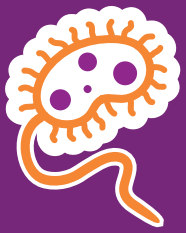

CORNELL UNIVERSITY

MARCH 28, 2026

EYH

expanding your horizons network

powered by techbridge girls

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Expanding your Horizons

Expanding Your Horizons (EYH) is a one-day conference designed to stimulate participants' interest in math and science through hands-on activities, provide diverse scientist role models, and foster awareness of opportunities in math and science-related careers. Students participate in two or three workshops organized by Cornell students and faculty, tour state-of-the-art lab facilities on Cornell's Ithaca campus, connect with peers and mentors, and learn that anyone with a curious mind has what it takes to pursue a future in STEM! Other highlights of EYH include a keynote speech by a prominent woman scientist and interactive scientific demonstrations that participants and their parents can access throughout the day.

EYH at Cornell officially began in 1988. In 1987, a group of graduate students invited about 30 girls and parents to Cornell to discuss the benefits and impacts of math and science. The grad students discussed their degree programs, thesis projects, course work, and how math and science had helped them. The girls asked questions about different majors, job opportunities and difficulties they might face. The girls said that they would like to do some experiments the next year and EYH was born. In 1988, we found the EYH Network (now powered by Techbridge Girls) and conducted a conference very similar to what is still run today.

From the beginning, Cornell's EYH Conference has been organized and run by (mostly) graduate student volunteers from departments all over Cornell. The number of workshops, focused on hands-on science exploration, has increased from 15 to over 30. In 2014, we expanded our capacity to accept 500 students. Since then, EYH has continued to reach thousands of young, diverse scientists of any gender identity with our annual conference and, with the ongoing support of the entire Cornell community, looks forward to serving students in the upstate NY region for many years to come.

KEYNOTE

Arachnophilia: Sharing a passion for spiders and exploration

Dr. Linda Rayor, PhD
Senior Lecturer Emerita in the Department of Entomology

Dr. Rayor studies spiders around the world and will share how she has combined a passion for animal behavior, travel, and talking to the public about science!

About Dr. Linda Rayor

Linda Rayor is a Senior Lecturer Emerita in the Department of Entomology at Cornell University where she has taught courses on insect behavior, spider biology, and the social behavior of animals. In addition to her teaching and research contributions, Dr. Rayor started the Naturalist Outreach Program which, since 1998, has sent Cornell Graduate and Undergraduate students into K-12 classrooms to inspire students to learn more about our natural world and current trends in conservation work. To date, she and her students have given over 2800 presentations to over 114,000 people. She has dedicated her career to scientific outreach and producing educational content STEM content for all ages.

Dr. Rayor received a B.A. in Molecular Biology from the University of Colorado – Boulder and a Ph.D. in Systematics and Ecology with a focus on Behavior Ecology from the University of Kansas – Lawrence. She joined the Department of Entomology at Cornell in 1994 and has passionately pursued scientific outreach since. She hosted two seasons of the show 'Monster Bug Wars' on the Discovery Channel which produced entertaining and educational content on the behavior of predatory arthropods. In addition, she has produced 37 nature-focused educational videos on the YouTube channel NaturalistOutreach, which have currently been viewed more than 4.2 million times.

Dr. Rayor is the recipient of multiple awards including multiple distinguished teaching awards from Cornell University, the Entomological Society of America, and the Animal Behavior Society. She has published over 30 peer-reviewed research articles and given talks around the world on the behavior of spiders. She is also the organizer of Insectapalooza, a 1-day fair showcasing the wonderful world of insects to the local community. Insectapalooza is one of the largest science outreach events at Cornell University and showcases hundreds of live specimens for interactive learning.

Lab Tours

1. Marine InvertebrateBiodiversity
2. Powering Up Plasmas!
3. Lots and Lots of Robots! (Robots and insects)
4. Ovary Observatory
5. Explore Space Without Leaving Earth
6. How to Discover New Catalytic Reactions
7. X-rays: Seeing the Invisible
8. How Not to Eat Fungicides and Other Lessons From Mass Spectrometry
9. Lighting Up with Colorful Perovskites
10. Cosmology Lab Tour
11. From Metals to Alloys
12. Neurons in Action: Recording from the Living (Mouse) Brain
13. Microstructural Evolution under Impact with Lego Blocks
14. Exploring Light & Matter: Inside the Laser Lab
15. Fashion Meets Future Tech
16. My Amazing Brain: A Tour of the Cornell MRI Facility
17. Our Actions and Brain Activity: Exploring the EEG Facility

Demos

Check it out at breakfast too!

1. Cornell NanoScale Facility Virtual Reality Experience

2. Building a Brain
3. Oobleck: the Dr. Seuss Science Experiment
4. Crafty Neuroscience!
5. Oil and Water: Can They Ever Get Along?
6. How Computers Make Clothes: From Digital Design to Laser Cutting and 3D Printing
7. Fun with Fluid Dynamics
8. Laser Waterfall
9. Additive Manufacturing
10. Bend It, Don't Break It! Engineering Strong Shapes
11. Candy Crystals: Building Unit Cells from Sweet Treats
12. CROPPS-in-a-Box: Plants That Can Text!
13. The Secret Double Life of Damseflies
14. Skin Detectives: A Microscopic Tour of the Body's Biggest Organ

JUNIOR SCIENTIST

2026 EYH WORKSHOPS

1. Beyond Bacon: Why Fats are so Important

Fats are a major component of some of our favorite foods, from bacon, to ice cream, French fries, and potato chips, but that is not all that fats are or do. This workshop delves into the amazing world of unique roles that they play in our bodies. Fats help keep animals warm in the winter, hold your body's cells together, keep you from turning into a mummy, and so much more. Join us to learn how they do it!

2. Reverse Your Tastebuds

How do we differentiate the tastes of so many different foods? How does our tongue work to allow us to taste sweet, salty, or sour? Wouldn't it be nice if vegetables tasted sugary sweet? Well, maybe they can! The miracle berry fruit contains a compound that will turn your taste buds upside down! With this workshop, discover the science behind taste and the molecular signaling events that make it all possible.

3. Mushroom Mafia

Do you have what it takes to survive the mushroom mafia? Fungi partner with just about every other organism on Earth and it can be tricky to figure out when they are friends or foes. Come decipher these bizarre fungal relationships through our mafia-inspired game and by seeing them in detail for the first time under the microscope!

4. Exploring Math: Patterns and Puzzles

Do you know how to win games every time? Or how to calculate and maximize your chances of winning a game? Or what happens when you can teleport across the board while playing tic-tac-toe? We will explore these ideas using twists on common games, trying to introduce notions of strategy and mathematical analysis.

5. Seeing the World Differently: A Dissection-Based Exploration of Eye Variation

Why do goats have rectangle pupils? How can cats see at night? Come learn about how eyes work and how they vary between animals. In this workshop, you will learn about how eyes work through hands-on dissections.

6. Someone Call the Plant Doctor!

Somebody call the doctor… the plant doctor! Have you ever wondered what's spoiling your favorite fruits and veggies? Plants can get sick, just like you. Take a trip with us to the lab and solve the mystery of what is killing your tomato plants, ruining your strawberries, and making your potatoes a rotten mess!

7. Bouncing into Polymer Chemistry

Making useful items like sticky glue, rechargeable batteries, and plant-based plastic is all part of polymer chemists' daily jobs. In our workshop, we'll explore how chemists string together long chains of atoms to create polymers, and how they build different materials from these polymer chains. Come make your own custom stretchy slime and bouncy balls from polymers, which you can take home with you!

8. Enigmatic Magnetics

What do computer memory, hydroelectric power and electric cars have in common? Magnetism! Magnetism is used every day to encode information on computers, harvest clean energy to power our cities and power electric cars. Explore how the technology of tomorrow will use magnets!

9. Splat Science: High-Speed Metal Impacts

Ready to smash some science? Traditional manufacturing uses extreme heat, but in our lab, we use supersonic speed! In this workshop, you'll discover how Kinetic Energy (motion) can bond metals instantly. You will step into the shoes of a researcher using our "Human Cold Spray" setup, experimenting with velocity by launching clay "particles".

10. Fueling Your Gut Reactions!

Did you know that there are TRILLIONS of tiny microbes living inside your gut? Scientists refer to this community of microbes as the gut microbiome. In this workshop, you will learn about the chemical reactions these microbes carry out, both inside your intestines and during the production of some of your favorite foods. Join us to build a gut model (out of cake!) and get hands-on with some of these chemical reactions!

11. Colorful Chemistry Detectives

You've probably used different brands of black markers before, but did you know that although they all look black on paper, each company uses different mixtures of dyes? Explore the chemistry of colorful dyes by making your own dye from crushed bugs, study the effect of chemical interactions on your dye, and make some cool art along the way! As a synthetic chemistry detective, see if you can use chromatography to figure out the brand of your mystery marker and then mystery solved!

12. Invisible Rainbows: The Secrets of Light

Did you know that white light from everyday sources like light bulbs, the suns, or mobile phone screens contain hidden colors? In this workshop, you'll uncover these "invisible rainbows" by building your own spectrometer--a tool scientists use to split white light into its colorful spectrum. But that's not all-discover why regular water stays colorless under blue light while tonic water glows bright blue and create your very own lava lamp with your favorite colors. You can even take them home!

13. Cell City Relay

Have you ever wondered how the tiny cells that make up our bodies ultimately govern everything that we do? Or how your cells communicate with each other to fight off pathogens? Join us as we shrink down to become the organelles inside of a cell and conduct our own cell signaling relay race. You'll also get to stain a slide with your own cells and see different cell types under the microscope!

14. Black Widow vs. Wonder Woman

Ever wonder what you have in common with Black Widow and Wonder Woman? Your body does amazing things and you just don't know it! Like the super spy Black Widow, it can decode secret messages. It can also make sure your cells only tell the truth when talking to other cells, just like Wonder Woman's Lasso of Truth! These superpowers help make us who we are and allow us to do incredible things. Come discover how "super" you are and better understand some of your favorite heroes!

15. Holey Cow

How do cows turn hay into milk? Come meet Sunny, our fistulated cow, and explore a cow's stomach and experience aspects of life as a dairy cow. Learn what cows eat and how food gets digested. You will get to place your hand in a cow's stomach (called a rumen) and look at its contents under a microscope.

16. How Thin Can It Go?

Have you ever wondered how small the smallest materials are? Join us to go through the scales, all the way down to the one atom limit! In this workshop, you will search through a variety of samples, looking at smaller and smaller objects. Then, we will observe the current functionality of these materials as manipulatable conductors (using just pencils and paper!) as well as the potential future as superconductors (what does that even mean?). Discover how nanoscience is shaping the future of technology!

17. Microplastic Detectives: What's Hiding in the Sand?

Can you us help find the tiny clues hiding in beach sand? In this hands-on workshop, you'll become a microplastic detective, using a static charged filter to pull tiny plastics out of sand collected from across the East Coast. Then we'll head to the lab, use microscopes to examine the plastic pieces up close, and ask: what might these pieces have been before they broke down? How did they end up in the sand in the first place? What do our results tell us about how we use plastic, how we throw it away, and how those choices affect the surrounding world?

18. Googling with Paper Airplanes

Have you ever wondered how computers talk to each other? How a video from California gets onto your phone in New York? Would you like to throw paper airplanes? In this workshop, you will learn how the internet works by throwing paper airplanes!

19. Program Your Own Animation!

Interested in how animators make cartoons fly? Do you love puzzle games? If you've ever wondered about what it takes to make something creative with the computer, this workshop is for you! We will teach you the basics of Scratch, a popular free program, to make characters fly. We'll teach you computer science techniques to make your animations super cool with interactions and fun effects! Come make animations and discover how the inner details of programming can help you create!

20. Have You Ever Seen a Human Brain? Exploring the Human Brain Collection

Have you ever wondered what a real human brain looks like up close, or even what it feels like? In this hands-on workshop, students will explore Cornell's human brain collection to discover what makes the human brain so special, and how it is also remarkably similar to a sheep's brain. Students will touch, observe, and explore real preserved human and sheep brains to learn how structure supports function, how different regions shape behavior, and how scientists study the brain to understand health and development.

21. Fantastic Living Forms and How to Reconstruct Them

From macro- to microscopic levels, how do living organisms grow to create complex shapes and structures? Plants have repeating structures such as leaves and petals that form beautiful designs such as spirals and branching patterns. Intriguingly, species at the microscopic level, such as algae and diatom, also have repetitive structures like branched filaments and frustule. These natural designs are a great source of inspiration for art and architecture. In this workshop, we will explore the intersections between architecture and nature. We will look to plants, green algae, and diatoms for inspiration, uncovering the simple rules they use to create complex and beautiful patterns, ask if we can recombine patterns from these different species for different purposes, and design them ourselves to create paper cup models of our own.

SENIOR SCIENTIST

2026 EYH WORKSHOPS

1. Turning on the Lights

Have you ever passed by a wind farm and wondered what all of those "windmills" were for? Wind farms convert energy from the wind into electricity that can be used to power an entire home! Join us in this exciting workshop, where you will get to build your very own wind electricity generator and use it to Turn on the Lights!

2. Pareto Pursuit: The Great Resource Rush!

What if YOU could run your own county? You and your friends make all the decisions... and have all the responsibility! How do you make ensure the economic welfare of your citizens? Do you form alliances with other nations? Do you stockpile materials? Do you guard information? Join us for a role playing game where you'll learn why and how countries trade. We'll see why some countries, like the US, purchase lots of goods (imports) and others, like China, sell lots of goods (exports). Prizes await teams with the best resource management!

3. Peering into the Mysterious World of Molecules

Why do apples turn brown when you cut them open? Why do your lips turn blue in the cold? Color is everywhere within our world but it also shares secrets about the atomic world with us. As chemists we try and decode what our colorful world is telling us. Join us in this workshop, where we will use spectroscopy, the study of light, to learn just how much color can teach us about the world around us. In this workshop, you will learn about how molecules manifest color in our food and drink and how we can use it to learn about changes that are happening on the atomic level.

4. Molecular Lego: Building Blocks of Life

Did you know your body is a molecular factory, building and fine-tuning proteins to keep you alive? In this hands-on workshop, you'll create amino acids—the building blocks of proteins—and decorate them with modifications that act like switches, turning proteins on or off. You'll also explore how unusual changes can damage proteins and lead to disease. Join us to uncover how tiny molecules shape life and health!

5. Learn to "fly"!

Join us in exploring the magical world of love in an itsy-bitsy animal—the fly! In this workshop, you will gain hands-on experience as a fly biologist studying how animals pass on their genetic information and reproduce to form brand new animals. You will get to set up a male and a female fly and observe the male woo the female, and if she accepts, even spot them mate! You will also work with "blind" males that have white eyes (instead of red) and test how they fare in this game of love! Lastly, you will dip your hands in genetics by isolating DNA, the recipe book for everything from wing shape and eye color to complicated mating dances and looking at the building block of life!

6. The Hidden Rainbows of Plants

Rainbows aren't just in the sky, they exist everywhere…even in plants! Join us in the lab to discover what colors are inside your favorite plants, fruits, and vegetables- and learn how plants use their hidden rainbows to survive!

7. Molecules in Formation: the Power of Crystals

Have you ever wondered how scientists determine the shapes of molecules they can't directly see? Through a rapid crystallization demonstration, a symmetry-and-lattice activity, and a "diffraction" mystery box, you will discover how X-ray crystallography works and why crystals matter. You will also build your own origami viral capsids to model protein folding and crystal formation!

8. De-spelling the Magic of Coding

At first glance, coding seems a lot like magic. It requires knowledge of different commands and components that are put together to cast incredible spells! While coding won't let you shoot fireballs or make yourself invisible, it can allow you to do amazing things with your computer! In this workshop, learn how to navigate the mystical world of your computer and put together "potions" using the Python coding language. This workshop does not require a background in coding and is designed to help beginners learn some of the basics of coding through fun and magical activities! Activities are also available for more advanced students.

9. Crystal Clear: Sweet, Salty, and Changing the World!

Come take a look up-close at some of life's most important crystals forming in real time under a microscope and learn about all the sizes and shapes they can come in. We will explore the world of crystallization and how you can change their environment to customize their appearance and texture. We'll then use what we know about crystallization to make ice cream like you've never seen before and use crystallization to fight climate change!

10. Electrifying Chemistry

How do submarines replenish their oxygen? How are scientists trying to fuel cars with water? How do batteries work? Join us to learn about the close relationship between electricity and chemical reactions. In this workshop you will construct your own electrochemical cells and use them to split apart water molecules, deposit metals, and more!

11. Deconstructing Starlight

How do we know what is inside the Sun? Learn how to build your own spectroscope and use it to analyze the composition of light. We'll observe how different atoms and energy transitions change the colors of light we see, and how astronomers use this information to study what is inside our Sun and stars beyond our Solar System.

12. Physics of Foodstuffs: Unravelling the Microscopic World of Food

What do milk, gelatin, oil, and food coloring have in common? They all exhibit surprising science! In this workshop, we'll use everyday foods to explore how liquids mix, separate, and even dance. From watching tiny structures form under a microscope to making droplets burst and swirl across a surface, you'll see fluids behave in wild and colorful ways. Come join us to discover the amazing and tasty science hiding in your kitchen!

13. Discover the Nature of Light

Our eyes capture the world's light, which brings us the beauty of the world and visual information from day to day. But do you know the nature of light? It has an unusual motion, which deforms at different boundaries and can be used to detect a wide range of things, from DNA molecules to gravitational waves in the universe. Join us in a hands-on activity to discover the nature of the mysterious light!

14. AI Playground: Where Ideas Teach Machines

Ever wondered what artificial intelligence (AI) is, how it works, how it affects your day-to-day life? In this hands-on workshop, you'll learn to identify which technologies are AI and which are not, the basic principles on which every AI model is built, and experience the science behind such AI models by building a mini AI model yourself, using just a sheet of paper and some general knowledge of objects around you. You also get to test it against a fully-functional complex model! Can you tame the expert? No experience needed! Learn what AI is, how AI works, where it can fail, and much more!

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For general information, please contact us

E-mail: eyh@cornell.edu
Website: www.eyh.cornell.edu
Phone: (607) 252-6728