

254th American Chemical Society National Meeting

Presidential Symposium on
Building a Safety Culture Across the Chemistry Enterprise

Washington, DC, August 21, 2017

Safety Goggles Aren't Just for Nerds

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Chancellor / Professor of Chemistry and Physics

University of Missouri–St. Louis

UMSL



Louis the Triton



- 17,000 students
- Awarded over 100,000 degrees since founding in 1963
- Urban university with diverse student body
 - High school: Advanced credit and STARS program (Students and Teachers as Research Scientists)
 - Undergrads, grad students and post-graduate
 - Non-traditional learners and veterans – average age 28

Louis the Triton

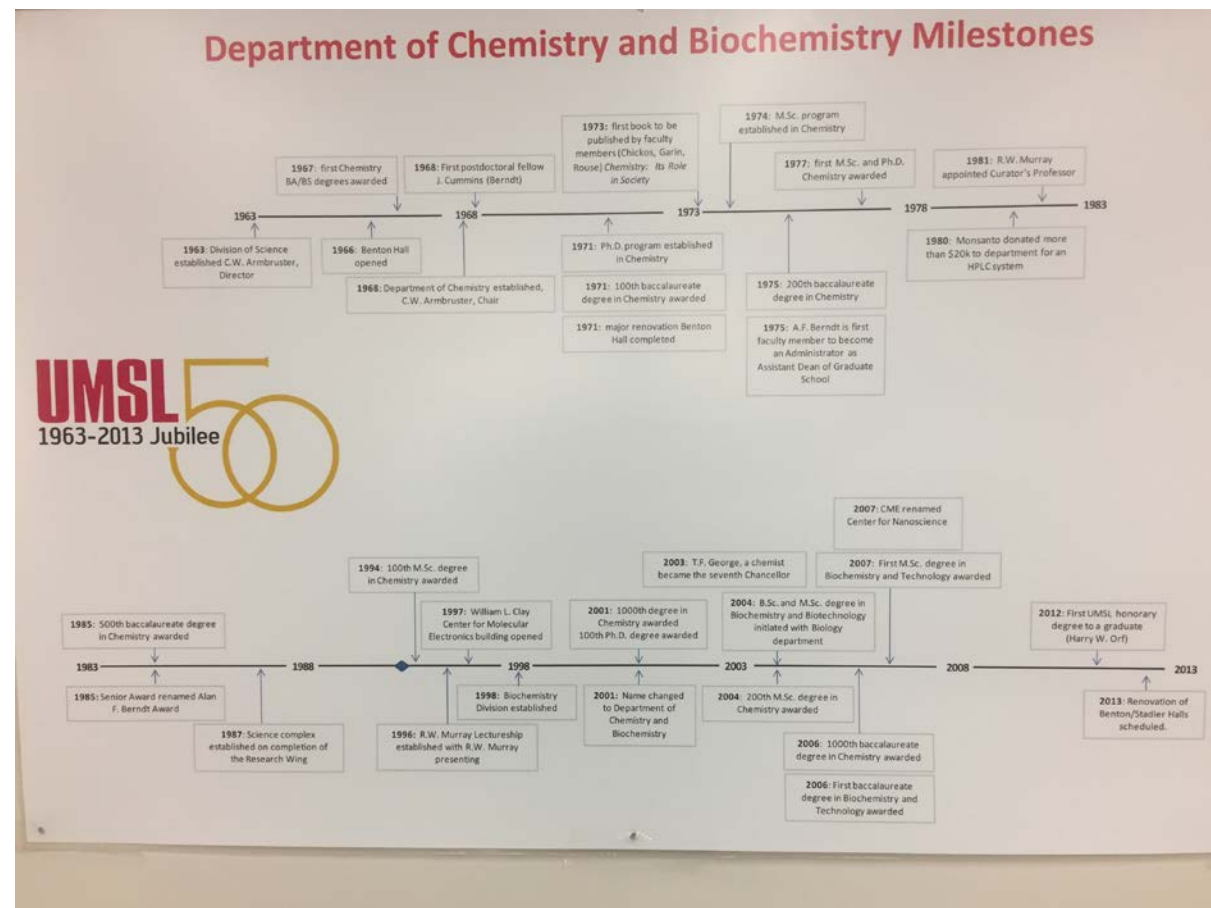
- Son of Poseidon, Greek god of the sea.
- Largest moon of the planet Neptune, discovered in 1846 by a British astronomer 17 days after Neptune itself was discovered by German astronomers.
- Only large moon in our solar system with a retrograde orbit, i.e., in the opposite direction to its planet's rotation.



The Department of Chemistry and Biochemistry has grown over the past 50 years.

- Benton Hall was opened in 1966.
- In 1987 we completed the Research wing of the science complex.
- In 2001 we awarded our 100th Ph.D degree.
- In 2004 we awarded our 200th M.S. degree
- In 2004 we introduced B. S. and M.S. degrees in Biochemistry and Biotechnology in coordination with the Department of Biology.
- In 2006 we awarded our 1000th baccalaureate degree.
- In 2016 the new Science Learning Building opened with new teaching labs

The field of chemistry is ever changing, and UMSL has embraced our role in preparing the next generation of chemists.



Safety in the Academic Lab

- Key office on campus: Environmental Health & Safety.
- Data indicates researchers are more likely to get hurt in an academic lab than in an industry lab.
- OSHA, Lab Safety Institute, Chemical Safety Board all show examples of serious injury from lab incidents.
- UMSL realized our teaching labs in Benton Hall were outdated and did not provide the safe environment we value.



- Benton Hall opened in 1966.
- Housed chemistry teaching labs.

- Old labs did not meet our safety standards.
- Benton Hall renovation began 2016.
- UMSL secured funding to build new teaching labs.



- Science Learning Building held first classes in summer 2016.
- State of the art teaching labs.
- Labs designed for Chemistry, Biology and Physics.



Truths we must accept

- We can't teach chemistry without chemicals.
- We cannot eliminate all hazards in the lab.
- Students must experience how chemicals react.
- Experimentation stimulates curiosity and lets students apply learning to everyday life.

So, what do we do?

- We minimize hazards.
- We communicate and train on the hazards still present in the lab.
- We provide the right resources and facilities.
- We make safety a team effort.
- We train.
- We check our progress with routine audits.

UMSL

LABORATORY SAFETY PLAN

- Developed Lab Safety Plan using OSHA Chemical Hygiene Plan as a model.
- Plan was a joint effort between Environmental Health & Safety with the science departments.
- Plan has full support of campus leadership.

FOREWARD

Students, Faculty, Staff, Principal Investigators, Researchers, and all laboratory personnel:

This UMSL Laboratory Safety Plan is part of a program designed to make our laboratories safer for everybody. It provides the minimum standards for laboratory personnel using chemicals, potentially infectious or any potentially hazardous materials or equipment. It contains general lab safety practices as well as specific information for the safe handling, storage, and disposal for several types of materials. It also includes first aid, emergency response procedures, training requirements, and responsibilities for laboratory personnel.

The Principal Investigator or Laboratory Manager should fill out the "Lab Safety Plan Owner's Page," and keep a printed copy available in their laboratory. They should also have all students and researchers fill out and sign the "Lab Safety Plan Awareness Certification" page after reading the plan.

My expectation is that all laboratory personnel will read the plan and comply with the portions that apply to them, and to their laboratory. Please contact the Environmental, Health & Safety Department with any concerns, suggested changes or additions, or questions.

It is my sincere hope that all UMSL personnel will make safety a high priority and do their utmost to keep our laboratories a safe place to work and learn.



RONALD YASBIN,

DEAN, ARTS AND SCIENCES, PROFESSOR OF BIOLOGY

Teaching labs provided with lab specific safety manual -- quick reference for lab instructors and students. Example:

Lab Safety Information

SLB 416

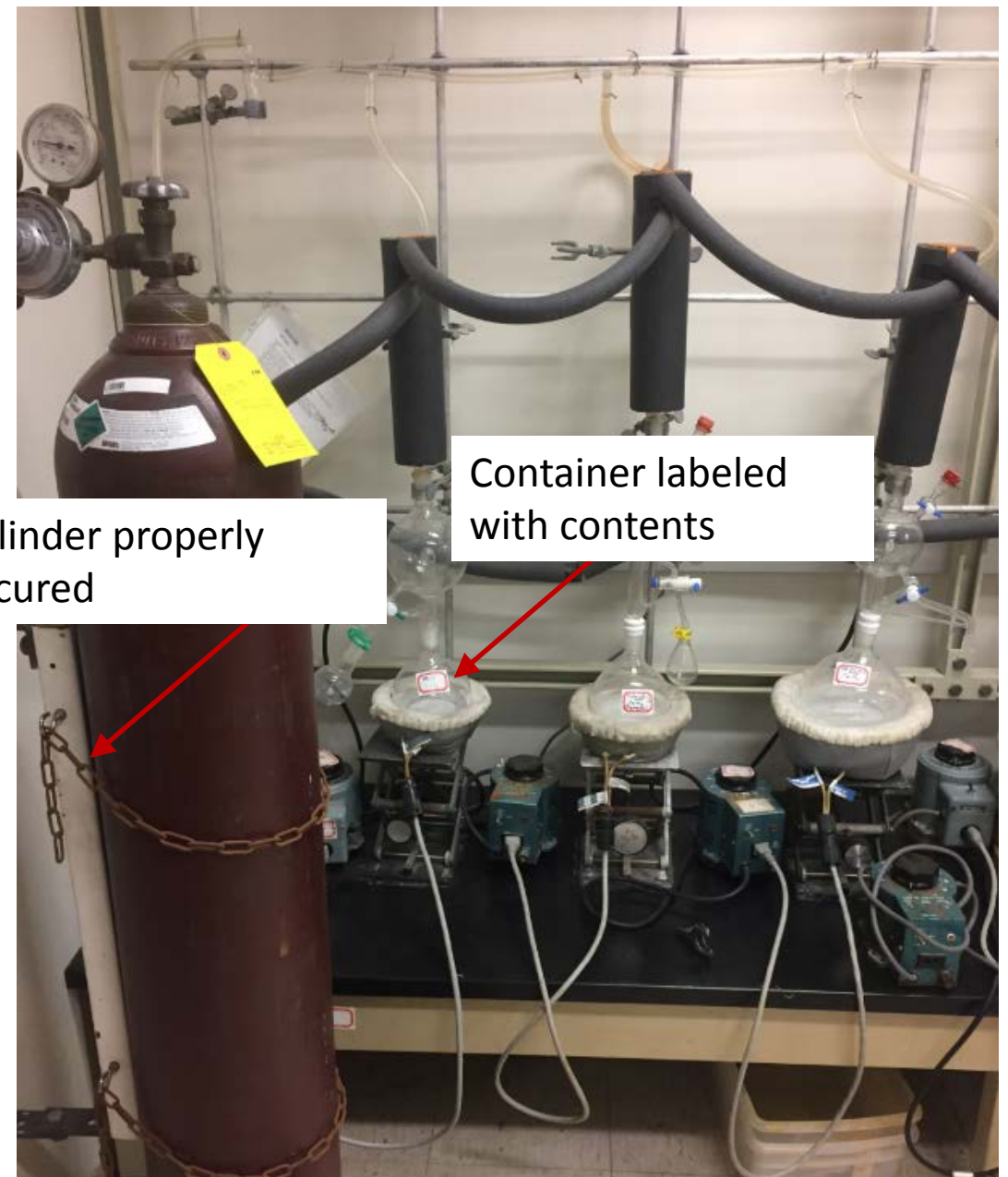
UMSL | Environmental
Health and Safety

Contents

- Lab Safety Plan
- EHS/Emergency Contact Information
- Lab Safety Inspection Reports
- Chemical Inventory
- Unwanted Material Pickup Request Forms
- Secondary Container Label Template
- Safety Data Sheets
- Standard Operating Procedures
- Spill Response/Incident Reporting Forms
- Peroxide Forming Chemical Label
Template/Testing Sheet
- Unwanted Material Management Guidance
- EHS Published Safety Procedures/Guidance

- New teaching labs provide modern lab environment.
- Conducive to learning in a safe environment.
- Prep rooms let us minimize chemical storage in the lab.





Research labs may have more activity, but are expected to still follow standard safety practices.

- Signs posted on doors for special hazards.
 - Magnetic fields
 - X-ray or laser use
 - Biohazard
 - Radioactive Materials
- And of course, no eating or drinking in the lab.



And we train.....



STUDENTS and
TEACHERS
AS
RESEARCH
SCIENTISTS

2017 SCHEDULE

<http://www.umsi.edu/~sep/STARS/index.html>

IN PARTNERSHIP WITH:

*Cortex Innovation Community
Donald Danforth Plant Science Center
Saint Louis University
Washington University in St. Louis
University of Missouri-St. Louis*


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UMKC School of Medicine....Missouri Botanical Garden....BioSTL*

MANDATORY UMSL Attendance Activities are Shaded






- STARS are high school students working with faculty on research projects at UMSL, Washington University, St. Louis University and the Danforth Plant Science Center.
- Receive safety training before entering a lab.
- Mentors provide lab specific safety training.





Online training offered for undergraduates before starting a class, which sets standards and expectations for how students act in the lab.


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EHS Safety Courses 


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Resource Documents 

Announcements 


Biosafety 

Faculty Information 


Tools 


COURSE MANAGEMENT

Control Panel


Files 


Course Tools




Evaluation 


Grade Center 


Users and Groups


Customization 


Chemistry Undergrad 


Build Content  Assessments  Tools 

 **Physical Chemistry**
This folder contains a lab safety presentation and assessment for an undergraduate physical chemistry course. The presentation is available as a PDF or a Power Point presentation. The PDF version is recommended for student viewing.


 **Organic Chemistry 2633**

 **Starting With Safety Video Series**
This is a basic lab safety video series put out by ACS Continuing Education. The contents of this folder are available as a DVD in the Chemistry stock room. The videos are copyright protected and should be set as view only. You can save these videos under the video option or into your Kaltura media account.

 **Starting with Safety Quizzes**
This folder contains the quizzes that accompany each video segment of the Starting With Safety video series




 **Starting with Safety Teachers Guide**




- Graduate student training is more focused on specific hazards.
- First-time TA receive safety training before leading a lab section.
- Faculty and graduates students are required to attend safety training annually and experience inspections semi-annually



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 Chemistry Graduate
 

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EHS Safety Courses
 

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COURSE MANAGEMENT

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Chemistry Graduate

Build Content
 Assessments
 Tools


Pyrophorics Material Training Module
 This folder contains informational resources for working with pyrophoric materials


Graduate and TA orientation lab safety training
 This module contains materials for new graduate students and teaching assistants who are placed into leadership positions within the lab.


Lab Waste Management Training Module
 The purpose of this training module is to inform lab personnel of the practices and policies at UMSL as they pertain to lab generated waste.




How Are We Doing?

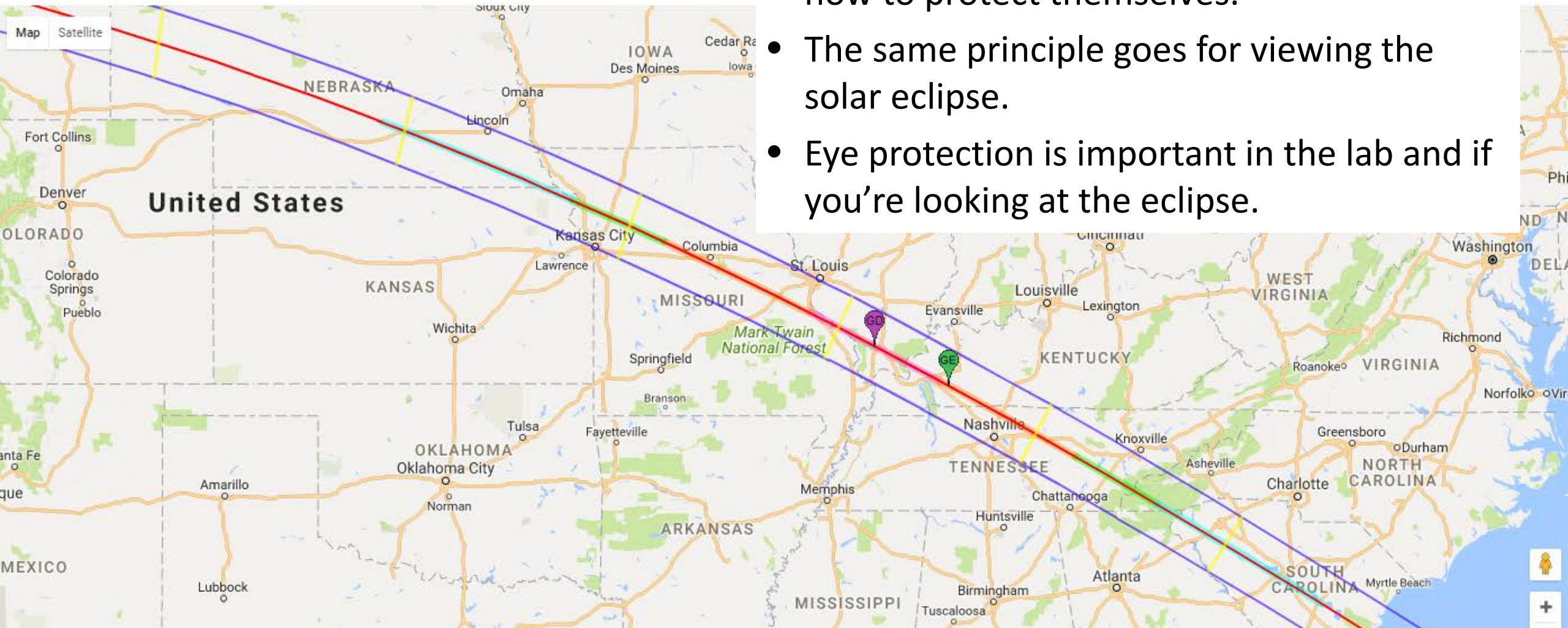
- It's easy to put up signs and train.
- We need to see if our efforts are paying off.
- We use the iAuditor app for iPad.
 - The checklist is modified to meet our specific need and types of labs.

- iAuditor app generates a report for each inspection
- Color coded for quick visual check
 - ✓ Green is all good.
 - ✓ Yellow alerts us to monitor an item.
 - ✓ Red means we still have work to do.

Audit		
Question	Response	Details
House keeping		
The purpose of this section is to evaluate personnel's ability to move through the lab safely and to evaluate the lab's fire safety conditions, equipment, and evacuation capabilities.		
Trash, boxes, broken glass bins and sharps containers are discarded promptly when filled. There should be no broken glassware or sharps left out on bench tops or other work surfaces.	Yes	
Are the exits and aisles free of obstructions, debris, or other tripping hazards? Minimum of a 36 inch walkway.	Yes	
Can the lab door be closed when personnel are working with hazards?	Yes	
Are power cords intact and away from wet areas?	Yes	
Are electrical panels accessible and fully covered?	Yes	
If sprinkler system is present, are items stored greater than 18 inches from the sprinkler head?	Yes	
Is the fire extinguisher accessible?	Yes	
Date fire extinguisher was last checked.	2/25/17	
Signage		
The purpose of this section is to ensure that the signage in the lab is up to date, appropriate and accurate.		
Please post emergency evacuation plans once they become available through your building coordinator.		
Is there lab specific emergency contact information posted? This person is responsible for responding to questions and concerns after regular business hours and to emergencies.	No	Please post lab specific contact information, so that students, staff, and first responders know who to contact in the event of an emergency.

- iAuditor lets us add photos to the report.
- Each lab is inspected twice a year.
- Our inspector is a full-time Laboratory Safety Coordinator who tracks and helps correct our deficiencies.

Question	Response	Details
Do the regulators, hoses, and other tubing appear to be in good condition?	Yes	
Chemical Storage and Labels		
Are hazardous chemicals stored below eye level? Storing hazardous chemicals above eye level increases the risk of accidental exposure.	Safe	
Are secondary chemical containers, not used by the end of the work day, labeled with the chemical name in English and the associated hazards listed on the original container? Concentration should be listed where applicable. Old labels should be taken off or completely blackened out to prevent confusion.	No	All secondary containers should be clearly labeled with both the chemical name and any associated hazards.
<div>    </div> <div> Appendix 5 Appendix 6 Appendix 7 </div>		
Are chemical labels legible?	Yes	
Is the integrity of the chemical container in good condition in order to maintain containment?	Yes	
Are glass bottles of hazardous chemicals stored off the floor?	Yes	
Chemical storage on bench tops is minimal?	Yes	
Are flammable/combustible liquids stored in a flammable storage cabinet or in an inert gas environment away from ignition sources? The storage requirements for most chemicals can be found in the chemical's safety data sheet.	N/A	



- It's à propos that the solar eclipse is happening today.
- Lab personnel have to know their risk and how to protect themselves.
- The same principle goes for viewing the solar eclipse.
- Eye protection is important in the lab and if you're looking at the eclipse.



SOLAR ECLIPSE ACROSS AMERICA

Monday, August 21, 2017: Sun...Moon...You!



AMERICAN ASTRONOMICAL SOCIETY
National Science Foundation



ECLIPSE AMERICA ▾ EYE SAFETY ▾ IMAGING & VIDEO ▾ RESOURCES ▾ FAQ ▾ EVENTS & ACTIVITIES ▾ GRANTS PROGRAM ▾ INFORMATION FOR... ▾

Eye Safety / How to Tell If Your Eclipse Glasses or Handheld Solar Viewers Are Safe

How to Tell If Your Eclipse Glasses or Handheld Solar Viewers Are Safe



Short Answer

Look for evidence that they're certified to meet the ISO 12312-2 international standard for safe direct viewing of the Sun.



Look to make sure your eye protection meets the standards.

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