



SWARM

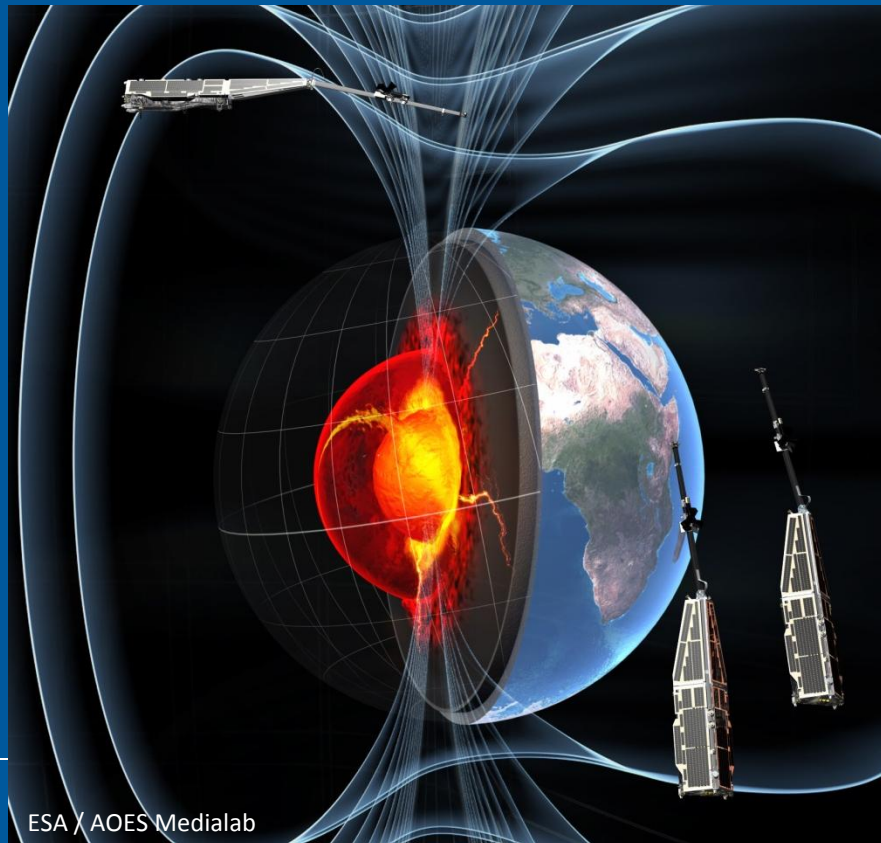
Swarm: ESA's satellite trio on voyage through Earth's magnetic field

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part of ESA's Living Planet Programme

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ESA / AOES Medialab

Swarm

Objective: to provide the best ever survey of the geomagnetic field and its temporal evolution



Proposed: 2002

Selected: 2004

Constellation

- 3 satellites:
 - 2 side-by-side in low orbit
 - 1 in higher orbit
- three orbital planes with two different near-polar inclinations
- Near polar orbits for global coverage

Each single satellite

- Magnetic field magnitude and vector components
- Electric field vector components
- Plasma density and temperature
- Ion drift velocity
- Air drag
- Position, attitude and time

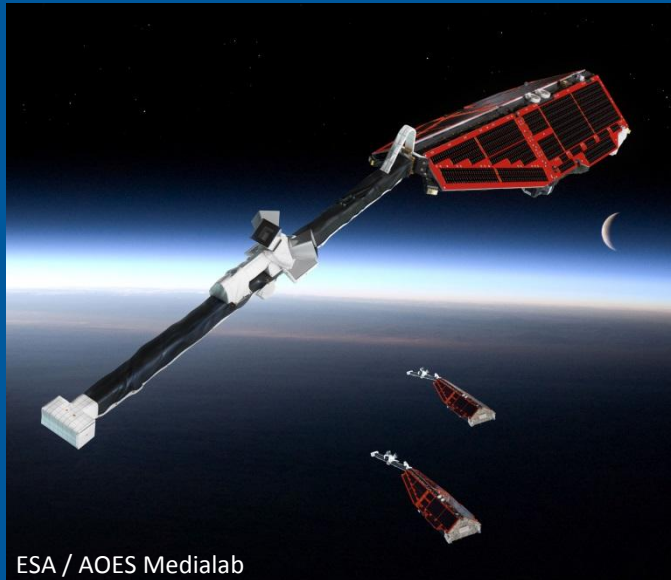
Swarm Mission Details

Manufacturer:

- EADS Astrium
Friedrichshafen

Launch:

- 22. November 2013
- Rockot (Eurockot) “all in one”

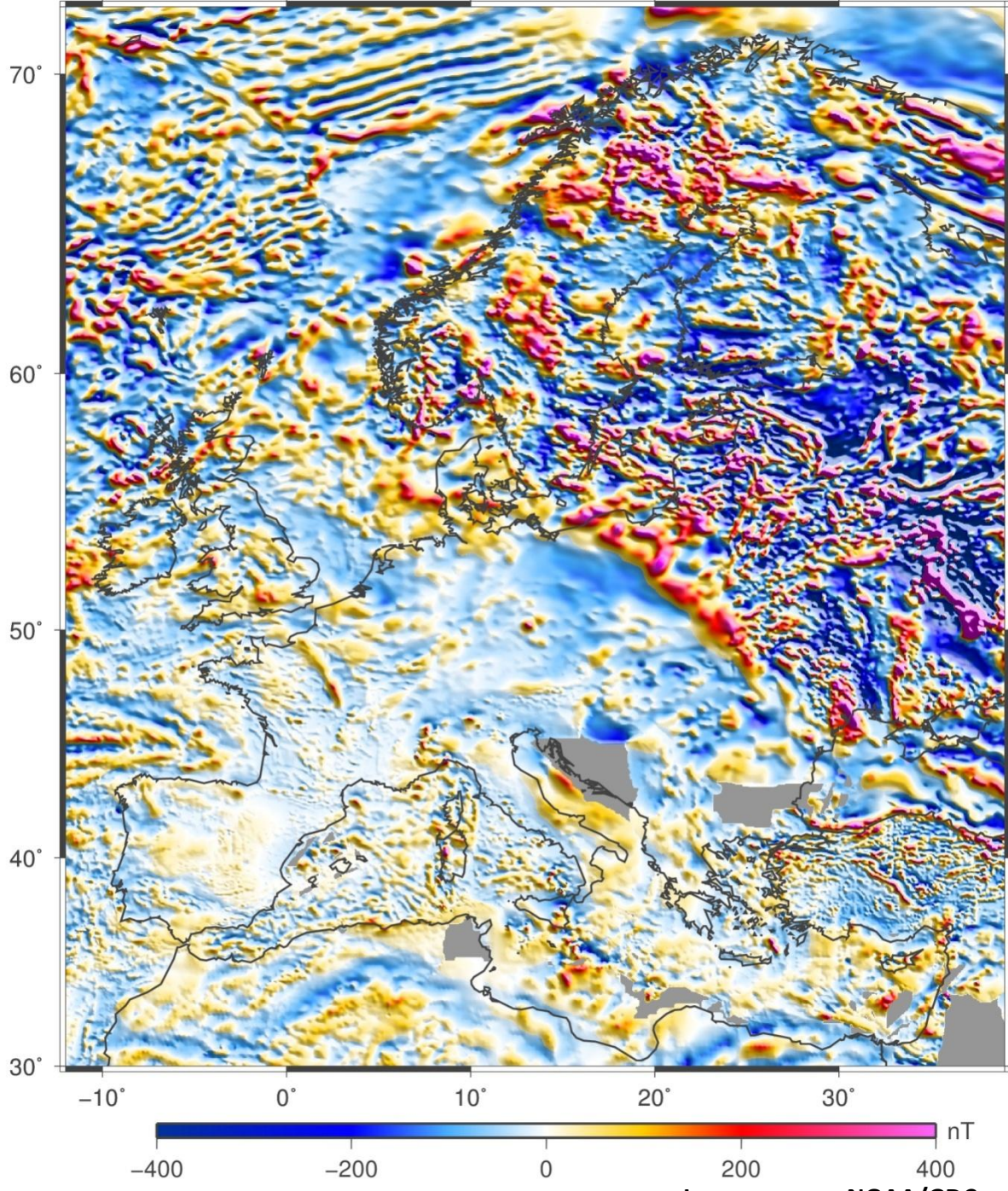


Relevance of Swarm & Mission objectives

- Observation of the geomagnetic field and its variations
- insights into the interior of the Earth (e.g. processes at the core-mantle boundary)
- Insights into Earth's ionosphere and current systems
- Interactions of atmosphere and solar wind
-> Forecast of disturbances in the signal transmission (e.g. GPS)
- **Magnetization of the crust**-> discovering ore deposits
- Ocean circulation
- Gravity field
- Navigation

Crustal magnetization map

- Due to magnetic minerals -> detection of ore deposits
- Carries information about the past of a terrestrial planet, its evolution, and its tectonic, magnetic and thermal history
- High resolution through stereo effect of the low orbiting Swarm pair



Stereo view of the two low orbiting Swarm satellites



- Overlap of the mapped area from two slightly different viewing angles
- Spatial resolution: 150 km

- Coordination of the German SWARM user community
- Information about:
 - Satellite and mission design
 - Swarm data products
 - Product utilisation
 - ESA Announcements
- Initiation and coordination of German funding programmes,
- Compilation of an appropriate user concept,
- Contact point for industry, politics and press.

Duration: June 2009 – June. 2014

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www.swarm-projektbuero.de

