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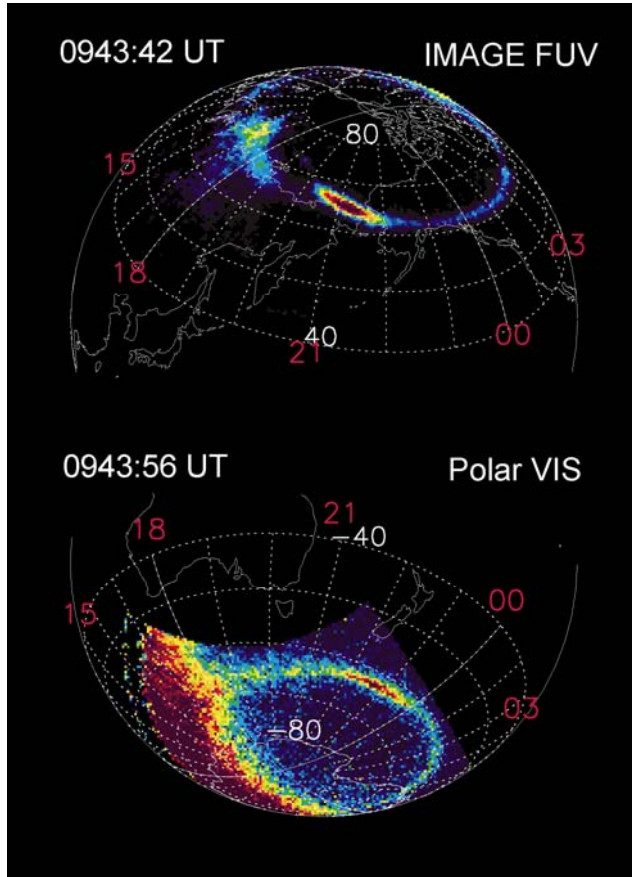


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The Norwegian IPY-ICESTAR program is part of the IPY ID63:project "Heliosphere Impact on Geospace"

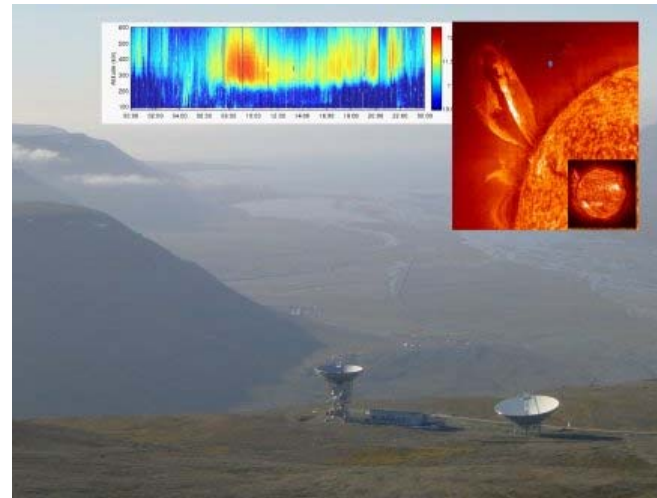


An auroral brightening (substorm) seen simultaneously in South and North

Main objectives

1. **How various constituents of the magnetosphere-ionosphere system respond to geomagnetic disturbances under different heliospheric conditions. This will be achieved by studying:**
 - Interhemispherical studies from space and ground.
 - Middle atmosphere chemistry changes induced by energetic particle precipitation

2. **Continuous radar measurements by the EISCAT Svalbard Radar throughout the Polar Year.** With the IPY open data policy these data will be freely accessible for the international community and also be used as a main data base for our own scientific studies
3. **Public Outreach and Education**
 - The Space Suitcase
 - Conference on Space Science for Norwegian journalists

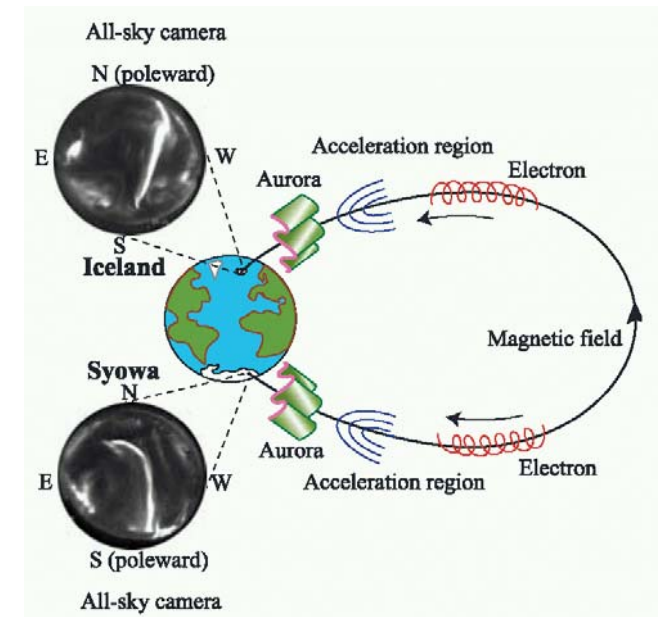


The Svalbard radars respond to a coronal mass ejection (upper right). Large increases of electron densities in the ionosphere (upper left).

IPY-ICESTAR research

The scientific goals of the Norwegian ICESTAR/IHY Program are closely linked to the international ICESTAR Program and will focus on Inter-hemispherical Studies of magnetosphere-ionosphere coupling the heliospheric drivers and the effects of geomagnetic disturbances in the mesosphere and stratosphere.

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Aurora seen from Iceland and Syowa (Antarctica) simultaneously (Sato et al., 2005)

The overall program will assess:

- how the various constituents of the magnetosphere-ionosphere system respond to geomagnetic disturbances under different heliospheric conditions, and
- how these disturbances interact with the polar upper and middle atmosphere.

We will determine:

- the timing and location of substorm onsets in the two hemispheres.
- the conjugacy or non-conjugacy of theta aurora to obtain information about structure and dynamics of the closed magnetosphere during positive z - component of the interplanetary magnetic field.
- the magnetic reconnection rates (dayside and nightside) to clarify the energy/mass exchange with the solar wind.
- the interaction with the middle atmosphere by use of satellite and ground-based observations of minor constituents in the middle atmosphere, and measures of energetic particle precipitation (EPP) to further develop models of the EPP-induced chemical changes, in particular with regard to nitrogen species.

We will obtain new knowledge about interaction between magnetosphere and ionosphere by radar observation of ion outflow and related fine scale ionospheric structures and plasma physics, and also from observations of conductance, convection patterns, polar cap potentials and field aligned currents in the two hemispheres.