

Growth in Arctic operations increases the need for space infrastructures: communication, navigation, earth observation

Klikk for å redigere undertittelstil i
malen

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Increasing activities in the Arctic

➔ Increasing need for communication and navigation

Oil & Gas



Transport



Search & rescue

Tourism



Fisheries

Increasing activities in the Arctic

→ Space infrastructures are indispensable in the Arctic

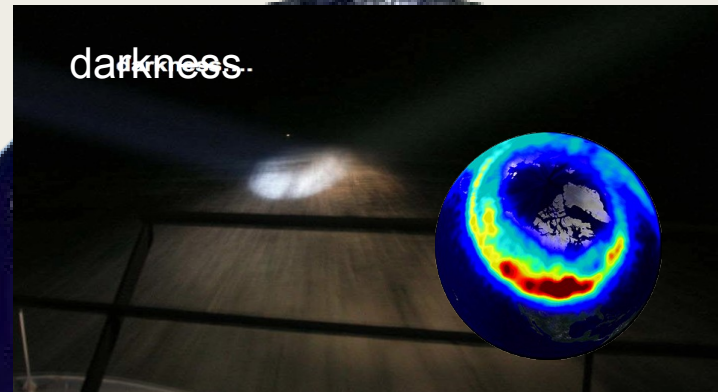
V a s t A r c t i c o c e a n



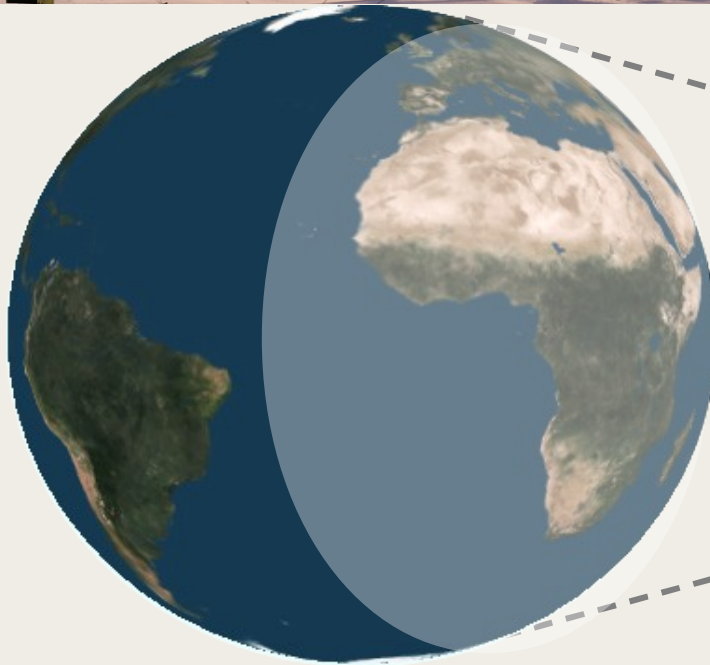
L a c k i n g
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C h a l l e n g i n g w e a t h e r



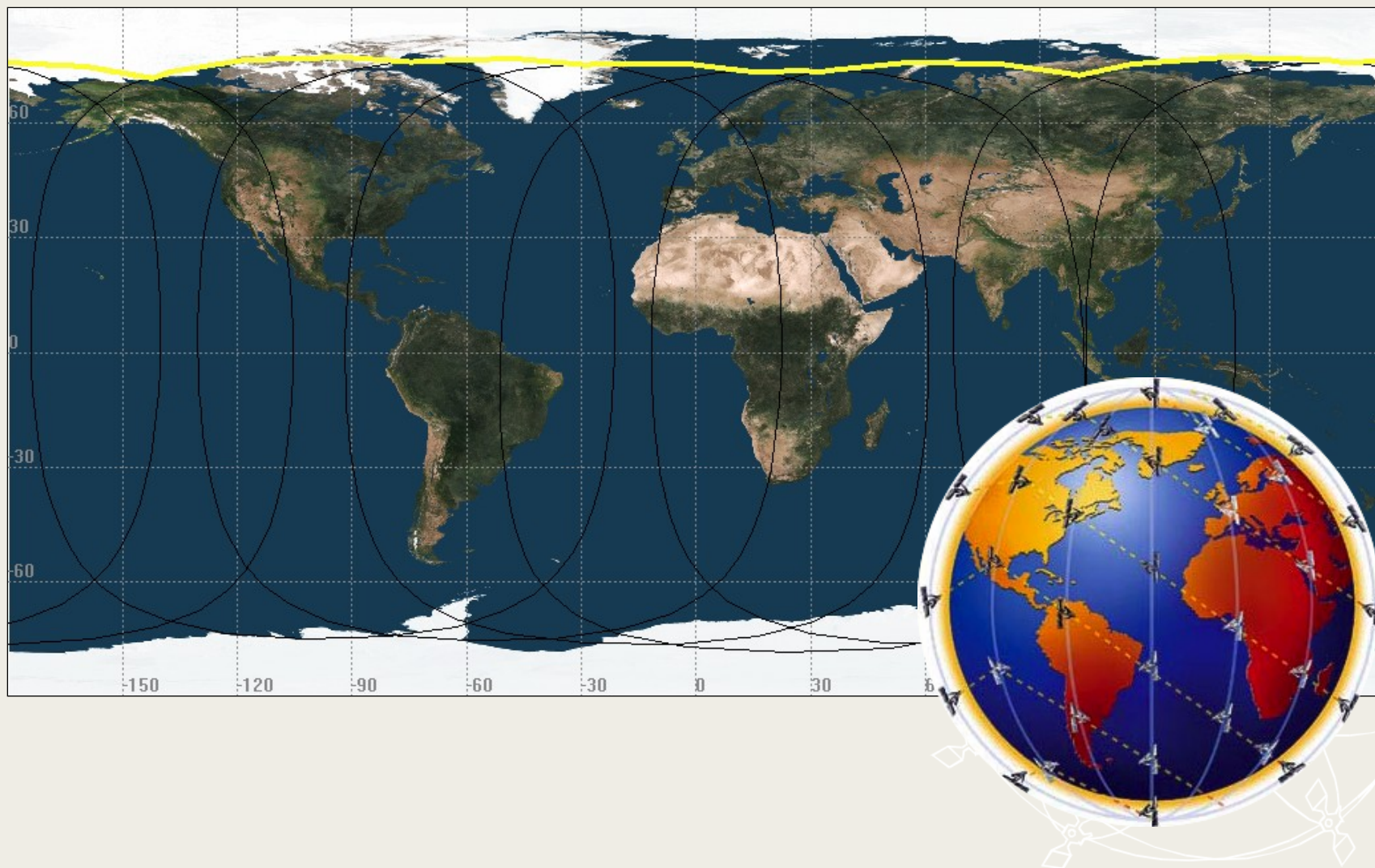
Geostationary satellites do not cover the Arctic



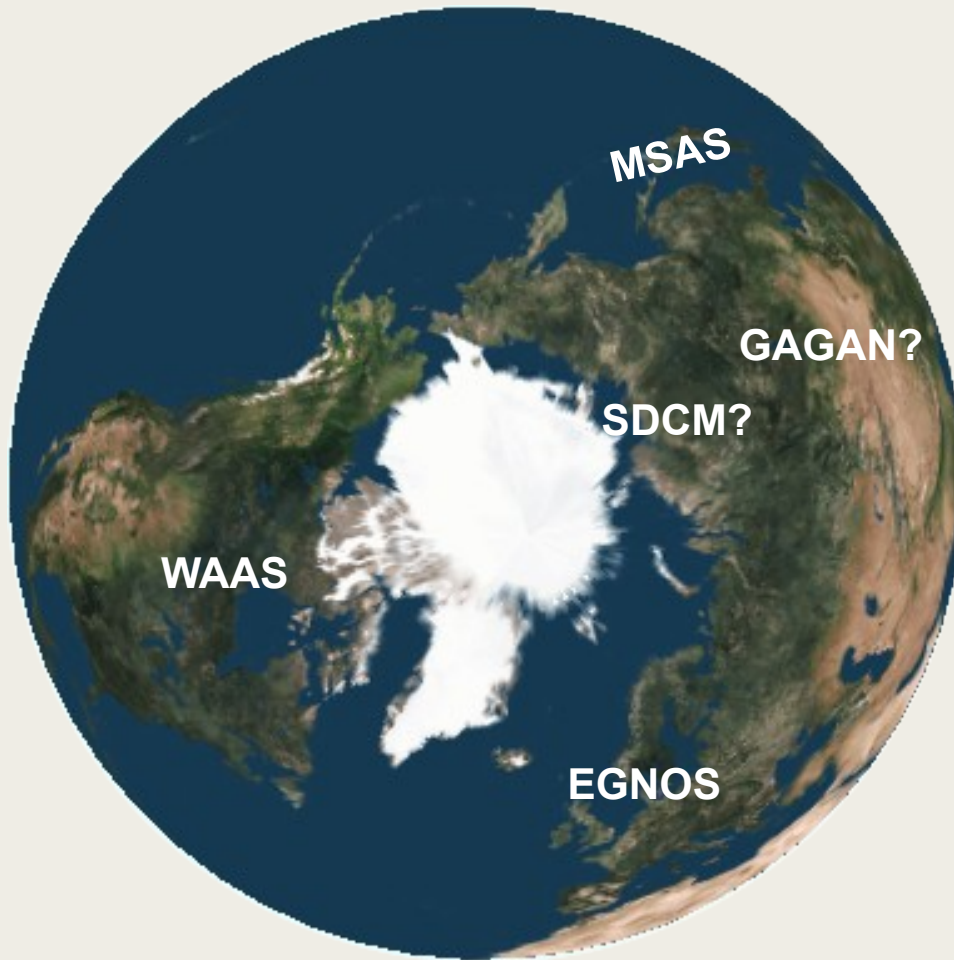
35 800 km altitude

Geostationary satellites (GEOs) are used for broadband communication and broadcast

Only narrowband communication north of GEO footprints

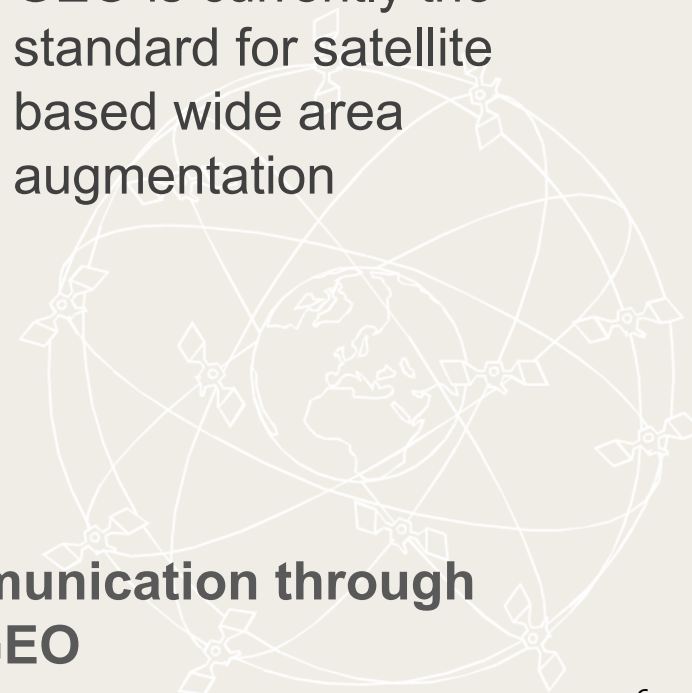


GEO as part of a navigation system will not cover the Arctic



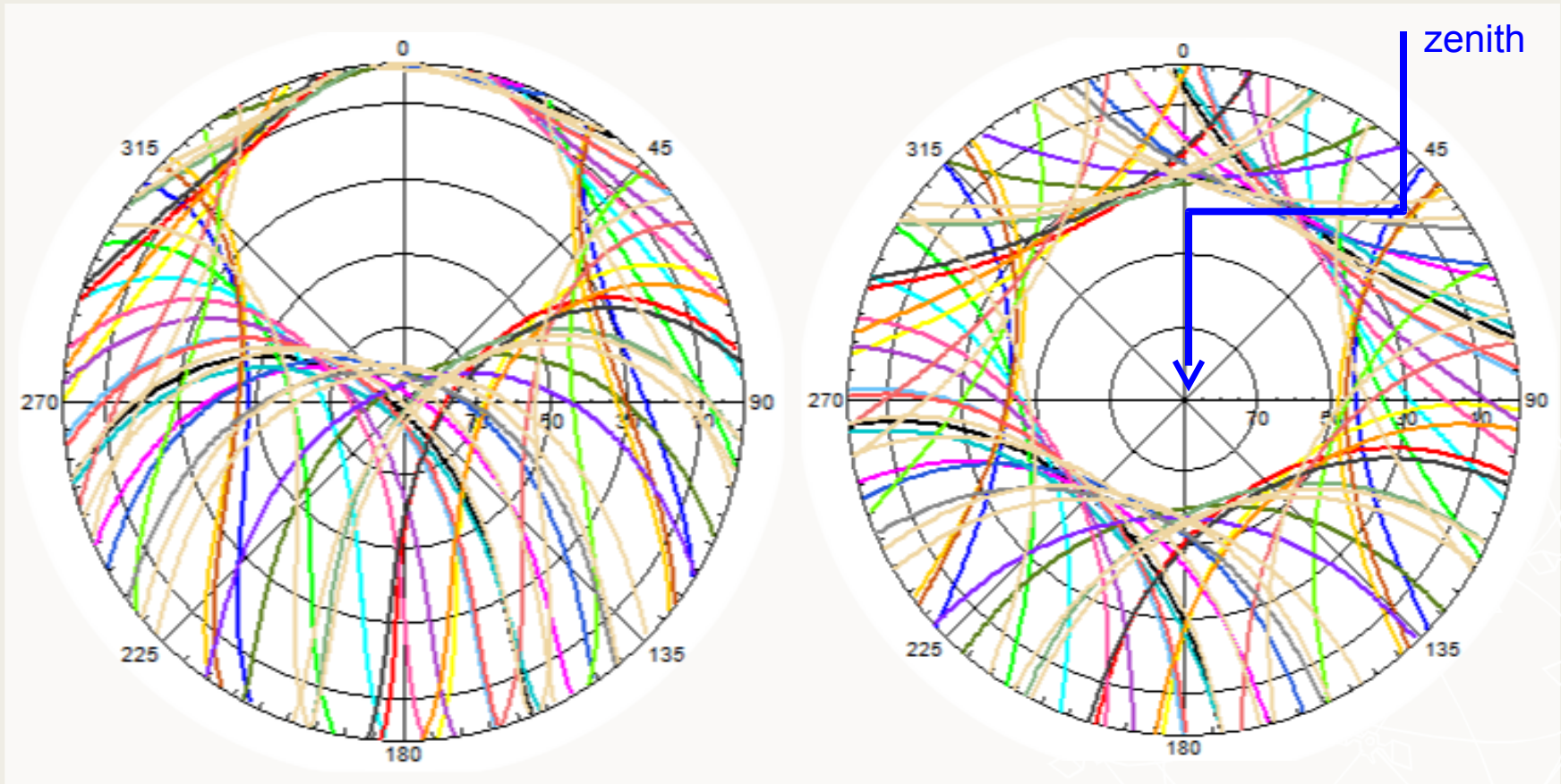
- Safety-of-life integrity service required for both maritime and aviation applications
- GEO is currently the standard for satellite based wide area augmentation

Distribution of integrity needs communication through other means than GEO



No navigation satellites in zenith affects vertical accuracy

GPS SkyPlot, dec 8 2010

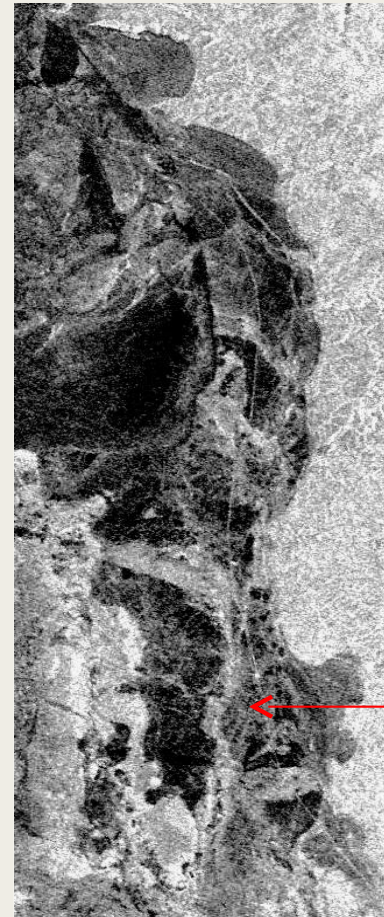


Paris 48° N

Longyearbyen 78° N

Shrinking ice cap → Increasing ship transport in and close to the ice

Transport in the ice – clear sky



Radar data from Envisat

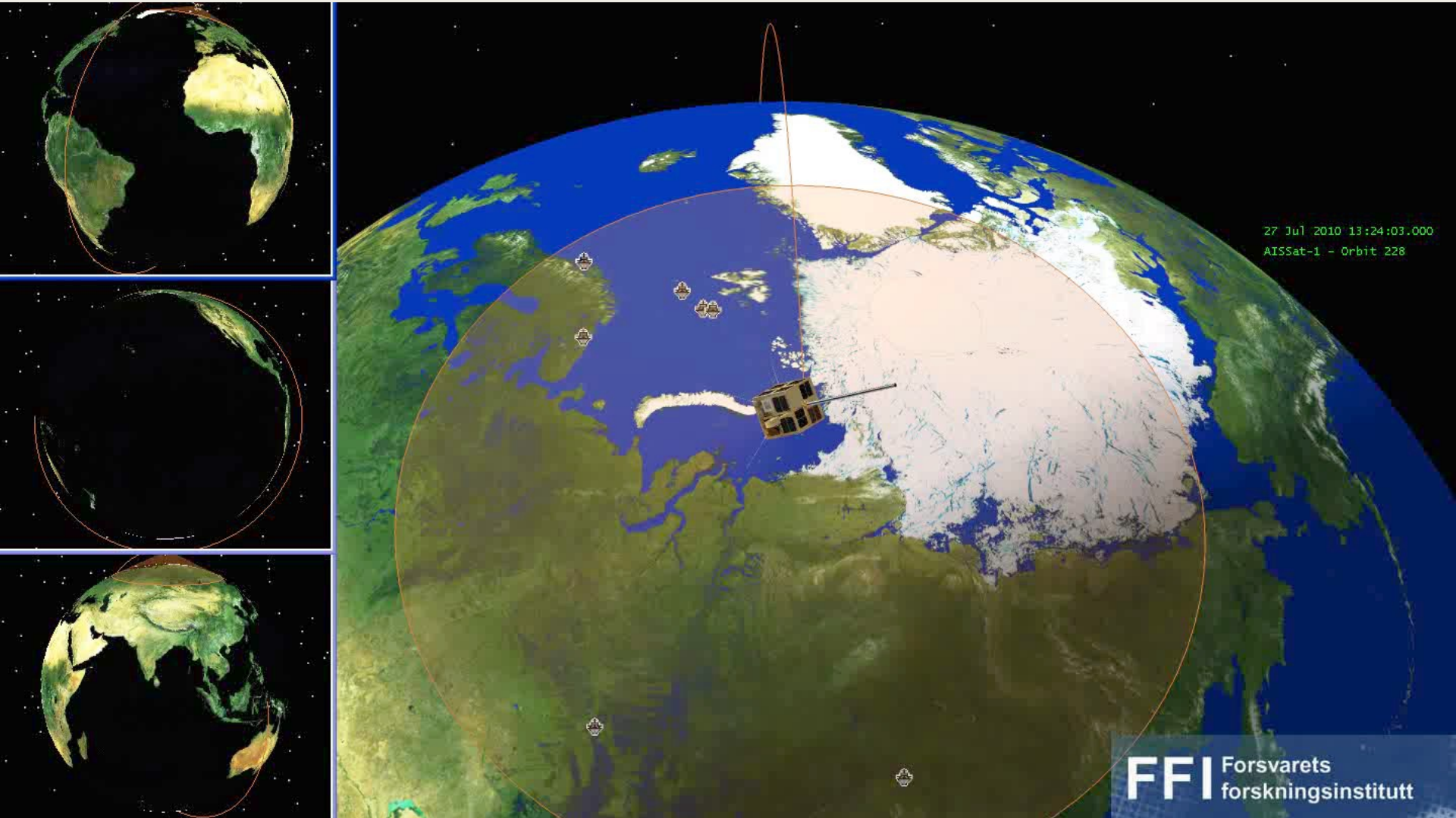


Ice navigation based on satellite imaging, satellite navigation, and satellite communication

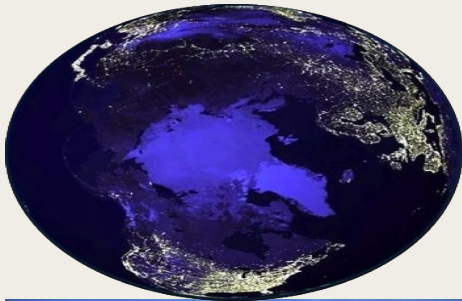
AIS (Automatic Identification System) Automatic identification of ships from space



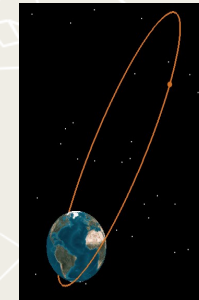
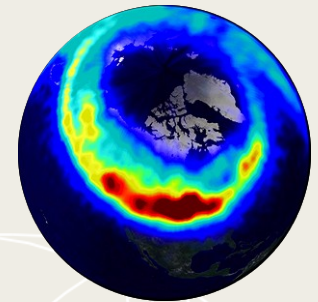
AISSat-1 a small cube satellite monitoring ship traffic from polar orbit of 600km



Growth in Arctic operations → increasing needs for navigation, communication & monitoring



- ICT demands as in “rest of world”
- Vast ocean, remote area: no ubiquitous infrastructure
- Solar activity
- Space systems based on GEOs will not suffice



Special focus and measures needed