CONSTELLATION

Spring 2015, No. 1

"Equipped with his five senses, man explores the universe around him and calls the adventure Science. At the last dim horizon, we search among ghostly errors of observations for landmarks that are scarcely more substantial. The search will continue. The urge is older than history. It is not satisfied and it will not be oppressed. The history of astronomy is a history of receding horizons."

— Edwin Hubble

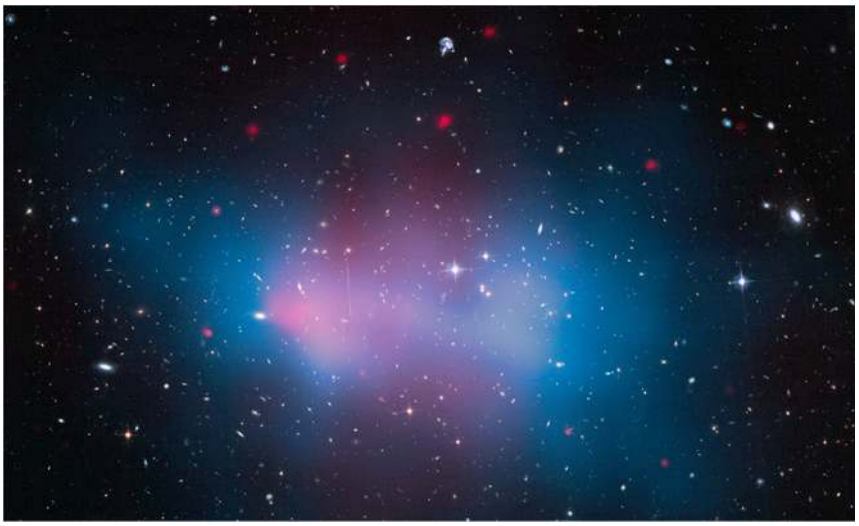
CONTENTS

The Heavyweight Champion of the Cosmos

By Dr. Ethan Siegel

As crazy as it once seemed, we once assumed that the Earth was the largest thing in all the universe. 2,500 years ago, the Greek philosopher Anaxagoras was ridiculed for suggesting that the Sun might be even larger than the Peloponnesus peninsula, about 16% of modern-day Greece. Today, we know that planets are dwarfed by stars, which themselves are bound together by the billions or even trillions into galaxies.

But gravitationally bound structures extend far beyond galaxies, which themselves can bind together into massive clusters across the cosmos. While dark energy may be driving most galaxy clusters apart from one another, preventing our local group from falling into the Virgo Cluster, for example, on occasion, huge galaxy clusters can merge, forming the largest gravitationally bound structures in the universe.



Take the "El Gordo" galaxy cluster, catalogued as ACT-CL J0102-4915. It's the largest known galaxy cluster in the distant universe. A galaxy like the Milky Way might contain a few hundred billion stars and up to just over a trillion (10^{12}) solar masses worth of matter, the El Gordo cluster has an estimated mass of 3×10^{15} solar masses, or 3,000 times as much as our own galaxy! The way we've figured this out is fascinating. By seeing how the shapes of background galaxies are distorted into more elliptical-than-average shapes along a particular set of axes, we can reconstruct how much mass is present in the cluster: a phenomenon known as weak gravitational lensing.

That reconstruction is shown in blue, but doesn't match up with where

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REPORT FROM THE MAPS EDUCATION COMMITTEE

Dear MAPS Members:

Based on responses to the survey we received from you last year, we are attempting to address some of the requests that were offered as being meaningful to the membership. The Education Committee would like your feedback on a posting on the MAPS Website Education page. While we are considering posting video versions of some of our presentations/workshops there are some technical issues to overcome. In the meantime, April Whitt was gracious enough to share her expertise during a workshop on the seasons at our Baltimore Conference. John Meader provided the photographs, April provided the captions, Tim Collins and the Website Committee did the technical work on preparing the presentation for the website, and Tim also provided the musical accompaniment to the presentation. In addition to the PowerPoint, we have posted the worksheets, and several other documents that April used during her presentation.

See: www.mapsplanetarium.org/2015/03/reasons-for-seasons.

Specifically what we would like from you as a member is the following:

- Is this a format you would like to see continued?
- Why or why not?
- Other comments?

We will continue to research the video and live streaming formats for our conference as well. Other organizations have some experience in those fields and we are looking at their products. If you have any suggestions pass them on to us.

On the next page of this issue of the *Constellation* you will find an article by Patty Seaton, “Brought to You Live” to underscore the value and ease in which live segments can be incorporated into your planetarium presentations. She has included some wonderful ideas that you may like to try out for yourself!

As always, we would love to hear any comments, suggestions, ideas that would help us all become better at bringing the universe to our audiences.

Lee Ann A. Hennig
Committee Chair
MAPS Education Committee

Brought to you… Live!

By Patty Seaton

Live Interaction under the dome… what does that mean? In traditional times, this is what all of us did – interactive lessons with students and the public with our optical-mechanical projector. Here at my facility, 36 years after the doors opened, we still operate our original Minolta Viewlex Series IV projector. Our County, prior to the opening of the Howard B. Owens Science Center (HBOSC), had operated a Spitz A-1 projector out of a school. HBOSC has some 60 slide projectors still in use to both support live programs and for fully automated shows. However, even with our automated shows, we always include at least a live star presentation, complete with Q&A from the audience.

Ever since I took over as planetarium specialist, I have taken the initiative to ensure all of our programs include live interaction. So what does that look like at my facility?

- For Pre-K, it means handing out shapes that the students lift up during the program, including when we make "shapes" in the stars.
- For Kindergarten, it means counting and singing during the program.
- For first grade, it means sorting colored stars according to their temperatures, and making the connection between color and temperature.
- For second grade, it means observing and charting moon phases for two months to determine a pattern.
- For third grade, it means using fists to measure the height of the North Star in the sky to determine latitude.
- For fourth grade, it means working in teams to select items to sustain life, then observing different planetary surfaces in search of a habitable world. In another program, it means using binoculars to observe deep sky objects in the planetarium.
- For fifth grade, it means using iPads to collect and analyze exoplanet data, and look for locations of stars with exoplanets.
- For sixth grade, it means using diffraction gratings to observe spectra of gases to identify gases in stars. In another program, it means designing a street lamp cover to minimize the effects of light pollution, and using the Globe at Night images of the Orion nebula to determine effectiveness of the designs.
- For seventh grade, it means using images from the Hubble Space Telescope for inspiration to free write and then develop a draft poem (an integration with the Reading/English Language Arts program).
- For eighth grade, it means observing and recording the path of the sun for each of the solstices and the equinoxes.
- For the public, this means creating several live programs where our presenters act out characters and use the audience to help us use the stars to solve a variety of problems/ mysteries. Sometimes it means a simple astronomy lecture with Q&A sessions.

Live interaction takes on many forms. And it is not limited to a traditional theater. I have dreams of adding digital to my theater someday, but plan to run programs exactly as described. My digital will take over my still images. My slide projector panoramas of planetary surfaces will become video images: imagine my volcanic world actually erupting! My world with animals actually teeming with life! But the overall objectives will remain the same…to work with my students and my public to keep them involved and active in their own learning. It is a true joy, and allows me as a teacher to implement multiple methods of learning. To allow students with strengths in music and art to succeed. To use the beauty of the stars to open up dialogue and interaction…live, under the dome.

ELECTION RESULTS

We extend our sincere thanks to the candidates who participated in this year's election of officers, and all who step up to serve the MAPS organization in any capacity. The official results of the election resulted in these officers assuming their posts as of the end of the Long Island conference May 16, 2015:

- President-Elect - Kevin Williams
- Secretary - Stephen Dubois
- Treasurer - Keith H. Johnson

Also changing mantles at that time, the current president, Alan Davenport, will assume the role of Past-President, and the current President-Elect, Jerry Vinski, will advance to the MAPS Presidency.

On behalf of the MAPS Executive Committee, I encourage everyone to consider contributing to the advancement of our organization and the profession as executives, committee chairs and members or hosts and volunteers.

Warm regards,

Alan Davenport, President
Paul J. Krupinski, Audit Chair

The Heavyweight Champion of the Cosmos

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the X-rays are, which are shown in pink! This is because, when galaxy clusters collide, the neutral gas inside heats up to emit X-rays, but the individual galaxies (mostly) and dark matter (completely) pass through one another, resulting in a displacement of the cluster's mass from its center. This has been observed before in objects like the Bullet Cluster, but El Gordo is much younger and farther away. At 10 billion light-years distant, the light reaching us now was emitted more than 7 billion years ago, when the universe was less than half its present age.

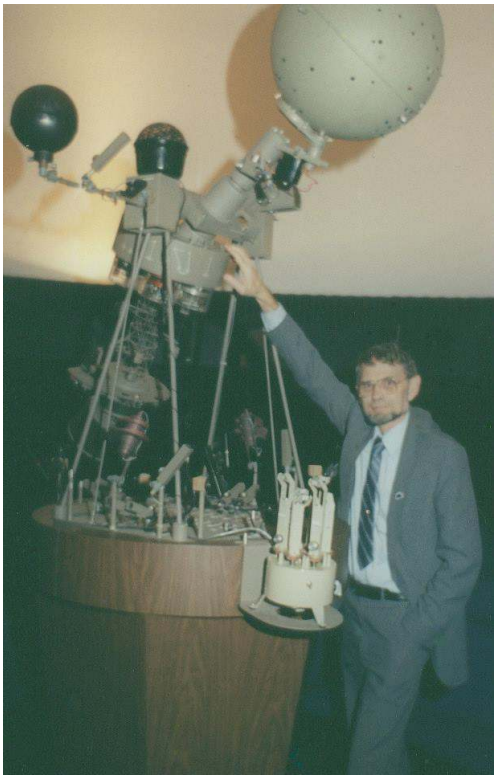
It's a good thing, too, because about 6 billion years ago, the universe began accelerating, meaning that El Gordo just might be the largest cosmic heavyweight of all. There's still more universe left to explore, but for right now, this is the heavyweight champion of the distant universe!

Learn more about "El Gordo" here: http://tinyurl.com/lyctms5

El Gordo is certainly huge, but what about really tiny galaxies? Kids can learn about satellite galaxies at NASA's Space Place http://spaceplace.nasa.gov/satellite-galaxies/.

Image credits: NASA, ESA, J. Jee (UC Davis), J. Hughes (Rutgers U.), F. Menanteau (Rutgers U. and UIUC), C. Sifon (Leiden Observatory), R. Mandelbum (Carnegie Mellon U.), L. Barrientos (Universidad Catolica de Chile), and K. Ng (UC Davis). ESO/SOAR/NASA

First MAPS Secretary/Treasurer Passes After Stellar Career
By Paul J. Krupinski



The planetarium community has lost another shining star. Dr. James Roy Orgren, our very own first secretary/treasurer, passed away Sunday, November 23, 2014 in Columbia, MO. Jim Orgren was 86.

Born on the summer solstice, Thursday, June 21, 1928 in Lansing, MI, he was destined to inspire those around him about the beauty and complexity of our amazing universe through the planetarium and the classroom. Early on in life he served as a Trappist monk in Holy Trinity Abbey for eight years.

From 1964 to 1966, at age 36, he served as planetarium director of the Earth and Space Science Laboratory, Frederick, MD. MAPS held its second of four meetings on Saturday, May 22, 1965. In an early interview, Orgren said membership increased three fold at the May meeting to 25 attendees! If we turn back the pages of time, the name Middle Atlantic Planetarium Society or MAPS was officially adopted at that May meeting in Frederick!

Later that year in Lancaster, PA, the fourth meeting of MAPS educators commenced in the North Musuem Planetarium, Franklin & Marshall College --- it was December 4, 1965 and the first MAPS officers were elected! Jim Orgren would become our region's first secretary/treasurer.

Orgren departed ESSL in 1966 to join the Buffalo State College community in Western New York as an associate professor in the General Sciences Department and received continuing appointment in 1969. He also served as director of the Buffalo State College planetarium from 1966 to 1984. He earned his bachelor's degree in philosophy from Aquinas College in Grand Rapids, MI; a master's degree in education from Michigan State University; and another master's degree from Cornell University in earth sciences. He completed his Ed.D. in science education at the State University of New York at Buffalo.

He quickly demonstrated his commitment to teaching, service, and scholarship. He was active in college and department affairs at Buff State and he chaired the Curriculum Committee and the Personnel Committee when the Geosciences Department was established. In the planetarium, he developed various devices, special effects, and software applications to enhance the use of the planetarium and to improve its value as a teaching tool. He also taught and advised graduate students. In 1977 Orgren received the SUNY Chancellor's Award for Excellence in Teaching and he was promoted to full professor.

After a fire destroyed the facility on November 17, 1978, the college decided to rebuild the planetarium and Dr. Orgren spearheaded efforts to build a new and improved star theater. He spent a sabbatical as an intern at the Strasenburgh Planetarium in Rochester to learn how to better operate the college's new Whitworth Ferguson Planetarium, which became an important educational and community resource for Western New York. Its new public programs became popular, attracting thousands of visitors every year.

On a personal note, I meet Dr. Orgren for the first time while attending an introductory astronomy class at Buffalo State College…I was 18. He would become my professor, advisor, mentor and dear friend for many memorable years. I still remember this distinguished man, who at the time looked a lot like Abe Lincoln, walking down the stairs of the lecture hall, carrying his brief case, which held his text book, pens, pencils, chalk and astronomy notes. I still remember spending countless hours with him and other intrigued students under the dome on campus learning stars names, constellation positions, the control

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Pages of Stars

Last year, 2014, the IPS Portable Planetarium Committee began an annual call for planetarian colleagues from around the world to prepare short recordings and text that can used under a planetarium dome. The text can be:

1. Astronomical and scientific commentary
2. A classical Greek (or another culture's) sky story or
3. An original story or a poem (any kind of topic) with some astronomical details or with an event that happens under the night sky (including the name of some stars or constellations or other sky objects visible with the naked eye)

We were happy to receive two submissions in 2014 and we will post them online in the Free Media space on the IPS website: http://www.ips-planetarium.org/?page=pagesofstars. We are sure you will be inspired by them!

First Place: "The Rabbit in the Moon" by Andy Kreyche (akreyche@hartnell.edu) from the United States. Andy adapted this story from several versions of a Japanese folktale.

Honorable Mention: "Introduction to the Planetarium" by Oded E. Kindermann (okindermann@gmail.com) from Argentina. Oded's script is part of an introduction that he uses for his shows when he works with children from 4 to 6 years old. His goal is to calm the students while they are waiting in front of the planetarium and also to present the word and concept of "constellations."

We hope to see even more submissions in 2015 please! Participants must send materials, before December 31. For rules see: http://www.ips-planetarium.org/?page=portablecom

Susan Reynolds Button, Chair
IPS Portable Planetarium Committee
Chittenango, New York
315-687-5371, sbuttonq2c@gmail.com

East Kentucky Science Center and Planetarium

by Steven LJ Russo, Director

It's been pretty busy here at the EKSC since the Summer.

We held ten Summer camps on a variety of science topics including astronomy, rocketry, chemistry, biology, magnetism, and robotics. All ten camps were filled to capacity with 30 students in each.

Staff of the EKSC poses with the "Block Exhibit" (Pauletta, Steve, Heather, and Susan). Photo by Steve Russo.

Our Summer was also spent doing outreach programs to housing projects in surrounding counties and programs in the library system as part of the "Fizz, Boom, Read" nationwide Collaborative Summer Library Program. This Summer's program was a science based theme and was designed to keep kids reading over the Summer.

The Fall was busy with the EKSC making appearance at several community events, holding our Halloween open house, our annual "Early Childhood event" and our regional science fair. Each of these activities attracted literally hundreds of people.

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CONTACT!

MAPS Executive Committee

Officers (2013-2015)

President
Alan Davenport
M. F. Jordan Planetarium
Orono, ME
davenport@galaxymaine.com
207-581-1341

President Elect
Jerry Vinski
Hillsborough, NC
jvinski@raritanval.edu
908-938-6825

Past President
Patty Seaton
H. B. Owens Science Center
Prince George's County, MD
pxts13@yahoo.com
301-918-8750

Secretary
Stephen Dubois
Ferguson Planetarium
Williamsville, NY
perchbuoy@yahoo.com
716-542-5483 x243

Treasurer
Keith Johnson
Edelman Planetarium
Glassboro, NJ
johnsonk@rowan.edu
856-256-4389

Board Members (2014-2016)

Lee Ann Hennig
Thomas Jefferson High School
Alexandria, VA
lahennig@verizon.net
703-597-9228

Paul J. Krupinski
Mr. K.'s Mobile Dome Planetarium
RMSC's Strasenburgh Planetarium
Cheektowaga, NY
mobiledome1993@earthlink.net
716-908-1341

Megan Norris
Suits-Bueche Planetarium
Schenectady, NY
megan.norris@misci.org
518-275-8599

President's Message

Pondering the momentous final president's message for my term made me realize the ironic coincidence of endings in this planetarian's career. I retired, after 33 years, spent entirely as the director of the University of Maine Planetarium, on February 28th. This comes at my mission's culmination, just having completed construction of a new astronomy center to replace and upgrade the antique technologies that served me well for decades. It has been a demanding year of challenges ending in a life change akin to a nova. At the same time I recognize the life cycle of a single professional, I see the technological advances, educational efficacy, and diversity in our field all irrevocably bolstering our programs, missions and profession toward a better tomorrow.

The signs of a healthy profession abound: The Baltimore 2014 meeting was a showcase for sharing with many brilliant ideas to borrow. I am sure we will again see MAPS members share, communicate and celebrate new ideas, successes and even failures with their peers at Long Island this May. Also at this time, the International Planetarium Society is looking forward with its 2020 project for planetarium advancement. (Note also, there is an opportunity for IPS members to provide important data in support of professional development in that organization's future plans via a survey posted by Karrie Berglund. See IPS Vision 2020. I have seen a MAPS grant support educational research in the use of planetariums, and we expect to see more of that in the future. Every facility is different, each one seems to labor under different expectations, but they all share the magic power derived from being unlike any other medium.

Thank you all for giving me the opportunity to serve with what small efforts I could muster to make a difference, and thanks to the Executive Committee and committee chairs who work so hard to organize and build on the service that MAPS provides its members. This is an inspiring organization supporting a great cause, your dedication to astronomy education.

Warm regards,

Alan

Alan Davenport
MAPS President

Dr. James Roy Orgren

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panel of the Spitz A3P, the Spindler & Saupe Director 24 controlling dozens of Kodak carousel projectors, as well as multiple special effects devices in and around the cove.

More importantly, we learned how to share our understanding of the night sky passionately with others. There was nothing more exciting than being with your astronomy professor, fellow astronomy club members (who would become lifelong friends) under the canopy of stars on a clear dark night, peering though telescopes and just sharing quality time together…now that's truly priceless!

Dr. Orgren gave me a special gift shortly after graduating in December of 1989…a paid trip to Ogelbay in Wheeling, West Virginia --- my first MAPS conference! And the rest, as they say, is history.

Dr. Orgren received a number of National Science Foundation awards and helped to both create and evaluate New York State's high school earth sciences curriculum. He was a member of several professional organizations, including the National Science Teachers Association. He retired from teaching in 1991. Dr. Orgren is survived by his wife, Sally and six children.

May perpetual light shine upon Dr. James R. Orgren, like the unrelenting light that shines down on us from the thousands of stars every clear night and may he rest in peace. Thank you for sharing your knowledge of space and time with me and with countless others. You may be gone and truly missed by many, however you'll certainly never be forgotten!

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EKSC

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Our big event was our "Block Party." A grant allowed us to purchase many different block set-ups to teach kids about engineering concepts. Several hundred children and adults participated in this event.

The winter season was hard on us, as here in eastern Kentucky, one inch of snow will shut the schools for several days. Major snowstorms of a foot and 8 inches, had some schools out for a month and even our Science Center was closed for eight days in February. But things are looking good, as we are booked solid for March and April, and are now in planning for Nano Days, Astronomy Day, and Summer Camps.

Support for the EKSC remains strong in the community as proven by the money raised in the annual William G Duke Golf Scramble. Each year, Big Sandy Community and Technical College (The organization that runs the EKSC) holds an annual fund raiser. The President of the college picked the Science Center to get the proceeds from this year's scramble. The Golf Scramble raised almost $30,000.00 (yes, thirty thousand dollars) for the Science Center. Not too bad since the EKSC is located in a town of 3,400 people!

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CONSTELLATION DEADLINES

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

Cover Date	Deadline
March 2015	Friday, March 6
June 2015	Friday, June 5
Sept. 2015	Friday, Sept. 11
Dec. 2015	Friday, Dec. 4

Submissions should be sent to the editor:

Kevin Conod
(973) 596-6609
Fax #: (973) 642-0459
kdconod@yahoo.com

Advertising Coordinator: Don Knapp
airedale47@gmail.com

The public can help decide what labels will go on the images and maps coming from the flyby NASA's New Horizons spacecraft. The SETI Institute has announced the launch of its "Our Pluto" campaign, which is soliciting input on how to name features on the surfaces of Pluto and Charon.

The science team will not have time to come up with names during the quick flyby, so they must assemble a library of names in advance. Consequently, they are inviting the public to visit the web site ourpluto.seti.org where they can vote for the names they think should be used to identify the most prominent features on both Pluto and Charon.

After the campaign ends on April 7, the New Horizons team will sort through the names and submit their recommendations to the International Astronomical Union (IAU). The IAU will decide how the names are used.

GOTO

My Town,Our Planetarium # 188

Rebirth of a Czech Jewel

Ostrava, the third largest city in the Czech Republic, lies in the eastern part of the country, near the border with Poland. Once known primarily as a coal mining and heavy industry city, it now proudly offers new opportunities in the arts, culture, music, and education, including the VSB Technical University and its planetarium.

Opened in 1980, it is now named for the famous Czech astronomer Johann Palisa, who discovered more than 122 asteroids in the early 1900's. The entire planetarium building has recently undergone a total to-the-walls renovation and has re-emerged as a true jewel of astronomy and science education. Exhibits on astronomy, astronautics, physics, geology and seismology join a beautiful observatory which is also open to the public.

About the planetarium's new GOTO INC projection system, Tomas Graf, scientific manager of the renovation project said, "The HYBRID planetarium allows us to satisfy the interest of many people, not only pupils and students from all kinds of schools but also the general public, parents, young children and even amateur and professional astronomers, who would appreciate an authentic image of the night sky." Graf even utilizes the system in popular programs featuring jazz, classical, and relaxation music.

The essential, authentic sky image is provided by the GOTO PANDIA HYBRID system. The GOTO PANDIA produces a spectacular sky from a tiny starball only 48 cm in diameter. It shines 8,500 brilliant stars onto the 13 meter dome, along with hundreds of deep sky objects and a 40,000,000 micro-star Milky Way. A fulldome video system from EVANS & SUTHERLAND is seamlessly linked and synchronized with the PANDIA through GOTO's unique HYBRID software and manual control console.

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URL: www.goto.co.jp/index-e.html

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5715 Susan Drive East, Indianapolis, IN 46250
Tel：+1-317-537-2806
E-Mail: gotousa@earthlink.net
Contact : Ken Miller

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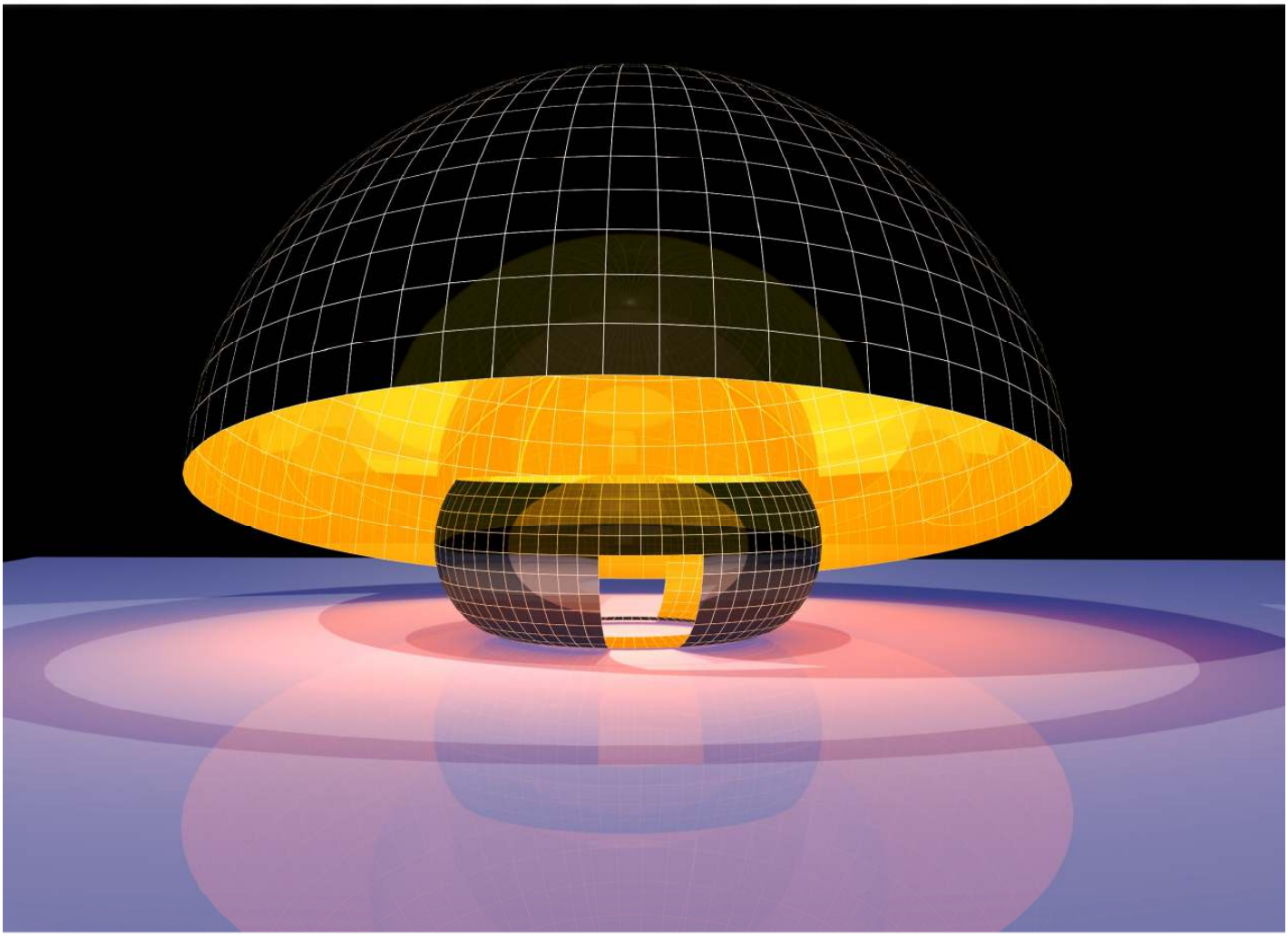

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