

PEARL

Polar Environment Atmospheric Research Lab

Virtual Tour



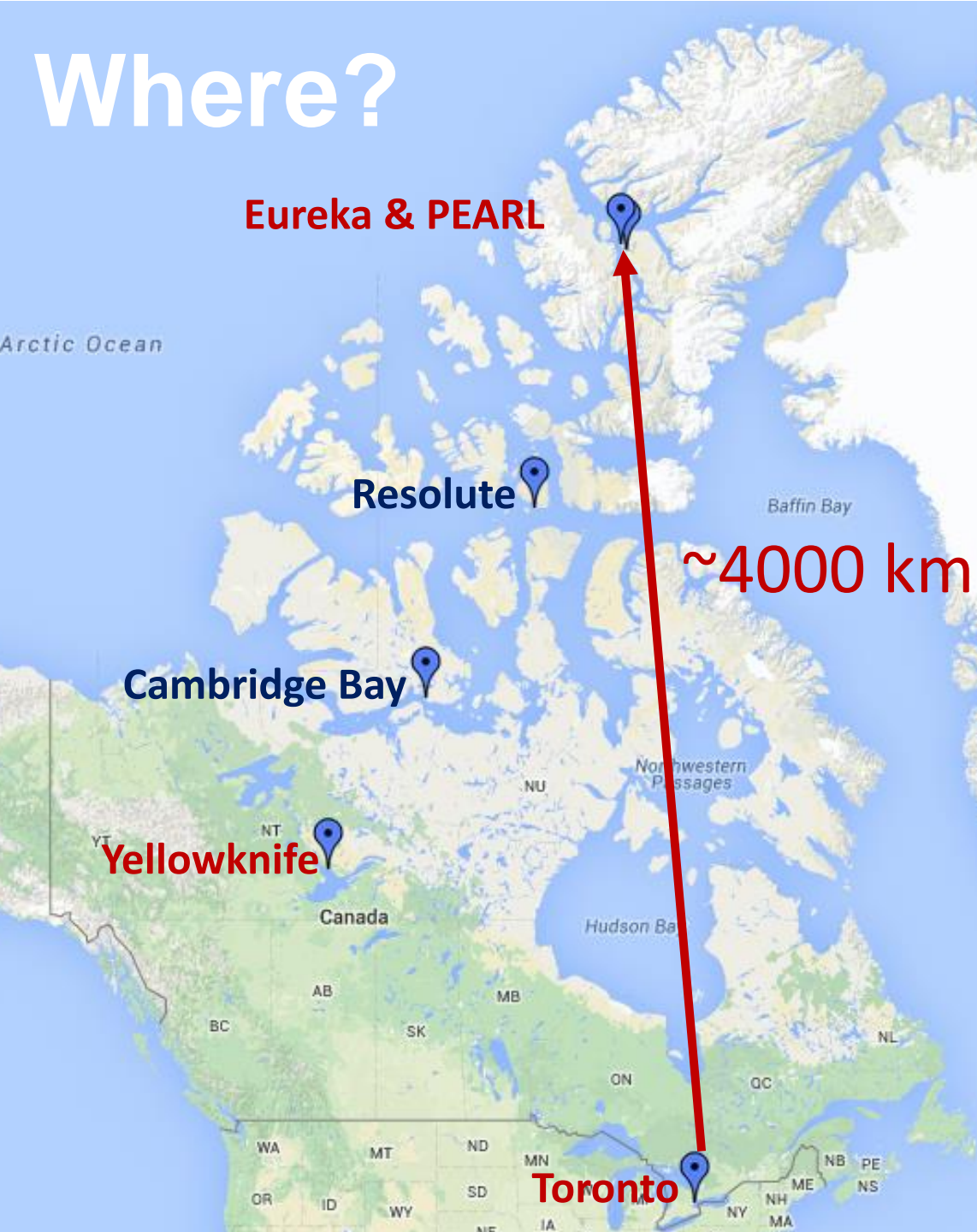
Prepared by:

Dan Weaver

Measuring the Canadian high Arctic atmosphere



Where?



Eureka, Nunavut is
at 80°N
on Ellesmere Island

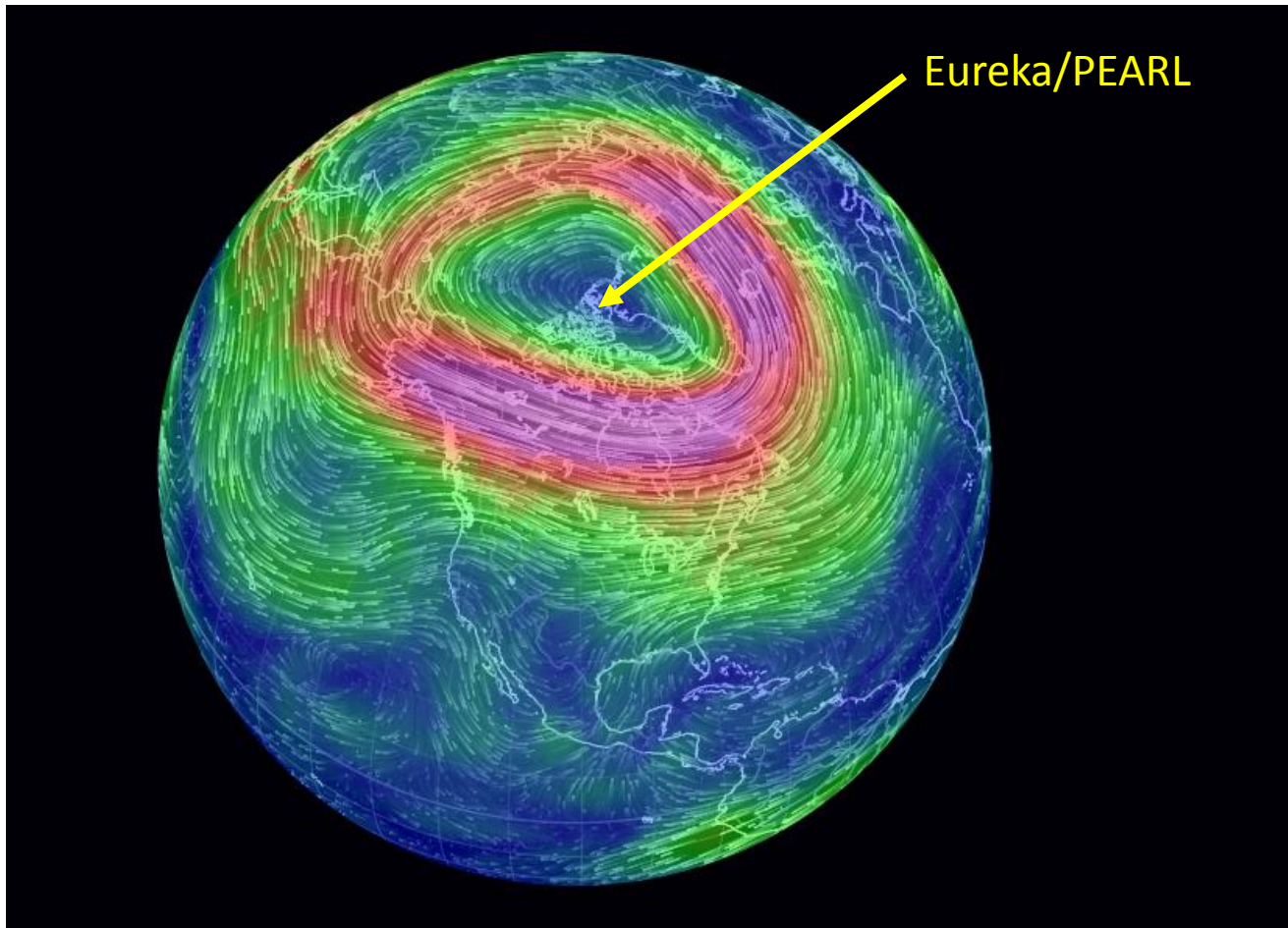
Distances

- Eureka/PEARL is over 4000 km north of Toronto!
- Yellowknife is ~halfway point



Polar Vortex

March 10, 2015 (70 hPa, stratosphere)



Arriving at Eureka International Airport





No Service 99% 11:13 PM 45%

Current **-47°C**
Clear Feels Like: -47

Wind Speed & Direction	Humidity	
Calm	—	
Pressure	Visibility	Ceiling
—	16km	unlimited
Sunrise/Sunset	Yesterday's High/Low	
—	-46.8° -49.3°	

Evening Sunday **-36°**
Weather delays unlikely

Overnight Sunday **-36°**
Weather delays unlikely

Morning Monday **-35°**
Weather delays unlikely

Monday **-35°**
Weather delays unlikely

The Weather Network **Eureka** NU, Canada

Dress warmly!



TEMPERATURE / MAX. TEMP. **DEWPOINT / MIN. TEMP.**

A.E.S. REMOTE TEMPERATURE / DEWPOINT DISPLAY

TEMPERATURE / MAX. TEMP. **DEWPOINT / MIN. TEMP.**

CLEAR **ERROR** **MESSAGE** **POWER**

NORMAL **MAX** **MIN**

The digital display shows two sets of numbers: -46.8 and -49.3. The first set is under 'TEMPERATURE / MAX. TEMP.' and the second is under 'DEWPOINT / MIN. TEMP.'. The display is red and has a 'NORMAL' indicator light to the right.

Eureka at twilight



Eureka at twilight

Hydrogen shed



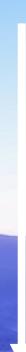
Eureka
Weather
Station



Diesel &
power
generation



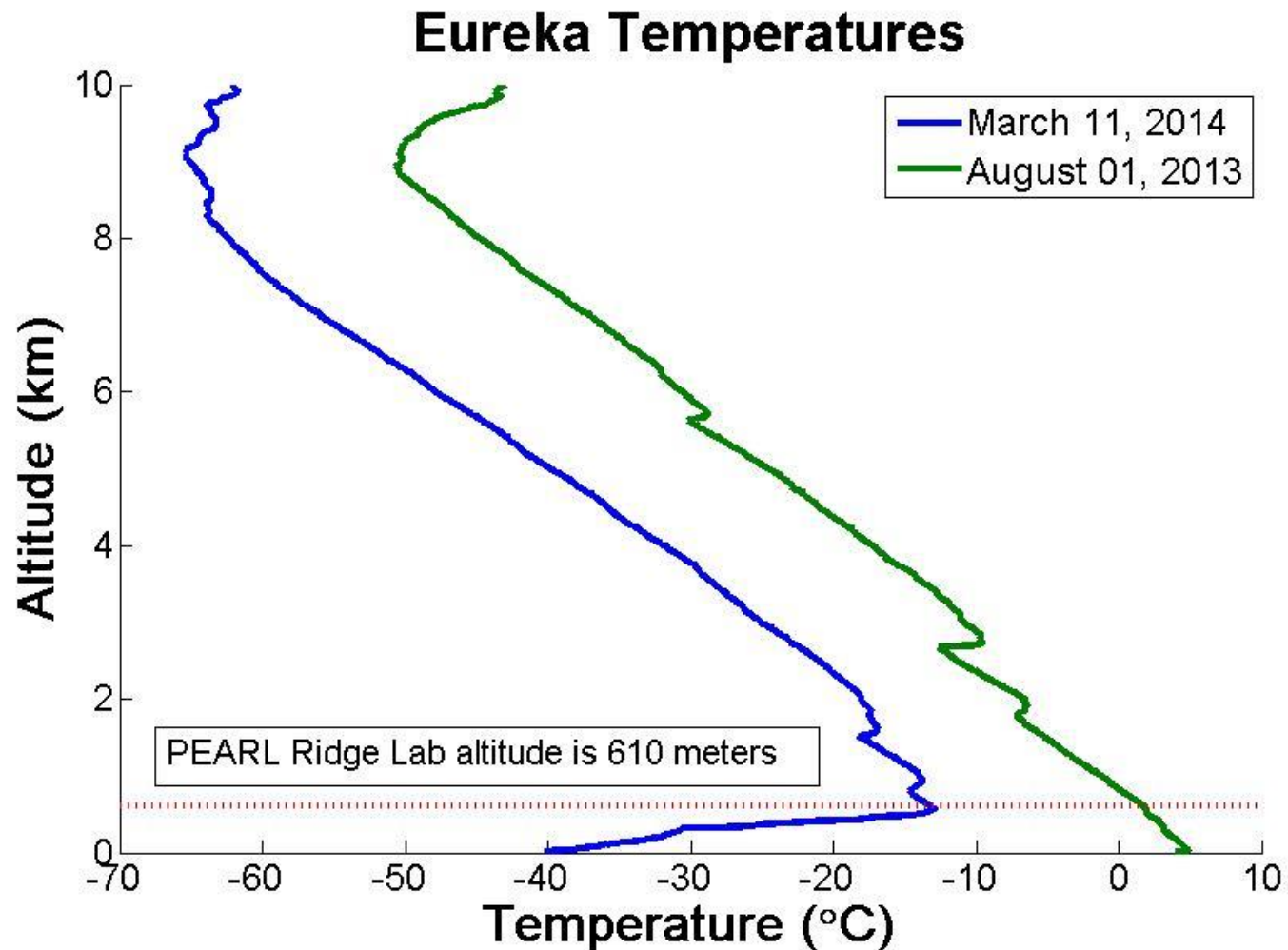
Zero-altitude
PEARL
auxiliary lab
(OPAL)



Diesel power generators & temperature inversions



Interesting phenomena: Temperature inversion





The Eureka Weather Station



Eureka public transit?



WELCOME TO EUREKA
WEATHER STATION

CANADA POSTES
POST CANADA
EUREKA, NU
XOA OGO



“Mud room” for
transitioning between
inside & outside



Eureka is the northernmost permanently settled civilian place in the world.



It's like a tiny town. There is:

- Post office
- Store
- Bar (BYOB)
- Airport
- Labs
- Guest rooms
- Power facilities
- Sewage facilities
- Water infrastructure

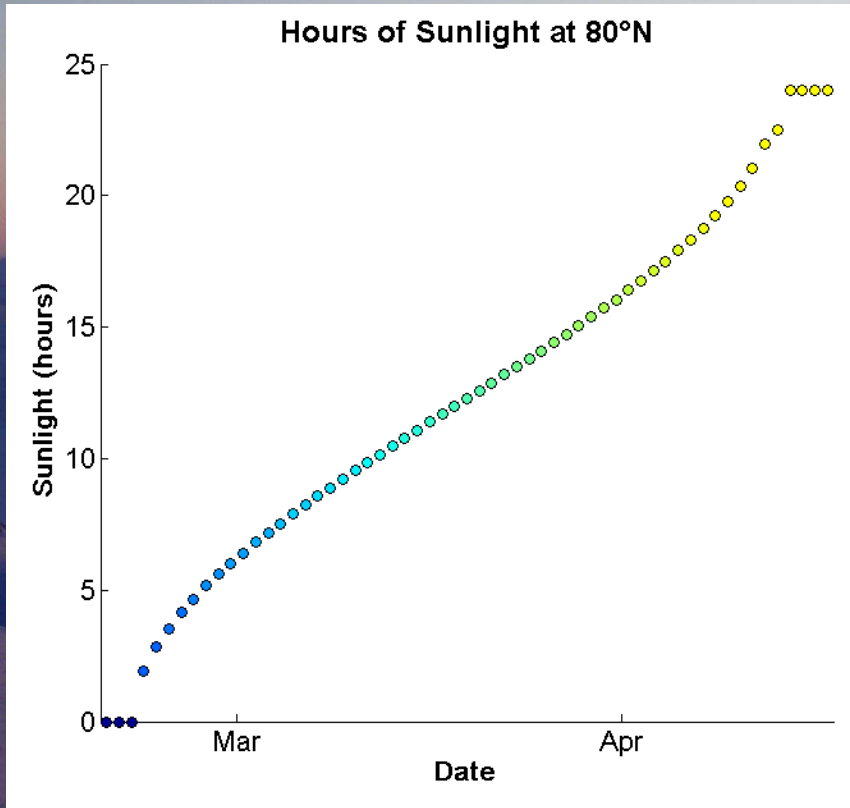
Eureka Weather Station's recreation room



There's always plenty of food in Eureka



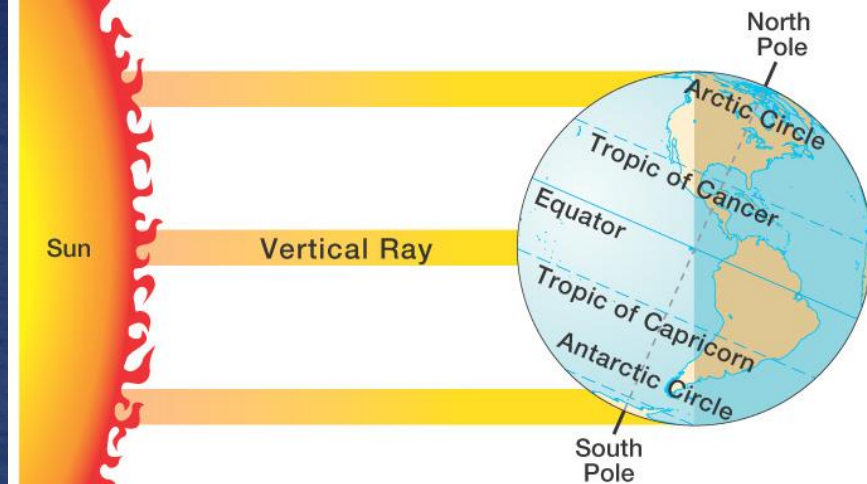
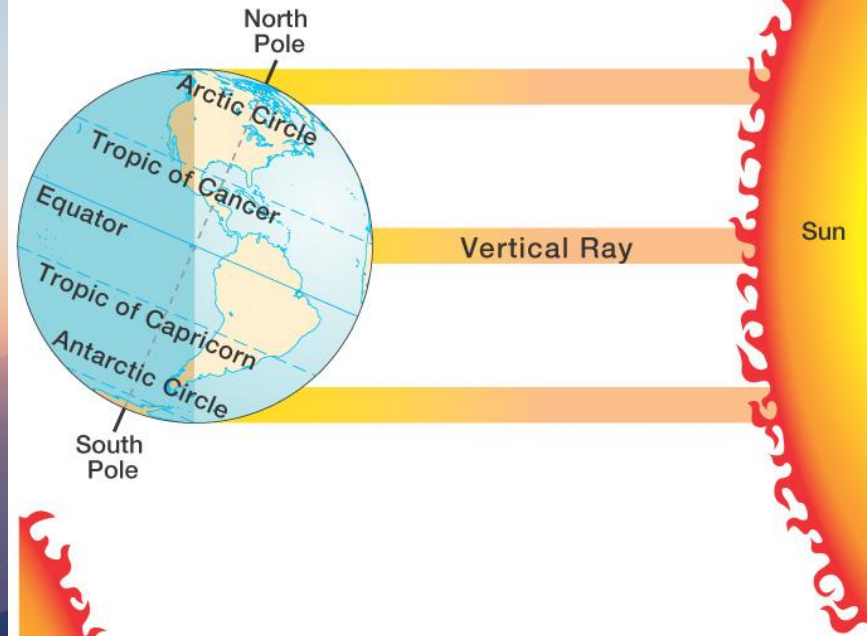
Daylight



Eureka, Nunavut
18 February – 18 April 2015
Data from the U.S. Naval Observatory

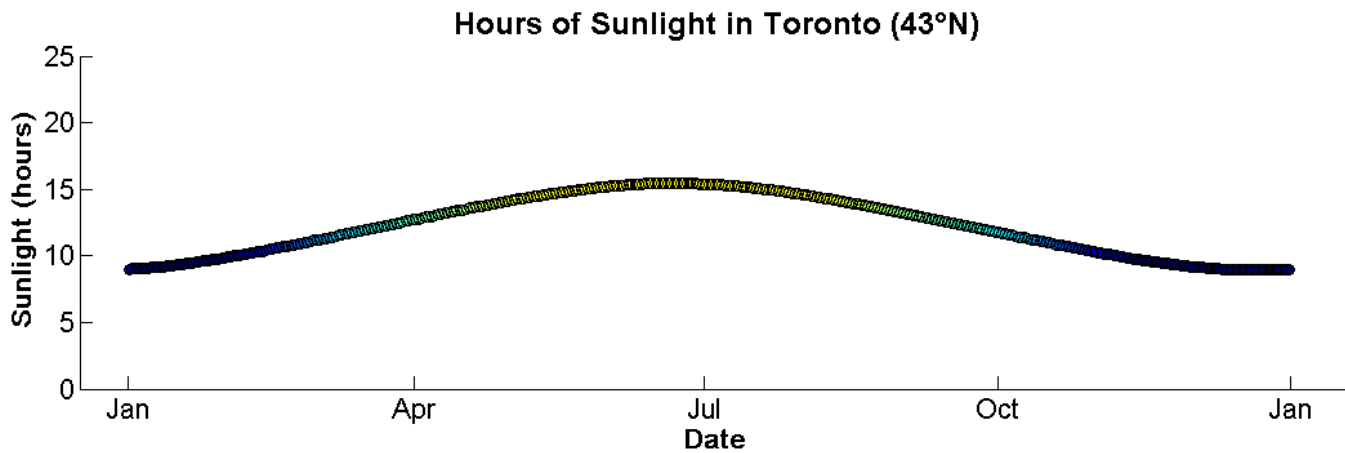
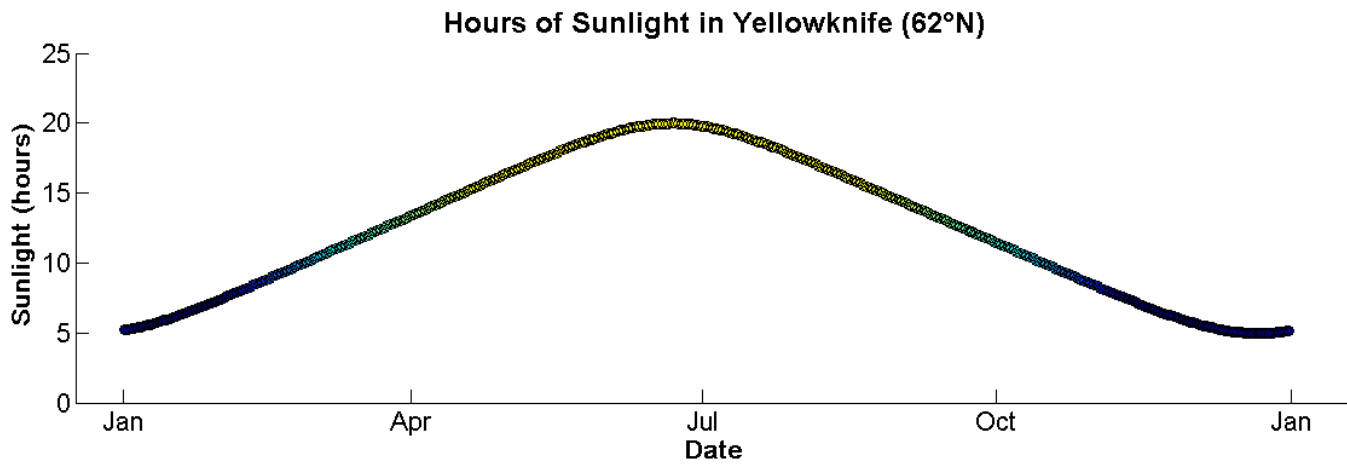
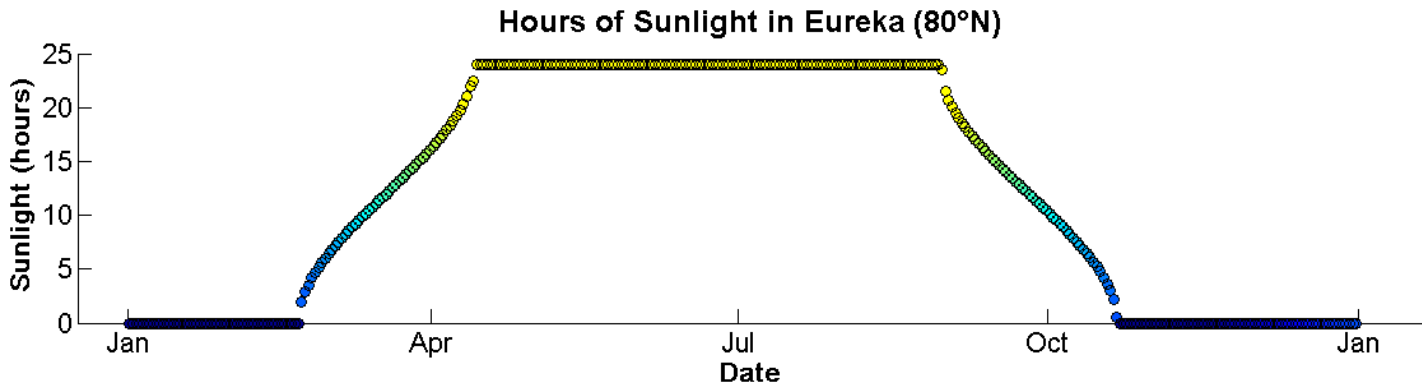
Side Views

June 21



December 21

Side View



The Hydrogen shed for radiosonde launches



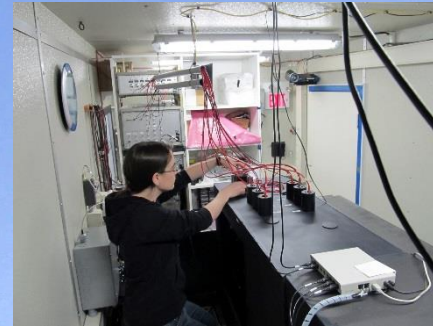


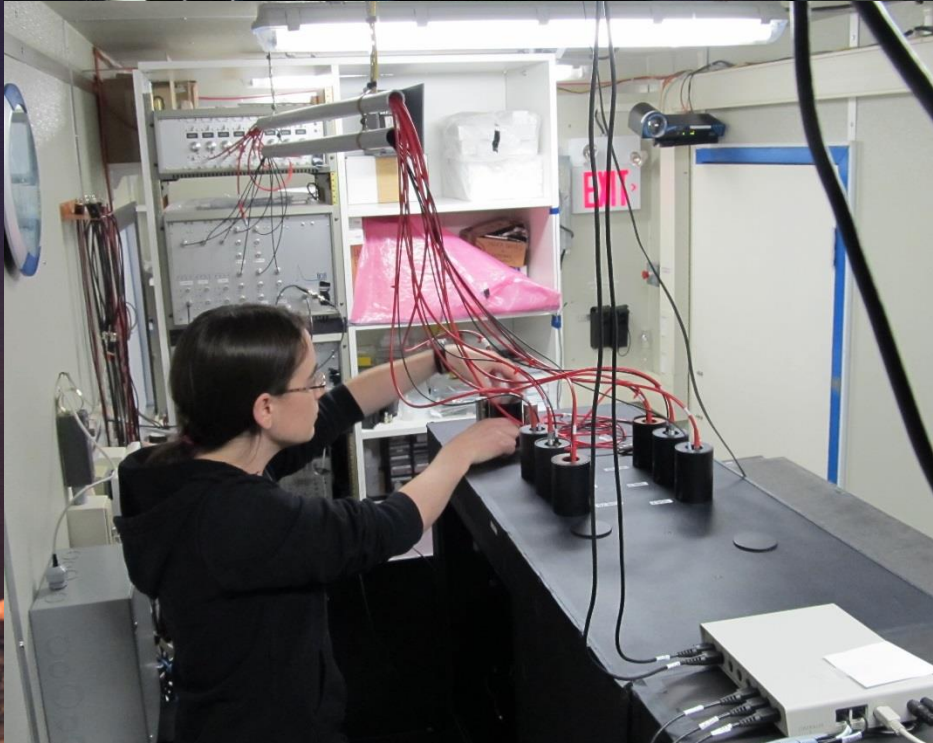
PEARL includes 3 facilities

- PEARL Ridge Lab
- Zero-altitude PEARL auxiliary lab (OPAL)
- SAFIRE



Zero-altitude PEARL Auxiliary Lab (OPAL)







SAFIRE

(Surface and Atmospheric Flux, Irradiance and Radiation Extension)



Meteor antenna needed to be dug out of snow



The flux tower





Driving to the PEARL Ridge Lab

Be prepared to shovel snow when in the Arctic!

DYK:
Canada's high Arctic is a polar desert.
There is very low humidity!

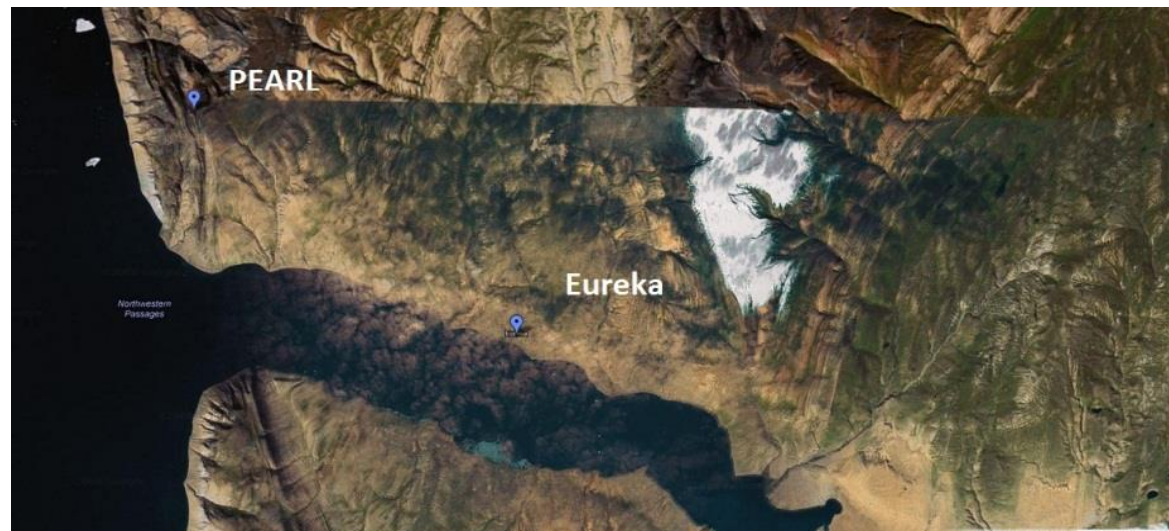


Figure .: Location of PEARL relative to Eureka.



80° North





If you're **really** stuck...
Environment Canada can help



Upper Paradise

(Canadian Forces facility)



(Between Eureka and the PEARL Ridge Lab)

The PEARL Ridge Lab













It's not easy to get here, but it's beautiful!

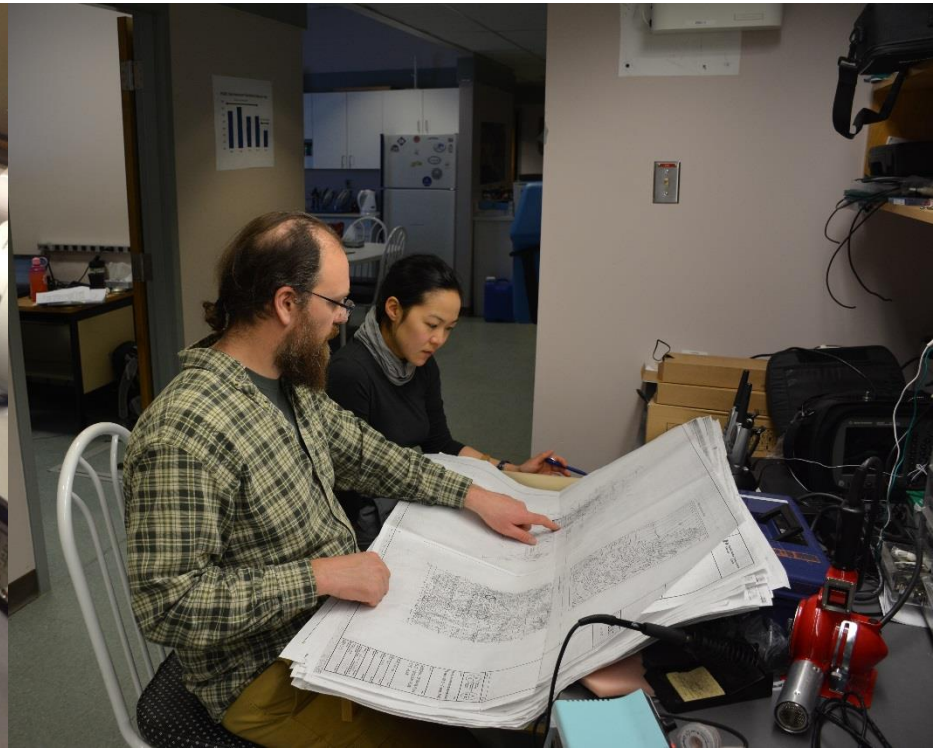
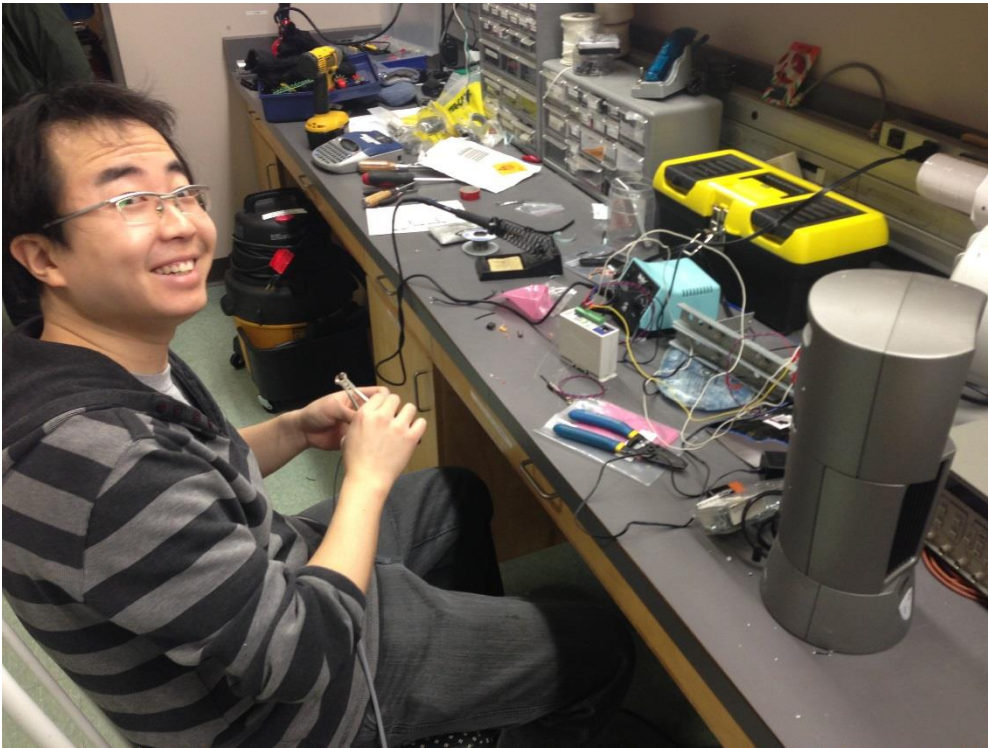
The Front Door



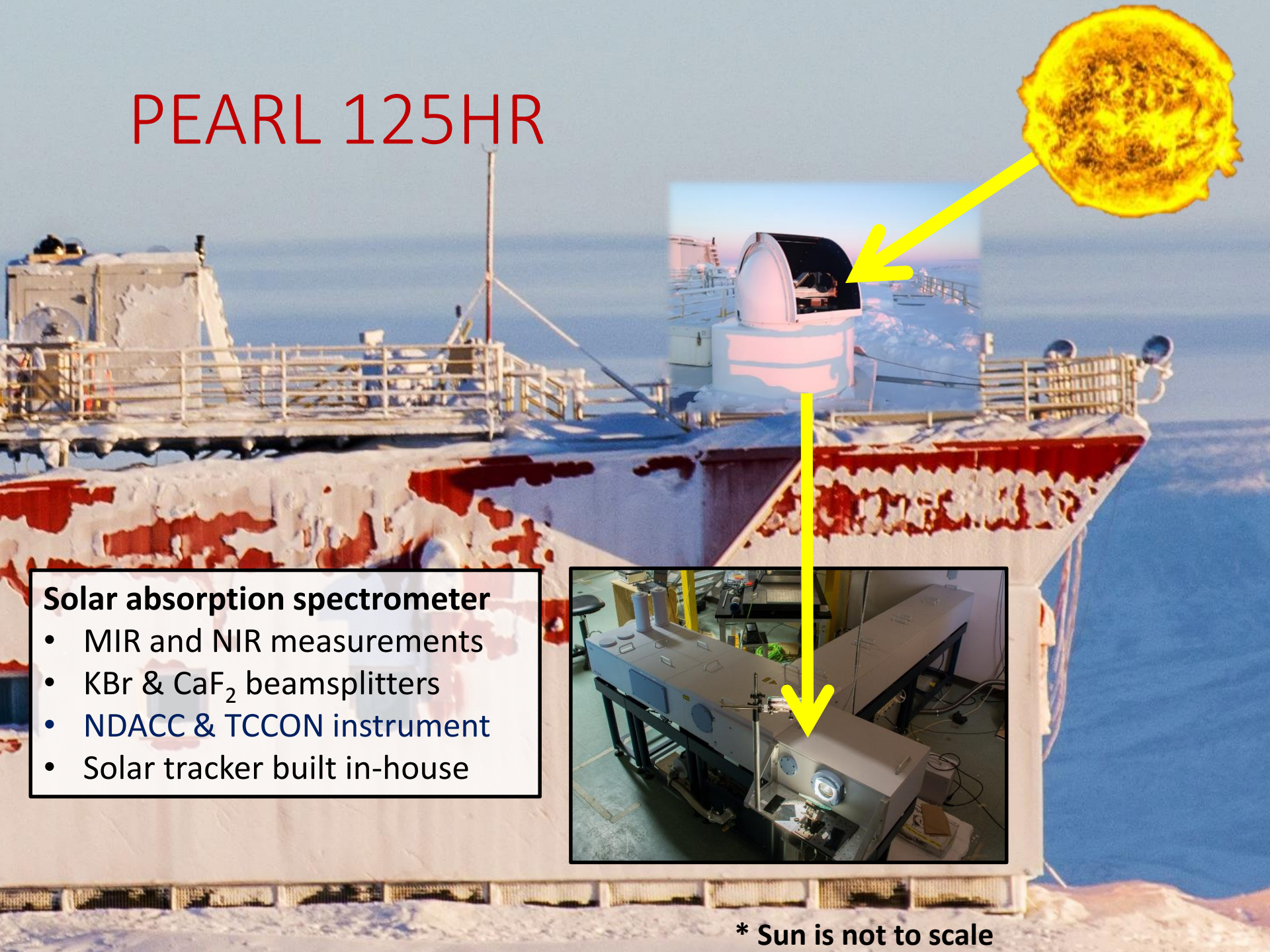
PEARL Ridge Lab kitchen



Lab bench in the hallway

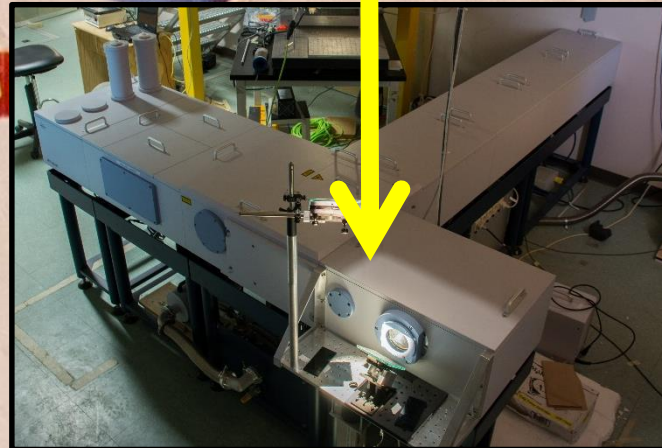


PEARL 125HR



Solar absorption spectrometer

- MIR and NIR measurements
- KBr & CaF₂ beamsplitters
- NDACC & TCCON instrument
- Solar tracker built in-house

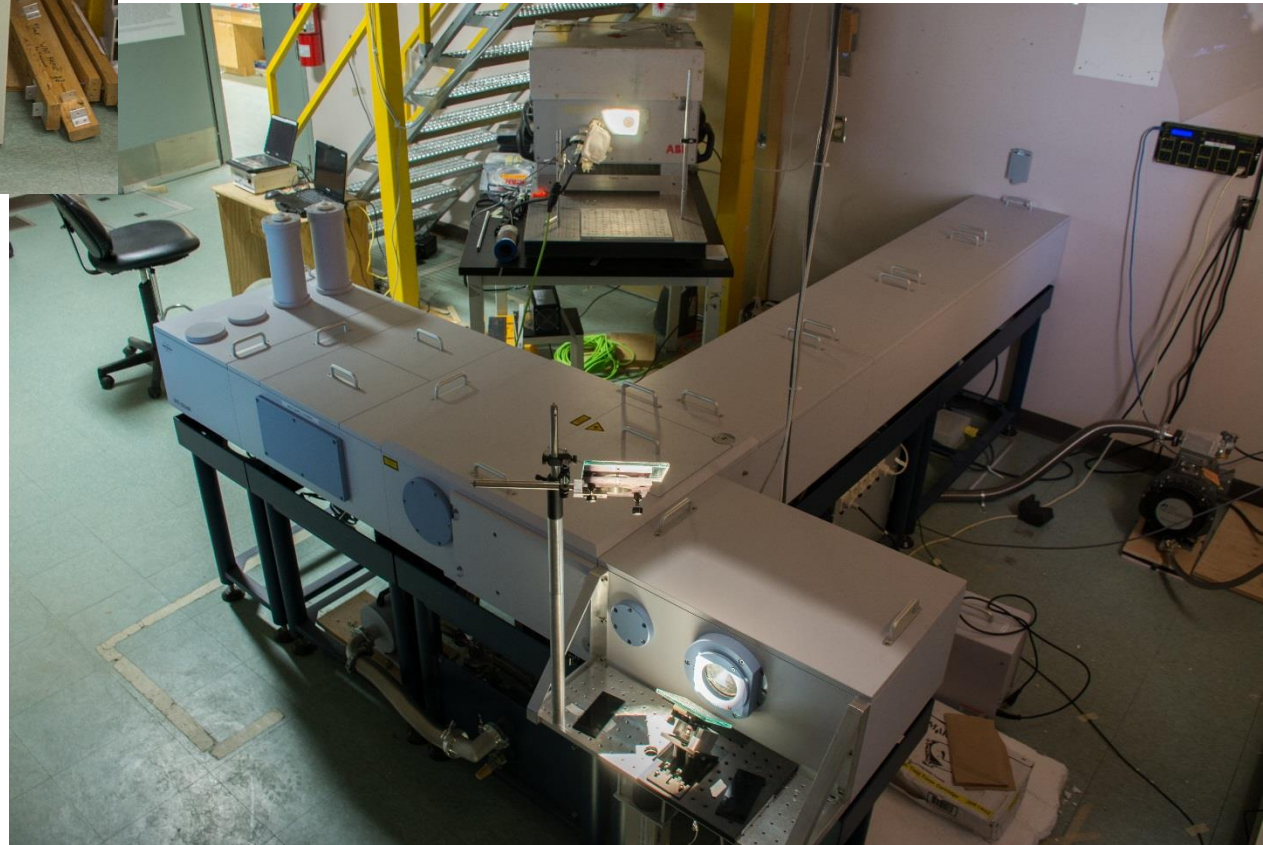


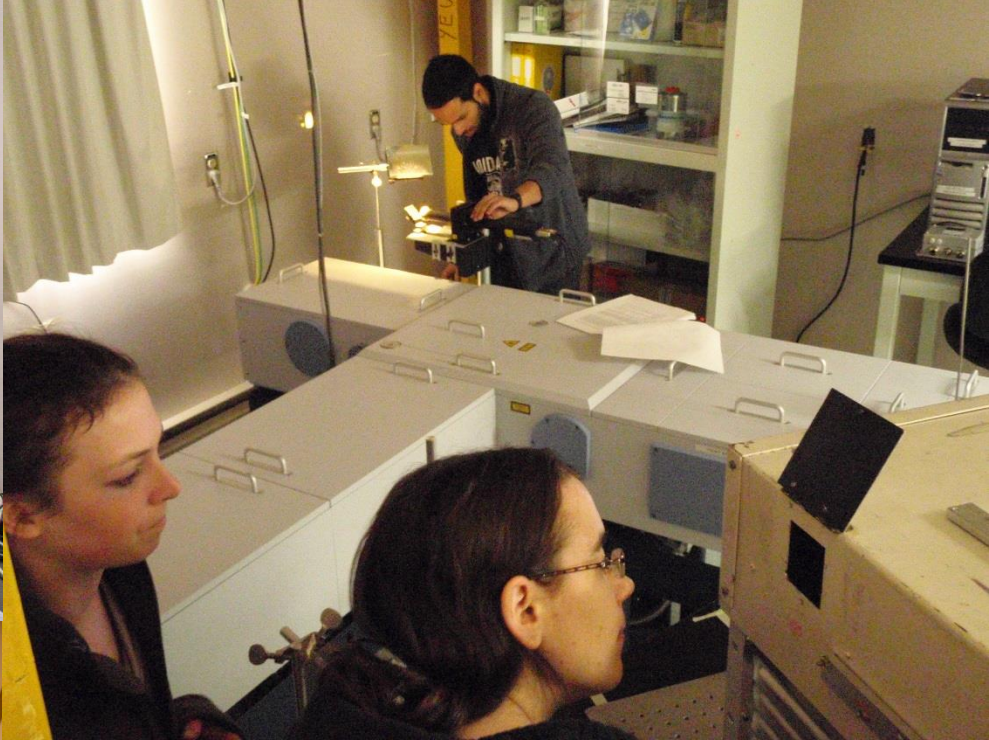
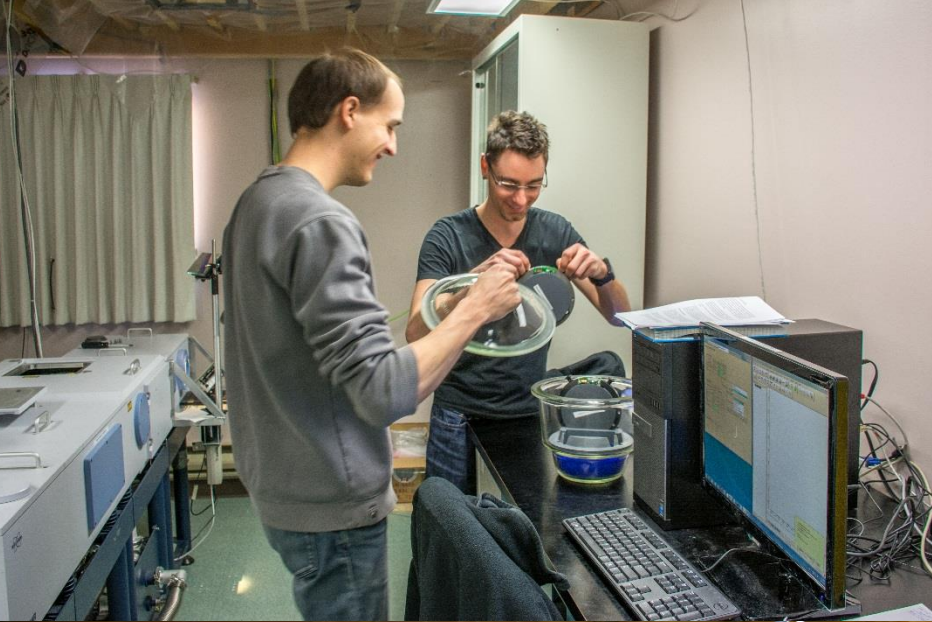
* Sun is not to scale

PEARL 125HR

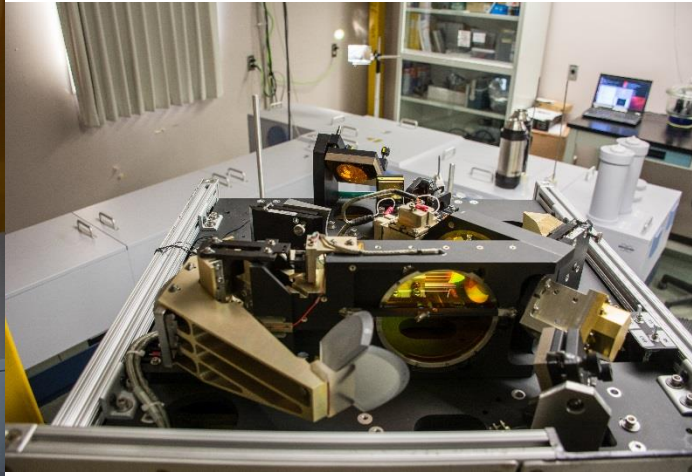


High resolution spectrometer, which uses a solar beam, sent down from a rooftop sun tracking instrument, to create a “map” of the atmosphere above the lab.



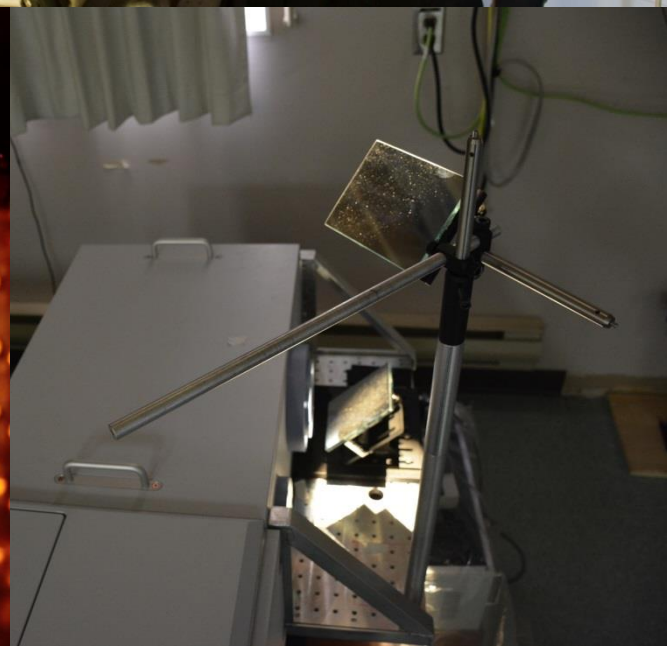
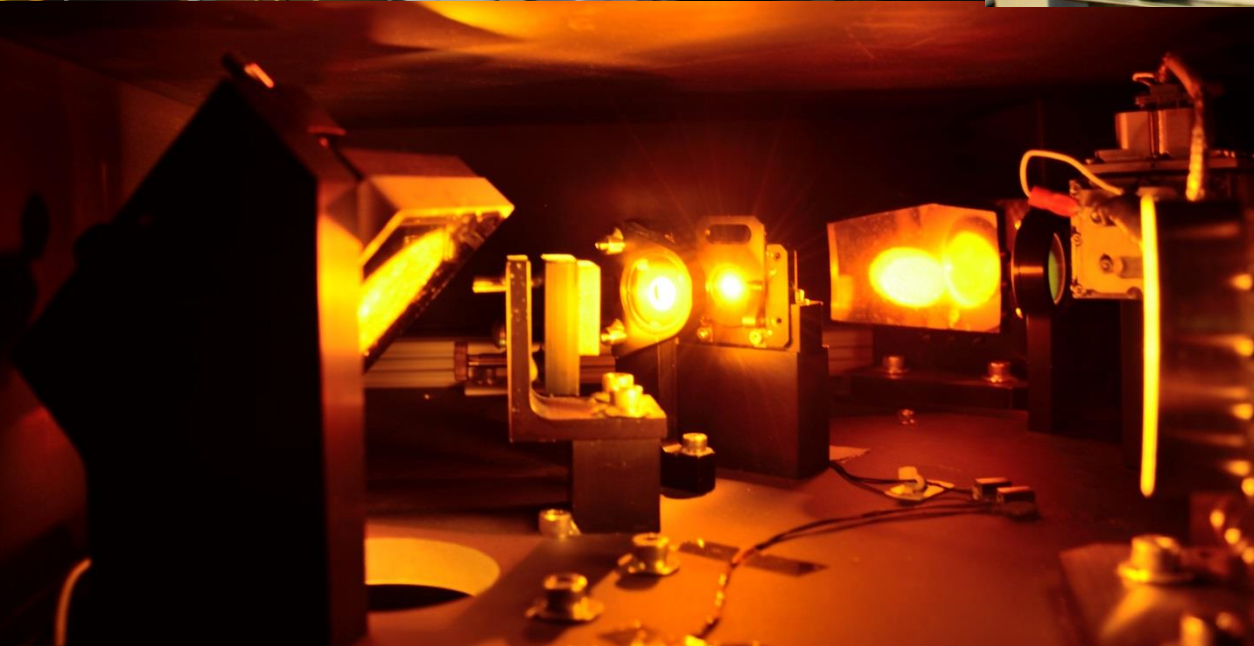
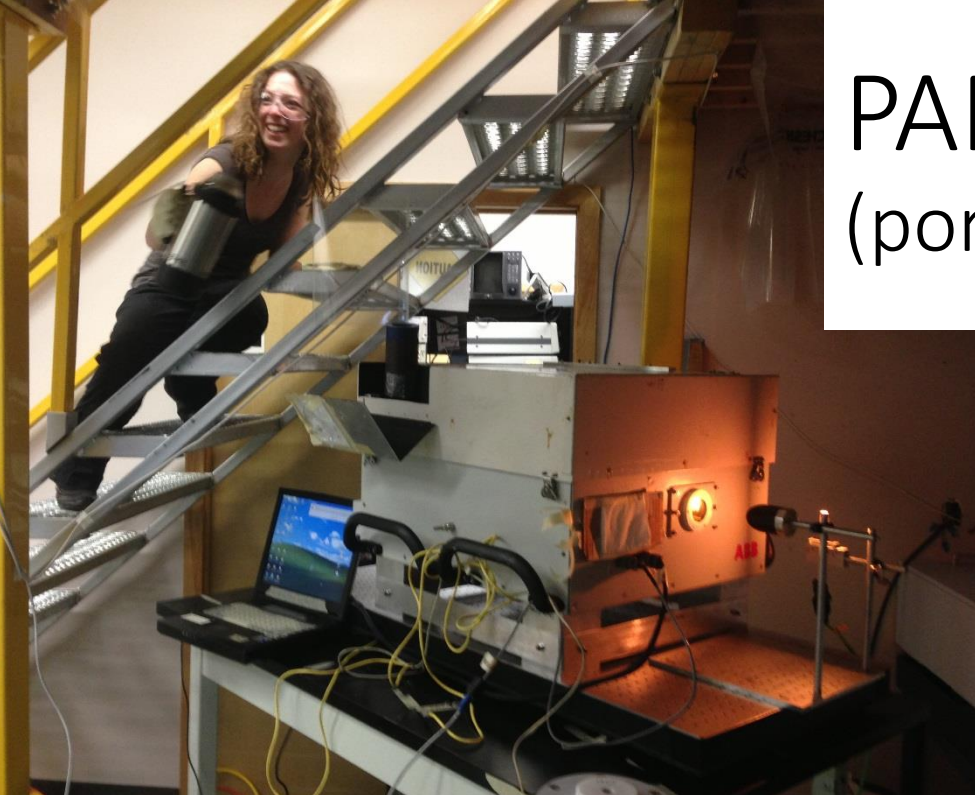


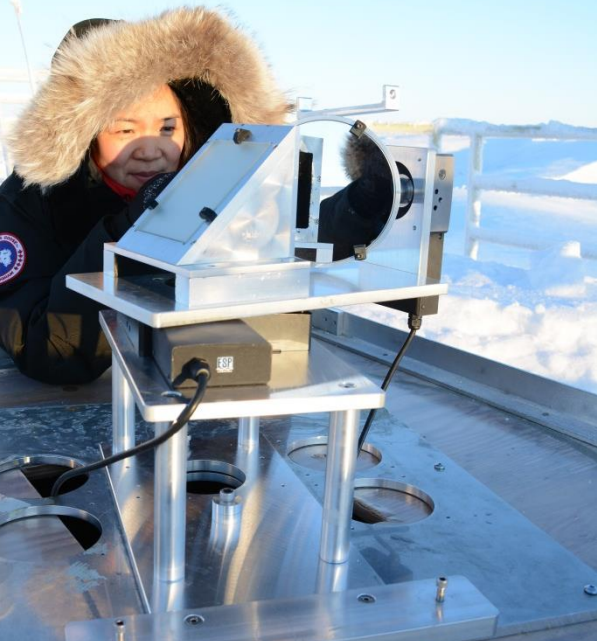
IR lab



PARIS

(portable spectrometer)





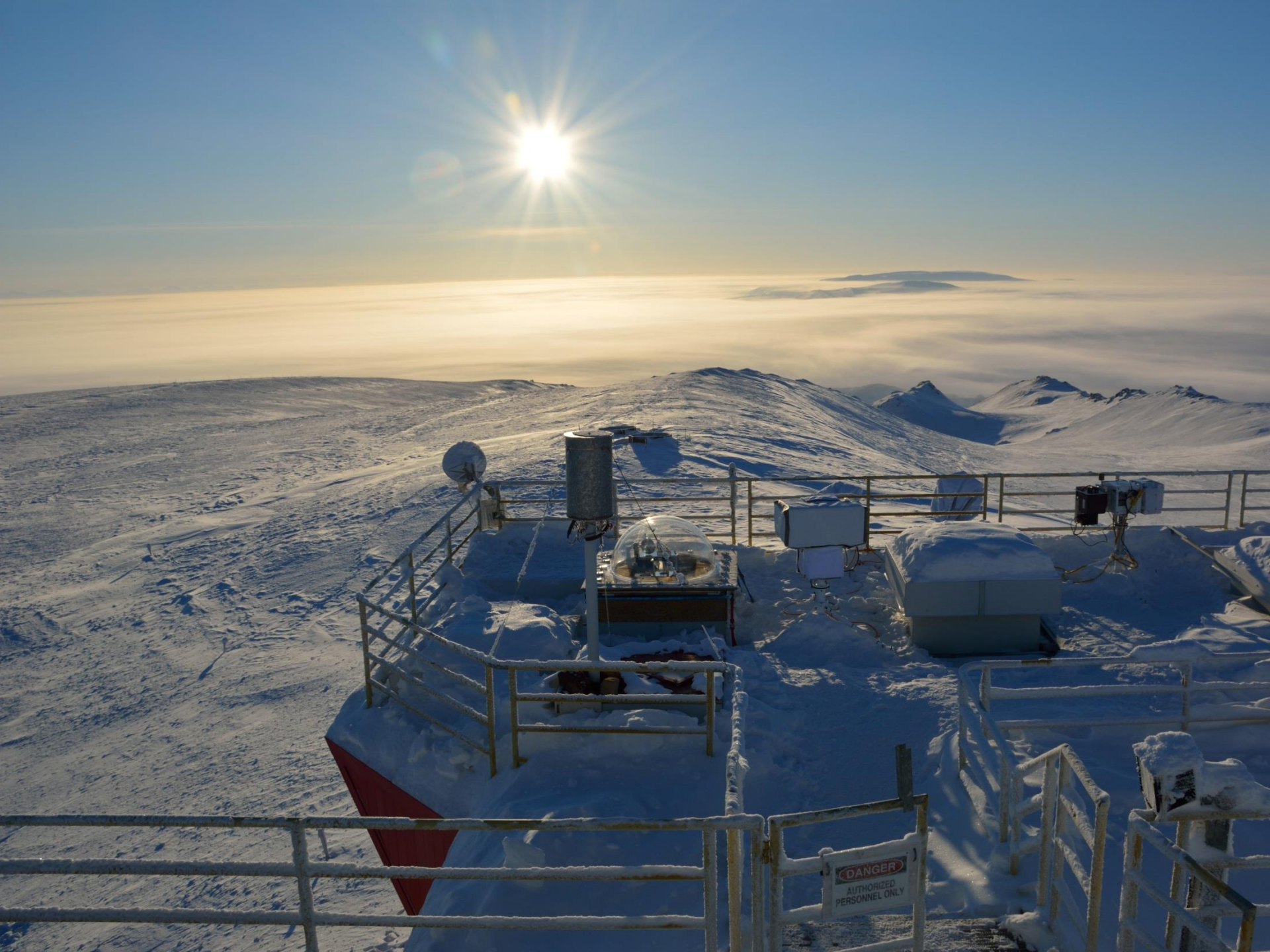
UV-Vis Lab



Up to the PEARL Ridge Lab roof







DANGER
AUTHORIZED
PERSONNEL ONLY



SPS and MAESTRO







Challenges of cold temperatures!



View from the roof









Eureka wildlife



Fox





Muskox



Wolf







© Dan Weaver

Arctic Hare







Scenery near PEARL



















Thank you.



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