exchange for planetarians around the world.

The global association of planetarium professionals, IPS has nearly 700 members from 35 countries around the world. They represent schools, colleges and universities, museums, and public facilities of all sizes, including both fixed and portable planetariums.

The primary goal of the Society is to encourage the sharing of ideas among its members through conferences, publications, and networking. By sharing their insights and creative work, IPS members become better planetarians.

CONTACTS:

- For more about "A Week with the Society of the German-Speaking Planetariums" or the program logo contact Tilo Hohenschläger at *mail@tilohohenschlaeger.com.*
- For additional information about the IPS, contact Shannon Schmoll: *president@ips-planetarium.org* You also are invited to learn more from our website at *www.ips-planetarium.org.*

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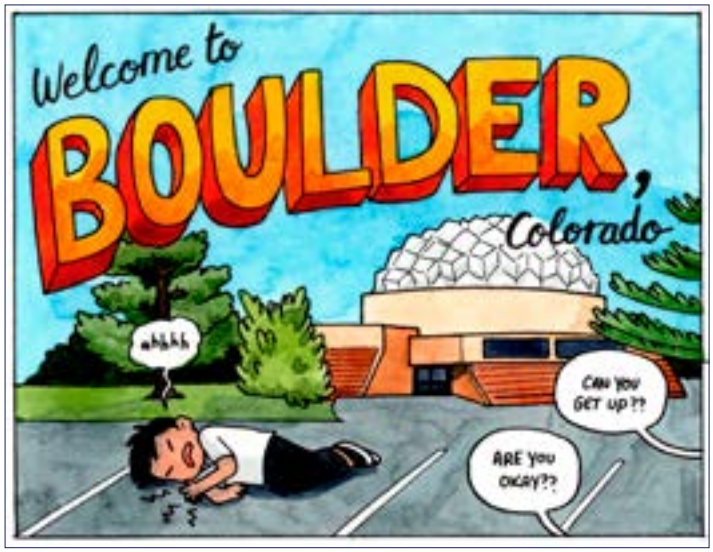
A WEEK IN THE US (CON'T)



like-minded people who are incredibly passionate for science communication and education, with who I hope to keep sharing knowledge and experiences in the future.

It made me feel more confident in the work that I do and the person that I am, while also giving me ideas for improvement and for new projects. Just like looking down at the Wyoming plains that go on forever, it was a much needed breath of fresh air.

I want to thank Planetario USACH, the International Planetarium Society (IPS), the Rocky Mountain Planetarium Association (RPA), and the Live Interactive Planetarium Symposium (LIPS) for their financial support on making this happen.

5 REASONS TO DO A WEEK... (CON'T)

Using DIY materials to build celestial models, the goal is to explore solar system mechanics and acquire an intuitive, 3D understanding of eclipses, seasons, and lunar phases. The students loved it, and it was a privilege to represent our teaching philosophy abroad.

The deadline is December 31st. I hope this short text conveys just how much I recommend applying if you're eligible! The program is also looking for new American planetarians to host international colleagues. It's a win-win for everyone involved.

I'm deeply thankful to Brian Koehler and his staff for their hospitality, warmth and professionalism, and to the committee for making it possible for me to do A Week in the United States!

RECOMMENDED TRAVEL PLANS (CON'T)

The Theater360 at the National Museum of Nature and Science in Ueno, center of Tokyo provides a truly unique immersive experience.

6. FOR THOSE WHO LOVE ASTRONOMICAL TELESCOPES (OLD AND NEW)

The showroom at the telescope shop Astro House Tomita has many actual telescopes on display. They also stock a wide variety of telescope accessories. Anyone who's been to the Orion Telescope Center in Cupertino, California, will want to visit this one. It's located south of Fukuoka Airport, but it's best to ask a Japanese friend to take you to Onojo City.

Did you know that there's a Museum of Astronomical Telescopes (MAT) in Shikoku that houses Japan's unused small- to medium-sized telescopes? Housed in the classrooms and halls of a former elementary school, it houses hundreds of vintage telescopes and astronomy-related books. It's open only on Saturdays and Sundays, but guided tours are available. Anyone interested in vintage telescopes should definitely visit.

7. OTHERS

I'm not sure if anyone is into this sort of thing, but there's a JAXA rocket launch site in Uchinoura, Kagoshima Prefecture. Japan's pride and joy, the Hayabusa, was launched from here. If you can rent a car, I recommend taking a ferry from Kagoshima to Sakurajima, a volcanic island that is always emitting smoke, and heading to Uchinoura. The road is well maintained, and you can even see traces of the massive eruption in 1914 that turned the island into a peninsula.

If you go further across the sea to Tanegashima Island, you'll see an even larger launch site.

June is the rainy season in Kyushu. If you head to Hokkaido, Japan's northernmost prefecture, you can avoid the rain and enjoy the refreshing summer. Hokkaido's major cities of Sapporo, Asahikawa, Kushiro, Obihiro, Muroran, Wakkanai and Kitami all have science museums with planetariums. Hokkaido is also the region with the largest number of public astronomical observatories in Japan. Nayoro City Observatory KITASUBARU has an 8m diameter planetarium dome and a 160cm diameter telescope, and observation sessions are held almost every night. There are many other public astronomical observatories, and information can be found at *https://www.koukaitenmondai.jp/.*

Japan is one of the world's leading astronomy nations, with many planetariums and public observatories. If you travel to Japan's remote regions, you may be surprised at the number of amateur astronomers. Everywhere you go, you will find countless stone monuments dedicated to the moon (Tsukimachi Tou). They are hidden quietly on the side of the road or in fields, but they are a sign of the love that ancient Japanese people had for the moon. Take a walk around Japan in the hope of making discoveries like these.

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UNDER THE CLASSDOME
WHATS IN A NAME

I can't count how many times a former student has reappeared as a parent of one of my current students. I also noticed that I'm older than all the parents that attended Open House this year. I'm old, undeniably. I've also seen a lot of technological evolution. I used slide projectors and laser discs during my first several years as a planetarian. I've seen the internet evolve, literally from the start. I remember my brother taking me to his high school and using a terminal to work on the college mainframe. Send me a telegram if you ever used an acoustic coupler to connect your phone to a modem.

I also remember the advent of email. The other teacher in my office led a computer club that won a contest, and the prize was a computer that connected to the newly invented internet. Back in those days, your home address was in a public phone book and we used our social security number for all kinds of identification purposes, such as on tests in college classes. Times have certainly changed.

My work as GLPA President and my approaching retirement have given me some new perspectives. Our email addresses have become a fundamental form of identification. Yes, there are platforms like Slack, Discord and so forth, but they all need an email address as your root identifier. Want an account for a website or app? You had better be able to verify your email address. What I want to ask you to think about more seriously is your email address and what you use it for.

I have been partitioning my digital existence by setting up different email accounts.

- Personal - *mark@percyfamily.com* - My brother set that up long ago
- Work - *mpercy@williamsvillek12.org* but also *mjpercy@williamsvillek12.org* because of the google
- Planetarium work - *mjp.planetarium@gmail.com*
- The burner that I used to (reluctantly) set up a FaceBook account for "Jake Therobot" - *williamsvilleplanetarium@gmail.com* - don't expect a reply from that one, but I did plan for sharing it with other planetarium staff and whomever fills my shoes next year.
- My sound engineering work - *mjp.soundservices@gmail.com*
- My small time electrician and sound installation work - *mjp.wires@gmail.com*

There are more, but you get the picture...

I do some of that to simply separate my business into appropriate containers, but some of it can be pretty serious. The school controlled work email is the one I need to be most careful about. We get reminders all the time from the IT department that only school business should be conducted via that. Despite the warnings, I see colleagues using it all the time for shopping and other personal business. That's a violation of the acceptable use policy that we click "OK" to every time we log in. Management ignores that most of the time, but they have every right to discipline you about it if they want to take you to task.

What is "school business" exactly? That can be murky. While my professional evaluation plan involves "professional leadership", would they condone me doing GLPA/MAPS/IPS business? I didn't ask, I just moved all of that to the "planetarium work" email before they had the opportunity to consider the question. A few years ago, I assumed that preparing for the total eclipse and educating our community was "school business." I wasn't expecting to get called in for a "bring a friend from your union" meeting when my activities were positioning our school district as the regional leader. Apparently, the district leadership wasn't in full agreement about that. It was a real mess with a lot of stress to migrate everything over to the planetarium work address. I really wish I had thought about it more a long time ago.

Changing jobs is another way that your email communications could get derailed. Over the years, I have observed several folks who expected to stay with their institution indefinitely have to change their jobs. Budget cuts, reorganizations, politics and life changes can all happen without much warning. These are generally very stressful changes to begin with and rebuilding a digital identity certainly doesn't make life any easier. If your address gets shut down, your address book and the ability to tell people that you have a new address will disappear too.

Another thing to keep in mind with your institutional address is the lack of confidentiality. Any email group at school blind carbon copies (I have also used carbon paper!) the administrators. Want to complain about how they handled an issue to your colleagues? You just shared that

(Continued on pg. 73)

IPS INTERNATIONAL PLANETARIUM SOCIETY

PLANETARIUM EDUCATION

Research Fellowship 2026

Round 1 Proposal due:
13 March 2026

Round 2 Proposal due:
15 May 2026

USD$5000

The IPS Education Committee is again offering a USD$5000 fellowship to individuals to conduct research that helps planetarians learn how best to use their spaces for educational purposes.

Round 1 proposals require only a short overview. A small number of applications will then be invited to submit a full Round 2 proposal.

All applicants must have an affiliation with a planetarium, academic institution, or planetarium professional organization.

For more information & proposal: **https://tinyurl.com/IPS-PERF**

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INTERNATIONAL NEWS

Dear fellow planetarians...

Below you will find inspiring news of events, new planetarium show, professional development and many other activities taken place under our domes. This proves, that planetaria all over the world are indeed alive. For this section I'm indebted to contributions from Andreas Schmidt, Fabien Marquet, Alex Delivorias, Loris Ramponi, Ignacia Castral, Andrew Kerr and Amie Galagher.

Let's start this tour around the world in Germany.

SOCIETY OF GERMAN SPEAKING PLANETARIA

SCHLESWIG-HOLSTEIN

The annual conference of the Society of German Speaking Planetariums will take place from Saturday, 18 April to Monday 20 April 2026 at the Mediendom, University of Applied Sciences Kiel. For participants arriving early, there will be an informal self-paid dinner on Friday evening. The Mediendom Kiel features a 9-meter dome (4,7k resolution) with 64 concentrically arranged seats and a Digistar 2025 system. With 64 speakers and a Spatial Sound Wave system, it provides an impressive immersive audio experience.

Conference sessions will be held both in the Mediendom and in the adjacent Audimax building, which offers a foyer, a large auditorium, several lecture rooms, and a sponsor hall. In addition, a mobile 15-meter dome, provided by the Tat Team, will be set up on campus to host further dome sessions. Further details and the call for papers will be published at www.fh-kiel.de/mediendom/gdp-2026/. The staff at Mediendom looks forward to welcoming you in Kiel at the Mediendom!

BADEN-WÜRTTEMBERG

As of 1 August 2025, Ubbo Grassmann is the new director of the Carl Zeiss Planetarium Stuttgart. He succeeds Dr Uwe Lemmer, who retired after 16 successful years at the helm. Stuttgart's City Council made the appointment at its final meeting before the summer recess. Grassmann has served as deputy director for more than ten years and has been acting director since 1 June 2025. In recent years, he has driven numerous initiatives for the Planetarium's continued development. While keeping astronomy, spaceflight and space research at the core, he has broadened the programme to include cultural and music formats. One example is *Tunesday*: once a month, musicians perform live in the Star Theater while images, videos and lighting effects are projected onto the dome. Grassmann also played a key role in introducing online ticketing.

First Mayor Dr Fabian Mayer welcomed the Council's decision: "I know Mr Grassmann from his previous work and am convinced he will lead the Planetarium excellently into the future. Mr Grassmann pursues the vision of a modern planetarium as a 'meeting place of the sciences. He transforms scientific facts into inspiring, experiential stories—clear, tangible and accessible across generations". Marc Gegenfurtner, head of the Department of Culture, also praised the appointment: "Ubbo Grassmann stands for innovative formats. With him at the helm, the Planetarium will continue its programmatic and technical development—as a place of learning, fascination and community". Born in Kiel in 1981, Grassmann studied design with a focus on motion graphics. In 2009, he wrote his diploma thesis at Planetarium Hamburg on the Cassini–Saturn mission. The resulting learning concept—with modules ranging from the classroom to under the dome—anticipated today's interactive educational formats.

GDP. Ubbo Grassmann, new director at Carl Zeiss Planetarium Stuttgart. *Courtesy of U. Grassmann.*

BERLIN

On Saturday, 13 September, the Stiftung Planetarium Berlin (Berlin Planetarium Foundation), the Society of German-language Planetaria (Gesellschaft Deutschsprachiger Planetarien), the Association of Amateur Astronomers (Vereinigung der Sternfreunde) and the Astronomical Society (Astronomische Gesellschaft) invited visitors under the motto "Observe, marvel, experience" to the second nationwide Long Night of Astronomy together with numerous planetaria, public observatories and astronomical institutes. Everything revolved around the magnificent celestial bodies of the Universe: the second nationwide Long Night of Astronomy offered exciting, mostly free experiences for the whole family at the Zeiss-Großplanetarium in Berlin and at further institutions all across Germany — from Hamburg and Bochum via Heidelberg to Munich. Whether keynote lectures on cosmic topics, live observations through telescopes, tours of observatories and astronomical institutes, 360° fulldome programmes in planetaria, hands-on and craft activities, interactive formats or Q&A sessions: the Long Night of Astronomy presented a diverse programme for all space enthusiasts.

At the Zeiss-Großplanetarium in Berlin, visitors experienced cosmic event offerings from 5 p.m. to 1 a.m. for the entire family. A nationwide livestream connected participating institutions from 7 p.m., providing background

GDP. Long night of Astronomy in Berlin. *Both courtesy of Pedro Becerra.*

information from experts and giving everyone, regardless of location, the opportunity to take part live. The night sky itself also offered plenty that late-summer evening: fascinating celestial objects such as Saturn with its impressive rings, the waning Moon, Uranus and Neptune beckoned to be gazed at. This year the Long Night of Astronomy was held for the twelfth time in Berlin and for the second time nationwide. Originally founded in 2014 by the Stiftung Planetarium Berlin, it ties into the tradition of street astronomy, which became especially popular in Germany after the Second World War. At that time astronomers with self-built or salvaged telescopes gathered in public squares to bring people closer to a night sky that—at the time—was largely free of light pollution. "The Long Night of Astronomy is intended to lift the gaze from everyday life and direct it into the cosmos. Scientific expertise meets the joy of collective wonder. Our hope is that people all across Germany will look up and catch the fascination of astronomy", said Tim F. Horn, president of the Stiftung Planetarium Berlin.

The novel Youth Research Centre Helleum II of the Stiftung Planetarium Berlin represents a new, innovative extracurricular learning environment in the Berlin-Hellersdorf district and offers young people in lower and upper secondary levels the opportunity to learn autonomously and by inquiry. In workshops, project work and independent research endeavours, pupils in the Helleum II learning workshop discover how STEM subjects—namely mathematics, computer science, the natural sciences and technology—come alive when they are connected with questions from the Universe: How do astronomers measure the movement of stars? Which physical forces act in space—and also on Earth? How can natural laws be simulated and understood in the laboratory?

Helleum II was presented on 26 September at a ceremonial inauguration attended by Dr. Torsten Kühne, Berlin state secretary for School Construction and Digitalisation, and Senate Building Director Prof. Petra Kahlfeldt. From 3 November 2025 onwards, the new learning centre will open its doors to young people. With Helleum II, the Stiftung Planetarium Berlin continues its long-standing experience in out-of-school education and, headed by Dr Anke Renger, offers young people the chance to nurture their curiosity and make scientific discoveries at a practical level. At the new site, the principle of workshop-style learning will be central. This pedagogical approach emphasises independent, inquiry-based learning, in which learners actively take part in shaping their own knowledge process. The learning environment is designed with various materials as a flexible space, enabling work, experimentation and research both individually and in (small) groups.

A highlight of Helleum II is the observatory on the roof. Here participants can use remote technology to project images from night-time stargazing or daytime solar observations directly onto a large touchscreen, offering an immediate and impressive access to astronomy and providing diverse possibilities for pupils' own projects. For the opening, some learning zones of the initial learning environment, Sounds and Signals, will be installed, to be explored by

GDP. Inaguration of Helleum II in Berlin. *Both courtesy of Pedro Becerra.*

one or two school classes in a research-oriented way. "The Helleum II, with its workshop learning concept, will establish itself as an important location for inquiry-based learning and as a student research centre. With offerings such as a Youth researches club, young people can independently tackle scientific questions and experiment. Through these approaches, Helleum II will be recognised not only as a valuable learning location in Marzahn-Hellersdorf but also as a significant component of the out-of-school education landscape in STEM and astronomy", said Dr. Anke Renger, head of Helleum II.

After more than ten years of successful operation of the children's research centre HELLEUM for kindergarten and primary school children by Alice Salomon University in cooperation with the district and the Senate school administration, the Stiftung Planetarium Berlin now expands its educational offerings in the district and establishes the Youth Research Centre Helleum II as a place where young people may engage in research in the fields of STEM and astronomy.

ASSOCIATION OF FRENCH-SPEAKING PLANETARIUMS

The 4th edition of the APLF Fulldome Festival was held simultaneously in nine planetariums across France, bringing together professionals and the general public around a shared passion for immersive storytelling under the dome. This year's Public Award and Professional Award both went to *The Great Solar System Adventure*, directed by Max Crow and produced by NSC Creative (United Kingdom) — a stunning journey through our cosmic neighborhood that captivated audiences of all ages.

The 2025 APLF Conference took place 24-27 September at the Cosmodrome in Genk (Belgium), gathering more than 70 participants from the French-speaking planetarium community. The event featured workshops, fulldome screenings, and discussions on the future of planetarium education, technology, and scientific mediation. A particularly moving moment of the conference was the tribute to Seppe Canonaco, one of the founding figures of the Europlanetarium Genk, who dedicated over four decades of his life to astronomy outreach and education. A passionate mentor and comet observer, Seppe's legacy continues to inspire generations of visitors and educators under the dome.

APL. Tribute to Seppe Canonaco at the APLF conference. *Courtesy of Cosmodrome, Genk.*

For the first time in France, a hybrid projection system is being implemented in a non-oriented, non-tilted planetarium room, preserving the traditional radioconcentric layout of the (refurbished) seats at the Planétarium du Forum départemental des Sciences in northern France. Developed by RSA Cosmos, the system combines six Sony 380GTZ video projectors delivering a 6K fulldome image with a Konica-Minolta Cosmo Leap →**optical star projector.** The first public light of this new hybrid planetarium is scheduled for October 2025, marking a major milestone for immersive science education in France.

EUROPEAN/MEDITERRANEAN PLANETARIUM ASSOCIATION

CROATIA

In September, the Rijeka Astronomy Centre (RAC) continued its summer program for tourists with the planetarium show *Starry Nights* narrated in the English language, followed with night sky observation through the centre's telescope. On 7 September, RAC celebrated the total lunar eclipse with the planetarium show *Reach for the Moon*, which was produced as part of the project *Hello Space*. October started with Saturday morning planetarium shows for families with preschool children, as well as a special program for the 2025 World Space Week, an international event celebrated in RAC for the past 16 years. For this occasion, RAC presented *Living in Space - Life on ISS*, a live show dedicated to the 25th anniversary of continuous human presence onboard the International Space Station.

Started in 2025 and continuing through 2026, RAC is participating in the development and implementation of project *Hello Space*, in collaboration with the European Space Agency, the Croatian Ministry of Science, Education and Youth and other Croatian partners. The project's main goal is to disseminate to the wider public the importance and excitement of space research and exploration. In this respect, RAC will contribute to the project with planetarium shows designed to engage the general public in Croatia through visually captivating and educational space-themed programs, exploring such topics as space exploration, space weather and the universe, making complex space concepts accessible and exciting. In November, and again as part of the *Hello Space* project, RAC organised a *Look at the sky* event, which included screenings of the planetarium show *Two Small Pieces of Glass*, a telescope exhibition in collaboration with the Academic Astronomical Society of Rijeka, and a guided tour of the night sky from RAC's observatory.

At the time of writing, the Rijeka Astronomy Centre is preparing various events to be held for the rest of November and December, including celebrations of the Leonid meteor shower, Carl Sagan Day, the Italian National Space Day, as well as various special events for the Christmas season.

EMPA. Observing the total lunar eclipse on RAC's panoramic terrace. *Courtesy Rijeka Sport Ltd.*

GREECE

The Eugenides Planetarium in Athens premiered for the autumn season the planetarium show *The Stellars* by Creative Planet, for the younger audiences, as well as the giant screen documentary *T.REX* by Giant Screen Films converted for digital fulldome. It has also scheduled for the autum season repeated screenings of beloved past in-house productions, including the following: *The Story of Earth*, highlighting the birth of our planet and its evolution through plate tectonics, *The Centre of the Cosmos: from the Geocentric system to the expansion of the Universe*, narrating the fascinating tale of the continuous displacement of Earth, and hence of mankind, from the centre of the Cosmos and *Beyond Earth*, a fascinating journey among the planets and satellites of the Solar System.

The Eugenides Planetarium's Space Series sequence of short videos on various astronomy topics has been further expanded with the addition of four episodes, the first of which was *Back to the Moon*, a brief presentation of NASA's efforts to return to the Moon through the implementation of the Artemis program. *Life in the Solar System* investigates the most promising solar system bodies that may harbour microbial life, while *Red Planet* presented what our continued investigation of neighbouring Mars has revealed about is wet past. Finally, the 14th episode of Space Series, titled *Edge of the Solar System,* attempts to answer the question of how far must we travel from the Sun before we can claim to have escaped its influence and entered interstellar space.

ITALIAN ASSOCIATION OF PLANETARIA

Last April, Derek Demeter (Emil Buehler Planetarium, Seminole State College, Sanford) arrived from Florida to give lectures in various Italian cities as part of the Two Weeks in Italy initiative. The winner of the next edition (April 2026) is Maureen Hintz, professor in the School of Physics, Utah Valley University. Her lecture, dedicated to the origin and evolution of the calendar, will describe a famous archaeological-astronomical site in Four Corners County, at the junction of New Mexico, Arizona, Colorado, and Utah. This is the site of the famous Chaco Canyon, a ceremonial center of the Anasazi people, where the main epochs of the astronomical calendar are marked by the appearance of the luminous silhouette of the "Sun Dagger".

Through the thirty editions of Weeks in Italy, which began in 1995 thanks to the idea of the Serafino Zani Observatory in Lumezzane (Brescia), numerous American teachers and planetarians have participated. In the following years, the classes have been held not only in the Brescia area but also in Perugia, Assisi, and Farra d'Isonzo (Gorizia). Then, what for several decades was known as the Week in Italy has doubled in size. This is thanks to the involvement of the APS StarLight, un Planetario Tra le Dita (Perugia) and the Farra d'Isonzo Observatory and Planetarium. After the pandemic, with the promotion of the Association of Italian Planetariums and the financial support of the International Planetarium Society, which is covering the travel expenses of the American teacher, the Two Weeks in Italy has further expanded its scope, offering a tour of lectures in various Italian cities. Last year, the destinations were Perugia, Assisi, Florence, Ravenna, Lumezzane (Brescia), and Gorizia. Italian planetariums interested in this original activity taught in English, thus having both a scientific and linguistic interest for students, have been involved by PLANit in Maureen Hintz's tour, which will stop in several cities.

The Civic Planetarium of Ravenna was founded in 1985. A year later, in October 1986, it hosted the first Meeting of Italian Planetariums, organized by the Friends of the Planetariums Association, which had been founded in Brescia a few months earlier. Next year will mark the 40th anniversary of the meeting of the Italian Planetariums, which will be held again, like the first, in Ravenna. The dates are April 16-18, 2026.

IAP. Official opening with local authorities of the Civic Planetarium of Ravenna in 1985. The following year it hosted the first Meeting of Italian Planetariums and next year will be the site of the 40th national meeting. *Courtesy of Ravenna Planetarium.*

PLANit, together with the Catholic University and Infini.to – Turin Planetarium, has sponsored a research project titled Sky & Wonder to study planetarium visitor emotions, with a particular focus on profound wonder. This emotion can have significant effects on psychological well-being and emotional connection with the natural world. The ultimate goal of the research, which will be published for the benefit of all Italian planetariums, is to improve understanding of the emotional impact of planetarium activities, providing planetarians with new tools to design even more engaging content, promoting learning, and enhancing the visitor experience. The experimental research is being conducted by

Valentina Bossoni as part of her master's thesis in Psychology. The work is supervised by Professor Andrea Gaggioli (director of the International Master in user experience psychology and full professor of general psychology at the Catholic University) and Dr. Alice Chirico (researcher and director of Experience Lab). The project is coordinated by Eleonora Monge and Simona Romaniello (director and head of education at Infini.to – Turin Planetarium, respectively) and Dario Tiveron (president of PLANit), while the planetarium activities are led by Emanuele Balboni and Marco Brusa (planetarians at the Turin Planetarium). The project was supported by Luca Peyron, coordinator of the Digital Apostolate Service.

The archive of fulldome material available free of charge to planetariums participating in PLANit for use under their domes continues to grow. Recent acquisitions include, for example, a clip used to create transitions between two different fulldome scenes—also useful during live shows—using an effect reminiscent of the portal from Dr. Strange. The clip was created by Michelangelo Rocchetti (Museo del Balì). Another example is the fulldome tour of the Vera C. Rubin Observatory includes the interior, the access road, and a beautiful sunset. From Sardinia comes the fulldome photograph The Milky Way over the Giants' Tomb taken on 2 July in the location of Is Concias, in the municipality of Quartucciu, by Manuel Floris, director of the Unione Sarda Planetarium. Three thousand years ago, the Nuragic people built collective tombs, later called "Giants' Tombs". The sepulchral monument shown in the photograph bears the name *Sa domu e s'Orku*, in Sardinian *The House of the Ogre*. It is one of the best-preserved giants' tombs in Sardinia, uniquely oriented among the approximately 800 known giants' tombs, its axis is oriented precisely along the north-south line. Located approximately 20 km from the center of Cagliari as the crow flies, the site benefits from low light pollution, making the Milky Way clearly visible.

IAP. The fulldome photograph The Milky Way over the Giants' Tomb is one of the contents available on the website for members of PLANit. *Courtesy of Manuel Floris.*

IAP. The publications *The Planetarium*, the instrument, and the first lessons and *The Sky in a Room*, the first as audio guide, the second in PDF, are available on the website planetari.org.

The PLANit website also offers the manual *Equatorial Solar Clock: Theoretical, Graphical, and Construction Elements* by Gian Nicola Cabizza and Nicola Scarpel, for use during school workshops in the Italian planetariums. Finally, the publication *The Planetarium, the Instrument, and the First Lessons* is available in PDF, covering the basics of astronomical geography that can be taught under the dome of any planetarium. This publication, which was released together with *The Sky in a Room*, can now be listened to through the voice of Gianluca Di Luccio, who edited the audiobook version after carefully reviewing the texts. The initiative took place on the occasion of the Centennial of the Planetarium and is divided in 25 chapters, that include numerous audio clips, published in the area accessible to PLANit planetariums.

ASSOCIATION OF MEXICAN PLANETARIUMS

The Morelia Planetarium in the State of Michoacan inaugurated 50 years ago, in 1975, will be completely renovated and will include museografical areas, and an astronomical observatory for students the and general public. The heart of the project is the Planetarium Digitalized Projection Theater instead of the former Zeiss Mark IV Planetarium which will now be exhibited. The renovated Projection Theater will be equipped with: a Digistar System 2025-2026 from Cosm/E&S, six Christie 4K35 LASER RGB (36,500 lumens each), Illumination System and Professional Surround Audio 5.1 in the Spitz NanoSeam TM projection Dome of 20 m in diameter and a 12 degrees tilt. Digistar will offer shows in addition to the great performance of the hardware and software, with a high impact visual fidelity, whose colours, brigthness, intensity and contrast that together with the high-quality audio and visual scale will provide a great experience placing it as the top planetarium in Mexico and Latin America.

PACIFIC PLANETARIUM ASSOCIATION

The Pacific Planetarium Association continues to host [nearly] monthly Planetarians' Zoom Seminars. Upcoming seminars are listed on the seminar schedule page (*www.ppadomes.org/events/online-seminars/pzs-schedule*). You too, can lead or present at a seminar! The schedule page includes possible dates for the usual «last-Fridays-of-the-month», but there›s flexibility if you have particular limits for days that would be good for you. The schedule page also has the four simple steps it takes to get on the schedule: 1) Choose a date

for your presentation. 2) Invent a catchy Title. 3) Compose and submit brief (1 paragraph) description of what you have in mind. 4) compose and submit a brief Bio (who you are, where you work, 1-3 sentences).

Sam Storch, retired, wrote an article called *One Hundred Years in the Dark,* which celebrated the centennial of the planetarium's invention. The article was published in the October 2025 issue of *Sky & Telescope*.

MIDDLE ATLANTIC PLANETARIUM SOCIETY

Carlos Miranda at P-Tech Planetarium in New Jersey, connected students with an astronaut aboard the ISS through ARISS, Amateur Radio on the International Space Station. The kids were super excited, nervous, but excited. He incorporated the planetarium to present information about the ISS and astronaut Yui; the livestream captured other videos, interviews, and the actual contact.

The planetarium is partnering with the local community college, under the guidance of planetarian and STEM TRACS Director Patrick McQuillan, for graphic design students to create 3D models for the planetarium. A team of dedicated educators, including Carlos Miranda, collaborated with software and education specialist Martin Ratcliffe from COSM to design a series of Digistar Control Panel pages.

Anchored in NGSS standards, these interactive panels are designed for classroom integration but are flexible enough to be used internationally. This partnership brought together teaching expertise and planetarium technology to create engaging, accessible astronomy lessons.

(Continued on pg. 57)

MAPS. Students at P-Tech Planetarium connecting to astronaut onboard ISS. *All courtesy of Carlos Miranda.*

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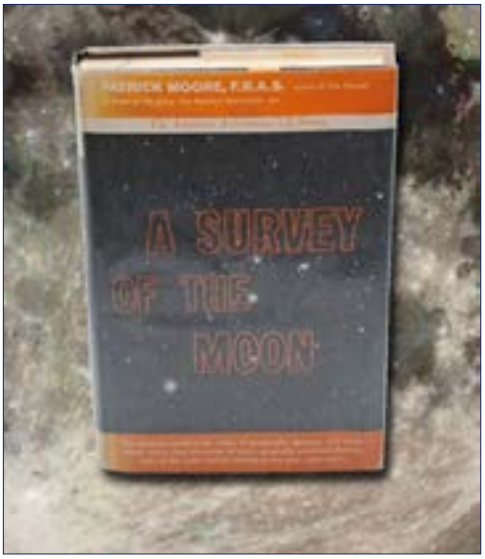
TALES FROM DOME UNDER THE MOON WITH MOORE

I happened to catch the low-hanging Waxing Crescent Moon as seen out our living room window during an August twilight this past summer. Never tired of looking at our neighbor world, I grabbed a pair of 8X40 binoculars we keep close at hand to look at things out on *Grönviken* (i.e., Green Bay), which is the large body of water out in front of our island house.

Standing there and looking at the pronounced shadows accentuating the three-dimensionality of the lunar landscape along the terminator, it brought me back to the spring when I was a sophomore (i.e., 10th grade if your unfamiliar with the American school system) in high school. I had borrowed a friend of my brother's small spotting scope to observe the Moon while going through Sir Patrick Moore's (1923 - 2012), "A Survey of the Moon."



A copy of Sir Patrick Moore's 1963 book, "A Survey of the Moon." This is the book, based on my recollections of its dust jacket, I believe was the guide used to follow the day-to-day changes on the face of the Moon with the borrowed spotting scope belonging to my brother's friend. (Public domain)

Checked out from my school library, each chapter of Moore's book was devoted to what one could see on its surface each passing day during one month, starting with New Moon (albeit this one was only an explanation of the phase). I had seen lots of astronomy books by this time, but it was the first one approaching the observation of a single astronomical object in such detail.

The spotting scope itself was exactly that, made for use on a rifle range, and it wasn't exactly of the highest quality. It was, however, the only thing I had access to at the time since I didn't even have a pair of binoculars of my own, let alone a telescope.

Its objective lens was something like 6cm (2.4") in diameter, and it had a zoom feature which, at its greatest power, allowed me to see about a quarter of the Moon in the eyepiece at a time. Whatever its actual magnification was, it allowed me to follow and observe just about everything Moore was describing each night.

The spotting scope's weakest feature was the tripod, which only proved it was designed to sit on a shooter's bench at a rifle range. Its three thin chrome legs were very short, which meant it had to be used while sitting up on something higher than even a kitchen table top. It also had a sort of a panning head holding the telescope on the tripod's legs, which you had to really make sure was tightly racked to keep it from moving around.

Weather permitting, I was out every night. Fortunately I had the little scope on long-term loan, especially useful if I was going to try and follow the complete monthly change in the Moon's phases.

Since its tripod was so short, I ended up using the narrow wooden platform for sitting on the edge of our aboveground swimming pool in the backyard as a base. Unfortunately, it was not quite high enough to stand completely upright, so I had to observe at a three-quarters crouch. This sometimes led to some short breaks in observing to get out the kinks in my back from time to time.

This turned out to be a fascinating, and absorbing exercise in observing one subject on a routine basis. I was learning what each day's Moon had to offer as well as helping instill a sense of discipline. What was I going to miss if I skipped a night?

Naturally, I didn't want to do that. It was obvious to me that these were actually changes easily observed as the Moon slipped farther eastward along its orbit each day. I was actually seeing with my own eye (it was, after all, a small refractor) what Moore was talking about in his book and understanding what I was observing with its help.

There were some nights during the four weeks where there were forced gaps of a day or two in my observing due to cloudy weather; the enemy of every amateur astronomer who lives in the suburbs around Rochester in Upstate New York.

How often does it get cloudy there? On average about 200-nights-per-year. There is a story, which is no doubt apocryphal. When the local, world-famous Eastman Kodak Company picked the color for their well-known gray card used in setting photographic exposure readings with a light meter, they used the color of Rochester's often cloudy sky. Or at least that's what they told us when I took "Introduction to Black & White Photography" my freshman year of college. To put this into numbers, that's a reflectance of 18%; a relatively dark gray. And I can vouch for that as I've seen *a lot* of cloudy days and nights while growing up in what's also known as "the Flower City."

My observing program of watching the ever-changing phases of the Moon ended when I got to the end of the

Earth's Moon just after First Quarter (but not seen at the higher magnification of the spotting scope). Moore's book would devote one of its chapters to discussing what was observed in such a one-day's view, with the greatest emphasis typically being on what was seen along the terminator, which is where the most change would have taken place. The exception to this might be when a lunar feature showed up better with the Sun at a higher angle above the lunar surface. (Wikipedia: Luc Viatour, GNU Free Documentation License, Version 1.2)

book. It had been, at least to me, a long haul, but nothing by comparison to those devoted amateur astronomers who sweep the skies night-after-night in hopes of spotting a new comet, or take long-term observations of variable stars as they build up the data to make up its varying light curve.

This month became my first foray into some sort of an observing program, and it wouldn't be for about another year-and-a-half before I got my own 15cm (6") Newtonian telescope. If interested, that story is recounted in "A Telescope Tale" in another issue of the "Planetarian" from earlier this year.

Thinking back on that recent chance glance at the Waxing Crescent Moon out our living room window made me think just how funny such a thing can instantly take you back to a point in time over 50 years ago. Perhaps you have had such an experience yourself, and when you think about it, everyone has to start somewhere. For me, it was the Moon with Moore.

INT'L NEWS (CON'T)

(Due to layout issues, two parts of Last issue's international news were missing. They are printed below. The editor apologizes for the inconvenience.)

BAYERN

The Sparkassen Planetarium in Augsburg is getting a facelift. The S-Planetarium will undergo the first real facelift since it opened in 1989: In August, the crew will renew the seating, the carpeting and the wall design in order to enhance the visitors' experience within the dome. Darker colors, more comfortable seats and a general refresh plus a poster exhibition in the foyer about 100 Years of Planetarium will mark an important step forward for this fully digital 10m theatre in the heart of Augsburg and make it ready for many years to come.

BERLIN

From 9-13 April the Stiftung Planetarium Berlin hosted the theme days Invisible Worlds: From the microcosm to the universe at the Zeiss-Großplanetarium to commemorate the 400th anniversary of the microscope. Europe's most advanced science theater offered a diverse programme for all ages, blending science, art, and technology. Highlights included mega-microscopy, fulldome shows, hands-on experiments, lectures, and live performances, providing opportunities to explore hidden realms — from the microscopic to the cosmic. The event culminated in the World Microscope Day on 13 April. Visitors were encouraged to bring their own samples or prepare them during on-site workshops, subsequently viewing them live on the planetarium's impressive dome during the mega-microscopy sessions. Both school groups and individual attendees had the chance to delve into the microscopic world firsthand. The Microscopic Theater event showcased the fascinating diversity of small cells. Selected 360° fulldome programs allowed immersion into the seemingly invisible world of microorganisms. Esteemed lectures provided insights into current research topics. In the foyer, an exhibition featured historical microscopes (1830–1960), large-scale video projections, information booths, and interactive experiment stations. Art and literature were also integral to the theme days: the audiovisual performance <MAKRO | MIKRO> combined science and music into a unique experience. Presenter Clarissa Corrêa da Silva introduced her children's book Mein Wunderbares Ich on epigenetics. A curated film program in the in-house cinema rounded out the offerings.

Monica Bolles
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IMMERSIVE MATTERS: AUDIO MATTERS
ADVANCING THE CONVERSATION ON IMMERSIVE AUDIO IN FULLDOME

Monica Bolles is a member of the IPS Immersive Sound Committee and also serves on the IMERSA Board of Directors. Through her company Resonant Interactions, Monica continues to shape the future of immersive audio and digital art, focusing on delivering unforgettable, multi-sensory experiences that merge sound, technology, and human interaction.

1. INTRODUCTION

As an audio engineer, I may be biased, but I believe audio and sound is at least 70% of the overall experience in fulldome productions. In fact, a recent study by Made Music Studio and Sentient Decision Science found that "there's a dramatic 86% correlation between our subconscious emotional response to a sound and our conscious desire to engage with an associated experience or avoid it in the future." (Perlmutter et al. 2019)

Sound is the emotional core of experiences. When done well it draws people in, communicates a story, and connects the audience to the content. However audio is often the last component thought about when systems are being designed and when shows are being produced. Audio is often given the smallest budget and yet asked to achieve the highest quality.

This article reaches out to some of the members of the IPS Immersive Sound Committee as well as some other choice experts in fulldome audio to explore the challenges faced by audio designers and installers in the fulldome and planetarium communities. Through a selection of case studies, this article highlights how technological innovations, thoughtful design, and collaboration can elevate audio to match the visual spectacle of the dome. By sharing these insights, we hope to inform both creators and decision-makers, encourage best practices, and inspire a more standardized and immersive audio experience across the industry.

2. INDUSTRY SNAPSHOT: IPS AUDIO SURVEY

At the 2024 International Planetarium Society Conference in Berlin, the IPS Immersive Sound Committee presented survey findings on the state of audio in the fulldome industry, gathering insights from creators, operators, producers, and decision-makers. (Ammerman et al. 2024) The results revealed two primary challenges: a lack of standardized audio practices and budget limitations that restrict what's possible. While 5.1 surround remains the unofficial baseline, it often falls short in domes due to its dependence on specific speaker placement, limited "sweet spot," and inherently two-dimensional design. As immersive production tools become more accessible, their full potential can only be realized when facilities are equipped to support them and when audio is prioritized early in project planning and budgeting. This article is a followup and continuation of some of the conversations started with that survey.

3. CASE STUDIES / LESSONS LEARNED

TOM AMMERMAN:

(New Audio Technology) Tom Ammerman is the founder of New Audio Technology. New Audio Technology created the Spatial Audio Designer processor and plugins that many domes and audio designers use in helping to mix and map audio formats to their specific speaker setups.

Challenge: Mixing a dome show without access to a dome.

Solution: Used Spatial Audio Designer to binaurally mix on headphones, check in a Dolby Atmos 7.1.4 studio and finalized on-site directly from the laptop on a 49.1 configuration.

Key Insight: Immersive audio can be produced efficiently from conventional workflows without expensive additional resources.

FULL NARRATIVE:

I just mixed a dome show for Peter Schilling. The challenge was how to mix the individual channels of a production for a planetarium without having a studio. Audio and music producers often work from their home studio/office, and even achieving a plausible stereo mix is a big task. Even 15 years ago, when I still had my own studio, and long before Dolby Atmos, I was aware of this problem. At that time, we developed a software plugin, the Spatial Audio Designer, which enabled the mixing of any output formats in a conventional audio workstation using a 100% object-based approach.

In addition, we designed a corresponding binauralisation that corresponds to the sound and behaviour of a real studio. So it was less about neutral, accurate binauralisation, which simply has nothing to do with reality, and more about binauralisation that incorporates all the problems and weaknesses of even excellent studios.

With this binauralisation, which, incidentally, works with standard headphones, I was able to virtually pre-produce the

audio tracks I had received from Peter's producers in 7.1.4. I then finalised it in a Dolby Atmos studio in one day, and then spent another 1.5 days with Peter in the studio making content adjustments.

Finally, I took it to the Berlin Planetarium, where the premiere and show were to take place. In Spatial Audio Designer, you can easily switch from 7.1.4 studio format to 49.1 planetarium format. Such speaker configurations can be quickly created with the corresponding Array Creator Tool. Then I just had to add the appropriate number of outputs to my audio workstation and I was able to connect 1:1 via DANTE (IP audio protocol) to the speaker system using a simple LAN connector. It then became apparent that a few final adjustments were necessary to transfer what we had created in the Dolby Atmos studio to the dome. It took about 6 hours to finalise 11 tracks. These 50-channel mixes were then exported as mono WAV files and could be added to the media player (Cuebase DAW) on-site to play in sync with the dome videos accordingly.

All in all, it was a flexible workflow that could be implemented directly from the usual production workflows of audio and music producers. The Dolby Atmos studio was only necessary because there is also going to be a Dolby Atmos version and because Peter had to approve it. It would have been possible to go directly from the binaural mix to the dome. That would hardly have taken any longer than it did for me, as we only adjusted the content in the studio. And, of course, it is possible to quickly create immersive, surround and stereo mixes for further exploitation/licensing from the object-based final dome mix.

So it's more than easy to create immersive audio mixes for domes with different formats from standard workflows. And that's without any significant additional costs for the extra effort involved. So the only question is, when are you going to create the sound and music your videos deserve? :)

CHARLIE MORROW:

(Morrow Sound) Charlie Morrow is a composer, producer, and sound artist, founder of Morrow Sound, and Chair of the IPS Immersive Sound Committee. A pioneer in spatial and immersive audio, he has led the creation of innovative content and delivery systems, including the Morrow Sound Cube, a spatial speaker array and processor installed in planetariums and domes worldwide.

Challenge: Traditional dome audio systems emphasize overhead sound, overlooking the importance of a ground-level audio horizon for spatial realism.

Solution: Designed the 8.1 Morrow Sound Cube, with four floor and four overhead speakers, to balance vertical soundfields and create an "audio-transparent" environment where architectural boundaries seem to disappear.

Key Insight: Ground-level sound cues are essential for immersive realism, allowing listeners to perceive space as continuous and lifelike.

FULL NARRATIVE:

Immersive sound environments achieve greatest realism when they replicate the natural auditory reference points humans use to orient themselves. By grounding the sonic environment with floor-level cues, audio designers can more closely mimic outdoor listening conditions, improving audience immersion and engagement in domed spaces. The

Morrow Sound Cube, the building block of my 8.1 modular design, has four floor or ground level speakers and four overhead speakers, avoiding ear level diffusion. These cubic units can be built out in any direction to create a unified sonic illusion space which backgrounds the physical architectural acoustics. Subwoofers, center point and other mono sources as well as directional speakers effectively edge blend beams within the 3D soundfield. As well, our software scales the virtual size of sound objects. Sonic illusion is that the walls, dome, floor become audio transparent. They can disappear with the perfect ratio of floor level sound and overhead soundfields, allowing for a tuning in and out of full immersivity. In a planetarium, as we did in Wolfsburg, Germany, this means installing the horizon speakers at seating floor level instead of at the visual horizon. Sound illusion can be that creatures and machines can move through the walls and floors at full immersion.

TIM ARCHER:

(Masters Digital) Tim Archer is the founder of Masters Digital, an audio production company, specializing in sound design and installation for giant screen films (IMAX), museums, science centres and themed attractions. The company has over forty years of experience in the industry.

Challenge: Achieving realism in immersive dome audio with diverse speaker configurations.

Solution: Treat systems as multiple mono sources, move sounds dynamically, and mix for all seats in the theater.

Key Insight: Dynamic spatial distribution and movement prevent comb filtering and enhance realism for every audience member.

FULL NARRATIVE:

With over 40 years of experience creating immersive sound design mixes for Dome and Giant Flat Screen theatres, I've learned a few techniques that help achieve the realism needed for a truly immersive audio experience. The following are just a few examples.

First, regardless of the number of speakers or their configuration, I always approach these systems as multiple mono sources. In my experience, a spatial environment is composed of several distinct mono elements working together. For this reason, I avoid playing the same audio out of more than one speaker. For example, in a forest scene, each speaker might carry the sound of wind through the trees, but each channel plays a slightly different version of that sound.

Next, everything in the scene is constantly moving—nothing is static, just like in real life. Using the forest scene again, atmospheric sounds subtly shift between speakers to keep the environment alive. Since each speaker carries unique audio, there's no risk of comb filtering—the phasey effect that occurs when identical sounds play from multiple speakers.

Finally, my goal is always to mix for all seats in the theatre, which can be quite challenging. Typically, I have the opportunity to mix the final track on-site, checking how the mix translates from different seating positions. I pay particular attention to seats located close to speakers, where sound can become distracting and pull viewers out of the experience. Occasionally, this requires making mixing decisions that account for less-than-ideal seating, which is always a balancing act.

PIERRE BRAND:

(Primetime Studio) Pierre Brand is the owner of Primetime Studio. Primetime Studio is a studio focused on delivering immersive mixes. Pierre has mixed a multitude of fulldome productions that have been distributed internationally.

Challenge: Produce immersive mixes for multiple domes and cinema formats without repeating work.

Solution: Create a master mix in Spatial Audio Designer, then export stems for Dolby Atmos, Morrow Sound, 5.1, and stereo.

Key Insight: One immersive mix can efficiently support multiple formats and speaker setups, saving time and cost.

FULL NARRATIVE:

For the most part, 5.1 still is the audio format content makers choose as a common denominator. One reason may be the assumption that an immersive mix is complicated, expensive, and can only be played in certain domes. So, the question is: is it possible to mix immersive audio for different dome speaker setups or formats without having to perform multiple mixes? The answer is yes. Even though an immersive mix may take more time, it is, in most cases, a perfect working base for creating mixes for different formats and setups.

Let me give you an example. I have recently worked on an audio play for domes and movie theatres. The client specifically wanted an immersive sound mix beyond 5.1 or 7.1.

The main distribution formats are "Spatial Audio Designer", "Dolby Atmos", and "Morrow Sound", none of which are directly compatible in regards to a DAW or studio setup. We

started with "Spatial Audio Designer" as the master mix, which also features the possibility to export stem groups (dialogue, SFX, music, atmospheres). This is immersive mix No. 1 for domes using SAD.

We then used some of those stems for the "Dolby Atmos" Cinema mix. This was basically a one-day stem mix, thus saving costs. This is immersive mix No. 2 for cinema use. We also used the stems for a "Morrow Sound" mix, which is mix No. 3. On top, we can also export a 5.1 or stereo mix using the Cinema Master, creating mix No. 4 and 5.

This example clearly shows that one full immersive mix can be used to "transform" a mix in several formats and for different speaker setups with little effort.

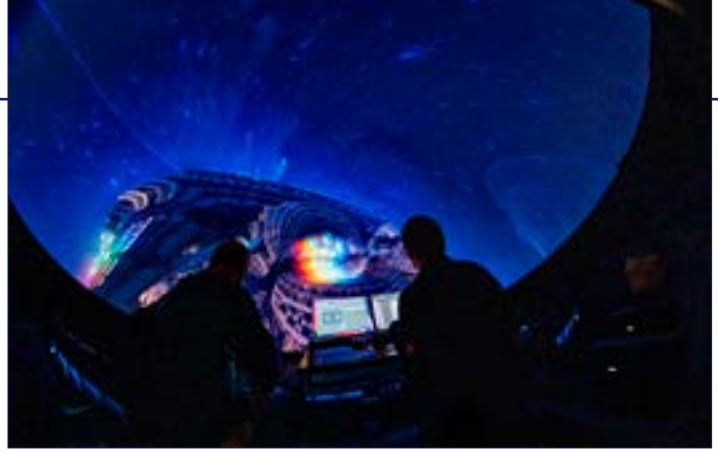
ANA MONTE & DANIEL DEBOY

(DELTA Soundworks) Ana Monte and Daniel Deboy own and operate DELTA Soundworks. DELTA Soundworks specializes in immersive audio design and has designed and mixed immersive audio for many fulldome productions.

Challenge: Design and mix immersive audio for an award-winning fulldome production for a 13.1 theater and then downmix to 5.1 for distribution.

Solution: Use object based mix approaches and a variety of immersive tools and technologies to achieve a moving and compelling sound design that can output to different formats.

Key Insight: Height channels and object-based formats enhance immersion, especially for visually complex vertical elements.



FULL NARRATIVE

(Edited from Live Interview)

These comments are in reference to the award winning sound design and mix DELTA Soundworks created for the fulldome production Into the Microverse.

https://www.microverse-cluster.de/en/news/microbes-in-the-spotlight-into-the-microverse-shines-with-award-winning-audio.html

ANA MONTE:

When it comes to understanding the need for immersive audio systems, I think it's important to make an analogy with the picture, because people don't always understand sound spatially. It's like having projectors mounted above the audience but only showing the lower half of the image—you're missing a whole dimension of information.

It's the same with sound. If you're only working in 5.1 or 7.1, you're limited to the horizontal plane, and you lose that crucial vertical element. In this film, for instance, the robots are often flying through clouds—way up high. You need that height information. You can't have the picture suggesting altitude while the sound stays anchored below, especially in some domes where the speakers are positioned near the floor. That's really a pity.

From a sound designer's point of view, thinking spatially in that way is a real challenge—it certainly was for me at the beginning. You realize that it's not just about moving a sound from left to right, like a quick "whoosh." There were clouds drifting overhead in this piece, and if you only have stereo—just left and right—it doesn't feel right. The sound becomes too narrow. For something like clouds, which are broad and diffuse and stretch high above you, you need far more information to create the feeling that you're actually flying through them.

DANIEL DEBOY:

In a lot of situations when you work with external composers, you don't always get to choose who you collaborate with. If the composer hasn't worked in spatial audio before, you might end up receiving only stereo material for the mix. In this particular case, we had to work from stereo stems, so elements like percussion, keyboards, etc... summed together in stereo tracks.

There weren't many stems, but there were a few, so I could do an upmix from stereo. Upmixing algorithms can generate multiple signals that you can use to feed loudspeakers each with a slightly different signal instead of using the same two channels from the stereo material and placing that on several channels, which can yield weird sounding results. In this production, I used Nugen Upmix and Penteo as upmixing tools to bring the music mix into a channel-based format 7.1.4 that could later be embedded in the object based mix. We used Spatial Audio Designer for that.

Dialogue was the main focus of the production. It was important to use spatial audio since the visuals were filled with these robots flying around, so the sound needed to follow the picture. I mixed the show in our studio on a 7.1.4 setup, plus top channel, and exported the full mix in 13.1 (Auro 3D compatible loudspeaker layout), which was what the venue had to offer in which the movie premiered.

Height information is really valuable for fulldome productions, where so much happens vertically. It's something you miss in many Dolby Atmos studio situations, which tend to focus more on the horizontal plane. Having that extra layer—the vertical dimension and center-top channels—adds a lot to the immersion.

Creatively, this setup also supported the story. The film involved robots with built-in microscopes, so there were moments when the perspective zoomed into what they were seeing. You'd still hear their voices even when they weren't visible onscreen, so we had to find a place for that sound. One of the robots had a communication port, so it became a kind of picture-in-picture situation.

For inner voices, like when we were hearing the robot's thoughts, I liked placing that sound above—inside the robot's "head," so to speak. I tend to use the vertical space in fulldome mixes in that way quite often.

The final mix was also exported in 5.1 and some other ITU standardized formats, which are available for download in the movie database. We included a note that we can export the mix in 3D for any loudspeaker configuration, even if it's not a standard format. So far, no venue has requested us to create a dedicated export for their venue. It is fairly simple to do if we get the exact loudspeaker positions of the venue and it is inexpensive.

Into the Microverse was the first show that we would not finalize in the venue itself and blindly transferred from the studio to the venue, just like you would do for Dolby certified cinemas. We are proud that it won the Janus for "Best Sound" in 2024 and it gives me great confidence that years of listening and mixing in fulldome setups has paid off, but also that transferability is doable even though fulldome venues do not follow a standardized loudspeaker configuration.

DAVID LEDOUX

(Société des Arts Technologiques) David Ledoux is the Research-Integrator in Immersive Sound for the Innovation department at the Society for Arts and Technology [SAT]. The SAT notably operates the Satosphere, built in 2011 as the first permanent immersive modular theater dedicated to experimentation in art and technology.

Challenge: Play content in multiple formats across one dome environment.

Solution: Any live input or playback content format (surround, ambisonics, loudspeaker renders, etc.) is directly mapped to the Satosphere's loudspeaker surface, using object-based control and Matrix-Based Amplitude Panning (MBAP).

Key Insight: Object-based control and basic panning algorithm as the most efficient, flexible and direct remapping technique for any content input format. Scalable spatialization for more than 64 loudspeakers, without too much latency for live sources.

FULL NARRATIVE

(Edited from Live Interview)

The biggest challenge is always SatFest, a fulldome film festival which takes place every two years at the SAT. We receive content from all over the world—in every imaginable format. Sometimes, creators have produced their piece specifically for a certain planetarium, with renders customized for that dome's setup.

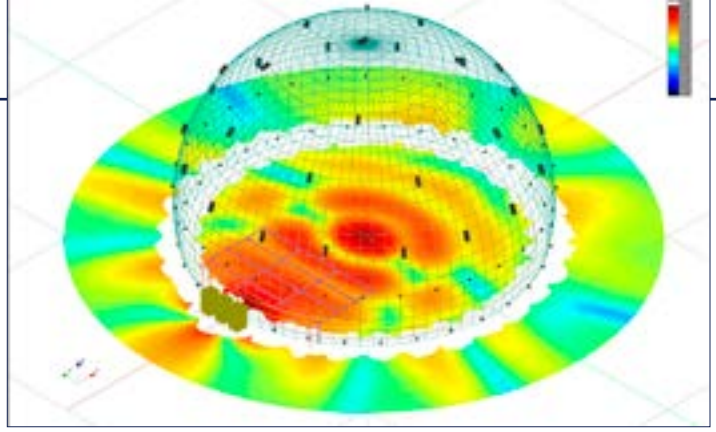
Nowadays, we can take that dome's speaker configuration and treat it as an object map, then play back the rendering directly onto the Satosphere's 97 loudspeaker surface. That's something we couldn't do before, without proper tools.

Bolles-AudioMatters-MAPP 3D_SAT_011-Studio.png

For the SATFest, we receive ambisonic content in various orders—often third-order, but sometimes fourth or even higher—as well as different surround, stereo, and Dolby Atmos mixes, which are channel-based. We don't have time to convert or upmix files to our loudspeakers system before the festival. There's just too much work to get through. Our main task is to validate each render's playback quality—to make sure everything's working and spatially coherent. If we notice silent channels or mismatched formats, we contact the creator to confirm whether that's intentional or an error.

So, what we have is a multi-channel playback session template in Reaper that can handle everything. Each content format has its own multi-channel track based on however many channels the original render has. Each year for SatFest, we just reuse that session, drag in the new content, and all the outputs automatically route through the same pipeline mapped to the Satosphere's speaker system.

For ambisonic contents, for instance, every ambisonic order's track is decoded to 64 virtual loudspeaker positions distributed along the dome's 97 loudspeakers' surface. Those 64 points can be controlled as delta-locked objects to distribute their signals through either VBAP or MBAP spatialization algorithms in the Satosphere. It's a flexible, "one-size-fits-all" approach that lets us use object-based control and panning algorithms as a kind of audio remapping tool—we can just drag and drop the content as it is.



To synchronize audio and visual playback, which is handled by a different system, the audio playback session has a dedicated Time Code track going through the exact same pipeline as the audio content to have the exact same latency. The Time Code track's output channel is transmitted to the video playback server for syncing, using a Dante network link.

Aside from the playback content, the system also has to handle live Q&A during screenings. To minimize audio latency, we run the microphone output in parallel, with a spatial mapping that is not handled by the playback computer, which is dedicated solely to running the media, but by our hardware DSP processor.

GEORGE BARNETT

(SSIA) George Barnett is Co-CEO and Founder at SSIA technologies. SSIA technologies designs and installs planetarium systems and often consults on and designs the accompanying audio systems.

Challenge: Educate clients on immersive audio and overcome physical installation limitations.

Solution: Demonstrate immersive audio benefits and implement creative speaker placement in challenging spaces.

Key Insight: Education and early planning are critical; 5.1 should be the minimum standard, with immersive formats as the long-term goal.

FULL NARRATIVE

(Edited from Live Interview)

One of the biggest challenges we face with system upgrades isn't the installation itself — it's education. Many clients still don't fully understand what immersive sound can bring to their theaters or why it matters. We've had customers who didn't see any reason to move beyond stereo, or even questioned the value of 5.1, simply because they'd never experienced it before. Helping them understand that most content today is produced in at least 5.1, and that it dramatically improves the audience's experience, is often the hardest part of the process.

When it comes to the installs, the real challenges tend to come from the physical spaces themselves — older domes, limited access, and difficult layouts. Getting the speakers into the right locations is important, but being able to maintain them afterward is almost more important. There have been situations where we've had to abandon speakers in place because there was simply no way to reach them once

(Continued on pg. 53)

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MOBILE NEWS NETWORK
OUTREACH WITH A MOBILE DOME

HIGHLIGHTING "坂下星見の会" (SAKASHITA HOSHIMINOKAI):

On Facebook, I noticed a posting by Takimoto Masumi about a very unique dome that I had never seen before. I asked her to tell me more about this dome and activities of her group.

Takimoto Masumi replied, "This mobile planetarium (air dome) is a product of Goto Optical and is called 'Hoshi Tamago' (or star egg). Maybe it's because it looks like an egg. The projection inside is made by attaching a fisheye conversion lens to a standard projector used for meetings, etc., so that it can project a circular image. The entrance is what looks like a turtle's face.

The kids say it looks like Baymax." (Note: Baymax is in a superhero science fiction comedy and is a white inflatable robot who serves as a personal health care provider companion.) Researched will show that this dome was originally provided with the GOTO NEX projector

NEX has its own charm, but its main function is to show the positions of stars using a pinhole, and you have to hold the constellation chart in your hand, so it's quite analog and the range of information is limited. But I like the current projection because it can display images from a computer, so you can enjoy it freely. It's also bright enough that even small children won't cry.

Takimoto Masumi then elaborated about the group she works with, "The name of this team is "坂下星見の会" (Sakashita Hoshiminokai), a circle of astronomy enthusiasts. (Perhaps it could be called a "star-watching circle"...) I serve as the coordinator and representative (president) of the group. We aim to share the beauty of stars and the universe with others and inspire a love for them through our activities.

This mobile planetarium is used not only for projections at our group's base but also for various events upon request.

- Children's gatherings (for parents and children) in the community
- Science classes at schools
- Local and other events
- For hospitalized patients (at hospitals, etc.)

We strive to accommodate requests as much as possible.

The majority of our members are in their 50s to 60s, but we also have an energetic grandfather over 80 years old among our members. In addition to the 4m dome, we now have 5m and 7m diameter domes, allowing more people to view them at once."

She continued, "I usually do a lot of work for our Association, but I used to work at a photo studio, so I still go out and take photos if requested. Other members also have other jobs, or some have retired.

ABOUT THE SAKASHITA STARGAZING CLUB'S (SAKASHITA HOSHIMINOKAI) ACTIVITIES:

- Voluntary activities (free to participate)
  Regular seasonal events (mainly spring, summer, and fall) at our base - Concerts centered around stargazing at the observatory, candle displays, and projection mapping on the old former school building.
- Requests from other organizations (paid: transportation costs, etc.)
  We offer star-related content, such as starry sky tours in the planetarium, astronomy lectures, telescope observations, and related craft experiences. We don't show commercial films; instead, we incorporate astronomical knowledge and new information and create our own original stories based on that. In particular, at the planetarium, we talk about recent astronomical phenomena, seasonal constellations, myths, and more.

Our group is more like a club than a job. However, maintaining the various activities costs money, so we accept requests for help for a small fee. Our group is made up of people of all ages who are interested in stars. Satoka is one of them. She's moved away from us a bit now, but she still helps out when needed."

Satoka Tanaka sent me a nice note too. She explained:

> "As Takimono-san told you, I was a member of Sakashita Stargazing Club (Sakashita Hoshimi-no-kai). I started working at Kawasaki Municipal Science Museum since April 2020. Before that, I lived in Mie prefecture and was working at Suzuka Cultural Center Planetarium from April 2017 to March 2020.
>
> I joined Sakashita Stargazing Club in 2015 or 2016 when I was still an engineer of semiconductor company. I was able to make great experiments such as star gazing parties, mobile planetariums with Hoshi-tamago cute air dome, hand-craft workshops at the science outreach events, and more.
>
> The people who joined the club were all kindly open for making new colleagues easy to join the activities of the club. Especially Takimoto-san was always kind in accepting and supporting us. I think this point is a great feature of the club and still make the club so active and comfortable place for the members.
>
> It was my first time to talk in a mobile planetarium when I joined a science outreach event as a staff of the club. I had a wonderful time interacting closely with the children in a mobile dome. Later I became a staff of (fixed) planetarium and had experiments

> of presentation in a dome, but the first for me was the mobile of the club. After I moved to Kawasaki, it became difficult to participate in the activities of the club, but I'm still a member of the club...)."

It is wonderful to learn of this group in Japan. I am discovering many such groups around the world who are doing wonderful work just for the love of it. Portable planetariums, of all sizes and shapes, play such a critical role in educating and inspiring people to appreciate and explore our beautiful universe. Thank you Takimoto Masumi and Satoka Tanaka and the rest of your team for bringing joy and wonder to your audiences.

MULTITALENTED MOBILE DOME DIRECTOR:

I love to hear news about planetarians' other talents and joys. John Meader is the owner/director at Northern Stars Planetarium, a traveling inflatable planetarium for the schools and libraries of Maine, since 1987. John is also a Registered Maine Guide and an artist. John has shown his work in more than 20 photography and art shows.

This summer and fall, John had two great shows at the Margaret Chase Smith Library in Skowhegan, Maine. The artworks on the walls beside the planetarium are his photos of night sky photography.

jtmeader@northernstarsplanetarium.com

SPACE PLACE IN A SNAP:

Looking for a series of short and interesting videos? You can find ten NASA videos such as "Why is the Sky Blue," "What is a Solar Eclipse," "Exoplanets-Searching for Other Planets Like Ours," and "How Does GPS Work" at the following site: *https://plus.nasa.gov/series/space-place-in-a-snap/*

DOWNLOAD MESSENGERS OF TIME AND SPACE FOR FREE:

IPS Education Committee co-chair, Dr. Jenny Shipway, recently announced, "Well, over the past year I've been working with the NOIRlab team on a NSF-funded fulldome film about time-domain and multi-messenger astronomy, highlighting the contribution of the Gemini Telescope and Rubin.

You can now download Messengers of Time and Space for FREE straight from the website!

It's a high-quality, 29 minute 2k/4k film with original score, primarily aimed at people who already have a bit of an interest in astronomy. It has a standard documentary style with American narrator, best for ages 13yr+ although it has great visual variety that I'd expect to keep younger audiences engaged too. It comes with accompanying educational resources.

The film includes:

- Animated scenes including the 1919 eclipse, the solar system, a comet, 'Oumuamua, supernova explosions, nebulae, an aurora, kilonova, and more!
- Live footage from the Gemini and Rubin telescopes, including inside the control rooms and Rubin data centre. Also from other facilities.
- Live footage and voiceover of a young female role model, Cicero - a real astronomer working at Gemini. Also the voice of the astronomer Karen Meech and a bit about Vera Rubin.
- Electromagnetic spectrum
- Live footage from LIGO, with animations showing how it detects gravitational waves
- Animated scene inside a neutrino detector
- Acknowledgement of all this as a human endeavour, involving many different roles

You can stream the whole show to watch on laptop at *https://storage.noirlab.edu/media/archives/videos/dome_preview/messengers.mp4* (Top tip: make sure you have the sound on before you hit play)

Find out more and download the full resolution film at:

- Article: *https://noirlab.edu/public/news/noirlab2518/*
- Trailer Preview and Downloads: *https://noirlab.edu/public/videos/messengers_trailer/*
- Show Preview and Downloads: *https://noirlab.edu/public/videos/messengers/*

Jenny emphasized, "I'm happy to answer any questions about the film. And do please do let me know if you play it and how it goes down!" *www.jennyshipway.com*

INTERNATIONAL MOBILE PLANETARIUM MEETING - 6 SEPTEMBER 2025,

We had an extended session with participation from planetarium colleagues from 16 countries around the world.

On this occasion, Lionel Ruiz explained how to build a "Hipparchus Circle" device, and some novelties on the SpaceCrafter 2025 software. Bryant González updated us with new projects in Paraguay and a DIY small planetarium

(Continued on pg. 72)

KARRIE BERGLUND
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LIP SERVICE
TIGER EATS FISH

I can hardly believe that the Live Interactive Planetarium Symposium (LIPS) 2025 took place more than three months ago! I have so many fantastic memories that it's hard to know where to begin to share what happened.

LIPS 2025 was hosted by the Fiske Planetarium on the University of Colorado Boulder campus in late July. They also hosted LIPS 2022, so I knew they would once again do an excellent job. A big shout out to John Keller, Nickolas Conant, Amanda Wimmer-Flint, Samantha Kornreich, and all of the other staff for their hard work!

My highlights from LIPS 2025 included:

1. STARBALL!

John Kaufmann (left) and Dan Dennis in action during *Starball! Credit: Andy Kreyche*

Billed as a "dreamy musical astronomy adventure," Starball was created and is performed by two longtime friends of mine, John Kaufmann and Dan Dennis. John and Dan are both former supervisors of Pacific Science Center's Willard Smith Planetarium (as am I), and they have been performing, writing, and producing live theater shows for decades. They are now each teaching theater, John at Evergreen Valley College and Dan at Ohio University.

Here is John's summary of Starball from his website (*https://www.johnkaufmann.org/gallery20):*

> "At the start of the show, audience members are asked to write down a remembered dream. The dreams are then collected in a box. Through music and astronomy, we introduce people to the mechanics of the night sky. For the rest of the show, we randomly draw dreams from the box and use them as inspiration to create original constellations in the sky."

An audience member reads a dream during the public performance of *Starball! Credit: Andy Kreyche*

After the audience creates their own four constellations based on dreams that were read, the group works together to create a song to link those four constellations together. I have seen at least a dozen performances of Starball by now, and every show has been unique. Why? Because every audience is unique, bringing their own dreams and interpretations to the show.

In fact, the title of this column, "Tiger Eats Fish," hails from the Starball public performance during LIPS 2025. Usually the constellation song is four lines long, one line per constellation. However, during LIPS 2025, a young girl suggested a line that didn't quite fit. That line was, "tiger eats fish." Rather than tell the girl that her suggestion was not usable, Dan and John simply developed a song with five lines:

> The magic is gone
> Cat on my lap
> Here comes the smileladon
> Tiger eats fish
> Rave all night

"Tiger eats fish" became the tag line of LIPS 2025 because it so perfectly encapsulates our philosophy: Always say yes to the audience, and be sure to use the audience's suggestions even if they are different from what you expected to hear. Telling that little girl her suggested line didn't fit in the song would have broken the magic of the show as well as likely made the girl embarrassed.

Sara Schultz kindly created a graphic for LIPS 2025 and shared with us so that we could get it printed on t-shirts. I wear my "tiger eats fish" t-shirt proudly!

You can learn more about Starball at: *https://www.youtube.com/watch?v=2_PBFFtOcv4*

Note that John and Dan would love to bring Starball to your dome. To learn how to make that happen, contact their agent, AJ Epstein, via the contact form link at: https://westoflenin.com/

2. THEATER SKILLS WORKSHOP BY JOHN AND DAN.

This 90 minute workshop took place the morning after the Starball public show. John and Dan led us through several exercises and discussions designed to get us thinking about how we can integrate theater skills into our own presentations. Because John and Dan both have extensive experience leading planetarium programs, the exercises were specifically chosen to enhance teaching under the dome.

John and Dan encouraged us to define our values for a program. These could include scientific accuracy, involving the audience in multiple ways, and/or ensuring that the audience leaves the dome knowing how to find things in the real night sky. They also drew a distinction between having objectives for a program and instead focusing on outcomes that are based on your values for that program.

Another interesting discussion involved defining your own persona. For example, are you comfortable being silly, or would you rather be a more serious presence? Watching others in action can help you figure it out, but in the end it's up to you to decide what you are most comfortable with.

John Kaufmann (right) and Dan Dennis lead us through theater exercises and games to help us see opportunities to infuse our programs with theater. *Credit: Andy Kreyche*

I was not the only one who considered the theater skills workshop a highlight. Here are some comments from the LIPS 2025 anonymous survey:

- I really enjoyed the talk about values and our "North Star"! Gave me a lot to think about for my own programs!
- The theater skills workshops are incredibly impactful, and always spark reflection on the way I present and the ways I train and advise new presenters. Identifying my values as a planetarium presenter is such a great idea and will help guide the ways I encourage the audience to interact in the future!
- Both the energy and content of the workshop seemed guide the rest of the conference. Multiple times people were referring back to ideas presented there, like the intended values behind a show.

John and/or Dan can also lead performance skills workshops for your staff. Contact me (k*arrie@DigitalisEducation.com*) for details.

3. PUBLIC SHOWS IN THE FISKE PLANETARIUM.

We were lucky enough to have two 30 minute programs presented in the Fiske for public audiences. The two programs were "Alien Safari," with Erin Benitez and Rachel Goralski of the Suffolk County Vanderbilt Museum and Planetarium and "Shapes in the Sky," led by Shira Moskowitz of the Maryland Science Center.

It is always interesting to see LIPS presenters in action with the public rather than with other LIPS attendees pretending to be a certain age. These two programs were engaging, full of good content, and just fun to watch. Several LIPS 2025 survey respondents included the public presentations in their list of most valuable sessions. Kudos to Erin, Rachel, and Shira for their outstanding programs!

4. FOUR (!) SCHOLARSHIP RECIPIENTS.

Thanks to the LIPS community, we raised enough funds to provide scholarships to four people. I will share comments from each of them about their experiences.

> **Constanza Yovaniniz Letelier, Planetario Chile:** This was not only my first time at LIPS, but also my first time at a planetarium conference of any type! It was a wonderful opportunity to meet fellow planetarians and learn about what other planetariums are doing in their programming.
>
> One of my biggest takeaways from LIPS 2025 was the importance of audience participation and interaction. This is especially true with digital projectors, where you can do a lot of things on the go, but I was surprised to see that it can also be done really well with pre-prepared FullDome material, such as the shows "Alien Safari" and "The Sun's Fury".

Ellen Torres Thompson of the Lawrence Hall of Science presented "The Sun's Fury" to LIPS attendees. *Credit: Andy Kreyche*

For a conference that is about planetariums (where you'd expect to be in a dome all day), I really enjoyed the panels that took us outside, such as "Kinesthetic Astronomy" and the "Plunger Sundial". Interacting with your whole body and the space around you really helps you absorb the concepts you're discussing, which is a very good complement to what we do inside the dome. It's all about finding ways of making our visitors more active participants, both inside and outside of the dome. Which sounds logical on paper, but I feel like I really get it after having experienced it in person.

(On a side note, it was really funny to be the only person from the southern hemisphere at LIPS—things as simple as the movement of a shadow or the seasons of the year were all upside down to me and it always took me an extra second or two to remember that!!)

I am really grateful that I got to attend LIPS 2025! It gave me a ton of ideas to work on new, more interactive programming at our planetarium, but most importantly, it allowed me to share with other people who share this somewhat "uncommon" career of informal science education, reminding me of what I enjoy about it and the infinite possibilities of what we can do in a planetarium.

Kelli McLeod, Bishop Museum:
I was fortunate enough to receive a scholarship to attend LIPS2025. I'm new to the planetarium world, so getting to spend three days fully focusing on planetarium education while meeting with other planetarium presenters was an amazing and valuable experience!

The live demonstrations in the dome allowed me to learn about planetarium experiences I had never previously encountered – immersive astronomy-based theatre through Starball!, dancing in the planetarium with Dancing Up A Solar Storm, and learning about life science through Alien Safari. These allowed me to understand how the dome can be used for education beyond the stars – life science, art, and literacy are all potential sources of inspiration for the dome. The hands-on workshops outside the dome were also valuable – many of them addressing things that my own institution has already been wanting to explore, such as sensory friendly events. They also allowed me to deepen my understanding of astronomy topics that always seemed too complex.

The most valuable parts of the symposium were the people. We bonded over shared challenges and successes, brainstormed and advised on new and exciting projects, and shared resources and ideas. It was great to meet so many people coming from so many different institutions. Not only did we all have various levels of expertise to share, but it was also inspiring to hear how people use their domes in their different capacities – again, showing how unique and diverse our planetarium programming can be. I've already reconnected with people I met at LIPS, and they've given invaluable advising on project development.

This symposium was valuable for me, as a planetarium presenter, but also for my institution, as we have a bigger network of planetariums to connect with, and are inspired by the information I've brought back. I am so grateful to the LIPS community for granting me this scholarship to attend the symposium.

Anika Mahajan, University of Colorado Boulder:
I consider myself a newcomer and slight outsider to the planetarian community. I am a PhD student designing and researching interactive planetarium technologies. I came to LIPS 2025 to llearn who I am designing for and what they do. And I was blown away...

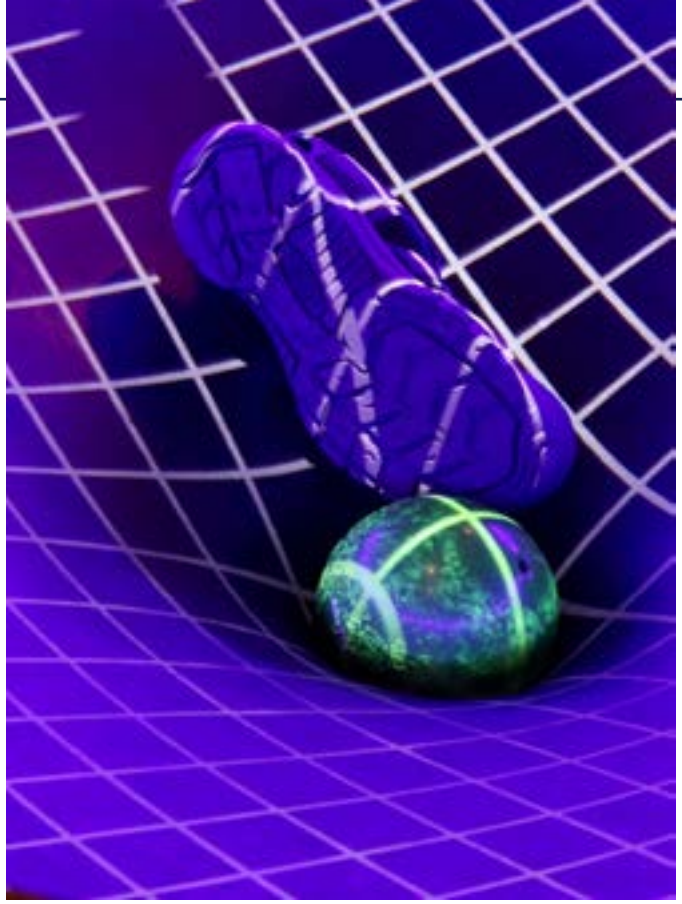
People brought interactivity in many different ways: through art, dance, embodied graphs, and dreams. We were the Sun, erupting solar flares with billowing scarves. We were the Earth, tilting and rotating as the day went by. We were educators, teaching the same concept but for different goals. LIPS lived up to its name; each session embraced interactivity and communication in its own way. Everyone at LIPS are designers in their own right: in their activities and interaction.

The sessions succeeded in equal part due to the presenters but in equal part due to the audience. The LIPS community is eager and enthusiastic. They were willing to do anything and try anything, happily. I was scared to present at LIPS, but as I went to more sessions, the fear disappeared. I knew the audience at LIPS would try anything I asked them to do and with an open mind.

The LIPS community is warm and inviting. As a newcomer, I felt truly welcomed. I got to know and meet everyone attending during and after the sessions, which was valuable in its own right. LIPS 2025 was a wonderful, transformative experience through the sessions and the people. And I hope to be a part of LIPS 2026...

Tiger eats fish!

Derek Demeter, Seminole State College - host of LIPS 2013 and LIPS 2026
It was truly a pleasure to return to the Live Interactive Planetarium Symposium (LIPS) this year at the Fiske Planetarium at the University of Colorado in Boulder. The last LIPS conference I attended was in 2019 at the Cradle of Aviation in New York, and since the pandemic hit, our planetarium underwent major renovations that kept me from attending future events.



Eddie Goldstein used whatever was at hand (or foot?) to demonstrate the awesome gravity well that he and Dmitri Klebe created. *Credit: Andy Kreyche*

Additionally, my role as an officer in the International Planetarium Society shifted my focus to IPS conferences in the years following the pandemic. Thanks to the generous LIPS scholarship, I was able to attend LIPS 2025. Upon arriving, I was reminded of just how much I value the energy and inspiration that LIPS provides, motivating me to continue my work in live and interactive planetarium programming.

As the director of the Emil Buehler Planetarium at Seminole State College, I'm proud to say that our planetarium exclusively offers live, interactive programs for K-12 schools, college courses, and the general public. From live star talks and astronomy-focused programs to coursework for various educational levels, our planetarium aims to engage audiences in dynamic and immersive ways. Recently, we expanded our space to include a new museum/classroom area, and I was eager to explore new ways to utilize this addition for hands-on learning. LIPS is known for its kinesthetic activities, and I left the conference with a wealth of ideas for incorporating similar activities into our new space. One of the standout moments for me was the neurodivergent session, where I saw many activities offered at Fiske that could easily translate into our classroom environment.

Another highlight was experiencing the show Starball in the dome. The performance was fantastic, and I loved how it transformed the dome into an interactive playground for exploring the sky. The way the audience could interact with the stars was truly unique, and I'm excited to bring this concept to our own dome. I was thrilled to connect with the team behind Starball and exchange contact information.

The session on theater and performer techniques led by Dan and John was also a personal favorite. As someone who is always looking to improve my skills as a presenter, their playful and insightful session offered invaluable tips that I can't wait to implement into my own programming.

I had the pleasure of hosting my own session, The Human HR Diagram, which we first presented in 2019 with some new improvements. It was rewarding to share it again and receive constructive feedback that will help us further refine the activity. One key takeaway was learning how to tailor the HR diagram for different grade levels by categorizing stars by age, temperature, or color. This new approach will be invaluable for the variety of programs we offer, from K-12 through our college courses.

I was also inspired by Andy's plunger sundial activity, and we plan to create our own version for school field trips. Additionally, I'm excited to develop a similar activity exploring Earth's seasons, orbit, and the stars visible in the sky, inspired by the outdoor session led by Mike, John, and Nick.

Overall, I was deeply impressed by this year's LIPS. The diversity of sessions—from planetarium activities to classroom strategies to theoretical discussions—provided a rich experience for both seasoned professionals and newcomers alike. It was wonderful to see such a broad range of planetarium professionals, from support staff to students to administration, coming together to share knowledge and grow. LIPS truly offers an inclusive and comprehensive professional development opportunity that benefits everyone involved.

I'm already looking forward to LIPS 2026, and I'm thrilled to announce that I've volunteered to host it! LIPS 2025 will be hard to top, but I'm eager to continue the incredible legacy of this event and help guide it into the future. We've already started the logistical planning, and I'm excited to get started on making LIPS 2026 a reality. I hope to see you all in Florida next August for another unforgettable experience at LIPS!

Thank you to all of our scholarship recipients for sharing their feedback with us.

I also want to give a huge thank you to our sponsors:

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(Continued on pg. 73)

Chrysta Ghent Heslin
chrysta.ghent@gmail.com

SEEKING WHAT WORKS
ZOOMINARS AND THE PLANETARIUM COMMUNITY

As a planetarium director with a background in both formal and informal education, I have always been interested in learning (which may explain why I took 11 years to finish graduate school). Naturally, when it came to choosing a research topic for my PhD, I wanted to investigate the state of professional development for my community.

The training and background of planetarium professionals (PPs) covers a broad spectrum (Croft, 2008; Ghent, 2017; Hartweg, 2016; Plummer & Small, 2013). As with other informal science educators, there is also no agreed-upon set of requirements and professionalization for PPs (Patrick, 2017; Tran, 2008; Tran & King, 2011). We may need support in developing our professional skills, such as designing and facilitating age-appropriate lessons in the planetarium or managing the planetarium as a business. While many PPs have opportunities for professional development, such as attending conferences and courses for educators (Plummer & Small, 2013), these may not support the dispersed nature of PPs or the range of topics for which PPs desire support. One solution may be virtual professional learning opportunities which could provide an environment for PPs to come together to discuss and support best planetarium practices to effectively reach their educational goals.

In 2018, Alan Gould started a series of monthly online seminars to be hosted by and for planetarium professionals called Planetarians' Zoominars, heretofore referred to as Zoominars. During each session, a planetarium professional presents a different topic on the Zoom video platform. These sessions are run from the USA in the English language, and are open to anyone who is interested. Information on upcoming Zoominars can be found through the PPA website (https://www.ppadomes.org/events/online-seminars), the International Planetarium Society website (ips-planetarium.org), and through an email listserv of planetarium professionals (dome-l). These Zoominars are also recorded and archived for later viewing. Alan described the overall goal as "just to establish another mechanism for informal communication among planetarium people to build the community." My dissertation investigates how these Zoominars support PPs in order to begin to develop an understanding of what PP professional learning looks like and how it can support the personal goals of PPs by asking the following: How do the Zoominars generate value as part of the whole PP community?. To answer this question, I analyzed 20 archived Zoominar video observations and 16 participant interviews. Below are summaries of what I learned about the role of the Zoominars in our community.

KEY FINDING 1

ZOOMINARS SUPPORTED PRACTICE

I found that Zoominars support PPs' both through their work in the dome and as a member of the PP community. Participants reported two main reasons for attending a Zoominar: a need for social interaction and an interest in acquiring educational content. Most interview participants indicated their social interaction during Zoominars as either active or passive participation.. Active participation was most often cited by Zoominar attendees, but there were also attendees who identified themselves as passive participants while still reporting the Zoominars as valuable to their goals.

A planetarium is more than a dome that shows the night sky, and PPs' practice involves more than talking about that sky. Modern planetariums have evolved to become immersive theaters that are capable of sharing content such as sporting events, art, music, other fields of science, and more. The job of a PP has also evolved to presenting these topics, which speaks to the background of PPs covering a broad spectrum (Plummer & Small, 2013; Hartweg, 2016). However, every PP does not have the background of every discipline that a planetarium may be asked to present. While astronomy is still a major content area expected from planetariums and their presenters, introducing new and widespread content essentially causes PPs to become novices even if they have been in the field for decades. The Zoominars have a useful format of social learning to allow PPs to learn from their peers. Thus, Zoominars covering topics ranging across what planetariums are now being asked to offer allows different members of the community to express their experience as an "old-timer" or learn as a "newcomer" at different times (Lave & Wenger, 1991). Even if a Zoominar does not relate directly to what a PP currently does in their dome, it may be something that can be used in the future. PPs attend the Zoominars because they will always learn something.

KEY FINDING 2

PRACTICE-BASED DISCUSSION OCCURRED AFTER ZOOMINARS

I also found that Zoominars support PPs in deepening their learning or social interactions outside of the sessions in ways that contribute to a sense of professionalism. A majority of participants interviewed indicated at least one instance of continuing relationships after a Zoominar, with half reporting about a specific Zoominar they attended. Chat content was largely not practice-related unless prompted by the presenter, which notes that deeper or continuing

(Continued on pg. 80)

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he built. SK Shrestha from Nepal told us their experience of 10 years with mobile domes in Nepal, how they operate them and the challenges they overcome. Suresh Bhattarai detailed the work done by the Nepal Astronomical Society in their country. Pat Monteith presented about Next-Gen STEM engagement in the dome, taking into account the new possibilities offered by Generative AI. Patricia Reiff demonstrated several useful ways of achieving fulldome scenes using the OpenSpace software in the portable planetarium. Finally, Marco Ávalos explained about the initiative of the Nordic Planetarium Association of having an in-person meeting for mobile dome operators in Estonia, taking place in mid-September this year. The meeting concluded with an invitation to Fukuoka, Japan, from Mr. Isshi Tabe, for everyone to attend and make presentations at the 2026 IPS Conference there.

Our next online meeting will be the first Saturday in January, we hope to see you there!

Remember, you can watch all mobile planetarium online meetings on IPS's YouTube channel. *https://www.youtube.com/@ipsdomes*

EUROPEAN SMALL & MOBILE DOMES DAY

The Nordic Planetarium Association carried out their biannual NPA 2025 conference, an in-person event that took place at the city of Tartu, in Estonia. Their goal is to "...meet up, exchange stories and experiences and get inspired by one another." They also encourage vendors to attend and demonstrate their projects and products.

Within this context, they planned to dedicate a special day for small and mobile domes' operators, during the last day of their meeting. So, last September 13th they had several presentations that were also shared online freely to whoever wanted to participate via Zoom. This was very relevant, because experienced colleagues talked about their newest endeavors with their planetariums. This was their presentation agenda:

- Welcome to European Small & Mobile Domes Day – Anna S. Arnadottir / Jonna Rintamäki
- Pop-up Planetarium – Ruth Grützbauch
- Explorer Dome Adventures – Josh Yates
- The stranger dome stories – Michael Danielides
- Cosmos of Scotland – Steven Gray
- Ursa Mobile Dome – Jonna Rintamäki / Santeri Manninen
- Lessons from LIPS – Karrie Berglund

Afterwards, they turned to a panel of discussions and spontaneous mini-presentations in the mobile dome, which covered challenges and opportunities when running a mobile dome, the best practices during live presentations, and gimmicks and gadgets to use under the dome.

Since this was the first time the organization had a day specific for small and mobile domes, they also discussed about the future of this initiative, how to network and collaborate in the following years. To conclude, they premiered a fulldome show "Astra and Sirius", a production from Sweden funded by IPS, specially designed for small and interactive digital domes. The show is to be released freely to the community free of charge.

The details about the event can be found at their webpage: *https://www.npa-planetarium.org/npa2025/esmod-day*

For all inquiries or questions, please contact Üllar Kivila, Head of Planetarium, Science Centre AHHAA – *ullar.kivila@ahhaa.ee*

KANTIPUR PLANETARIUM: BRINGING THE UNIVERSE TO NEPAL

A group of science enthusiasts in Nepal have been offering immersive, hands-on experiences directly to schools and communities all over Nepal, particularly with mobile domes. They aim at "filling the gap between the traditional and modern ways of learning".

Using mobile domes from 5 to 8 meters in diameter, they also take advantage of diverse projection systems, such as a Digisky system, a Newtonian mirror system, and ST projectors. The topics they cover are focused mainly on the study of constellations and the Moon.

Kantipur Planetarium is celebrating their first 10 years of operation. Besides setting up the planetarium domes, their services include also indoor talks, telescope observations, Astronomy photo booths and props, stargazing and camping activities, science-themed events, corporate bookings and Astronomy & Science gadgets on demand.

They have provided a very extensive reach countrywide, which includes schools, Muslim communities, Buddhist monasteries, local villages and indigenous groups. To achieve this, they have to overcome great challenges such as difficult terrain, limited resources, and the need to customize content for language and culture.

The Kantipur Planetarium operators joined our international community during the last September Online Worldwide Mobile Planetariums' Meeting (available at IPS's YouTube channel), when they shared (and surprised us) with their experience in their country. And of course, they want to keep sharing with their colleagues all around the world, so you can contact them at *kantipurplanetarium@gmail.com*

A MESSAGE FROM OUR NEW PORTABLE PLANETARIUM COMMITTEE CHAIR, MARCO ÁVALOS

Never before had I been so sure I am standing on the shoulder of giants. Accepting the honor of guiding the Chair position for our Portable Planetarium Committee at IPS, there is of course that feeling of great challenge, and the desire of impacting positively our community.

And this decision was easy to make, since for years I have been learning about the work that so many mobile dome owners and operators have been doing. And particularly the invaluable and continuous support from this committee

members, each one of them excelling at their tasks with mobiles and their respective management, hardware and software. So, this first shoutout goes for the giants I mentioned before: Susan Button (USA), our former Chair and also ex-President of IPS itself; Alan Gould (California, USA), Lionel Ruiz (Marseille, France), Guilherme Marranghello (Bage, Brazil), and Loris Ramponi (Brescia, Italy).

All together we keep admiring the way that our mobile planetarium colleagues around the world overcome so many challenges in order to "bring the stars to you". And it doesn't matter how many years we ourselves may have with our job, there is always something new to learn, an issue we can now solve, a different idea we had not explored. Even myself, after 35 years of operating our mobile Planetario Aventura in Costa Rica, have the urge of changing and innovating our dome every time.

Along with the world, we have seen our planetariums (all of them) evolving during the last years, and the relationship between fixed and mobile domes has adjusted itself as well. We have a very huge responsibility with our societies, because we are the ones able to reach about everyone. And as the ambassadors, we have the obligation of providing the quality and the credibility that any planetarium deserves.

It will be my challenge to search for new opportunities for the mobile domes, considering their ample diversity, their different technologies, cultures and environments under which they operate. I will also participate with this column for our Planetarian and new content for the respective sections of IPS webpage.

I invite all of you to keep participating in our Online Worldwide Mobile Dome Meetings, already set for the first Saturday of January, May and September every year, at 14:00 UTC. Also, do everything possible to attend and participate in every IPS event and conference, because the mobile operators and producers also learn so much from our big (fixed) brothers.

So again, thank you so much for your trust. We will keep bringing the stars to you!

Marco Ávalos

LIP SERVICE (CON'T)

- The Elumenati
- ePlanetarium
- National Space Science and Technology Institute
- Seiler Planetarium
- SSIA Technologies

Board member Andy Kreyche modeling his "Tiger Eats Fish" t-shirt. Used with permission.

As always, I end this column with reminders about the LIPS Google Group, Live Interactive Planetarium Symposium Facebook group, and the LIPS team chat. Contact me (*karrie@DigitalisEducation.com*) if you need information about any of these, or if you'd like to share any ideas or feedback.

And remember:
Tiger eats fish!

UNDER THE CLASSDOME (CON'T)

message with the boss. Your emails could be read by anybody and should be treated as public communication. Furthermore, public institutions are subject to laws like the Freedom of Information Act or your state's equivalent. Some of our planetarium business is confidential. We maintain membership information, financial information and even have to deal with misconduct and harassment. Any of that could be made public if you use your institutional email.

I'm not telling you how to manage your digital life, but I am asking you to think about it. Don't wait until you're in the middle of a mess. Also remember that it will take time to create the partitions. I keep getting emails for planetarium business at my school email and I keep asking people to change it in their address books. The work email address will disappear next June, so I hope I can get all of it switched before that happens.

IMMERSIVE MATTERS (CON'T)

the dome went in. In those cases, we've had to find creative workarounds, attaching new speakers beneath or around the old ones just to keep the system functioning.

Ideally, of course, we'd be installing full immersive systems everywhere — that's where the magic really happens. But in the real world, budgets tend to define what's possible. Probably 85% of our installs end up being 5.1, and maybe another 10% are 7.1 — usually just because someone's heard it's "better." The truth is, there's still not a lot of content mixed specifically for 7.1, let alone beyond that.

And on the content side, that's another big piece of the puzzle. Making sure theaters are calibrated to a standard that works across all productions can be a real challenge. Unlike Hollywood, where standards are well established, the dome world is still kind of the wild west. Specs are still coming together, but everyone's got their own idea of what's "right," which makes it tricky to create a consistent playback environment.

IV. OVERALL LESSONS LEARNED

Technological Advances: Tools and algorithms like Spatial Audio Designer, ambisonics, MBAP, and a growing list of other hardware and software processors make immersive audio more accessible.

Content and Distribution: Immersive works are being created, but do not appear to be reaching the theaters equipped to present them properly. Strengthening distribution pathways and addressing technical or logistical barriers will be key to ensuring that this immersive content reaches capable venues and audiences.

Height Channels: Critical for sound following visuals in a dome.

Standardization: While 5.1 remains the most common baseline, many theaters still rely on stereo playback. Establishing consistent standards and encouraging immersive-capable systems will improve quality and compatibility across venues.

Budget Considerations: Audio should be prioritized early in planning and budgeting. Upgradability should be considered.

Education and Collaboration: Early involvement of audio professionals ensures better outcomes.

V. NEXT STEPS

- Develop a unified voice to educate decision-makers about sound and immersive audio.
- Incorporate audio professionals early in the design and build process.
- Promote 5.1 as the minimum standard; explore immersive formats when possible.
- Encourage budget-conscious strategies for upgrading audio systems.
- Leverage technological advancements to create flexible, multi-format immersive content.

VI. CONCLUSION

Immersive sound is at the heart of fulldome experiences, shaping how audiences connect with stories and space. Across these case studies, we see that thoughtful design, collaboration, and the use of emerging technologies can overcome budget, technical, and creative challenges. As a community—audio professionals, planetarians, and content creators alike—we have the opportunity to prioritize sound, share knowledge, and advocate for standards that elevate every dome experience. By keeping the conversation going, experimenting, and supporting one another, we can ensure that immersive audio continues to captivate, engage, and inspire audiences around the world.

LINKS

Monica Bolles: https://monicabolles.com, http://resonantinteractions.com

Tom Ammerman: https://www.newaudiotechnology.com

Charlie Morrow: https://www.morrowsound.com

Tim Archer: https://mastersdigital.com

Pierre Brand: https://www.primetimestudio.de

Ana Monte & Daniel Deboy: https://deltasoundworks.com

Into the Microverse: https://www.microverse-cluster.de/en/news/microbes-in-the-spotlight-into-the-microverse-shines-with-award-winning-audio.html

David Ledoux: https://sat.qc.ca/en

George Barnett: https://www.ssia.tech

IMERSA: https://imersa.org/

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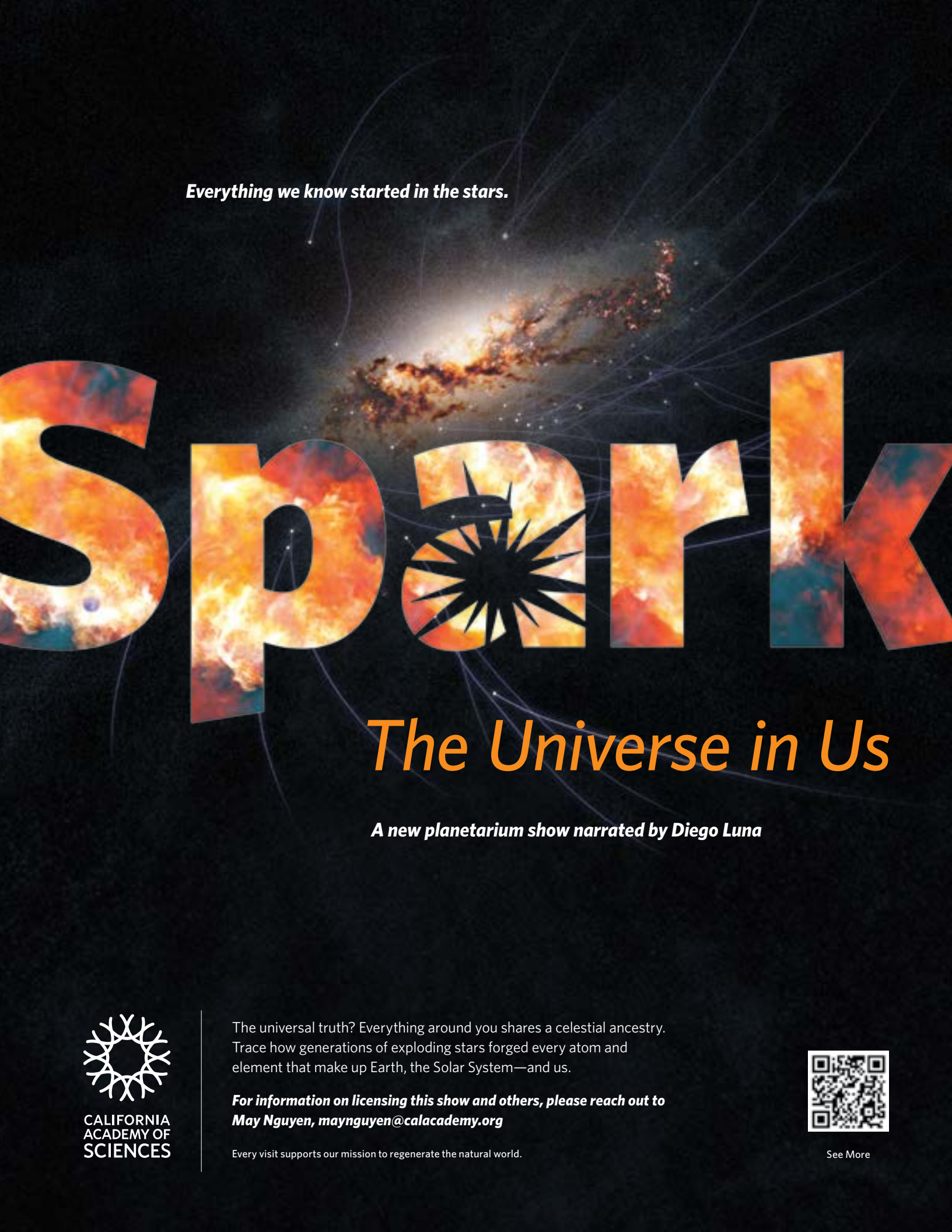

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A LITTLE BIT OF EVERYTHING

Ron Walker
The Star Barn Planetarium
P.O.Box 161
Cave Creek, Arizona, 85327
thestarbarn@gmail.com

Sometimes it is fun to be a amateur planetarian, sometimes it's not. For whatever reason we do this (I'm still trying to find a good reason), or at least one better then, "I just had to do it" I've given up trying to explain and accepting the fact that it all started as a creature from the "id". Unfortunately, I don't have the resources that the Krell had, so if something goes wrong it's up to me to make it right. All this while trying to expand into new shows and the equipment required to make my programs a little less boring.

The big worry is that a part on one of the bigger projectors would die and I would be literally left in the dark. Since I have been offering shows for over eleven years now and since most of my equipment is from the 60's and 70's I have come to the conclusion that it is all built like a brick (you know what) and will outlast me...that is until it doesn't. Suddenly one realizes that that beautiful new projector has been in service for over thirty years before I got it and I've put another eleven years on it. So when the year/month indicator went out of calibration with the projected Sun as I was returning from first decade BC to the present epoch, I chocked it up to "electrical slippage" and nothing else. But there was something else wrong...the Moon's position for the date was not right either. But the phase in respect to the Sun was correct.

Most people that come visit only once (chock that up to my generic style delivery) and those numbers drop more during the summer. It is sad what the Covid did for attendance but I have to have something to blame (other then myself) for the lowering turnout. Anyway, a good part of summer went by without much interest in shows and, as it is with most things, out of sight/out of mind. For those few people that come for the first/last time I have a show I call, "An Introduction To The Planetarium And The Night Sky" which takes place on the day that they come, or, the day they come for a show is the day it is for real.

My shows are most often given on weekends so if everything flows as usual, I must adjust the annular position of the Sun and planets for the new show date. Well, the Sun is not moving smoothly, nor is the Moon. Is the drive motor locking up? I only ask this because I had the worm gear in the motor for a Conic projection Orrery do just that. Never had a motor do that before...now every motor must do that, as least it's the first conclusion I jump to.

Now the Sun and Moon won't move at all, but the readout dial works...did I break off some gear teeth? Unfortunately when I purchased this projector it came, "as-is", and with no instructions, especially no instructions as to the inner workings of the central core. Now when I first reassembled the projector some eleven years ago I remember the Moon projector having about an inch of play. I didn't think much of it as it was at the end of a long gear chain and the accumulative "slop" would probably be substantial and never gave it a second thought. As I checked this again I found no "slop" at all between the Moon gears and the main drive shaft but the entire main drive shaft turned freely. Thus the projectors in the north planet cage (Saturn, Sun, Moon) all worked together perfectly with no "slop" at all but the main drive shaft turned freely into the central core. What broke.

I went back over many of the photos I took of the projector to get an understanding of how exactly the machine worked. The top of the north end of the central core just below the north planet cage lies a gear train which does several things. The annular motor drives these gears and first of all drives the selsen motor that drives the readout at the control desk. Thus, the motor must be operational as it drives this part of the system. Next the drive runs a shaft that goes through the entire central core to similar gears just above the south planet cage. Checking this out I find that the motor drives all of these gears and indeed all of the southern planets work flawlessly. So, Mercury, Venus, Mars, and Jupiter work properly with the readout dial and the motor. So far, so good. The north gear train ends with a plastic gear that drives a gear at the bottom of the north planet cage drive shaft, and that is where the problem must lie.

Bring out the engine hoist, last used to put this projector together, and remove the north star ball and planet cage after disconnecting at least fifty wires. What a pain. Once apart I find the gear at the end of the drive shaft in the planet cage perfectly in place and all turns freely with just a touch. All the gear teeth are there as well as the teeth on the plastic gear I was concerned about. I go and touch it and it falls limp at an angle allowing a disengagement with the next gear in the chain back to the motor.

Now I have often marveled that every gear on every shaft is on ball bearings and this gear is no different. What is different is that the shaft appears to be broken off of the central core. Closer inspection exposes a plate at the bottom of the shaft that contains the back end of three screws 120 degrees apart. These screws have become loose enough that the shaft and gear could angle enough to slip out of mesh and thus allow disengagement of the gear.

But why the back end of the screws facing this way? Taking off the protective cowling allows a nut-driver in and tightening of the support structure thus holding the gear in perfect alignment. The holes that the screws go through are somewhat large and for good reason. Once the north section of the projector is back in place it is very easy to move the plate and get the gear teeth to mesh perfectly before tightening the gear support down. Now to put all of those wires back.

So the "slop" in the Moon has been eliminated as this adjustment has been done correctly. (As far as I can tell anyway.)

If you are interested in what this all looks like, I invite you to peruse the, "Planetariums As A Hobby" site here: *https://planetariumsasahobby.freeforums.net/thread/220/aint-right*


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Director/Writer KWON O CHUL CHO HEA SEUNG
Music KIM SU JIN Sound CHO KYE HWAN
KWON O CHUL
ASTROPHOTOGRAPHY

KEITH'S CAPTURED QUIPS ~ CHAPTER THIRTY-THREE

"I sill wonder if gravity will go away soon."

"Did you go in space? If you didn't,how do you know about all of this stuff?"

"The screen looks just like a roof but it's not a plain old roof."

"Thanks for teaching me science because I really thought it was like Social Studies."

"I want to be an astronaut and go in to space and sleep on the roof."

10 YEARS AGO (DECEMBER 2015):

Great issue on Mars and all based around a movie. Did I hear people saying planetariums were turning into movie theaters?

There is some talk about virtual reality and this is the way everything is going but I'm not so sure. Part of what makes venues work is the group of people that attend them. Movies work better when there is a crowd participating and the same goes for a planetarium show. Having people around experiencing what your experiencing tends to make the presentation more intense. Even from my small experience in my little dome I find a group of twenty or so is much more involved and appear to enjoy a show more then a group of two or three.

Staffan Klashed says in his article, "The Next 20 Years Of Planetariums: What challenges and opportunities are we facing?, I seem to see a shift to the more spectacular presentation. This was written ten years ago and it appears to be true. Just look at the "Sphere" in Los Vegas. Everyone says it's a WOW...if you can afford the tickets.

25 YEARS AGO (DECEMBER 1999):

John Mosley does an update on an earlier article in the Planetarian called, "The Real, Real Constellations Of The Zodiac". Basically pick the stars you want and call them a constellation. For me, that big "W" in the sky is the Walker constellation and has nothing to do with an evil queen that was probably the basis for the evil queen in Snow White (the original not the remake). And what gives an eastern European priest the right to go down south and call a couple of stars The Telescope, or another group of stars The Microscope. Can't the aborigines of Australia use their own star outlines. So the official number of 13 and not 12 or 21 is just as he says. It's arbitrary and not very many people care.

Interestingly the other main article by Wayne Wyrick, "Possible Origin Of The Pawnee Creation Story" which are based on Skidi Pawnee constellations where part of Scorpius is called The Swimming Ducks. There is no right or wrong here.

Now Richard McColman's "Zoom Tune-Up in his Planetechnica column is more up my alley. Since I'll never afford an LED dome, things like this must work for me, and also whatever percentage of Planetarians out there that can't afford the latest and greatest will appreciate the many years the classic projectors have left to give.

45 YEARS AGO (DECEMBER 1979):

George Reed tried to get "International Planetarium Week" started and I'm not sure if it is off to a good start, Now I'm looking at this just coming off of the 100 year celebration of the planetarium which we all enjoyed but I must admit not very many people came to any of my shows centered around this topic. But then, not many people have come back after Covid anyway.

Would you believe that if you gave away tickets to your programs less then 5% of the takers would actually come? Donald Hall in his article "Know Your Audience" looks at various ways to get people to come to your planetarium shows.

Should there be a Christmas show or is it promoting astrology? I always thought it was a sign for the Syrian astrologers (or priests, or Magi) and has little to do with astrology. If the Christmas show works for you, then by all means present it. If not, then don't.

If your in for some heavy reading try Charles Gronauer's article, " A Study Of Distortion Resulting From Viewing Angles In The Planetarium Theater".

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Encounters in the Milky Way was created by the American Museum of Natural History, New York (amnh.org).

Encounters in the Milky Way was developed with the major support and partnership of the National Aeronautics and Space Administration (NASA).

SEEKING WHAT WORKS (CON'T)

discussions took place outside of the Zoominar parameters. These continuing relationships led to projects and other work being done that led back to the community at large. For example, one PP described a program that was created: "I can think of one example where the topic was on grants for developing programs, so this conversation that was a Zoom topic and then became an offline conversation, actually did develop into a program which was then offered to the planetarium community at large. So it became an idea, and then offline became more of an idea and then became a reality that eventually helped planetariums."

As Lee-Kelley, Turner, and Ward (2014) pose, "occasional physical gatherings, such as conferences, are insufficient to build the relationships that underpin effective communities of practice" (p. 44). A virtual environment is easier for more PPs to access and reduces the pressure on participants, allowing for more opportunities to continue discussion after the Zoominars. At in-person conferences, I have collected countless business cards as a result of conversations about shared interests or ideas; only to find months later that conversation is almost never revisited, not from lack of interest but more so lack of accountability or forgetfulness. With Zoominars, there may be a greater chance of conversations taking place over chat or email, automatically creating a sense of accountability or a concrete start to a continuing relationship.

WHAT DOES THIS MEAN FOR THE PLANETARIUM COMMUNITY?

As a member of this community, my sense is that we are full of individuals with a desire to provide the best experiences we can for our visitors and a willingness to learn from and support one another. If community members want additional interactions during a Zoominar, more Zoominars could follow the workshop format or provide scheduled opportunities for interactions in a didactic format; this could look like breakout rooms or discussion periods with questions designed by the presenter. Alternatively, the format can be defined when the Zoominar is announced which would allow participants to go into the session aware of the expected amount of opportunities to interact. A further option would be to provide an online forum where discussion can continue after one or even all Zoominars as this would encourage continuing participation and relationship building. I would also encourage more members of the planetarium community to take part in the planning and implementation process of the Zoominars as well as broaden the opportunity for participation by replicating the Zoominar model in countries and time zones worldwide, extending our opportunity to learn from each other and expand our opportunities for connections.

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IPS ELECTIONS 2026

IPS will conduct elections for Officers in late 2026 and we are now seeking nominations from IPS members around the world!

IPS is governed by five Officers and, currently, nine Board Members—two in each of Asia, Europe and North America, and one in each of Africa, Oceania and Latin America. (There will be no continent-based Board Member elections in 2026, because no three-year terms will expire at the end of 2026.)

IPS members are asked to put forward their nominations for Officer positions of President-Elect, Executive Secretary and Treasurer for 2027-28. These elections are held every two years. Current Executive Secretary Derek Demeter is eligible for re-nomination, but Treasurer Michael Smail will have completed three consecutive terms and is not eligible to stand again for 2027-28. IPS will also be electing a new President-Elect. The terms of office for the winning candidates will begin on 2027 January 1 and end on 2028 December 31. The President-Elect will be IPS President in 2029-30 and Past President in 2031-32.

Multiple nominations for all positions (especially President-Elect) are highly desirable, so we encourage nominations from the worldwide IPS membership.

Please first discuss your nomination with your nominee, then send nominations to Martin George, Chair of the IPS Elections Committee, at *martingeorge3@hotmail.com.* Nominations will close at the time of the IPS General Meeting at the upcoming 2026 IPS Conference in Fukuoka in June, where any final nominations may be made from the floor.

Please contact Martin George if you have any queries about these positions, or the election process.

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INTERNATIONAL PLANETARIUM'S CALENDAR

COMPILED BY: LORIS RAMPONI

2025

- **1-4 December.** South American Meeting, APAS Conference, Planetarium USACH, University of Santiago do Chile. In the following days (4-6 December) telescope tour.
  Contact: *apas@planetariochile.cl*
  https://www.youtube.com/watch?v=Sbqv62xXGKQ
- **19-21 December**. Workshop of Planétariums Interactif Associés francophones (PIAf), Marseille, France.
  Inscriptions: *lionel.ruiz@live.fr*
  Each month, all the year, PIAf Meeting online.
  Free inscription: *https://groups.io/g/lss-plane*
  https://planetariums-interactifs.org/
- **31 December.** Deadline for the contest "A week in the United States". For information and application requirements go to: *www.ips-planetarium.org/?page=WeekinUS*
- **31 December.** Deadline for the contest "A week with the GDP". Gesellschaft Deutschsprachiger Planetarien e.V., (GDP) is the Society of German-Speaking Planetaria. For information and application requirements go to: *https://www.ips-planetarium.org/page/WeekwithGDP*
- **31 December.** Deadline of the prize "Page of stars" organized by IPS Portable Planetarium Committee in collaboration with Serafino Zani Astronomical Observatory. Contact: Susan Reynolds Button.
  sbuttonq2c@gmail.com
  http://www.ips-planetarium.org/?page=pagesofstars

2026

- **10 January.** 10th Worldwide Meeting online dedicated to traveling planetariums and in particular to operators, producers and sellers. Begin at 14:00 Universal Time UTC.
  The yearly calendar for the mobile planetariums online meeting, setting it, usually, every first Saturday of January, May and September.
  Contact: Susan Button, *sbuttonq2c@gmail.com*; Marco Avalos *Dittel,info@planetarioaventura.com*
  http://www.ips-planetarium.org/
- **11 February.** International Day of Women and Girls in Science. There are also planetariums among the institutions that organize public events about the purposes of the Day.
  https://www.un.org/en/observances/women-and-girls-in-science-day
- **20 February.** Deadline of the Stipends Application for IPS 2026 conference registration. The stipends cover full conference registration for IPS members whose circumstances make it otherwise difficult or impossible to attend. Applications will be initially reviewed by the International Development Committee, and this will be followed by a final decision from the IPS Officers.
  Contact: *martingeorge3@hotmail.com.*
  https://www.ips-planetarium.org/page/stipends
  https://www.ips-planetarium.org/page/StipendApplication
- **31 March.** Deadline of 14th PLANit Prize for an original video production, organized each year by Italian Association of Planetaria (PLANit), Italy. The prize is open to everyone. First prize 500 euro.
  Contact: *segreteria@planetari.org*
  www.planetari.org
- **9-11 April.** Italian Association of Planetaria (PLANit), 41st National Conference of Associazione dei Planetari Italiani. Contact: *segreteria@planetari.org*; Dario Tiveron, *dario@fddb.org www.planetari.org*
- **18-20 April.** Gesellschaft Deutschsprachiger Planetarien e.V., (GDP), Annual Conference of the Society of German-Speaking Planetaria.
  Contact: Voss, Björn Dr., *bjoern.voss@bkm.hamburg.de*
  www.gdp-planetarium.org
- **22-26 April.** Dome Fest West 2026, Boulder, Colorado, USA. Contact: Ryan Moore, *ryan@domefestwest.com*
  https://www.domefestwest.com/
- **7 May.** International Day of Planetariums.
  Ips-planetarium.site-ym.com/?page=IDP
- **7 May.** Astronomy Day. Astronomy Day is a world-wide event designed to celebrate all facets of astronomy.
  https://www.astroleague.org/astronomyday/news
- **13-16 May.** Middle Atlantic Planetarium Society, MAPS Conference, Howard B. Owens Science Center, Maryland, USA.
  Contact: Patty Seaton, *pxts13@yahoo.com*
  https://www.sepadomes.org/annual-conference/
- **18 May.** International Museums Day,
  http://icom.museum
- **25-29 May.** CAP 2026, Communicating astronomy with the public, Byurakan Astrophysical Observatory, Armenia, and Armenian Astronomical Society in collaboration with Commission C2 of International Astronomical Union (IAU). *https://capconferences.org/*
- **26-28 May.** 11th Fulldome Festival Brno, Brno Observatory and Planetarium, Brno, Czech Republic.
  Contact: *director@fulldomefestivalbrno.com*
  https://www.fulldomefestivalbrno.com/
- **2-4 June.** European Network Science Centres & Museums (ECSITE), Annual Conference, Universeum, Gothenburg, Sweden.
  https://www.ecsite.eu/conference

- 28th International Planetarium Society Conference, Fukuoka City Science Museum, Fukuoka, Japan.
  18-19 June. Fulldome Festival. @ Fukuoka City Science Museum.
  20-21 June. IPS Board Meeting.
  21 June. Welcome (Social Event).
  22-23 June. Open Ceremony, Sponsor Promotion, Sessions and workshops.
  24-26 June. Sponsor Exhibition, Concurrent Sessions, General Meeting, Keynote
  27 June. Post Conference Tour.
  Contact: *ips-fukuoka@fukuokacity-kagakukan.jp*
  https://www.ips2026fukuoka.com/
- **30 June.** Asteroid Day. *https://asteroidday.org/*
- **13-19 July**. Fulldome Festival Jena, Jena, Germany. *https://fulldome-festival.de/info*
- **31 July**. Deadline for the applicants of "A Week in Italy for an American Planetarium Operator", in collaboration with IPS Portable Planetarium Committee. *Ips-planetarium.site-ym.com/?page=Italy*
- *Early August*. LIPS Conference (Live Interactive Planetarium Symposium), Seminole State College/ Emil Buehler Planetarium in Sanford, Florida, USA. Contact: Karrie Berglund, *karrie@digitaliseducation.com; https://www.lipsymposium.org/registration*
- **12 August**. Total solar eclipse (Artic, Greenland, Iceland, Atlantic Ocean, northern Spain and very extreme north eastern Portugal). *https://nso.edu/for-public/eclipse-map-2026/*
- **September**. 5th Festival FullDome. Different French planetariums are involved in the initiative. Contact: Fabien FM. MARQUET, *f.marquet@centre-astro.fr*
- **Middle of September.** Association of French Speaking Planetariums, APLF Annual Conference, Vulcania Planetarium, Saint-Ours, France.
  Contact: nicolas fiolet. *nfiolet@lacoupole.com (APLF) www.aplf-planetariums.org*
- **16-19 September.** Association of Science and Technologies Centers, ASTC Annual Conference, Phoenix, Arizona Science Center, Arizona, USA. *https://www.astc.org/*

2027

- **20 March.** The Best of Earth Fulldome Awards 2027. The Best of Earth Awards Show is a coalition of fulldome film festivals around the world (Jena, Los Angeles, Plymouth, Melbourne, Canada, Brno) to celebrate the innovation and magnificence that fulldome provides. The event will be streamed. *http://bestof.earth/*
- **2 August.** Total solar eclipse (Europe, Africa and the Middle East).
  https://en.wikipedia.org/wiki/Solar_eclipse_of_August_2,_2027
- **10-19 August.** XXXIII IAU General Assembly, International Astronomical Union, Rome, Italy.
  https://www.iau.org/science/meetings/future/general_assemblies/2760/
  Access to virtual platform available. See as example: *https://astronomy2024.org/registration/*

2028

- 29th International Planetarium Society Conference, Planetario Galileo Galilei, Buenos Aires, Argentina. *https://www.ips-planetarium.org/news/705534/*

2025 PLANETARIUM ANNIVERSARIES

75 YEARS

- Planetario Agrimensor German Barbato, Montevideo, Uruguay.

50 YEARS

- Morelia Planetarium, Mexico.
- Fiske Planetarium, Boulder, CO., USA
- Flandrau Science Center & Planetarium, Tucson, AZ., USA

40 YEARS

- Planetario USACH, University of Santiago do Chile.

2026 ANNIVERSARIES

100 YEARS

- 18 July 2026, Zeiss-Planetarium, Jena, Germany.

40 YEARS

- First national meeting of Italian Planetariums.

35 YEARS

- Planetario Aventura, mobile planetarium, Costa Rica.

LAST LIGHT
CHATTING WITH FRIENDS

April S. Whitt
Fernbank Science Center
156 Heaton Park Drive NE
Atlanta, Georgia 30307 USA
april.whitt@fernbank.edu

For this last offering, here's a list that Alan Gould shared:

TOP TEN PHRASES HEARD IMMEDIATELY BEFORE "THE BIG BANG":

Trust me.

What does this button do?

Help me get the lid off this thing.

Remember, this is still experimental.

Where does all this stuff go?

Sure, it's safe to mix these!

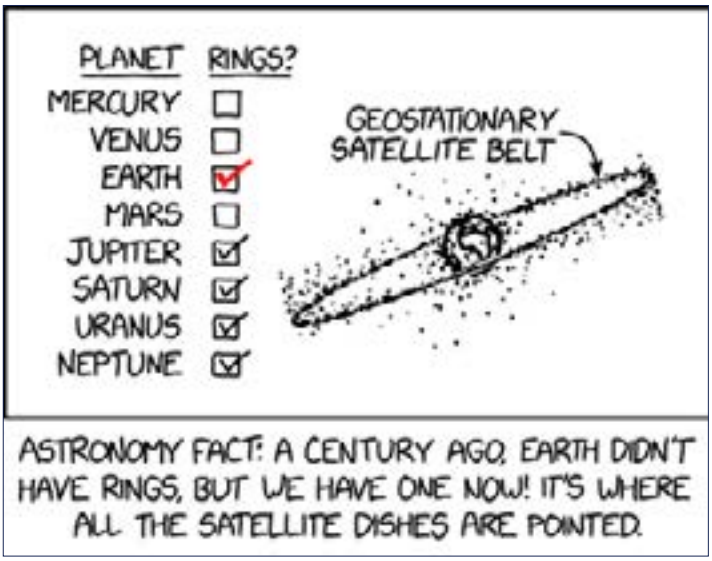
It's only dangerous if you drop it.

What could go wrong?

Let me handle this.

I don't feel so good.

—Paula Robinson



"If you don't know where you are on the Earth, the angle of satellite dishes can help constrain your latitude. If some of them are pointing straight up, you're probably near the equator, right under the ring." https://xkcd.com/3156/

Back at the beginning of the millennium, when planetarium colleague and NASA-guy Rob Landis was traveling to Russia, I asked if there was anything he'd like sent to him. I'd been sending things to Peace Corps volunteers for years (nothing says "home" like Twinkies), and figured there must be something unavailable in Russia.

Tongue-in-cheek, he responded that, "Sure ... would love a box of Lucky Charms. Can't get them here."

He also mentioned that postal addresses in Moscow are written differently than in the U.S. Rather than name, street, city, state, zip code, the order was Country, Code, State, City, Street, Recipient's Name

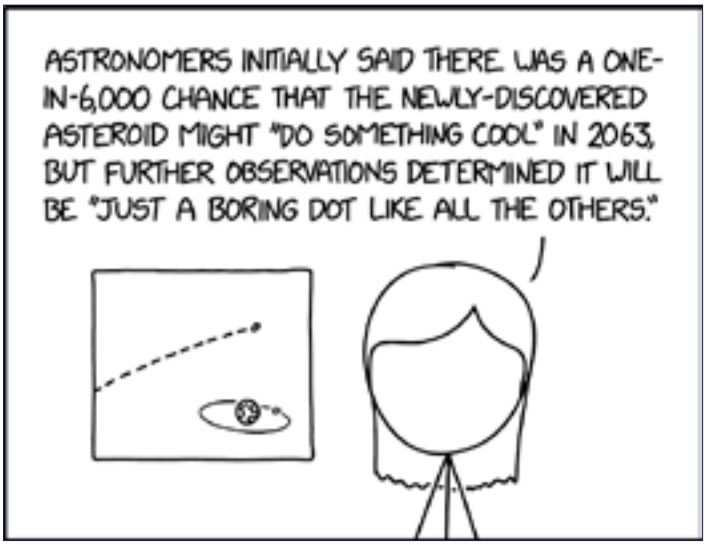
Rob was in Moscow from late summer into early winter 2000. He received a package note from the Russian postal service that came to Volga Apartments that NASA leases. He had to go to the local (neighborhood) postal distribution offices with this Russian form, customs, etc. He presented that form and was informed that the package was sent back.

The box of cereal traveled back to Atlanta, Georgia, U.S.

In that time, while in Moscow working the International Space Station, he got a call from Jet Propulsion Lab in Pasedena, California, about a job interview.

In late November, he interviewed for the Cassini mission, was offered the job, accepted it, and moved to southern California in January 2001. By mid-March 2001 or so — he received the package.

Who says the postal service doesn't deliver?



Their calculations show it will 'pass within the distance of the moon' but that it 'will not hit the moon, so what's the point?' https://xkcd.com2984/

It has been an honor and a privilege to offer this column. Editor Shiloe has been gracious with my sorry technical skills. I hope you'll keep in touch. With very best wishes for the holiday seasons!


Excellence in education deserves extraordinary equipment.
GOTO would like to congratulate Keith Turner, Planetarium Director at Carmel High School in Carmel, Indiana,on the occasion of his receiving the 2025 Thomas J. Brennan Award from the Astronomical Society of the Pacific, for excellence in Astronomy and Planetarium education.
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