

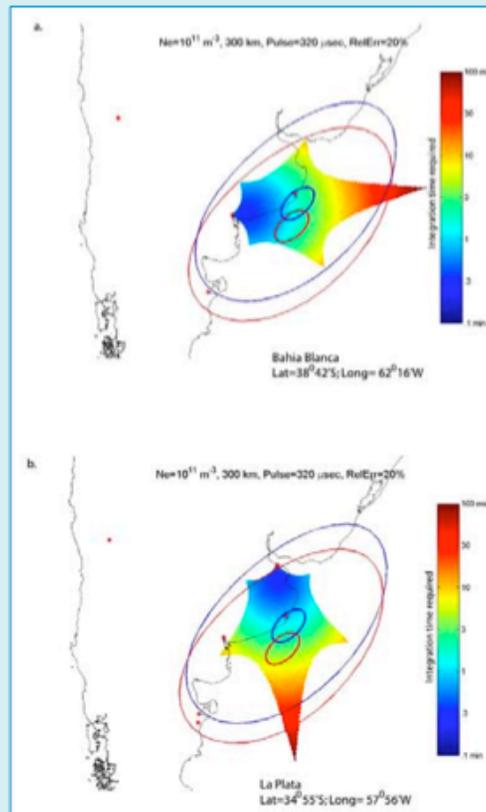
Antarctic
ISR
Workshop
8-9 AUGUST 2008

A diagram showing a globe of Earth with its magnetic field lines. The field lines are represented by black loops that converge at the poles. Three blue arrows point towards the South Pole, indicating the direction of the magnetic field. The globe is shown in a three-quarter view, with the South Pole at the bottom.

Short History...

Report on the Concept Development for an Upper Atmospheric Research Facility at the Arcicbo Geomagnetic Conjugate Point in Argentina

NAIC Arcicbo Observatory • April 17-19, 2006

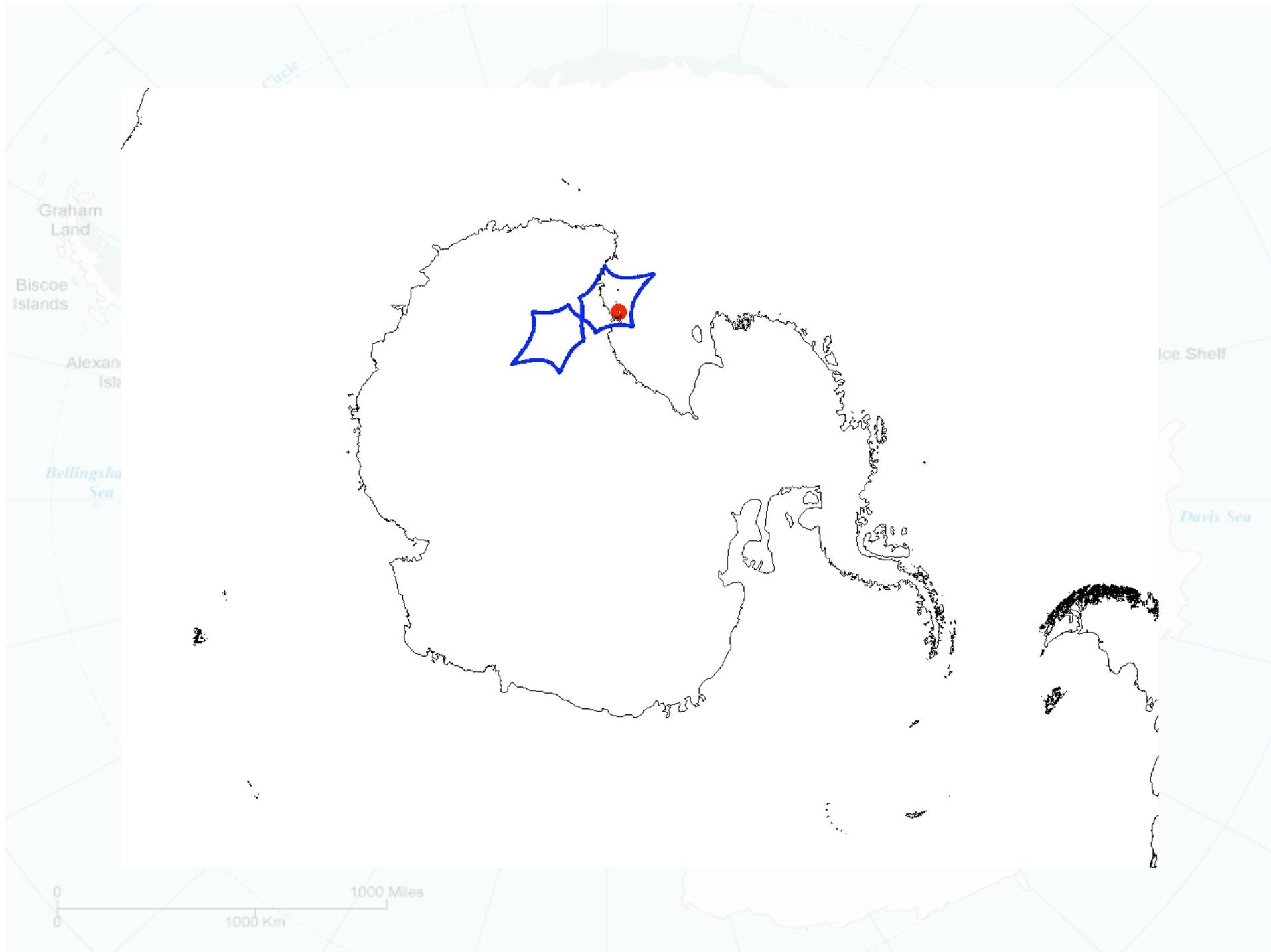


Edited By

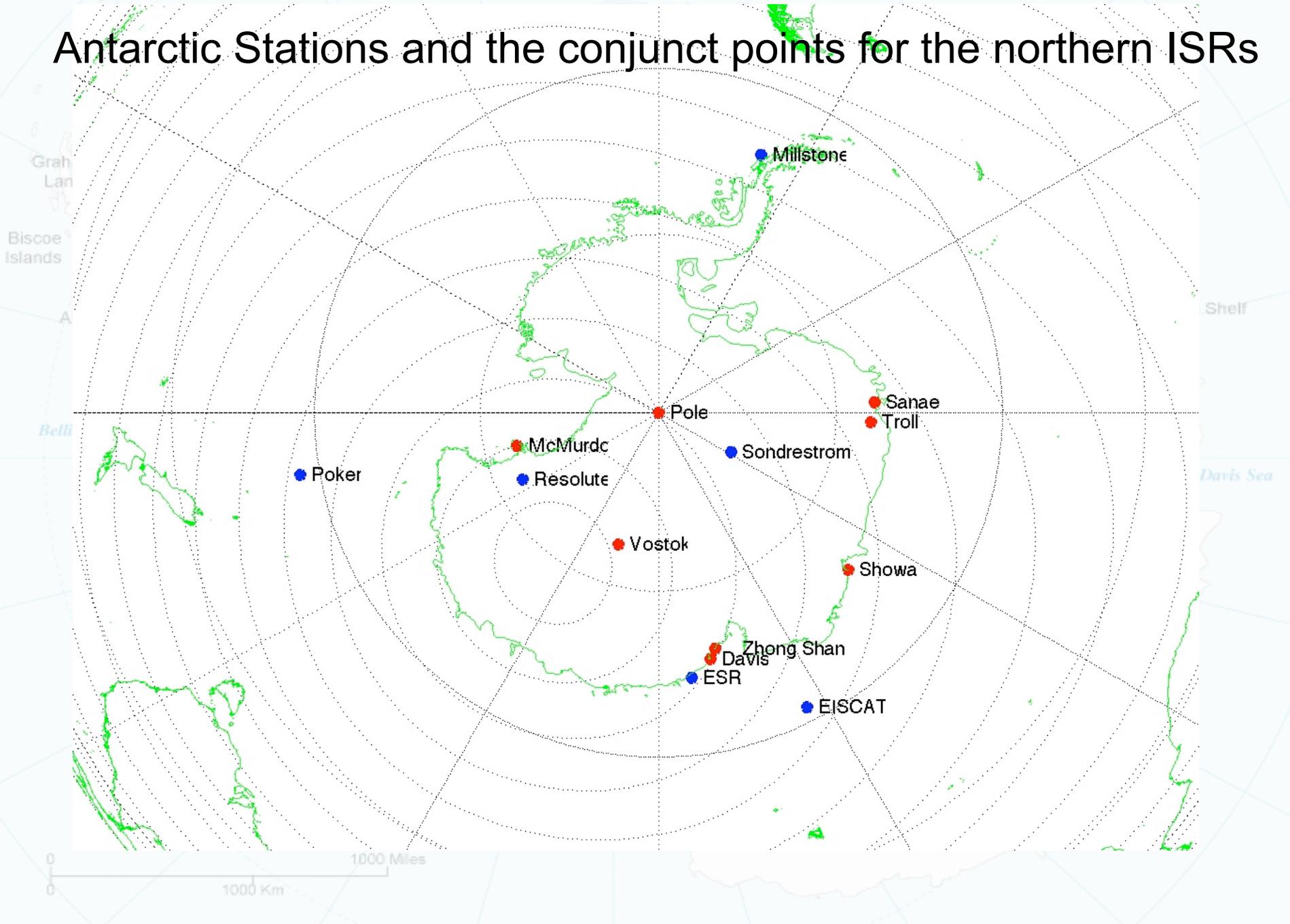
Dr. Diego Janches, Northwest Research Associates

Dr. Robert L. Brown, National Astronomy and Ionosphere Center

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Antarctic Stations and the conjunct points for the northern ISRs



Agenda

- The goal of the workshop was to discuss the science rationale for establishing an Incoherent Scatter Radar in Antarctica
- Co-sponsored between Volodya Papitashvili and Bob Robinson.
- The product of the workshop should be an advocacy document identifying
 - the “killer” science cases that can only be addressed by establishing an ISR at high southern latitudes.
 - Management and operational considerations
 - International collaboration!

Things to consider:

- Outstanding questions
 - Which science topics can only be addressed and solved by having an ISR at high southern latitudes?
- Location with respect to:
 - Which science questions we want to address.
 - Conjunction with any of the existing northern ISRs?
 - Open/closed filed-line boundary.
 - Other instruments (superDARN, AGO etc).
 - The axis between the geographic and magnetic pole?

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First Name	Last Name		Affiliation
Alan	Rodger		British Antarctic Survey, UK
Ian	McCrea		RAL, UK
Jian	Wu		LEME, China
Ryoichi	Fujii		STELAB, Japan
Toru	Sato		Kyoto University, Japan
Robert A.	Vincent		University of Adelaide, Australia
David	Walker		University of KwaZulu-Natal, South Africa
Ron	Woodman		Geophysics Institute of Peru, Peru
USA			
Joshua	Semeter		Boston University, USA
Allan	Weatherwax		Siena College NY USA
Ray	Greenwald		Virginia Tech University, USA
Bill	Bristow		Geophysical Institute University of Alaska, Fairbanks, USA
Mike	Kelley		Cornell University, USA
John	Foster		Millstone Hill Observatory, USA
Ramon	Lopez		UT Arlington, USA
Umran	Inan		Stanford University, USA
Alex	Glocer		University of Michigan, USA
Craig	Heinselmann		SRI International, USA
NSF			
Vladimir	Papitashvili		NSF, USA
Bob	Robinson		NSF, USA
Rich	Behnke		NSF, USA
Organizers			
John	Kelly		SRI International, USA
Robert	Clauer		Virginia Tech University, USA
Ennio	Sanchez		SRI International, USA
Anja	Strømme		SRI International, USA
Tony	Van Eyken		EISCAT Scientific Association

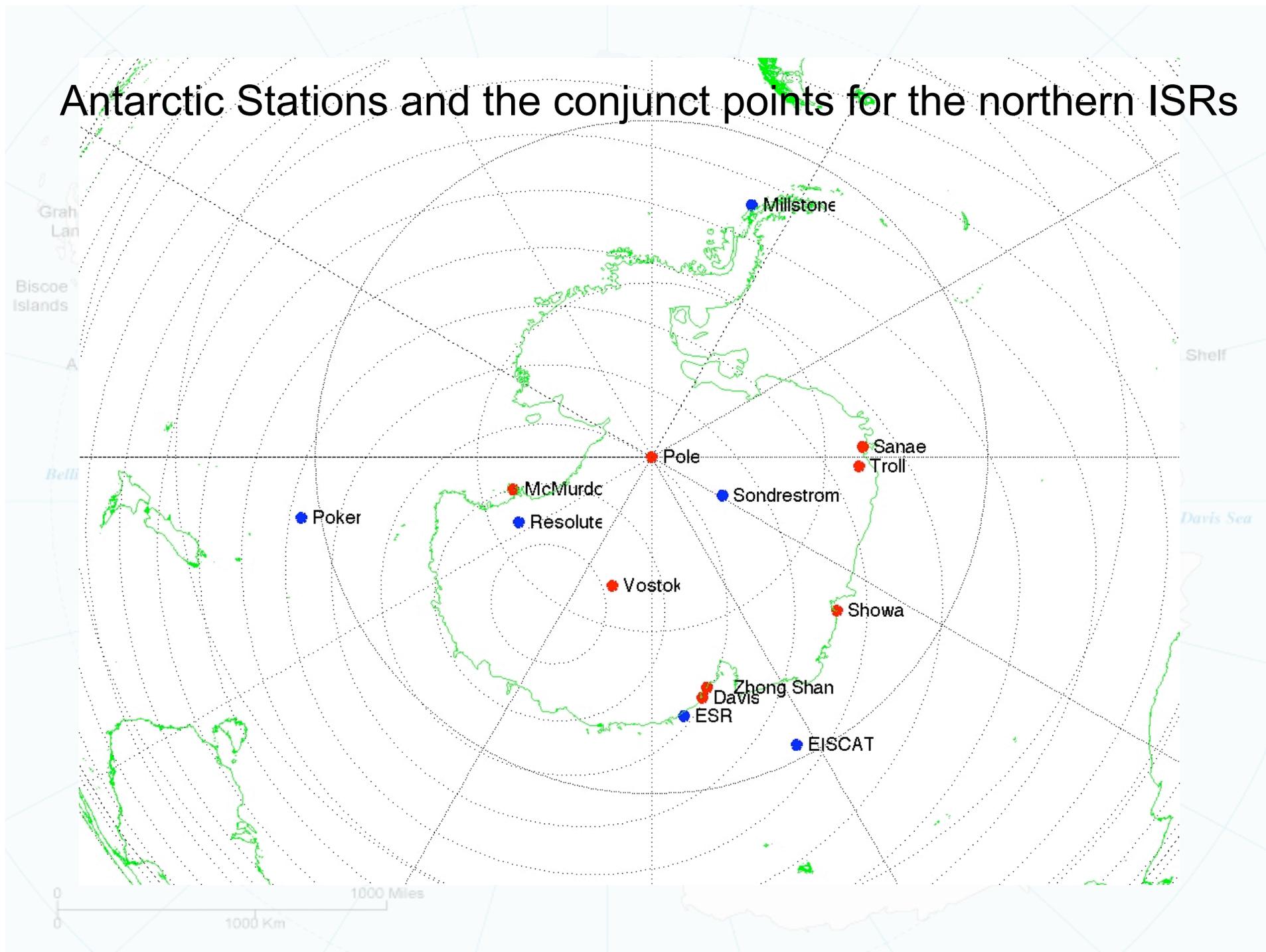


Some constrains...

- Run at full duty cycle, AMISR consumes 700 kW...
 - Only costal locations was considered
 - Some existing infrastructure is required - considered only locations with existing stations



Antarctic Stations and the conjunct points for the northern ISRs



Possible locations

Conjugate pair	Geographic lat & lon	Geomagnetic lat & lon
Syowa Leirvogur (Iceland)	-69.0, 39.6 64.2, 338.3	-70.4, 83.6 69.3, 71.1
McMurdo Resolute	-77.9, 166.7 74.7, 265.1	-79.0, 290.1 82.9, 303.0
Davis Zhonshan Longyeabyen	-68.6, 78.0 -69.4, 76.4 78.2, 15.8	-76.5, 128.2 -74.6, 96.5 75.3, 112.1



Agenda for the Antarctic ISR workshop

Time and location:

The workshop will take place in the **Acapulco room on the gold level in the West Tower** at the [Hyatt Regency Hotel in Chicago](#), 8. – 9. August 2008.

Agenda:

Friday 8. August

09:00 – 09:15 Welcome and opening words from the organizers.
09:15 – 09:30 Opening comments from NSF.
09:30 - 10:15 Introductory presentation about the capabilities of current Incoherent Scatter Radars and a description of AMISR.
10:15 – 10:45 *Coffee break*
SESSION ON INTERHEMISPHERIC STUDIES
10:45 – 11:00 Introduction by **Bob Clauer**
11:00 – 11:10 **Ian McCrea** and Mike Lockwood “Interhemispheric comparisons of reconnection signatures as a means of understanding IMF Bx control and magnetospheric asymmetry”
11:15 – 11:25 **Alex Gloer** “Magnetosphere Ionosphere Coupling - Physical Processes and Modeling”
11:30 – 11:40 **Joshua Semeter** “Conjugacy of Auroral M-I coupling”
11:45 – 11:55 **Nikolay Østgaard** “Auroral Conjugacy Studies” presented by Tony van Eyken
12:00 – 12:10 **Kirsti Kauristie** “Some thoughts about Antarctic ISR as a scientific instrument, technological challenges and international collaboration project” presented by Tony van Eyken
12:10 – 13:45 *Lunch*
Session on Interhemispheric Studies continues
13:45 – 13:55 **John Foster** “Conjugacy Characteristics of Polar Tongue of Ionization”
14:00 – 14:10 **Ramon Lopez** “Interhemispheric Ionospheric Potential Differences”
14:15 – 14:25 **R. A. Vincent** “Interhemispheric differences in wave dynamics and coupling into the SH MLT and above”
14:30 – 14:40 **Ian McCrea** et al. “Comparative observations of mesospheric echoes, winds, tides and layer height trends in the Arctic and Antarctic”
14:45 – 14:55 **Ron Woodman** “AMISR in Antarctica: PMSE Related Questions”
15:00 – 15:30 *Coffee break*
15:30 – 16:30 General discussions about the Interhemispheric Session
16:30 – 16:45 Short break
16:45 – 17:45 General discussions

19:00 *Dinner at Bistro 110.*

Saturday 9. August

09:00 – 09:15 Opening comments from the organizers
SESSION ON UNIQUENESS OF THE SOUTHERN HEMISPHERE
09:15 – 09:30 Introduction by **Alan Rodger**
09:30 – 09:40 **Ryoichi Fujii** “On the performance and location of a new IS radar from the viewpoint of scientific purposes and comprehensive observations”
09:45 – 09:55 **Bill Bristow** “Antarctic SuperDARN and AMISR”
10:00 – 10:10 **A. D. M. Walker** “Can AMISR Techniques Contribute to the Understanding of Short Period Ionospheric and Magnetospheric Fluctuations?”
10:15 – 10:45 *Coffee break*
10:45 – 10:55 **Allan Weatherwax** “An Overview of Existing and Planned Space Physics and Aeronomy Projects in Antarctica: Understanding the Sun’s influence on Earth’s Global Space Environment”
11:00 – 11:10 **M.C. Kelley** et al. “Detection of iron layers, PMSE and noctilucent clouds in conjunction with a Space Shuttle launch”
11:15 – 11:25 **K. Sato** et al. “Coordinated observation of PANSY and AMISR in the Antarctic”
11:30 – 11:40 **Francois Forme** “Small-Scale Plasma Physics using IS radars” presented by Anja Strømme

11:45 – 12:15 General Discussions about the Southern Hemisphere Session
12:15 – 13:45 *Lunch*
13:45 – 14:15 Summary with a list of “Outstanding Questions” - both scientific and strategic - compiled from the presentations and discussions.
14:15 – 15:00 Round table discussions on selected “Outstanding Questions”
15:00 – 15:30 *Coffee break*
15:30 – 16:00 Round table discussions continues
16:00 – 16:30 Form a committee to proceed with the work.
16:30 – 17:00 Concluding Remarks

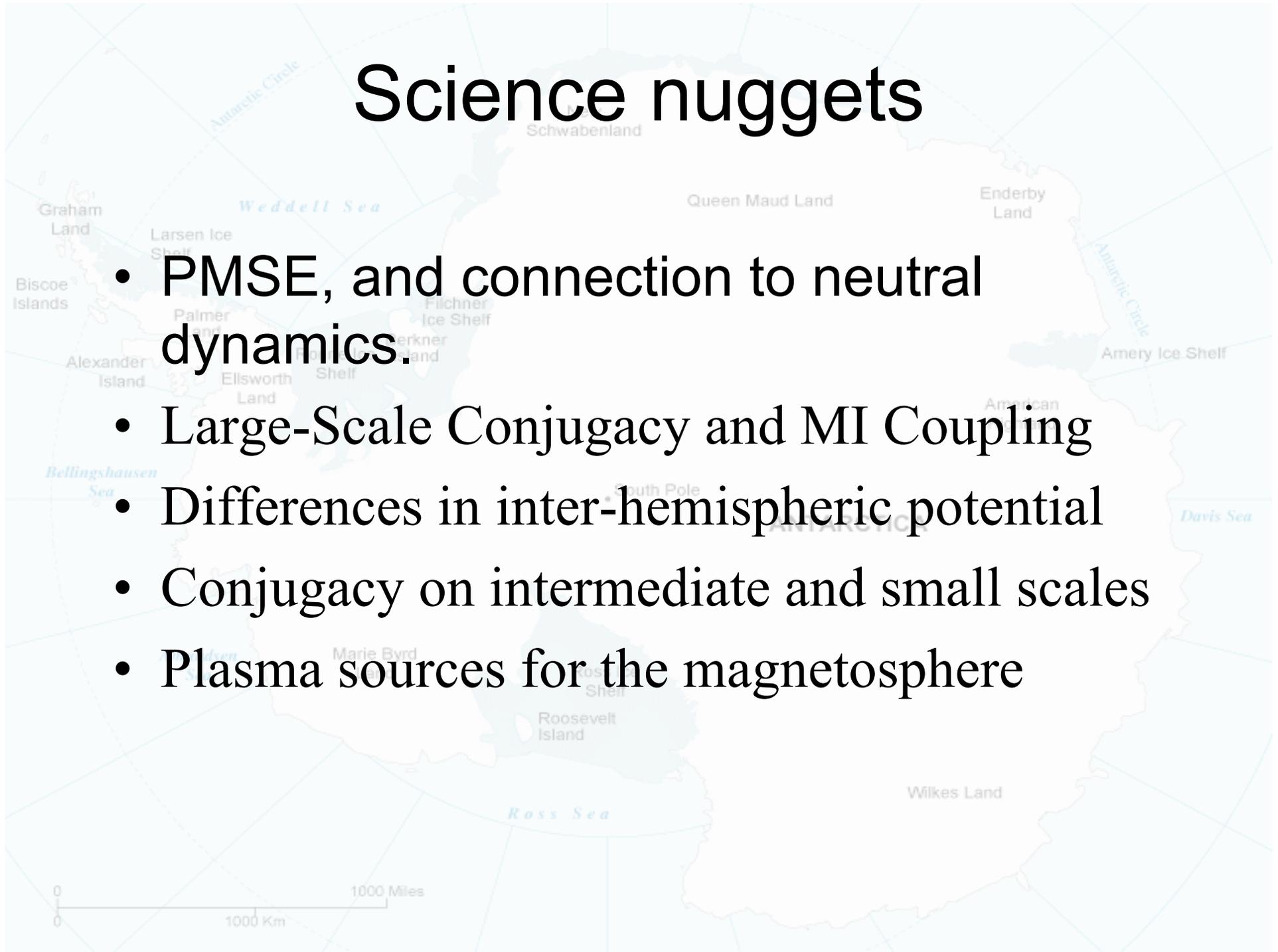
The workshop should result in a report discussing the need and feasibility of a high latitude southern ISR, and an initiative group or committee that will continue to lead the effort to establish a southern hemisphere ISR at high latitudes.

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Science nuggets

- PMSE, and connection to neutral dynamics.
- Large-Scale Conjugacy and MI Coupling
- Differences in inter-hemispheric potential
- Conjugacy on intermediate and small scales
- Plasma sources for the magnetosphere



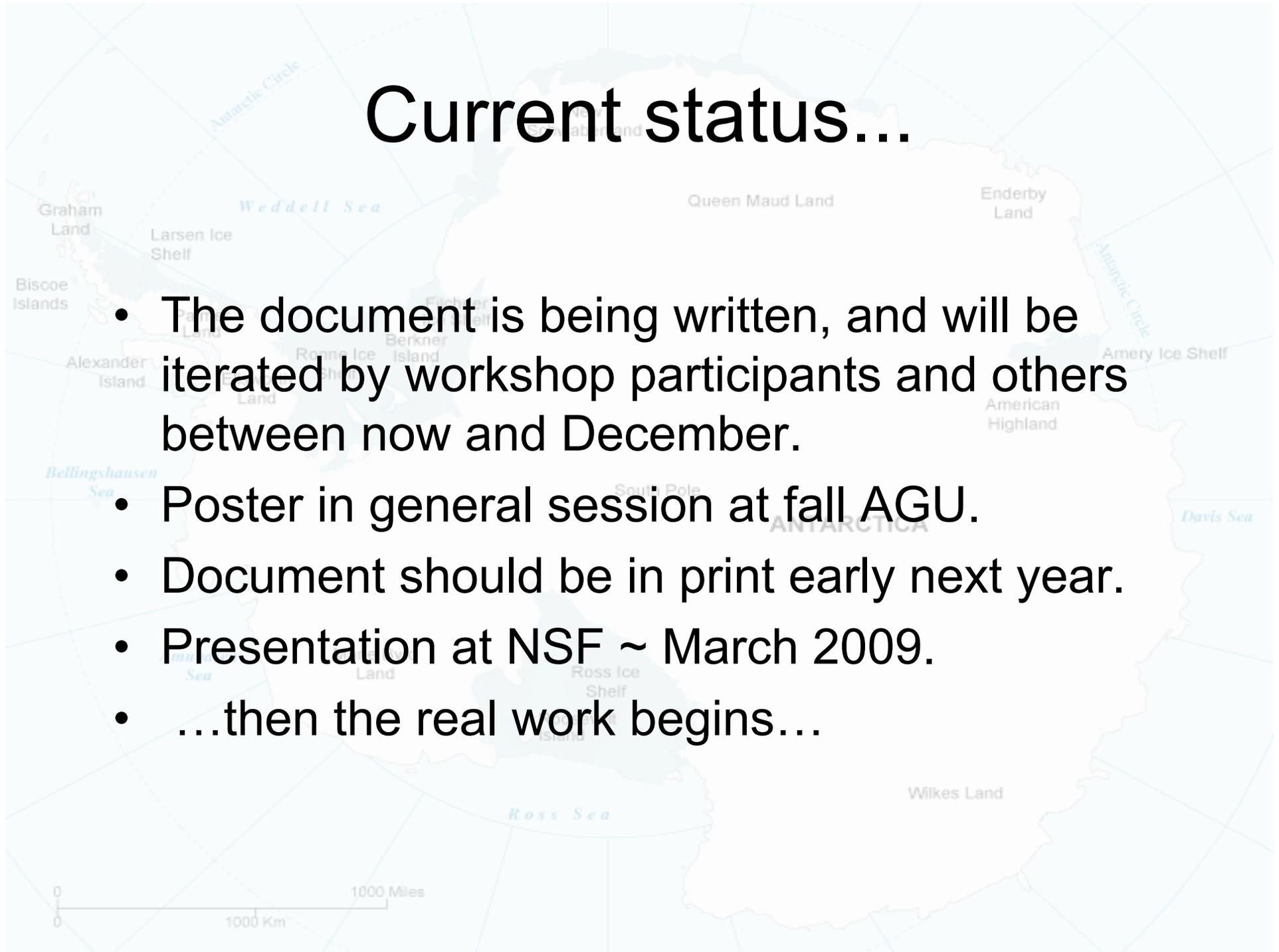
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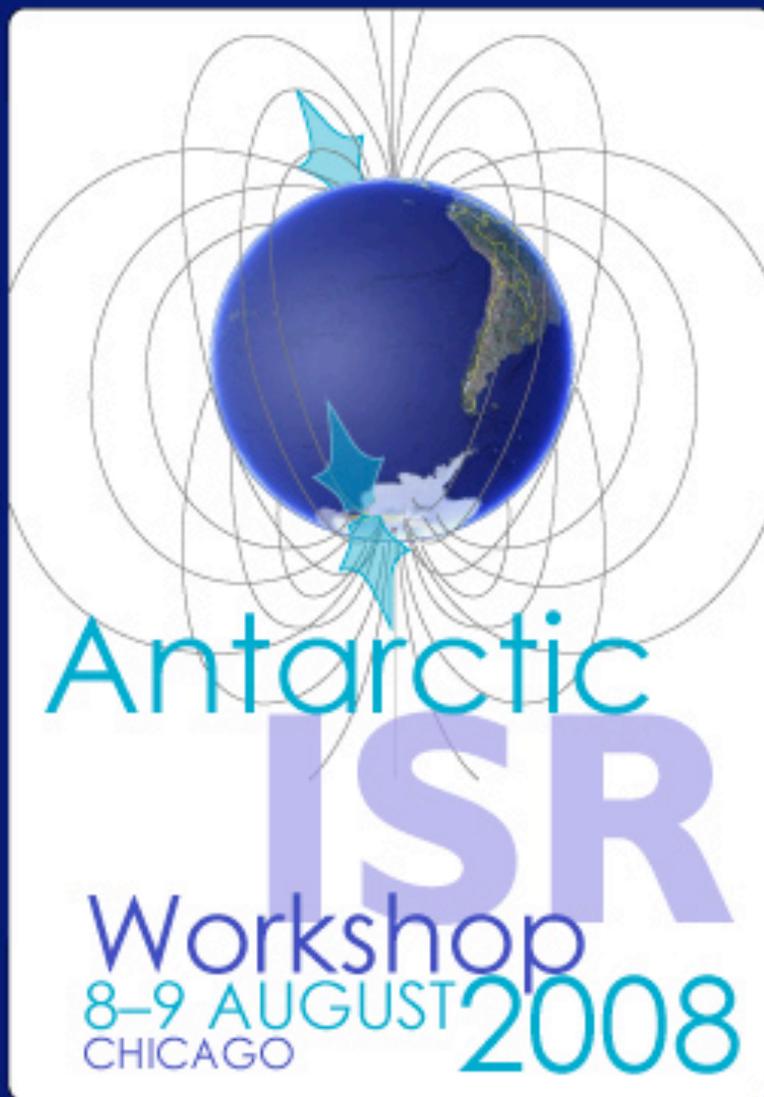
- The document is being written, and will be iterated by workshop participants and others between now and December.
- Poster in general session at fall AGU.
- Document should be in print early next year.
- Presentation at NSF ~ March 2009.
- ...then the real work begins...



Next steps..

- Submit Proposal to OPP for a feasibility study 2009.
- Start formal discussions with international partners.
- Possibility of deployment and testing at Andøya, Norway as a collaboration with EISCAT.
- Apply for funding for construction. (The modular design of AMISR makes a stepwise deployment possible if needed).
- Have a full working AMISR face in Antarctica preferably by the next solar max.





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