SCIENCE *exploration* DAY

2015 29 years

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Wednesday, March 18, 2015 • 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

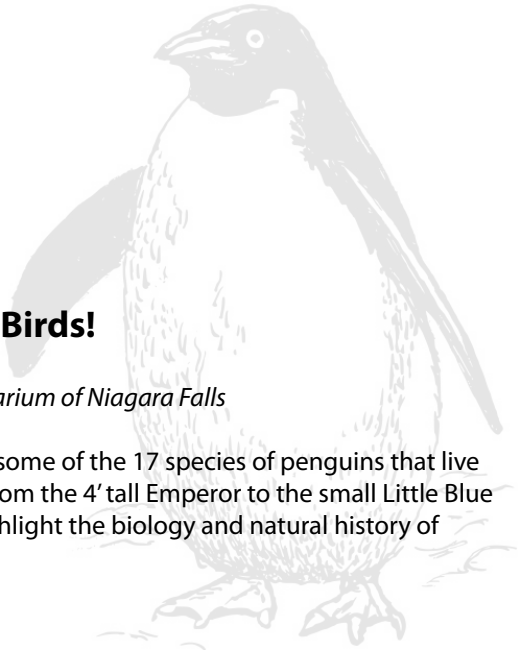
Michael Muehlbauer, Supervisory Wildlife Inspector for the Upstate New York, U.S. Fish and Wildlife Service, Office of Law Enforcement

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, Professor of Forensic Science, Department of Political Science and Criminal Justice

An overview of a typical crime laboratory and the responsibilities for each section will be explored. With a focus on evidence, discussions will include a definition of forensic science, Locard's Exchange Principle, how different scientific disciplines integrate to assist investigators in resolving inquiries of a legal nature, and the importance 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

Dr. Pinar Okumus, Assistant Professor and Dr. Mettupalayam Sivaselvan, Assistant Professor, 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
Tour the Motion Simulation Laboratory (MSL)

Dr. Kevin F. Hulme, Senior Research Associate Center for Applied Simulation and Engineering Design, University at Buffalo

Tour our Motion Simulation facilities where students will be introduced to applied simulation technologies that support research in vehicle and transportation design, and in the entertainment industry. Our laboratories foster partnerships both with Academia and Industry in Western New York, and are also used for clinical applications, and for education and workforce training. Our SimCUBE simulator provides a fixed-base (motion-free) simulation capability located within a 4-screen surround visualization container. Our SimRING driving simulator is comprised of a motion-based platform (donated by Moog), a Ford Contour passenger cabin (and driver controls), a sound system, and a 360 degree immersive theater that provides participants with a fully surround field-of-view.

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

With the help of a Guiding Eyes Dog in training, you will learn general animal health information about what it takes to care for four-legged patients. 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. If you have pets or love animals, this presentation should not be missed.

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

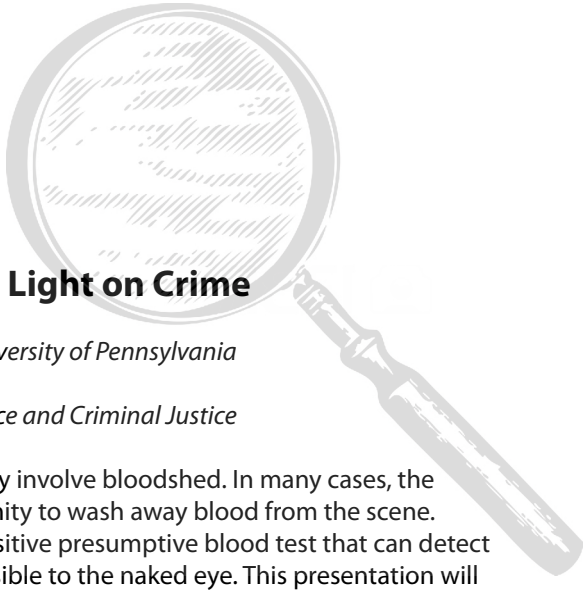
Dr. Jennifer Zirnheld, Electrical Engineering, University at Buffalo, plus colleagues: Dr. Alexander N. Cartwright, Dr. Kevin M. Burke, Dr. Tommaso Melodia, Dr. Natasha Litchinitser, Dr. Qiaoqiang Gan, and our students.

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 Department of Chemistry, University of Buffalo

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



S-13
Luminol: Shedding Light on Crime

Dr. Ted Yeshion, Edinboro University of Pennsylvania
Professor of Forensic Science
Department of Political Science and Criminal Justice

Crimes of violence frequently involve bloodshed. In many cases, the perpetrator has an opportunity to wash away blood from the scene. Luminol is an extremely sensitive presumptive blood test that can detect trace amounts of blood invisible to the naked eye. This presentation will introduce the student to how forensic investigators use Luminol to provide chemical indications for the presence 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
Talk on the Wild Side
Hawk Creek Wildlife Center

Hawk Creek is an accredited wildlife sanctuary that reconnects humans to the natural world and inspires an appreciation of nature. This non-profit organization rehabilitates hundreds of animals each year for release into the wild and offers permanent sanctuary to over seventy non-releasable animals. Meet some of their birds and mammals that serve as educational ambassadors, enriching the animals' daily lives and helping you learn about the environment. A flight demonstration will help illustrate the abilities of birds of prey.

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
Tours of the Department of Chemical and Biological Engineering

Dr. Mark T. Swihart, UB Distinguished Professor, Executive Director, NYS Center of Excellence in Materials Informatics

Learn about exciting chemical engineering research in the cutting-edge fields of nanoscale materials and computational science and engineering. Visit laboratories where biochemical and biomedical engineering research is conducted to study complex biological systems at scales from molecules, to individual cells, to tissues, to organs.

S-21
Wolves - Helping to Restore The Balance of Nature

Joseph Allen, Adjunct Professor University of Buffalo

When gray wolves were reintroduced into Yellowstone National Park in 1996, no one anticipated the degree of ecological benefits that were to come out of the presence of this apex predator in a land bereft of wolves for over 70 years. From prey reduction, browse renewal, stream and river bank reguvenation, the return of ancillary species and wild behaviors, to a "balancing" of the complex food pyramid, wolves have been an unmitigating benefit to the Greater Yellowstone Ecosystem as well as the northern Rockies. The reintroduction of this apex predator has arguably been one of the greatest stories in conservation history.

S-22
Chromosomes and Cancer

AnneMarie W. Block, Ph.D., FACMG, Director,
Clinical Cytogenetics Laboratory, Roswell Park Cancer Institute

This presentation will be an introduction to the field of Cancer Cytogenetics. The genomes of cancer cells are very unstable, often characterized by gains/losses of whole chromosomes and re-arrangements between chromosomes. This specialized area of chromosome analysis examines the genetic changes that occur in the cells of cancer patients. Students will receive instruction in this cutting-edge field of genetics. The relevance of these findings to patient diagnosis and prognosis will be discussed. Students will be shown techniques used in the laboratory and will be given the opportunity to cut-out an actual karyotype.

S-23
Cosmology – The Real Bing Bang Theory!

Dr. Dejan Stojkovic, Physics Department University of Buffalo

You know that the Big Bang Theory is a TV show, but it is also part of the study of Cosmology. Have you ever wondered about the origin and evolution of the universe? This presentation on the history and recent developments of modern cosmology will introduce students to the scientific study of the large scale properties of the universe as a whole. Learn more about this interesting area of scientific study that involves the fields of physics and astrophysics.

S-24
Engineers for a Sustainable World

Connor Brown, Nicole Wawrzyniak, Victoria Riso
University at Buffalo

Learn about engineering with this innovative session that includes sampling smoothies made from their Solar Smoothie Cart. Interact with these UB engineering students who are doing their part for sustainability, while you learn about steps you can take to help the environment.

S-25
The Art and Science Connection - Walking the Line Between Art and Technology

John Arnold, Artist / Educator

Where is the line between art and technology?
Artists and scientists have more in common than most people think. We will explore new, unexpected ways art and science are connected. Also, we'll look back to some significant moments in the history of art/science connections.

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 2015 Distinguished Service Award

Dr. Ted Yeshion is a Professor of Forensic Science at Edinboro University in Pennsylvania, in the Department of Political Science and Criminal Justice. Dr. Yeshion has shared his 40 years' experience as a forensic scientist, crime laboratory director, special agent, and forensic consultant with thousands of students throughout the years at Science Exploration Day.

Dr. Yeshion has an international reputation as a leading forensics expert in the application and interpretation of Luminol, a presumptive blood test, which has been the focus of his presentations at Science Exploration Day. He has appeared on local and national news and radio stations and is a noted author and international lecturer.

As a Fellow of the Edinboro University Institute for Forensic Sciences, Dr. Yeshion is involved in research, scholarly efforts and public and professional awareness of various forensic activities, expertise and related academic programs at the University.

Dr. Yeshion earned his Bachelor of Science degree in Pre-Medical Biology from York College of the City University of New York, a Master of Science degree in Forensic Science from George Washington University, and a Doctor of Philosophy degree from the State University of New York at Buffalo.

His career also includes positions with the North Carolina State Bureau of Investigation as a Special Agent/Forensic Serologist and the Florida Department of Law Enforcement.

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Wednesday, March 18, 2015
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!

Niagara Frontier Science Supervisors

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Graduate School of Education
University at Buffalo The State University of New York