

Services for Space Mission support within the ESA Space Situational Awareness Space Weather Service Network

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<http://swe.ssa.esa.int>



Outline

- I. Objectives
- II. Space Weather & Effects
- III. ESA Space Situational Awareness Programme
- IV. Space Weather Services for Satellite Operations and Space Missions
- V. Conclusion

I. Objectives



Introduce ESA's SSA SWE Service Network



Build link with user's community

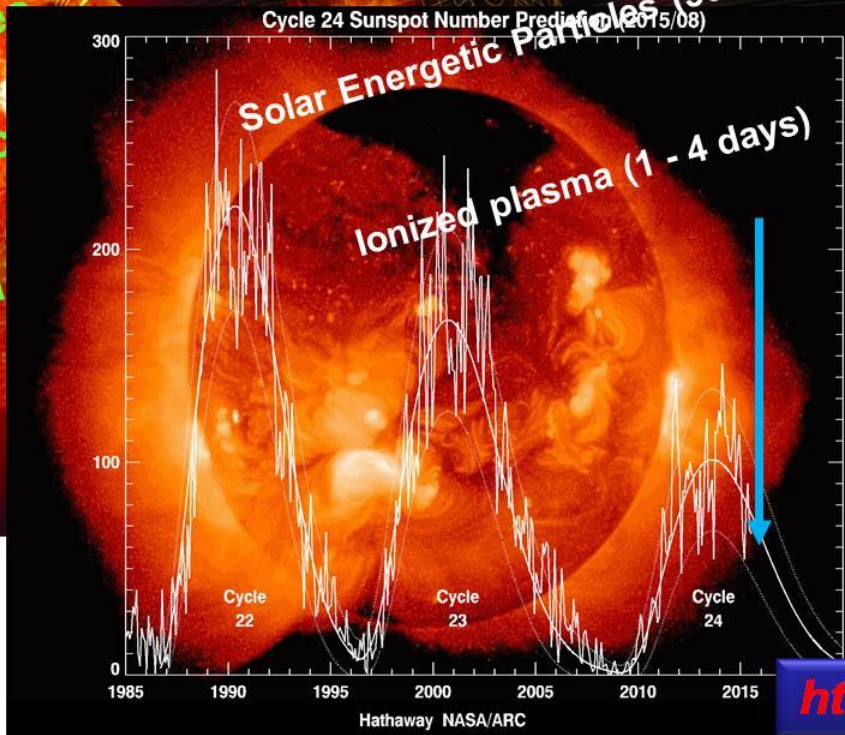
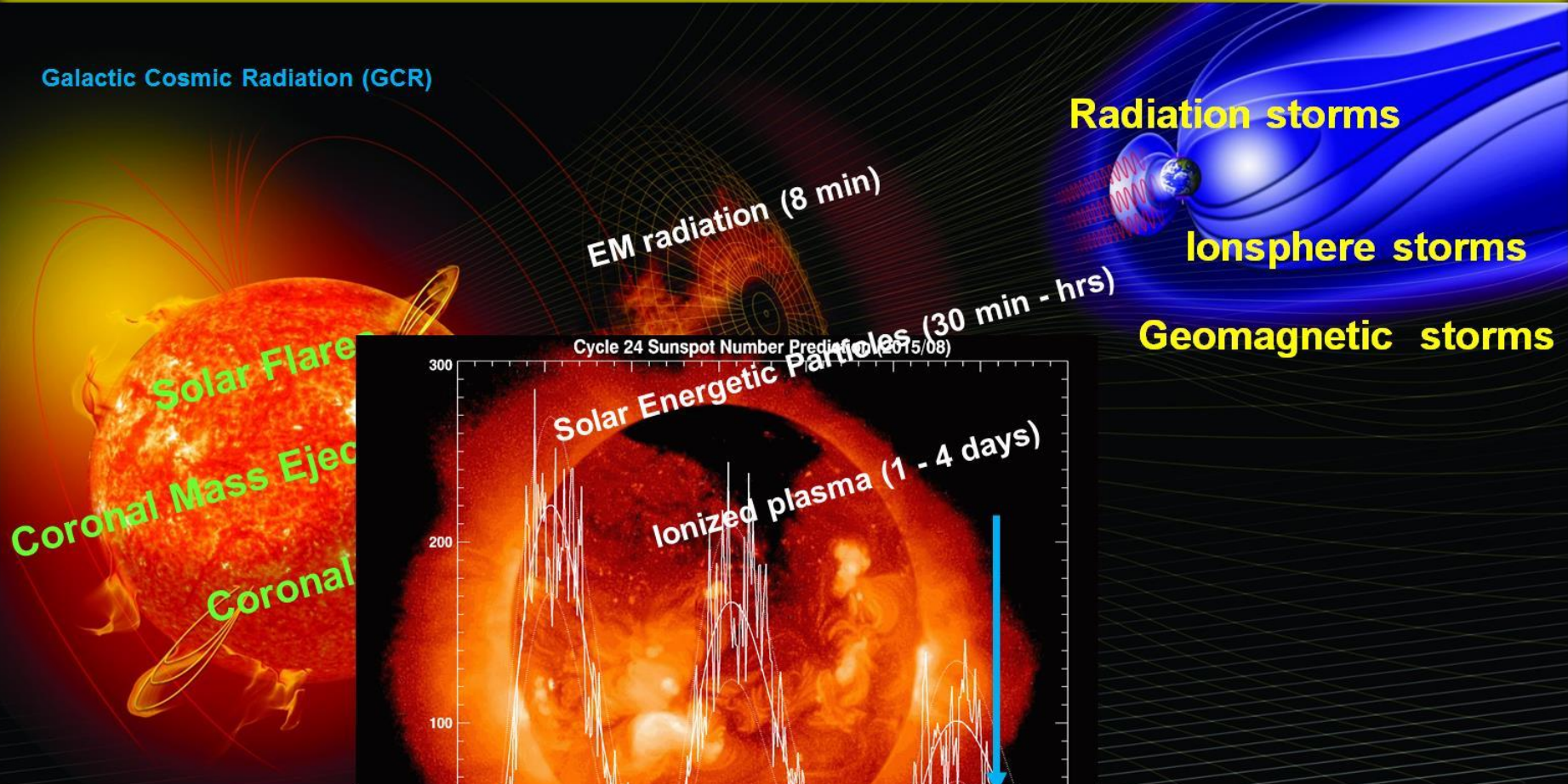
→ collecting contact points

→ understanding user requirements

Ila. Space Weather – Drivers

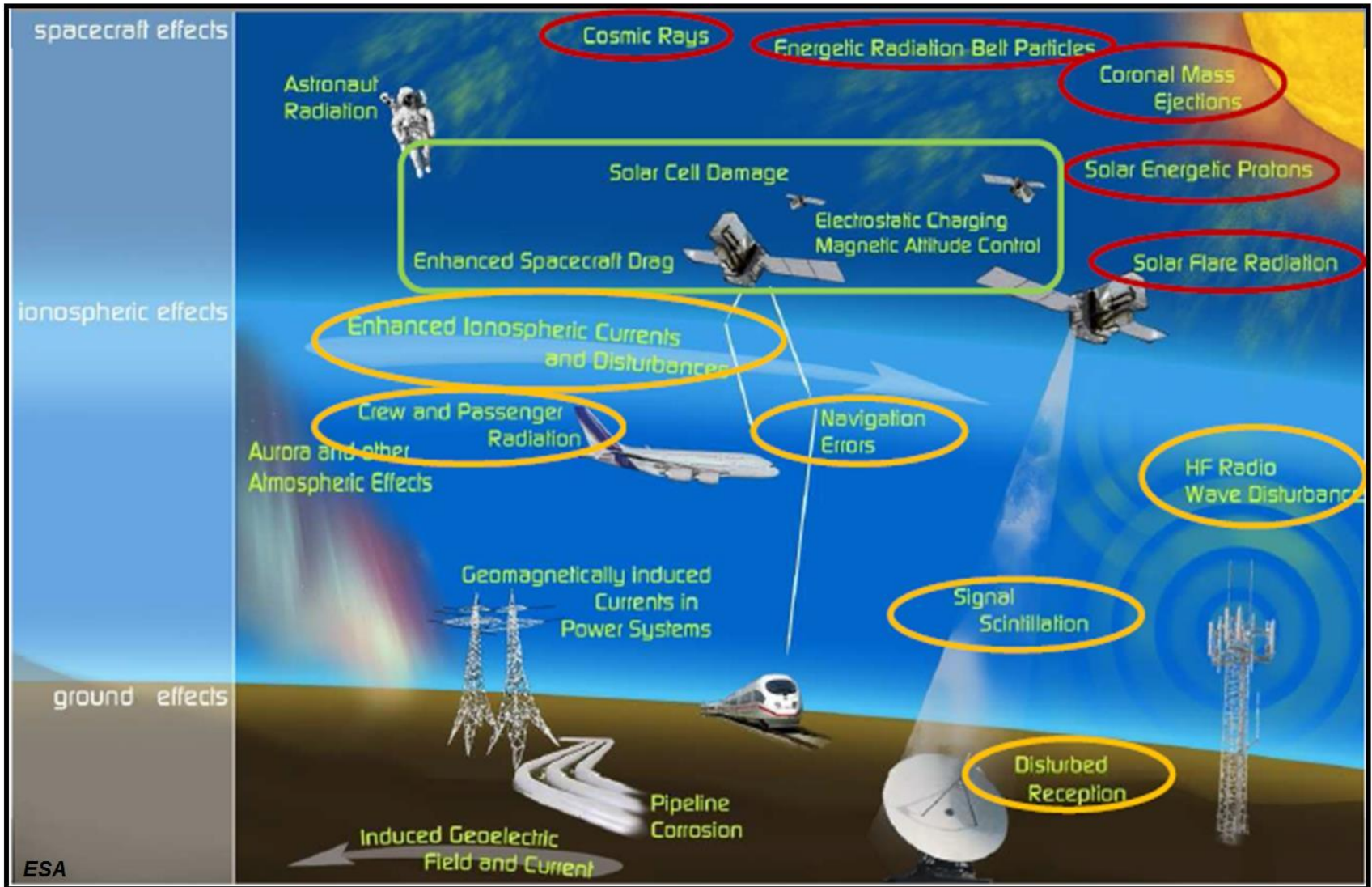
Space Weather: Disturbances of the upper atmosphere and near-Earth space environment that can disrupt technology

Galactic Cosmic Radiation (GCR)



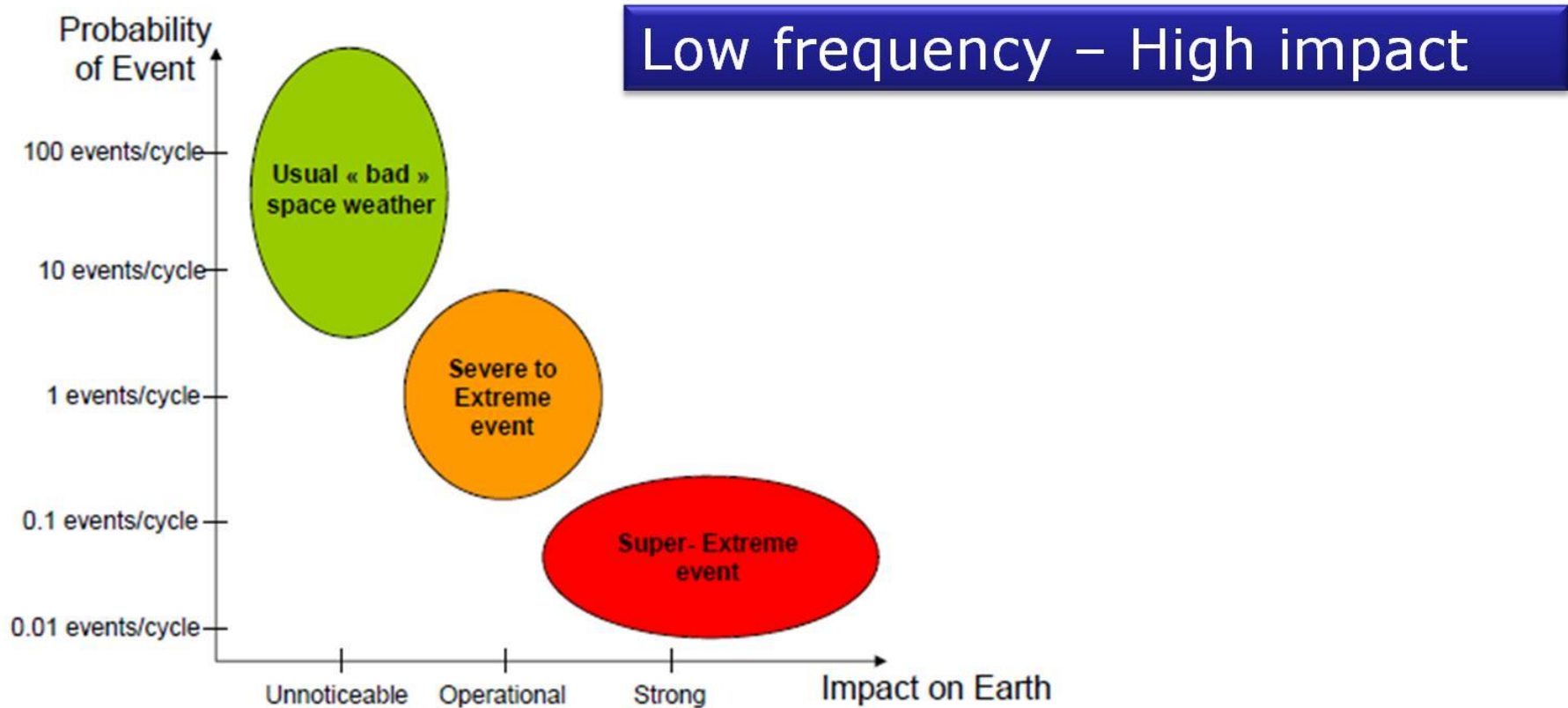
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IIb. Space Weather – Impacts



ESA

Ilc. Space Weather – Probability



(E. Robert, 2013)

IId. Space Weather – Responses

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monitoring

post-event analysis

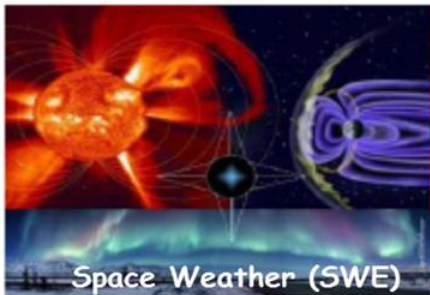


operational services

III. ESA SSA Programme (1/4)

overall objective

To support **independent European utilisation** of, and **access to, space for research or services**, through the provision of data, information and services regarding the near-Earth space environment and particularly regarding hazards to infrastructure in orbit and on the ground



Period 1 (2009-2012) – *Period 2 (2013-2016)* – Period 3 (2017-2020)

III. ESA SSA Programme (2/4)

space weather objectives

services to end users ↔ customer requirements

- ↳ Detection and Forecasting of Space Weather and its Effects
- ↳ Monitoring of the Sun, Solar Wind, Radiation Belts, Magnetosphere and Ionosphere
- ↳ Support Services relating to SWE effects
- ↳ Statistical Monitoring of Micro-particles of natural or human origin

federated approach → expertise & assets in ESA SSA Member States



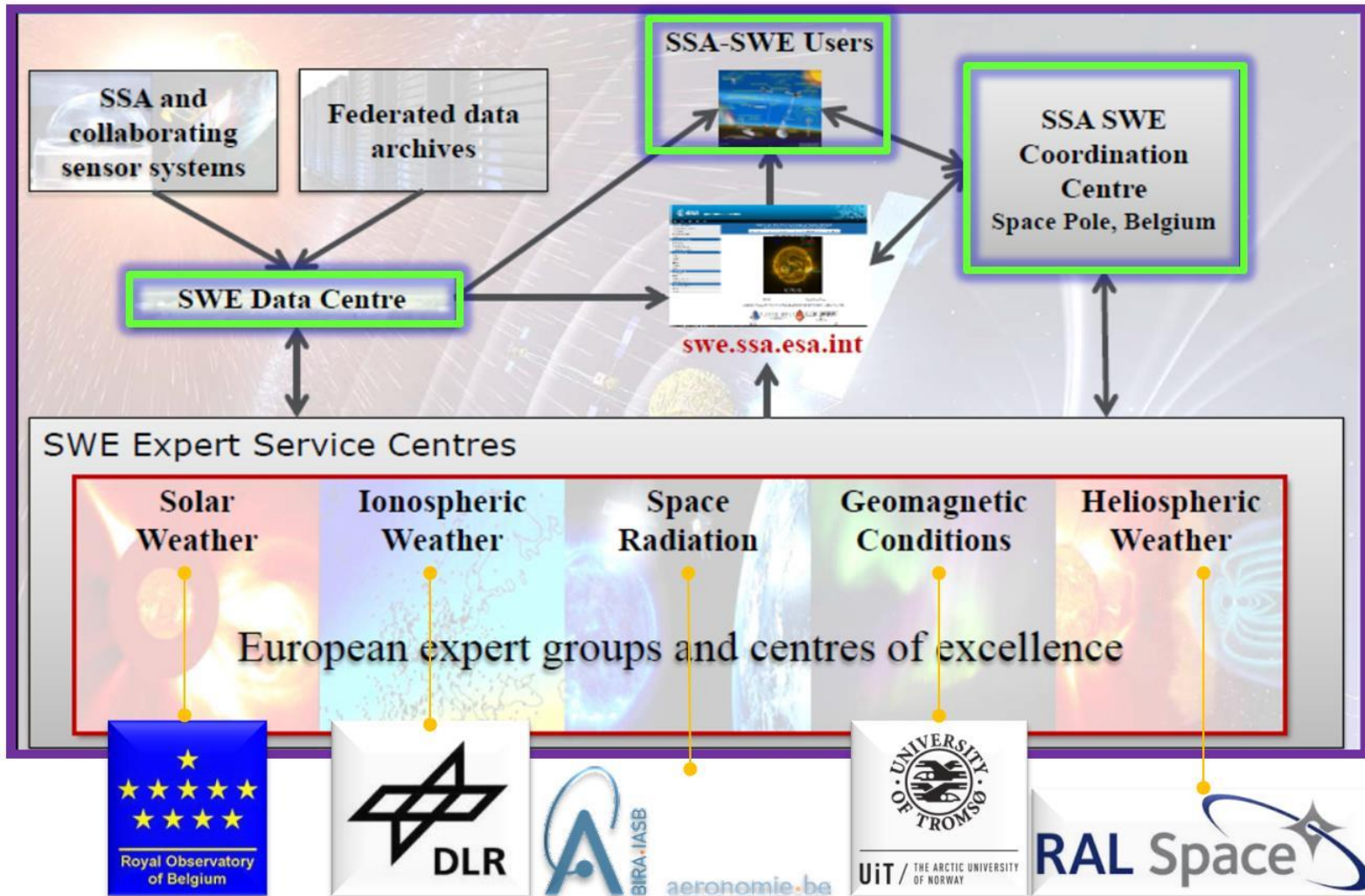
III. ESA SSA Programme (3/4)

space weather service network

<http://swe.ssa.esa.int>

Bottom-up ↑

Top-down ↓



III. ESA SSA Programme (4/4)

space weather portal

esa space situational awareness

ESA SSA SWE NEO SST

About SWE

- What is Space Weather
- SSA Space Weather Activities
- User Domains
- Current Space Weather
- Contact

Expert Service Centres

- Solar Weather
- Space Radiation
- Ionospheric Weather
- Geomagnetic Conditions
- Heliospheric Weather

SWE Applications

- SWE Data Browsing and Analysis
- SPENVIS
- SEISOP
- SEDAT
- IONMON
- EDID

Other Resources

- Documents
- SWWT
- SWEN Newsletter
- Upcoming Events

Sign-In

You are not signed in.

Sign In

Request For Registration

Welcome to the SSA Space Weather Service Network
Please note that all SSA-SWE Services are under review/construction

Quiet, Predicted 10CM Flux: 93, Predicted Ap index: 15 ---

Latest ESA SREM particle data
Integral (h): Week Ending: 2016-07-13 00:00

Document Repository

- ESA Space Situational Awareness Programme
- SSA Space Weather Network
- User manuals
- Other documents

ESA Space Situational Awareness Programme

- Space Weather Customer Requirements Document SSA-SWE-RS-CRD-1001 (28-07-2011)
- Space Weather System Requirements Document SSA-SWE-RS-RD-0001 (09-07-2013)
- Space Weather Product Specifications Document SSA-SWE-RS-SSD-0001 (08-07-2013)

- Spacecraft design
- Spacecraft operation
- Human spaceflight
- Launch operation
- Trans-ionospheric radio communication
- SSA surveillance and tracking
- Non-space system operation
 - Power grid operation and pipelines
 - Resource exploitation
 - Aviation
 - Auroral tourism
- General data service

Registration is needed

Latest data from SWE network. For a full overview of current conditions follow the links to Expert Service Centres.



08 July 2016: ESA SSA ITT for SSA P2-SWE-XXIV ADVANCED GEOMAGNETIC SERVICES
Read more...



18 February 2016: ESA SSA invitation for new service developments
Read more...

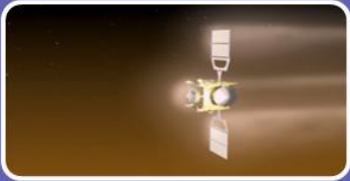
V. SWE Services for Satellite Operations and Space Missions



GAIA – Launch and L2 insertion manoeuver

- Daily forecast and alerts on flaring activity and particle storms

Dec. '13 – Jan. '14



VENUS EXPRESS – Aerobraking Campaign

- Monitoring energetic particles and irradiance variations

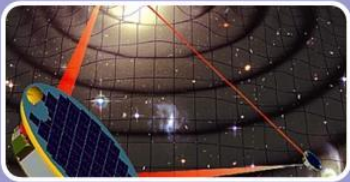
May – July . '14



ROSETTA

- Weekly bulletins focused on solar proton events

Nov. '14 - ...



LISA PATHFINDER

- Alerts on solar proton events

Dec. '15 - ...

V. SWE Services for Satellite Operations and Space Missions

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== Space Weather bulletin for Rosetta operations ==

Bulletin #100
 prepared by Sophie Chabanski (SSCC), Mark Dierckxsens (BIRA), Andy Devos (SIDC forecasters)
 on July 11, 2016 at 12:36 UTC
 Valid until July 13, 2016 at 12:36 UTC

=== Past 72 hours (Earth viewpoint) ===

Solar flare activity: C8.6 [far from Rosetta's footprint]
 10-MeV proton flux: < 0.4 pfu near Earth
 F10.7 index: 94 sfu at Earth

=== Next 48 hours (Earth viewpoint) ===

All quiet: no
 Solar flares: C-flares expected
 Solar protons: Quiet

=== Rosetta Magnetic connectivity ===

Connection with Earth: yes
 Connection with STEREO/A: no
 Connection with STEREO/B: no

Rosetta longitude: -98.1 (HEE)
 Solar footprint long.: 40.14 (HEE)
 Connection with Earth: yes
 Connection with STEREO/A: no
 Connection with STEREO/B: no

=== Comment ===

Solar Activity:
 Solar activity has been low, with only a few C-flares. The strongest C-flare the eastern hemisphere (Earth view). NOAA 2564 is the most active region. A nearly partial halo CME was observed on July 5, with first measurement to a filament eruption and was relatively close to the footprint of Rosetta, neither at Rosetta.

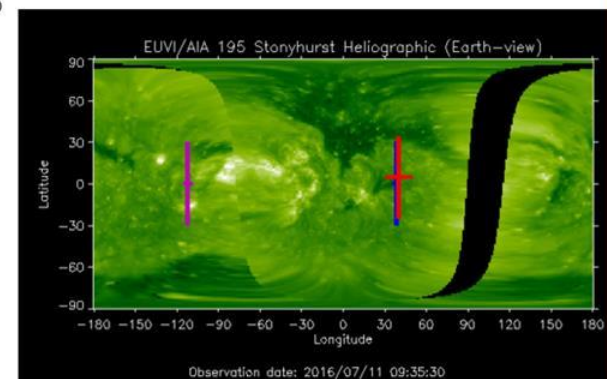
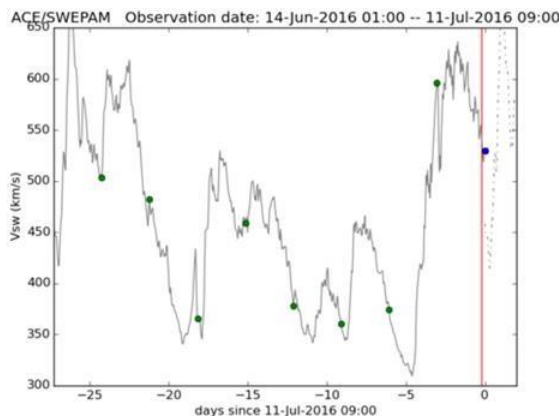
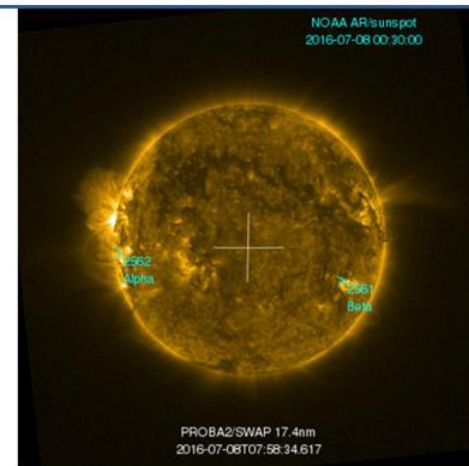
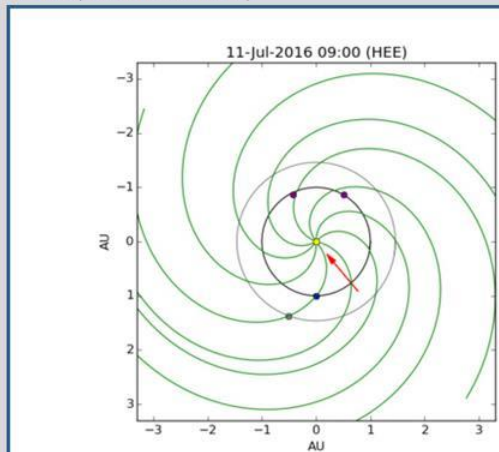
Radiation:

Earth and Rosetta are currently magnetically connected with each other. SREM data near Earth or on Rosetta during the past 72 hours.

PRESTO: No Presto messages were sent

Active regions of interest: No regions close to Rosetta's footprint

SSCC Helpdesk
<http://swe.ssa.esa.int/>



Graphical overview of the solar and interplanetary conditions supporting the risk evaluation of high-energy proton events for the Rosetta mission, part of the tailored space weather bulletin provided by the SSA space weather service network.



<http://swe.ssa.esa.int>

Help us, help you
We're listening



SSA Space Weather Coordination Centre (SSCC) Help-desk

Email: helpdesk.swe@ssa.esa.int

Phone: +32-2-7903-913 during office hours
(Monday to Friday, 9:00 - 17:00) (CET)

Address: SSA Space Weather Coordination Centre
Space Pole
Avenue Circulaire - Ringlaan, 3
1180 Uccle - Ukkel (Belgium)



THANK YOU