

SWEDES FOR SCAR's WORKING GROUPS

At the meeting reconstructing the Swedish SCAR Committee, in Stockholm 2008-03-06, it was also discussed who should represent Swedish research in SCAR's various working groups - those relevant versus Swedish research. After some post-meeting discussions and considerations the list below represents the present state-of-the-art:

Astrophysics & Astronomy/AA and Antarctic Astronomy & Astrophysics/AAA: Per Olof Hulth, Physics, Stockholm University, hulth@physto.se

Antarctic Climate Evolution/ACE: Margareta Hansson, Physical Geography, Stockholm University, margareta.hansson@natgeo.su.se

Antarctica and the Global Climate System/AGCS: Sheila Kirkwood, Spacephysics, Kiruna, sheila@irf.se and Margareta Hansson as above.

Environmental Contamination in Antarctica/ECA: Henrik Kylin, Environmental Assessment, Swedish University of Agricultural Sciences, henrik.kylin@ma.slu.se and Björn Olsen, Medical Sciences, Uppsala University, bjorn.olsen@medsci.uu.se

Geodetic Infrastructure of Antarctica/GIANT: Lars Sjöberg, Geodesy & Photogrammetry, Royal Institute of Technology, Stockholm, sjoberg@geomatics.kth.se - who may also take part in *Antarctic Neotectonics/ANTEC* work.

History of Antarctic Research: Aant Elzinga, History of Ideas and Theory of Science, University of Gothenburg, aant.elzinga@hum.gu.se and Dag Avango, History of Science and Technology, Royal Institute of Technology, Stockholm, avango@kth.se and Lisbeth Lewander, Gender Studies, University of Gothenburg, lisbeth.lewander@wmst.gu.se

Biology and Medicine: Björn Olsen, Medical Sciences, Uppsala University, bjorn.olsen@medsci.uu.se

International Bathymetric Chart of the Southern Ocean/IBCSO: Martin Jakobsson, Geology & Geochemistry, Stockholm University, martin.jakobsson@geo.su.se

Ice Sheet Mass Balance and Sea Level/ISMASS and Subglacial Antarctic Lake Environments/SALE: Per Holmlund, Physical Geography, Stockholm University, per.holmlund@natgeo.su.se

Biological Monitoring: Bo Fernholm, Swedish Museum of Natural History, Stockholm, bo.fernholm@nrm.se and potentially also Terö Härkönen, at the same address, tero.harkonen@nrm.se, who may also represent us in the *Seals* group.

SCAR and Oceanography: Katarina Abrahamsson, Marine Chemistry, University of Gothenburg, k@chem.gu.se and potentially also Göran Björck, Geoscience Center, University of Gothenburg, gobj@gvc.gu.se

Permafrost and Periglacial Environments/PPE: Jan Bouelhouwers, Physical Geography, Uppsala University, jan.boelhouwers@natgeog.uu.se

Highlights of Swedish Antarctic Research 2007/08

JASE - The Japanese Swedish Antarctic Expedition 2007/08

Swedish PI: Prof. Per Holmlund, Stockholm University; per.holmlund@natgeo.su.se

This expedition was a 3000 km ITASE traverse between the Japanese station Syowa and the Swedish station Wasa, via the deep ice core drilling sites Dome Fuji and Kohnen (EPICA-DML). The scientific programme was linked to the project Trans-Antarctic Scientific Traverses Expeditions – Ice Divide of East Antarctica (TASTE-IDEA). The Swedish part of the traverse started at the Wasa station (73°S, 13°W) and travelled via the Kohnen station along the ice divide towards Dome Fuji. Some of the specific scientific aims of the expedition were to: 1) produce a steady state EPICA-DML deep ice core record based on surface measurements along the flow line, 2) determine variability of accumulation rate of snow, 3) model backscatter from ENVISAT ASAR (satellite sensor) over Antarctic firn/snow, 4) characterize atmospheric aerosol, 5) study air-snow transfer processes, 6) study changes in position of ice divide and basal processes, and 7) to map surface and bedrock topography.

MARA – Moveable Atmospheric Radar for Antarctica

PI: Sheila Kirkwood, Swedish Institute of Space Physics; sheila.kirkwood@irf.se

This is a multi year project in atmospheric physics using radar equipment at the Swedish station Wasa (73°S, 13°W) to study waves in the mesosphere and aerosol particles. The science addressed with the radar includes: 1) Understanding processes related to aerosol particles and waves in the polar middle atmosphere by testing theories based on measurements in the Arctic against observations over Antarctica. 2) Understanding the origin and development of tropospheric aerosol particles in the relatively 'clean' air of the Antarctic in comparison with the polluted air of the Arctic. The radar will contribute to accurate back-trajectory calculations for aerosol particles arriving at the measuring site, which are studied by scientists from the Finnish Meteorological Institute. 3) Improving understanding of the meteorological disturbances which determine weather conditions at Nordenskiöldbasen and neighbouring Antarctic stations.

ICECUBE

Swedish PI: Per Olof Hulth, Stockholm University; hulth@physto.se

Sweden is a long standing and substantial partner in the international collaboration IceCube (formerly AMANDA). IceCube is a neutrino observatory for astrophysics to be installed at the South Pole during Austral summers over approximately six years. The IceCube In-Ice detector will consist of a minimum of 4200 optical modules deployed on 70 vertical strings buried 1450 to 2450 meters under the surface of the ice, and an IceTop surface air-shower detector array comprised of a minimum of 280 optical modules. Once a significant fraction of the IceCube array is completed it will be operated and used for scientific investigations as the maturity of the system allows. The completed detector will be operated for 20 years. The detector is being designed, built, installed and used for research by an international collaboration. Scientific goals for the project include: 1) to open unexplored wavelength bands for astronomy including the PeV (10¹⁵ eV) energy region, 2) to answer fundamental questions as to the physical conditions in gamma ray bursts and whether the multi-TeV photons are of hadronic or electromagnetic origin, 3) to predict the "diffuse" flux of high-energy neutrinos, 4) to work the multi-prong attack on the particle nature of dark matter, 5) to search for super-symmetric particles and the topological defects created during grand unified phase transitions in the early universe, and 6) to study neutrino oscillations over megaparsec baselines.

Oden Southern Ocean 2007/08

USA and Sweden have joined in a multi year cooperation to perform research cruises in the Southern Ocean with the Swedish icebreaker Oden. The scientific objective of the cruise was to collect a range of data in sectors of the Antarctic seas that are rarely visited and data-sparse. The primary cruise track went from Punta Arenas in Chile, across the Drake Passage towards Antarctica. At the Marginal Ice Zone the ship followed the ice edge west through the Bellingshausen and Amundsen Seas, and then southwest through the Ross Sea polynya to McMurdo Sound. The 17 days transit of this primary track was extended by 20 dedicated science days for transects, water column profiles and ice stations. The Oden is a Class 1A icebreaker with research laboratories including a sea water intake system, and a multibeam sonar with a sub bottom profiler. The focus of Swedish scientific projects on the cruise included: 1) organo-halogens and atmospheric ozone depletion, 2) organic contaminants, 3) marine bacterial populations, 4) CO₂ uptake and fluxes, sea ice and biogeochemical processes in the ocean, 5) chemosynthetic ecosystems, and 7) structural systems biology of picoplankton.