SPACE AND THE ARCTIC

sponsored by the EC, ESA and EUMETSAT

Dr. Tillmann Mohr
**Day 1, Monday**
**19 October 2009**

18.00 - 21.00  
Ice breaker reception  
Steamer in Stockholm archipelago

**Day 2, Tuesday**
**20 October 2009**

08.00 - 09.30  
REGISTRATION at WTC

09.30 - 12.30  
Plenary Session I -  
Chair: Reinhard Priebe, EC/DG-MARE  
Moderator: Göran Boberg, SNSB  
WTC: Room New York

09.30 - 10.00  
Opening of the Workshop - Olle Norberg, Director General, Swedish National Space Board  
Introduction and aim of Workshop - Reinhard Priebe, Director responsible for the Arctic, EC/DG-MARE

10.00 – 10.30  
Environmental challenges in the Arctic - Nicolaj Bock, EEA

10.30 – 11.00  
Arctic marine transport and space - Lawson Brigham, University of Alaska Fairbanks, USA

11.00 – 11.40  
Coffee Break

11.40 – 12.00  
Space today and possibilities for the future  
Volker Liebig, Director of ESA EO Programme

12.00 – 12.20  
Observations of the Arctic: EUMETSAT’s Contribution to Current and Future Programmes  
Ernst Koenemann, Director of EUMETSAT Programme Development

12.20 – 12.30  
Discussion

12.30 – 13.30  
Lunch
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<th>Room</th>
<th>Chair &amp; Rapporteur</th>
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<td>14.00-17.40</td>
<td>Thematic Session: Climate Change and the Arctic</td>
<td>New York</td>
<td>Tillman Mohr, Hugo de Groof</td>
<td>Pierre Le Borgne, Meteo France, France, Steinar Eastwood, met.no, Norway</td>
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<td>14.00-17.40</td>
<td>Thematic Session: Transport &amp; Security</td>
<td>Manhattan</td>
<td>Thomas Fagà, Bertil Håkansson</td>
<td>Ulf Gullne, Swedish Maritime Agency, Sweden</td>
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<td>14.00-17.40</td>
<td>Thematic Session: Sustainable Exploitation</td>
<td>Paris</td>
<td>Iain Shepherd, Ola Gråbak</td>
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<td>14.00-14.20</td>
<td>Sea surface temperature measurements over the Arctic</td>
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<td>14.20-14.40</td>
<td>The International Polar Year - The contribution by</td>
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<td>14.20-14.40</td>
<td>Space Agencies and expected observational legacies</td>
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<td>Monitoring the cryosphere from space: research and</td>
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<td>15.00-15.20</td>
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<td>Circumpolar permafrost monitoring</td>
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<td>14.00-14.20</td>
<td>Satellite reception of AIS signals from vessels in</td>
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<td>14.20-14.40</td>
<td>the Arctic, Ghislain Ruy, Luxspace, Luxemburg</td>
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<td>Transports in the Baltic Sea and needs for Northern</td>
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<td>oil spill service, CleanSeaNet</td>
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<td>15.00-15.20</td>
<td>SeaTrack Web - the Oil spill information system and</td>
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<td>15.00-15.20</td>
<td>Hydrological predictions for the Arctic environment</td>
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<td>14.20-14.40</td>
<td>Reindeer husbandry and forestry – conflict</td>
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<td>14.40-15.00</td>
<td>EO based services for climate change adaptation,</td>
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| 15:40–16.00 | Challenges to ice monitoring around Greenland  
Volker Rachold, Executive Secretary, International Arctic Science Committee (IASC)  
Lars Toudal Pedersen, Danish Meteorological Institute, Denmark |
| 15:40–16.00 | Russian space infrastructure applied to the Arctic  
Vasili Smolyanitsky  
Arctic and Antarctic Research Institute & JCOMM, Russia |
| 16.00–16.20 | On Galileo for the Arctic  
Frank Udnaes, EC/IDG Energy & Transport |
| 16.20–16.40 | Regional Modelling of Arctic climate in recent and possible future climates  
Ralf Döscher, Swedish Meteorological and Hydrological Institute/Rossby Centre, Sweden |
| 16.20–16.40 | Navigating in iceberg infested waters  
Scott Rogerson, International Ice Patrol |
| 16.20–16.40 | Serving the Arctic: Polar Communications and Weather (PCW) Mission  
Guennadi Kroupnik, PCW Mission Manager, CSA |
| 16.40–17.00 | Stockman Oil field, SDAG  
Edmond Coche, Stockman Development AG |
| 17.00 - 17.20 | Sea ice change and climate  
IPY and ESA  
Henri Laur, Head of ESA Mission management office |
| 17.00 - 17.20 | ESA activities related to satellite communications for high latitude regions  
Frank Zeppenfeldt, ESA |
| 17.20–17.40 | Rapporteur report & Statement Discussions  
Hugo de Groof, DG-ENV |
| 17.20–17.40 | Rapporteur report & Statement Discussions  
Bertil Håkansson, SMHI |
| 17.20–17.40 | Challenges for fisheries enforcement and safety in the far north  
Gunnar Pedersen, KSAT, Norway |
| 17.20–17.40 | Rapporteur report & Statement Discussions  
Ola Gråbat, ESA |
Day 3, Wednesday
21 October 2009

09.00-12.00 Plenary Session II
Chair: Reinhard Priebe, EC/DG-MARE
Moderator: Jerome Bequignon, ESA
WTC: Room New York

09.00 – 09.15 Session Reports & Statement - Discussions
Rapporteurs

09.15 – 09.45 EU - Baltic Regional Strategy
Alexander Schenk, Ministry of Finance, Swedish Governmental Offices

09.45 – 10.15 The Potential of GMES in the Arctic
Mikko Strehendorff, EC GMES Bureau

10.15 – 10.45 Marine Core Services
Pierre Bahurel, Mecator, Coordinator, MyOcean project

10.45 – 11.15
Coffee Break

11.15 – 11.45 Progress since the Arctic Communication
Reinhard Priebe, EC/DG-MARE

11.45 – 12.00 Statement Conclusion and Workshop closing:
Jerome Bequignon, ESA
Conclusions (1)

1. The advances in Arctic sciences made possible by Earth observations have led to a better understanding of climate change and its consequences to the Arctic environment.

4. Current Earth Observation satellites provide good monitoring of sea-ice concentration and extent as well as the arctic land environment. The GMES Sentinel missions is a means to continue and improve operational sea-ice and iceberg monitoring and as input to essential climate variables. ESA polar orbiting satellites ERS-1 and 2 and Envisat, replaced and complemented by the planned Sentinel missions, will ensure continuity of observations.
Conclusions (2)

5. Meteorological satellites in geo-stationary orbits lack coverage in the far North. This not only restricts the accuracy of weather forecasts in the region but also limits information on climate change. Meteorological satellites in polar-orbit for monitoring the Polar Regions such as EUMETSAT Polar Satellite Programme including the Satellite Application Facilities, will contribute to an increased coverage of the Arctic.

6. It is essential to continue research and development of new satellite sensors complementary to in-situ observation infrastructure and surveys. By monitoring precise changes in the thickness of the polar ice caps and floating sea-ice the upcoming Cryosat-2 mission can answer essential questions on the changing Arctic environment. Enhanced sea-ice thickness measurements are also a key to effective and safe ice navigation in the future.

11. International partners are already planning special-purpose missions for Arctic communication and observation. Any European capability should complement and not duplicate these efforts.
Recommendations

b. The European Commission to ensure that proposals for future operational GMES satellites and services, address the special needs of the Arctic (sea ice, icebergs, snow, glaciers, ice sheets and permafrost)

d. ESA and EUMETSAT to review the coverage of meteorological missions and to identify the necessary priorities and technical solutions for weather forecast.

g. The European Commission, ESA, and Member States to sustain continuous observations ensuring long term data records to support climate monitoring. The European Space Agency and EUMETSAT should discuss the possibility of joint programmes with international partners.

h. The EU, ESA, EUMETSAT and their Member States as well as other involved parties to support and implement a fully open and “obstacle” free data access policy and infrastructure.

i. ESA to check the requirements of the Sustaining Arctic Observing Networks (SAON) for measurements from space.