SCIENCE exploration DAY
scienceexplorationday.com BUFFALO

Wednesday, March 13, 2013
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

New York Sea Grant

Great Lakes Program
University at Buffalo

Western Section of the Science Teachers Association of New York State

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

SCIENCE exploration DAY

27 years 2013

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Featuring Keynote Speaker:

Bill Owens, Praxair

The Cold, Cold World of Cryogenics

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Dedication

Peter E. Demmin

Science Exploration Day 2013 is dedicated to the memory of Peter E. Demmin.

Dr. Demmin taught at Amherst High School for 36 years and was Chemistry Department Chair for 26 years. His specialty was Advanced Placement Chemistry. He was co-author of a Chemistry textbook as well as author of several review books and a test-prep book for the AP Chemistry exam that is still in use today.

Dr. Demmin was involved with the SED planning committee for many years and served as host for the keynote presentations.

The 2013 Distinguished Service Award

Dr. James N. Jensen is Professor of Environmental Engineering at the University at Buffalo and Faculty Director of UB's Research Exploration Undergraduate Academy.

Dr. Jensen received a BS degree in environmental engineering from Caltech in 1980 and MSPH and PhD degrees from the University of North Carolina at Chapel Hill in 1983 and 1988.

Dr. Jensen's research and teaching interests are in sustainable drinking water and wastewater treatment. He is the recipient of a number of teaching and research awards, including a Chancellor's Award for Excellence in Teaching.

Dr. James N. Jensen has been participating in Science Exploration Day since its early days and his efforts have received praise from teachers and students alike. A number of high school students who attended his SED sessions have gone on to enroll in Civil and Environmental Engineering at the University at Buffalo.

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 and 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

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Keynote Presentation

All students and teachers will attend this presentation

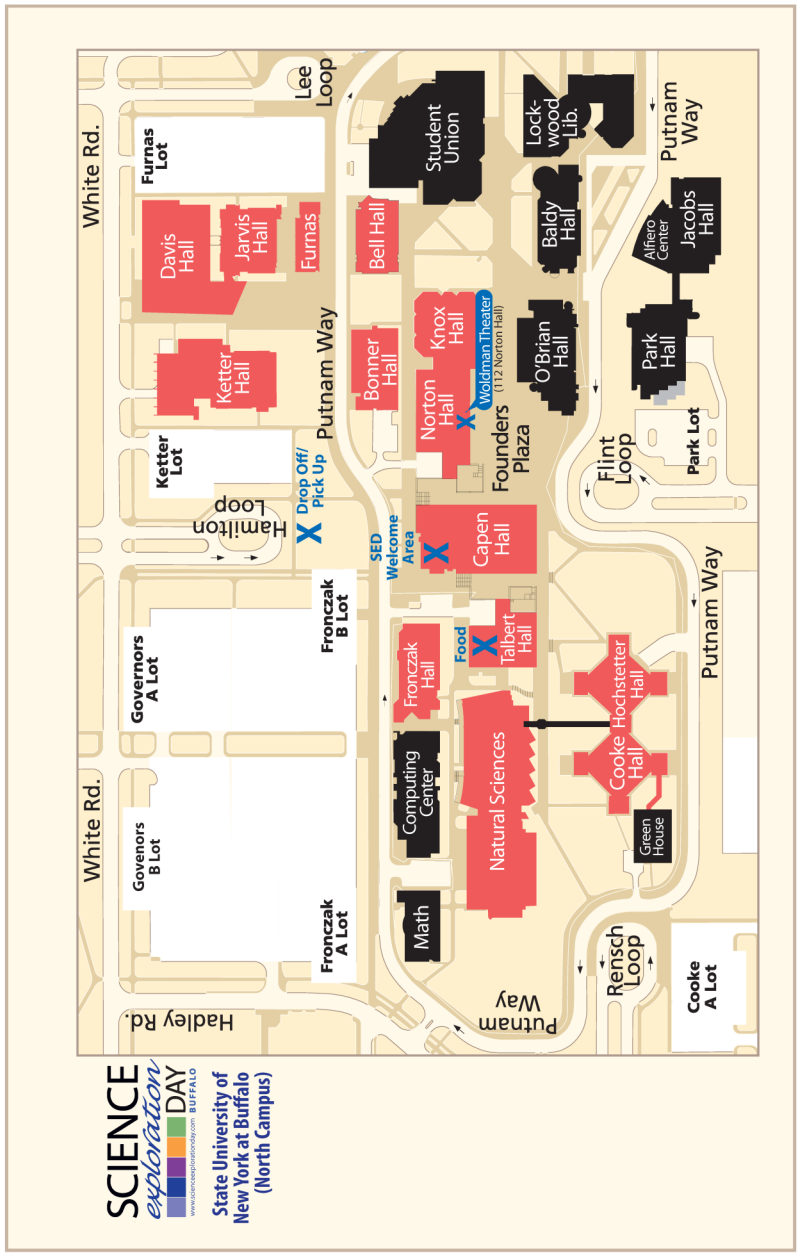
The Cold, Cold World of Cryogenics

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.



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.

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 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.

Small Group Presentations

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.

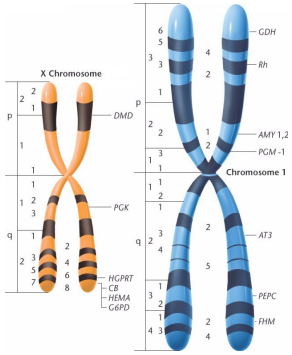
2. Science in Your Life (That you probably never think about!)

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!

3. Chromosomes and Cancer

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

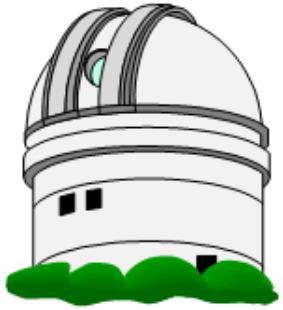


This presentation will be an introduction to the field of Cancer Cytogenetics. The genomes of cancer cells are very unstable, often characterized by gains/ losses of whole chromosomes and re-arrangements between chromosomes. This specialized area of chromosome analysis examines the genetic changes that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

Large Group Presentations

(These presentations will be assigned to students)

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.

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.

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.

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.

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.)

7. The UB Motion-Based Driving Simulator

Dr. Kevin Hulme, Senior Research Associate, NYS 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 with both academia and industries in Western NY, and is also used for education and workforce training.

Our driving simulator is comprised of a motion-based platform (donated by Moog) and three forward and one rear-view visualization screens, providing passengers with a nearly full-surround field-of-view. The motion platform has a passenger cabin comprised of the front half of a Ford Contour and is outfitted with steering wheel, foot pedals and stereo audio system for event-triggered sound cues.

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.

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.

18. Pioneering Safety on the Ground and in the Air

Joseph Dunlop, Senior Director, Business Development, 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.

15.The WILD side of Western New York

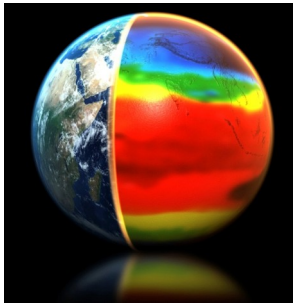
Kristen Rosenburg, Reinstein Woods Environmental Education Center, NYS Department of Environmental Conservation

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.

16. Tour of Biological Sciences Department Research Laboratories

Dr. Todd Hennessey 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 in the department's laboratories, including state-of-the-art instrumentation.



9. Tour of the Geology Department Research Laboratories

Dr. Richelle M. Allen-King, 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.

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.

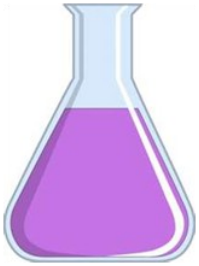
Participants will learn general animal health information about what it takes to care for four-legged patients. If you have pets or love animals, this presentation should not be missed.

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

Dr. Jennifer Zirnheld, Electrical Engineering, University at Buffalo, plus colleagues: Dr. Alexander Cartwright, Dr. Kevin M. Burke, Dr. Tommaso Melodia Dr. Natasha Litchinitser, 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.

12. Tour of Chemistry Department Research Laboratories



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

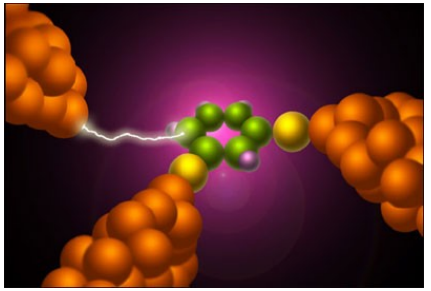
This session includes tours of two research laboratories. Students will learn about ongoing research activities in the areas of nanotechnology and bioanalytical mass spectrometry, including state-of-the art instrumentation.

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.

14. Tour of the Physics Department Research Laboratories



Dr. Hong Luo, Professor and Chair, 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.