



## **Astronomical Observatory Sites in the Canadian High Arctic**

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**Kislovodsk, Russia**

**8 October 2010**

**Photo: Paul Loewen**



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**Paul Hickson, Thomas Pfrommer (UBC)**

**Liviu Ivanescu, Rene Racine (U de Montreal)**

**Dell Bayne, Bruce Cole (EC)**

**Brad Wallace (DRDC)**

**David Walker (CTIO)**



Photo credit: Thomas Pfrommer



Google Earth

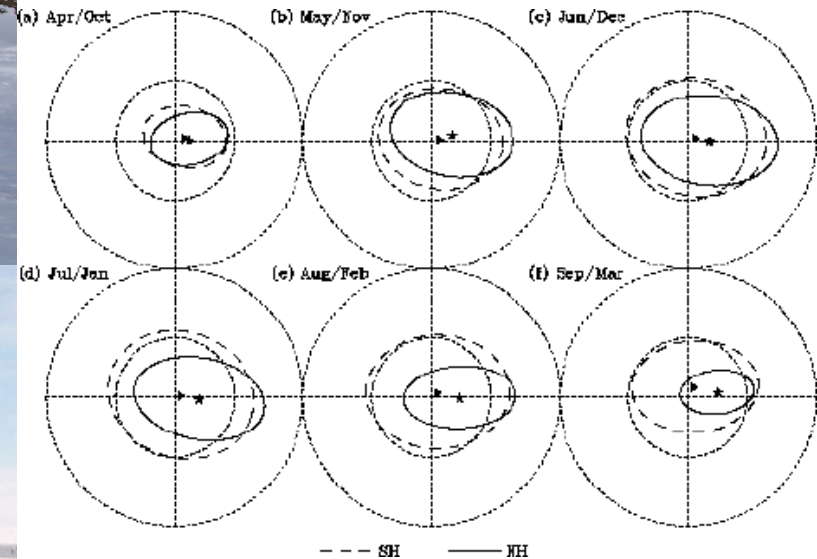




PEARL Observatory  
 Eureka, Ellesmere Island  
 80 deg North  
 600 m elevation



AASTINO Observatory  
 Concordia Station, Antarctica  
 76 deg South  
 3200 m elevation



--- SH    — NH  
 Waugh and Randel, 1999, JAS, 56, 11, 1594







**Alert**

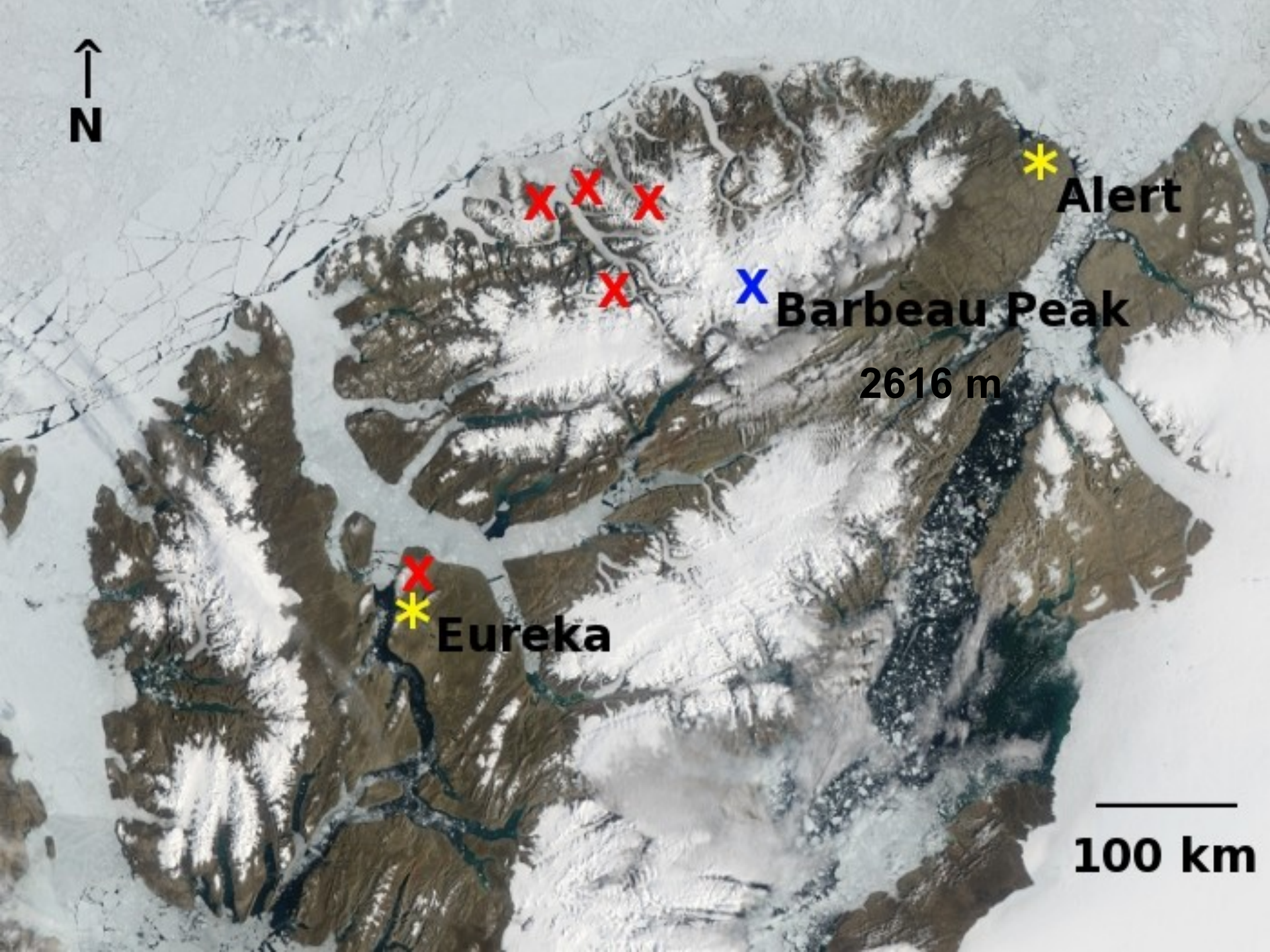
**Barbeau Peak**

**2616 m**



**Eureka**

**100 km**



British Empire Range  
Yelverton Bay, Ellesmere Island  
82 deg North  
2616 m highest elevation

Site 11A  
1098 m



1720 m

Camp



1402 m



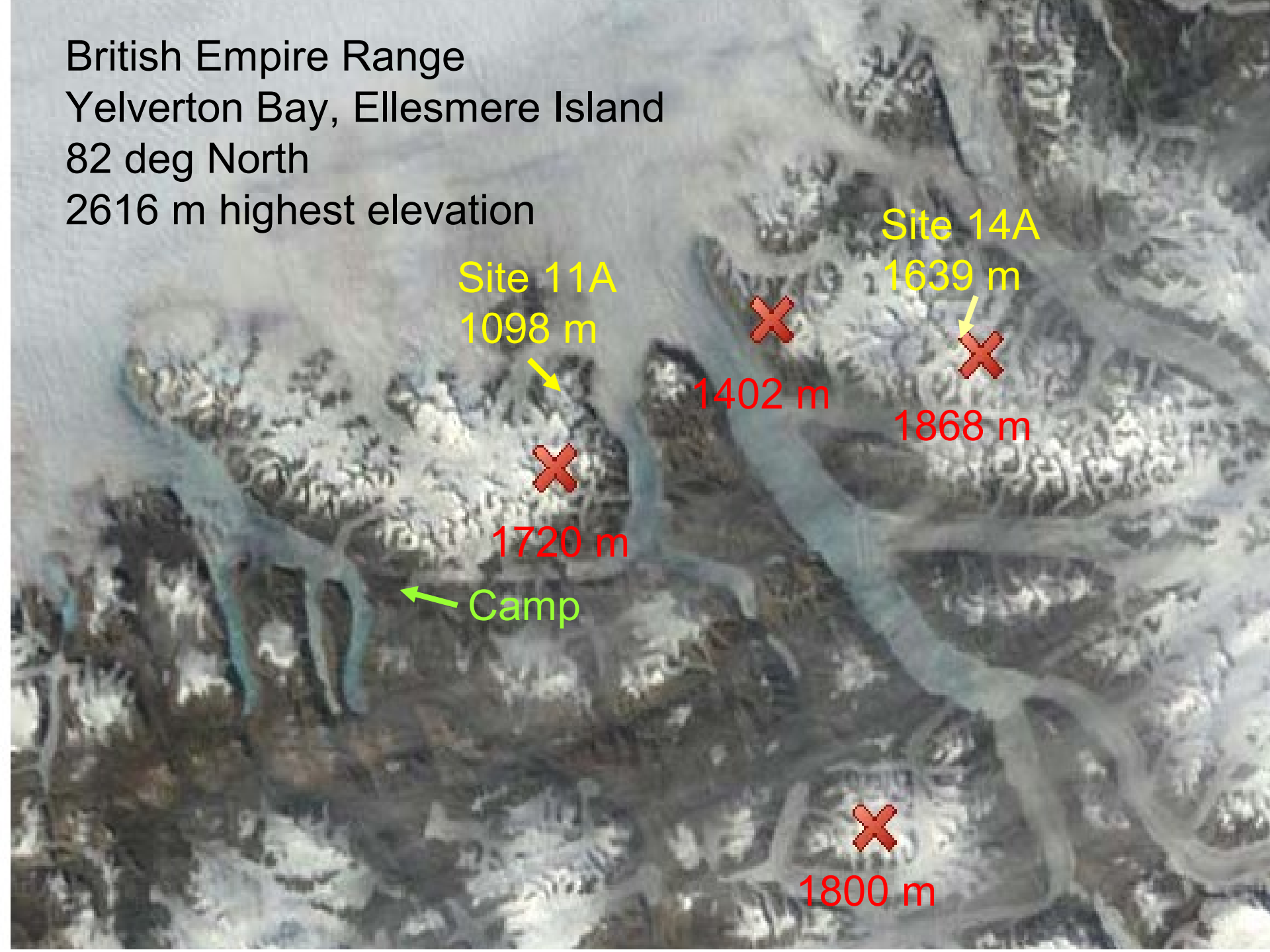
Site 14A  
1639 m



1868 m

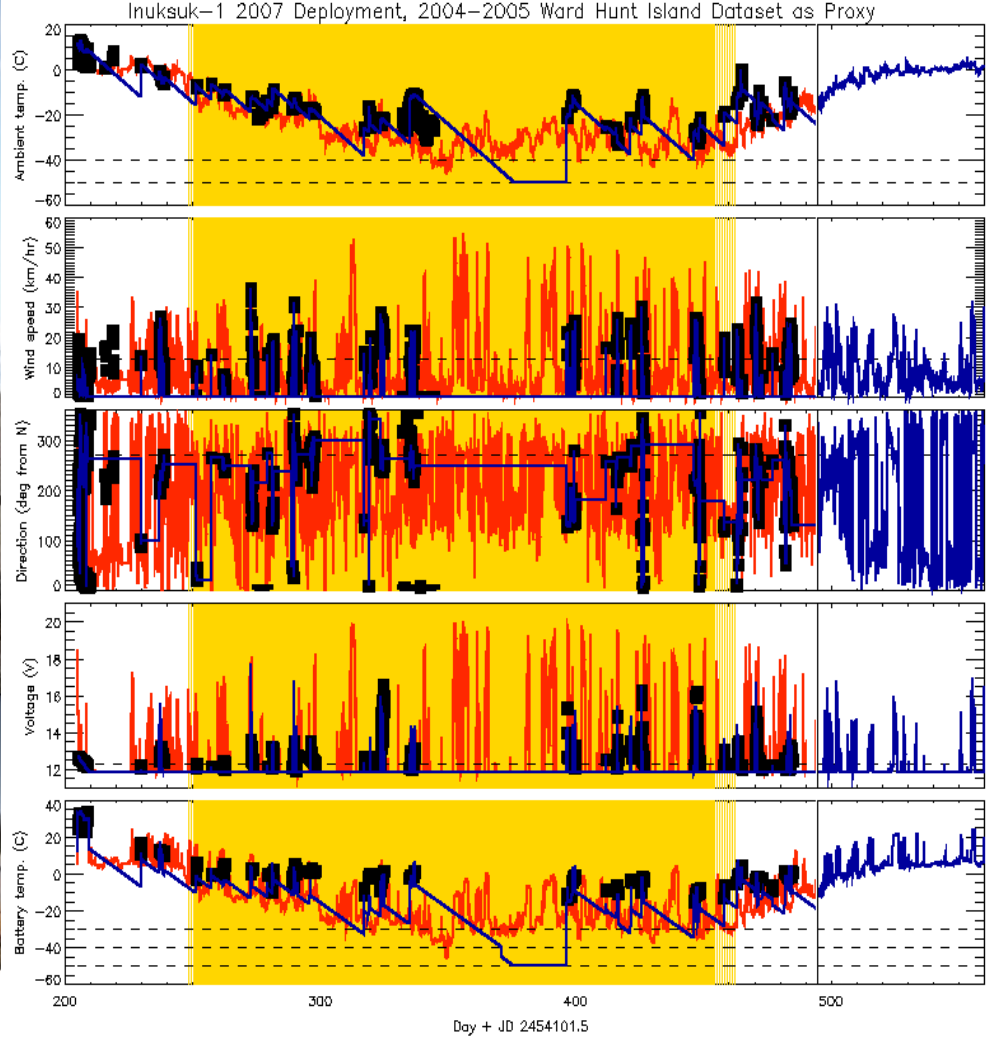


1800 m





# Inuksuk-2



## Automated Meteorological Station and Horizon-Viewing Camera: Inuksuk



Completely cloudy



Mostly cloudy



Mostly clear



Completely clear



An aerial photograph of Ellesmere Island, Greenland, showing its rugged terrain and ice-covered regions. The text is overlaid on the map.

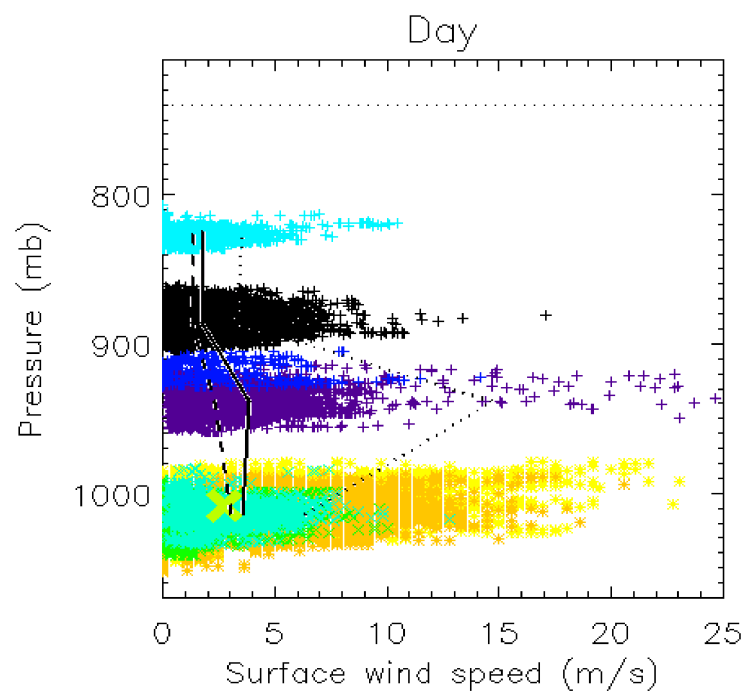
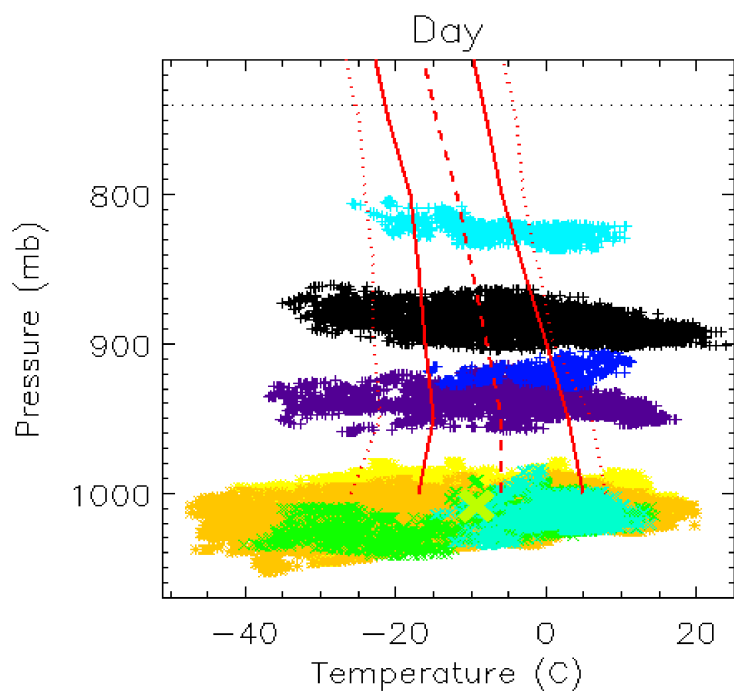
Ellesmere Island

Site Testing

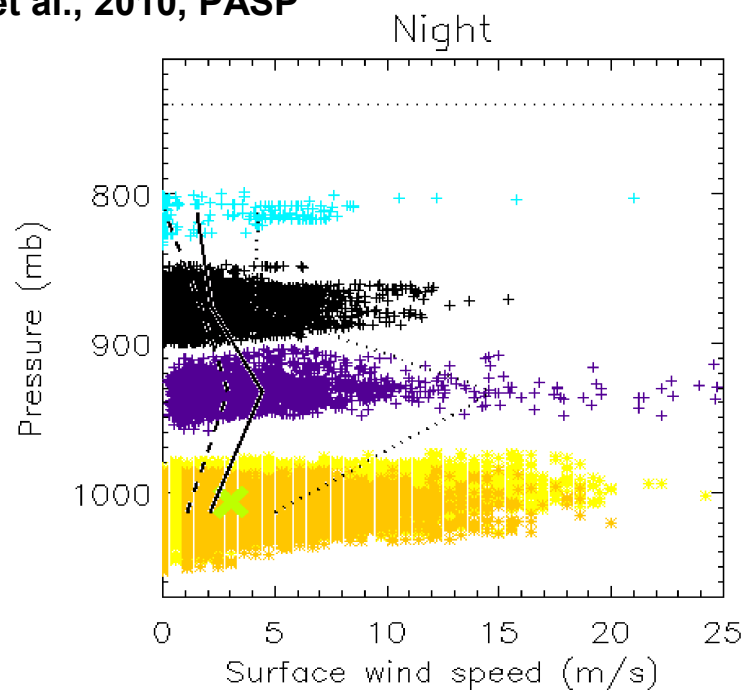
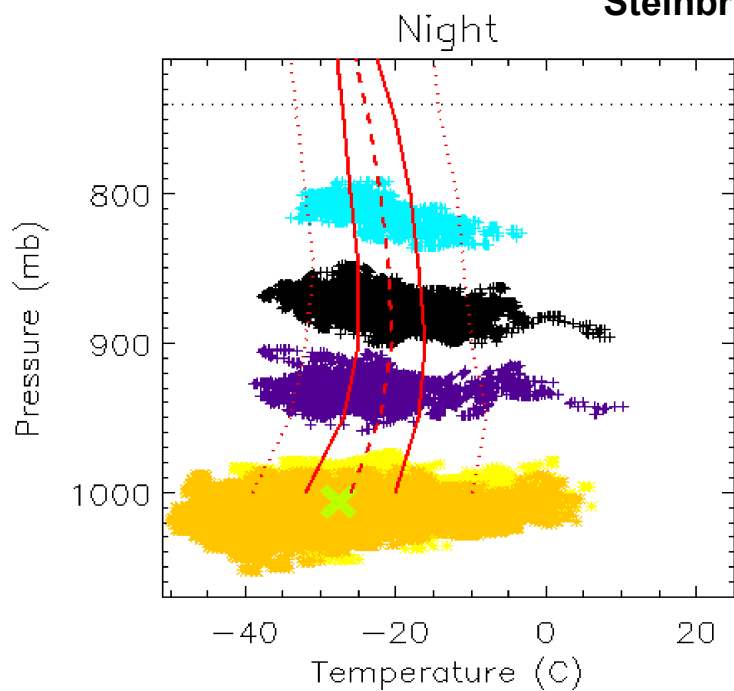
2007

Eric Steinbring

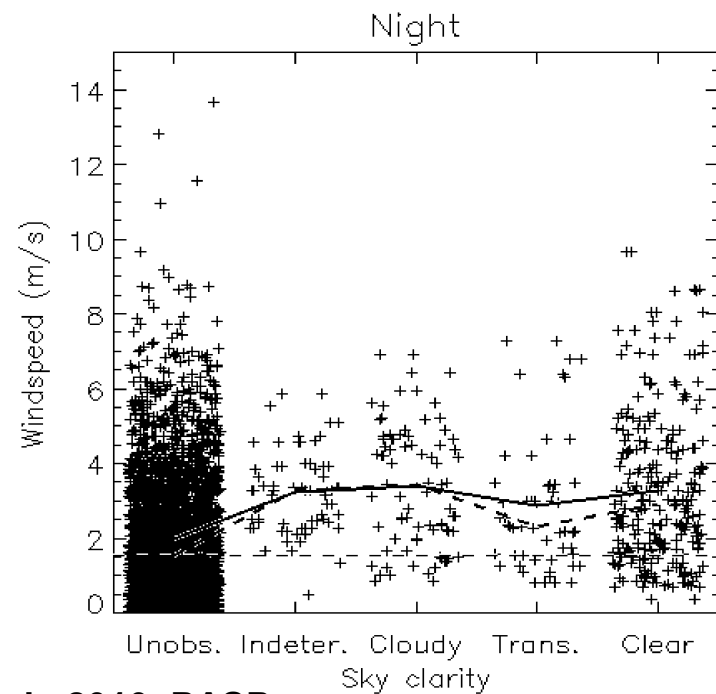
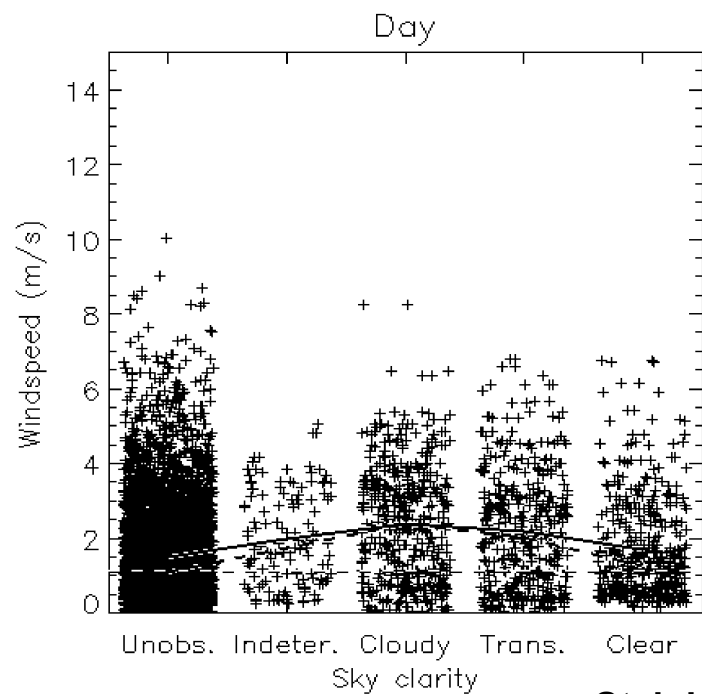
NRC/HIA



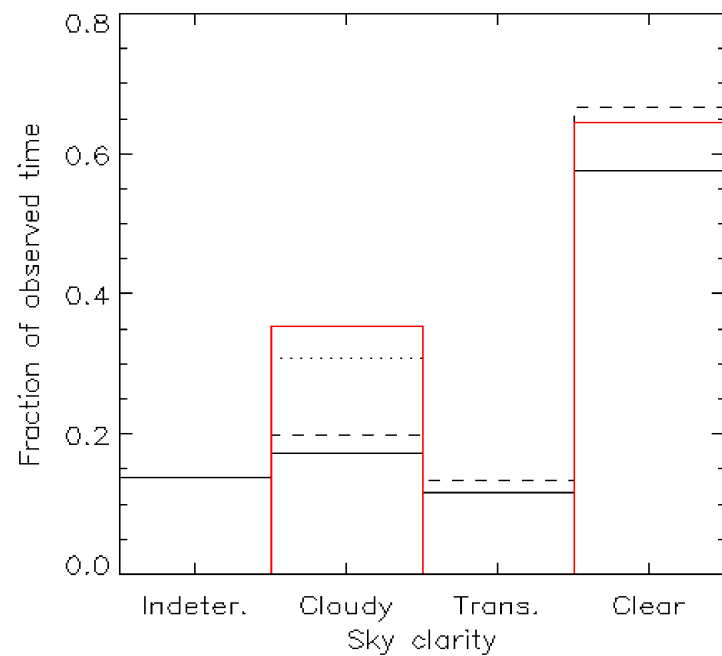
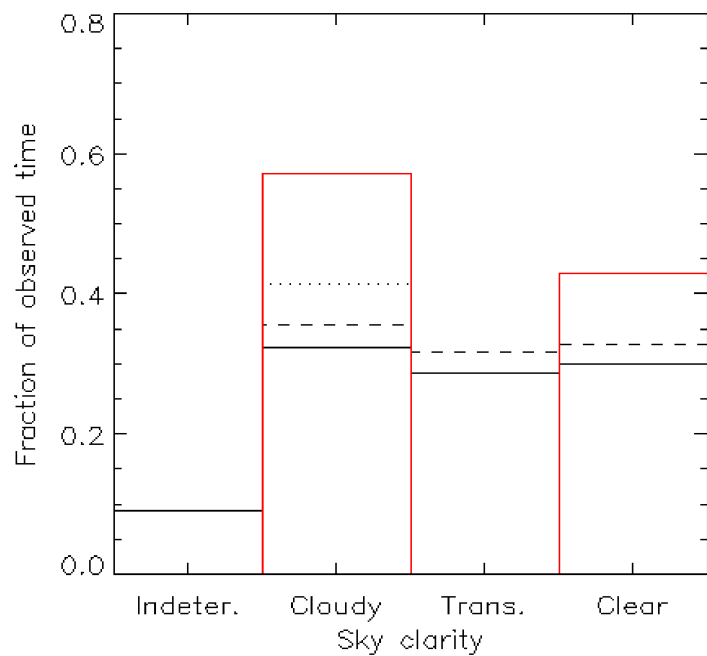
**Steinbring et al., 2010, PASP**



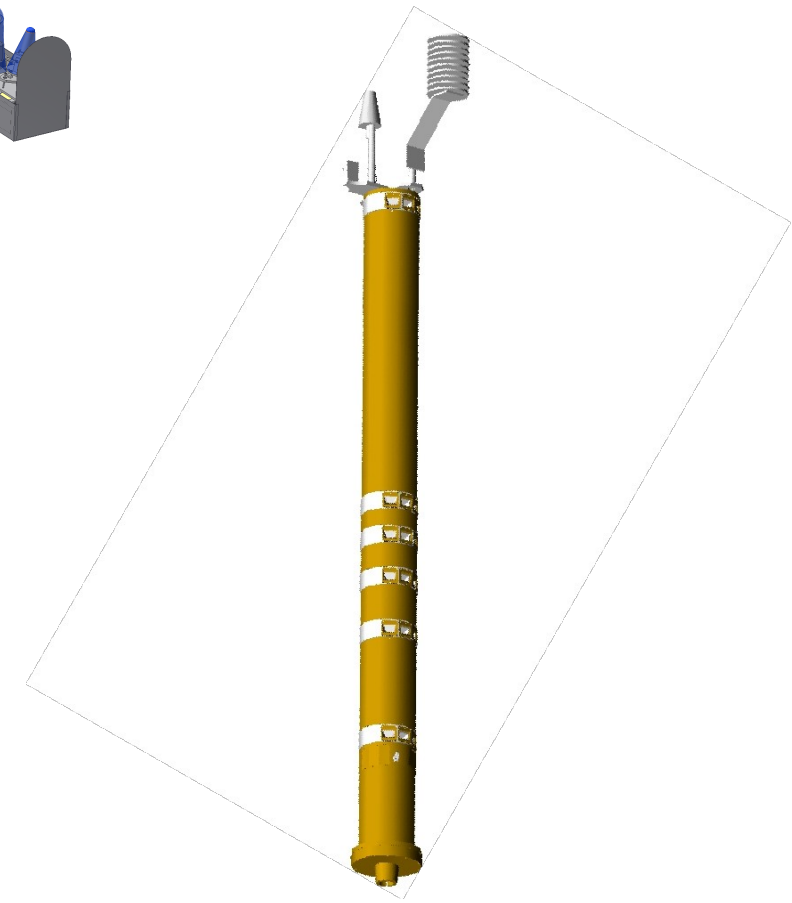
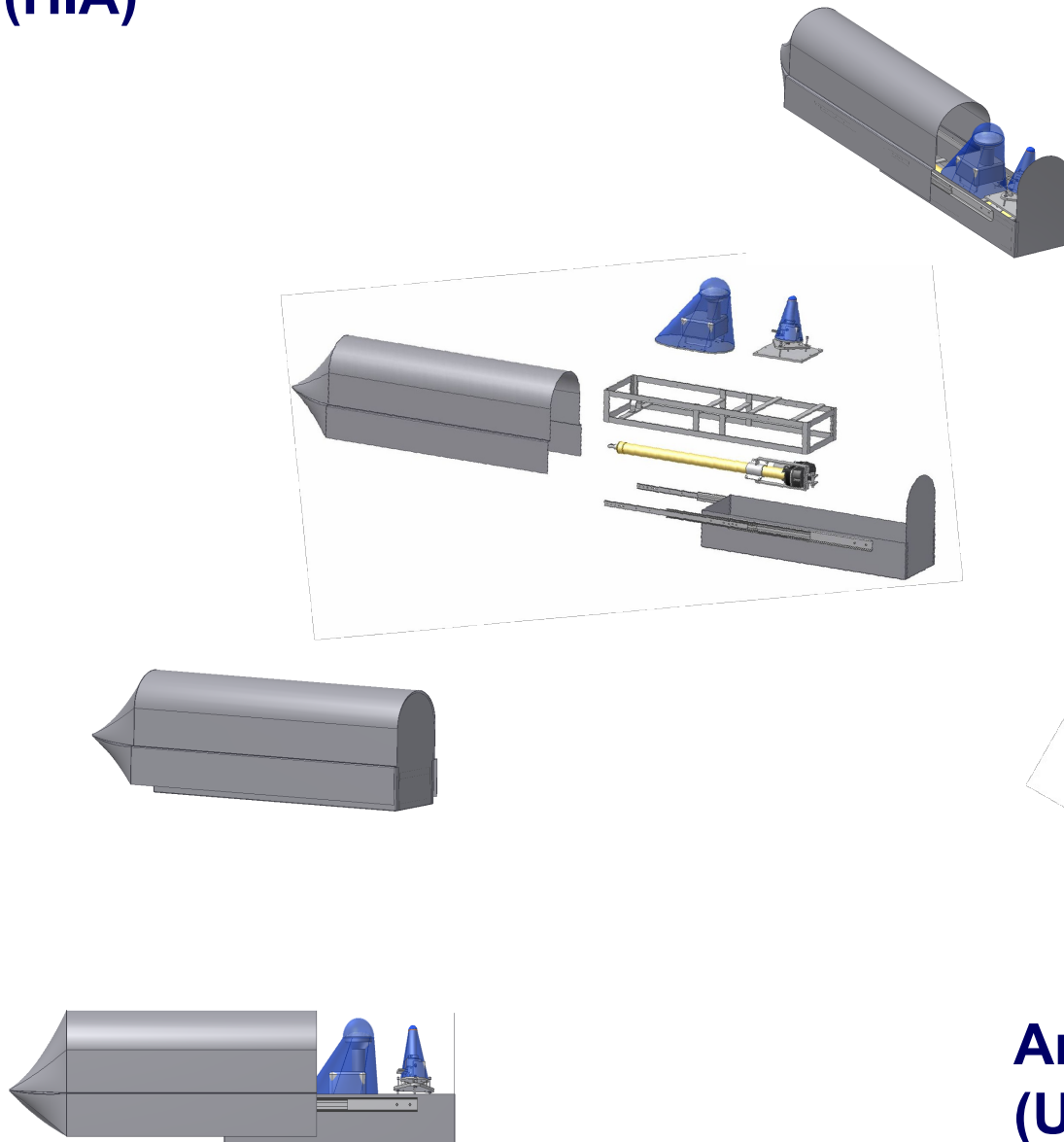




**Steinbring et al., 2010, PASP**



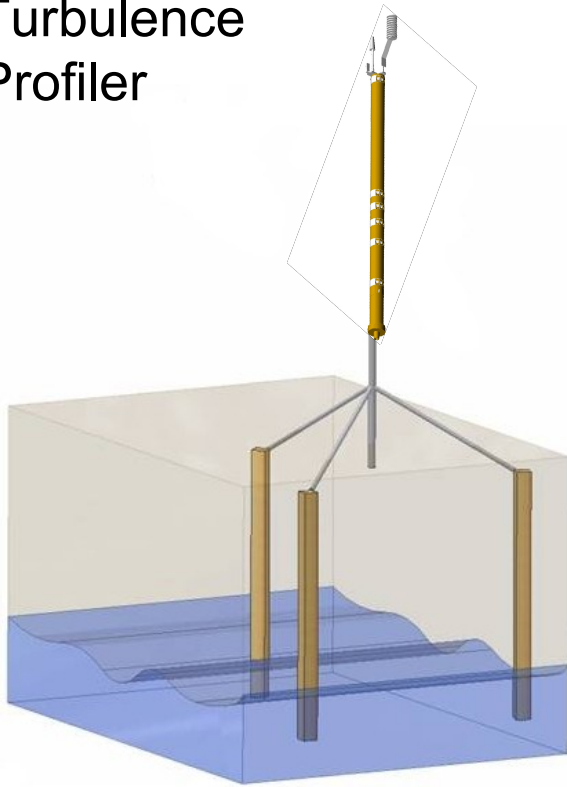
# All-Sky Camera and Polaris Tracker: Ukpik (HIA)



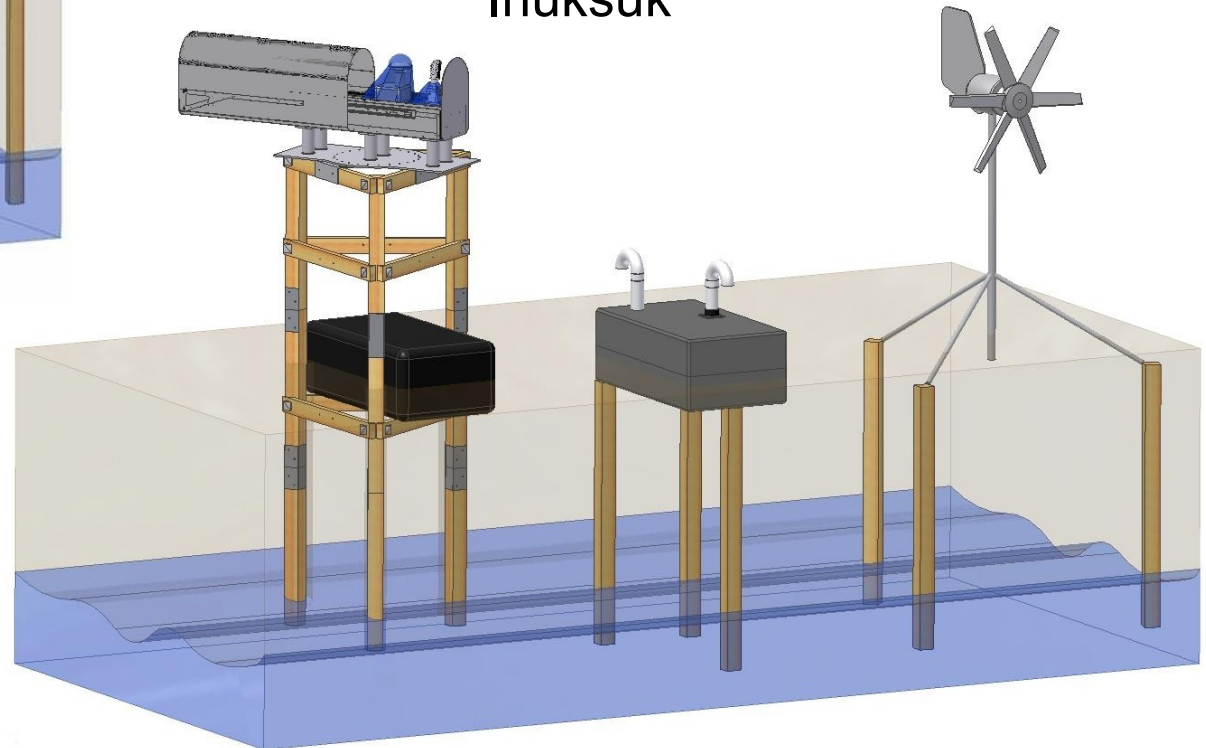
**Arctic Turbulence Profiler (UBC)**



# Arctic Turbulence Profiler



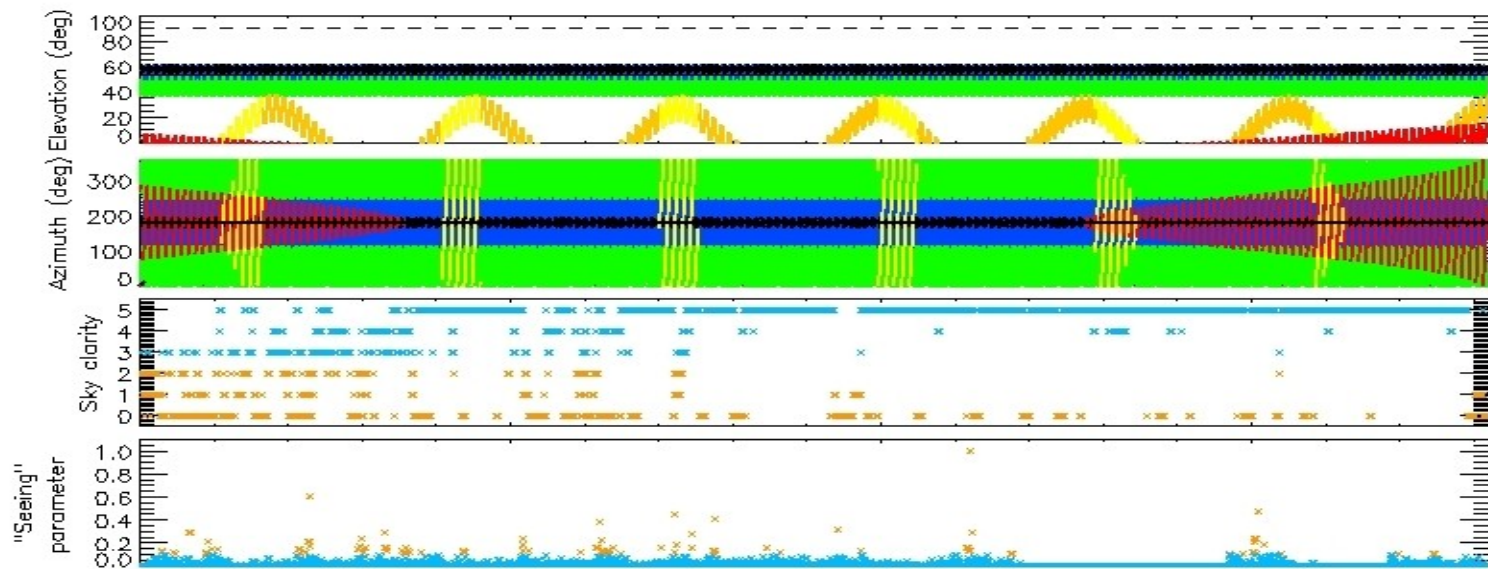
## Ukpik and Inuksuk



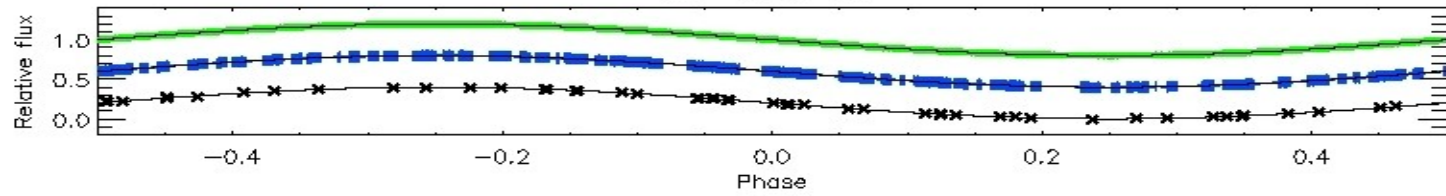
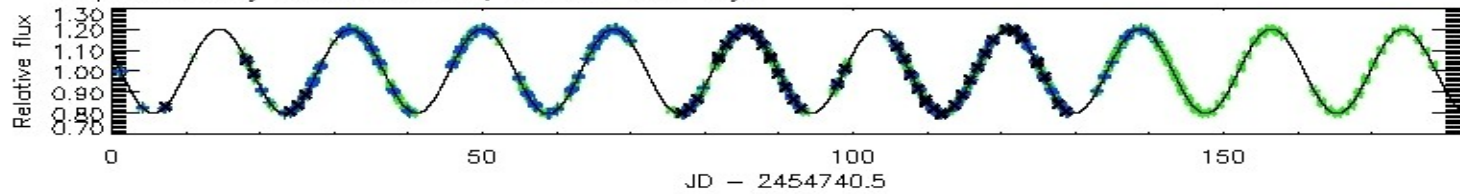




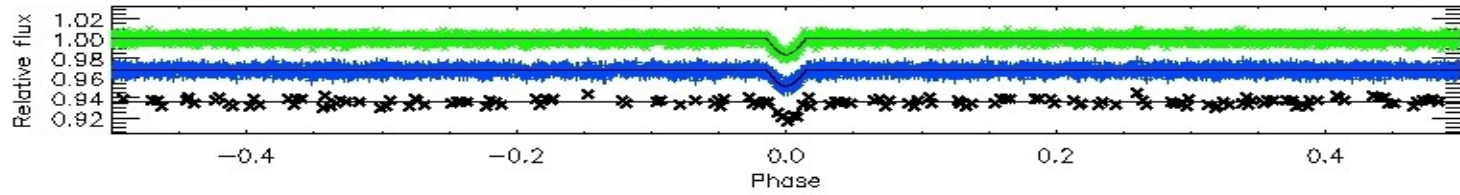
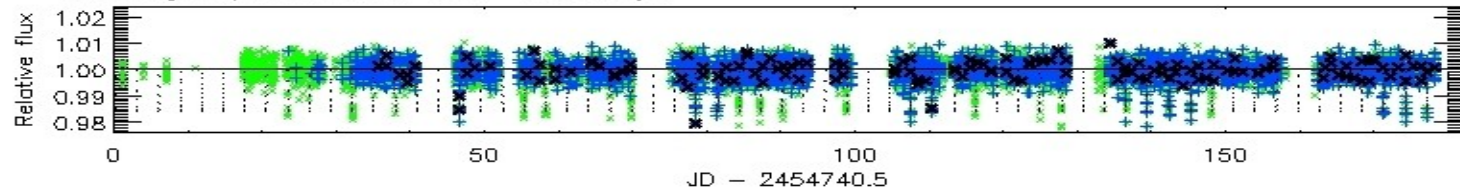




Ellipsoidal binary star GCVS450350, Period = 17.74 days

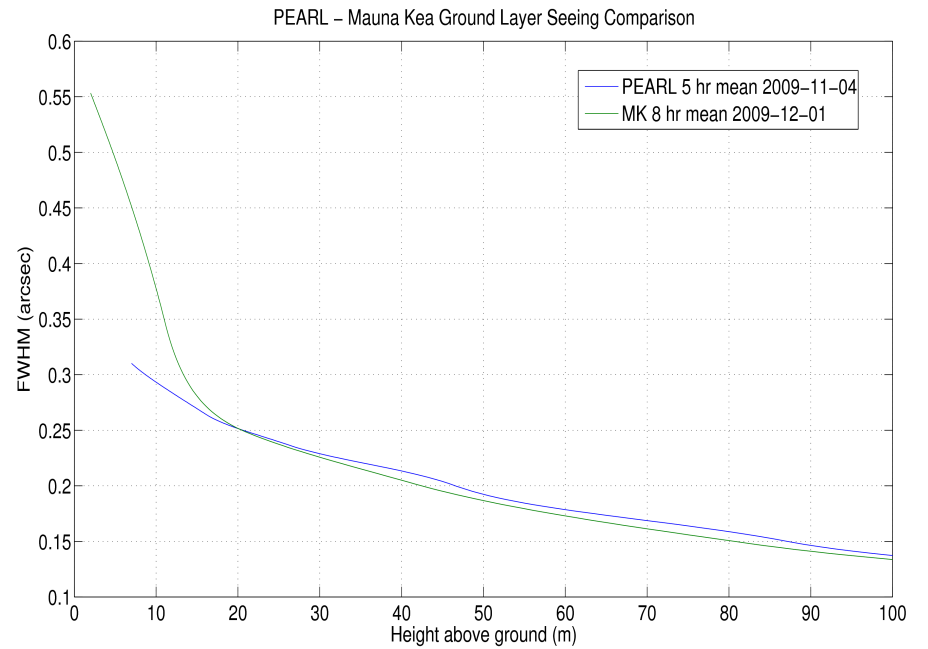


Transiting exoplanet HATP3, Period = 2.899 days

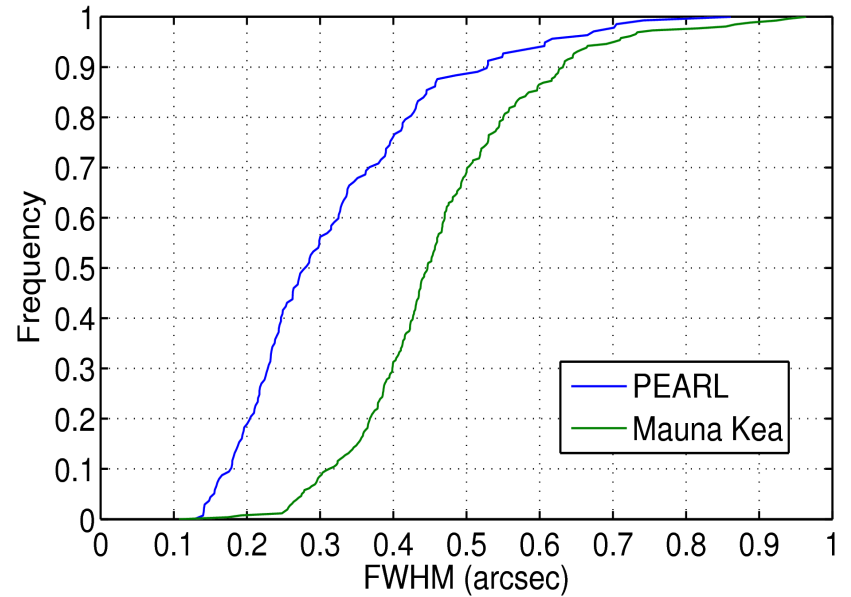




Hickson et al., 2010, SPIE



Ground layer at 6m



### Median ground layer seeing

Height	PEARL	Mauna Kea	Dome C
6 m	0.25"	0.45"	1.4"
20 m	0.21"	0.25"	0.94"
40 m	0.18"	0.21"	0.21"

### Estimated median total seeing

Height	PEARL	Mauna Kea	Dome C
6 m	0.38"	0.58"	1.4"
20 m	0.35"	0.43"	1.0"
40 m	0.33"	0.40"	0.35"
Free atm.	0.25"	0.31"	0.25"



Aerosondes with microthermal probes  
launched from Eureka  
(2011)

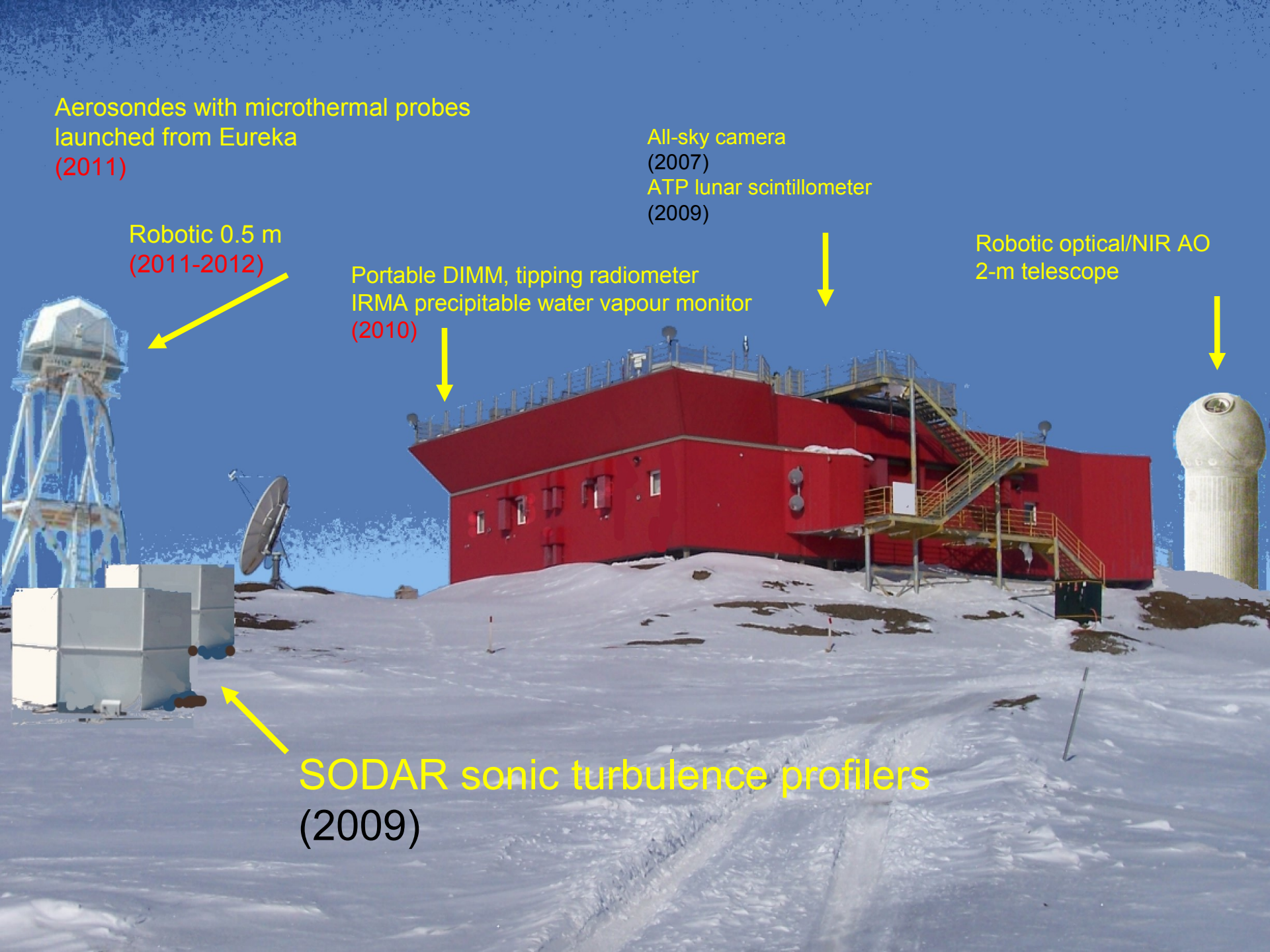
Robotic 0.5 m  
(2011-2012)

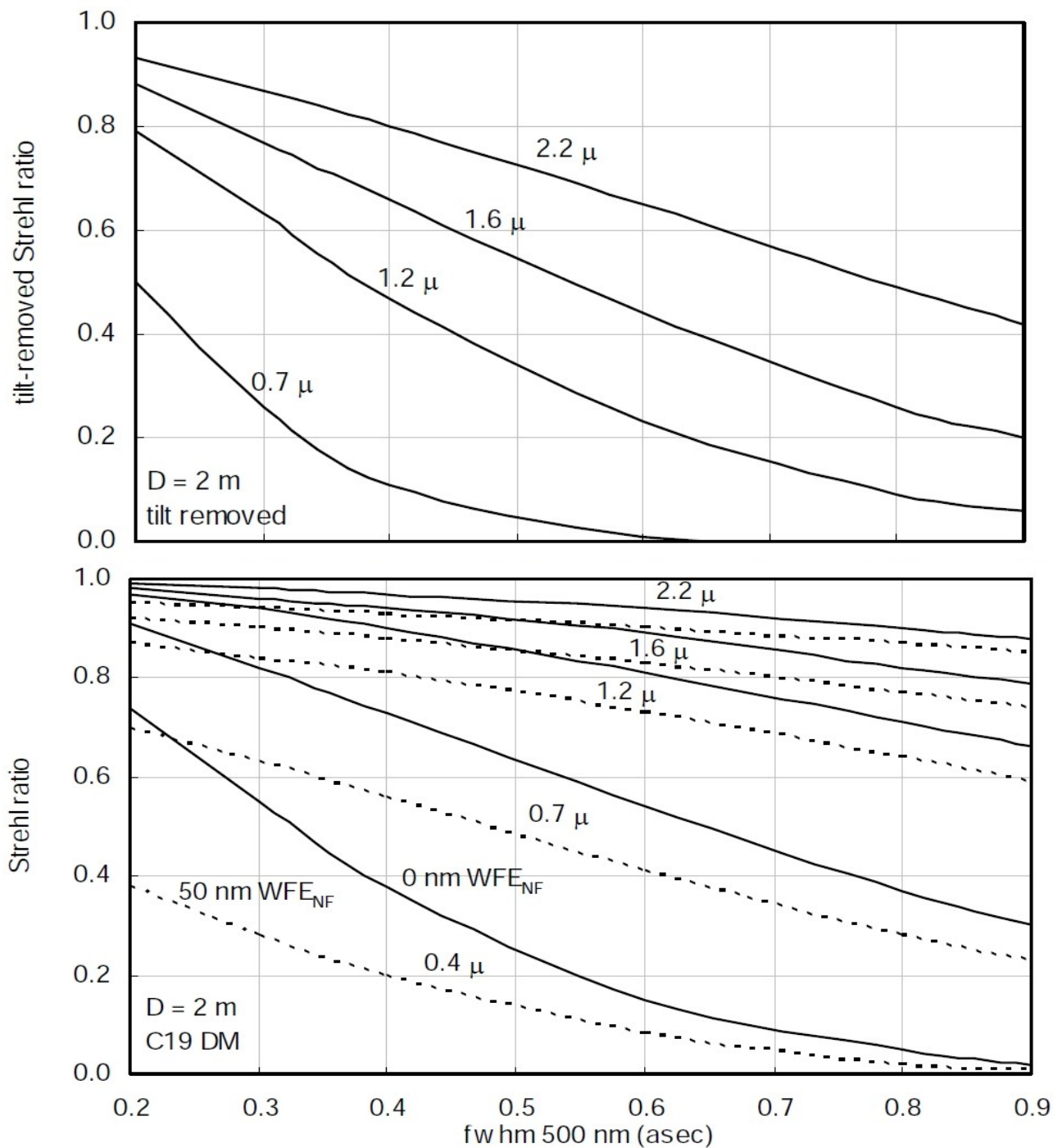
Portable DIMM, tipping radiometer  
IRMA precipitable water vapour monitor  
(2010)

All-sky camera  
(2007)  
ATP lunar scintillometer  
(2009)

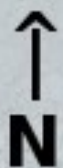
Robotic optical/NIR AO  
2-m telescope

SODAR sonic turbulence profilers  
(2009)







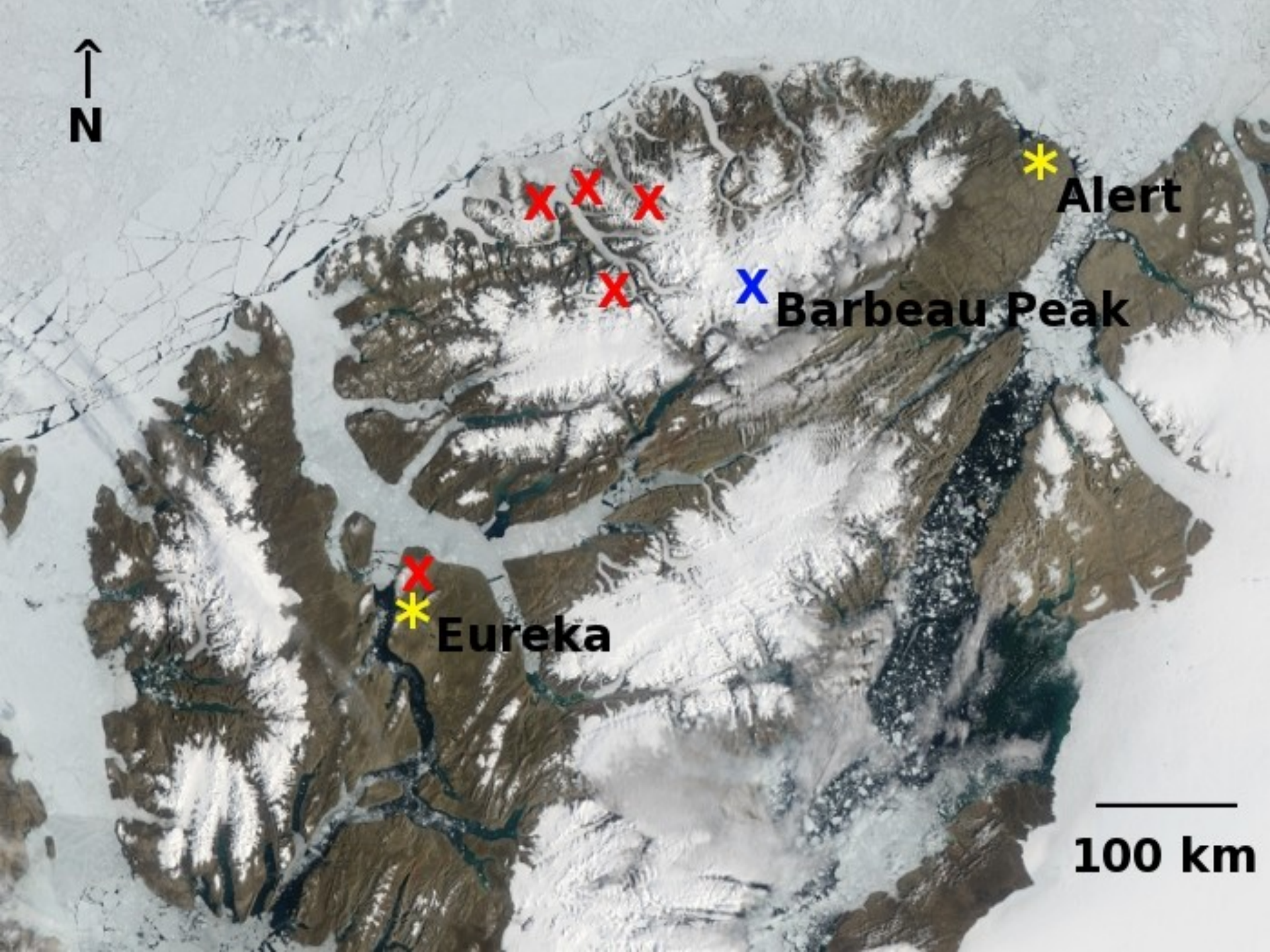


**Alert**

**Barbeau Peak**

**Eureka**

**100 km**







**With particular thanks to the HIA and UBC shops, IT groups, and procurement/shipping services; support by the Canadian Network for Climate Change, National Research Council, Environment Canada, Polar Continental Shelf Program, and the Natural Sciences and Engineering Research Council of Canada**