



Audience Survey Question

ANSWER THE QUESTION ON THE INTERACTIVE SCREEN IN ONE MOMENT

Which of these aspects of laboratory EHS do you feel MOST knowledgeable about?

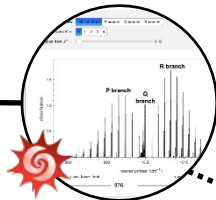
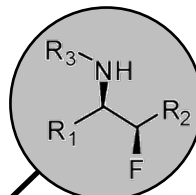
- Where our lab wastes go after they leave the lab
- What will happen in case of an emergency in the lab
- What safety equipment is available to me in the lab and how it is best used and maintained
- What government regulations apply to the work in our laboratory and how we demonstrate compliance with these

* If your answer differs greatly from the choices above **tell us in the chat!**

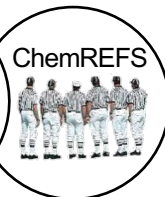
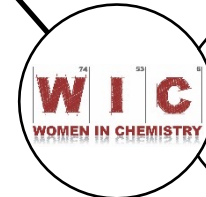
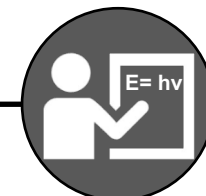
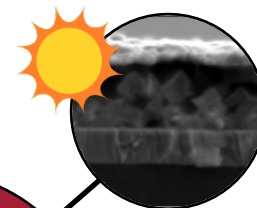
Idaho State
UNIVERSITY



Chem
BS/MS



Physical
Chemistry
PhD



EHS rep group job

mentors

EHS committee service



EHS
Coordinator

Safety
Director



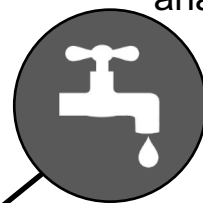
Idaho State
UNIVERSITY



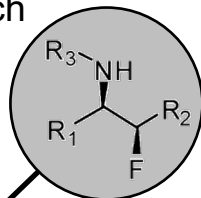
ACS Technical Division
Chemical Health & Safety (CHAS)

an unexpected path...

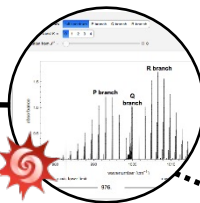
Idaho State
UNIVERSITY



analytical
lab tech



organic
synthesis



chem ed



teaching
assistant

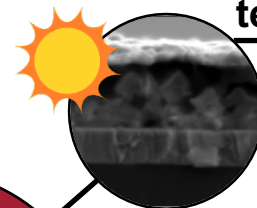


STEM
outreach

Chem
BS/MS

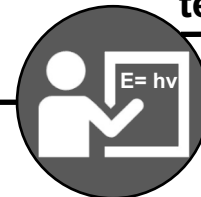


Physical
Chemistry
PhD



technical/practical experience

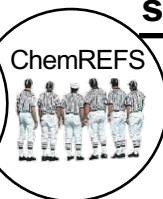
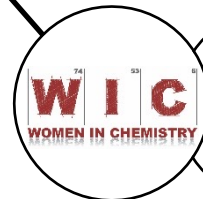
synthesis, nano, gloveboxes,
air-sensitive methods, vacuum
systems, lasers, cryo, lab move



teaching/training skills

teaching assistant, STEM
outreach, equipment
trainer, safety trainer

soft skills



leading teams and
volunteers, advocacy,
organizing events,
developing programs,
conflict management

EHS rep group job

mentors

EHS committee service

Direct EHS experience



MIT.nano



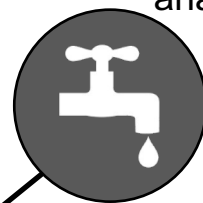
Safety
Director



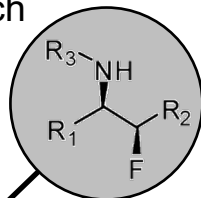
EHS
Coordinator

reframe translatable skills...

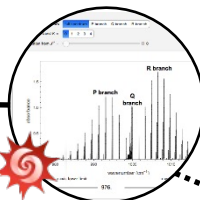
**Idaho State
UNIVERSITY**



analytical
lab tech



organic
synthesis



chem ed



teaching
assistant



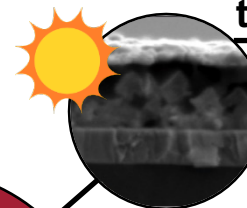
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**Chem
BS/MS**



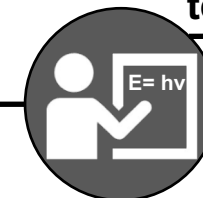
ACS Technical Division
Chemical Health & Safety (CHAS)

technical/practical experience



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teaching/training skills

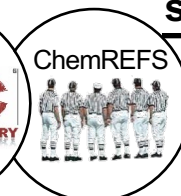
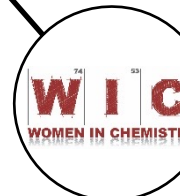


teaching assistant, STEM
outreach, equipment
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**Physical
Chemistry
PhD**

soft skills



leading teams and
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Direct EHS experience

EHS rep group job

mentors

EHS committee service

codes and
standards

**EHS professional
certifications**

gas monitoring

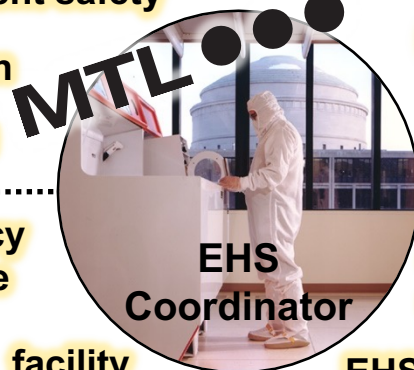
equipment safety

**construction
e-learning**

**emergency
response**

HAZWOPER

**facility
management**



**EHS
Coordinator**

semiconductor fab

cleanrooms

MIT.nano



**Safety
Director**

LOTO

**toxic
gases**

chem safety

i.e. opportunities...



1

Be reflective of your whole self when considering your career path.

2

Chemistry provides a technical foundation to build upon, so be confident in the unique skills you would bring to an EHS position.

3

Continue to foster a scientific mindset in your approach to EHS.

A few parting thoughts...



Audience Survey Question

ANSWER THE QUESTION ON THE INTERACTIVE SCREEN IN ONE MOMENT

Do you feel comfortable discussing EHS concerns with people outside the laboratory?

- Yes, I am confident that I can explain to anyone why my work is safe for myself and for the environment
- Somewhat, I find that people are not easily convinced that laboratories are safe places to work
- No, people who don't work in my lab are not qualified to understand safety aspects of our work

* If your answer differs greatly from the choices above **tell us in the chat!**

Career Path



ACS Technical Division
Chemical Health & Safety (CHAS)

Research

Safety and
Operations



Chemical
Sciences

Center for
Nanophase
Materials
Sciences



Facilities /
Operations



**ES&H (Individual
Contributor)**

- Laboratory Space Manager
- Chemical Management
- Environmental Protection / Waste
- Nanomaterials!

ES&H and Operations Management

- Division research support
- Directorate level operations support (+ training, facilities, IT)
- Laboratory / Enterprise level program management (hazard analysis, ELN, ...)



Certifications – what do you need?



NATIONAL REGISTRY OF CERTIFIED CHEMISTS

- Chemical Hygiene Officer
- Industrial Hygiene Chemist
- Clinical Chemist / Technologist
- Toxicological Chemists / Technologist
- Environmental Analytical Chemist
- Cannabis Chemist (coming soon)

Balance – Certification / Education / Experience!

A sampling of courses available:

- CIH / CSP prep courses
- How to be a more effective Chemical Hygiene Officer
- Safety Leadership in the Chemistry Enterprise
- Laboratory Waste Management
- Empowering academic researchers to strengthen safety culture
- Foundations of Chemical Safety and Risk Management (FREE)



My ESH&Q Team (and where do chemists fit in?)



Professional Development – Engagement is Key!



ACS Technical Division
Chemical Health & Safety (CHAS)

- National involvement through meetings
 - ACS National and Regional Meetings
 - Division of Chemical Health and Safety
 - Campus Safety, Health, and Environmental Management Associate (CSHEMA)
- Local Involvement (cross-disciplinary!)
 - ACS East Tennessee Section
 - Tennessee Valley Section of AIHA
- Organizational/Field Specific
 - Communities of practice / EFCOG
 - Regional APLU, SASEF, ...
- Share Knowledge
 - ACS Journal of Chemical Health and Safety
 - Read
 - PUBLISH!!!
 - List-serv: Division of Chemical Health and Safety (DCHAS-L)
- Continuous Education
 - Safety: move beyond the standard (Reactive chemicals, human performance, ...)
 - Management / Leadership

Get out and see how others run their labs!

Career Progression

How do skill / qualification requirements change as one progresses from SME/IC to management?

Early Career

- Narrow(er) focus
- Expectations to understand other areas are limited
- Fundamental knowledge and capabilities
- Focus on “Hard” Skills

Later Career

- Broad focus
- Awareness of topics beyond your expertise!
- Interpersonal and collaborative capabilities
- Systems thinking!
- Focus is on “Soft” Skills



Audience Survey Question

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Who is your primary resource for EHS aspects for your laboratory work?

- The manager of my lab understands and shares what I need to know about EHS in the lab
- I have built a productive relationship with the EHS staff in my organization
- I rely on discussions with peers to identify and address EHS issues that arise
- I rely on my chemical intuition to manage EHS concerns

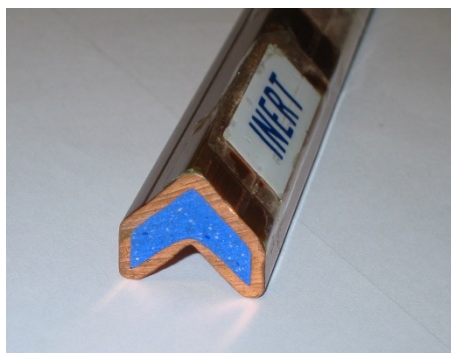
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Career Path – Beginning in Industry



ACS Technical Division
Chemical Health & Safety (CHAS)

Explosive Technology, Inc. Fairfield, CA



- Energetic Materials Chemistry
- Quality Assurance
- Failure Analysis
- Training

Career Path – Transition to Academia



ACS Technical Division
Chemical Health & Safety (CHAS)



SACRAMENTO STATE

UC DAVIS



- Chemical Hygiene Officer
- Industrial Hygienist
- Plan Review Specialist
- Safety Manager
- Subject Matter Expert



UC DAVIS

DEPARTMENT OF CHEMISTRY

ACS Technical Division
Chemical Health & Safety (CHAS)

Q: What is the difference between the role of an EHS professional in industry and academia?

- Responsibility
- Accountability
- Liability



Different Safety Professional Roles

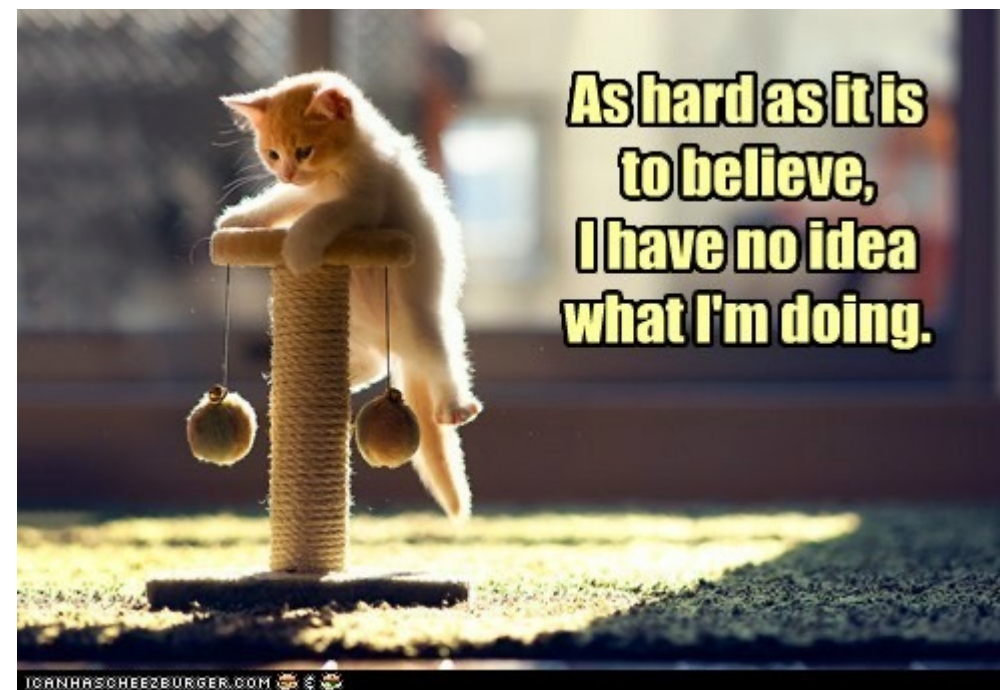


ACS Technical Division
Chemical Health & Safety (CHAS)

Q: How do responsibilities differ if you are hired to work as an embedded safety professional within a department vs the EHS team directly?

Campus EH&S team is focused in large part on campus-wide policy and initiatives

Embedded safety professionals are focused, primarily, on representing the best interests of their department or unit.





Q: Describe how chemists might move into an EHS professional role. That is, how does a chemistry education relate to:

- * **chemical hygiene officer** - understanding the regulatory framework of the laboratory standard
- * **embedded safety professional** - understanding what the scientific needs are and the hazards/risks of those needs
- * **industrial hygienist** - understanding how chemicals can move about in the workspace and migrate into the breathing zone or physical contact with a worker
- * **research/lab safety specialist** - understanding how researchers/scientists do their work and what level of risk workers might be accustomed to
- * **hazardous waste management** - understanding how chemicals behave when in contact with each other and how wastes are generated
- * **safety engineer** - understanding what the scientific needs are and the hazards/risks of those needs
- * **leadership/management roles** - understanding how research gets accomplished

Where to Start?

Q: What can they start doing while in school to increase their chances of securing a safety-related job?

Make the acquaintance of safety professionals at their institution.

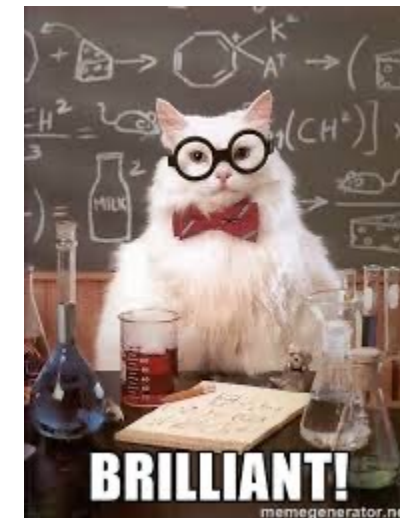
Look for internships or opportunities to volunteer for safety-related projects.

If they're doing research, take on safety duties in their lab.

Join the ACS!



ACS Technical Division
Chemical Health & Safety (CHAS)





Audience Survey Question

ANSWER THE QUESTION ON THE INTERACTIVE SCREEN IN ONE MOMENT

Which of these statements best describe your understanding of the professional qualifications of laboratory Environmental Health and Safety (EHS) staff.

- Only EHS professionals can fill the EHS role adequately
- Chemists can fill EHS roles but they are at a disadvantage to credentialed EHS professionals in those situations
- Chemists have an advantage over traditional EHS professionals because they know the science better
- Only chemists can perform EHS work for chemistry research activities adequately

* If your answer differs greatly from the choices above **tell us in the chat!**

ACS CHAS Peer Led Workshop:



Empowering academic researchers to strengthen safety culture



Led by Amanda Chung, University of California, Irvine
Hossain Shadman, University of Memphis

Sunday, 26th June 2022 from 2PM – 6PM ET

Registration for this workshop is \$25 per participant.

This **workshop** is directed at frontline researchers in academic institutions: **graduate students, postdoctoral scholars, and undergraduate students**. Faculty and safety staff are also very much encouraged to participate.

Workshop Goals:

- Educate participants about the value of risk assessment
- Guide participants towards gaining awareness of safety culture messages from leadership at their institutions
- Empower participants to expand their safety networks and develop laboratory safety teams

<https://www.eventbrite.com/e/acs-chas-empowering-academic-researchers-to-strengthen-safety-culture-registration-295820506097>