GELFAND OFREDCH

SPRING 2025 SATURDAY SERIES CLASSES

Carnegie Mellon University

Scholarship funds are available!

- Each class is \$55
- Scholarship funds are provided through gifts from Carnegie Mellon University alumni

Full schedule can be found on the last page

www.cmu.edu/gelfand.com

4910 Forbes Ave, Cyert Hall A64 Pittsburgh, PA 15213 gelfandcenter@andrew.cmu.edu 412-268-1863

STEM FOCUSED





A BRIEF INTRODUCTION TO PHYSICS-BASED ANIMATION

Grades 8-9, April 12

In this interactive workshop, students will explore the fascinating world of physics-based animation through hands-on coding and virtual reality. Guided by CMU researchers, students will learn the basics of particle-based simulation and experiment with their own custom animations. Using Python in an accessible coding environment, participants will modify and create simulations, bringing dynamic scenes to life. Additionally, students will engage with virtual environments through VR headsets, gaining a unique perspective on how physics shapes digital animations and interactive media. This workshop is perfect for students interested in STEM fields and eager to see how coding, physics, and creativity combine.

Dr. Minchen Li



Dr. Minchen Li is an Assistant Professor in the Computer Science Department at Carnegie Mellon University since 2023. Previously, he was an Assistant Adjunct Professor at the UCLA Department of Mathematics, within the AIVC Lab. He completed his Ph.D. in 2020 from the SIG Center for Computer Graphics at the University of Pennsylvania, advised by Chenfanfu Jiang. Minchen's research accomplishments have been recognized with several prestigious awards, including the SCA Early Career Researcher Award (2024), the ACM SIGGRAPH Outstanding Doctoral Dissertation Award (2021), etc. He is an active member of the research community, regularly serving as a program committee member for conferences such as ACM SIGGRAPH, Eurographics, and SCA, as well as an external reviewer for journals including ACM TOG, IEEE TVCG, and IEEE ICRA.

BLOOD TYPING, DISEASES, AND DIAGNOSES

Grades 5-8, February 15 at the MELLON INSTITUTE

Blood typing is of critical importance, especially if a transfusion is needed. In this project, we will explore blood and blood typing through a variety of techniques. Using synthetic blood, students will learn about how blood interacts with the body and how blood typing occurs. Students will conduct an experiment using antibodies to identify blood type followed by examination with slides of blood smears. This will ultimately let students identify the blood type needed for a mock transfusion.

Dr. Lynley Doonan



Dr. Lynley Doonan joined the Department of Biological Sciences at Carnegie Mellon University as Special Faculty in 2018. She earned her Ph.D. at the University of Pittsburgh in Molecular, Cell, and Developmental Biological Sciences with a teaching minor and her B.S. in Biological Sciences at Carnegie Mellon University. She has been teaching introductory laboratory classes to expose students to a variety of basic biology laboratory techniques.

BRAIN-BOTS Grades 4-6, April 12

How does the brain work to control your body? In this workshop you will have the opportunity to learn about the inner workings of the brain. We will discuss how our brains use electrical impulses to generate our thoughts, actions and behavior with a focus on how the brain controls our muscles. The electrical signals the brain uses to control your body can even be used to control a robot! There will be hands-on activities to explore your awesome brain in action.

Kendra Noneman, Julia Ostrowski, Emily Lopez and Eve Ayar



Kendra, Julia, Emily and Eve are all Ph.D. students at Carnegie Mellon's Neuroscience Institute. As scientists, they research different aspects of how the brain works to control the body and senses, with specialties in areas like vision and hearing. As part of the neuroscience programs at Carnegie Mellon, they serve as teaching assistants, as well as being involved in science-related outreach programs. One of their shared passions is bringing accessible science to kids, and inspiring more young minds to join STEM fields like neuroscience.

BUG BOTS

Grades K-2, March 15

Bounce your way into the exciting world of robots by exploring motion, power, and electricity. Discover the way motors and batteries operate. Discuss robots and bugs and then create a robot, explain how it moves, and take the robot home to share with your family and friends! Parents are invited to attend the Bug Bots parade at the end of class.

Reed Luttmer



Reed Luttmer is a fourth-year student at Carnegie Mellon University, majoring in Mathematical Sciences. They are a head teaching assistant within CMU's School of Computer Science, a research assistant for CMU's Infant Cognition Lab, and the community development chair of the CMU Math Club. Reed has worked in a variety of childcare settings, including as a tutor, quiz bowl coach, ski instructor, and most recently, a supervisor at an overnight camp for children with social, emotional, and behavioral challenges. For fun, Reed enjoys reading, going for walks, playing quidditch, and spending time with friends and family. Reed is passionate about sharing their love of STEM with others, and they are excited for this to be their fourth year working with the Leonard Gelfand Center!

BUILDING BLOCKS OF 3D PRINTING

Grades 3-5, March 15

What do Legos, sandcastles, and 3D printing have in common? In this workshop, we will explore how building up layers of material forms the foundation behind 3D printing. Through building up parts using different materials and techniques, students will learn about novel manufacturing methods while working to achieve goals with their built parts.



Alex Gourley

Alex Gourley is a Ph.D. student in mechanical engineering working on additive manufacturing at CMU. He was born and raised in Iredell County, North Carolina. Alex went to Duke University and double majored in mechanical engineering and chemistry. While at Duke he played on the football team as a center for the offensive line. He was a member of the Duke Motorsports team and worked one summer for a NASCAR team. Outside of his studies, Alex enjoys playing video games, music, and woodworking.

www.cmu.edu/gelfand.com 4910 Forbes Ave, Cyert Hall A64 Pittsburgh, PA 15213

CHEMISTRY OF SHAMPOO

Grades 3-5, February 15 AT THE MELLON INSTITUTE

With all the hair products on the market, do you ever wonder what makes a good shampoo? Does your shampoo work the best? What does "work the best" mean? In this lab, you will test shampoos by testing the pH, the percent of solids, flash foam formation, foam retention, relative viscosity, India ink dispersion, and the cost of the shampoo. After you have completed each of the tests, we will graph and compare the data on all the shampoos, and as a class, determine which shampoo works best on your hair. You may bring your own shampoo to test, and there will also be shampoo samples in the lab to test.

Dr. Carrie Doonan



Dr. Carrie Doonan is the Director of Undergraduate Laboratories and a Teaching Professor in the Department of Biological Sciences at Carnegie Mellon University. She was educated at Chatham College (BS) and the University of Connecticut (Ph.D.) and began her teaching career at Carnegie Mellon University in 1993. Her primary area of focus involves the teaching and administration of a range of experimental laboratories in the department. She is responsible for writing and developing experimental units, training of junior faculty and teaching assistants and is actively involved in all aspects of the undergraduate program. Dr. Doonan has adapted many of her curricular innovations for use in K-12 outreach and has been invited to present this work at regional and national forums. She served as a Biotechnology Institute National Biotechnology Teacher-Leader in 2003 and 2005 and was awarded the Julius Ashkin Teaching Award in the Mellon College of Science in 2000. She was also awarded the Mark Gelfand Award for Service Learning and Outreach in 2011, and the Richard Moore Award in 2022.

CODING FOR BEGINNERS

Grades 2-4, April 12

Have you ever wondered how computers make decisions? In this course we will learn how computers follow routines and instructions to complete a final task. Coding can seem like a lot of complicated numbers, so we will teach through fun activities where students perform everyday tasks to simulate how a computer 'thinks.' Kids will act as both a person instructing a computer, and as the computer interpreting its instructions. The purpose of this course is to introduce coding concepts with off-line instructional activities.

Teddi Bishop



Teddi Bishop is a fourth-year student at Carnegie Mellon University, double majoring in chemical and biomedical engineering. Teddi works for the Leonard Gelfand Center as a teaching assistant and an office member where she organizes and prepares the classes. She previously conducted research in a laboratory at the University of Pittsburgh where she co-authored a paper studying the interactions between T-cells and breast cancer cells using microfluidics. For the past two summers, Teddi has worked as a research and development engineering intern for Procter and Gamble. In the future, she plans on pursuing a fifth year master's degree in biomedical engineering and returning to work at Procter and Gamble.

www.cmu.edu/gelfand.com 4910 Forbes Ave, Cyert Hall A64 Pittsburgh, PA 15213

DIGITAL PHOTOGRAPHY

Grades 7-9, January 25

This class provides a first introduction to photography, optics, and imaging. We will begin by investigating the properties of optical elements such as lenses, prisms, and filters, and see how we can use them to manipulate light. Then, we will go over how digital image sensors work and take a look at the internals of a digital camera. We will use this background to understand the various settings (focus, zoom, exposure) and stages (optical, analog, digital) of the modern photography pipeline. In parallel, we will get hands-on experience with all these concepts using high-end digital cameras, including a photography competition at the end.

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 undergraduate 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. He is also more broadly interested in computer vision and computer graphics. He received the Best Paper Award at CVPR 2019, the NSF CAREER Award, and the Sloan Research Fellowship.

DIGITAL TWINS FOR ASSISTING CIVIL ENGINEERS

Grades 6-9, March 15

This workshop will show how sensor systems and digital models can form "digital twins" that simulate the behaviors of physical systems of airports, water systems, bridges, and power plants. Engineers can use those digital twins to assist them in improving the efficiency of operating physical systems while ensuring safety.

Dr. Pingbo Tang



Dr. Pingbo Tang is an expert on civil infrastructure operations and human systems engineering for civil infrastructure operational safety. Prof. Tang's research explores remote sensing, human systems engineering, and information modeling technology in support of the spatiotemporal analyses needed for effective management of production systems, construction sites, constructed facilities, and civil infrastructure systems. His ongoing studies have examined sensing and modeling methods for comprehending the Human-Cyber-Physical-Systems (H-CPS) in accelerated construction and infrastructure operations (e.g., airport operations, nuclear plant outage control). He won best paper awards at multiple conferences, the 2013 Recent Alumnus Achievement Award of the Civil and Environmental Engineering Department at Carnegie Mellon University, the NSF CAREER Award in 2015, and the Daniel W. Halpin Award for Scholarship in Construction from the American Society of Civil Engineers in 2020.

DNA AND EVOLUTION

Grades 5-7, February 15 AT THE MELLON INSTITUTE

You may have heard of DNA, but have you ever wondered what DNA looks like and what its job is? DNA is what makes you you, a strawberry a strawberry, and is what made a T-rex a T-rex. We will explore how DNA functions and changes by mutation, and how DNA mutations cause animals on Earth to evolve and change. In this activity, you will get to break apart the cell membrane of a strawberry and extract its DNA. You will get to see, touch, and take home actual DNA. You will get to see and touch diverse types of live animals and put together a tree to show how they are related to one another, like a family tree. Finally, you will be able to play games to explore how evolution happens by a process called natural selection.

Brian Corletti



Brian Corletti is a research assistant in the Undergraduate Biology Laboratories at Carnegie Mellon University, where he assists with experimental setup for laboratory courses. Brian holds a Bachelor of Science degree in Geology from Allegheny College. Currently, he is a biology research assistant pursuing graduate studies. He has been serving as a teaching assistant in the biology undergraduate laboratories for the past two years.

HOMEMADE COSMETICS

Grades 3-5, January 25

Skin is the largest organ in the human body. It serves to protect us from environmental stresses and hazards. As such it is important that we understand this organ and how to protect and care for it. In this workshop, students will create homemade skincare products from lotions and lip gloss to bath scrubs. This hands-on workshop will have students working in the lab and participating in lecture demonstrations to create their own formulation of a variety of overthe-counter homemade cosmetic products.

Dr. Gizelle A. Sherwood



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 photo-physics of oligomers related to MEHPPV 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



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.

www.cmu.edu/gelfand.com 4910 Forbes Ave, Cyert Hall A64 Pittsburgh, PA 15213

HOW DOES THE BRAIN WORK?

Grades 4-6, March 15

Learn about brains across different species and learn that size is not indicative of intelligence. Observe a dissection of a sheep brain and the similarities and differences to the human brain. See slides of human brain (secured in plastic bags with formalin, only for viewing). We will discuss human anatomy and how behavior emerges from the brain. We'll focus specifically on the visual system of the brain that allows us to recognize our visual world effortlessly and rapidly. Then you will build 'a brain' to take home!

Sophia Robert



Sophia Robert received her B.A. in Philosophy and Biology at Williams College and then studied visual neuroscience at the NIH in the Lab of Brain and Cognition. She is now a 5th year Ph.D. student in Cognitive Neuroscience in Dr. Marlene Behrmann's lab. Her research investigates how different parts of the brain process sensory information and how the organization of these parts changes or is maintained in response to brain injury. Using magnetic resonance imaging (MRI), she studies the brains of children with medically resistant epilepsy who have large parts of their brains removed to alleviate seizures. Besides her graduate work, she is passionate about education and teaching students about the amazing complexity of the brain and mind so that they, too, can become curious and ask questions about what we are and how we have come to be.

HOW ENGINEERS MAKE PLANES FLY

Grades 3-5, April 12

Discover how planes fly and how engineers use Computational Fluid Dynamics (CFD) in plane design. Design your own wing and then test it in a "wind tunnel". What shape will produce the best wing? What shapes produce no lift? Fly in to find the answers to these questions and more!

Junior Ruiz



Junior Ruiz is a first-year student at Carnegie Mellon University, currently deciding between majoring in Mechanical Engineering or Civil Engineering. Originally from Connecticut on the East Coast, Junior is new to the Pittsburgh area. Junior also has a rich cultural background, having lived and studied in Mexico for two years, and being able to speak both Spanish and English fluently, an experience that has shaped his interests. This is Junior's first year working at the Gelfand Outreach Center, where he enjoys engaging with children-a passion he's honed through experience at numerous childcare centers. Outside of academics, he has a love for photography, reading, playing video games, and learning new languages.

IT'S ALIVE! THE SCIENCE BEHIND MAKING LIVING ROBOTS Grades 6-8, March 15

How do you make robots more like animals? How do muscles work? How do you keep cells alive outside the body? The answer to all these questions and more are in this session! Learn about bioinspired robots, cyborg robots, and muscles. Explore hands-on how electricity can control your muscles and build a syringe-powered robot!

Biohybrid and Organic Robotics Group



This class will be taught by members of the Biohybrid and Organic Robotics Group at CMU. Animals have long served as an inspiration for robotics. However, many of the mechanical properties, physical capabilities, and the behavioral flexibility seen in animals have yet to be achieved in robotic platforms. Towards addressing this gap, research in the CMU Biohybrid and Organic Robotics Group (B.O.R.G) focuses on the use of organic Materials as structures, actuators, sensors, and controllers towards the development of biohybrid and organic robots. The research group's long-term goal is to develop completely organic, autonomous robots with programmable neural circuits. These robots will have future applications in medicine, search and rescue, and environmental monitoring.

www.cmu.edu/gelfand.com 4910 Forbes Ave, Cyert Hall A64 Pittsburgh, PA 15213

LIQUID SCIENCE

Grades K-2, January 25

Normal liquids can do crazy things when you look at them in the right way. Did you ever think you could watch them crawl on top of or below other liquids? This class is an introduction to the chemical and physical properties of different liquids and will allow you to apply critical thinking skills and the scientific method to make observations about liquids. Learn about physical properties such as density, viscosity, cohesion, and adhesion by observing the behavior of different liquids. You've never seen liquids this crazy!

Teddi Bishop



Teddi Bishop is a fourth-year student at Carnegie Mellon University, double majoring in chemical and biomedical engineering. Teddi works for the Leonard Gelfand Center as a teaching assistant and an office member where she organizes and prepares the classes. She previously conducted research in a laboratory at the University of Pittsburgh where she co-authored a paper studying the interactions between T-cells and breast cancer cells using microfluidics. For the past two summers, Teddi has worked as a research and development engineering intern for Procter and Gamble. In the future, she plans on pursuing a fifth year master's degree in biomedical engineering and returning to work at Procter and Gamble.

MATH TURNED INSIDE OUT

Grades 5-7, January 25

In this workshop students will be introduced to the basic ideas of topology, a field of mathematics that is becoming increasingly crucial to physics and engineering. It is the study of how spaces are organized and how they are structured and whether they can be smoothly deformed into each other or not. Through hands-on exercises, students will construct topologically inequivalent objects, like cylinders and moebius strips and examine them to discover and understand their differences.

Dr. Shubhayu Chatterjee



Dr. Shubhayu Chatterjee joined the Department of Physics at Carnegie Mellon University as an Assistant Professor in January 2023. His research focuses on emergent phenomena in condensed matter physics and tries to understand novel behavior which results from the sheer scale and complexity of billions of interacting particles in everyday materials. He also studies how to use tools from the quantum information community to sense such emergent phenomena. Prior to joining CMU, he was a postdoctoral fellow at UC Berkeley. He received his Ph.D. in Physics from Harvard University and holds an integrated master's in physics from the Indian Institute of Technology Kanpur.

THE MICROSCOPIC WORLD OF CELLS

Grades 2-4, February 15 AT THE MELLON INSTITUTE

What do a person, an onion, and bacteria all have in common? All of these, and all living organisms, are made of cells. Most cells are too small to see by eye, but in this workshop, you will use microscopes to explore what cells from organisms including plants, yeast, and bacteria look like when you get really, really close. You will learn how microscopes work, and how scientists use them for research. You will practice using microscopes to guess the identity of microscopy mystery samples. Then you will be the scientist, preparing samples on microscope slides to test hypotheses about what happens to cells when you change their environment.

Dr. Emily Drill



Dr. Emily Drill is an Assistant Teaching Professor in Biological Sciences at CMU. She has been teaching laboratory courses at CMU since 2012 in a variety of topics including genetics, cell biology, developmental biology, and neuroscience. She teaches high school students through summer programs including the Pennsylvania Governor's School for the Sciences; most recently, she worked with a group of students on a research project using CRISPR technology.

NATURE'S ARCHITECTS: EVOLUTION AND ACTION

Grades 4-6, March 15

Have you ever wondered why you feel cooler when the wind is stronger? Or why some people can digest dairy products while others cannot? Did you know, earthworms manifestly thrive in the soil, but their physiology is poorly suited for terrestrial life? Although seemingly unrelated, these phenomena share a common underlying explanation; organisms can affect their own and others' characteristics by "constructing" their own habitats. In this class, we will aim to understand how nature's architects can drive the process of biological evolution, drawing on in-class activities and natural examples, which you will see play out in real time!

Joseph Prentice



Joseph Prentice is a research associate in the Bridges Lab (Department of Biological Sciences), where he is currently working on mathematical models of niche differentiation and the emergence of metabolic cooperation in populations of bacteria and their viruses (phage). Broadly, Jojo is interested in how ecology and evolution interact to produce novel traits among species in complex biological communities. Outside of work, he enjoys rock climbing, running, and reading. He is looking forward to teaching another Gelfand Center class!

THE SCIENCE AND ENGINEERING OF FABRICS

Grades 6-8, April 12

Have you ever looked closely at the fabric that makes up your shirt, backpack, or bed sheets? If you do, you will see that they are made of tiny threads, but the patterns with which they interlock can be quite different in different types of fabric! In this workshop, we'll discuss different ways that fabrics can be created, and you'll have a chance to try out a few yourself!



Dr. Rachel Kurchin

In her professional capacity, Dr. Rachel Kurchin is a computational materials scientist at Carnegie Mellon University who studies materials for clean energy applications. In her spare time, she enjoys knitting, riding her bike, and playing with her cat Fred.

www.cmu.edu/gelfand.com 4910 Forbes Ave, Cyert Hall A64 Pittsburgh, PA 15213

THE SENSING BRAIN

Grades 6-8, January 25

How does your brain process what you see and hear? In this workshop you will learn about how the body's different senses work, and how your brain uses information about each sense to learn about the world around you. We will have demonstrations and activities related to the different senses.

Kendra Noneman, Julia Ostrowski, Emily Lopez and Eve Ayar



Kendra, Julia, Emily and Eve are all Ph.D. students at Carnegie Mellon's Neuroscience Institute. As scientists, they research different aspects of how the brain works to control the body and senses, with specialties in areas like vision and hearing. As part of the neuroscience programs at Carnegie Mellon, they serve as teaching assistants, as well as being involved in science-related outreach programs. One of their shared passions is bringing accessible science to kids, and inspiring more young minds to join STEM fields like neuroscience.

USING DNA FINGERPRINTING IN FORENSICS

Grades 6-8, February 15 AT THE MELLON INSTITUTE

DNA fingerprinting allows forensic scientists to compare crime scene DNA to suspect DNA in a case. In this project, we will learn about how differences in our DNA can be used like "fingerprint" to identify individuals. DNA can be obtained from a single hair left behind at a crime scene. We will work with DNA isolated from hair from a mock crime scene and compare it to mock suspect DNA. We will learn essential lab skills like micropipette and use techniques that real forensic scientists use to solve our mock case.

Dr. Brett Wisniewski



Dr. Brett Wisniewski is Special Faculty at Carnegie Mellon University where he teaches biology lecture and lab courses. He studied at Northwestern University for his Ph.D. and Marquette University for his BS. He has always strived to make biology education accessible to individuals from all backgrounds.

WHAT FLOATS YOUR BOAT?

Grades K-2, April 12

What makes a boat float? In this class we will start with this question and delve into the science and engineering of boat making. Become problem solvers by using different types of materials to discover which ones can stay afloat. Join us for a hands-on, action-packed voyage!

Krista Aylwin



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-four's teacher 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.

www.cmu.edu/gelfand.com 4910 Forbes Ave, Cyert Hall A64 Pittsburgh, PA 15213

GELFAND OREACH

SPRING 2025 SATURDAY CLASSES

Each class is \$55* Classes take place from 9:00 AM - Noon on the Carnegie Mellon campus

*To apply for scholarship funds, please submit a copy of the first page of your IRS 1040 tax form from 2023.

January 25th

- Gr. K-2: Liquid Science
- Gr. 3-5: Homemade Cosmetics
- Gr. 5-7: Math Turned Inside Out
- Gr. 6-8: The Sensing Brain
- Gr. 7-9: Digital Photography

February 15th

CLASSES HELD AT THE MELLON INSTITUTE

- Gr. 2-4: Microscopic World of Cells
- Gr. 3-5: Chemistry of Shampoo
- Gr. 4-6: DNA and Evolution
- Gr. 5-8: Blood Typing, Diseases, and Diagnoses
- Gr. 6-8: Digital Photography

March 15th

- Gr. K-2: Bug Bots
- Gr. 3-5: Building Blocks of 3D Printing
- Gr. 3-5: How Does the Brain Work?
- Gr. 4-6: Nature's Architects: Evolution and Action
- Gr. 6-8: It's Alive! The Science Behind Making Living Robots
- Gr. 6-9: Digital Twins for Assisting Civil Engineers

April 12th

- Gr. K-2: What Floats Your Boat?
- Gr. 2-4: Coding for Beginners
- Gr. 3-5: How Engineers Make Planes Fly
- Gr. 4-6: Brain-Bots
- Gr. 6-8: The Science & Engineering of Fabrics
- Gr. 8-9: A Brief Intro to Physics-Based Animation



Carnegie Mellon University Leonard Gelfand Center

www.cmu.edu/gelfand.com

4910 Forbes Ave, Cyert Hall A64 Pittsburgh, PA 15213 gelfandcenter@andrew.cmu.edu

412-268-1863