VIRGINIA TECH

SCIENCE FESTIVAL

Exhibit and Event Catalog

November 4, 2017

Moss Arts Center, Alumni Mall, Torgersen Hall, and Newman Library

vt.edu/sciencefestival

Welcome! The Virginia Tech Science Festival is a celebration of science as a way of thinking Expo-style exhibits, performances, experiences, and experiments will show the many ways science is bigger than you think.

At the Institute for Creativity, Arts, and Technology (ICAT), we make a habit of exploring how science, engineering, arts, and design come together. We are thrilled to partner with organizations, departments, and colleges across the Virginia Tech campus to host the Virginia Tech Science Festival for the fourth year running. The festival brings together thousands of people to experience the joy of science. Whether you come as a school field trip, scout group, college student, lifelong learner, or family, we hope the festival inspires you to see science as accessible and relevant to you.

It is my sincere hope that you learn from what you see, make connections with other people, and dream bigger than you did before.

Ben Knapp
Founding Director
Institute for Creativity, Arts, and Technology
Virginia Tech

VIRGINIA TECH

SCIENCE FESTIVAL

FREE!

## Saturday, November 4

10:00 – 4:00   Festival expo

4:00 – 5:30   Nutshell Games

7:00   An Evening with Christopher Emdin: STEM Education and Empowerment for the Rest of Y'all

Be there for **FREE** hands-on exhibits and demonstrations, one-on-one conversations with scientists, and a celebration of science as a way of knowing.

Science is bigger than you think. Science is a way of knowing about everything – people, trends, living things, rocks, economics, how things move, what people buy, probabilities, stars, animals, history, memory, physics, and so much more. You might even say that science is universal. #VTSciFest
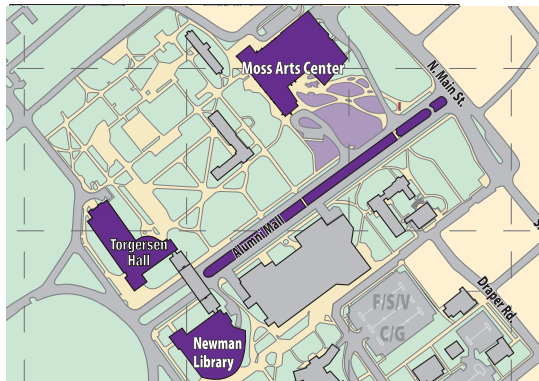
www.vt.edu/sciencefestival

VirginiaTech
Invent the Future®

SAFE – Supporting Autism-Friendly Environments

Science Is Sensory-Friendly
Moss Arts Center, Room 251

Sensory-Friendly Space
Center for Autism Research, Virginia Tech | vtcar.science.vt.edu
> All ages
> The Virginia Tech Science Festival is partnering with the Center for Autism Research at Virginia Tech to provide a sensory-friendly break room. Stop by our research vehicle on Alumni Mall, too. Look for volunteers and exhibitors with SAFE Mentor buttons. Exhibitors who attended a SAFE Mentor training are identified with the autism puzzle piece.
> Project contact: Angela Scarpa

Science Is Hands-On
Moss Arts Center Learning Studio, Room 253

Children's Teddy Bear Clinic
Carilion Children's | CarilionClinic.org
> All ages
> Come to our virtual clinic, where you can view simulated X-rays of body areas, take vital signs, listen to the heart and lungs with a stethoscope, and make a hospital-type bracelet to wear.
> Project contact: Alex Brendel

VT PEERS: Seeing Engineering Everywhere
Virginia Tech Partnering with Educators and Engineers in Rural Schools (VT PEERS) | enge.vt.edu/researchfacilties/vtpeers.html
> Ages 8 and up
> Explore the engineering design process as you disassemble, troubleshoot, and explore the function of everyday objects.
> Project contact: Tawni Paradise

Science Is in the Arts
Moss Arts Center Learning Studio, Room 253

The Nature of Art
Children's Museum of Blacksburg | blacksburgchildrensmuseum.org
> All ages
> From Fibonacci to fun, explore math, science, problem-solving, and beauty in nature-inspired art. Join us for a hands-on, play-based community art experience with a twist!
> Project contact: Sarah Hanks

Kid-Made Electronic Musical Instrument
Institute for Creativity, Arts, and Technology (ICAT), Virginia Tech | icat.vt.edu
Center for Research in SEAD Education, Virginia Tech | crse.centers.vt.edu
> Ages 5 and up
> ICAT's Instrument Maker Camp teaches kids to design an electronic musical instrument from a Raspberry Pi computer, junk, wires, and some coding. Talk to the kids and see an example of what they made.
> Project contact: Kari Zacharias

Musical Robots: MechXylos, Global-Standpoint
ICAT, Virginia Tech | l2ork.music.vt.edu
> All ages
> Mechanical contraptions with a fondness for music!
> Project contact: Kyriakos Tsoukalas

Direct Your Own Virtual Concert!
Noah Miller Lab
> Ages 5 and up
> Using virtual reality, you will be able to be the director of a concert with natural hand motions in an immersive environment.
> Project contact: Noah Miller

Science Is Bigger Than You Think
Moss Arts Center Grand Lobby

Information
Virginia Tech Science Festival | vt.edu/sciencefestival
> All ages
> Stop by for festival maps and information.
> Project contact: Phyllis Newbill

Making Science Fun
Science Museum of Western Virginia | smwv.org
> All ages
> The Science Museum of Western Virginia is making science fun with hands-on activities that showcase the science of our incredible exhibits and programs.
> Project contact: Hannah Weiss

Greg Kennedy, Innovative Juggler
Innovative Juggler | InnovativeJuggler.com
> All ages
> Originally trained as an engineer, Greg Kennedy uses the principles of geometry and physics to create groundbreaking work with original apparatus. Jugglers know him for his award-winning creativity. Audiences know him for his entertaining performance, making visual spectacles by combining art and science.
> Project contact: Brynna Raine

Incredible Wearables
Virginia Cooperative Extension, Virginia Tech | ext.vt.edu *and* 4-h.org/parents/national-youth-science-day/#!about-nysd
> Ages 5 and up
> Design a wearable device that will record biological signals to help you make informed decisions about your health. The 4-H Science Day challenge will focus on three important topics: engineering design, wearable technology, and health monitoring.
> Project contact: Shannon Wiley

Harness the Power of Biology

Novozymes Biologicals | novozymes.com

> All ages
> At Novozymes Biologicals we have a passion for harnessing the potential of biology! We do this by using bacteria in unique and exciting ways. In our project we will display how we use bacteria in everyday life and how they impact each and every one of us.
> Project contact: Dezarai Thompson

Weather School

WDBJ7 | wdbj7.com

> Ages 5 and up
> From clouds in a bottle to why hurricanes are so strong this year, our meteorologists are here to answer your questions!
> Project contact: Robin Reed

Meteorology

Meteorology Club, Virginia Tech | gobblerconnect.vt.edu/organization/meteorologyclubvt

> Ages 5 and up
> See the wonderful mystery that is the weather. See weather up close and personal with a tornado in a bottle, instant snow, and much more.
> Project contact: Aaron Swiggett

Virus Tracker

Biocomplexity Institute of Virginia Tech | bi.vt.edu

> All ages
> Virus Tracker is an educational game that can transform any event into a full-blown zombie epidemic. Players score points by passing on your zombie virus to other players or by curing them with the latest vaccine. The game creates a map of all interactions—information that helps real-life scientists. Exhibitors who attended a SAFE Mentor training are identified with the autism puzzle piece.
> Project contact: Kristy Collins

501st Legion Costuming Group

Garrison Tyranus | garrisontyranus.com

> All ages
> This *Star Wars* costuming group celebrates creativity and giving back to the community.
> Project contact: Paul DePaola

Science Is in the Cube
Moss Arts Center Cube

3D Printing
DREAMS Lab, Mechanical Engineering, Virginia Tech | seb199.me.vt.edu/dreams
    All ages
    Learn about 3D printing with the Virginia Tech DREAMS Lab! Visitors can interact
    with 3D-printed objects, learn about different kinds of 3D printers, and see firsthand
    our 3D printing robot and small-scale machines!
    Project contact: Joseph Kubalak

Bringing Fossils Back to Life: An Immersive Fossil Excavation (Promo)
Paleobiology and Geobiology, Department of Geoscience, Virginia Tech |
paleo.geos.vt.edu
ICAT | icat.vt.edu
    All ages
    Last summer ICAT joined Virginia Tech's Paleobiology Research Group in the
    Triassic redbeds of Wyoming for the excavation of a phytosaur skeleton. Presented
    in 360-degree 3D, this promo will give the audience an immersive view on what it's
    like to dig up fossils! Full experience to come in the spring.
    Project contact: Michelle Stocker

Science Is Robotics
Moss Arts Center Grand Staircase

Improving Ergonomics with 3D Printing
Formy, Inc. | FormyGrips.com
> All ages
> Blacksburg startup Formy demonstrates how 3D scanning and 3D printing can be used to create more comfortable hand grips for products.
> Project contact: Sky Van Iderstine

3D printers and Interactive DIY Arduino Robotics
WDL Systems | wdlsystems.com
ICOP | icoptech.net
> Ages 5 and up
> WDL Systems, with manufacturing partner, ICOP, will be displaying 3D printers and interactive Arduino-based DIY robotics projects. Join us to win 3D prints, play with our Arduino-based projects, and ask us questions about our products or related topics.
> Project contact: Bob Buchanan

A Global Network of Volunteers Providing Free Open-Source 3D-Printed Assistive Devices
e-NABLE | enablingthefuture.org
> Ages 5 and up
> e-NABLE is a global network of over 10,000 volunteers in more than 40 countries who provide free open-source 3D-printed assistive devices to anyone who can use them. Mechanical hands are printed and assembled on site, with finished devices on display and hands-on assembly opportunities available. Exhibitors who attended a SAFE Mentor training are identified with the autism puzzle piece.
> Project contact: Peter Binkley

Assistive Robotics
Assistive Robotics Lab, Mechanical Engineering Department, College of Engineering, Virginia Tech | me.vt.edu/arlab
> Ages 5 and up
> See a back exoskeleton designed to help its wearers lift heavy boxes, and a high-powered prosthetic leg includes the knee and ankle joints.
> Project contact: Alan Asbeck

Robotics

Terrestrial Robotics Engineering and Controls Lab, Virginia Tech |
me.vt.edu/research/laboratories/trec

Mechanical Engineering Department, College of Engineering, Virginia Tech | me.vt.edu

All ages

Participants will interact with robots developed by students in the Mechanical Engineering robotics lab. Learn about humanoid robots ESCHER, THOR, and DARWIN (who plays soccer!). Talk to the students who work with them daily, and learn how to get into the field of robotics.

Project contact: Alexander Leonessa

Science Is Life
Moss Arts Center Mezzanine Lobby

Conservation and Bio-Fact Station
Mill Mountain Zoo | mmzoo.org
> Agest 5 and up
>
> Conservation issues often seem far away or beyond our control, but small actions can have a big impact. Through games, educational materials, and bio-facts, Mill Mountain Zoo will help educate people on the challenges facing animals and habitats across the globe and in our own backyard. Exhibitors who attended a SAFE Mentor training are identified with the autism puzzle piece.
>
> Project contact: Bambi Godkin

The PASSER Project: A Computer Automated Feeding System in Use from Virginia to Peru
Ecophysiology Lab, Radford University | ru-eco-physlab.weebly.com
> All ages
>
> The PASSER Project automates the collection of biological and environmental data in relation to the feeding behaviors of bird populations. This data has also been used to study primate feeding behaviors in the Amazon Rainforest of Peru. We also have a feeder build to interact with humans.
>
> Project contact: Conner Philson

Creepy Carnivorous Plants
Hahn Horticulture Garden, Virginia Tech | hort.vt.edu/hhg
> All ages
>
> Plants have amazing adaptations that help them to survive! Check out some creepy carnivorous plants, and learn why they evolved to have the ability to consume insects.
>
> Project contact: Stephanie Huckestein

Microbial World
Microbiology Club at Virginia Tech |
gobblerconnect.vt.edu/organization/Microbiology_Club
> All ages
>
> Learn about the microbial world around, on, and within you. Participants will use microscopes, observe live microbes on Petri dishes, and learn the importance of proper hand-washing.
>
> Project contact: Ann Stevens

Plants, Prizes, Selfies, and Specimens

Massey Herbarium, Virginia Tech | masseyherbarium.org

Department of Biological Sciences, Virginia Tech | biol.vt.edu

All ages

Get an inside look at the Massey Herbarium, Virginia's largest scientific plant collection! Take a selfie at our Specimen Selfie Station using real specimens and collecting gear. Make your own miniature plant specimen to take home. Spin the Botanical Wheel of Destiny!

Project contact: Jordan Metzgar

Strawberry DNA Extraction

Virginia Tech-Wake Forest University Biomedical Engineering Society | www.sbes.vt.edu/bmes

Ages 8 and up

Ever wonder what DNA looks like? Stop by and we will guide you through the process of DNA extraction of a strawberry. You can even take home a sample of the DNA you extract! Exhibitors who attended a SAFE Mentor training are identified with the autism puzzle piece.

Project contact: Kristen Renner

Fishing Is More Fun with a Well-Managed Population

Department of Fish and Wildlife Conservation, Virginia Tech | fishwild.vt.edu

Ages 5 and up

New River walleye are adapted to life in the river. Managers used to stock non-native walleye. Each spring we collect spawning walleye and examine their genetics. Native individuals are spawned in a hatchery, and their young are stocked in the river to restore the native population.

Project contact: Sheila Harris

Fossil Identification in Action

Paleobiology and Geobiology Research Group, Virginia Tech | paleo.geos.vt.edu

Global Change Center, Virginia Tech | globalchange.vt.edu

All ages

Virginia Tech's Paleobiology Research Group explores and studies the breadth of the fossil record in comparison with living animals in order to understand evolution. We will show how to use bony features to learn how animals move, grow, and eat.

Project contact: Michelle Stocker

How Do Flying Snakes "Stick" the Landing?

The Socha Lab | thesochalab.org

Biomedical Engineering and Mechanics, Virginia Tech | beam.vt.edu

> Ages 11 and up
>
> Flying snakes are amazing because of their gliding abilities, but they are also impressive climbers! To be able to land on trees and climb steep slopes, the snakes must be able to grab onto things. Come find out how these snakes hang on without hands, and how we study the friction they experience!
>
> Project contact: Michelle Graham

Inside Reptiles (and You)

McGlothlin Lab, Department of Biological Sciences, Virginia Tech | mcglothlin.biol.vt.edu

> All ages
>
> See how we use X-rays to look at lizard bones and discover what bones can tell us about how other animals are related to us!
>
> Project contact: Joel McGlothlin

Become a Watershed Detective!

Learning Enhanced Watershed Assessment System (LEWAS) Lab, Virginia Tech | lewas.centers.vt.edu

> All ages
> Where does all of Blacksburg's rain go? Discover for yourselves with our interactive touchscreen display and a virtual reality site visit! Find out how the LEWAS Lab uses a Raspberry Pi, Python computer code, and water sensors to remotely monitor the Stroubles Creek watershed.
> Project contact: Serena Emanuel

Looking Down Is Looking Up: How Aerial Photography and Geospatial Data Illuminate Our Communities

Geography, Forestry, and VirginiaView, Virginia Tech | virginiaview.cnre.vt.edu
Virginia Geospatial Extension Program | gep.frec.vt.edu

> All ages
> Our exhibit introduces visitors of all ages and interest levels to basic methods for examining the Earth's surface. We see how people use the landscape and what our impacts are at varied scales. For many visitors, viewing how familiar local landscapes change over time is especially engaging.
> Project contact: James Campbell

Shape Your Own Watershed with the Augmented Reality Sandbox

Virginia Department of Environmental Quality | deq.virginia.gov

> All ages
> How do mountains and valleys in a watershed affect streams and rivers? Shape your own watershed using the Virginia Department of Enivironmental Quality's Augmented Reality Sandbox! Build a dam and see how that changes the flow of water. Make it rain and watch how the rainwater runs off into the streams and river—in augmented reality!
> Project contact: Mary Dail

From Your Faucet to the Ocean: How Our Watershed Works.

American Water Resources Association Chapter, Virginia Tech | awra.org

> Ages 5 and up
> This exhibit displays how water flows throughout our watershed. A source of pollution can travel a long way, affecting many plants and critters.
> Project contact: Alexa Maione

Creating Tomorrow's Community Places: The World of Landscape Architecture

Landscape Architecture, School of Architecture + Design, Virginia Tech | lar.vt.edu
ASLA-VT: Student Chapter of the American Society of Landscape Architects (ASLA), Virginia Tech | gobblerconnect.vt.edu/organization/aslavt

> Ages 8 and up
> Creating fun and healthy community places takes more than pretty design. Come plan an art museum, park, or shopping area using your knowledge of art, engineering, natural sciences, and people.
> Project contact: Terry Clements

Build-a-Stream

Stream Team, Department of Biological Sciences, Virginia Tech | www.research.biol.vt.edu/ERG_webpage/VT_ST_ERG.html

> All ages
> The landscape around a stream affects how streams flow and change over time. Design your landscape and discover how the stream responds with our hands-on stream table. Come build a stream with us to see how it works!
> Project contact: Mary Lofton

The Changing Technology on the Trail

Center for Human-Computer Interaction: Technology on the Trail | technologyonthetrail.wordpress.com

> Ages 5 and up
> Hiking provides the opportunity to connect with nature. With new emerging technologies today, they are replacing older gear in favor of digital devices that can do it all. But does the newer gear mean better? Come interact with both the new and the old, and choose for yourself!
> Project contact: Timothy Stelter

Tweeting the Trail: Learning about the Appalachian Trail with Surface Technologies

Department of Computer Science, Virginia Tech | technologyonthetrail.wordpress.com
Center for Human-Computer Interaction (CHCI) | hci.vt.edu
ICAT | icat.vt.edu

> Ages 11 and up
> Explore what hikers say about the Appalachian Trail on Twitter! We are presenting a surface system for Twitter visualization. You can explore what hikers say on Twitter or search and play with the tweets on the multi-touch table!
> Project contact: Shuo Niu

Science Is Messy
Moss Arts Center Portico and Lawn

Galipatia Marshmallow Towers
Center for Enhancement of Engineering Diversity (CEED), Virginia Tech |
eng.vt.edu/ceed
> All ages
> Join the students of the Galipatia Living Learning Community, and use your
> engineering skills to build a tower with marshmallows and toothpicks.
> Project contact: Eileen McNulty

Oobleck
Curie and DaVinci Living Learning Communities | inventscommunity.org/curie-davinci
> All ages
> We will introduce visitors to our project, Oobleck, and let them interact with it
> firsthand. We will teach them about non-Newtonian fluids and get them interested
> in hands-on science.
> Project contact: Alexis Silveman

Are you Gellin'?
Department of Chemistry, Virginia Tech | chem.vt.edu
Robert B. Moore Research Group, Virginia Tech | morg.chem.vt.edu
> All ages
> Gels exist everywhere, from the foods we eat to the shampoos we use to wash our
> hair. This exhibit will teach the basic concepts of gelation, using hands-on
> demonstrations that are fun for all ages. Experiments will explore everything from
> gel formation to gel properties and real-life applications.
> Project contact: Kristen Felice

Soil Judging
Soil Judging at Virginia Tech Club | cses.vt.edu/students/undergraduate-
programs/clubs-and-organizations/soil-judging-team.html
> Ages 8 and up
> As soil judgers, we assess the landscape and the color, texture, and structure of soils
> to advise landowners on how to best use their land. Our goal is to spread
> knowledge about soil science to many age groups so everyone can understand the
> importance and beauty of soil.
> Project contact: Ben Smith

Moving Slime, Bottle Rockets, and Super-Absorbent Polymers

Alpha Chi Sigma, Virginia Tech | alphachisigma.org

All ages

Make goo move with magnets, compete with friends and family to shoot off film canister rockets, and watch a powder expand to many times its original size, all while learning about the chemistry that makes these things possible.

Project contact: Laura Wichin

Exploring the Solar System (in Person?)

Roanoke Valley Astronomical Society | rvasclub.org

Ages 5 and up

Join local amateur astronomers as they explore our solar system through hands-on activities for all ages. Discuss the effects of long-duration missions beyond Earth's orbit on the human body with Dwight Holland, past president of the International Space Medicine Association.

Project contact: Ray Bradley

Agriculture in Your Life

Ag Econ Club, Virginia Tech | gobblerconnect.vt.edu/organization/AgEcon

All ages

Join Virginia Tech's Ag Econ Club to learn about agriculture in Virginia, what we grow, how it contributes to our economy, and how it plays a role in our lives. Come make a grain jar with us, and see our state's agriculture for yourself!

Project contact: Benjamin Garber

Off Road Vehicle Design

Baja Society of Automotive Engineers (SAE), Virginia Tech | vtbaja.wixsite.com/vtbaja

Ages 5 and up

Baja SAE is a competition that simulates real-world engineering design projects and their related challenges. Every year the Virginia Tech Baja team is tasked to design and build an off-road vehicle that will survive the severe punishment of rough terrain and the harsh environment of competition.

Project contact: Andrew Touzinsky

Patient Transport

Carilion Clinic | carilionclinic.org

All ages

This hands-on display shows off Carilion Clinic ambulances of varying sizes and types. Kids are welcome to climb on board and see what the inside of an ambulance is like!

Project contact: Nicholas Mattheisen

Autism Sensory, Social, and Cognitive Exploration

Center for Autism Research, Virginia Tech | vtcar.science.vt.edu

Ages 5 and up

Hands-on activities will show sensory, social, and cognitive features related to autism spectrum disorder. Exhibitors who attended a SAFE Mentor training are identified with the autism puzzle piece.

Project contact: Angela Scarpa

Human Powered Submarine

Human Powered Submarine Team, Virginia Tech | hps.aoe.vt.edu

Ages 8 and up

The Human Powered Submarine (HPS) Team is a student-run engineering design team. The team's mission is to design, build, and race submarines that are propelled solely by human power. Having just come out of a competition cycle, the team is now working to design a completely new submarine.

Project contact: Amanda Butynes

Hybrid Electric Vehicle

Hybrid Electric Vehicle Team, Virginia Tech | me.vt.edu/Teams/hybrid-electric-vehicle-team

EcoCar3 | ecocar3.org/vthevt/about-us

Ages 5 and up

The Hybrid Electric Vehicle Team at Virginia Tech is a student engineering design team working to convert a 2016 Chevrolet Camaro into a hybrid-electric vehicle as part of the EcoCAR3 competition, which is sponsored by the U.S. Department of Energy and General Motors.

Project contact: Patricia Westfall

Planet Size Comparison

Design for America, Virginia Tech | icat.vt.edu/content/design-for-america

Ages 5 and up

We know planets are big, but how big is "big"? Which planets are similar in size? How big is Earth compared to other planets? Come find out the answers to these questions and more!

Project contact: Christine Junod

Formula Society of Automotive Engineers (SAE)

Virginia Tech Motorsports Formula SAE | vtmotorsports.weebly.com

All ages

Virginia Tech Motorsports Formula SAE is a student design team that designs, builds, tests, and competes two formula-style race cars. The team has a combustion car and a fully electric car, as well as sub systems that correspond to different aspects of the car.

Project contact: Andrew Fall

Science Is Sensory
Torgersen Hall, Room 1100

Information
Virginia Tech Science Festival | vt.edu/sciencefestival
> All ages
> Stop by for festival maps and information.
> Project contact: Phyllis Newbill

Flexing Our Muscle: An Electrifying Experience
Bioactivity, Virginia Tech | bioactivity.org
> Ages 8 and up
> Learn how we can measure muscles' electrical signals and use them to play Dance
> Dance Revolution! We'll show you how our team and the rest of the biomedical field
> is developing technologies to solve medical problems around the world!
> Project contact: Andy Cohen

Can You See Me Now? Using Eye Tracking to Understand Babies and Kids
infant Language Emotion Attention Perception (iLEAP) Lab |
psyc.vt.edu/labs/infantperception
Department of Psychology, Virginia Tech | psyc.vt.edu
> All ages
> We offer a fun series of movie clips (for example, scenes from *Up)* for free viewing
> on a laptop computer that is fitted with a portable eye tracker. We can replay the
> viewer's exact pattern of attention to each movie clip. These patterns tell us a lot
> about a child's attention and processing.
> Project contact: Robin Panneton

Breathe Better with Science
Jefferson College of Health Sciences | jchs.edu
Carilion Clinic | CarilionClinic.org
> Ages 5 and up
> See real lungs, and learn how they work and how they change when damaged by
> smoking or pollution. You will also see and feel how a special vest helps people with
> Cystic Fibrosis breathe better.
> Project contact: Chase Poulsen

Virus Tracker Vaccinations

Carilion Children's | CarilionClinic.org

Biocomplexity Institute, Virginia Tech | bi.vt.edu

Ages 5 and up

How fast can germs spread? Through interactive technology, event-goers can see just how fast a virus can spread. Our staff will be on the scene to help "vaccinate" Science Festival attendees from the "zombie virus."

Project contact: Alex Brendel

Science Is Motion
Torgersen Hall, Atrium and Room 1100

Wallops Flight Facility
NASA | nasa.gov/wallops
> All ages
> Learn more about NASA's only owned and operated launch range that can be found in Virginia!
> Project contact: Rebecca Hudson

Virginia Tech Physics Outreach
Physics Department, Virginia Tech | phys.vt.edu/
> All ages
> The Physics Outreach team has many exciting and electrifying hands-on demonstrations of physics concepts. Crowd participation is encouraged! Both young and old will be able to enjoy learning everything from what happens to marshmallows in space to how electric generators work. Exhibitors who attended a SAFE Mentor training are identified with the autism puzzle piece.
> Project contact: Henry Hilgendorf

Chem-E-Car
Virginia Tech Chem-E-Car Team | chemecarvt.wixsite.com/vtcarteam
> Ages 11 and up
> We are tasked with building a shoebox-sized vehicle that is controlled by chemical reactions. The team applies fundamental chemical engineering principles, in addition to skills in programming and mechatronics, to control our vehicle.
> Project contact: Rebecca Engler

BOLT Electric Motorcycle
BOLT at Virginia Tech | bolt.org.vt.edu/about_us.php
> Ages 8 and up
> BOLT Electric Motorcycle at Virginia Tech is an interdisciplinary team which designs, builds, and competitively races 100 percent electric motorcycles.
> Project contact: Mary Galvin

Come Fly With Us!

New River Valley Rocketry | nrvr.org

Ages 8 and up

New River Valley Rocketry is a model and high power rocket club here in Blacksburg, Virginia. We have a 10,000-foot Federal Aviation Administration (FAA) flight waiver, experienced experts, and industry safety standards to ensure all our monthly launches are fun, safe, and memorable for flyers and spectators alike.

Project contact: Thomas Weeks

Rocketry

Rocketry at Virginia Tech | vtrocketry.aoe.vt.edu

New River Valley Rocketry and Tripoli Rocketry Association | nrvr.org

All ages

The mission of this club and undergraduate design team, associated with Virginia Tech's Department of Aerospace and Ocean Engineering and New River Valley Rocketry, is to create an environment for students of all backgrounds and ages to learn and work together building rockets.

Project contact: Brad Smith

Hands-On with Space

Students for the Exploration and Development of Space, Virginia Tech | seds.org.vt.edu

Ages 5 and up

Check out rocket parts, learn the basics about how a rocket engine works, and play with fun hands-on activities related to space!

Project contact: Ian Burrell

Science Is Helpful
Torgersen Hall, Room 1070

Tools for the Classroom
Technology-enhanced Learning and Online Strategies (TLOS), Virginia Tech |
tlos.vt.edu/

> Ages 8 and up
>
> Get a hands-on experience using tools that Technology-enhanced Learning and Online Strategies, a division of Information Technology, offers to the Virginia Tech community. We will have hands-on demonstrations of 3D printers and software, as well as assistive technologies that are used in the classroom.
>
> Project contact: Daniel Yaffe

Transportation in a Disrupted World: Traveling Safe!
SAFE-D University Transportation Center | vtti.vt.edu/utc/safe-d
Virginia Tech Transportation Institute | vtti.vt.edu

> All ages
> The way we move around is changing fast! New technologies and services like automated cars, Uber, and vehicle-sharing give us a lot of options and benefits, but they also can result in unintended challenges—particularly for families. Learn about how to stay safe while moving in this new world!
> Project contact: Miguel Perez

Deception of the Senses
Neuroscience Club, Virginia Tech |
gobblerconnect.vt.edu/organization/Neuroscience_Club

> All ages
> Taste threshold participants will assess changes in their threshold of sweet taste before and after drinking Gymnema tea. Neuroplasticity participants will try to make the basketball into the hoop while wearing distortion goggles.
> Project contact: Arie Roth

Build-a-Helmet
Helmet Lab | helmetlab.com
Department of Biomedical Engineering and Mechanics, Virginia Tech | beam.vt.edu

> Ages 5 and up
> Discover what current football and hockey helmets are made of, and try your hand at building one yourself. Test your design against helmets that players wear to see which keeps you safer!
> Project contact: Abi Tyson

Glo Germ
Carilion Clinic | CarilionClinic.org
Carilion New River Valley Medical Center | carilionclinic.org/locations/carilion-new-river-valley-medical-center

> Ages 5 and up
> The Glo Germ "kit" shows kids where germs hide on their hands—even when they look clean. This interactive demonstration allows you to see the sticking power of germs, how they spread, and the necessity of good hand-washing techniques!
> Project contact: Deb Sydnor

DermaScan Sun Damage Viewer

Carilion New River Valley Medical Center | CarilionClinic.org

Ages 5 and up

Sun Damage Viewer is a DermaScan electronic ultraviolet light source that enables you to view damaged skin on the face and neck area. It is not a diagnostic tool; it promotes preventative skin care, sun screen use, and regular skin check ups.

Project contact: Ashley Hash

Science Is Process
Newman Library Multipurpose Room and adjoining lobby

Information
Virginia Tech Science Festival | vt.edu/sciencefestival

> All ages
> Stop by for festival maps and information. Exhibitors who attended a SAFE Mentor training are identified with the autism puzzle piece.
> Project contact: Phyllis Newbill

The Balance of Nature
Interfaces of Global Change, Global Change Center, Virginia Tech | globalchange.vt.edu/igc

> All ages
> There are so many beautiful things to touch, taste, smell, hear, and see all around us thanks to the Earth. But did you know that the Earth needs us to help keep it healthy? Learn about ways that you can help take care of our planet and keep nature in balance.
> Project contact: Sydney Hope

Game Changineer
Virginia Tech | vt.edu

Bradley Department of Electrical and Computer Engineering, Virginia Tech | ece.vt.edu

> Ages 8 and up
> Computational thinking and programming video games in plain English: create your video game in just minutes, with an option to share your game. Computing concepts of abstraction, object-oriented design, algorithmic thinking, problem solving, debugging, and critical thinking are incorporated.
> Project contact: Michael Hsiao

What Is Nano and What Does It Have to Do with the Earth and the Environment?
NanoEarth, Virginia Tech | nanoearth.ictas.vt.edu

VTSuN: Virginia Tech Center for Sustainable Nanotechnology | sun.ictas.vt.edu

> All ages
> Nanotechnology is everywhere: in your smartphone, in your food, and in nature. But what can nanotechnology do for the Earth? And what can it mean for the environment? Find out at the NanoEarth booth!
> Project contact: Matt Chan

Library Technology Showcase

University Libraries, Virginia Tech | lib.vt.edu

Ages 5 and up

Newman Library has tons of innovative and fun technologies to support teaching and learning. Join us for a hands-on introduction to 3D printing, virtual reality, educational toys, creative design, and more. Be sure to also check out our Places and Spaces: Mapping Science exhibit on the fourth floor. Exhibitors who attended a SAFE Mentor training are identified with the autism puzzle piece.

Project contact: Edward Lener

Virus Tracker

Public Health Association, Department of Population Health Science, Virginia-Maryland College of Veterinary Medicine, Virginia Tech | vetmed.vt.edu

Ages 5 and up

Also see the Virus Tracker exhibit in the Moss Arts Center. Virus Tracker is an educational game that can transform any event into a full-blown zombie epidemic. Score points by passing on your zombie virus to other players or by curing them with the latest vaccine. Exhibitors who attended a SAFE Mentor training are identified with the autism puzzle piece.

Project contact: Kerry Redican

Scoring an A+ in Scientific Research

Good Laboratory Practice Program, Virginia-Maryland College of Veterinary Medicine, Virginia Tech | vetmed.vt.edu

Society of Quality Assurance | sqa.org

Ages 5 and up

Put on your lab coat, set up your test tubes, grab your checklist and learn why quality assurance (QA) is important to research! Perform an experiment as the laboratory scientist or act as the QA auditor and check the experimental results for completeness and accuracy. Discover how QA is done! Exhibitors who attended a SAFE Mentor training are identified with the autism puzzle piece.

Project contact: Sandy Hancock

Let's Be Scientists!

Virginia Career VIEW, School of Education, Virginia Tech | vacareerview.org

Ages 5 and up

Virginia Career VIEW will focus on exploring what it means to be and think like a scientist: to question, experiment, and share, through hands-on activities focused on participant-led questioning, "what happens if?". Learn about the importance of guessing (hypothesizing) and testing. Printable resources will be provided.

Project contact: Britni Brown O'Donnell

Robotics

T.E.K. Robotics, Virginia Tech | tekrobotics.com

Ages 8 and up

T.E.K. Robotics strives to engage school-age children in STEM education through hands-on activities. By allowing kids to accomplish simple objectives using remote-controlled robots, we hope to spark their curiosities about how these machines work.

Project contact: Philip Yates

Science Is Collaborative
Newman Library Fusion Studio, room 2038

A Baby Grand Piano for Your Backpack
Octivs Inc.
>   All ages
>   Octave's Modular Electric Piano is changing the way pianists play on the go, with a
>   weighted electric MIDI piano that fits in your backpack. For melodies that are always
>   with you, Octave's Modular Electric Piano is always in reach, exciting the next
>   generation's pianists, producers, and performers.
>   Project contact: James Rotbert

Fusion Studio
University Libraries, Virginia Tech | fusionstudio.lib.vt.edu
>   Ages 11 and up
>   The Fusion Studio is a project space for undergraduate groups working on
>   interdisciplinary projects. Check out the studio and learn about Octivs, one of our
>   project teams!
>   Project contact: Sara Sweeney

Science Is Visualization
Newman Library, Fourth Floor

Places and Spaces: Mapping Science Exhibit
University Libraries, Virginia Tech | lib.vt.edu
Cyberinfrastructure for Network Science Center | scimaps.org

Ages 11 and up

This exhibit consists of over 100 static and interactive visualizations. Topics range from Ptolemy's Cosmographia world map to modern examples of groundbreaking geospatial, mathematical, and scientific concepts. The maps serve as fantastic examples of the intersection of art, design, and science.

Project contact: Scott Fralin

Newman Library Virtual Environments Studio, room 4020

The Virtual Environments Studio
University Libraries, Virginia Tech | lib.vt.edu

Ages 5 and up

See the Virtual Environments Studio, a new space in Newman Library offering virtual reality and augmented reality experiences for patrons. We'll be showing off some popular VR experiences and explaining a little bit about how VR and AR technology works to visitors!

Project contact: Jonathan Bradley

Science Is on Stage
Moss Arts Center, Street and Davis Performance Hall, Anne and Ellen Fife Theatre

4 PM

Nutshell Games

Center for Communicating Science | communicatingscience.isce.vt.edu

Ages 11 and up

Some times you feel like a nut! The Center for Communicating Science at Virginia Tech will present the 2nd Annual Nutshell Games, a contest in which graduate students have a mere 90 seconds to explain their research. The event will be held in the Street and Davis Performance Hall's Anne and Ellen Fife Theatre, located in the Moss Art Center, from 4:00 to 5:30 p.m. on Saturday, November 4, 2017, in conjunction with the Virginia Tech Science Festival. The Center for Communicating Science will award $500 prizes to the three graduate researchers who explain their work most clearly as determined by a panel of esteemed judges. For more information, take a peek at last year's games at youtube.com/channel/UC01cz4Mal3-AOZeODCauLHw

An evening with

CHRISTOPHER EMDIN

"STEM Education and Empowerment for the Rest of Y'all"

Saturday, Nov. 4, 2017 | 7 p.m.
Anne and Ellen Fife Performance Hall
Moss Arts Center

vt.edu/sciencefestival

7 PM

An Evening with Christopher Emdin: STEM Education and Empowerment for the Rest of Y'all

Black Cultural Center | ccc.vt.edu/advocacy/Cultural_Community_Centers/bcc.html

Ages 11 and up

Christopher Emdin, Ph.D., will speak at a free public presentation at 7:00 p.m. on Saturday, November 4, in the Street and Davis Performance Hall's Anne and Ellen Fife Theatre, located in the Moss Arts Center.

Emdin is an associate professor in the Department of Mathematics, Science, and Technology at Teachers College, Columbia University, where he also serves as director of science education at the Center for Health Equity and Urban Science Education. He is also the associate director of the Institute for Urban and Minority Education at Teachers College, Columbia University. He is an alumni fellow at the Hutchins Center at Harvard University and currently serves as Minorities in Energy ambassador for the U.S. Department of Energy and the STEAM ambassador for the U.S. Department of State.

Emdin is a social critic, public intellectual, and science advocate whose commentary on issues of race, culture, inequality, and education have appeared in dozens of influential periodicals, including the *New York Times, Wall Street Journal,* and *Washington Post.*

Emdin holds a Ph.D in urban education with a concentration in mathematics, science, and technology; masters degrees in both natural sciences and education

administration, and bachelor's degrees in physical anthropology, biology, and chemistry.

He is the creator of the #HipHopEd social media movement and a much sought-after public speaker on a number of topics that include hip-hop education, STEM education, politics, race, class, diversity, and youth empowerment. He is also an advisor to numerous international organizations, school districts, and schools, where he delivers speeches and holds workshops and professional development sessions for students, teachers, policy makers, and other education stakeholders within the public and private sector.

Emdin provides regular commentary on *Al Jazeera* and the *Huffington Post*, where he writes the *Emdin 5* series. He is the author of the award winning book *Urban Science Education for the Hip-hop Generation and For White Folks Who Teach in the Hood and the Rest of Y'all Too,* which is currently on the *New York Times* best seller list.

Festival Team

Festival Chair

Phyllis Leary Newbill
Outreach and Engagement Coordinator
Center for Research in SEAD Education
Institute for Creativity, Arts, and Technology (ICAT)

Marketing and Publicity

Steven Mackay
Communications Director
College of Science

Erica Corder
Communications Manager
College of Engineering

Rosaire Bushey
Communications & Outreach
Manager
Mechanical Engineering

Heather Ducote
Director of Marketing and
Communications
Moss Arts Center/ICAT

Susan Bland
Communications Manager
Moss Arts Center/ICAT

Ali Marhefka
Communications Assistant
ICAT

Irene Kilmer
Visitor Relations Manager
Montgomery County VA Regional
Tourism
Marketing Team

Lisa Saul
Graphic Designer
Continuing and Professional
Education
Creative Services Team

Lori Atwater
Web Designer
Continuing and Professional
Education
Creative Services Team

Evaluation

Michelle Farber
graduate student
Center for Research in SEAD
Education
ICAT

Julee Farley
STEM/SEAD specialist
Montgomery County Public Schools
& Center for Research in SEAD
Education

Logistics

Jeanette Cooper
Program Coordinator
Continuing and Professional
Education
Virginia Tech

Ashley Gardner
Program Coordinator
Continuing and Professional
Education
Virginia Tech

Edward Lener
College Librarian for the Sciences
University Libraries

Ginny Pannabecker
Life Science Scholarly
Communication Librarian
VT Newman Library

Dan Yaffe
Instructional Technologist and
Curriculum Coordinator
Networked Learning Initiatives

Volunteer Team

Emily Reasor
Volunteer Coordinator

Karen Eley Sanders
Associate Vice Provost for College
Access
Virginia Tech College Access
Collaborative

Micaela Sanders
Volunteer Coordinator

Festival Partners

Kimberly Williams
Assistant Director
Black Cultural Center

Holly Williams
Program and Business Operations
Manager
ICAT

Carrie Kroehler
Center for Communicating Science

Ben Knapp
Director
ICAT

Amy Azano
Center for Autism Research
College of Science

Donald Pizzullo
Senior program manager
Virginia Tech Roanoke Center

Kristy Collins
Director of Education & Outreach
Biocomplexity Institute

Patricia Raun
Center for Communicating Science

Rachel Hopkins
Executive Director
Science Museum of Western
Virginia

Angela Scarpa
Center for Autism Research
College of Science

Cathy Sutphin
Associate Director
4-H Youth Development
Virginia Cooperative Extension

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