

# GELFAND OUTREACH

**Rigorous - Educational - STEM Focused - Hands-on - Fun**  
Summer 2024 Series Classes - Carnegie Mellon University

*Scholarship funds are available through gifts from several Carnegie Mellon alumni. Please see the information below to learn more.*

## Program Overview

The Gelfand Outreach Summer Series is designed to illuminate, encourage, and motivate our future scholars through week-long classes in science, technology, engineering, math, and arts. We value hands-on learning, creating, collaborating, and sharing ideas. We understand the importance of providing opportunities for our young learners in Pittsburgh and southwestern Pennsylvania. Our Summer Series enables local students to explore science, engage in experiments using the scientific method, build prototypes, and so much more.

## Instructors

We partner with members of the Carnegie Mellon University community to present these exciting summer courses for kindergartners through ninth grade students. CMU faculty and staff design our Gelfand Outreach classes to spark learning and enthusiasm in the fields of science, technology, engineering, math, and arts. We introduce young learners to their cutting-edge discoveries in research at CMU. Gelfand Outreach teachers are scientists and educators who understand the significance of early STEM education for our youth. For more information about each instructor see the brief biography following the course description.

## Application Process

Classes are open to students entering kindergarten through ninth grade. Parents register online and students are assigned to classes in the order in which we receive the registrations. Students may take one or more classes.

## Location and Time

Classes take place on Carnegie Mellon University's campus in the Oakland neighborhood in Pittsburgh, PA. The classes will meet Monday through Friday from 9 am - Noon daily.

## Cost

Classes are \$325. All fees must be prepaid. Payment is expected when a child is accepted to guarantee their spot in class.

## Financial Aid

Financial Aid Scholarships are available. To qualify you must submit a copy of the first page of your IRS Tax Form 1040 from the past year. We are able to offer scholarships through a gift provided by Carnegie Mellon alumnus Bernard Meisner (S '71) and other donors to support students in Gelfand Outreach classes.



**Rigorous**

**Educational**

**Hands-on**



Dr. Gizelle Sherwood



Bella Ballin

## A SUMMER OF CHEMISTRY GRADES 3-5

June 24<sup>th</sup> - 28<sup>th</sup>

Students will experience how chemistry applies to everyday life activities through participation in hands-on activities and demonstrations. They will learn fundamental chemistry concepts such as the three states of matter, chemical bonding, and much more! They will explore various fields of chemistry including Environmental, Forensic and Kitchen Chemistry. In this hands-on class students will be working in a lab and participating in lecture demonstrations to explore the amazing world of chemistry. Safety is essential! We will teach them how to work in a safe environment while having fun. To ensure all safety measures are met we ask that all students must wear close-toed shoes and long pants to the class. We will be working in a CMU chemistry lab and will provide lab aprons and safety goggles/face shields for additional safety precautions.

**Dr. Gizelle A. Sherwood** is currently an Associate Teaching Professor at Carnegie Mellon University. She earned her Ph.D. in 2008 where her research focused on the effects of aggregation on the photophysics of oligomers related to MEH-PPV and CN-PPV. She primarily lectures Modern Chemistry, the sophomore year Analytical Chemistry labs as well as a Cosmetic Chemistry course. She is passionate about engaging students in discussion of the application of Chemistry to everyday life and has been involved in several outreach programs working with both the Boy Scouts of America and the Leonard Gelfand Center.

**Bella Ballin** is currently a Lab Instructor in the Department of Chemistry at Carnegie Mellon University. After graduating with her BS from Chemistry in 2020. She joined the undergraduate teaching labs where she works with professors to teach students laboratory skills in General, Analytical and Organic Chemistry. She is passionate about supporting students while they learn hands-on techniques and has been involved in several outreach programs including Science Olympiad and Leonard Gelfand Center activities. She also enjoys bringing chemistry to life at home with her daughter.



Melanie Lam

## CREATE WITH ALICE VR GRADES 4-6

July 8<sup>th</sup> - 12<sup>th</sup>

Alice is a free platform for coding and animation. In this class you will turn your story ideas into 3D virtual worlds. You will create a scene with 3D models, learn to use methods and procedures to make it come alive, and then experience it on a VR headset. Students will work together to brainstorm, storyboard, debug and test their virtual worlds.

**Melanie Lam** is the Director of the Alice Project at CMU. She is a veteran producer and designer with numerous shipped titles on the Sims Franchise and Dreamworks movie games during her industry tenure. Moving into edtech, she designed a speech recognition reading app and provided engagement design consulting for Khan Academy. Melanie has been on the faculty of the Entertainment Technology Center and the Director of the National High School Game Academy, Carnegie Mellon's Summer Precollege Program. She is passionate about education equity and access, volunteering at Streetcode Academy and Current Silicon Valley towards that end. She holds a Bachelor of Communication Studies from Nanyang Technological University, Singapore and a Master of Entertainment Technology from Carnegie Mellon University.





Krista Aylwin

## FORM AND FUNCTION GRADES K-2

July 15<sup>th</sup> - 19<sup>th</sup>

Discover how things are made and how they function! We will discuss both man-made materials and objects in nature. We will talk about the design process, build as engineers, test our builds, and revise our ideas. Students will keep a journal of ideas and designs just like real engineers. Each day there will be different STEM building challenges from building a marble maze, boat, bridge and much more! Sign up if you like to build!

**Krista Aylwin** is originally from California, and she earned her BA in Child Development from California State University, Chico. After graduating, Krista moved to Pittsburgh and became the Lead Teacher in the Twos Classroom at Eastminster Childcare Center and at Carriage House Children's Center. She also taught English in Southeast Asia at the National University of Laos in Vientiane, Lao PDR. She is a preschool fours teacher classroom at Carnegie Mellon University, Children's School. Krista enjoys planning future travels, touring historical homes, creating embroidery projects, baking a new recipe and trying to keep her house plants alive. She currently volunteers with the organization Prism working with internationals as an English Partner. On the weekends, you can catch Krista hanging out with friends, exploring the wonderful parks of Pittsburgh or enjoying time at home with a good book.



Katie Kirk

## JUNK BOTS GRADES K-2

June 24<sup>th</sup> - 28<sup>th</sup>

What are robots and what makes robots work? Can robots really take over the world? In this class, we'll build different types of robots and learn about batteries, LED, circuits, electricity, and more. We'll explore how engineers build machines and make modifications to our robots to really make them buzz, rattle, and move! Draw and design your own junkbot, bringing it to life with household items! Have fun with science and technology while learning to think like a robotics engineer. The sky's the limit!

**Katie Kirk** is a Carnegie Mellon graduate who holds a Master of Fine Arts in Dramatic Writing. Thanks to CMU's connection with the Alfred P. Sloan Foundation, Katie collaborated with scientist consultants to write two full-length screenplays with factually accurate depictions of science and technology. As a playwright, Katie's work won the Mary Marlin Fisher Award and has been published by Concord Theatricals. Prior teaching experience includes "Writing the Adaptation for Stage and Screen" at CMU, as well as children's theatre classes at Chicago Street Theatre (Valparaiso, IN)—from introductory acting (K-2) to Shakespeare (6-8). Katie worked with Gelfand Outreach last year and is excited to be back for another summer of learning!

## NEUROSCIENCE 101 GRADES 6-8

June 24<sup>th</sup> - 28<sup>th</sup>

The brain oversees all our perception, thoughts, and actions. It is how we interact with the world around us every day! In this class, we will learn how the brain can understand the world around us through the sense of sight, as well as how the brain interacts with the world using our muscles and body. Finally, we will learn about what happens when something goes wrong in the brain, and how we can use prosthetics and brain-computer interfaces to help restore lost functions of the brain or body.

**Megan, Chris, Julia, Larry, Aida, Rawan, and Michael** are all Ph.D. students in systems or computational neuroscience at Carnegie Mellon. As scientists, they perform research in many labs that study vision, hearing, engineering, brain-computer interfaces, and rehabilitation. One of their shared passions is bringing accessible science to kids, and to inspire more young minds to join STEM fields like neuroscience.



Megan McDonnell



Julia Ostrowski



Chris Ki



Rawan Fakhreddine



Aida Mirebrahimi



Larry Jiang



Michael Malina

## RESEARCH @ CMU GRADES 6-8

July 15<sup>th</sup> - 19<sup>th</sup>

Students will be introduced to faculty members and graduate students who conduct cutting-edge science, computer science, and engineering research at Carnegie Mellon. Through discussions, tours, and hands-on activities participants will learn about studies that are designed to solve societal problems, application of science and mathematics content that they are learning in school, and about pathways to careers in STEM fields.



Dr. Ioannis Gkioulekas

**Dr. Ioannis Gkioulekas** is an assistant professor at the Robotics Institute of Carnegie Mellon University, where he has been since 2017. Before that, he was a PhD student at Harvard University, and even before that an undergrad student at the National Technical University of Athens, Greece. He works on computational imaging, which can be broadly described as coming up with systems that combine imaging (optics, sensors, illumination) and computation (physics-based modeling and rendering, inverse algorithms, learning) in innovative, unexpected, and meaningful ways. Particular problems he is interested in, include imaging around walls or through skin, material acquisition, differentiable rendering, and the integration of physics-based simulation, learning, and optics. He is also more broadly interested in computer vision and computer graphics. For his work he has received the Best Paper Award at CVPR 2019, a Sloan Research Fellowship, and an NSF CAREER Award.



Dr. Amanda Krause

**Dr. Amanda Krause** is an assistant professor in the Materials Science and Engineering Department at Carnegie Mellon University. Before joining CMU, she was an assistant professor of MSE at the University of Florida from 2019 to 2022. She received her B.S. and M.S. in Materials Science and Engineering from Virginia Tech, and her Ph.D. in Materials Science from Brown University. Her research focus is engineering ceramic interfaces and microstructures for improving properties.



Dr. Linda Peteanu

**Dr. Linda Peteanu** has been a teacher and researcher in the Department of Chemistry at Carnegie Mellon University for almost 30 years. She has taught several laboratory and lecture courses in physical and analytical chemistry and has hosted numerous undergraduate researchers in her laboratory. In her research she uses microscopy-based techniques to characterize molecules used in photovoltaics and light emitting diodes. She has been actively engaged in science outreach to K-12 students and to the general public through the Phipps Conservatory "Meet a Scientist" program. She is passionate about engaging students in science and research projects at a young age.



Dr. Ana Torres

**Dr. Ana Torres** is an assistant professor in the Department of Chemical Engineering at Carnegie Mellon University. Her research focuses on sustainability and process systems engineering as applied to clean and sustainable energy. Torres earned her B.S. in Chemistry in 2003 and a diploma in Chemical Engineering in 2005, both from the Universidad de la República Oriental del Uruguay. In 2013, after two years of industrial experience, she earned her Ph.D. in Chemical Engineering from the University of Minnesota - Twin Cities. She completed her postdoctoral studies at the Massachusetts Institute of Technology (MIT) in 2014. Torres was awarded a National Science Foundation (NSF) CAREER grant for her research in circular economies (CEs). The CAREER award is NSF's most prestigious award in support of early-career faculty who have the potential to serve as leaders in research and education within their department or organization.

## SCIENCE AND ENGINEERING SAMPLER GRADES 3-5

July 8<sup>th</sup> - 12<sup>th</sup>

Students will visit a variety of labs and spaces at Carnegie Mellon to learn about cutting edge research. Faculty, graduate students and staff in science, engineering and computer science will share information, demonstrations and hands-on activities to help Sampler participants develop a broader understanding of what it means to work as a scientist or engineer. Students will summarize the information that they have learned and make connections between the research activities and the content they are learning in school.



Dr. Joanne Beckwith Maddock

**Dr. Joanne Beckwith Maddock** is an assistant teaching professor in the Department of Chemical Engineering at Carnegie Mellon University. She earned her PhD from the University of Michigan where she studied bacterial and fungal biofilms which are a common cause of medical device infections. She also worked as a manufacturing engineer at a company that makes paint pigment. Currently, she teaches Intro to Chemical Engineering, and the Chemical Engineering Lab courses. She is passionate about helping students understand the impact that chemical engineering has on their everyday lives and the wide range of job opportunities a degree in chemical engineering offers. When she is not teaching, you can find her going for a run or rock climbing.



Dr. Sneha Narra

**Dr. Sneha Narra** received a Master of Science in computational mechanics, and a Master of Science and doctorate in mechanical engineering from Carnegie Mellon University (CMU). She worked as a postdoctoral research associate at the Next Manufacturing Center at CMU. She was an assistant professor in the materials and manufacturing program at Worcester Polytechnic Institute, before joining CMU as an assistant professor in 2021. As an instructor, Narra's goal is to help her students learn effectively in a comfortable environment and spark interest in them to explore outside the classroom. To meet this goal, she adopts a teaching philosophy that builds on creating an inclusive learning environment, active participation from students, learning through real-world examples and demos, and assessment techniques optimized for long-term retention and exploration. Narra is passionate about mentoring women in engineering and she participates in outreach activities, educates students about professional development opportunities, and provides opportunities to conduct research in interdisciplinary topics.



Dr. Jerry Wang

**Dr. Jerry Wang** is an Assistant Professor of Civil and Environmental Engineering, and Chemical Engineering (by courtesy) and Mechanical Engineering (by courtesy), at Carnegie Mellon University. He received his BS in 2013 from Yale University (Mechanical Engineering, Mathematics and Physics), SM in 2015 from MIT (Mechanical Engineering), and PhD in 2019 from MIT (Mechanical Engineering and Computation). He performed postdoctoral research at MIT in chemical Engineering. He was a member of the inaugural cohort of the Provost's Inclusive Teaching Fellowship at CMU, was the 2020 recipient of the Frederick A. Howes Scholar Award in Computational Science and the 2016 MIT Graduate Teaching Award in the School of Engineering and is an alumnus of the Department of Energy Computational Science Graduate Fellowship and the Tau Beta Pi Graduate Fellowship. Wang directs the Mechanics of Materials via Molecular and Multiscale Methods Laboratory (M5 Lab) at CMU, which focuses on computational micro- and nanoscale mechanics of fluids, soft matter, and active matter, with applications in Civil and Environmental Engineering across the nexus of water, energy, sustainable materials, and urban livability.



Craig Weeks

**Craig Weeks** is a PhD student in mechanical engineering working on computational fluid dynamics modeling of metal additive manufacturing processes. He is from Portland, Oregon and completed his undergraduate studies at Oregon State University, where he majored in mechanical engineering with a double minor in aerospace engineering and computer science. Craig was part of the hybrid and liquid-engine rocket teams at Oregon State, and interned at the NASA Glenn Research Center in Cleveland, OH working on electric aviation. In his free time, Craig enjoys trail running, playing piano and guitar, and discovering hikes in and around Pittsburgh.

# GELFAND OUTREACH

## Summer 2024 Series Classes

*Classes are \$325.00 each, all classes are conducted from 9:00 AM to noon at Carnegie Mellon University.*

Class Name	Dates	Grades	Brief Description
Junk-Bots	June 24 - 28	K - 2	What are robots and what makes robots work? Explore how engineers build machines and make modifications to robots. Draw and design your own junkbot, bringing it to life with household items!
A Summer of Chemistry	June 24 - 28	3 - 5	Learn fundamental chemistry concepts such as the three states of matter, chemical bonding, and much more! Explore various fields of chemistry such as Cosmetic, Environmental, Polymer, Forensic and Kitchen Chemistry.
Neuroscience 101	June 24 - 28	6 - 8	The brain oversees all our perception, thoughts, and actions. It is how we interact with the world around us every day! In this class, we will learn how the brain can understand the world around us.
Science & Engineering Sampler	July 8 - 12	3 - 5	Visit labs and areas at CMU to learn about cutting edge research! Faculty, graduate students and staff in science, engineering and computer science will share information, demonstrations and hands-on activities.
Create with Alice VR	July 8 - 12	4 - 6	Create a scene with 3D models, learn to use methods and procedures to make it come alive, and then experience it on a VR headset.
Form and Function	July 15 - 19	K - 2	Discover how things are made and how they function! Learn about the design process, build as engineers, test your builds, and revise your ideas.
Research @ CMU	July 15 - 19	6 - 8	Students will be introduced to faculty members and graduate students who conduct research at Carnegie Mellon. Discuss, tour, and participate in hands-on activities.

*To apply for scholarship funds, please submit a copy of the first page of your IRS 1040 tax form from last year.*

