

# newscience

NEWS FOR MEMBERS AND FRIENDS OF THE SAINT LOUIS SCIENCE CENTER

FALL 2021



NEW SCIENCE

11.02.1991

BRIDGE CONNECTOR

**We are all  
part of the story.**

ONE BUILDING | CELEBRATING 30 YEARS



**30<sup>TH</sup> ANNIVERSARY  
SPECIAL EDITION**

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## Connect with curiosity.

Dear Saint Louis Science Center Friends,

It's an exciting time here at the Science Center as we head into the fall. It's been a little over a year since we welcomed our community back inside our doors after closing during the pandemic, and it's been wonderful to see families and people of all ages coming back to discover that, whether learning the role of pollinators outside in GROW or even listening to a singing Tesla coil at Energy Stage, science is all around us.

Coming up, there's another important date on the horizon. This November, the Oakland Building celebrates its 30th anniversary. Three decades ago, we built a bridge to science and a new home for the St. Louis region to explore the ever-growing world of science and technology.

Today, we're as dedicated as ever to our mission "to ignite and sustain lifelong science and technology learning." As always, I want to give special appreciation to our members, philanthropic partners and community for your support. From the galleries and educators that greet our guests to our partnership with the City of St. Louis Department of Health making the science of viruses and vaccines easier to understand, you are the element that makes delivering our mission possible.

Inside this issue of *NewScience*, we're thrilled to share a look back over the past 30 years. This special collection of photos, memories and pieces of Science Center history will delight you and maybe even inspire you to share your own memories of the Science Center through the years.

In *Science Today*, read a tale of two black holes and how these interstellar objects are studied. Then, learn more about *Discover Science with Me*, a program for our youngest STEAM learners, and why early childhood learning is so important. Get a glimpse of our Planetarium Tunnel exhibits, *Outbreak* and *Mission: Control the Spread*, and then see a sneak peek at what's coming next. Plus, learn the latest updates on First Friday, our Planetarium star shows and more.

Finally, I encourage you to take a look at some of the incredible stories from our Youth Exploring Science (YES) Program, including three amazing YES Teens competing in the Network for Teaching Entrepreneurship (NFTE)'s Regional Competition, the YES Program's community activities with the University City School District and Summertime Science's adventures in exploring aerospace.

As I said, science is all around us. So, who's ready to explore?



Sincerely,

Todd Bastean  
President and CEO

**To ignite and sustain lifelong science and technology learning.** Mission of the Saint Louis Science Center

Connect with us for updates, special events and fun science.



## Hours

Thursday–Saturday 9:30am - 4:30pm  
Sunday 11am–4:30pm  
Closed Tuesdays & Wednesdays  
Holiday Hours: See Calendar Insert

## Contact

314.289.4400  
[slsc.org](http://slsc.org)  
Saint Louis Science Center  
5050 Oakland Avenue  
St. Louis, Missouri 63110

## Membership

Services & Sales: 314.289.4491  
[slsc.org/membership](http://slsc.org/membership)  
[memberships@slsc.org](mailto:memberships@slsc.org)  
Member Reservations: 314.289.4424

## Reservations

Advance Sales & Group Reservations:  
314.289.4424

## Education

Field trip information:  
[slsc.org/field-trips](http://slsc.org/field-trips)  
Educator Resources:  
[slsc.org/educator-resources](http://slsc.org/educator-resources)  
Programming information:  
[education@slsc.org](mailto:education@slsc.org)

## Events

Host your next private event at the Saint Louis Science Center. Services and catering provided by Saint Louis Science Center Events. For information: 314.533.8179

## Accessibility

Complimentary wheelchairs and strollers available in the lobby. Motorized scooters are available for a rental fee. Personal Hearing Assistance Devices available at the OMNIMAX® Theater and Planetarium. Captiview captions devices available for all OMNIMAX films.

## Official Partners

The Saint Louis Science Center gratefully acknowledges the support of our Official Partners.



## Features



Saint Louis Science Center Model

### 4 Anniversary

On November 2, we will officially celebrate the opening of the 5050 Oakland Building. In honor of this anniversary, we take a look at a time capsule that was created and buried by the Science Center team in the late 80s.

### 8 Membership Matters

Learn about the new benefit we are launching for you—the Member Access Portal. This new site will be your one-stop shop for educational content and announcements. Plus, reflect on member events we have had this past year.

### 10 Science Today

Take a leap into a black hole with a look at what we can learn from these intergalactic objects. Marco Cavaglia, Professor of Physics at the Missouri University of Science and Technology, takes us on a journey of physics, astrophysics and the unknown.

### 14 Gallery Spotlight

September 21st marks the Worldwide Day of Play and our early childhood program, *Discover Science With Me*, is celebrating with your little scientists. Find out how learning through play makes a huge impact on the development of our young learners.

### 22 Community

The Youth Exploring Science (YES) Teens reflect on their summer education and the Summertime Science series that took them out of the classroom and into the community.



Engage with *NewScience* in a more interactive way. If you see this icon, head to [slsc.org/newscience](http://slsc.org/newscience) for extended digital content.



BLAST  
FROM THE  
PAST



Frozen in time.

As you may know, this year marks the 30th Anniversary of the 5050 Oakland Building (when the Saint Louis Science Center built a bridge across the highway to expand its footprint). Before then, the James S. McDonnell Planetarium served as the sole location for science and technology learning since 1963. It wasn't until July 20, 1985 that we coined our hands-on museum the Saint Louis Science Center. As our attendance increased, a bigger space was needed and plans were created for the Science Center's new building at 5050 Oakland Ave.



**1986 Time Capsule**  
Copper plated steel box, sealed shut  
Saint Louis Science Center's Archives

*While we celebrate the 30th Anniversary of the Oakland Building, we also honor 36 years of officially being called the Saint Louis Science Center.*

To preserve and capture the official opening of the Science Center in 1985, staff decided to create a time capsule that coincided with the passing of Halley's Comet in March 1986.

The idea was to seal the capsule when Halley's Comet appeared, and then reopen it in July 2061 when the comet made it back to Earth after its 76-year journey around the solar

system. While we don't know what the time capsule contains, we do know that children were invited to write letters to their grandchildren who may see Halley's Comet during its next visit. Those letters and the other materials were placed inside the capsule on April 13, 1986.

# The Day We Opened To The Public.



## 5 Science Discoveries from 1991

1991 was a moment of radical scientific and technological change leading to the advancement of science that is evident today. Below are some of the major milestones and discoveries that shaped the year we expanded the Saint Louis Science Center.

### World Wide Web

The WorldWideWeb (W3) is a wide-area [hypertext](#) information retrieval initiative aiming to give universal access to a large universe of documents.

Everything there is online about W3 is linked directly or indirectly to this document, including an executive summary of the project, [Mailing lists](#), [Index](#), [November 93 issues](#), [Frequently Asked Questions](#).

**What's out there?**  
 Pointers to the world's online information, [subjects](#), [W3 servers](#), etc.

**Help**  
 on the browser you are using

**Software Products**  
 A list of W3 project components and their current status. (e.g. [Line Mode](#), [X11 Style](#))

**NSK/Shop - Servers - Tools - Mail robot - Library**

**Technical**  
 Details of protocols, formats, program internals etc

**Rhizosphere**  
 Paper documentation on W3 and references.

**People**  
 A list of some people involved in the project.

**History**  
 A summary of the history of the project.

**How can I help?**  
 If you would like to support the web.

**Getting code**  
 Getting the code by [anonymous FTP](#), etc.

1

### [AUGUST 1991] THE FIRST WEBSITE

The first website was developed at CERN labs in Switzerland by Tim Berners-Lee. The page was dedicated to information about the newly developed World Wide Web. **Thirty years later, there are now over 1.84 billion websites on the web.** To say that the internet has come a long way would be an understatement.

*Image credit: CERN*



2

### [SEPTEMBER 1991] COLOR SCANNER RELEASED: HP SCANJET IIC

Though we don't even stop to think about it today, the ability to scan color images into a computer did not exist until 1991. The HP ScanJet IIC was introduced so it could scan documents up to 8.5 inches by 14 inches, allowing consumers the opportunity to preserve color images and documents.

*Image credit: HP Computer Museum*



3

### [OCTOBER 1991] NOTEBOOK COMPUTER (MACINTOSH POWERBOOK)

Though "portable" computers had existed since the 1980s, Apple truly revolutionized portability with its PowerBook computer. The PowerBook included new features such as a built-in trackball and a keyboard that left room for palm rests. It ushered in the era of laptop computing for the everyday workplace and consumer.

*Image credit: Wikimedia Commons*



4

### [OCTOBER 29, 1991] FIRST VISIT TO AN ASTEROID BY A SPACECRAFT

The Galileo spacecraft was the first to closely observe an asteroid on its way to Jupiter (Galileo reached Jupiter in 1995). Taking images of the asteroid, named Gaspra, provided us with a better understanding of the composition of asteroids.

*Image credit: NASA*



5

### [EXACT DATE UNKNOWN, 1991] CARBON NANOTUBES

Japanese physicist Sumio Iijima first discovered and described carbon nanotubes, setting off a period of intense research into nanotechnology. Carbon nanotubes, though only 100 nanometers (0.0001 mm) across, are extremely strong and flexible structures that can conduct electricity and heat. Today, they are used in everything from clothing and sports equipment (ultralight but durable tennis racquets and bicycle components) to medicine (as a scaffolding for bone growth in damaged limbs) and computer technology (extremely small computer chip transistors).

*Image credit: American Chemical Society*

## The grand opening of the new Saint Louis Science Center on November 2, 1991 was an exciting day for all.

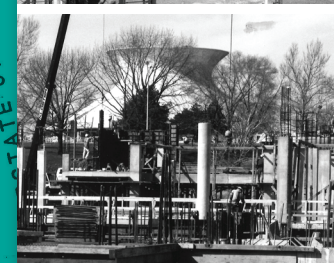
Even with near-zero wind chills, hundreds of well-wishers, community supporters, donors and the Science Center's Max the Robot witnessed the official ribbon-cutting. Brief remarks to the assembled guests outside the building were followed by applause as the ribbon was cut and the public entered the new Science Center for the first time, becoming the 7th largest science center in the U.S. and the 13th largest in the world at the time.

On the grand opening day, thousands of St. Louisans and out-of-town guests showed up to experience new exhibits, shows and activities. The most popular areas were our ever iconic roaring *T.rex* and the bridge crossing Interstate 64 and its radar guns.

The OMNIMAX® Theater, Alien Research Project and Discovery Room all sold out quickly. Early hands-on testing of the exhibits by special guests triggered some alterations to the Science Center's galleries before the public experienced them.

Prior to opening to the public, the exhibits department installed more than 500 new exhibits during a seven-month period in 1991. To create these exhibits, 40,000 square feet of exhibits were shipped in and installed with about half coming from other parts of the country. The galleries incorporated what were coined the Four Ps: primary experience (learning by doing); primary object (seeing the real thing); primary source (hard-core science information); and a positive learning environment.

### A LOOK BACK



See the 5050 Oakland Building being built from the ground up at [slsc.org/5050timelapse](http://slsc.org/5050timelapse).



FIRST LEVEL PLAN



# Upcoming Member Events

Catch up with us virtually or in person at these exclusive member events. We've got so much in store for you.

SEPTEMBER 20



**MEMBER MISSION**  
**WORLDWIDE DAY OF PLAY**

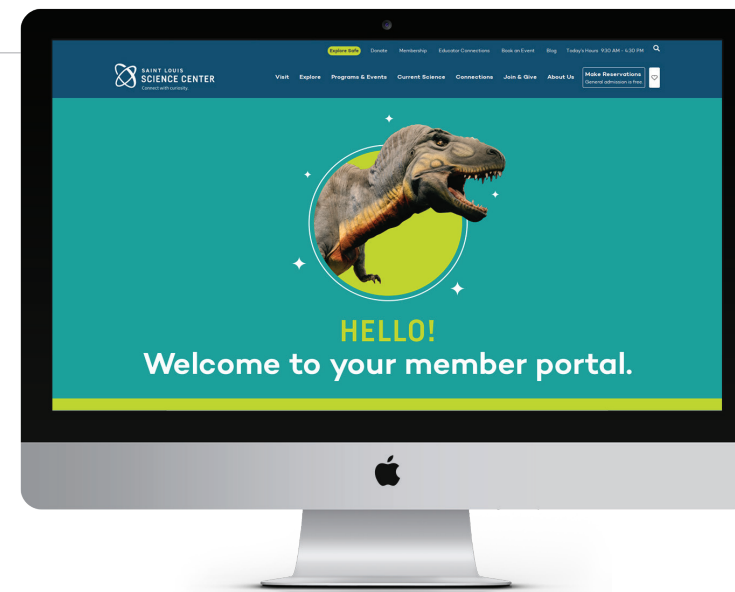
10am, 12pm & 2pm | (5 groups of 5 or less per time slot)  
For details about this event, turn to page 14.

NOW AVAILABLE



**VIRTUAL MEMBER CHAT**  
**CLIMATE CHANGE**

View this prerecorded conversation about climate change, its impact on our world and the ways we can come together as a community to address it.



## Member Access Portal Coming Soon

New Membership Benefit!

We are excited to announce that we are working on an easier way for you to access information, science content, events and announcements—the Member Access Portal. In the near future, you will be invited to join this online membership website dedicated exclusively to our members. The Member Access Portal allows you to learn about upcoming events, view virtual science content and catch up on members-only announcements that you may have missed—all in one place. This tool is a free benefit for members that is focused on keeping you connected to your membership community.

*Look out for your exclusive invite soon.*



## Gift memberships & member gifts

Gifting a Science Center membership unlocks a full year of benefits for someone you care about, whether they're a budding paleontologist or a lifelong learner.

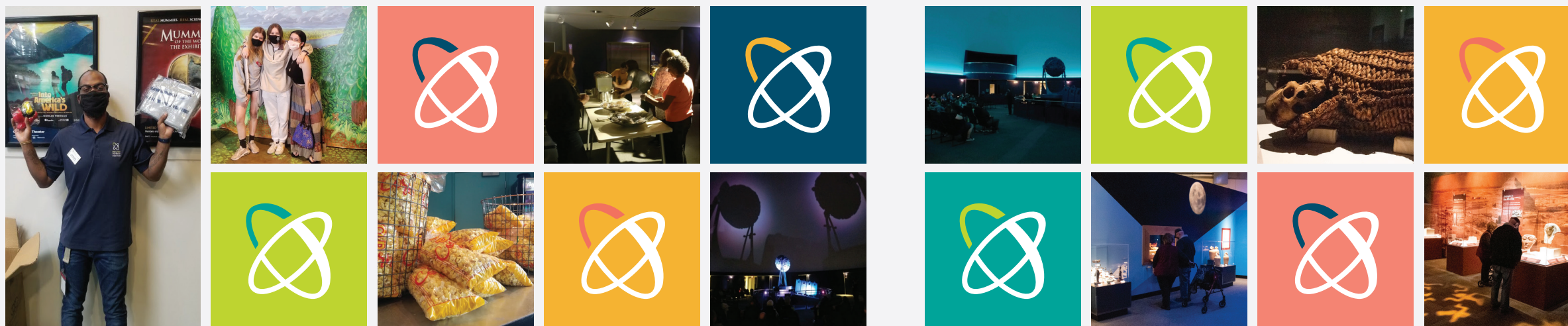


Plus, a membership purchase includes a limited edition, members-only Science Center plush dinosaur.\*

\*While supplies last.

VISIT [slsc.org/memberships](https://slsc.org/memberships) to gift a membership today.

## You make our member events memorable.



# A TALE OF TWO BLACK HOLES

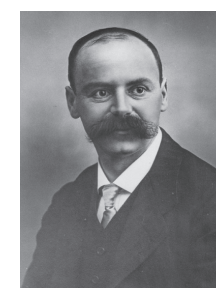
Information provided by Marco Cavaglia, Professor of Physics at the Missouri University of Science and Technology.

© Photo credit: NASA

## As you are reading these words, a catastrophe is about to happen.

Somewhere in the deep recesses of the Universe two black holes are swirling in space at almost the speed of light. In a few seconds they will collide and merge. Most of their energy will be trapped in a region of space from which there is no way out. However, some of it will escape the Armageddon, causing space to deform and time to warp over a cosmic expanse of billions of light years. As amazing as all this may sound, perhaps the most incredible aspect of this story is how we came to understand their physics and how we built instruments capable of detecting these cosmic collisions. Black holes are no match, even for human ingenuity!

Like many stories of human ingenuity, the tale of these black holes begins in a time of tragedy. While in 1915 many were coping with the madness of World War I, north of the Alps, two German physicists were working the math of what, 50 years later, would become known as black holes. Albert Einstein had just published his Theory of General Relativity telling the world that space and time can be molded like rubber. Gravity is not a force, but the effect of the curvature of "space-time."



Karl Schwarzschild, an army lieutenant on the eastern front battling both enemy gunfire and the disease which ultimately killed him, read about Einstein's theory and set his math skills in action. Before his early death just a few months later, he gifted the world with the first exact solution of the equations of General Relativity.

Unbeknownst to both, the Schwarzschild solution would spur decades of theoretical studies and astrophysical observations leading to one of the most astounding discoveries in science—**black holes**.

## What is a black hole?

A black hole is a region of space where gravity is so strong that nothing—not even light—can escape from it. We call this region of space "trapped." The trapped region is separated from the rest of the universe by a surface called the event horizon. The event horizon of a non-rotating black hole has a round shape, like a sphere. Just like the Earth has a gravitational pull and mass, so does a black hole.

Think of what might happen if we could take the Earth and compress it into the size of a marble to concentrate its mass and gravitational pull. Concentrate that pull enough so not even light can escape, and you have a black hole.

The size of the hole is measured in terms of its Schwarzschild radius—the larger its mass, the larger its radius. For a black hole with the mass of the Sun, the Schwarzschild radius is approximately 2 miles. That means if we could compress the four nonillion pounds of hydrogen and helium that make up the Sun in a region of space 2 miles wide, that would create a black hole.

## Can you travel into a black hole? What would happen if you did?

Once an object crosses the event horizon of a black hole, there is no way back. The gravitational field of the black hole warps space-time so strongly that an infinite amount of energy would be required to overcome its pull. One can imagine a black hole as a "waterfall of space-time." No matter how fast you try to swim outward, the inflow of gravity pulls you back. So, if you were to encounter a black hole, would you be doomed? Not so fast! It depends how close you get.

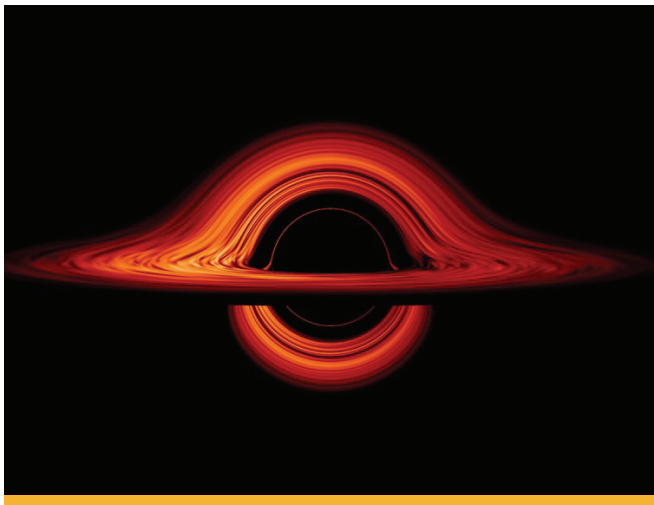
A common misconception of black holes is that they suck in everything around them. If we replaced the Sun with a black hole of equal mass, the Earth would continue on its orbit as if nothing had happened. However, the closer you get to the event horizon, the more difficult it is to break free from its gravitational pull.

Even if it is theoretically possible to get close to a black hole and come back to tell about it, it may not be a good idea to do so. If you were to dive headfirst into one of these cosmic monsters, the black hole would pull on your head more than on your feet. This could lead to what physicists call "spaghettification". If a black hole with the mass of the Sun were located at the Science Center, a person located 100 miles away in Rolla would experience a pull between their head and feet greater than 10,000 times the force due to Earth's gravity. That would certainly be very uncomfortable!

Although it may seem counterintuitive, the larger a black hole is, the flatter its surface, and the weaker its local gravity. Supermassive black holes, weighing millions of times our Sun, like those residing at the center of many galaxies, would not cause the same degree of spaghettification as smaller black holes. In other words, "small" black holes could turn unsuspecting guests into spaghetti, but supermassive black holes would not.

Continued on the next page.





© Photo credit: NASA

(continued)

### What would we experience when passing through the event horizon of a super-massive black hole?

Absolutely nothing! The surface of a black hole is just like empty space. Only if we tried to do a U-turn, we would realize that something is wrong as we would inexorably continue to fall toward the black hole center. Inside a Schwarzschild black hole time becomes space and space becomes time. Since time cannot be made to go backwards, the travel direction cannot be inverted. Since no information can be received from the interior of a black hole, we have no way to know what lies inside. Moreover, the equations of General Relativity break down at the center of the hole. It is likely that General Relativity must be extended or modified, but after 100 years we still don't know how.

While we cannot say for certain what lies inside black holes, General Relativity and astronomical observations show us what happens on the outside. The closer to a black hole, the slower time flows as seen from far away. Therefore, nothing can be seen crossing the event horizon by an outside observer. However, any matter present around the black hole heats up as it falls onto the event horizon. This allows astronomers to infer the presence of the black hole through the emission of highly energetic light, such as X-rays.

Two years ago, the Event Horizon Telescope produced the first ever image of the "shadow" of a supermassive black hole located at the center of M87, a galaxy located about 50 million light years from Earth, on the surrounding accretion disk.

Observing the shadow of an object is not the same as observing the object itself. To be sure that what we observe is really a black hole we must prove an event horizon is present. Black holes are objects made of gravity, so in order to "see" the event horizon we have to use gravity rather than light. General Relativity tells us that if we bump a black hole, it will emit gravitational waves. Much like a struck bell stirs the air around it causing

sound waves, an "out-of-shape" black hole stirs its surrounding space-time producing gravitational waves.

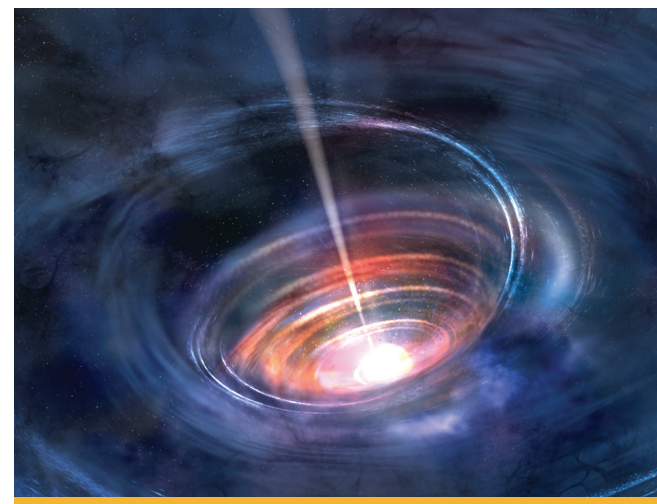
These "ripples of space-time" can be observed with very sophisticated detectors, called laser interferometers, that measure the space-time distortion caused by the waves as they pass through. Black holes produce very distinctive gravitational waves, unlike any other material object. If you can detect one of these waves, you know for certain that it must have been created by a black hole.

On September 14, 2015, a 1.3 billion-year-old space-time ripple, which began with an energy burst greater than the energy of the whole visible Universe, warped the space around Earth by a tiny fraction of the size of a proton. The two twin Laser Interferometer Gravitational-wave Observatory (LIGO) detectors in Louisiana and Washington state observed in unison this minuscule cosmic jolt. The signature of the wave which they recorded was unmistakably that of a collision of two stellar-mass black holes. This event provided the smoking gun that black holes exist as predicted by Einstein, and they can even merge.

One hundred years after their theoretical work, Einstein and Schwarzschild would have been elated by the discovery made by the thousands of physicists, technicians and engineers of the LIGO Scientific Collaboration and the European Virgo Collaboration who built, conceived and operated these amazing detectors through decades of painstaking work.

Five years and tens of binary black hole detections later, we have learned that black holes are ubiquitous in the Universe. They range in size from stellar sizes to supermassive objects as heavy as billions of suns. They collide, merge and grow. They form in catastrophic star collapses. Perhaps some of them came into existence in the very first moments of our Universe. We know that they are not eternal and may disappear in a very distant future in bursts of radiation. Like many other scientific discoveries that started in the shadows of devastating wars, the imagination of Einstein and Schwarzschild has set humanity on a path to knowledge that still continues today.

**That is part of the beauty of science.**



© Photo credit: NASA

# TOP 5

## THINGS PEOPLE SHOULD KNOW ABOUT BLACK HOLES

(according to the author, in no particular order)

- 1 Black holes come in all sizes.**

We only observed black holes with masses ranging from a few to several tens of billions of times the mass of the Sun. However, Einstein's General Relativity tells us that black holes can be created with essentially any mass—from subatomic values to the mass of the whole universe.
- 2 Black holes have no "hair."**

No matter how black holes are formed, the only physical quantities that determine their properties are their mass, spin rate and charge. Like bald heads of the same size, complexion and age look all the same, so do black holes.
- 3 Black holes are not really black.**

Due to the quantum nature of particles, black holes can evaporate by emitting radiation. In other words, they shine (in many shades of) "gray" rather than being pitch black.
- 4 Black holes can merge, but cannot split.**

If you collide two black holes, you can form a bigger one. Astronomers have observed this process tens of times. However, the laws of black hole thermodynamics forbid the reverse process. (Or so we think...)
- 5 Black holes can ring.**

Like a glass partially filled with water can vibrate at a specific frequency, so can a black hole with a given mass. The universe uses a "black hole" harp to play its symphony in gravitational waves.

### STEM EXPERT SPOTLIGHT



**Marco Cavaglia**, Professor of Physics at the Missouri University of Science and Technology, is a native of Italy and earned a Ph.D. in Astrophysics at the International School for Advanced Studies in Trieste. His scientific interests include gravitational physics, astrophysics, theoretical physics and education & public outreach. Cavaglia's previous positions include Professor at the University of Mississippi and a research scientist at the Albert Einstein Institute in Germany, the University of Beira Interior in Portugal, and the Massachusetts Institute of Technology. In addition, Cavaglia shares with his colleagues several recognitions, such as the 2016 Special Breakthrough Prize for the detection of gravitational waves, the 2017 Princess of Asturias Award for Technical and Scientific Research, and the 2017 Albert Einstein Medal.

A recipient of research awards, Dr. Cavaglia authored over 230 publications in peer-reviewed journals.

Read more of his research at [imac.mst.edu](http://imac.mst.edu).

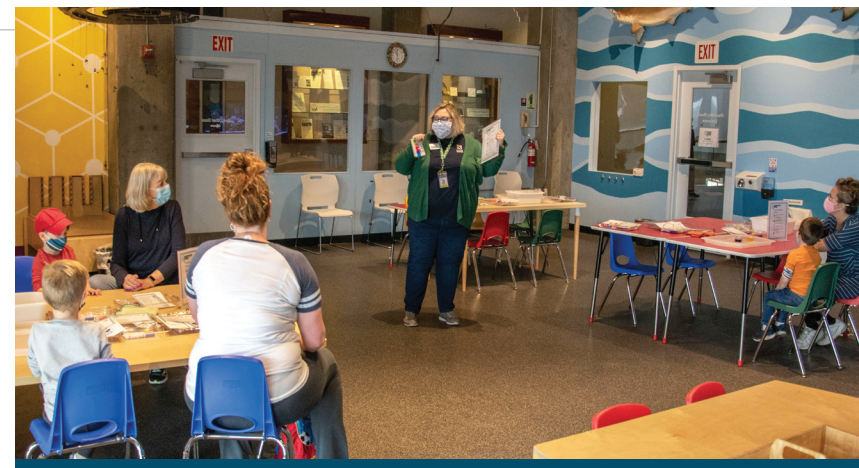


© Photo credit: NASA



# WORK HARD. Play Hard.

**Development and learning start long before a child can walk or talk. More brain development happens in the first five years than at any other time in our lives.** As children grow, we must use every opportunity as a teaching and learning moment, allowing them to explore and discover the world around them. At the Science Center, we recognize the importance of early childhood and strive to create educational content focused on our little scientists in the Discovery Room.



When the Science Center reopened in June of 2020 after the Covid-19 shutdown, safety guidelines and CDC regulations limited the use of the Discovery Room, impacting our early learner program. As a popular destination for our families, we wanted to ensure we could still serve our youngest guests and provide them with impactful science and education programs while creating a safe and quality program. Born from this was *Discover Science with Me*.

This program is designed to inspire wonder and curiosity for young children (ages 3-6) and give adult caregivers the confidence to support their child's learning. Each session, guided and facilitated by a museum educator, features experiments and playful hands-on STEAM experiences for children that are focused on developing motor skills, enhancing language acquisition, encouraging exploration and discovery and helping children deepen their understanding of the world. This allows for a more streamlined and structured class than normal Discovery Room activities. Sessions last 45 minutes and each is centered on a science-related theme (*refer to the calendar insert for a current list of science topics and dates*).

To keep our young ones safe but still provide a fun and joyful environment, guests will sit with their own social bubbles at individual tables that are properly distanced apart. Each group is provided materials to engage in a variety of learning activities connected to the session's theme. Activities may include reading together to learn more about a topic, observing living organisms or scientific objects, performing experiments and creating art. The themes rotate frequently so that guests can experience something different more often.

Since this program started last November, hundreds of families have enjoyed learning, exploring and playing together during *Discover Science with Me*. One of our most popular sessions has been "Tinker Time," where participants learn about the engineering design process and use a variety of loose parts and recycled materials to design, create, or build anything they can imagine.

This program is scheduled to continue in the Discovery Room throughout the remainder of 2021 in order to ensure that our early childhood space is a place where little learners and their grown-ups can come and play together safely.

### Members receive discount tickets

To learn about safety protocols and procedures, please [visit slsc.org/discover-science-with-me](https://slsc.org/discover-science-with-me). | **Member Discount:** \$20 per table (reg. \$25 per table)—Up to 5 people per table | **Call** 314.289.4424 to make your reservations today.

*See Calendar Insert for Upcoming Sessions.*



**EARLY CHILDHOOD  
FREE MEMBER EVENT!**

### Member Mission: Worldwide Day of Play

September 20 | 10am, Noon & 2pm |  
Discovery Room

Who knew learning and playing could go hand in hand? On Monday, September 20th we will celebrate the national Worldwide Day of Play that encourages children to step away from electronic devices and to just be kids and PLAY. To support this important concept, we are having a members-only event for our youngest players.

Members are invited to choose one of three scheduled *Discover Science With Me* sessions focused on the art of play. Participants will have the opportunity to play with and explore (and decorate!) a variety of spinning tops during the session. All guests will receive a treat upon exit.

Free reservations will open August 30.  
Spots are limited.

### DISCOVER MORE

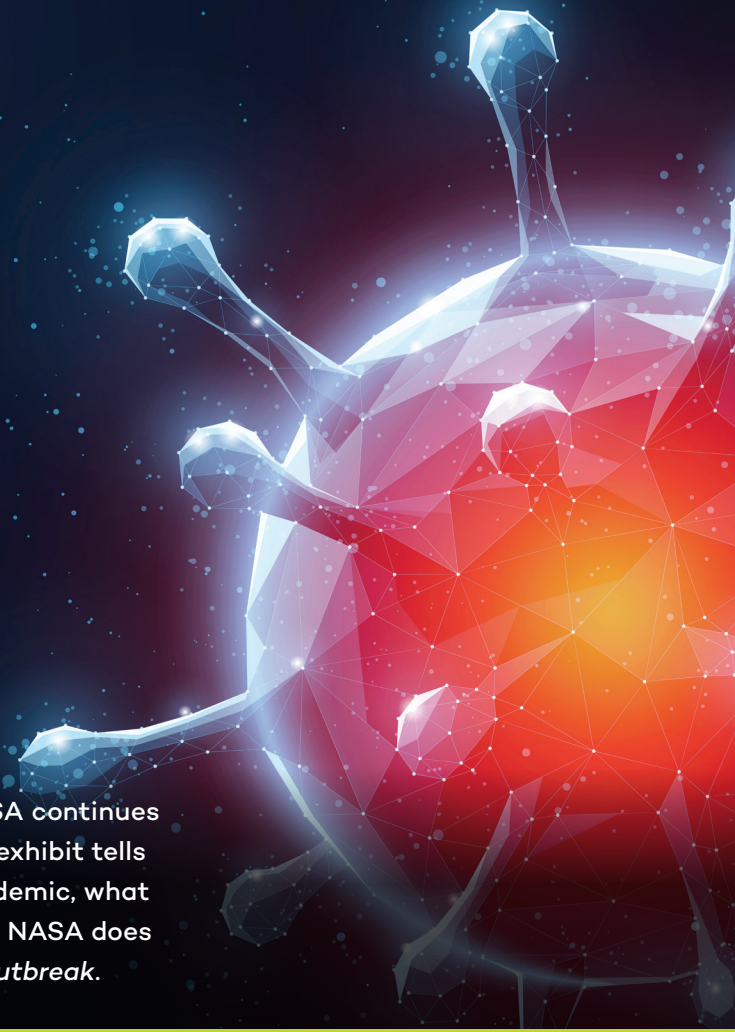
Watch *PLAYed*, a short film that discusses the importance of play in early childhood development from experts from around the world.





FREE PLANETARIUM TUNNEL EXHIBIT  
CLOSING LATE FALL

# MISSION: CONTROL THE SPREAD



Our new exhibit, *Mission: Control the Spread*, shows how NASA continues to innovate to overcome obstacles to benefit humanity. The exhibit tells the story behind NASA's innovations working to end the pandemic, what people can do to slow the spread of the coronavirus and what NASA does to keep astronauts safe. For more information, visit [slsc.org/outbreak](https://slsc.org/outbreak).



NEW! PLANETARIUM TUNNEL EXHIBIT

## Coming Soon: Inside the Vault

Have you ever wondered what treasures are in the Saint Louis Science Center's Collections? Step Inside the Vault, take a peek, and find out!

This fall, the Science Center will open an exhibition in the tunnel that will give guests the opportunity to gaze in wonder at some of the amazing artifacts and specimens from the Collections. **This will be the largest display of Collections objects in 30 years!**

Called *Inside the Vault*, the exhibition will showcase a remarkable variety of objects that illustrate the breadth and uniqueness of our Collections. **Why a vault?** Designing the exhibit space to look and feel like a bank vault helps to give a sense that you are stepping into a secure vault to store precious objects. All the items within the Science Center Collections are precious objects to be preserved and protected.

For more than 160 years, numerous individuals and groups have donated to the Collection, building it up to over 100,000 artifacts and specimens. Several of those individual donors were serious collectors who spent years amassing large collections based on their personal interests or field of study. This exhibition will feature the collections of six individual donors, highlighting some of the best and most interesting artifacts and specimens in each.

What can learning about these collections tell us about why humans have a desire to collect? What do YOU find interesting about these collections? What connections or differences do you see between the collections that makes you want to learn more? Help us to discover what about these collections, and collecting, inspires you and ignites your curiosity.

**So what's in the vault?** First is the *Hansen Mineral Collection*, which includes some beautiful and stunning minerals collected from all over the world. Next is the *Morton Lighting Collection*, which includes various lamps and lighting devices from all over the world and across time (over the past two thousand years). Also included is the *Barker Shell Collection*, which boasts more than 4,000 shells! Additionally, there is the *Davis Miniature Collection*, a fascinating collection of miniature statues and other objects representing both human and animal forms. Next is the *Stinchcomb Fossil Collection*, which includes fossils of marine creatures, plants, and mammals. Finally, the vault will feature the *Grimm Elephant Collection*, which is a collection focused on this majestic animal.

We hope you join us "inside the vault" to discover these fascinating artifacts for yourself and to learn more about what it means to collect.

### WHAT'S NEW? Galleries & Programs

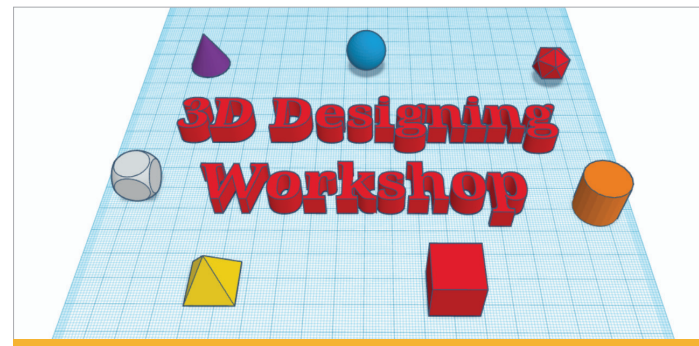


#### Energy Stage Shows

Join us for exciting and entertaining demonstrations using fire, electricity and more. Educators will ignite and deepen the curiosity of the Energy Stage audiences by showcasing all areas of STEM.

Energy Stage shows take place daily:  
10:15am | 11:15am | 12:15pm | 3:15pm

For more information, visit [slsc.org/energystage](https://slsc.org/energystage).



#### Makerspace

3D Designing Workshop  
September–November | 2–4pm

Come to Makerspace this fall and try your hand at 3D design. Guests will learn the basics of manipulating structures and shapes with a computer.

For more information, visit [slsc.org/makerspace](https://slsc.org/makerspace).

# FIRST FRIDAYS *are back!*

All First Friday events will take place from 5–9pm.  
Visit [slsc.org/first-fridays](https://slsc.org/first-fridays) for updates and schedules.

Please note: First Friday events will follow all existing Saint Louis Science Center health and safety guidelines, including capacity guidelines. Visit [slsc.org/expo-safe](https://slsc.org/expo-safe)



## SEPTEMBER 3 Nintendo Night

It's "game on!" at our Nintendo Night First Friday, featuring all things games and gaming. Activities will include featured speakers, trivia, local game developers, and an Esports showcase. The event will wrap up with a special screening of *Detective Pikachu*.



## OCTOBER 1 Tim Burton's *The Nightmare Before Christmas*

Kick off the spooky season with an evening celebrating the weird and wonderful worlds of Tim Burton. See feature presentations, participate in trivia, and learn the real science behind Burton's films. See a screening of *The Nightmare Before Christmas* at the end of the night.



## NOVEMBER 5 Star Trek

Boldly go to our November First Friday featuring *Star Trek*! We will be commemorating the 55th anniversary of the original *Star Trek* series with special educational activities, trivia, featured speakers, and food and drink specials. End the evening with a screening of *Star Trek: Beyond* (2016) in IMAX.

9:30AM-4:30PM | NOVEMBER 13

## SciFest: Creativity and Innovation Celebration

The Science Center's Oakland Building is turning 30! Join us for a free day-long event celebrating creativity and innovation not only at the Science Center, but also in our region. Learn alongside local innovators, artists, tinkerers and STEAM experts. Enjoy a variety of hands-on activities, and find inspiration for your own creativity.

You can visit [slsc.org/scifest](https://slsc.org/scifest) for the most up-to-date information.



# MUMMIES OF THE WORLD THE EXHIBITION

EXTENDED! CLOSING OCTOBER 3



SAINT LOUIS SCIENCE CENTER

## Esports

COMPETITIONS & OPEN PLAY  
Unlock the gamer in you.

Visit [slsc.org/esports](https://slsc.org/esports) for schedules and [slsc.org/gatewaylegends](https://slsc.org/gatewaylegends) to learn about the Science Center's esports participation in Gateway Legends.

# TYRANNOSAURS MEET THE FAMILY

OPENS OCTOBER 30!

Member Preview Night: Details To Come



OCTOBER 29-30 | FREE | FAMILY FRIENDLY

## Science

# Spooktacular

Get ready for science thrills!

Halloween-themed activities include spooky science shows, hands-on activities, movies and more. Details to come.



# Documentary Films at the OMNIMAX® Theater

Whether you are looking to see one of our immersive documentary films or want to experience a feature-length film, the OMNIMAX Theater has some great choices for you this fall. As always, members receive free documentary film tickets and discounted feature-length film tickets.

Visit [slsc.org/omnimax](https://slsc.org/omnimax) for film schedules.



OPENS OCTOBER 30 | DOCUMENTARY FILM

Roam the primitive forests and thick swamps with bizarre dinosaurs and colossal amphibians. Enter a surreal world of bug-eyed giants and egg-laying mammals—where survival means enduring the sunless, six-month polar winter surrounded by meat-eaters with night vision. Join intrepid Antarctic scientists on a quest to understand the ice continent's profound transformation—and to predict the future as humans drive dramatic change.

Welcome to the lost prehistoric world of Gondwana. Welcome to Antarctica.



CLOSES SEPTEMBER 30 | DOCUMENTARY FILM

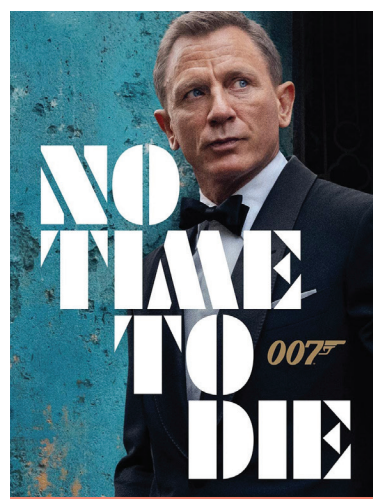
Join this amazing adventure to save California's enchanting Channel Island Fox, China's fabled Golden Monkey and the wondrous migrating crabs of Christmas Island.



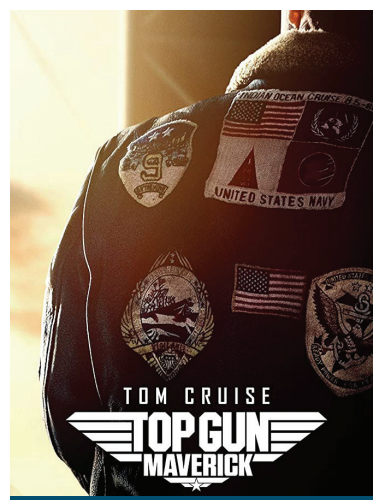
NOW PLAYING | DOCUMENTARY FILM

A non-stop ride via kayak, bike, train, hot air balloon, zipline and more, *Into America's Wild* explores some of the most beautiful but little-known landscapes of North America.

FEATURE-LENGTH FILMS  
MEMBER PRICE: \$11.95



OPENS OCTOBER 8



OPENS NOVEMBER 19

FREE FOR MEMBERS EVERY DAY

# McDonnell Planetarium Star Shows!

Enjoy the beauty of the nighttime sky during the middle of the day at the McDonnell Planetarium. Our star shows are guaranteed to impress and feature a variety of different shows for all ages. For more information on schedules and shows, visit [slsc.org/planetarium](https://slsc.org/planetarium).



◀ **FEATURED STAR SHOW**  
**LIVE SKY TONIGHT**  
SHOWING DAILY

Just like the sky, this live show is different each day to bring you the changing stars, planets and current astronomy news over St. Louis. You can see this show as many times as you like and you will continue to learn something new each time.

▶ **RETURNING FOR THE HOLIDAYS**  
**SEASONS GREETINGS**  
OPENING, NOVEMBER 26

Explore the nature of our seasons and why the winter solstice has long been a time of celebration in this live star show.



◀ **BACK BY POPULAR DEMAND!**  
**LASER LIGHT SHOWS**  
OCTOBER 22–OCTOBER 31

The laser show series fuses music, laser artwork, immersive lighting and 3D-atmospheric effects to create an unforgettable live experience.

**\$9.95 Members | \$10.95 Non-Members**

Visit [slsc.org/lasers](https://slsc.org/lasers) for schedules and information.  
Tickets On Sale October 1.

## ASTRONOMY DATES!

Come to the Planetarium to learn more about these special events.

**SEPTEMBER 22**  
**First Day of Fall**

September 22nd is the autumnal equinox, or the first day of fall!

**OCTOBER 21-22**  
**Orionids Meteor Shower**

The annual Orionids Meteor Shower will peak on the night of October 21.

**NOVEMBER 19**  
**Lunar Eclipse**

A midnight lunar eclipse will be visible in the St. Louis region this November.

**COMING NOVEMBER**  
**Details To Come**

Join us as we live-stream the event for NASA's James Webb Space Telescope launch in November.



Saint Louis Science Center President & CEO Todd Bastean, Loeb Prize Finalist Jennifer Adams, Loeb Prize Runner-up Devon Lahr, Loeb Prize Winner Susan Zareh, Saint Louis Science Center Trustee, Loeb Prize Donor and Mathematics Teacher of 58 Years Carol B. Loeb, Loeb Prize Finalist Laura Schowalter, and Loeb Prize Finalist Elizabeth Walsh-Rock

THE CAROL B. AND JEROME T.

# LOEB PRIZE

FOR EXCELLENCE IN TEACHING SCIENCE AND MATHEMATICS



2021 Loeb Prize Winner Susan Zareh from Forsyth School

On May 20, Susan Zareh from Forsyth School was awarded the 2021 Carol B. and Jerome T. Loeb Prize for Excellence in Teaching Science and Mathematics.

Carol B. Loeb presented the award to Susan as well as the other finalists—Devon Lahr (2nd Place) from Mehlville School, Jennifer Adams from Clayton High School, Laura Schowalter from Nipher Middle School and Elizabeth Walsh-Rock from STEAM Academy at McCluer South-Berkeley.

The awards ceremony took place in the OMNIMAX® Theater and was attended by the teachers and their invited guests. 2021 marks the 26th year the Loeb Prize has honored outstanding science and math educators in the St. Louis area.



## YES at 2021 NFTE Regional Competition

This year, the Saint Louis Science Center's Youth Exploring Science (YES) Program competed in the Network for Teaching Entrepreneurship (NFTE) Regional Competition. Two YES teen businesses advanced to the final round, which consisted of the top three NFTE businesses in the region.

YES Teens Kira Miller and De'Mea White are founders and co-CEOs of Ms. Curvvy, a business that boosts girls' self-confidence through apparel and accessories and provides a support group. Ms. Curvvy won 2nd place in the region and \$1,000. YES Teen Nehtia Hazelwood is the Founder and CEO of Nerve Beauty, a business that helps kids embrace their cultural identity and unique names through customizable accessories. Nehtia won 1st place in the region, a prize of \$1,500, and the Regional Entrepreneur of the Year Award. The NFTE finalists were presented their awards on May 20.

Congratulations to Kira, De'Mea, and Nehtia as they make their way to Nationals.



## On-the-Job Training

We are proud to be able to offer senior YES Teens the opportunity to participate in **On-the-Job Training (OJT)** internships during the summer. Through the OJT internships, YES Teens have an opportunity to grow and exercise their skills to complement their current curriculum in the YES Program, while simultaneously learning new systems in their OJT placements.



As they put their new work skills to practice, the YES Teens are learning real life work experience through offsite programming. Some help serve their community by providing fun STEM programming to young campers. Other areas the YES Teens have been able to work include the Exhibitions Department, Guest Services Department as well as working within Science Center galleries.



## Looking Outward

As a way to turn their efforts outward, the YES Program took a variety of hands-on STEM activities to area sites throughout the St. Louis Metropolitan area. Through this initiative, this community outreach program was able to reach 300 campers, ranging from 1st–5th grade in the University City School District. Summer activities included teaching campers about plants and the importance of pollination, how they can make an environmental impact on their own community, how to use their own creativity and the engineering design process to invent gadgets, and many more STEM initiatives.



## Science in the Sun

During the summer, the Youth Exploring Science (YES) Program educates guests through Summertime Science—a free educational program that is led by the YES Program's youngest teen employees. The YES Teens are responsible for leading classes that teach about science, technology, engineering, art, and mathematics.

This year, the Summertime Science program's theme was Aerospace in partnership with Boeing. Throughout the summer, YES Teens taught in-person and virtual learners about aerospace, forces of flight, and the types of chemical reactions that launch rockets. A special thank you to Boeing and our community partners for another successful summer.



“ Now more than ever, we are reminded of the importance of the food production process. Missouri beef producers work every day to produce a variety of beef choices that are wholesome and for families across our state, nation and the world, and as a cattleman myself, I was proud to present a proclamation officially recognizing May as Beef Month in Missouri. ” — Governor Parson

**Governor Parson's Beef Proclamation Presentation**

Featured left to right: Nathan Martin, Missouri Beef Industry Council Chairman of the Board; Governor Mike Parson; Marvin Dieckman, past president of the Missouri Cattlemen's Association; Todd Basteen, President and CEO of the Saint Louis Science Center; Chris Chinn, Director of Missouri Department of Agriculture.

# Celebrating National Beef Month with Missouri Beef Industry Council

This May, the Science Center's GROW Gallery celebrated National Beef Month with a variety of activities and events including a special visit from Governor Mike Parson who presented a proclamation declaring May as Beef Month in Missouri.

Take a look at some of the highlights from the Beef Month celebration of our region's hardworking farmers and ranchers, the animals they care for and the role agriculture plays in food production from harvest to home.



**Beef Day in the GROW Gallery**

Our friends from the Missouri Beef Industry Council came out and answered guest questions about beef. Guests took part in fun activities, presentations and giveaways, and even had the chance to meet Benny the Bull!



**Governor Parson tours the GROW Gallery**

During his visit, Governor Mike Parson talks with Bill McLaren, owner of Crooked Creek Beef, as they admire Bill's red angus beef cow. Bill and his wife, Linda, were recently selected as the farm family of the year by Franklin County.



**Philanthropic Partnership Supports Operation Food Search**

The Governor highlighted the importance of food insecurity issues through the "buy-one, give one" pound of ground beef campaign, a philanthropic partnership supported by Missouri Beef Industry Council, Dierbergs Markets, Illinois Beef Association, Missouri Corn Growers Association, St. Louis County Farm Bureau and St. Clair County, Illinois Farm Bureau benefiting Operation Food Search.



## CASE IH Renews Its Support of the GROW Gallery

GROW Founding Partner CASE IH renewed its support for agriculture educational programming, activities and events for another six years.

“We are thrilled to renew our partnership with the Saint Louis Science Center and the GROW gallery,” said Scott Harris, VP North America, Case IH. “At Case IH, we strive to teach the importance of farming, where food comes from and how it’s grown. The GROW gallery is a valuable, educational asset that allows people of all ages to better understand the agriculture industry.”

### Local Farm Family Purchases GROW CASE IH Combine

This June, the Richters from Richter Farms in Trenton, Illinois, stopped by GROW to pay a visit to their new CASE IH combine. The Richters are excited to take this combine home to the farm where they’ll put it to use harvesting corn and soybeans. CASE IH will deliver another new combine to GROW for guests to climb inside and learn about the important role this massive piece of equipment plays in farming.



### St. Clair County, Illinois Farm Bureau Supports Our Newest Flock of Chickens

Recently, guests have greeted a new flock of chickens in our outdoor GROW Gallery thanks to a generous donation from the St. Clair County, Illinois Farm Bureau. The St. Clair County, Illinois Farm Bureau supports the beautiful new flock of chickens as well as their upkeep and the chicken feed they eat.

NOVEMBER 30, 2021

# GIVING TUESDAY

## This Giving Tuesday, support science for our future.

Giving Tuesday is a global generosity movement unleashing the power of people and organizations to transform their communities and the world. For this Giving Tuesday, we invite you to bring the power of your generosity to science education in the St. Louis community.

The Science Center delivers connections to STEAM (science, technology, engineering, art and math) open for everyone in our community and our region. Access to science education helps us better understand our world and empowers today’s dreamers to become tomorrow’s researchers, coders, engineers and more.

This Giving Tuesday, make a gift to the Science Center in support of open, accessible science galleries like GROW and GameXPloration, free events like SciFest and First Friday, and our daily operation. Or, make a gift in support of our nationally recognized YES (Youth Exploring Science) Program, which for over two decades has provided a pathway to success through STEAM for local teens.

Our mission to ignite and sustain lifelong science and technology learning is powered by the generosity of science supporters like you.

Learn more or make a gift today at [slsc.org/givingtuesday](https://slsc.org/givingtuesday).





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SCIENCE CENTER**

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You can also send us an email if:

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- Your name is misspelled
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Smithsonian Affiliate  
Membership Program



# Be a part of our next 30 years...*and beyond.*

Celebrate the 30th anniversary of the Science Center's Oakland Building with a gift in support of our mission to ignite and sustain lifelong science and technology learning.

From providing the resources to maintain and update our open, accessible science learning galleries like GROW and GameXPloration, to delivering connections to real scientists and STEAM professionals through programs like SciFest and First Friday, to sustaining the Science Center's daily operation, your support helps power science experiences for everyone in our community.

There's never been a better time to support science for our future.

**Make a gift today at [slsc.org/donate](http://slsc.org/donate).**