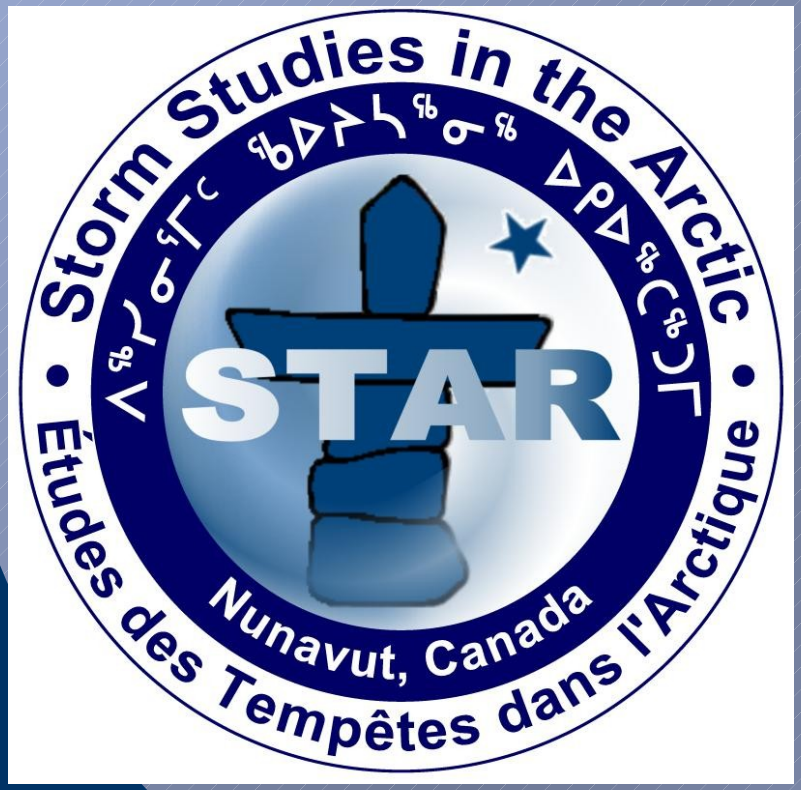
# Storm Studies in the Arctic (STAR)

## A CFCAS Network

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1st Annual STAR Workshop

NRC, Ottawa, ON  Nov. 17, 2006

http://www.starnetwork.ca/

# Outline

- Planned research
- Importance & Theme contributions
- How it will be conducted
- Logistics and equipment
- Timeline

# Planned Research

- Depends somewhat on PhD student's interest!
- Examination of GEM and/or GEM-LAM performance
  - Collaboration with Bob K and Ron G
  - Identify fields that are simulated well and not so well
  - Several events/cases
  - Using special STAR measurements
  - 3-D thermodynamic and dynamical attributes (possibly microphysical)
  - Model experiments to diagnose problem areas in more detail and examine some of these physically
- Data assimilation
  - George Liu in collaboration with Sylvie Gravel
  - use STAR measurements within model 3D-VAR/4D-VAR environment (where possible) to examine the effects on simulations
  - Compare control run to experimental simulations
- Characterization of storm events
  - Combine special datasets to obtain detailed 3D and 4D structure of storms and their surface impacts
  - Inter-comparison of various storms (internal structure & surface impacts
  - Will suggest why storms are different in a variety of ways
  - Detailed examination of a case study (winds & precip)

# Importance & Theme Contributions

- Modeling:
  - Identify model deficiencies & good points (Theme 3)
  - Better understanding of physics (Theme 1 & 2)
  - Contribute to model improvements (Theme 3)
  - Overall goal is to improve prediction capabilities
- Storm Characterization:
  - Improved understanding of storm structure and evolution (Theme 1 & 2)
  - Surface impacts (Theme 1 & 2)

# How it will be Conducted

- Field measurements:
  - 3-4 people in the field
  - Local and regional surface meteorology (mesonets and Iqaluit data)
  - Rawinsonde and surface remote sensing data (radiometers, sodar, Doppler radar)
  - Aircraft data & airborne Doppler radar
- Processing and analysis of data
- Compare with model data
- Apply field data to data assimilation

# Logistics and equipment

- Microwave radiometers (2), sodar, mesonet, visibility sensors, laser precipitation sensor, rawinsondes
- Students (2) and George will maintain instruments & conduct sonde launches … can assist elsewhere as well
- How best to ship instruments? Timing of this? Where do we store them?
- Where to deploy instruments?
- Power sources? Enough power at these sources? How do we cover the cost of this?
- Helium shipment (where do we get this and when to ship?)
- Deployment of mesonet (helicopter issues)
- Modeling activity logistics (can George do simulations remotely and how best to organize this so we do not over-subscribe computing resources?)

# Timeline

- Winter 2006:
  - Purchase & test remaining equipment (mesonets, sondes)
  - Licensing
  - Sighting plans
- Spring 2007
  - Ship some equipment/hardware to save on costs
  - Licensing and sighting
  - Other field logistics (plan timing of personnel, etc)
- Summer 2007
  - Installation of mesonet and other hardware that may be difficult to install in colder conditions
- Fall 2007
  - Begin field campaign