CEDAR 2018

CU Boulder Presents…

Antarctic Meteor Radar

The First 90 Days

PI: Dr. Scott Palo

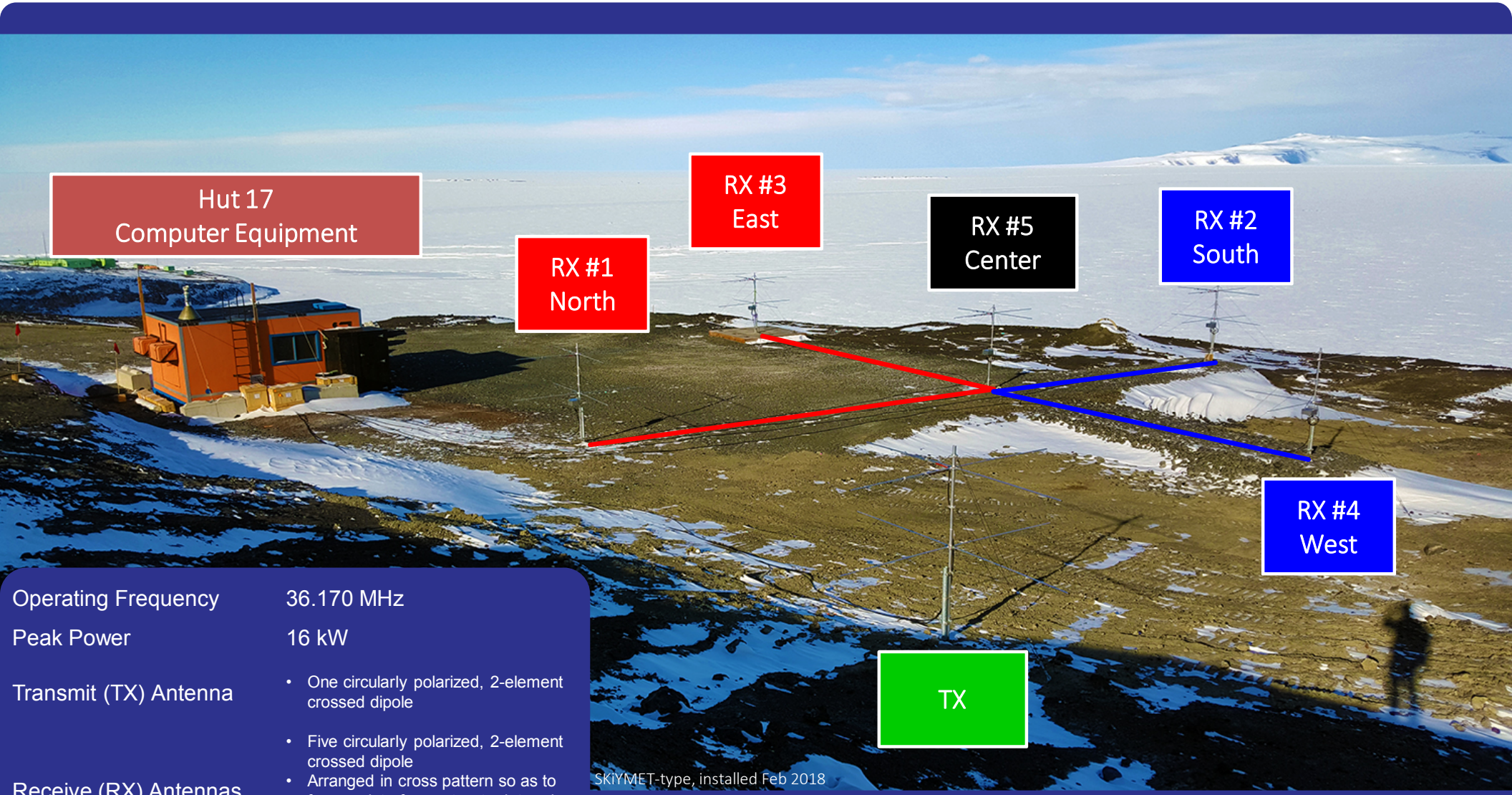
John Marino Presenting

Installed 2017 – 2018 Season | Operated by

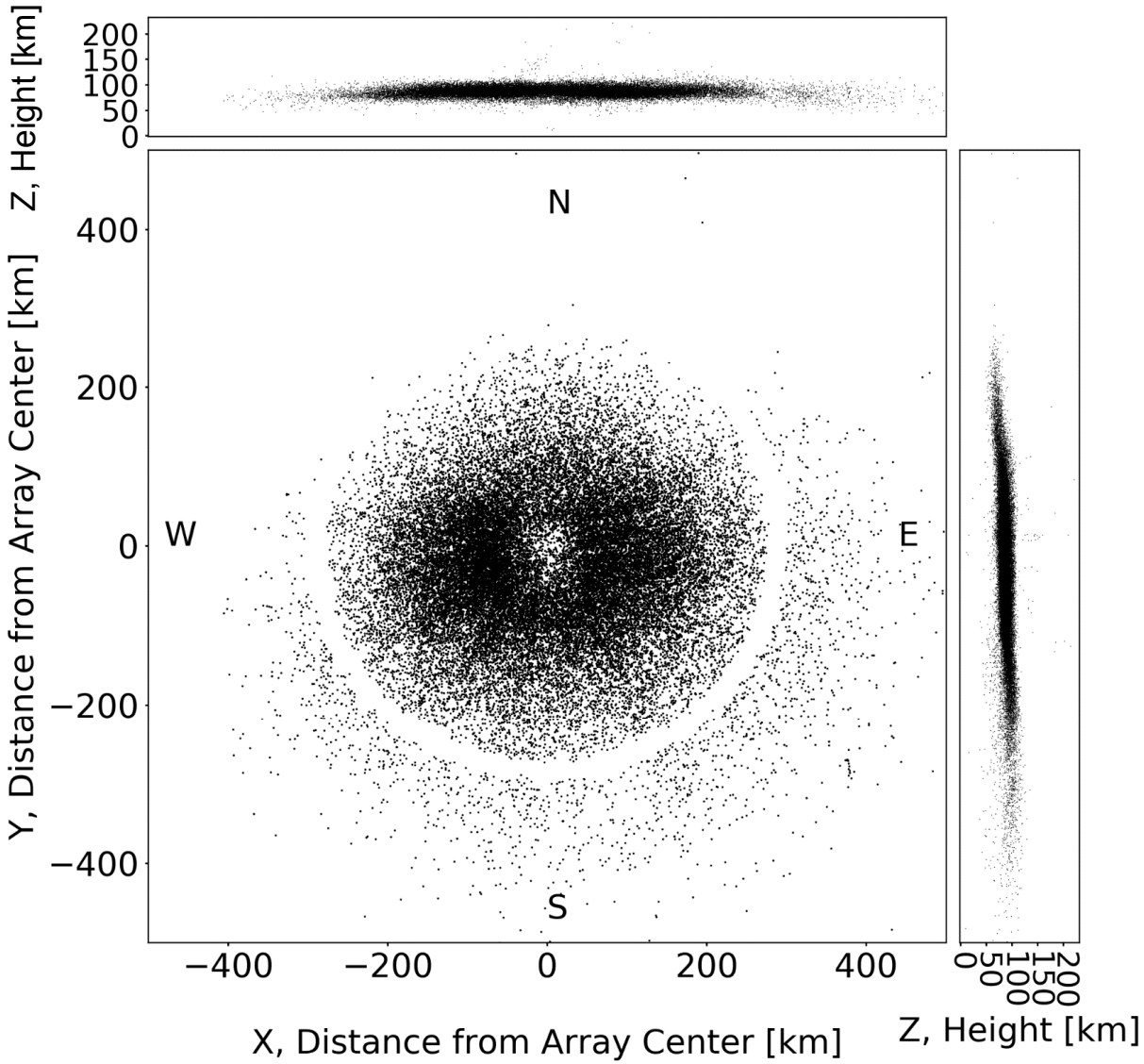
University of Colorado Boulder

Located at 77.8 S, 166.7 E

Between McMurdo (US) and Scott Base (NZ)



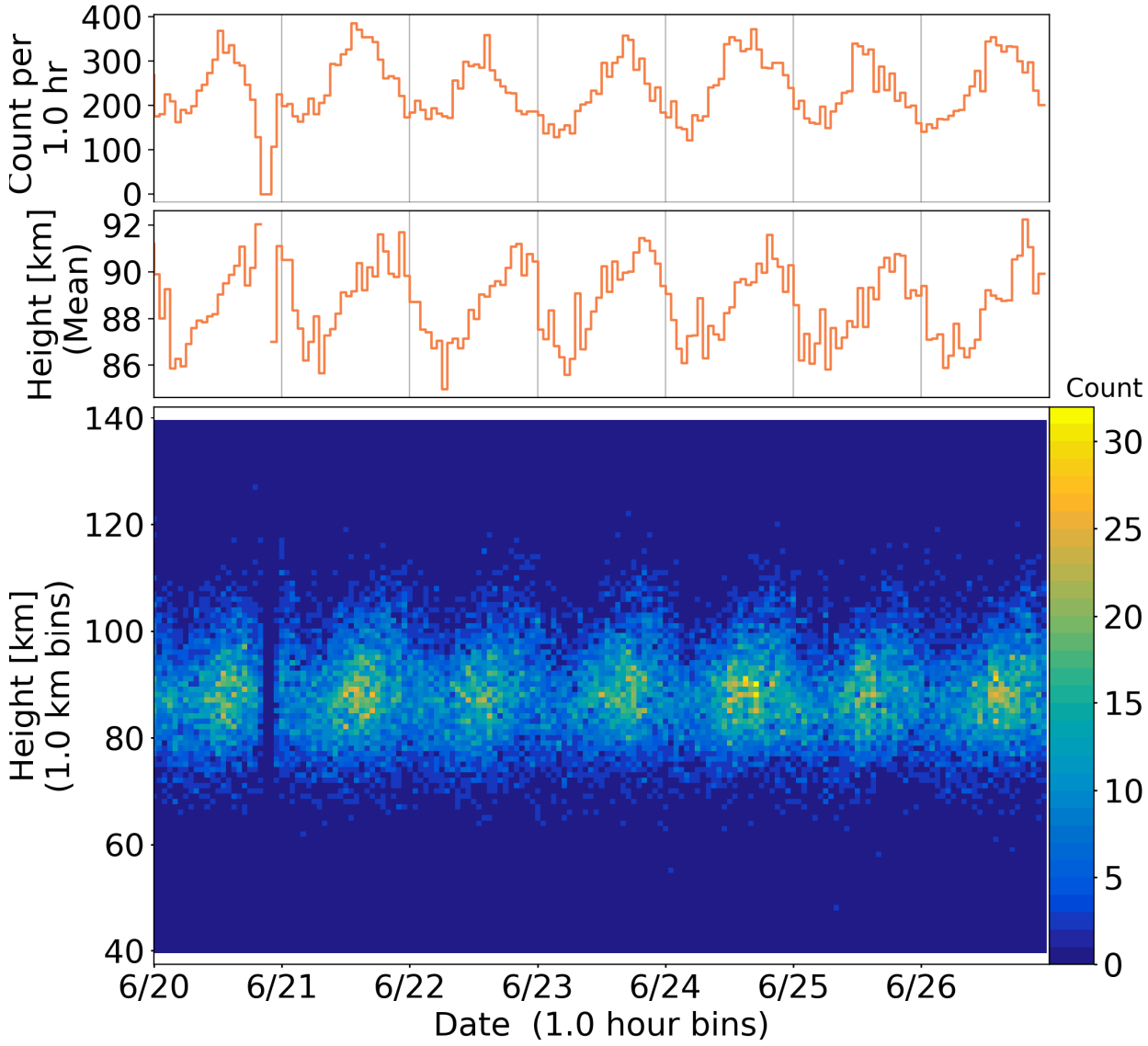
Operating Frequency	36.170 MHz
Peak Power	16 kW
Transmit (TX) Antenna	• One circularly polarized, 2-element crossed dipole
Receive (RX) Antennas	• Five circularly polarized, 2-element crossed dipole • Arranged in cross pattern so as to form an interferometer, to determine unambiguous Angle of Arrival



Spatial Plot

- Spatial Plot of Meteor Echoes
- Jun 20 – 26 2018

- (0,0,0) is receiver array location
- North refers to 'grid north' as defined for the Antarctic in the Universal Polar Stereographic (UPS) coordinate system.



Temporal History

- **Top** plot shows total hourly meteor counts
  - Range of 100 – 600 per hour
  - Average of about 250/hr
  - Diurnal variation clearly seen
- **Middle** plot shows mean meteor height per hr
  - Average of about 90 km depending on the time of day
- **Bottom** plot plots hourly histograms of meteor height in which *each pixel represents the total count per 1 hour per 1 km time bin.*

Campaign Snapshot

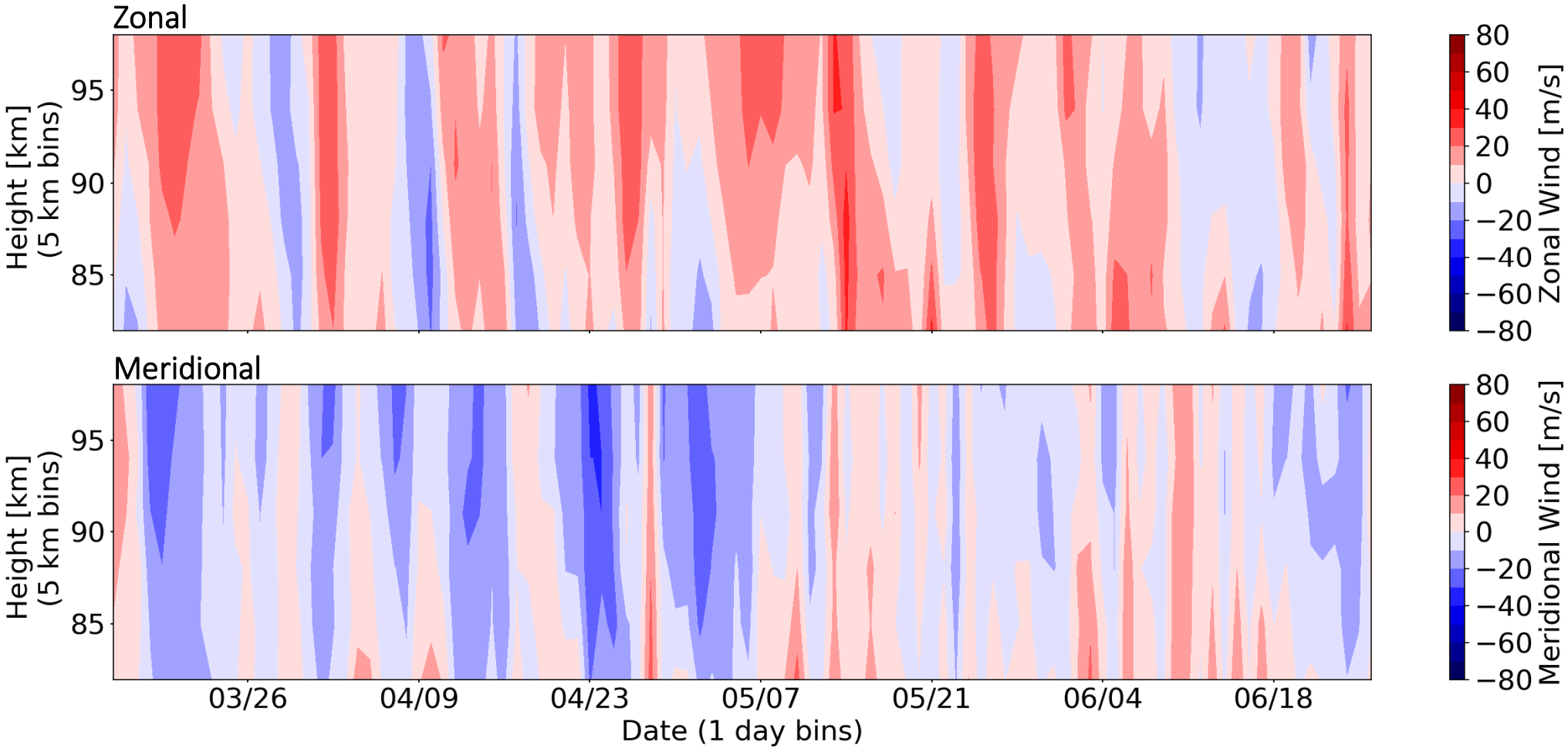
March 15th 2018 – Present (Jun 27th 2018)

Days In Operation	Total Number of Meteor Echoes	Count / Hour			Average Count / Day
		MIN	AVG	MAX	
104	621,375	105	248	604	5,974

Currently, our primary data product is wind ->

Hourly Wind Speed Components

Hourly Zonal and Meridional wind speeds from 82 – 109 km in ~ 3km bins



Some Next Steps

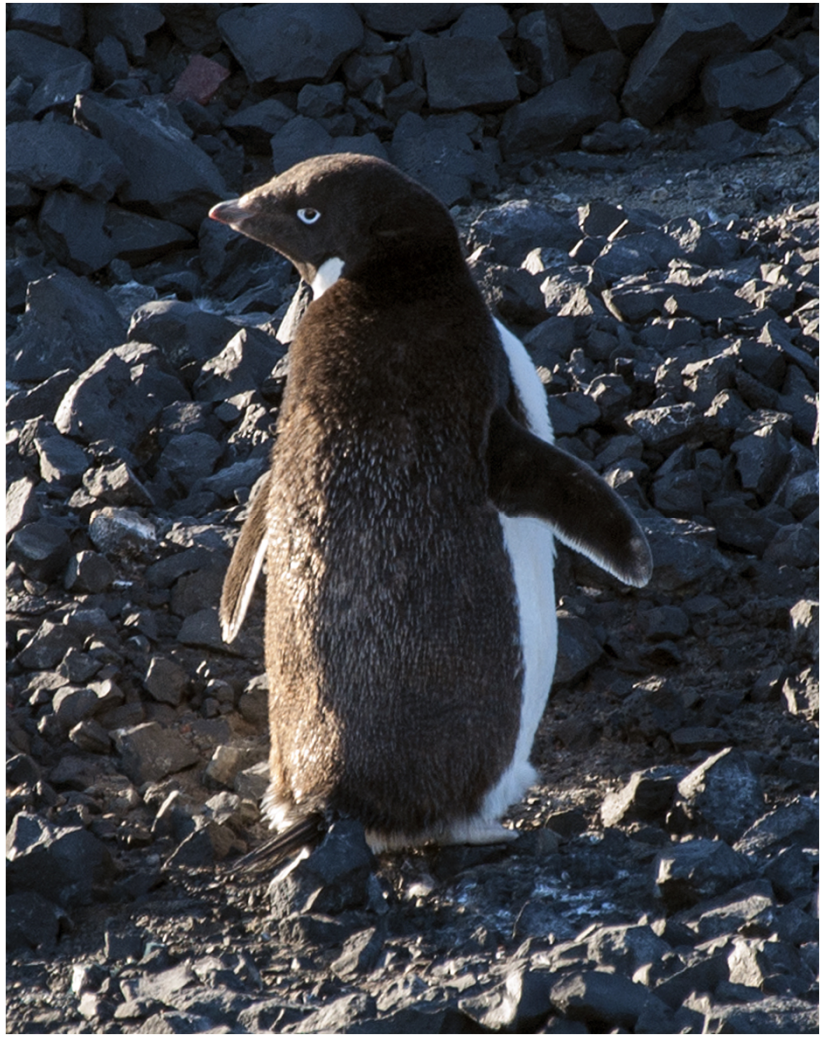
- Identify **atmospheric phenomena**
  E. g. : Planetary waves, gravity waves, tides, etc.

- Attempt **finer resolution** in wind calculations

- Continue taking data to find **seasonal variability**

- Explore **additional data products**
  E. g. : Temperature, new meteor showers / radiants, and others

- **Assimilate / validate / compare** with other instruments and numerical models
  E. g. : LIDAR at McMurdo, Global-Scale Wave Model (GSWM), and others



★ ★ ★ LIVE DATA ★ ★ ★

ccar.colorado.edu/meteors