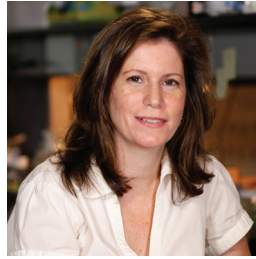## KEYNOTE SPEAKER

**Auditorium, 2 pm**

**Dr. Sheila Nirenberg**
**"A Prosthetic Eye to Treat Blindness."**

Dr. Sheila Nirenberg is a MacArthur "Genius" award winner and a Professor of Physiology and Biophysics at Weill Cornell Medical College in New York City.   As a neuroscientist, Dr. Nirenberg explores how the brain encodes visual information and she has invented a prosthetic eye to restore sight to blind people who have experienced photoreceptor cell degeneration. Dr. Nirenberg is also applying her neural coding discoveries to machine vision algorithms with the aim of advancing development of robotic "vision" and brain-machine interfaces.  Sheila Nirenberg holds a B.A. from the State University of New York, Albany, and a Ph.D. from Harvard University. She is a member of the Institute for Computational Biomedicine at Weill Medical College of Cornell University. Her research has been published in journals such as *Nature, PNAS, Neuron,* and *PLoS One.*

## THANK YOU TO OUR GENEROUS SPONSORS

## ABOUT WEF

**Wellesley Education Foundation (WEF)** is a 501(c)(3) non-profit organization dedicated to investing in programs that enhance, enrich and maintain educational excellence as well as foster innovation in the Wellesley Public Schools.  Since its inception in 1984, WEF continues to provide a thoughtful and effective vehicle for residents and businesses to show their support for the Wellesley Public Schools through generous donations. Over $1.8 million has been awarded in grants and assistance to WPS educators by WEF in the past 10 years.

## WORKSHOPS

*Space limited; sign up at room.*

### 10 am

**ROOM 164**
**StoryMaking** Children Creating Stories with Tangible Computational Media by Alisha Hasan Panjwani, MIT Media Lab

**ROOM 165**
**Science Theater!** with Science from Scientists. An interactive stage show for audiences of all ages. The show features exciting science demonstrations and accompanying explanations. *(45 minutes)*

**ROOM 231**
**Aerodynamics of Kites** In this workshop you can build an actual kite that flies like a dream... but there's a catch. You have to build it yourself from the materials we supply. Will it fly? Give it a try! *(30 minutes)*

**ROOM 238**
**Learn the Basics of Coding** — jrCode Academy. Learn how to code using Scratch with jrCode! During this session, students will walk through the steps of choosing their own sprites, animating them, and adding their own creative flair to their projects. *(45 minutes)*

**ROOM 239**
**LEGO Lab**
Can plastic help you explore nature? It can if it's a LEGO brick! Join teacher naturalists from Mass Audubon's Drumlin Farm Wildlife Sanctuary to try your hand at LEGO building, nature-style. We'll be using the cutting edge science of biomimicry to explore some of nature's most ingenious designs and then make our own creations. Take your LEGO building "outside," and come engineer with us! *(45 minutes)*

**ROOM 240**
**Science Show** by LINX. Come join the wacky and zany LINX Camps Scientists as they lead an audience-interactive lab experience that is gooier, sloppier and even more explosive than ever before! *(45 minutes)*

**ROOM 241**
**WEF Planetarium Show**
See the stars! Experience the night sky in its full glory without light pollution in a Starlab portable planetarium. Learn how to find the North Star, ask questions, see the Milky Way, see the southern constellations. *(30 minutes)*

**ROOM 243**
**Finding & Solving Design Challenges in Stories** by Engineering Lens. Experience an interdisciplinary learning environment for students that uses the engineering design process and thinking skill tools (questions, creative and critical thinking and meta-cognitive reflections) to create engineering design challenges which arise from the literature kids are already reading. *(45 minutes)*

**ROOM 250**
**"Genes in a Bottle" — Extract Your DNA**  Have you ever wondered why you look like your mom and dad and how that information is stored? In this activity, scientists from Boston University will help you purify your own DNA, visualize it, and then make a personalized  necklace containing the molecule that makes you, you! *(45 minutes)*

### 11 am

**ROOM 164**
**"How I Discovered I was an Engineer"** Nikolai Begg, WHS Grad and MIT PhD

**ROOM 165**
**Science Theater!** with Science from Scientists *

**ROOM 229**
**Build your first Android App with App Inventor!** with Wellesley College. Do you ever wonder how apps for your phone are made? Would you like to build apps of your own? Then, come to this workshop to learn building apps for Android devices with App Inventor, a visual programming environment, in which we create apps by putting together block pieces like jigsaw puzzles. Despite being easy to learn, App Inventor is very powerful, and very soon you'll be inventing powerful apps and games with it. Bring your own app ideas to discuss. *(6th grade and up, 1 hour)*

**ROOM 231**
**Aerodynamics of Kites** *

**ROOM 238**
**Learn the Basics of Coding** – jrCode Academy *

**ROOM 240**
**Science Show** by LINX *

**ROOM 241**
**WEF Planetarium Show** *

**ROOM 242**
**Make a Light-Up Greeting Card** with Hunnewell Elementary

**ROOM 243**
**Finding & Solving Design Challenges in Stories** *

**ROOM 263**
**Intro to Programming with Processing** with WHS. This hands-on workshop will introduce programming in the Processing programming environment. Processing was developed at MIT to encourage novices to learn to program through developing art, and for artists to include programming as a means of expression. At WHS, we use Processing as a first programming language in our introductory course. *(6th grade and up, 1 hour)*

### 12 pm

**ROOM 164**
**Climate Reality** – Quentin Prideaux, Climate Leader. An interactive talk and discussion about global warming and what we can do to stop it.

**ROOM 228**
**Understanding and Drawing Fun Maps** with Wellesley Parents Supporting Art Students. Celebrating 2015 as the United Nations International Year of Maps, the importance of Visual Arts combined with science and technology to generate innovation (STEAM). *(45 minutes)*

**ROOM 230**
**Coding with Microsoft**
Sign up now for serious screen time with our Surface Pro 3 and Windows 8.1. Behind this is real computer science that'll improve problem solving and digital literacy—all based on core STEM standards. Build a game with Crossroads Adventure and jump into a global campaign involving millions of other students, called the Hour of Code. *(45 minutes)*

**ROOM 231**
**Aerodynamics of Kites** *

**ROOM 238**
**Learn the Basics of Coding** – jrCode Academy *

**ROOM 240**
**Science Show** by LINX *

**ROOM 241**
**WEF Planetarium Show** *

**ROOM 243**
**Finding & Solving Design Challenges in Stories** *

**ROOM 250**
**"Genes in a Bottle" — Extract Your DNA** *

**ROOM 263**
**Intro to Programming with Processing** with WHS. *

### 1 pm

**ROOM 228**
**Understanding and Drawing Fun Maps** *

**ROOM 229**
**Build your first Android App with App Inventor!** *

**ROOM 238**
**Learn the Basics of Coding** – jrCode Academy *

**ROOM 239**
**Journey to the Center of the Body** Making surgical instruments smaller and smarter with Nikolai Begg, WHS Grad and MIT PhD

**ROOM 240**
**Science Show** by LINX *

**ROOM 241**
**WEF Planetarium Show** *

**ROOM 243**
**Finding & Solving Design Challenges in Stories** *

**ROOM 250**
**"Genes in a Bottle" — Extract Your DNA** *

**ROOM 263**
**Intro to Programming with Processing** with WHS. *

*\* See previous listing for details.*

## WELLESLEY STEM EXPO
### INSPIRING THE NEXT GENERATION
A Wellesley Education Foundation Event

**WEF**

**March 28, 2015**
Wellesley High School

### OVERVIEW OF ACTIVITIES

10-2 PM ...... **Exhibits, Workshops, Student Showcase & Speakers**

2 PM ...... **Keynote Speaker Dr. Sheila Nirenberg "A Prosthetic Eye to Treat Blindness"**

**Sustainability Challenge Winners Announced**

3-4 PM ...... **Meet the STEM Professionals Student Networking Reception**

**www.wellesleyeducationfoundation.org**

## EXHIBITS

### Robot Zoo
- ● ■ Cool and Practical Robots – iRobot
- ■ VECNA Robots
- ■ Harvest Automation
- ● Mass State Police Bomb Squad
- ● Robotic Tuna Fish – Olin College of Engineering Intelligent Vehicles Laboratory
- ■ Remote Underwater Surveillance System – MassBay
- ■ Micromouse – Maze Solving Robots
- ■ Robot Bugs, Origami Robots, and More! – Harvard Microrobotics Lab
- ■ Motorized Paper Airplane Dispenser – Olin College of Engineering
- ■ Wizard's Chess – Olin College of Engineering
- ■ WALL-E: Building a naturally interactive robot – Olin College of Engineering
- ● Aerial Drone Use of GPS Technologies – Schofield Elementary
- ■ Wellesley FIRST Lego League and Junior FIRST Lego League Teams
- ■ Schofield Lego Robotics Club
- ● Drone Photography - Peter Greer

### Sports STEM
- ■ Engineering in Baseball – UMass Lowell Baseball Research Center
- ■ The Making of a Titleist Pro V1 – Acushnet Company
- ■ How a Ski is Made – Parlor Skis
- ■ Science of Figure Skating – Hunnewell Elementary
- ■ Hoop Dreams—or Reality? How Geometry Can Net More Baskets – Upham Elementary

### Earth and Space
- ■ Tower Garden-Urban Farming – The Verve Difference
- ■ Safe and Sustainable Backyard Gardening – Wellesley College
- ■ Space Exploration – Clay Observatory
- ■ When Stars Go Boom; Explore Impact Craters; Be an Astronomer, Control Your Telescope; Here, There and Everywhere – the McAuliffe Center at Framingham State
- ■ Make a Comet! – Aldrich Astronomical Society, Inc. *(Room 216)*

- ■ Fun in the Sun: How Solar PV Works – Solarflair Energy
- ■ Watershed in a Box – WHS Green Team
- ■ Sustainable Wellesley High School Tours and Info – WHS Green Team
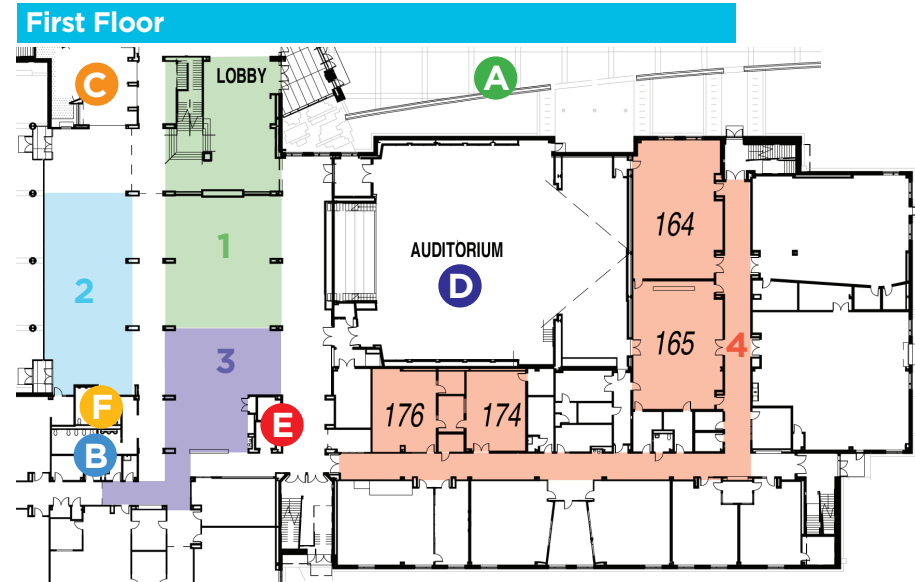- ● WBZ Storm Chase Vehicle

### Life Sciences
- ■ Go Inside a Life-Sized Humpback Whale – The Whalemobile
- ■ Power of Pollinators – Massachusetts Horticulture Society
- ■ The Brain Booth – Wellesley College Neuroscience Program *(Room 247)*
- ■ The Nature of STEM – Mass Audubon's Drumlin Farm Wildlife Sanctuary
- ■ Tide Pool Touch Tanks – New England Aquarium
- ■ Understanding Diabetes & Obesity Using Mice – UMass Medical
- ■ Newton Wellesley Hospital Shipley Medical Simulation Center
- ■ Natural Selection of Bird Beaks – WHS Biology Department *(12-2 pm, Room 248)*
- ■ Smart Scan App for Healthy Living – Wellesley Cancer Prevention Project
- ■ Meet the Mighty Worm – Natick Community Organic Farm
- ■ Seeds on the Move – Wellesley College Botanical Gardens
- ■ Science of Flowers – Bates Elementary
- ■ Forensic DNA - MassBay

### Physical Sciences
- ■ Explore Air and Things that Float – Boston Children's Museum
- ■ Hands-on Fun – Discovery Museums
- ■ "Egg-bert 'n' Ice" – Mad Science of Greater Boston
- ■ Galileo's Acceleration Experiment: Feather vs. Lead – UMass Medical
- ■ Explore Light and Optics – NES/OSA
- ■ Vinny the Velociraptor – Olin College of Engineering
- ■ Science of Cooking - Whole Foods
- ■ Egg-Marine Challenge - Club Invention
- ■ Fabulous Food Science – Fiske Elemenaty

## EXHIBITS, WORKSHOPS, & SHOWCASE FLOOR PLAN

### First Floor



### Second Floor



### KEY
| | |
|---|---|
| ■ | Zone 1 |
| ■ | Zone 2 |
| ■ | Zone 3 |
| ■ | Zone 4 |
| ■ | Zone 5 - 2nd Floor |
| ■ | Zone 6 - Robot Zoo |
| Ⓐ | Outside |
| Ⓑ | Bathrooms |
| Ⓒ | Café: Food Open from 10-3; cash & checks only. |
| Ⓓ | Keynote Speaker |
| Ⓔ | Elevator |
| Ⓕ | Meet the STEM Professionals |

## EXHIBITS

### Physical Sciences
CONTINUED
- ■ WMS and WHS Science Olympiad Team
- ■ Chemistry's Rainbow – WHS Chemistry Department *(Room 246)*
- ■ TEAM Power – St. John School
- ■ St. Paul School

### Engineering and Technology
- ■ Build Cool Gadgets with Simulink–MathWorks
- ■ Bringing Software to Life – Robogals Wellesley *(Room 220)*
- ■ Fun with 3D Printing and 3D Scanning – Toys in Box
- ■ Try Altered Reality, Build 3D-Print Microscope & More – Innovations Institute
- ● Explore Tesla Model S
- ■ Mini Zip-lines! – Engineering Discovery from Olin College
- ■ Build a Small Hovercraft then Ride in a Big One – Explo *(Room 226)*
- ■ Building Bridges – STEM Beginnings
- ■ Design Challenges – the Museum of Science
- ■ Engineer a Balloon Powered Vehicle – Tenacre Country Day School
- ■ Fun with LEDs – Einstein's Workshop
- ■ Gamify: Build games on iPad – WPS *(Room 219)*
- ■ Experience WHS TV Studio *(Room 174)*
- ■ Gyroscopes and Their Use in Segways – Schofield Elementary
- ■ Take Apart Lab – Hardy Elementary *(Room 215)*
- ■ STEM at the Library - Wellesley Free Library
- ■ Cisco's Young Women's Innovation Challenge
- ■ Aero Club of New England

### Math
- ■ Math Moves U – Raytheon
- ■ Laser Maze – MassBay
- ■ Classifying the Venn Way – MassBay
- ■ Math Olympics! – Russian School of Mathematics
- ■ 3D Printed Tanagram Project – Hanscom Middle School
- ■ M&M Math – Sprague Elementary
- ■ Can you Kanoodle? – Schofield Elementary
- ■ Make Your Own Secret Code – Olin College of Engineering

## STUDENT SHOWCASE

### Zone 4, 10 am - 2 pm
**Come see some of the unique and fun STEM activities students in Wellesley are doing!** The showcase includes samples of student work, posters and projects from the local elementary schools, middle school and high school, including school based enrichment activities as well as student clubs that help promote and engage students in the areas of science, technology, engineering and mathematics (STEM). Posters, projects and items are created by students of all ages and across various disciplines of STEM learning.

## SUSTAINABILITY CHALLENGE

### Auditorium
**High School Students were challenged to create an accurate, thorough, creative, engaging and fun video which defines the word "sustainability."** Highlighted submissions will be shown and winners announced at 2 pm in the Wellesley High School Auditorium. Winning participants will be awarded a Go Pro video camera.

## MEET THE STEM PROFESSIONALS RECEPTION

### Faculty Dining Room, 3 - 4 pm
**Meet people with exciting STEM Careers!** Talk to programmers, inventors, entrepreneurs, scientists and other STEM professionals and learn about how they got interested in their respective fields, what educational pathways they followed and what they like most about their careers. *(High School Students Only.)*

## WHAT'S NEXT?

If you had fun today, consider learning more by investigating our **What's Next Listing** of local STEM opportunities, a compilation of local internships, camps, clubs and classes pertaining to STEM. This listing is not exhaustive but highlights some of the cool opportunities available around us.

See the listing here:
**www.wellesleyeducationfoundation.org**
> Events
  > Wellesley STEM Expo
    >What's Next after STEM Expo