Polar Space Task Group
An Overview

Jeff Key (NOAA)
PSTG Vice-Chair

on behalf of Polar Space Task Group

Asia CryoNet Meeting
4 December 2013, Beijing
Cryosphere Satellite Missions

Sea ice extent and concentration, ice sheet elevation, glacier velocity, snow accumulation

Ice sheet elevation, sea ice thickness

Ice sheet mass change

Sea ice extent and concentration, glacier area, surface albedo and temperature, radiation budget

Courtesy: M. Drinkwater

In Orbit  Approved  Planned/Pending approval

Solid Colour = R & D mission; Hatched = operational mission
The IPY provided an international framework for understanding polar processes and high-latitude climate.

Spaceborne technology offered unique capabilities for obtaining essential data for predictive models.

During the recent IPY era, spaceborne instrumentation represented a technological leap beyond the capabilities of the previous IPYs (1882-83, 1932-33).

Required coordination in order to optimize space agency contributions - to achieve IPY science objectives.

Combined result using RADARSAT-1, ALOS PALSAR, and Envisat ASAR InSAR data - and funded by NASA.
Invited participation from national and international Agencies: ASI, CSA, CMA, CNES, DLR, ESA, EUMETSAT, INPE, JAXA, NASA, NOAA, ROSHYDROMET, USGS, WMO, WCRP-CliC.
IPY-STG Accomplishments

- CSA/DLR/ESA/JAXA **InSAR acquisitions** over Greenland with NASA commitment to process and distribute velocity products
- CSA/MDA **Radarsat-2 mapping of Antarctica**
- USGS **Landsat Image Mosaic** of Antarctica (LIMA)
- ESA Envisat **ASAR mapping** of Antarctica margins and coastal ice
- DLR **TerraSAR-X repeat mapping of fast glaciers** in Greenland and Antarctica
- ESA, DLR and ASI captured the break-up of the Wilkins Ice Shelf in great detail, spatially and temporally.
- ASI **COSMO-SkyMed velocity mapping** of the Perito Moreno glaciers
- Expanded JAXA **ALOS coverage** in the Arctic
- NRC Canada **MODIS circumpolar mosaic** of the Arctic
- Extension of CNES SPIRIT project to make more stereo image data available and to produce more DEMs
The Polar Space Task Group (PSTG) was established in 2011 under the auspices of the World Meteorological Organization’s (WMO) Executive Council Panel of Experts on Polar Observations Research and Services (EC-PORS).

The group’s mandate is to provide coordination across space Agencies to facilitate acquisition and distribution of fundamental satellite datasets, and to contribute to or support development of specific derived products in support of cryospheric scientific research and applications.
# Current Nominated PSTG Members

<table>
<thead>
<tr>
<th>Members of PSTG</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ASI</strong></td>
<td>Battazza, Fabrizio</td>
</tr>
<tr>
<td></td>
<td><a href="mailto:fabrizio.battazza@asi.it">fabrizio.battazza@asi.it</a></td>
</tr>
<tr>
<td><strong>CNES</strong></td>
<td>Hosford, Stephen</td>
</tr>
<tr>
<td></td>
<td><a href="mailto:steven.hosford@cnes.fr">steven.hosford@cnes.fr</a></td>
</tr>
<tr>
<td><strong>CSA/CEOS</strong></td>
<td>Crevier, Yves</td>
</tr>
<tr>
<td></td>
<td><a href="mailto:yves.crevier@space.gc.ca">yves.crevier@space.gc.ca</a></td>
</tr>
<tr>
<td><strong>CMA</strong></td>
<td>Zhang, Peng</td>
</tr>
<tr>
<td></td>
<td><a href="mailto:zhangp@cma.gov.cn">zhangp@cma.gov.cn</a></td>
</tr>
<tr>
<td><strong>DLR</strong></td>
<td>Gottwald, Manfred</td>
</tr>
<tr>
<td></td>
<td><a href="mailto:manfred.gottwald@dlr.de">manfred.gottwald@dlr.de</a></td>
</tr>
<tr>
<td><strong>DLR</strong></td>
<td>Floricioiu, Dana</td>
</tr>
<tr>
<td></td>
<td><a href="mailto:dana.floricioiu@dlr.de">dana.floricioiu@dlr.de</a></td>
</tr>
<tr>
<td><strong>ESA/EC-PORS</strong></td>
<td>Drinkwater, Mark (Chair)</td>
</tr>
<tr>
<td></td>
<td><a href="mailto:mark.drinkwater@esa.int">mark.drinkwater@esa.int</a></td>
</tr>
<tr>
<td><strong>EUMETSAT</strong></td>
<td>Holmlund, Kenneth</td>
</tr>
<tr>
<td></td>
<td><a href="mailto:kenneth.holmlund@eumetsat.int">kenneth.holmlund@eumetsat.int</a></td>
</tr>
<tr>
<td><strong>INPE</strong></td>
<td>Buss de Souza, Ronald</td>
</tr>
<tr>
<td></td>
<td><a href="mailto:ronald@dsr.inpe.br">ronald@dsr.inpe.br</a></td>
</tr>
<tr>
<td><strong>JAXA</strong></td>
<td>Shimada, Masanobu</td>
</tr>
<tr>
<td></td>
<td><a href="mailto:shimada.masanobu@jaxa.jp">shimada.masanobu@jaxa.jp</a></td>
</tr>
<tr>
<td><strong>NASA</strong></td>
<td>Dobson, Craig</td>
</tr>
<tr>
<td></td>
<td><a href="mailto:craig.dobson-1@nasa.gov">craig.dobson-1@nasa.gov</a></td>
</tr>
<tr>
<td><strong>NOAA/EC-PORS</strong></td>
<td>Key, Jeff (Vice-Chair)</td>
</tr>
<tr>
<td></td>
<td><a href="mailto:jkey@ssec.wisc.edu">jkey@ssec.wisc.edu</a></td>
</tr>
<tr>
<td><strong>NOAA</strong></td>
<td>Clemente-Colon, Pablo</td>
</tr>
<tr>
<td></td>
<td><a href="mailto:pablo.clemente-colon@noaa.gov">pablo.clemente-colon@noaa.gov</a></td>
</tr>
<tr>
<td><strong>PLANETA</strong></td>
<td>Asmus, Vasilii</td>
</tr>
<tr>
<td></td>
<td><a href="mailto:asmus@planet.iitp.ru">asmus@planet.iitp.ru</a></td>
</tr>
<tr>
<td><strong>USGS</strong></td>
<td>Mullins, Jerry</td>
</tr>
<tr>
<td></td>
<td><a href="mailto:jmullins@usgs.gov">jmullins@usgs.gov</a></td>
</tr>
</tbody>
</table>
PSTG Potential Areas of Strategic Focus

- **Sea and glacial ice mass variability** and glacial ice **contribution to sea level**
- **Polar atmospheric, ocean, cryosphere and terrestrial products to facilitate improved weather, climate** and environmental observation, monitoring and prediction
- **Freshwater budget closure** at high latitudes (snow and permafrost impact on polar hydrological cycle)
- **Circumpolar changes in permafrost and terrestrial biosphere**
- **Physical and biological forcing of atmospheric chemistry** in polar atmosphere
- **Identifying new opportunities for integrated applications in response to emerging socio-economic issues of polar regions**
Polar Space Task Group (PSTG) relationships

Requirements Sources
- IGOS Cryosphere Theme
- GCOS
- WCRP ( CliC, Sparc, CLIVAR)
- IASC (iAOOS, SAON)
- SCAR
- GODAE
- Global Cryosphere Watch

Space Agencies
ASI, DLR, CNES, CMA, CSA, EUMETSAT, ESA, INPE, JAXA, NASA, NOAA, PLANETA, USGS, etc.

Secretariat
- WMO
- EC-PORS
  - Global Cryosphere Watch
  - Global Integrated Polar Prediction System

CM – High Level Policy on Sat Matters

GEO

CGMS

CEOS

WGClimate

Reporting

PSTG
Collaborative Approach for the PSTG

- Review and understand cryosphere and polar scientific requirements;
- Establish a balanced implementation strategy covering atmosphere, ocean and terrestrial domains;
- Develop a set of key strategic goals and translate them into observational requirements;
- Commitment to support data acquisition, and support for product development and establishment of relevant accompanying scientific studies, as appropriate for the Agency;
- Identify gaps in the existing observation capabilities and formulate recommendations for future satellite missions.
Future Steps

• CEOS SIT: Establish communication link to CEOS and via WG Climate for reporting purposes
• Collect state of art and cryospheric science requirements and priorities via Workshops and interactions with representatives of Cryospheric science community
• Establish WGs (as required) for coordinating data acquisition activities
  – SAR Coordination WG established
• Establish Strategic Implementation Plan
• Implement through annual meetings and alignment of commitments taken through respective Agency programmes
• Periodic reporting to CEOS, CGMS, EC-PORS, CM
Summary

- The multi-agency Polar Space Task Group is established on the foundation laid by the IPY Space Task Group.
- In absence of any other similar coordinating body - PSTG has been re-established to continue to organise and coordinate future earth observing campaigns in support of polar and cryospheric science.
- PSTG facilitates more efficient use of space infrastructure in polar regions.
- It provides an essential link between the polar science communities and space agencies for articulating coherent, space-based data requirements in support of the operational implementation.