SCIENCE *exploration* DAY

2014 28 years

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Wednesday, March 19, 2014 • University at Buffalo, Amherst Campus

Featuring Keynote Speaker:

Bill Owens, Praxair

The Cold, Cold World of Cryogenics

Niagara Frontier Science Supervisors

New York Sea Grant

Great Lakes Program University at Buffalo

Western Section of the Science Teachers Association of New York State

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Keynote Presentation

All students and teachers will attend this presentation

The Cold, Cold World of Cryogenics

Presented by:

Bill Owens

Senior Engineering Consultant for Praxair, Inc.

Lecture and demonstration on Cryogenics, including oxygen-enriched flammability properties. This session will feature many experiments using nitrogen and oxygen cryogenic liquids to demonstrate both their properties and the effects cold temperatures have on other materials.

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State University of New York at Buffalo (North Campus)

Large Group Presentations (L)

(These presentations will be assigned to students)

L-1
Endangered Species – C.I.T.E.S. Trade in Wildlife

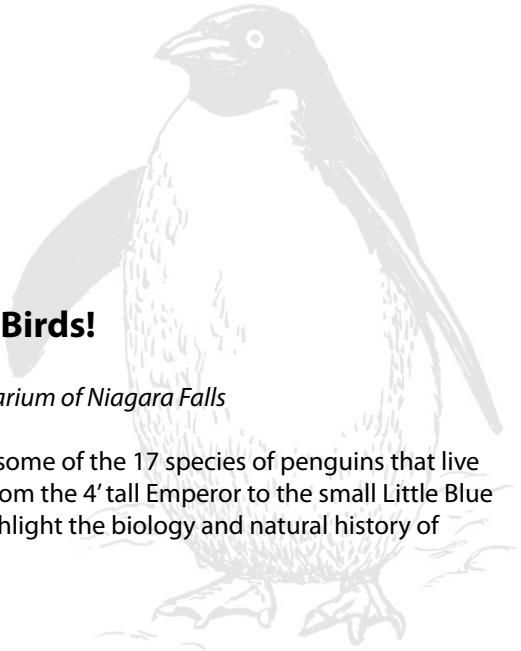
Michael Muehlbauer, Supervisory Wildlife Inspector for the Upstate New York, U.S. Fish and Wildlife Service, Office of Law Enforcement

The importation and exportation of wildlife and endangered species is regulated by the USFWS's law enforcement agency. Buffalo is an international border port where inspectors are responsible for monitoring the international wildlife trade in commercial products. A video, PowerPoint and display materials will add to this session.

L-2
A Sexually Transmitted Infections: The Gift that Keeps Giving

Beverly Roe, Professor, Erie Community College, South Campus

This informative program will provide an overview of both the common and uncommon sexually transmitted infections that young adults should be aware of.



L-3
Penguins are "COOL" Birds!

Jeanette Brunner, Educator, Aquarium of Niagara Falls

This presentation will focus on some of the 17 species of penguins that live in the Southern Hemisphere. From the 4' tall Emperor to the small Little Blue penguins, this program will highlight the biology and natural history of these interesting birds.

L-4
STEM Education Innovations in Buffalo Public Schools: The Interdisciplinary Science and Engineering Partnership

Dr. Joseph A. Gardella, Jr.
SUNY Distinguished Professor and John and Frances Larkin Professor of Chemistry, Director, Interdisciplinary Science and Engineering Partnership (ISEP, isep.buffalo.edu), University of Buffalo

Students from UB, Buffalo State College, Daemen, Medaille, Canisius and Niagara all collaborate to work with science, technology, special education and English as second language students to develop and implement new hands on science experiments and classroom work as part of the Interdisciplinary Science and Engineering Partnership (ISEP, isep.buffalo.edu).
This presentation will discuss some of the exciting work that middle and high school students in Buffalo schools are working on, including cancer genetics with Roswell Park Cancer Institute, earthquake simulations with a shake table in the classroom, environmental chemistry and DNA analysis and hands on EKG in anatomy and physiology.

L-5
The Real Science Behind CSI: Applied Forensic Science

Dr. Ted Yeshion, Edinboro University of Pennsylvania, Departments of Criminal Justice and Forensic Chemistry

An overview of typical crime laboratory and the responsibilities for each of the sections of the lab will be provided. Discussions will include a definition of forensic science, how different scientific disciplines integrate to assist investigators in resolving inquiries of a legal nature, and examples of crime scene reconstruction. The role of the forensic scientist as an expert witness will also be discussed.

L-6
Medical Entomology In Service to the Public

Dr. Wayne Gall, Regional Entomologist, NYS Department of Health, Buffalo

Dr. Gall will draw upon case studies, surveillance and his research as Regional Entomologist with the New York State Department of Health to demonstrate how the work of medical entomologists benefits the public and helps protect public health. Deer ticks, bed bugs, fly larvae that invade living tissue, and tropical rat mite dermatitis will be discussed.

Small Group Presentations (S)

S-1
Structural Engineering And Earthquake Simulation Tour

Tom Albrechcinski, SEESL/UB-NEES Site Operations Manager, Civil, Structural and Environmental Engineering, University at Buffalo

The Network for Earthquake Engineering Simulation (NEES) laboratory is a part of the Structural Engineering and Earthquake Simulation Laboratory (SEESL). The laboratory is capable of conducting testing of full or large-scale structures using dynamic or static loading. This is enabled by the availability of two shake (earthquake simulation) tables; large-scale dynamic and static servo-controlled actuators; and a 40-ton capacity crane. Participants will hear a presentation describing this very unique facility and observe an example of the nature of seismic testing using a "Mini-Shake Table" prior to the tour of the laboratory.

S-2
Science in Your Life (That you probably never think about!)

Dr. Don Birdd, Professor Emeritus, Science Education, Buffalo State College

We are surrounded by science—but we take it all for granted! This session will offer an innovative glimpse of the science incorporated in your daily life. You may not have considered or even realized that science is around you throughout the day. Join in this interesting and interactive session to learn more!

S-3
What will be our Next Big Advances in Cancer?

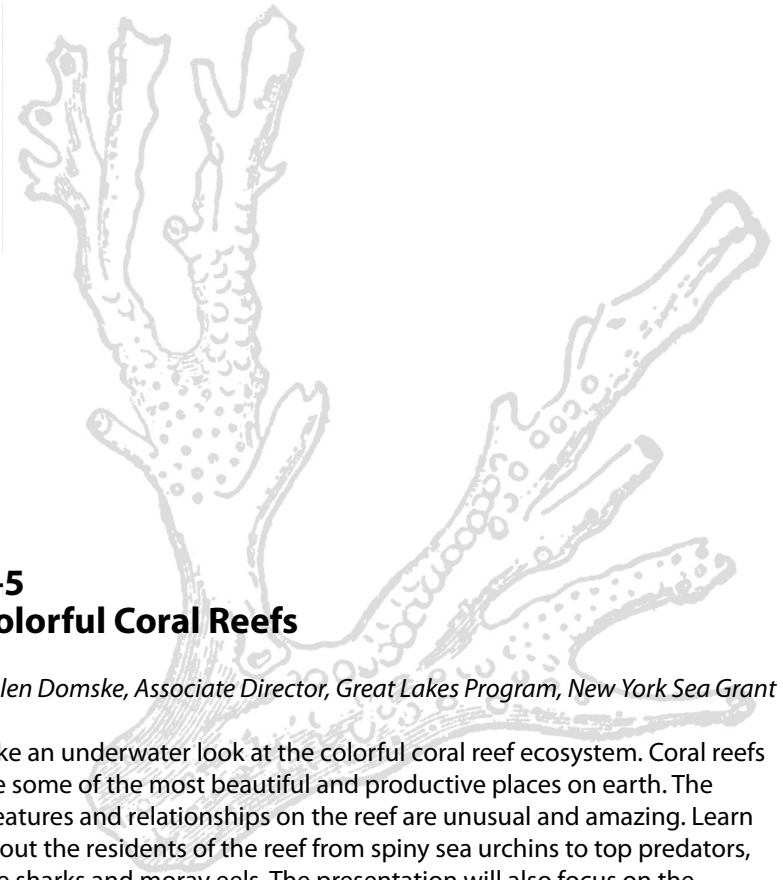
Richard P. Hershberger, PhD, MBA, Chief Academic Officer, Roswell Park Cancer Institute , Dean, Roswell Park Graduate Division, University at Buffalo

Cancer vaccines? Light and heat treatments? Prevention drugs? Genetically customized treatments? Targeted antibodies? Tanning and e-cigarette avoidance? Learn what Roswell Park and other cancer researchers are doing to create new ways of preventing, diagnosing, and surviving cancer. Where will you fit in on the cancer team, and what new ideas can you come up with to fight cancer?

S-4
Astronomy: Portable Star Lab Planetarium

Tim Collins, Whitworth Ferguson Planetarium at Buffalo State College

Finding their way around the night sky via a portable planetarium, participants will observe projections of constellations, stars and galaxies and learn more about the nature of the universe.



S-5
Colorful Coral Reefs

Helen Domske, Associate Director, Great Lakes Program, New York Sea Grant

Take an underwater look at the colorful coral reef ecosystem. Coral reefs are some of the most beautiful and productive places on earth. The creatures and relationships on the reef are unusual and amazing. Learn about the residents of the reef from spiny sea urchins to top predators, like sharks and moray eels. The presentation will also focus on the challenges that the coral reefs of the world face with climate change, over-harvesting and coral diseases. Preserved specimens will add a hands-on component to the presentation.

S-6
Really Gross Anatomy and Physiology

Don Gill, Jr., Instructor, Erie Community College, South Campus

An interesting laboratory presentation of preserved specimens prepared to various levels of dissection. Comparative anatomy and physiology will be discussed. (Not for the faint of heart.)

S-7
The Motion Simulation Laboratory (MSL)

Dr. Kevin Hulme, Senior Research Associate, New York State Center for Engineering Design & Industrial Innovation (NYSCEDII), University of Buffalo

Tour NYSCEDII's Motion Simulation Laboratory where students will be introduced to advanced simulation technologies that support research in vehicle and transportation design and in the entertainment industry. Our laboratory fosters partnerships both with Academia and Industry in Western New York, and is also used for education and workforce training. Our driving simulator is comprised of a motion-based platform (donated by Moog), and visualization screens that provide passengers with a nearly surround field of view. The motion platform has a Ford Contour passenger cabin and is outfitted with a steering wheel, foot pedals (gas/brake), and an off-board stereo audio system.

S-8
Would You Drink *That?*
The Science and Engineering of Drinking Water

Dr. James N. Jensen, Professor, Dept. of Civil, Structural and Environmental Engineering, University of Buffalo

Have you ever wondered where tap water and bottled water come from? Tour the drinking water research facilities at UB to see demonstrations of the science behind drinking water treatment. Find out why prescription drugs may actually show up in drinking water.

S-9
Tour of the Geology Department Research Laboratories

Dr. Marcus Bursik, Professor and Chair, Department of Geology

The Geology Department is involved with exploring volcanoes on Mars, cleaning the local groundwater supply, studying coral reefs, understanding volcanic processes and much more. This session include tours of the department's research laboratories. Students will learn about ongoing research activities in the geological sciences area, including state-of-the-art instrumentation.

S-10
Caring For Our Four-Legged Friends

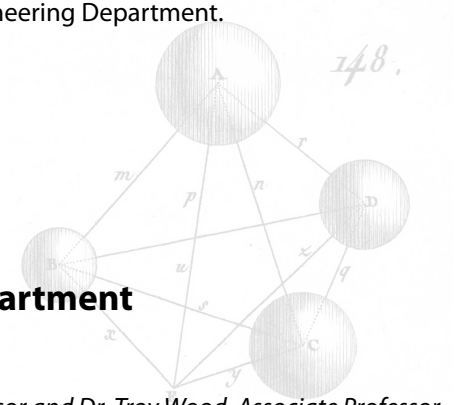
Kelly Valentine, Veterinary Technician, Medaille College

This presentation will shed light on the exciting and rewarding work of a Licensed Veterinary Technician. Using a discussion and demonstration, you can learn some emergency first aid and CPCR measures that all pet owners should know.
Participants will learn general animal health information about what it takes to care for four-legged patients. If you have pets or love animals, this presentation should not be missed.

S-11
Electrical Engineering - Interactive Tour With Hands-on Participation

Dr. Jennifer Zirnheld, Electrical Engineering, University at Buffalo, plus colleagues: Dr. Alexander N. Cartwright, Dr. Kevin M. Burke, Dr. Tommaso Melodia, Dr. Natasha Litchinitser, Dr. Qiaoqiang Gan, and our students.

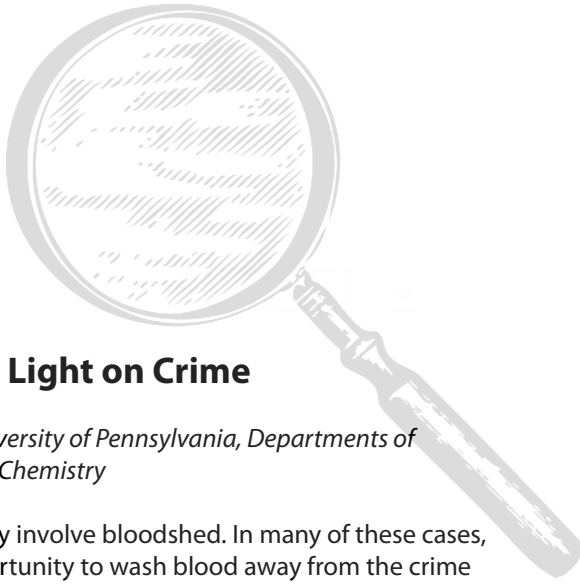
Electrical Engineering is an integral part of our lives, contributing on some level to nearly everything we do. Electrical Engineers provide power and energy solutions to light our homes and energize our consumer electronics; develop biomedical instrumentations to save lives; use nanotechnology to produce new materials and devices; provide entertainment with consumer electronics and video games; and advance new green technologies. The tour will focus on interactive demonstrations within several of the research laboratories in the Electrical Engineering Department.



S-12
Tour of Chemistry Department Research Laboratories

Dr. David Watson, Associate Professor and Dr. Troy Wood, Associate Professor, Department of Chemistry, University of Buffalo

This session includes tours of two research laboratories. Students will learn about ongoing research activities in the areas of nanotechnology and bioanalytical mass spectrometry, including state-of-the art instrumentation.



S-13
Luminol: Shedding Light on Crime

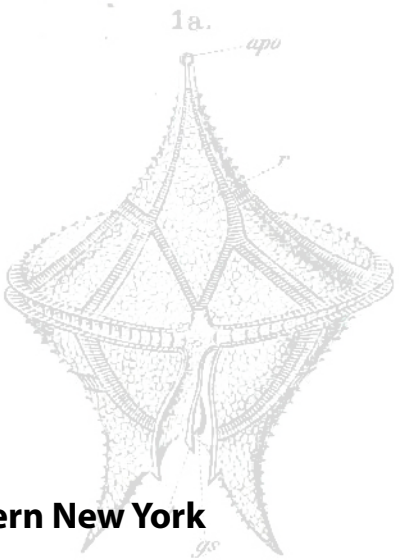
Dr. Ted Yeshion, Edinboro University of Pennsylvania, Departments of Criminal Justice and Forensic Chemistry

Crimes of violence frequently involve bloodshed. In many of these cases, the perpetrator has an opportunity to wash blood away from the crime scene. Luminal is an extremely sensitive presumptive blood test that can detect trace amounts of blood. This presentation will introduce the student to how forensic investigators use luminal to detect trace amounts of blood and how they are then able to use that information to reconstruct events that may have taken place during the commission of a violent crime. Actual case examples will be used to demonstrate the power of this investigative tool.

S-14
Tour of the Physics Department Research Laboratories

Dr. Hong Luo and Dr. Andrea Markelz, Professors, Department of Physics, University of Buffalo

The Physics Department has vigorous cutting-edge research programs in new materials, nanoscience, quantum devices, biomolecular physics, cosmology, high-energy physics, and atmospheric physics. This session includes tours of research laboratories where students will learn about ongoing research activities and state-of-the-art instrumentation.



S-15
The WILD side of Western New York

Kristen Rosenburg, Reinstein Woods Environmental Education Center, NYS Department of Environmental Conservation

Join a naturalist from the NYS Department of Environmental Conservation to learn about the wildlife found in Western New York. This presentation will offer information and a hands-on approach to learning about some of the interesting creatures that live around us.

S-16
Tour of Biological Sciences Department Research Laboratories

Dr. Laura Rusche and Dr. Michael Yu, Professors, Department of Biological Sciences, University of Buffalo

The Department of Biological Sciences is a vital hub of biological research and learning activity. Students will learn about ongoing research activities, touring departmental laboratories, as well as having opportunities to ask questions about getting a degree in the Biological Sciences Department.

S-17
Wild Weather!

Judy Levan, Warning Coordination Meteorologist, National Weather Service

Weather affects everyone, everyday. Western New York and the nation are experiencing unusual weather events. Meteorologists have the satisfaction of helping others during these times of wild weather. When the weather is at its worst, forecasters are in great demand. Learn about some of these unusual weather events and tools and tips to work with severe weather.

S-18
The Significance of Algae in Our Daily Lives

Dr. Berat Z. Haznedaroglu, Assistant Professor, Department of Civil, Structural and Environmental Engineering University of Buffalo

Believe it or not, algae is used in many things like food and medicine! This laboratory tour will cover the basics of what it is and how and where we use it, along with other information. Explore the "World of Algae" as you check out some interesting species under the microscope and learn how algae are studied for research purposes.

S-19
Investigating "Paranormal" Mysteries

Dr. Joe Nickell, Paranormal Investigator, Skeptical Inquirer Magazine

A presentation featuring a revealing and entertaining look at such mysterious phenomena as the ghost at Mackenzie House and cases of alleged "spontaneous human combustion" - from the speaker's own case files and all examined from the scientific point-of-view.

S-20
On the Road with NYSDOT

Dan Plesac, Technical Services Engineer, Licensed Professional Engineer, NYSDOT

Learn about highway construction and how the NY Department of Transportation tests materials like Portland concrete cement and paves with Hot Mix Asphalt in order to keep you on the road. The presentation will include specimens of new materials, pavement cores, rock cores and soil samples to provide an interactive approach.

S-21
Water Flows Uphill?
The Awesome Power of Water!

Dr. Sarah K. Delavan, Assistant Professor, Dept. of Civil, Structural and Environmental Engineering, University of Buffalo

We all know that ice floats at the top of our glass and water flows downhill, right? Have you ever stopped to think about why a solid would float instead of sink, or how water might flow uphill? The movement of water is one of the most powerful forces on earth! It levels mountains and provides electricity to our homes. Join this tour and find out many of the awesome things that water can do.

S-22
The Art and Science Connection

John Arnold, Artist / Educator

Artists and Scientists have more in common than most people think.
Digital technolgy has advanced to a stage where many artists are creating art using computers. Where is the line between art and technology?
Learn how software like Adobe Photoshop and Illustrator harness scientific principles to help artists create amazing images.

Science Exploration Day Committee

The following individuals have generously volunteered their time and efforts to make SED a reality:

Dr. Jeff Arnold
Director, Teacher Leadership Quality Partnership (TLQP) Project, Daemen College

John Arnold
Artist/Educator

Joseph Cozzarin
Teacher, Buffalo City Honors School (Retired)

Helen Domske
Associate Director, Great Lakes Program, UB; Sr. Extension Associate, NY Sea Grant

Bruce Donn
Teacher, Kenmore East High School (Retired)

Dr. Rodney Doran
Professor of Science Education, University at Buffalo (Retired)

Debra Kieliszek
Science Teacher, Cleveland Hill High School

Dr. Kenneth Licata
Teacher, Williamsville South High School (Retired)

Kelly Mergler
Science Teacher, Cleveland Hill High School

Donald Pearce
University at Buffalo School of Medicine

Paul T. Ruda
Teacher, Cleveland Hill Schools (Retired)

Cathy Zawodzinski
Teacher Leadership Quality Partnership (TLQP) Project, Administrative Assistant, Daemen College

The 2014 Distinguished Service Award

Dr. Wayne Gall has been one of Science Exploration Day's Large Group presenters since 2006, educating thousands of high school students about local issues related to entomology, like mosquitoes, ticks and bed bugs.

Dr. Gall has been Regional Entomologist for the New York State Department of Health in Buffalo since November 2001. He provides technical assistance on arthropods of public health importance to the 17 county health departments in the Western Region and performs associated research.

Dr. Gall is Adjunct Assistant Professor of Biology at SUNY Buffalo State where he maintains a laboratory and has taught two graduate courses (Medical Entomology; Insect Biodiversity). He earned his B.A. in Biology at the University of Buffalo, M.S. in Entomology at the University of Wisconsin at Madison, and Ph.D. in Zoology at the University of Toronto.

Prior to his appointment with the NYS Department of Health, Dr. Gall served on the staff of the Buffalo Museum of Science for nearly 19 years. His initial appointment in 1983 was as the Museum's first Administrator of Tifft Nature Preserve. From 1989 – 2001, he was Associate Curator and then Curator of Entomology at the Museum.

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Wednesday, March 19, 2014
University at Buffalo, Amherst Campus

First Lunch SCHEDULE

First Session	9:15am - 10:00am
Second Session	10:10am - 10:55am
Lunch*	11:05am - 11:25pm
Large Group	11:25am - 12:10pm
Fourth Session	12:20pm - 1:05pm

Second Lunch SCHEDULE

First Session	9:15am - 10:00am
Second Session	10:10am - 10:55am
Large Group	11:05am - 11:50pm
Lunch*	11:50am - 12:10pm
Fourth Session	12:20pm - 1:05pm

* Bag lunches are strongly recommended!

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