

# TRIUMF DAY OF MOURNING ALL HANDS MEETING

## - PHYSICAL SCIENCES DIVISION SAFETY NOTES -

- R. Kanungo
- G. Hackman

# PSD-SC MEMBERS

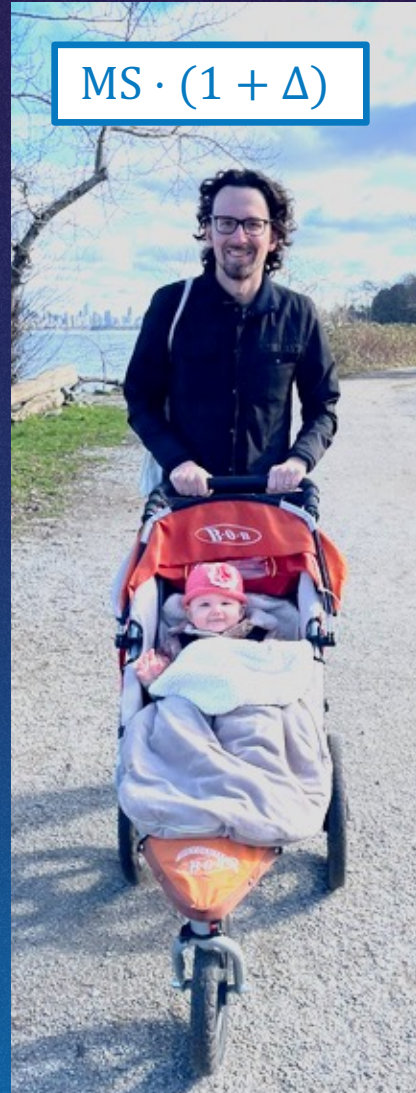
Chair:  
Greg Hackman

Dept. Reps:  
John Behr  
Clayton Handley  
Kenji Kojima  
Ruediger Picker  
Max Swiatlowski  
Nicole Vassh

Alt. Dept. Reps:  
Jason Holt  
Philip Lu  
Stephan Malbrunot  
Gerald Morris



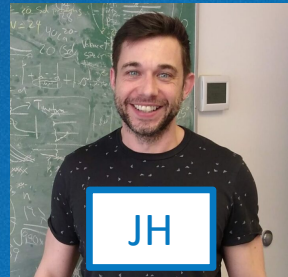
CH



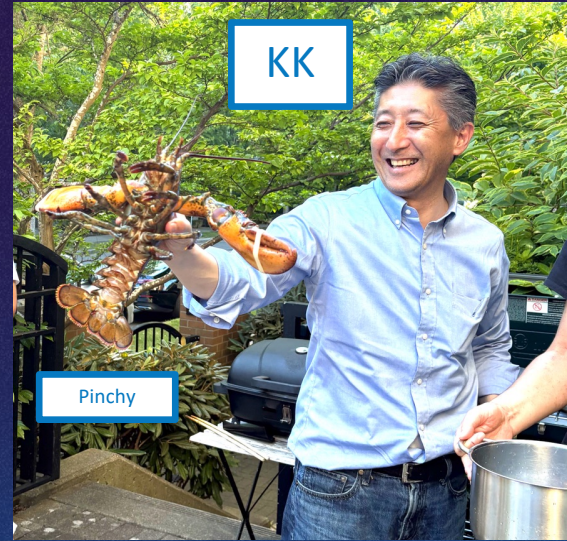
MS · (1 + Δ)



RP

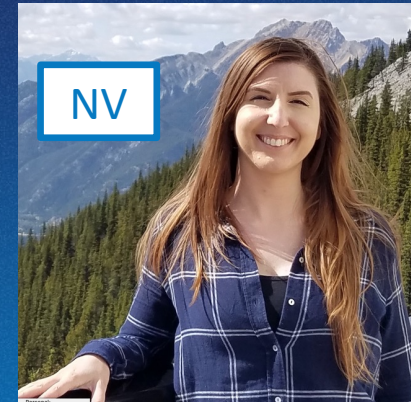


JH



KK

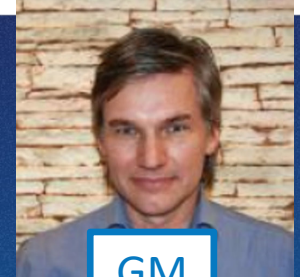
Pinchy



NV



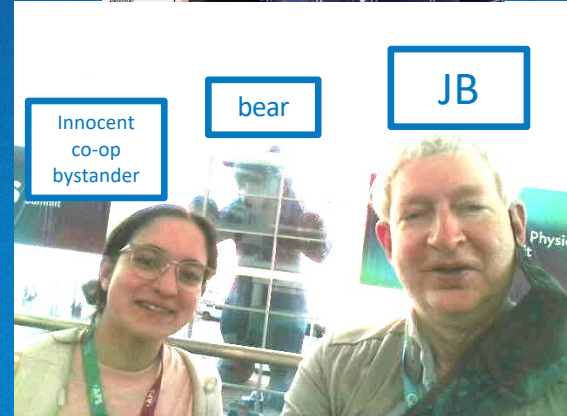
PL



GM



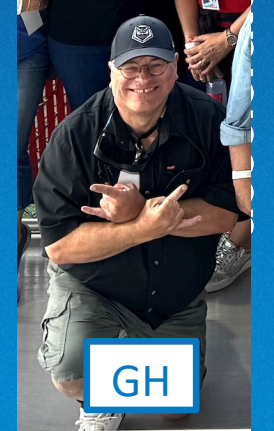
SM



Innocent co-op bystander

bear

JB



GH

# Messages from Physical Sciences Division on Safety

- ❖ **Safety must be your top priority in anything that you do. Motto is safety comes first & work comes after.**
  - Be conscious about your safety and others safety.
  - Stop work if unsure of safety or if you feel it is unsafe.
  - Stop work in the experiment/test area, if you are feeling too tired.
  - Physical Sciences Experiments have many external users. TRIUMF host must ensure they are fully informed of safety protocols at TRIUMF. Any TRIUMF member should help external visitors with any safety related questions or guidance.
- ❖ **Be alert to your surroundings.**
  - Laboratory workspace has many hazardous items. Have the knowledge of the hazards.
  - Report anything you see around as unsafe.
- ❖ **Be trained for operating.**
  - To work with equipment in the laboratory, you must complete the necessary safety training.
  - Don't fiddle around with equipment you don't know about. You must learn about the proper way to use the equipment prior to operation.
  - Don't use equipment as tables or benches! Gas cylinders are not posts to lean on!
  - Consult your supervisor or the facility coordinator, if you are unsure of operation.

# PHYSICAL SCIENCES DIVISION HAZARDS

- Lasers – can blind you
  - Francium hut, MHESA lab
- High voltage/current – can electrocute you
  - Any magnet, separator, optics, most detectors
- Cryogenics – can freeze or asphyxiate you
  - Most experimental setups
- Compressed gas cylinders – can explode
  - Many detector setups
- Explosive materials – can explode
  - Active material in many detectors e.g. isobutane, methane
- Flammable materials – can burn you
  - Acetone, ethanol, methanol ...
- Toxic materials – can poison you
  - As above, plus lead
- Work at heights – you can fall
  - Any setup > 15 feet tall
- Confined spaces – can impede rescue
  - UCN production target
- Etc .....

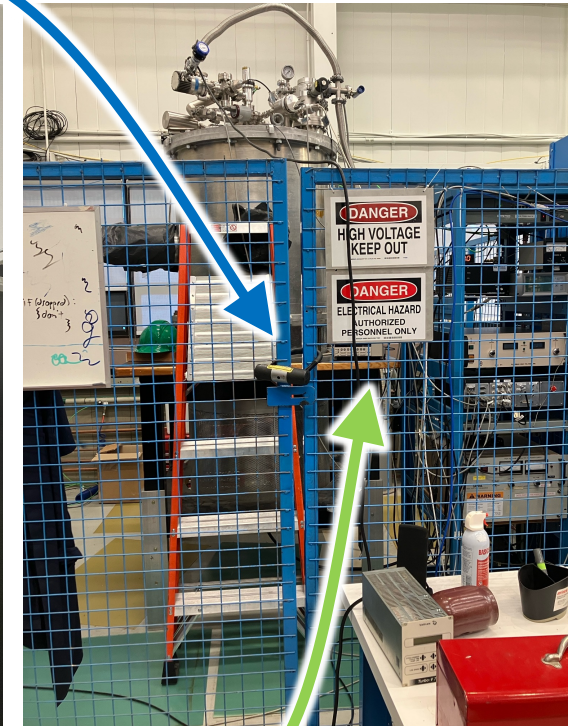
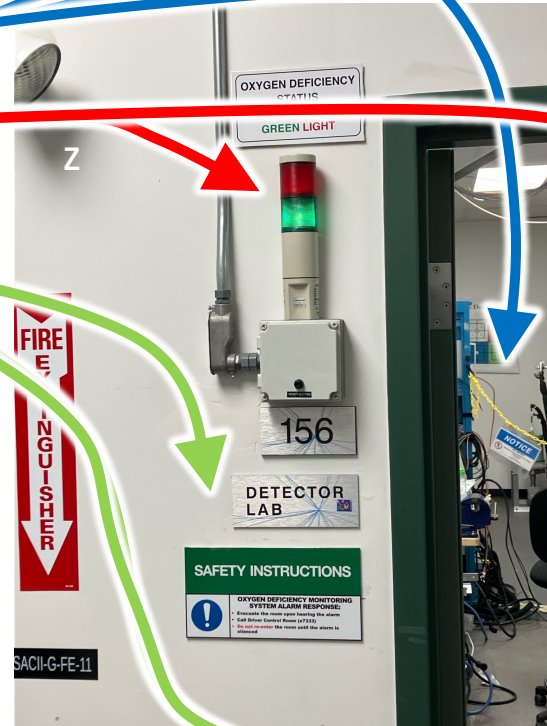
# PHYSICAL SCIENCES DIVISION HAZARDS

- Just three examples of real PSD activities
- Hazards present: cryogenics, lasers, high voltage
- ~50 comparable setups



# PHYSICAL SCIENCES DIVISION HAZARD MITIGATION

- Access controls
- Warning lights
- Signage
- Read the signs, observe the lights, stay out of locked doors – you'll be fine
- Hazard is not the same as risk



# GRAPHIC AND POTENTIALLY UPSETTING DISCUSSION MAY FOLLOW

- Multiple controls exist
- Many failures needed for something to happen
- But it does happen
- And it can be deadly

# YALE STUDENT KILLED AS HAIR GETS CAUGHT IN LATHE [1,2]



- Michelle Dufault, Yale Phys. & Astro. Undergraduate
- Weeks from graduating, Senior thesis on dark matter searches
- Working alone at night on a lathe in Chem. Dept. machine shop
- Caught hair in lathe
- Found the next morning ... dead

# TRAINING, TESTIMONIALS, FINDINGS: COULD IT HAPPEN HERE?

- Completed introductory machine shop course
- Just about to finish advanced course
- Co-worker: “She’s always been very careful ... That’s why I was shocked that this happened”
- OSHA: “... where she was working by herself in violation of the existing safety rules.”

Could this specific thing happen here?

- Much less likely
- No “student shops”
- Off hours: Detector facility shop locked, MHESA machines locked out
- Would need to work hard to defeat controls

## COULD THIS HAPPEN HERE? YES

- Many human elements in common
- Young worker(s)
- Limited experience
- Overconfidence?
  - More senior scientists too
  - Belief that a shortcut won't hurt
  - You're only immortal for a limited time
- Career pressure
  - Thesis, paper, next job, grants
- Beamtime pressure
  - Limited access to beam & beamlines
  - Compressed work schedules
  - Off-hours and alone
- These two pressures tightly coupled
- Not excuses – just facts.