POLAR Technology
Lake Morey, VT

MWOBS
MOUNT WASHINGTON
OBSERVATORY

Ken Rancourt
Director of
Summit Operations

Mount Washington Observatory- who we are

- Private, Non-profit, Member supported Research and Educational organization
- Founded in 1932 - continuously inhabit the summit (except for one night!)
- Weather Discovery Center – North Conway
- Many Collaborations and Partnerships (University, Private Co., Govt, etc.)
- And: we are NOT part of National Wx. Svc.

Today:

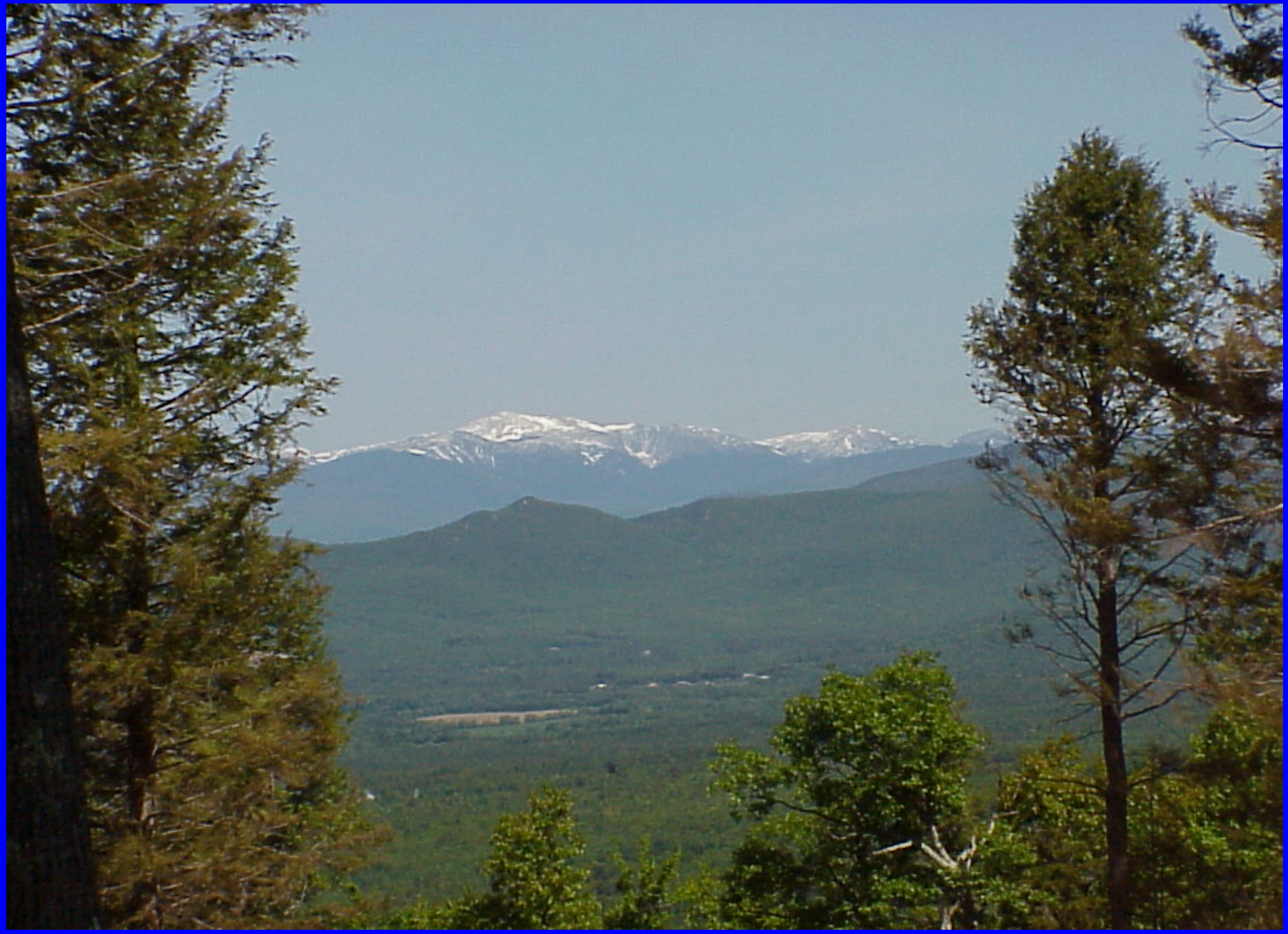
- Where we are
- How we get there
- What we do for work (and a little history)
- The research support/infrastructure we can provide for experiments; instrument evaluations/comparisons; product testing

Climate Information

- Temp: average 29F; Max 72F; Min -47F
- Precip: 250 in. snow; every month – April 2006 – 110 inches in 28 days
- Wind: average 37 MPH
  - Some calm hours - rare
  - Winter- once every 3 days G > 100mph
- Fog: 60% of the time (annual basis)
- Essentially Northern Labrador with wind

Meteorological Factors

- Wind speed –
  - Variable day to day, no diurnal
- Blowing snow (winds > 50 mph)
- Frequent potential for icing –
  - Temp < 32F, Fog = Rime Icing
  - How severe? (L M H) depends on type –
    - In-cloud (riming)
    - Freezing precip (glazing)
- Combination of factors is “significant”

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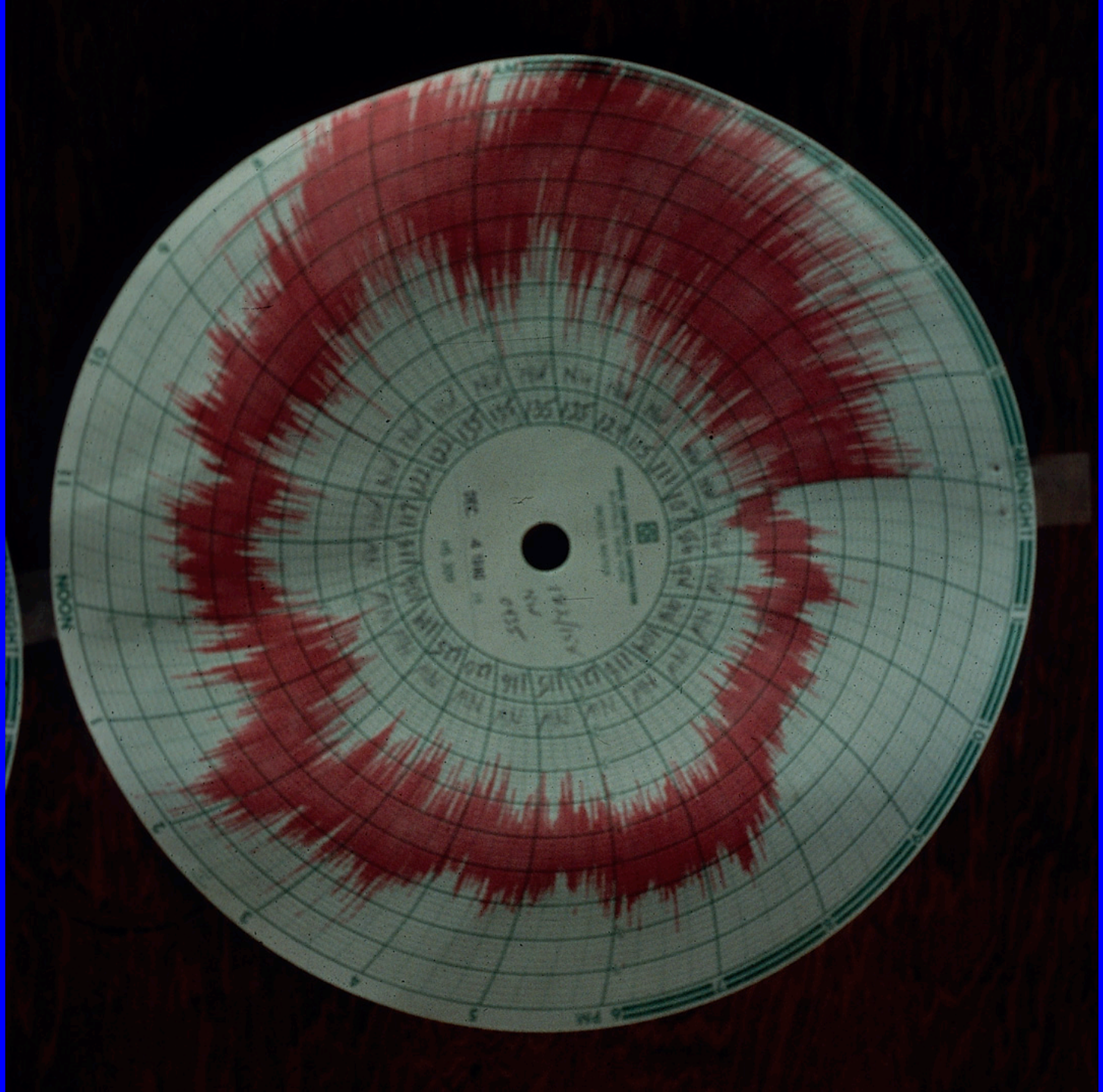
Wx.	Shift Change	Edu-Trip	Day-Trip	Parapet	Deck
Wind (MPH)	Vm=90 Vg=110	Vm=75 Vg=85	Vm=75 Vg=75	200staff 125other	110staff 95other
Temp	-20F	-20F	-20F	-40F	-40F
Vis.	25 feet	50 feet	50 feet	n/a goggles	n/a goggles
Notes	Rescue= -35F w/ discretion			Guests with staff	Guests with staff
Operator	Level A	Level B	Level B	n/a	n/a

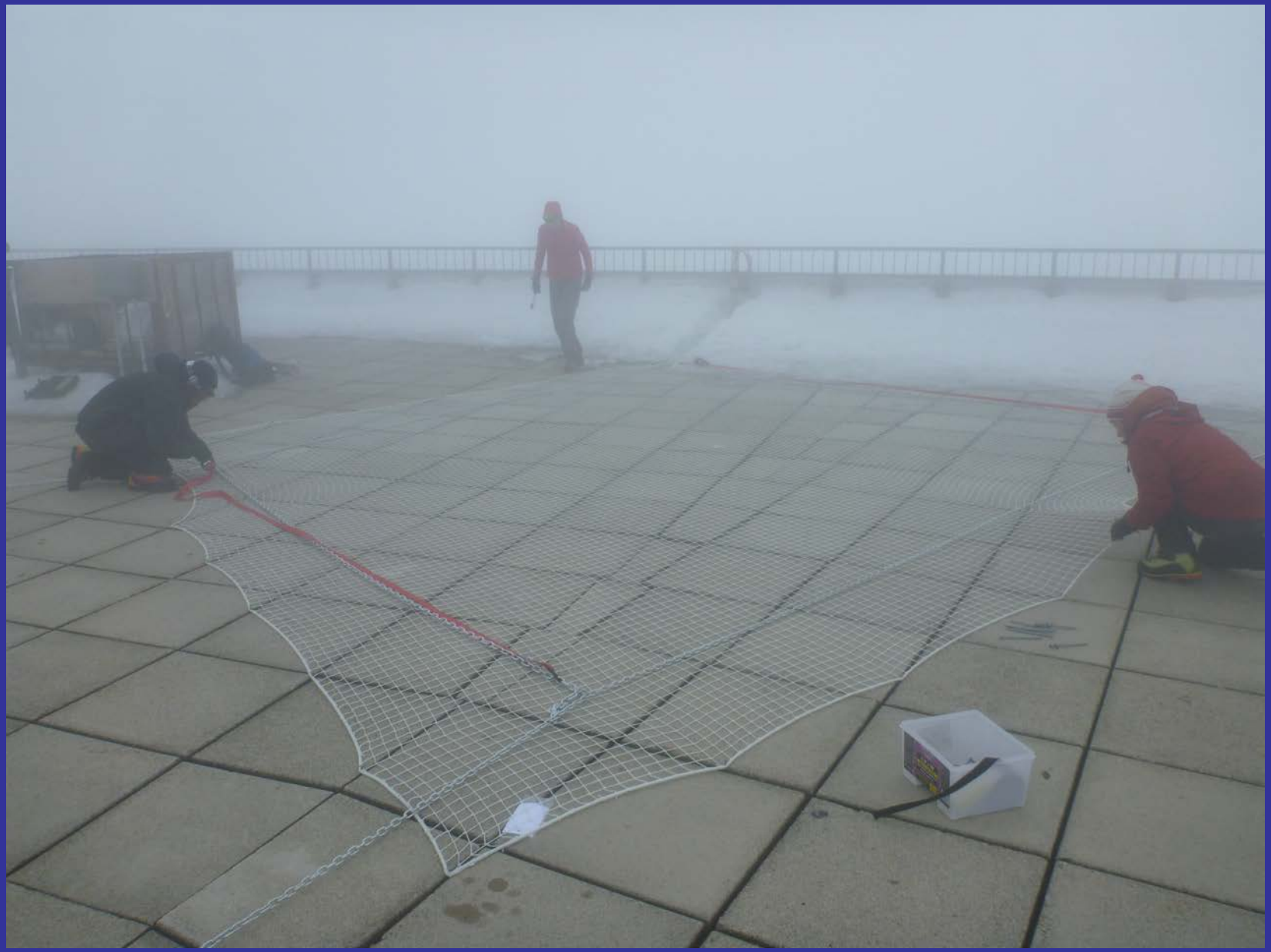

NOON
MIDNIGHT

What does this mean to the organization??

- Still have the highest wind in the northern and western hemispheres
- Still have the highest wind speed recorded by man
- Still the home of the World's Worst Weather!

Research and Support

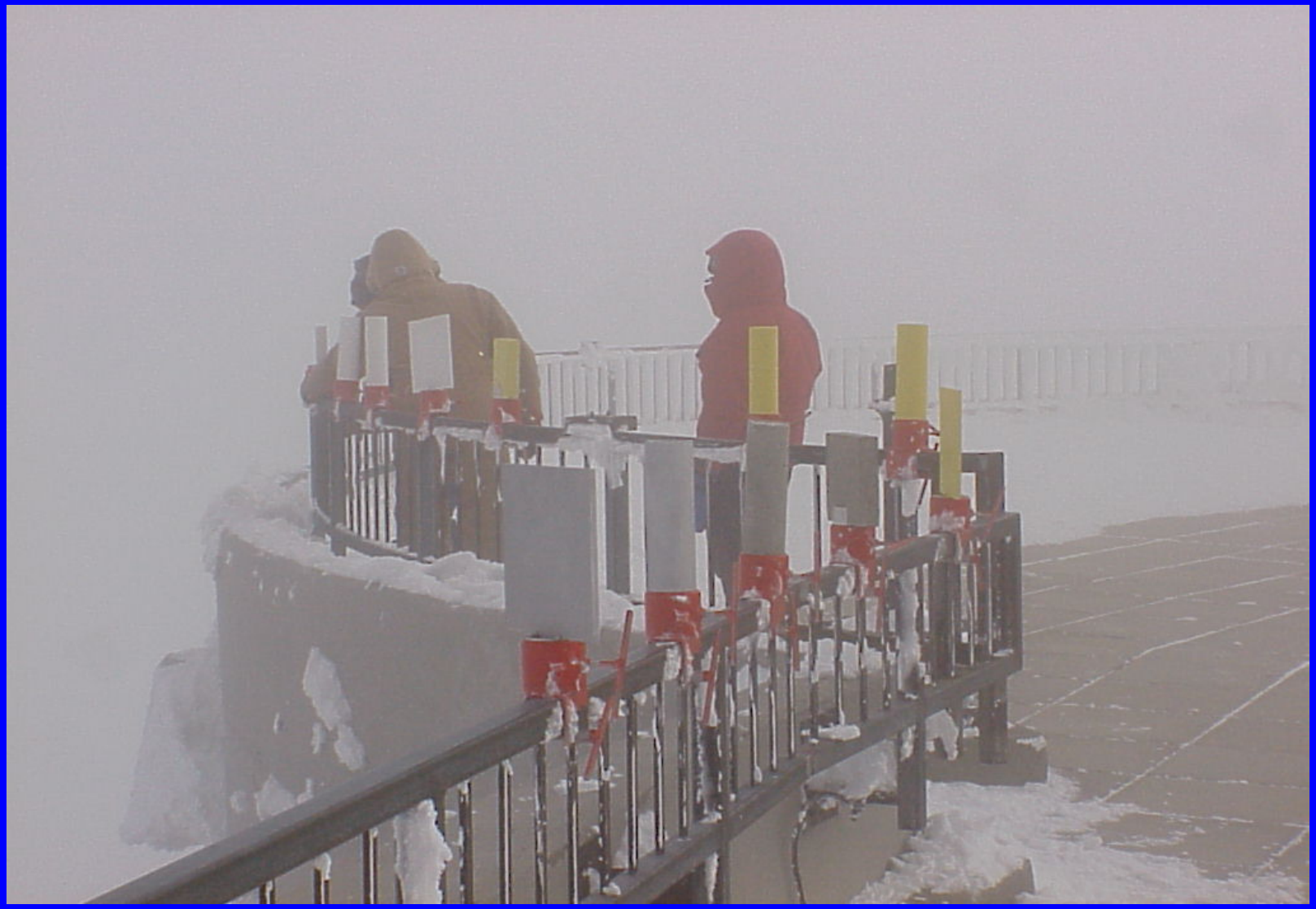
- 24/7/365 presence
- Meteorologists and IT on site full time
- Climate records span over 80 years
- Digital database of current weather
- Overnight facilities
- Off-mountain support
- Test here first! (if you can’t make it work here, then what.….?)



LOTUSAN

- Supporting Agency: US NAVY
- Main Activity:
  Ice adhesion studies on the summit
- Relevance: Do you fly in an airplane? Do you watch Television? Do you talk on the telephone?

Lotusan



Meteorological Sensors

- Wind speed in icing conditions – what instrument is adequate?
- Onset and duration of icing events – timing
- Measuring drop size and distribution –
  - The effects on icing rate on:
    - Blades
    - Power line loading (with wind)
- (In U.S.) ASOS Freezing Rain Sensor = ASOS Icing Sensor (with proper algorithm)

Meteorological Sensors - Wind

- Early sensor
- No heating
- Obvious results

Meteorological Sensors - Wind

- Ice free wind
- Sonic – no moving parts
- Some heat
- Acknowledged difficulties

Meteorological Sensors - Wind

- Comparison tests
- Under heavy icing all failed

Meteorological Sensors – LEDWI

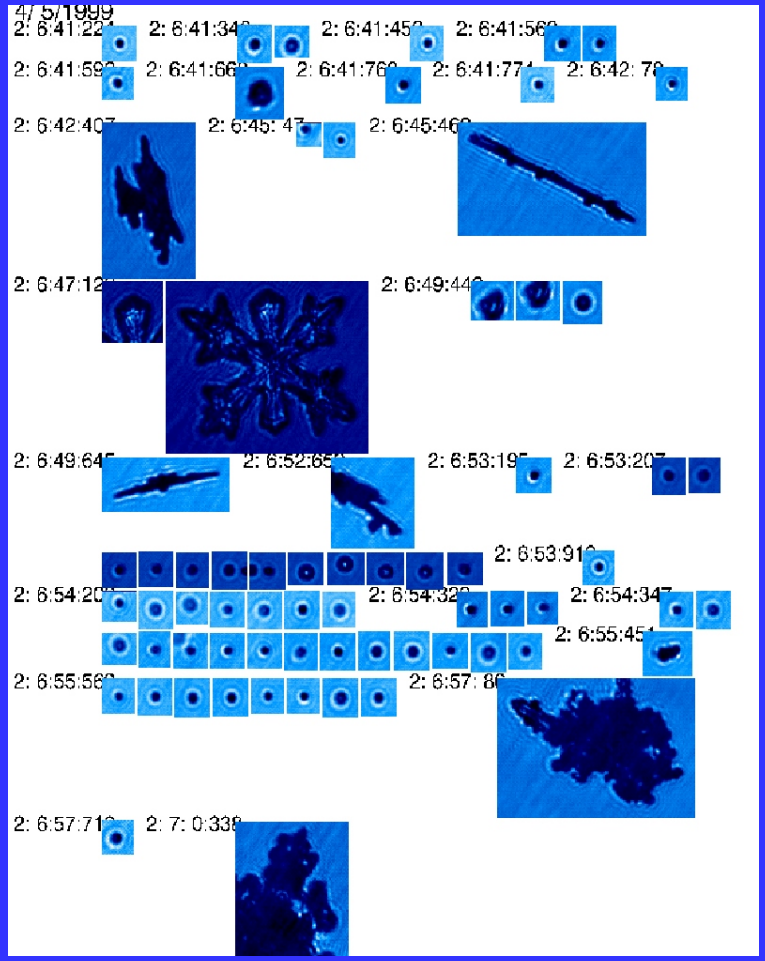
SNOW

Drop Size / Distribution

- Various laser devices
- All complex to operate
- High operating costs - calibrations

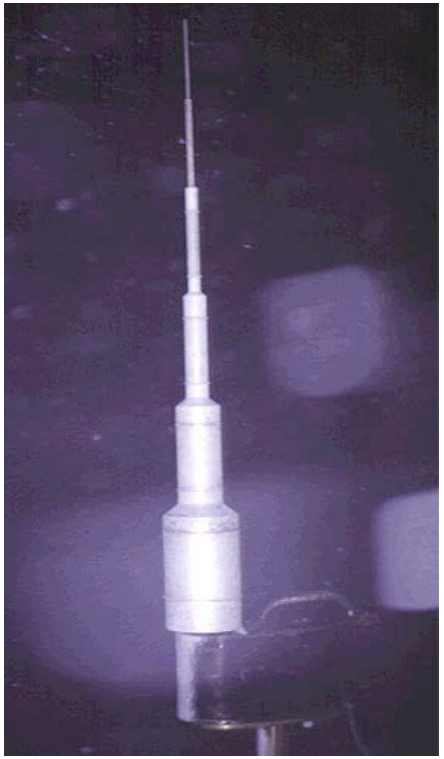
Drop Size – Mixed Phase

- Note rapid transition from snow crystals to individual (unfrozen) droplets – and back again



Manual technique - Multicylinder

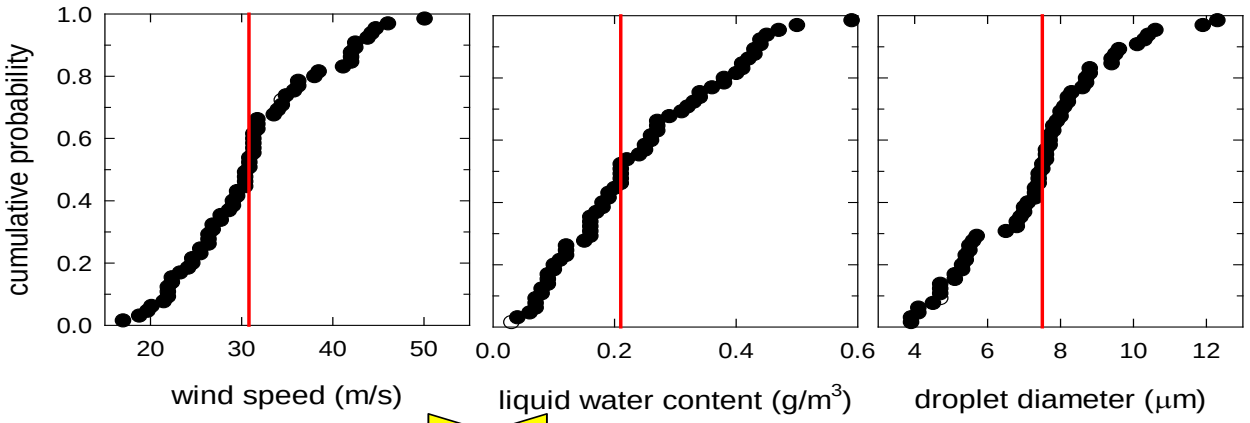
Cloud Water Flux

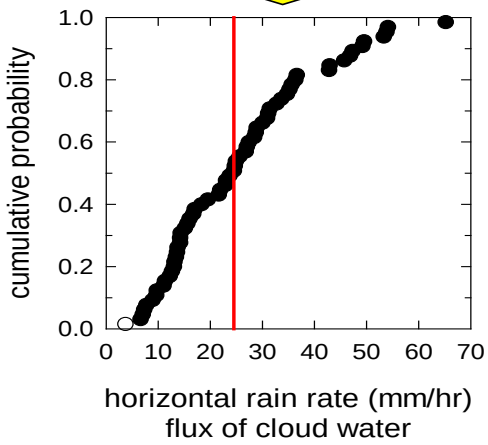


rotating multicylinder

Characterizing icing conditions: flux of cloud water

November 9 -14, 1995 at the summit of Mt. Washington





Necessary information
- flux of cloud water
- duration of icing conditions

Useful information
- droplet diameter

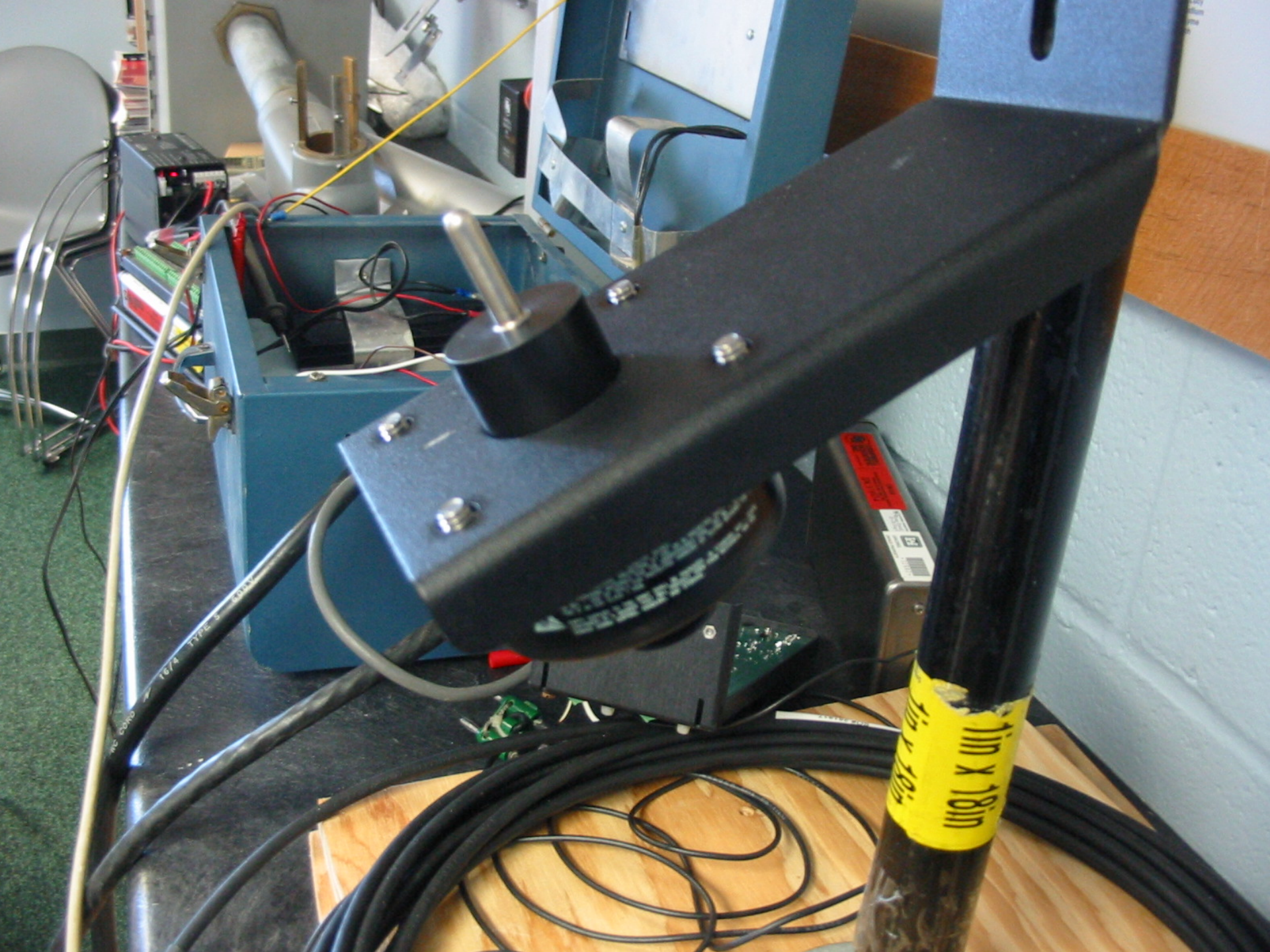
Ice Detector

Heavy riming ‘bridge effect’

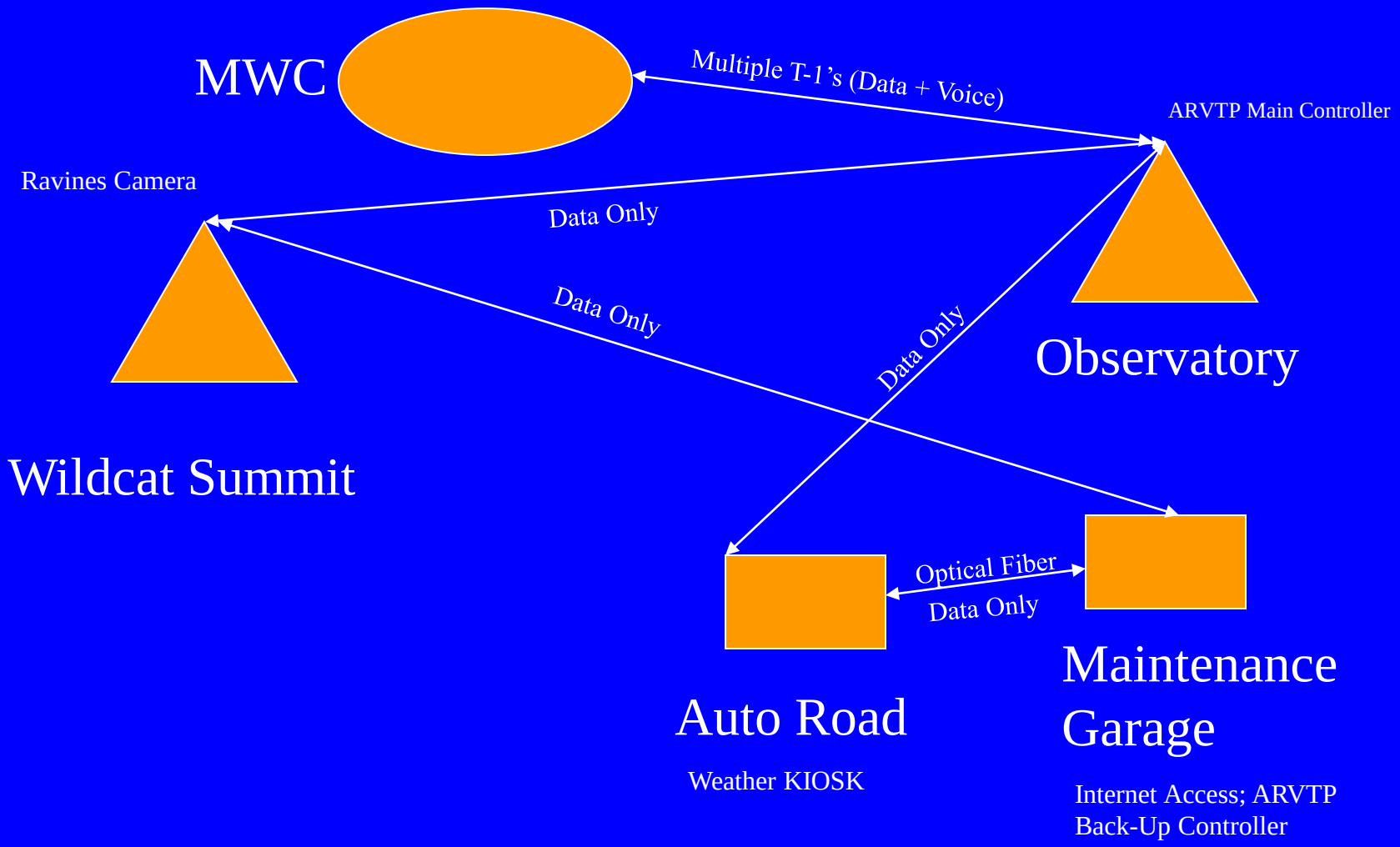
ASOS Icing Sensor


Heavy icing


MOUNT WASHINGTON OBSERVATORY
With deep appreciation, the Mount Washington Observatory presents below a list of ALL contributors to its New Building Fund campaign. Their donations and pledges made it possible for us to move into these new quarters in the Sherman Adams Building in 1980.



Communications Infrastructure (East Side)



5,300 ft.

ARVP

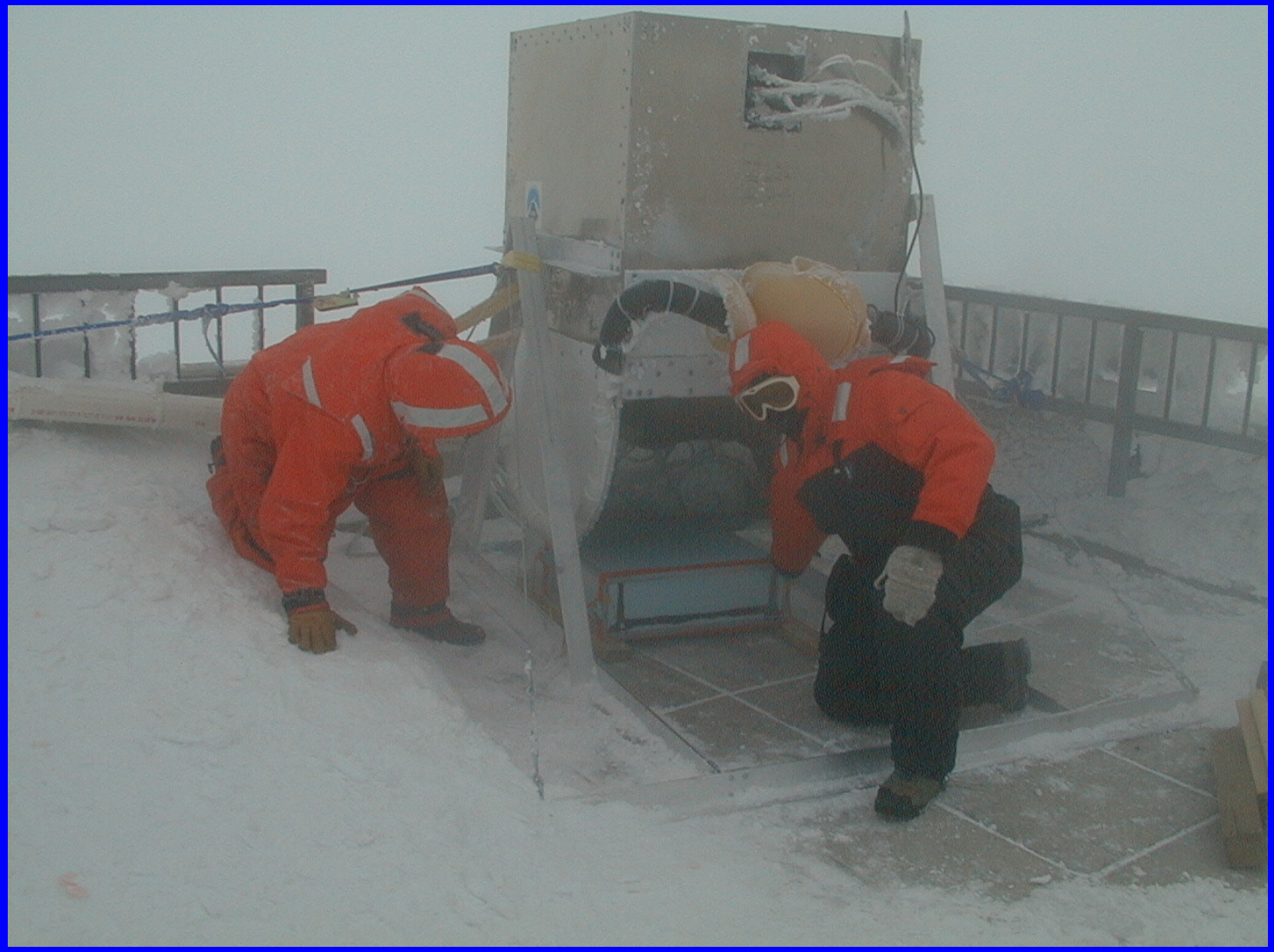
site

She's UP!


CAMPBELL SCIENTIFIC INC

MWISP – Summit

MWISP – Calibration



GroundWinds

Thank You!

www.mountwashington.org

Torn Summit Dish Cover