



## Tidbits about Science Exploration Day


- For the first SED (**1983**), there were 56 small group sessions scheduled, with no Keynote Speaker and no large group presentations. Over 1000 students attended.
- **1984** - Included a Keynote Speaker from NASA.
- **1986** - Had 6 large group presentations that included Helen Domske of UB, Jim Orgren from Buffalo State, and Frank Bajer from the Museum of Science.
- **1988** SED was cancelled due to scheduling problems, despite 48 schools being registered with 1548 students.
- **1989** Robert Ketter was a presenter for SED. Dr. Ketter became the president of the University at Buffalo and a building is named after him.
- Over **350 individuals** have been SED presenters over the years. Many have presented for ten or more years.
- Many of our Keynote presentations have been made by scientists from **NASA**, including a few astronauts.
- Lab tours have become the most popular student session selection.
- Estimating an average of 1,000 students each year, **25,000 students** have experienced SED presentations!
- **2003** SED was cancelled due to low student enrollment caused by reduced budgets and scheduling conflicts of AP exams.
- After a 2 year hiatus, SED began again in **2006**, during the UB Spring Break in mid-March, and continues to this day.
- Science Exploration Day now has a dedicated web site. The first version was done by Sarah English (teacher from Sweet Home School and former member of the committee) and was expanded by Jane Ross of Daemen College: [www.scienceexplorationday.com](http://www.scienceexplorationday.com)

# SCIENCE

## exploration

# DAY

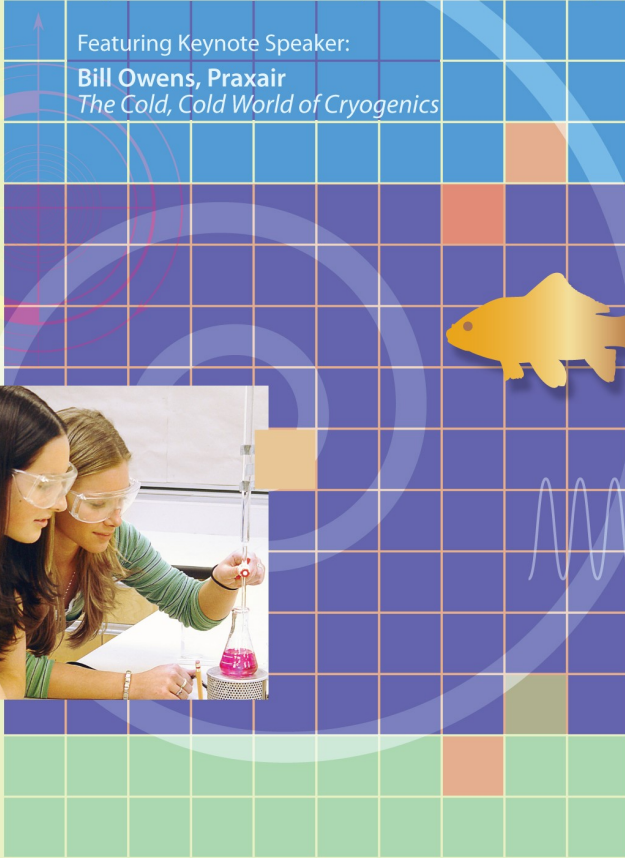
scienceexplorationday.com **BUFFALO**





Wednesday, March 14, 2012 • University at Buffalo, Amherst Campus


Featuring Keynote Speaker:


**Bill Owens, Praxair**  
*The Cold, Cold World of Cryogenics*
















## Keynote Presentation

*All students and teachers will attend this presentation*

# The Cold, Cold World of Cryogenics

*Presented by:*

**Bill Owens**

*(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.



***The 2012 Distinguished Service Award was presented to Bob McClellan, who has been a regular presenter since 1989. Bob brought the popular “Cold, Cold World of Cryogenics” to SED for 16 years, both as a presenter and Keynote Speaker.***



## Science Exploration Day Committee

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

**Dr. Jeff Arnold**, Director, TLQP Project, Daemen College

**John Arnold**, Artist and educator

**Joseph Cozzarin**, Buffalo City Honors School (Retired)

**Dr. Peter Demmin**, Science Department Chairman, Amherst Central High School (Retired)

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

**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**, Williamsville South High School (Retired)

**Kelly Mergler**, Science Teacher, Cleveland Hill High School

**Donald Pearce**, University at Buffalo School of Medicine

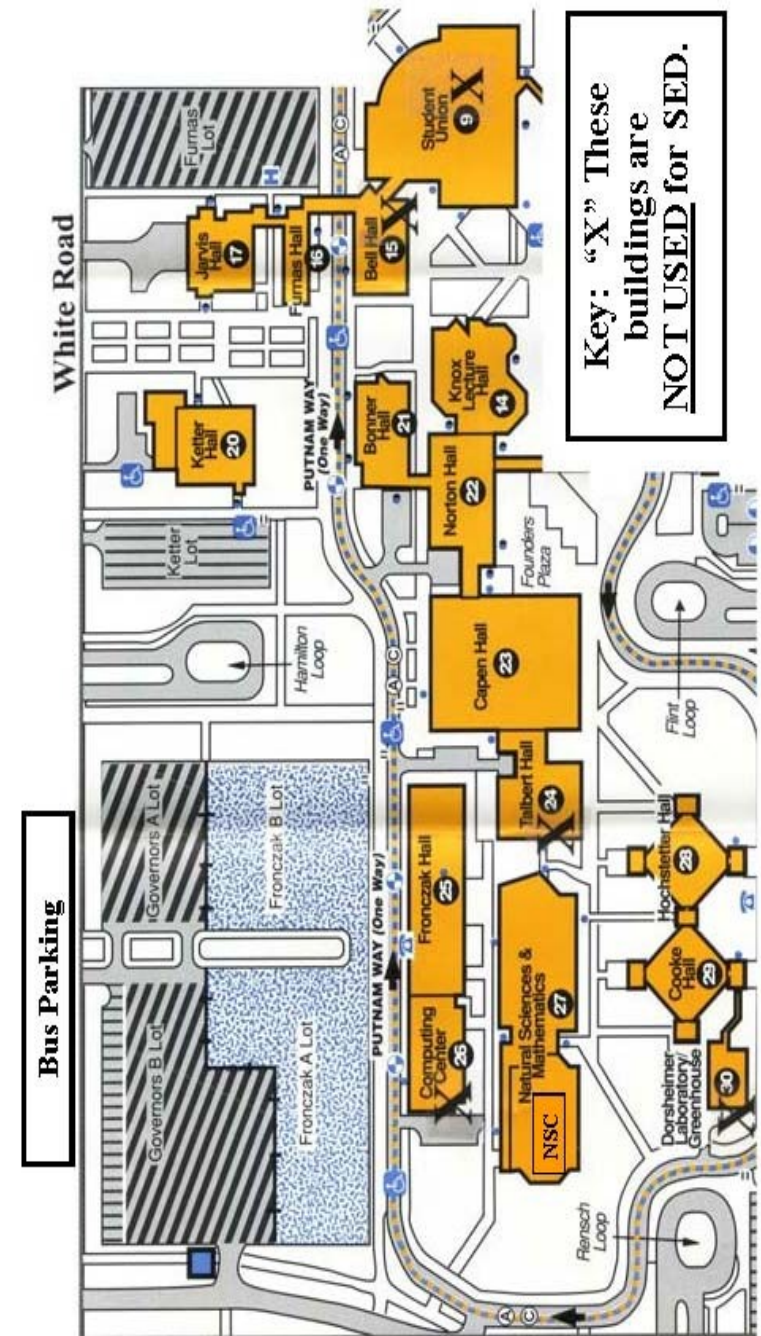
**Paul T. Ruda**, Cleveland Hill Schools (Retired)

**Cathy Zawodzinski**, Administrative Assistant, TLQP,  
Daemen College

Bus Parking

North Campus, University at Buffalo

Website: [http://www.buffalo.edu/community/visitor\\_directions.html](http://www.buffalo.edu/community/visitor_directions.html)





## Small Group Presentations

### 1. Structural Engineering And Earthquake Simulation Tour

*(Tom Albrechtski, 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 and example of the nature of seismic testing using a "Mini-Shake Table" prior to the tour of the laboratory.

### 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!

### Penguins are "COOL" Birds!

*(Jeanette Brunner, Educator, Aquarium of  
Niagara Fall, NY)*



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.

### 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.

## 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 and fly larvae that invade living tissue, are some of the arthropods that will be the basis of examples. Preserved arthropods associated with some of the case studies will be demonstrated after the PowerPoint presentation.

## Environmental Chemistry in our Community: The Role of Students and Community Cooperation

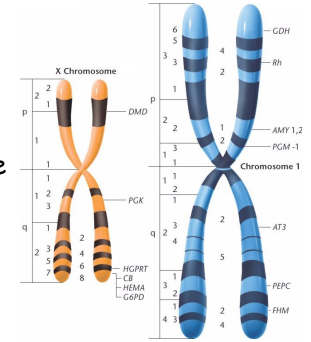
(Dr. Joseph Gardella, Jr., Professor of Chemistry and Faculty Fellow, UB Institute for Local Governance and Regional Growth)

A collaboration of UB students, community members, government and industry have worked to answer questions about pollution in local environments. A review of efforts in three Buffalo neighborhoods will be given, including Hickory Woods and Seneca Babcock, along with successes in citizen design of cleanups on East Ferry. A review of the Niagara County community of Lewiston Porter project will also be given. The ability of the community to understand and participate in the planning, execution and interpretation of scientific results improves the way we deal with environmental issues.

## 3. Chromosomes and Cancer

(Dr. AnneMarie W. Block, FACMG, Director, Clinical Cytogenetics Laboratory, Roswell Park Cancer Institute)

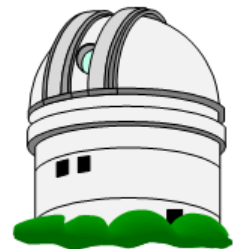
This presentation will be an introduction to the field of Cancer Cytogenetics. The genomes of cancer cells are very unstable, often characterized by gains/losses of whole chromosomes and re-arrangements between chromosomes. This specialized area of chromosome analysis examines the genetic changes that 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.

## 4. Astronomy: Portable Star lab Planetarium

(Tim Collins, Buffalo State College Planetarium)



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.

## 5. Something's Fishy



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

Learn about some of the more interesting fishes that make their home in the Great Lakes and in the oceans of the world. This presentation will cover fishes from the

blood-sucking sea lamprey and sturgeon (that live 100 years) in the Great Lakes, to sharks, seahorses and pufferfish that live in the ocean. Preserved specimens will provide a hands-on component to the presentation.

## 6. Really Gross Anatomy and Physiology

*(Don Gill, Jr., Instructor, Erie County 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.)



## 7. Training and the Role of the Veterinary Licensed Technician

*(Kelly Valentine, Veterinary Technician, Medaille College)*

Through this presentation students will learn about the role of a Licensed Veterinary Technician. A discussion and demonstration will be offered featuring of some emergency first aid and CPR measures that all pet owners should know about, along with general animal health information.

## Large Group

## Presentations

*(These presentations will be assigned to students)*



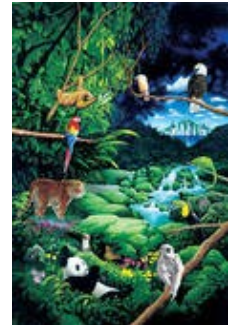
## Sexually Transmitted Infections: The Gift that Keeps Giving

*(Beverly Roe, Professor, Erie Community College)*

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

## Endangered Species — C.I.T.E.S. Trade in Wildlife

*(Michael Muehlbauer, Supervisory Wildlife Inspector for the Upstate NY, 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, slides and display materials will add to this session.

## 18. What's New on the Weather Radar Screen?

*(Judy Levan, Warning Coordination Meteorologist, National Weather Service)*

National Weather Service (NWS) radars are being upgraded to dual-polarization to enhance the ability to collect data on the horizontal and vertical properties of weather (e.g. rain, hail) and non-weather targets (e.g. insects, ground clutter). Learn about the differences between conventional Doppler radar and dual-polarization radar, the benefits/limitations of the new system and what it will mean for the weather forecasts you depend on.

## 19. Acid, Bases: Homerun

*(Helen Singh, Professor, Erie Community College)*

This presentation will focus on acid and bases using the reaction of vinegar with baking soda. Students will learn about these reactions through lively demonstrations such as inflating a balloon, making a volcano and baking soda bread; with the use of red cabbage indicator.

## 20. Pioneering Safety on the Ground and in the Air

*(Joseph Dunlop, Vice President, Calspan Corporation)*

Calspan has been advancing aerospace and transportation safety for more than 60 years. This presentation takes you on a virtual tour of Calspan, from advanced aircraft research in the skies over Lake Ontario, to vehicle crash tests at their Genesee Street location. Come see how Calspan has profoundly impacted the way you get from one place to another.

## 8. Reverse Engineering and Virtual Reality in Engineering Design

*(Dr. Kenneth English, Deputy Director, NYS Center for Engineering Design and Industrial Innovation, University of Buffalo)*

This tour will help you learn how engineers study product design through reverse engineering. See how a seemingly simple product like a toy requires mechanical and electrical engineering to get it to work. Also see how gaming systems like the Nintendo and Wii controller or a smart phone can be used to interact with virtual models of a product. View a three-dimensional model of a Saber-toothed tiger, watch the motion of a child seat in a car accident, and see how the Internet is used by engineers as you explore academic and industrial applications of engineering design.

## 9. 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.





## 10. Tour of the Geology Department Research Laboratories

*(Dr. Marcus Bursik, Department Chair)*

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.

## 11. Pharmacy Tour: Prescription for Success

*(Cindy Konovitz, Assistant Dean, School of Pharmacy & Pharmaceutical Sciences, University at Buffalo)*

Tour and learn about "Medication Experts" in action. The tour begins in our Pharmacy Museum and Turn-of-the-Century Apothecary, where students will see how pharmacy was practiced during the 1800's and early-to-mid 1900s. "Cigarettes for asthma" a prescription for alcoholic beverages (used during the Prohibition of the 1920s), other artifacts are on display. Students will visit training sites, including a patient discharge room (complete with a "model" patient) and professional practice laboratory, where they will have an opportunity to prepare a simple medication.



## 16. The WILD side of Western New York

*(Kristen Rosenburg, Reinstein Woods Nature 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.



## 17. Tour of Biology Departments' Research Laboratories

*(Dr. Stefan Roberts, Professor, Biology Department, University of Buffalo)*

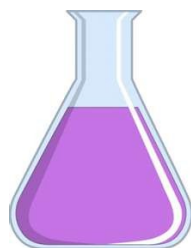
The Department of Biological Sciences is a vital hub of biological research and learning activity. Students will learn about ongoing research activities in the department's laboratories, including state-of-the-art instrumentation.





## 14. Tour of Chemistry Department Research Laboratories

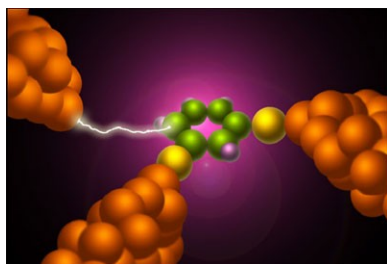
*(Dr. David Watson and Dr. Troy Wood,  
Department of Chemistry, University of Buffalo)*



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.

## 15. Tour of the Physics Department Research Laboratories

*(Dr. Hong Luo, Professor and Department Chair)*



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.

## 12. Electrical Engineering - Interactive Tour with Hands-on Participation

*(Dr. Jennifer Zirnheld, Electrical Engineering, University at Buffalo, plus colleagues: Dr. Alexander Cartwright, Dr. Natasha Litchinitser and Dr. Qiaoqiang Gan, and 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.

## 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. Luminol 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 luminol 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.

