

STAR researchers will study extreme Arctic weather

By Frank Nolan, Research Promotion Officer

If you think Winnipeg winters are harsh, just talk to John Hanesiak.

For the next four years, Hanesiak, Centre for Earth Observation Science (CEOS), will be getting up close and personal with some of the most severe winter storms in the Canadian Arctic.

Hanesiak is co-leader of Storm Studies in the Arctic (STAR), a research network focused on understanding severe weather systems in south-eastern Nunavut. The project includes other CEOS researchers from the University of Manitoba, as well as teams from McGill University, the University of Toronto, York University and the University of Western Ontario. Over the next four years, the STAR Network will receive \$3 million in funding from the Canadian Foundation for Climate and Atmospheric Sciences.

The ultimate goal of the STAR Network is to develop more accurate models for predicting major storm events, particularly around Iqaluit on southern Baffin Island.

"This area experiences some of the most frequent and severe winter storms in the Arctic," Hanesiak said. "Systems come in from the west and south, as well as backwards from Baffin Bay, and there's a lot of open water that feeds heat and moisture into the atmosphere, so the storms that develop can be very powerful."

Research conducted by the STAR Network will be organized around four major themes. The first two involve collecting specific storm data,



"We'll be launching weather balloons every three hours during storm events, so we'll obtain high-resolution data."

John Hanesiak

Hanesiak's team will use remote sensing equipment that can provide temperature and humidity profiles every ten or fifteen minutes, as well as Doppler radar equipment that can scan the atmosphere at a range of fifty kilometres. The team will also be using a National Research Council of Canada research aircraft equipped with radar that can provide information about cloud structure, precipitation intensity and dynamical storm features.

"The plane will be flying around inside the storms, and the information it provides, combined with the ground radar and our remote sensors, will give us an unprecedented amount of really good information."

The comprehensive surface and airborne measurements will also provide unique validation data for a new satellite called CloudSat, which was launched in May 2006. STAR measurements will be the only ones of their kind in the world that focus on CloudSat validation in the Arctic atmosphere.

The STAR team also includes CEOS director David Barber, Canada Research Chair in Arctic System Science. Barber's team will launch weather balloons from the Canadian Coast Guard Ship Amundsen and place buoys around the area to measure the

including measurements taken from the atmosphere, from the ground, and from the sea. The weather data will be collected in September and October of 2007, at the height of the storm season.

"We'll be setting up automatic weather stations at different elevations around Iqaluit, and we'll also be deploying pressure sensors upstream from the area," Hanesiak said. "We'll be launching weather balloons every three hours during storm events, so we'll obtain high-resolution data."

Hanesiak said that topography in the Arctic can play a major role in winds at the surface by funneling them through channels. Called gap winds, they can be hazardous to aircraft and people on the ground, and much of the

data collected by the STAR team will focus on describing these winds in very fine detail.

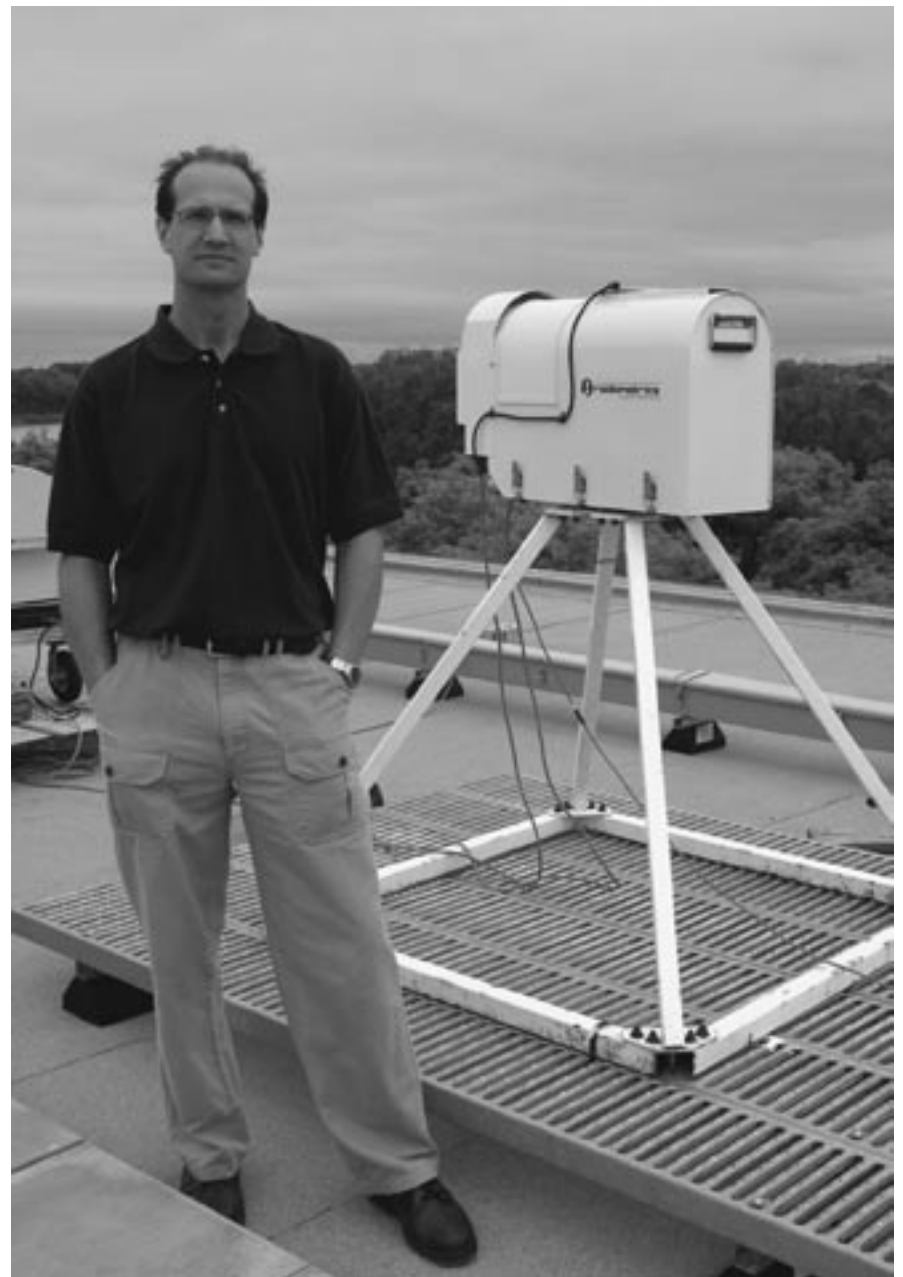


Photo by: Frank Nolan

CEOS researcher John Hanesiak is co-leader of the STAR Network, a collaborative project aimed at developing more accurate models for predicting severe winter storms around Iqaluit.

impact of storms on sea ice.

Once the information is collected, the STAR team will begin the project's third theme, which is focused on developing more accurate storm prediction models.

"For each storm event, we'll look at how well the existing models worked," Hanesiak said. "Themes one and two are all about understanding the physics of what's going on, and in theme three we'll be applying our field data to the numerical computer models to improve the way they forecast storm events."

Running through all of the STAR Network's activities is the project's fourth theme, which involves working with local communities, as well as governments and northern agencies.

"The area around Iqaluit is experiencing significant growth, with new industrial, tourism and recreation developments, so the local people have a great stake in our ability to accurately predict these potentially very dangerous storms," Hanesiak said. "We'll be working closely with the communities every step of the way, and we'll be involving local people to help us with our measurements and observations."

For more information about the STAR Network, please visit the project's Web site:

www.umanitoba.ca/faculties/environment/ceos/data/projects/star/star.html