SWWT Plenary Meeting 38

Tuesday, 29 November 2017, 15:00 to 16:30

Room Delvaux, Kursaal, Ostend, Belgium

Present: 122 participants

Agenda

1. Welcome and Introduction (Stefaan Poedts, 2 min)
2. The SSA Programme and SWE Segment status: Period 3 (Jussi, 20 min)
3. SSA SWE service network overview and development within Period 3 (Alexi, 15 min)
4. Next year's ESWW format (Petra Vanlommel, David Jackson, Piers Jiggens, 15 min)
5. H2020 evaluation process and Space weather topic in 2019 Space call (Andrej Rožkov, European Commission Research Executive Agency, 15 min)
6. ESA Space Environment related R&D activities within the ESA technology programmes (Piers Jiggens, 10 min)
7. Report on the outcomes of the WMO congress (Toshiyuki Kurino, 10 min)
8. Action Item Review (S. Poedts, 2 min)
9. Any other business

Minutes

Welcome and Introduction (Stefaan)

SP welcomes everybody, and in particular Dr. Andrej Rožkov from European Commission Research Executive Agency who will provide info on the H2020 evaluation process and Space weather topic in 2019 Space call.

The SSA Programme and SWE Segment status: Period 3 (JPL)

copy from SB report with adjusted slide numbers!

SSA SWE service network overview and development within Period 3 (AG)

copy from SB report

Next year's ESWW format (Petra Vanlommel, David Jackson, Piers Jiggens)

Mauro Messerotti introduces the point that the format of the ESWW may be adopted if necessary and three alternatives have been worked out by the PC. Petra Vanlommel then provided statistics on the number of parallel and plenary sessions on the previous ESWWs, with some remarks regarding the difficulties for the organization of bottom up meetings like the ESSWs, see slide 1 of Annex 3.

Piers Jiggens presented some issues with the present ESWW schedule (like the fact that sessions are proposed not knowing of other sessions and, therefore, 'overlapping' sessions that run in parallel, but also 'missing' sessions in some years, sessions with only few submission, etc.), and also some positive aspects, like the broad community contribution and the fact that the current format allows for a whole spectrum of space weather interests. Piers then proposed an alternative format that would have 6-8 fixed sessions (titles selected by the PC, ensuring a minimal overlap, the community proposes the abstracts but the PC selects the best proposals) and 6-8 'open' sessions (submitted as now, but submissions too close to any of the fixed session would be excluded).

Daniel Heynderickx mentions there is also an issue with the poster sessions, which simply do not work. The discussion on the poster sessions is, however, not the issue here. Anyway, Stefaan Poedts announces that next year, in Leuven, all the posters will be up all the week.

David Jackson then provided another alternative, also including a blend of fixed themes and open contributed sessions, but with only 3 thematic (fixed) sessions. This proposal would have the Monday and Friday exactly the same as this year. But the other days would have plenary

sessions in the morning and more time for posters and still many parallel sessions and topical discussion meetings in the afternoons.

After these proposals a show of hands indicated that almost everybody wants a new format, but the two alternatives both got a lot of support.

See the used slides in Annex 3.

H2020 evaluation process and Space weather topic in 2019 Space call (Andrej Rožkov, European Commission Research Executive Agency)

Andrej presented the opportunities/calls in the H2020 Space programme focusing on the Space Weather call in 2019 as this is most relevant for the space weather week participants. This call will be opened in Q4 2018 and will include architectural concepts of SWE services. It ws shown where the info can be found (see slide 2 of Annex 4).

The scope of the SWE call in 2019 is given on slides 4-5 of Annex 4 and concerns modelling capabilities and/or the delivery of prototype services in order to pave the way for forecasting horizons for SWE events. The impacts (to be covered by 'good' proposals) include improved scientific understanding of SWE phenomena, new models and forecasting techniques and an inventory of potential early indicators of extreme space weather events (see slide 6 of Annex 4). The indicative budget is 9M€ and will consider proposals between 2 and 3 M€. The call will be opened on 16/10/2018 and closed on 12 march 2019. The NCPs already have received slides from the commission. The NCPs are mentioned on the participant portal.

ESA Space Environment related R&D activities within the ESA technology programmes (Piers Jiggens)

PJ starts with an overview of the responsibilities of the Space Environment and Effects Section in ESTEC, the R&D division of it, and the TRL levels 1-9 they use (slide 3 of Annex 5). Then he presented the ESA Technology Programmes they are involved with, incl. the General Studies Programme (GSP), the basic Technology Research Programme (TRP, TRL:1-3), and the General Support Technology Programme (GSTP, which is at a higher TRL: 3-6) and Space Situational Awareness (SSA, TRL:15-9).

Ongoing TRP activities include an update of SEPEM (ESHIEM), an update of the SOLPENCO-2 system, JCAT on JUICE, VALIRENE , etc. (slides 5-7). GSTP ongoing activities include NGRM, SWHV-JHv, MCD, SCOPE (see slide 8). Other activities include GSP, CTP, ARTES, etc. (see slide 9).

The GSTP Compendium contains a booklet with ideas of things to be developed, with an indicative budget, see slides 8-11 of Annex 5. The planned activities are mentioned on slide 12 of Annex 5. The link to the EMITS system is given on the last slide (13) of Annex 5.

Report on the outcomes of the WMO congress (Toshiyuki Kurino)

This agenda point has been cancelled due to sickness of Toshiyuki Kurino.

Action Item Review (S. Poedts)

There were no actions from last two meetings.

Any other business

Olga Malandraki provided a brief report on the TWG (see Annex 6).

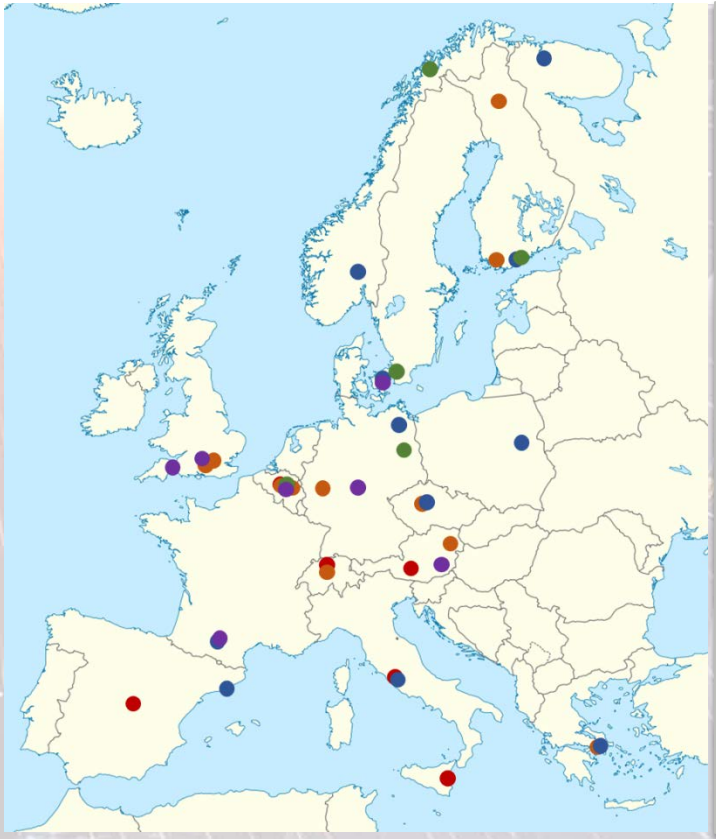
The meeting closed at 16:35.

SSA-SWE Activities and Plans for SSA Period 3

14th European Space Weather Week
Ostend, Belgium
27 Nov – 1 Dec, 2017

Juha-Pekka Luntama, Alexi Glover, Stefan Kraft
ESA SSA Programme Office

ESA SSA Federated Space Weather System



Data archives

- SSA SWE Data Centre (Redu)
- Federated data repositories

SSA SWE Coordination Centre

- User Helpdesk
- Space Pole, Belgium

SWE Expert Service Centres (ESCs)

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

European expert groups and centres of excellence

Sensor systems

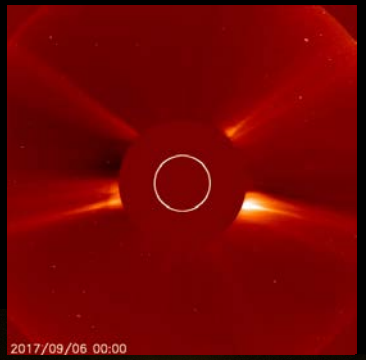
Results of the CBA for the SWE segment

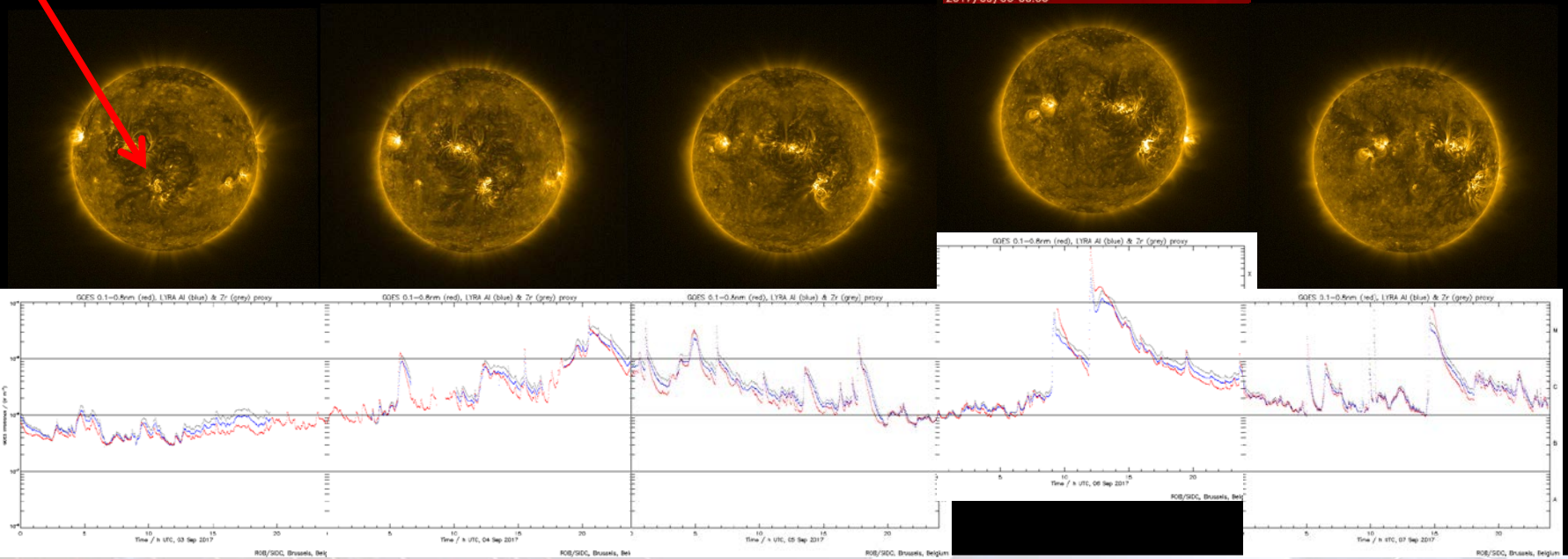
Cost/Benefit	Do nothing scenario	Do ESA scenario	Value added of ESA services
User domain benefits			
Satellite operations	- €293 M	- €267 M	€26 M
Launch operations	- €0.3 M	- €0.1 M	€0.2 M
Resource exploitation	- €327 M	- €135 M	€192 M
Power grids operations	- €5,771 M	- €4,546 M	€1,225 M
Aviation	- €3,312 M	- €3,066 M	€246 M
Logistic/Road transport	- €3,432 M	- €2,888 M	€544 M
Investment benefits			
GDP impact	None	€952 M	€952 M
Total Benefits (b)	- €13,135 M	-€9,950 M	**€3,185 M**
Programme Costs (c)	None	- €529 M	**- €529 M**
Total Net Benefits	- €13,135 M	- €10,479 M	**€ 2,656 M**
	Benefit / Cost ratio (b/c)		**6**

Extreme SWE event impact estimates

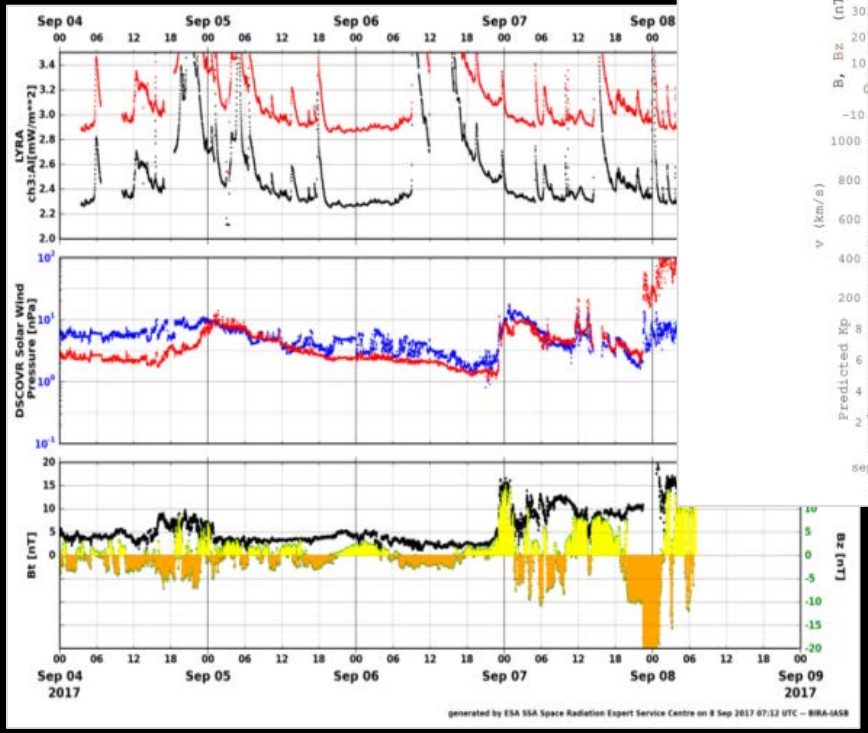
Domain	2016 (year 1)	2024 (year 9)	2032 (year 17)
Spacecraft design and operations	- €912.9 M	- €1,123.2 M	- €1,389.4 M
Launch operations	- €0.008 M	- €0.037 M	- €0.051 M
Aviation	- €6,635.6 M	- €11,139.8 M	- €18,701.5 M
Resource exploitation	- €197.5 M	- €234.9 M	- €279.5 M
Power system operators	- €5,630.5 M	- €6,364 M	- €7,195.2 M
Road & Transportation	- €1,595.4 M	- €1,783 M	- €1,992.8 M
TOTAL	- €14,971.9 M	- €20,644.9 M	- €29,558.4 M
Estimated savings with ESA SSA SWE	2,500 M	3,500 M	5,000 M

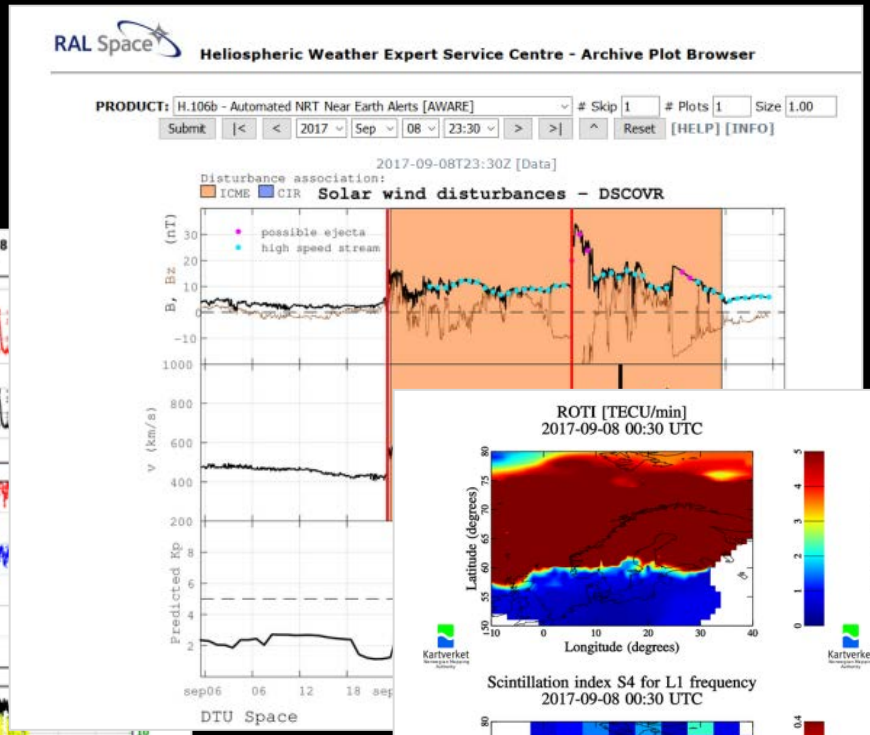
Space Weather
3 – 7 Sept 2017

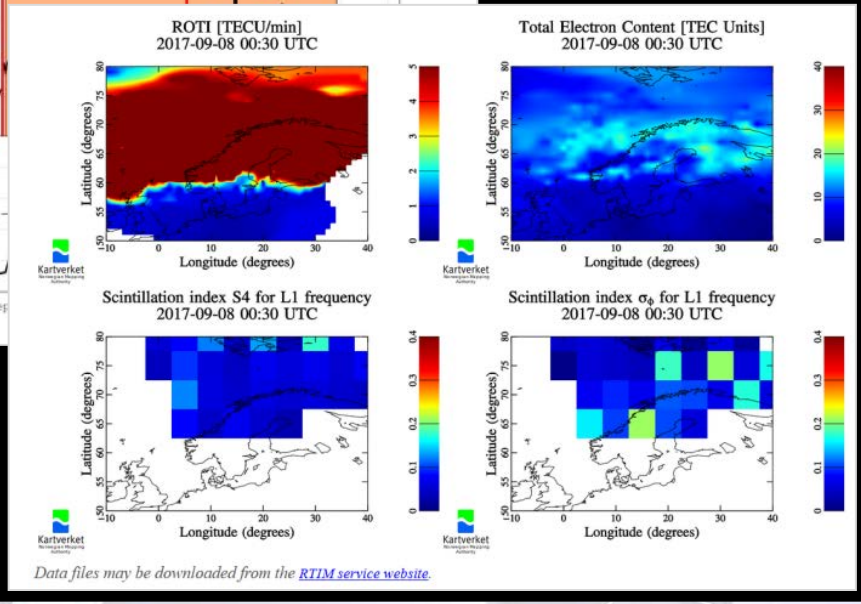




Geomagnetic storm on 7-8 September







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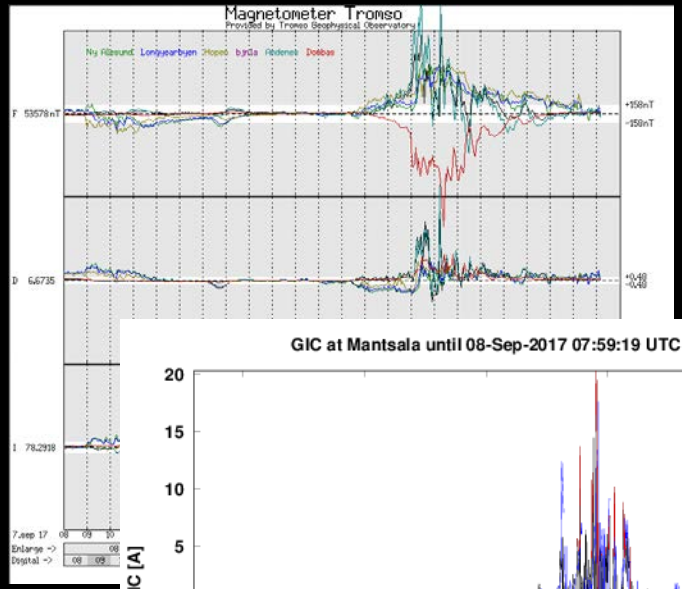
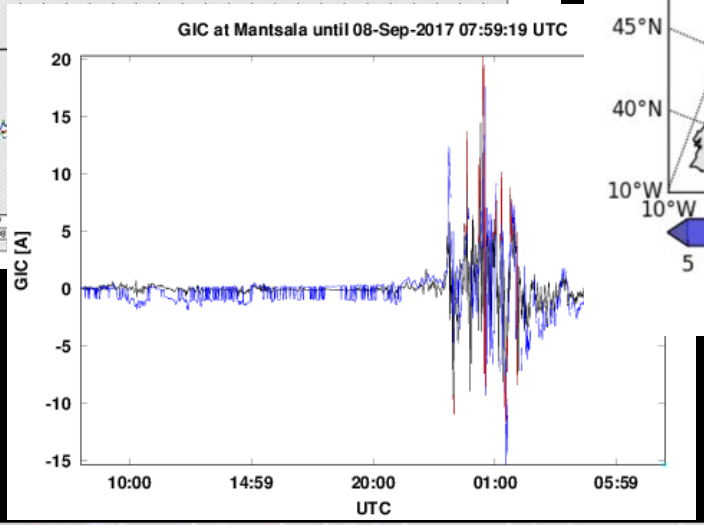
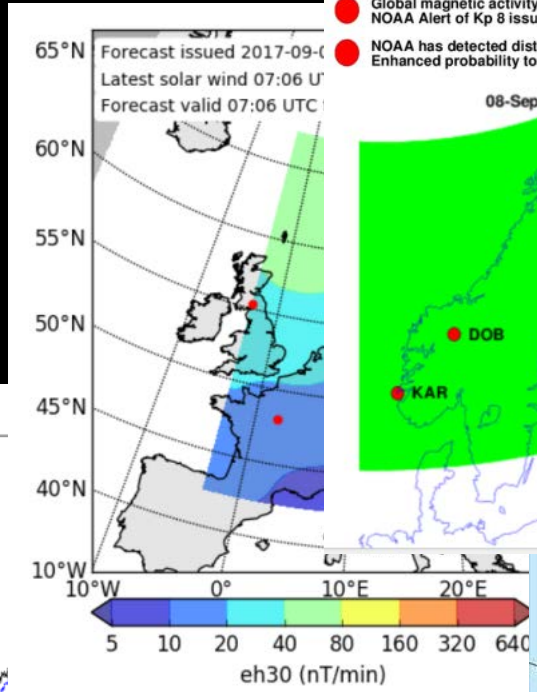
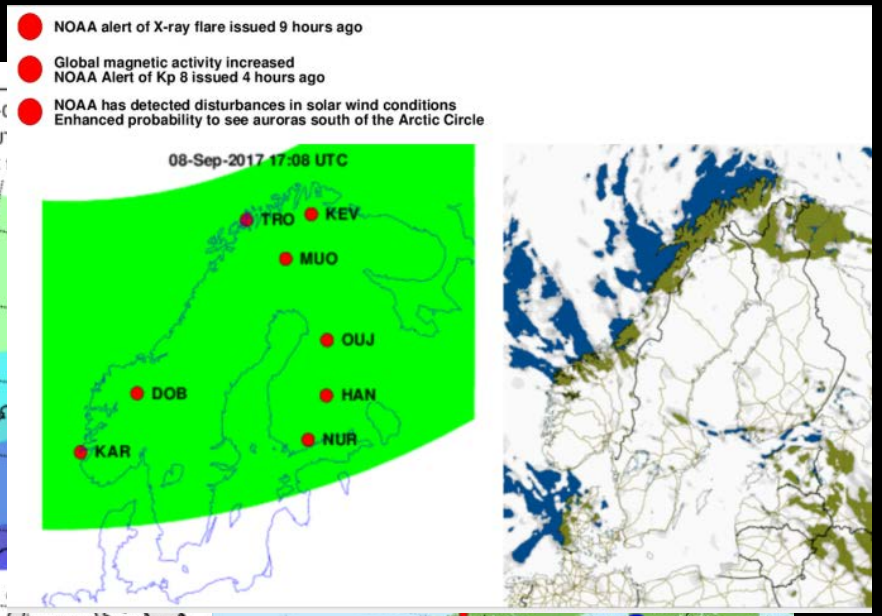
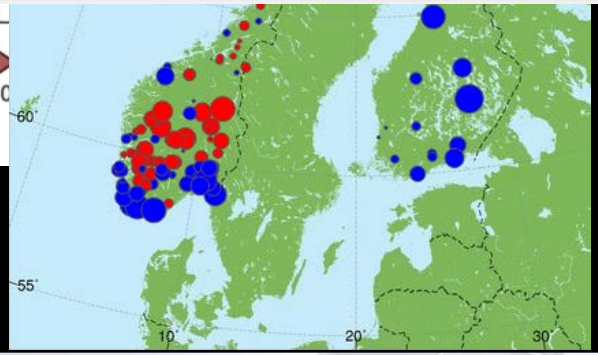


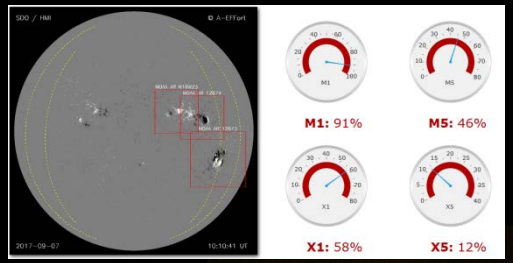


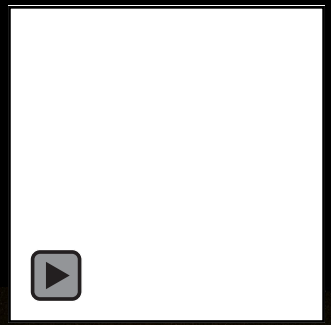


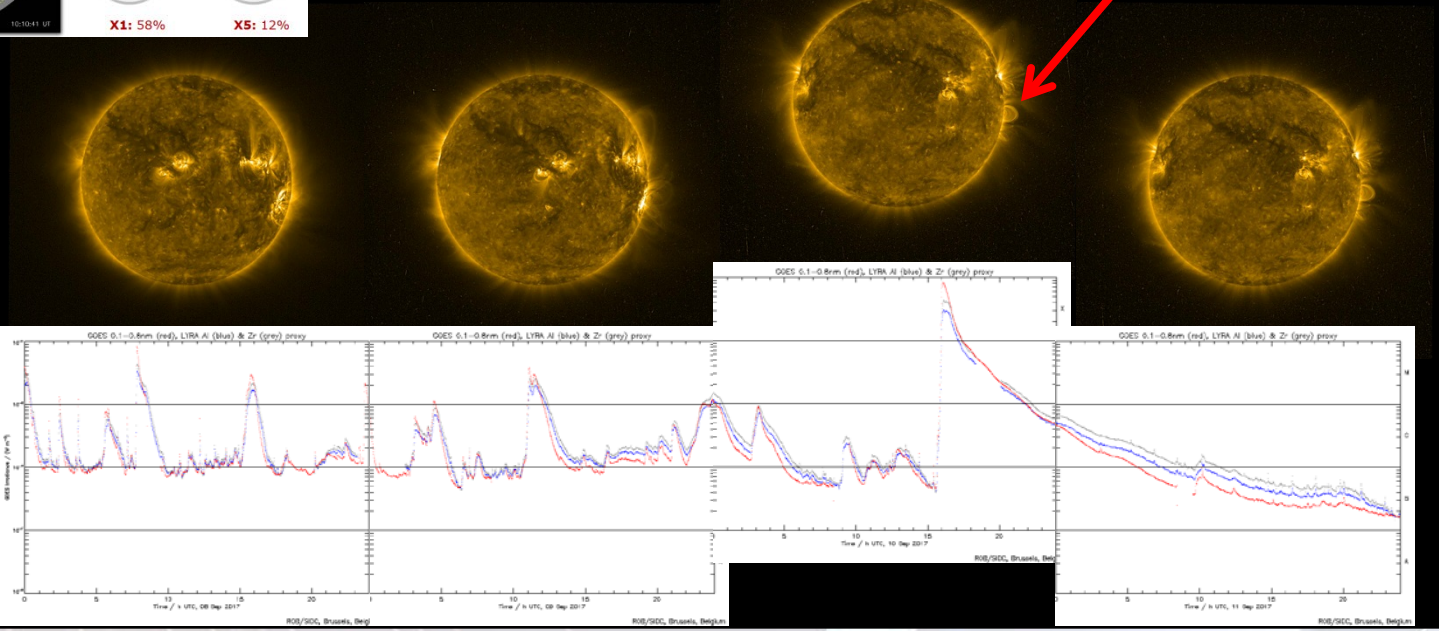




Space Weather
8 – 11 Sept 2017







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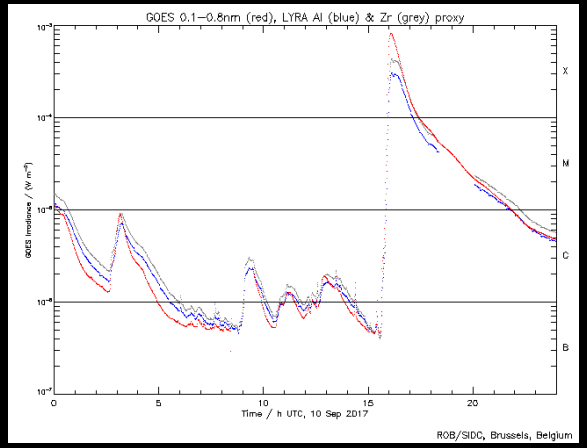
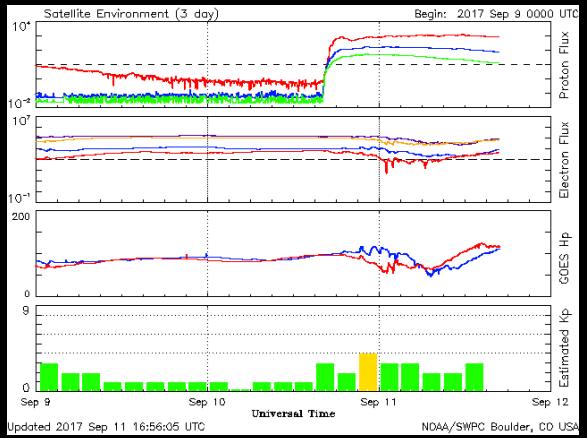
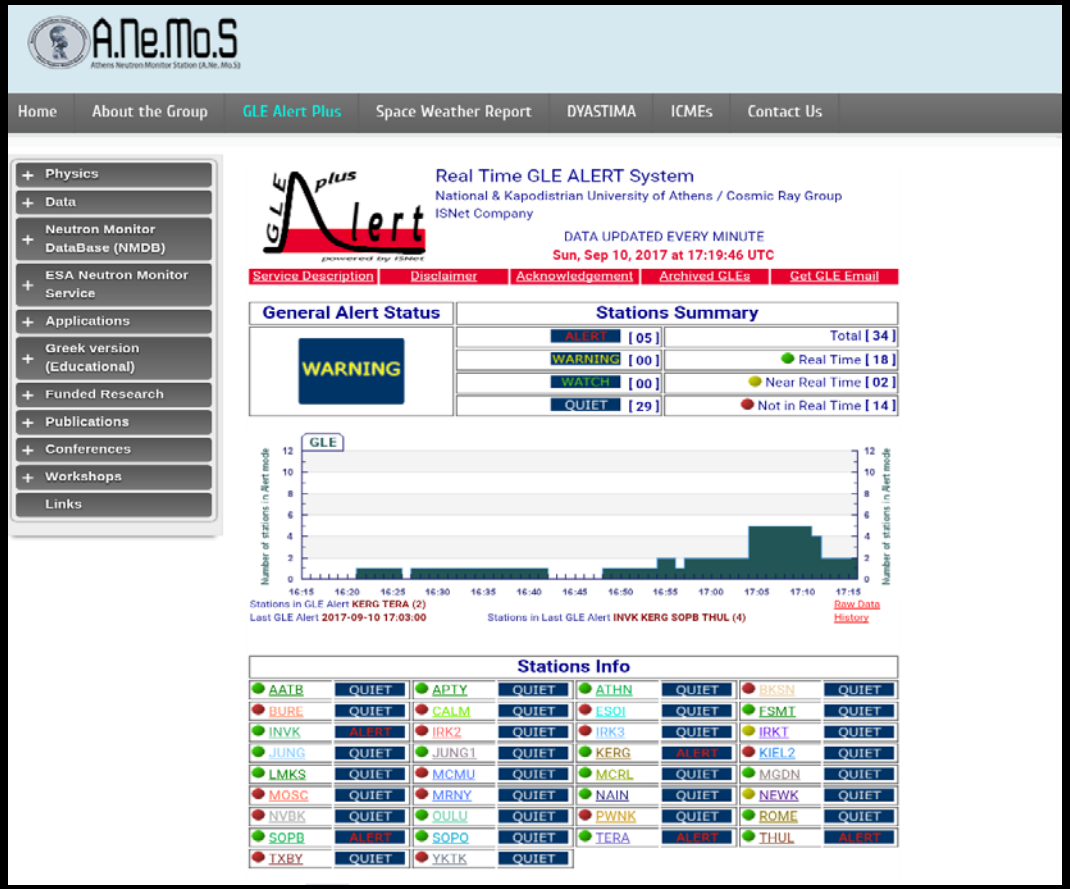






SSA SWE Plans for 2017-2019

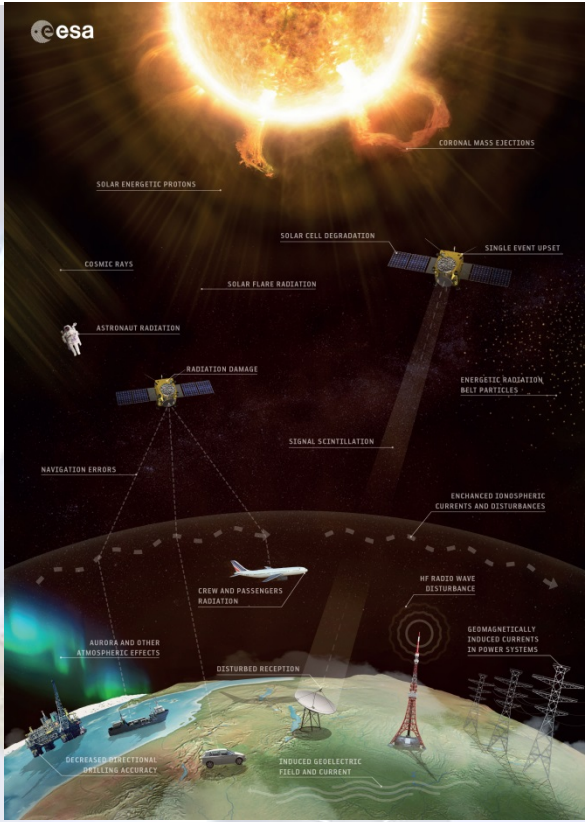
SSA SWE System Strategic Objectives in SSA P3

- Mature elements of the SSA SWE system
- Focused service developments targeting key users
- Establish robust R2O process for models and tools
- Continue development of the SWE mission to L1/L5
- Develop Distributed SWE Sensor System (D3S)
- Develop SWE instruments for L5 mission and D3S

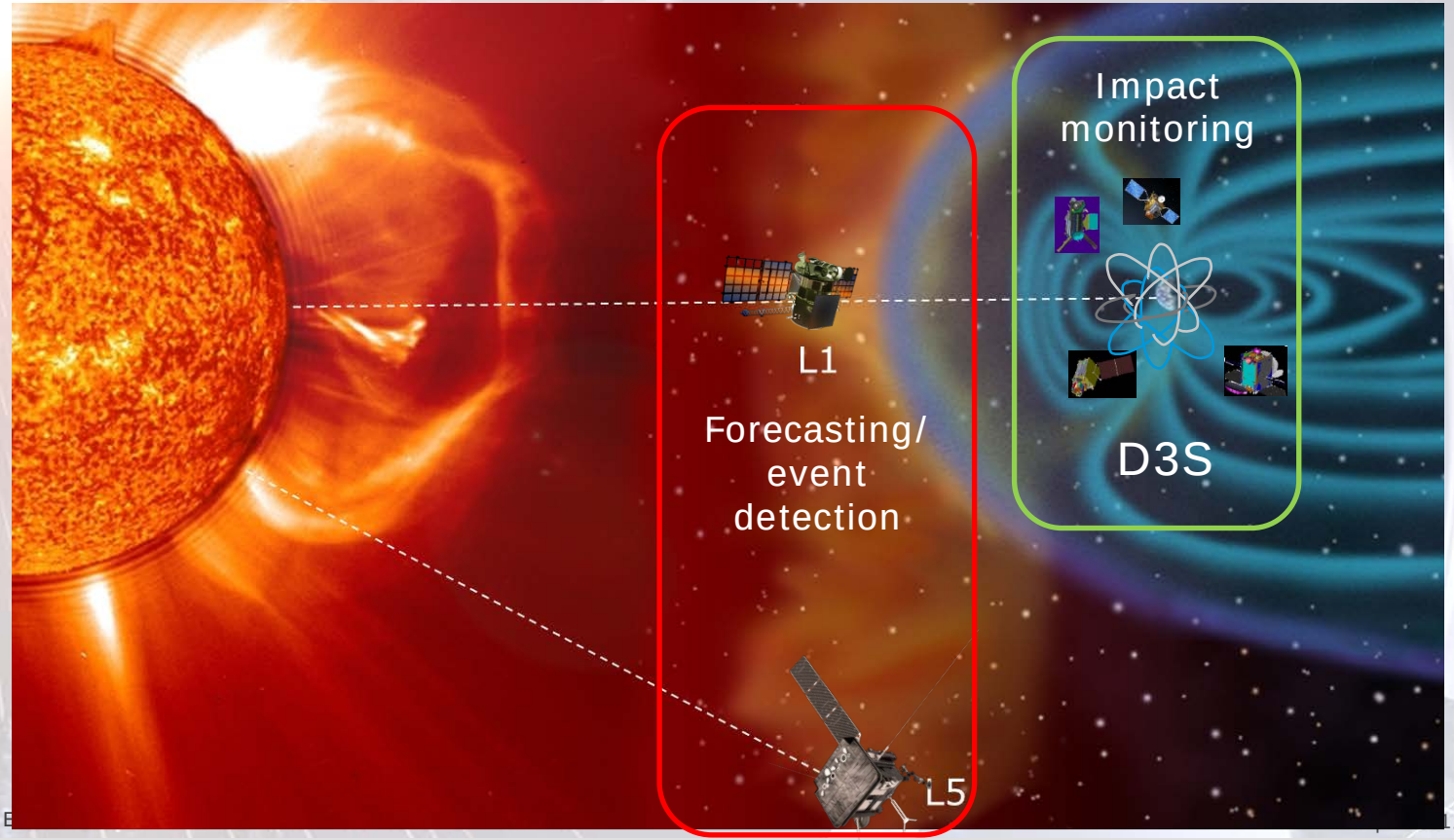
- Reinforce and mature SWE system
- Reduce dependence on non-European systems
- Begin transition towards operational system

Activities for maturing and improving services

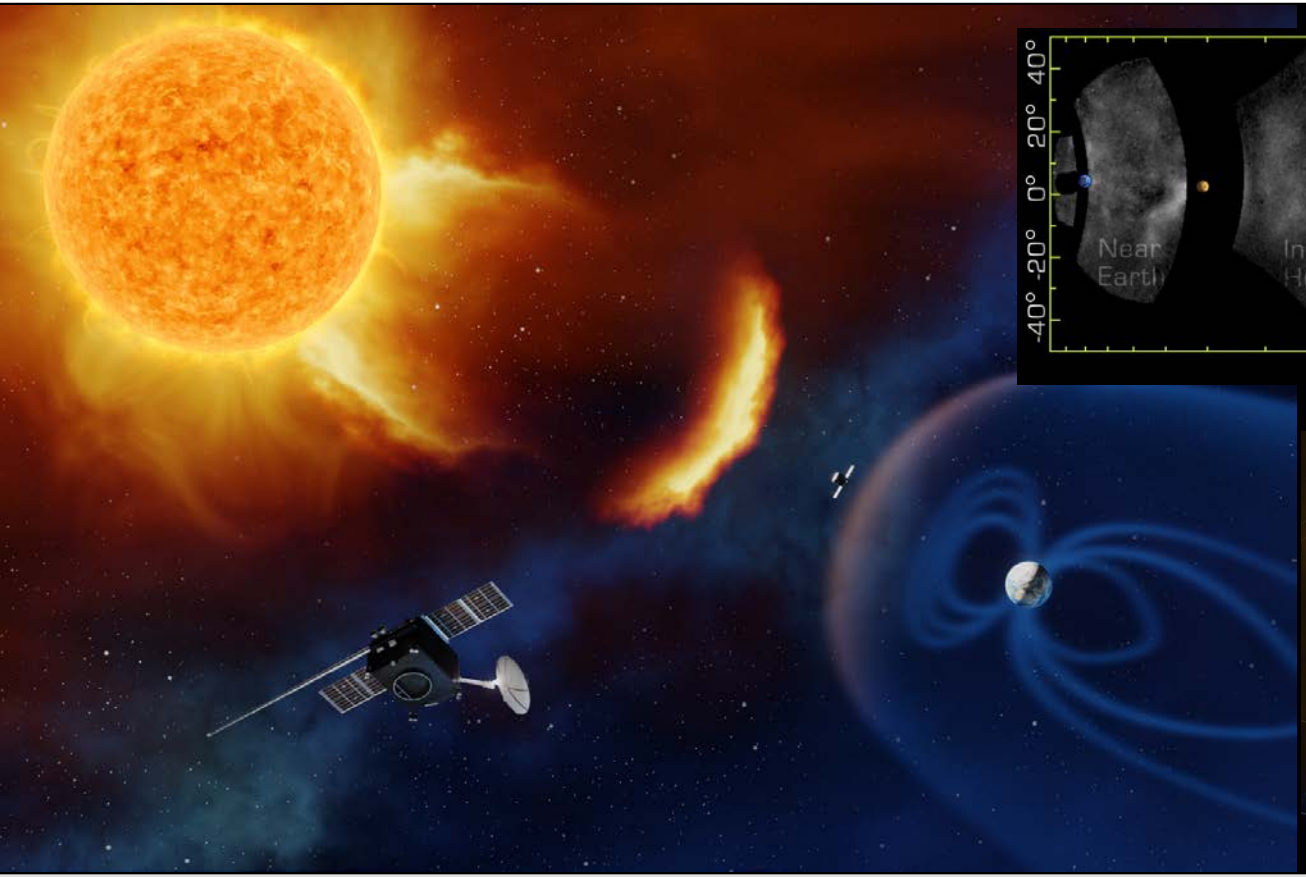
- SSCC continuation and evolution
- ESC network continuation and expansion
- SWE Network analysis
- SWE Service System design
- Heliospheric Weather applications development
- Space Environment Nowcasting and Forecasting
- Enhanced Solar Weather Event Analysis
- LOFAR Utilisation Study
- Enhancement of magnetometer network
- Tailoring services to Mediterranean region
- AVIDOS 3.0
- Space Radiation Application Developments for Spacecraft Operators

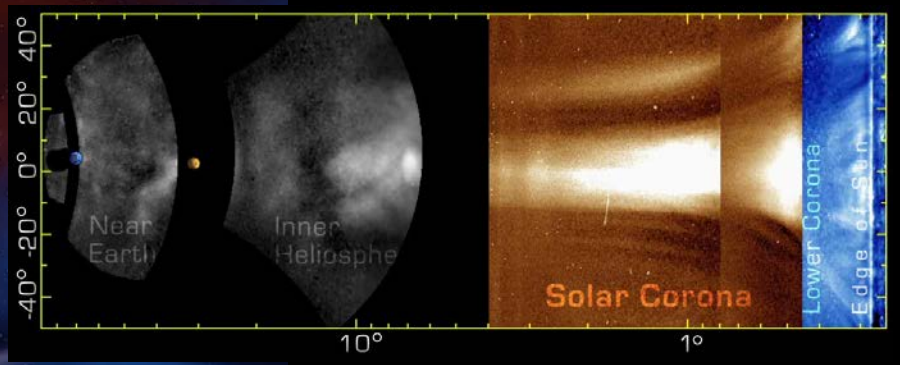


SWE Space Segment Activities

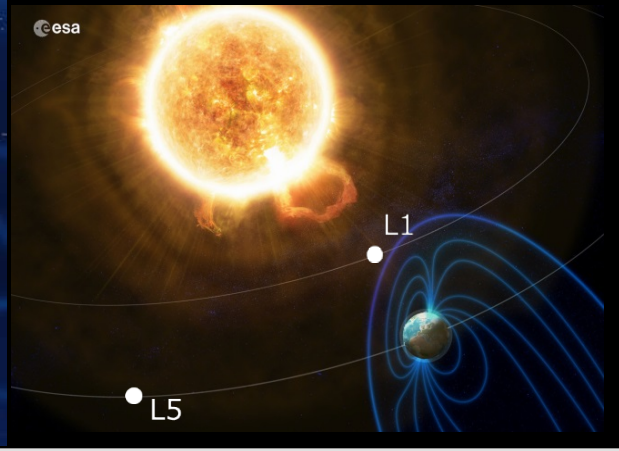


Lagrange mission





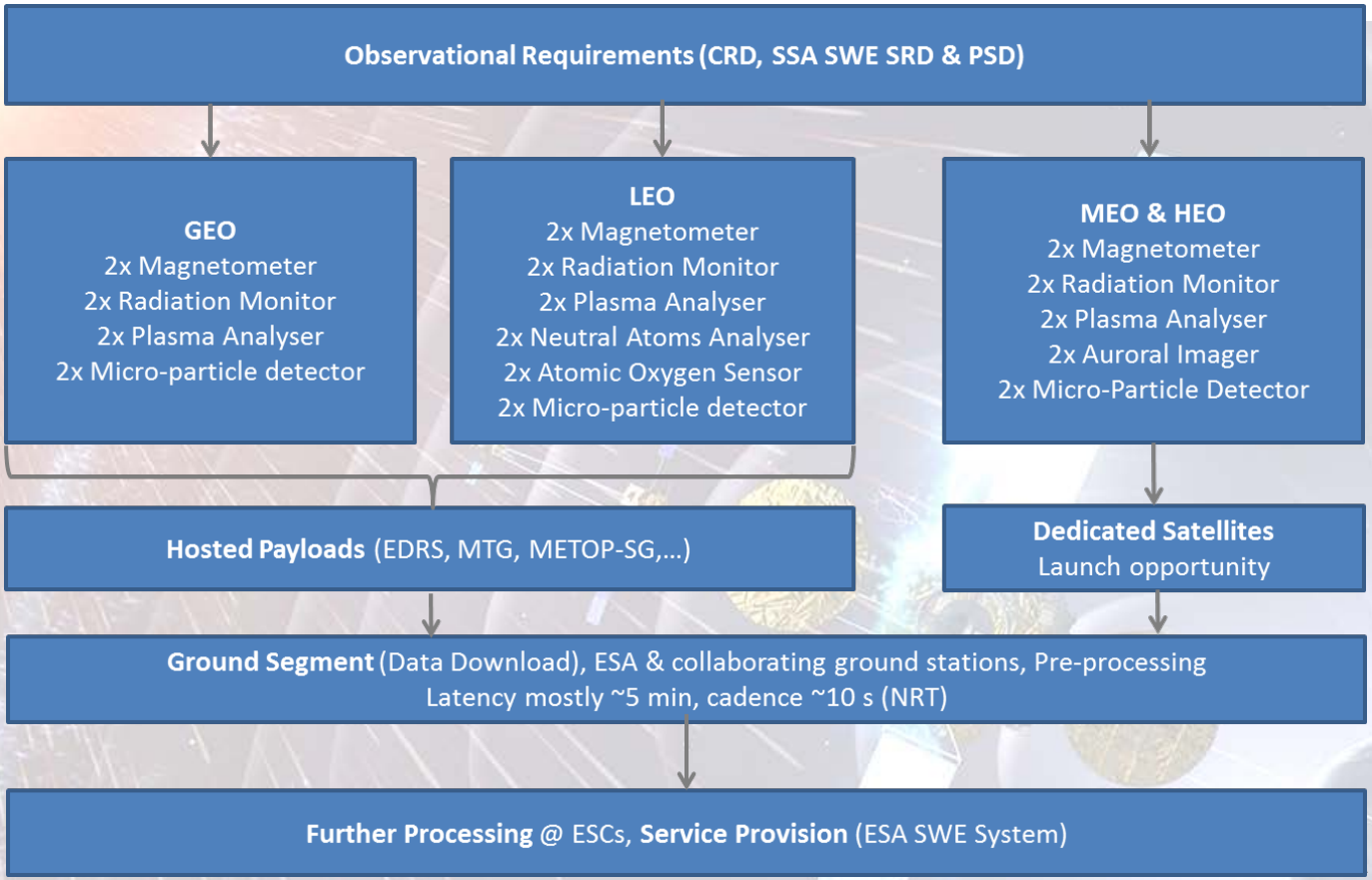
Video: NASA



ESA L1 / L5 Observations and Instruments

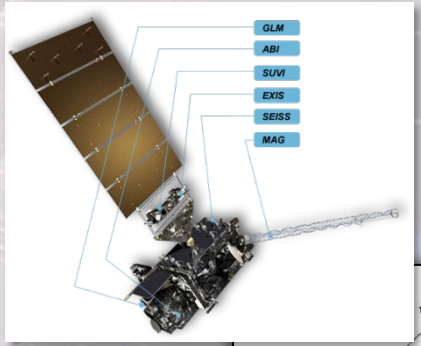
#	Product Name	Observation / measurement	Classification	Instrument
1	Interplanetary Magnetic-Field (IMF)	IMF properties and dynamics	High priority	Magnetometer
2	Solar-Wind Properties	Solar-wind velocity, bulk-density and temperature	High priority	Plasma Analyser
3	Photospheric Solar Disk Magnetic Field	Magnetic-field mapping of the photosphere	High priority	Magnetograph
4	White-light wide-angle Coronagraph Images	Intensity Mapping of outer corona	High priority	Coronagraph
5	Coronal EUV Images of the Sun	Intensity mapping of the low Corona	High priority	EUV imager
6	Heliospheric Images	Intensity Mapping of Heliosphere	High priority	Heliospheric Imager
7	Solar X-ray flux	X-ray flux monitoring	High priority	X-ray monitor
8	High Energy Protons	Energy distribution and flux dynamics with E>10 MeV	High priority (L1) Enhancing (L5)	Radiation monitor
9	Medium-Energy ions	Detection of Solar-Wind Ions with E = 30keV/nuc to 1 MeV/nuc	High priority (L1) Enhancing (L5)	Medium Energy Particle Spectrometer
10	Medium-Energy electrons	Solar-Wind Electron flux and energy distribution with E = 30 keV to 8 MeV	High priority (L1) Enhancing (L5)	Medium Energy Particle Spectrometer
11	~~Solar radio-spectrographic emissions~~	~~Detection of radio burst/flare signatures and associated outward expanding shocks~~	~~Enhancing~~	~~Radio burst spectrograph~~
12	Medium-Energy Ions	Solar-Wind Ion flux and energy distribution with E = 1 to 10 MeV/nuc	Enhancing	Medium Energy Particle Spectrometer
13	High-Energy Ions	Solar-Wind Ion flux and energy distribution with E >10 MeV/nuc	Enhancing	Radiation monitor

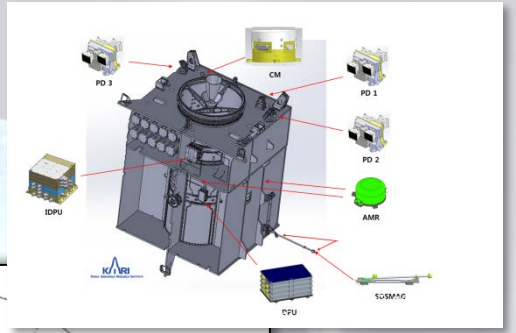
Distributed SWE Sensor System (D3S)

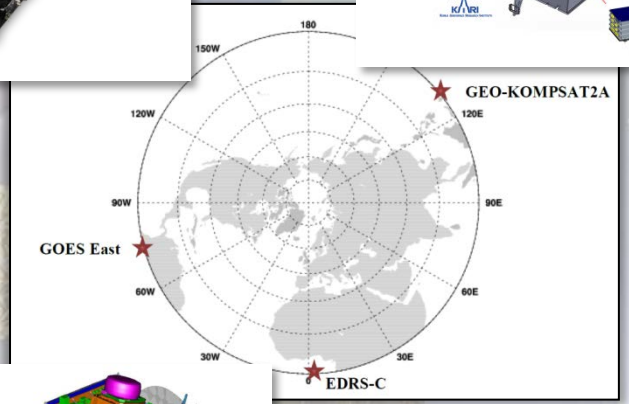


ESA SSA D3S Precursor Missions

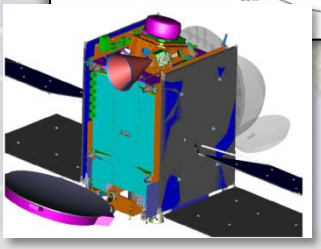
Next Generation Radiation Monitor (NGRM)
→ ARTES 7, EDRS-C (2018)

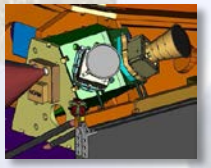






Service Oriented Spacecraft Magnetometer (SOSMAG)
→ Korean GEO-KOMPSAT-2A (2018)

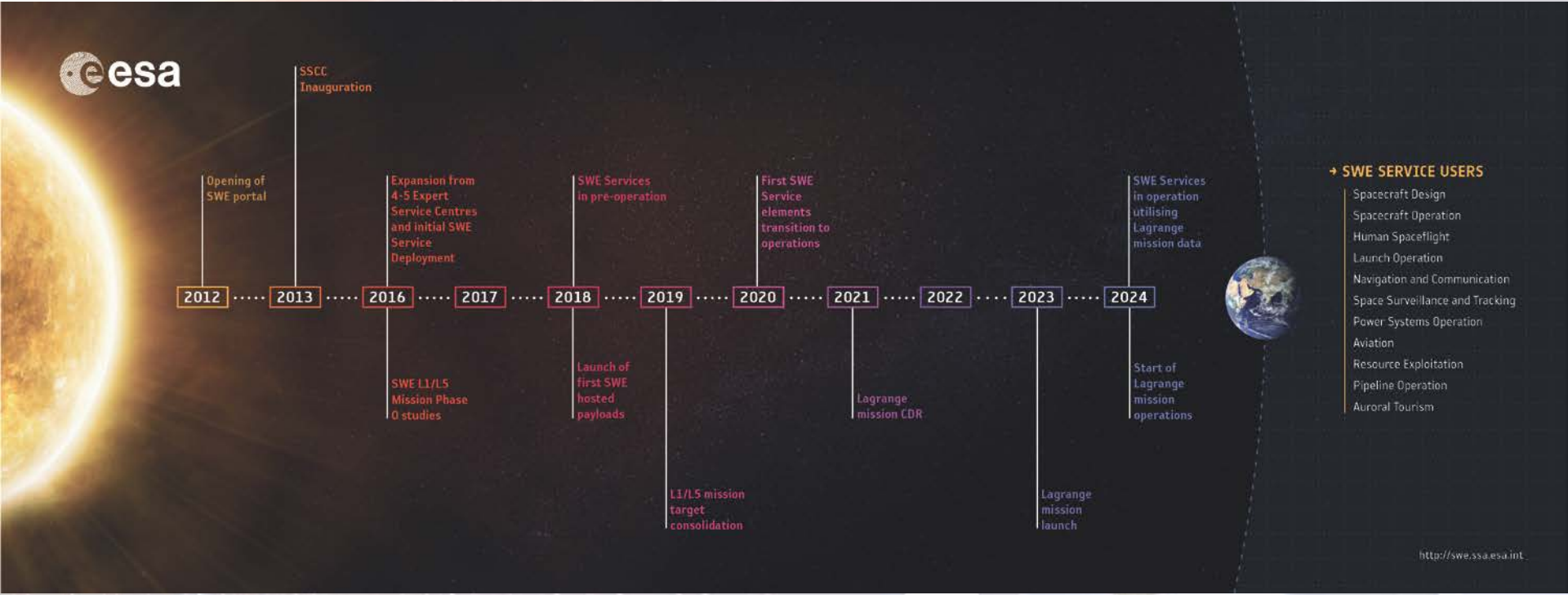




D3S: Opportunity for International Collaboration

- Monitoring of SWE impacts in near-Earth space is a major task
- D3S is by default a global system
- Many elements of “D3S” exist and more are being planned
- International collaboration and coordination
- Helps to build affordable, comprehensive monitoring system
    - instruments
    - flight opportunities
    - ground station support
    - data sharing
- Benefits globally
    - space weather services
    - scientific research and model development

ESA SSA SWE Timeline



THANK YOU

swe.ssa.esa.int

www.esa.int

SSA SWE Network Evolution in Period 3

A Glover, J Luntama

Space Weather Working Team
14th European Space Weather Week, Ostend, Belgium

SWE Segment Objectives for SSA Period 3

- Mature elements of the SSA SWE system for transitioning to operations
- Focused service developments targeting key users
- Establish robust R2O process for models and tools developed within or outside the Programme

Service Network

- Phase A/B studies for SWE mission to L1/L5
- Develop Distributed SWE Sensor System (D3S)
- Develop SWE instruments required by L5 mission and D3S

Space Segment

Reinforce & mature the SWE System

Reduce dependence on non-European systems

Begin transition towards operations

SSA Service Provision System @ end of P2

http://swe.ssa.esa.int

Data archives

- SSA SWE Data Centre (Redu)
- Federated data repositories

SSA SWE Coordination Centre

- User Helpdesk
- Space Pole, Belgium

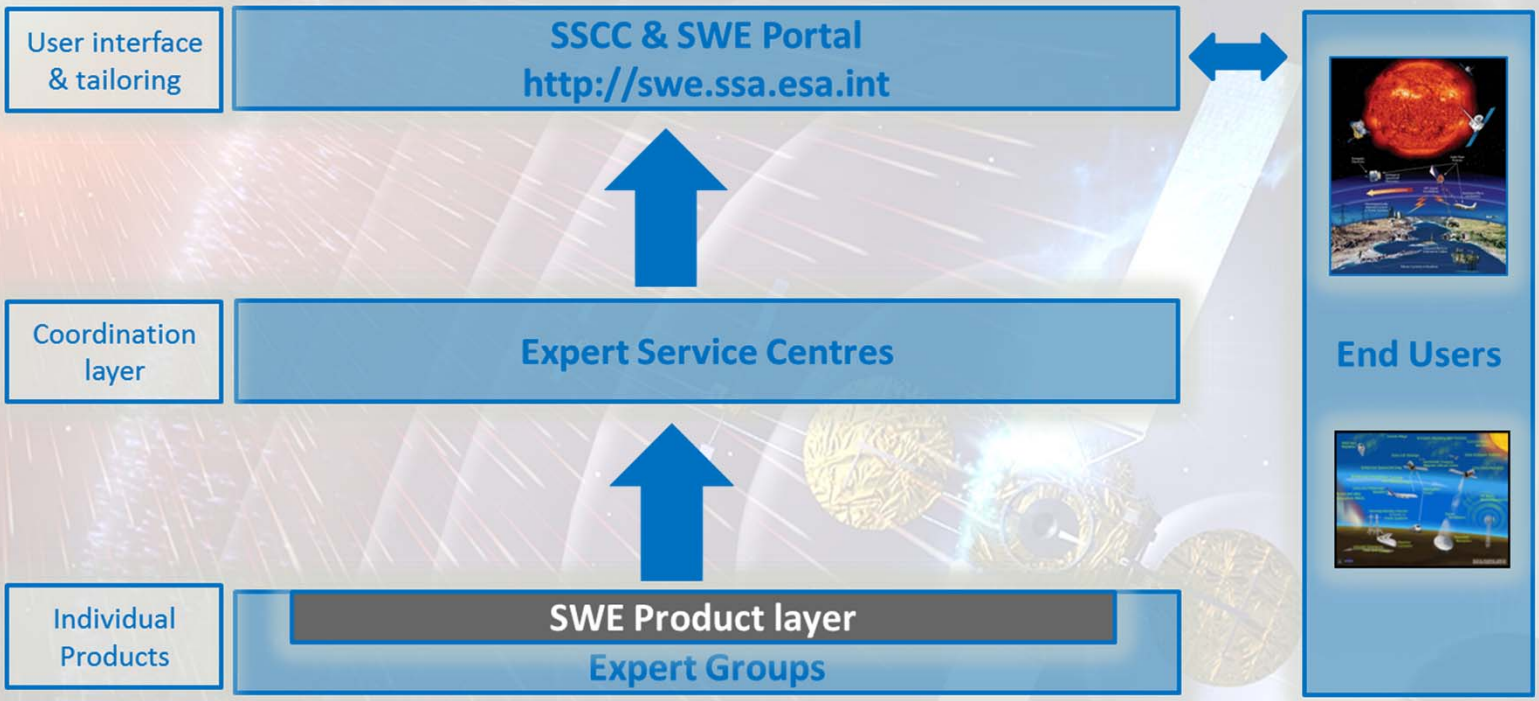
SWE Expert Service Centres (ESCs)

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

European expert groups and centres of excellence

Sensor systems

SWE Services Business Logic



Period 3 Developments

- 3 main development streams
  - Continued pre-operation & structured service improvement
  - Network Evolution
  - Product development & concept studies: early prototypes, facility utilisation studies
- P3 will see improved processes for smooth integration of parallel developments into SWE network

Structured Service Improvement

- SWE Coordination layer
  - Mature & consistent **network-wide processes**, interaction between network entities
  - **Coordinated V&V** feeding into maturity levels
  - Continue SWE **Coordinated Communication** exercises

- SWE Product layer
  - Extension & improvement to **address service gaps** & following ESC DDP
  - Regular product **availability monitoring**
  - **Improved tools** for categorising products and EGs
  - Work towards **API**s enabling ease of utilisation within Network

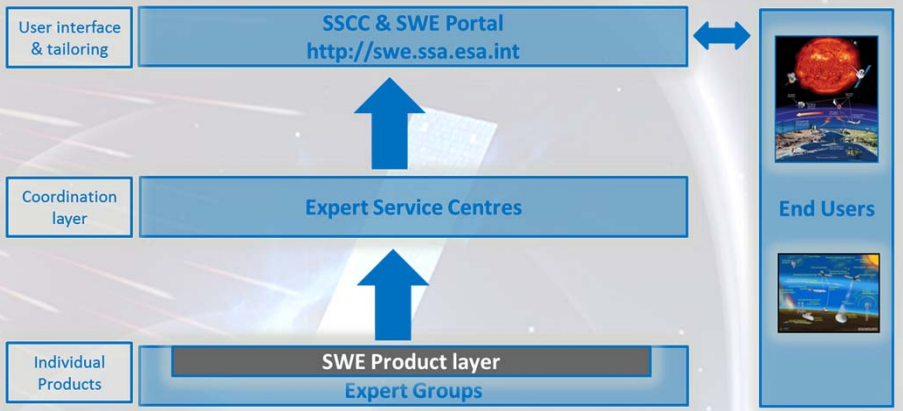
Reinforce & mature the SWE System

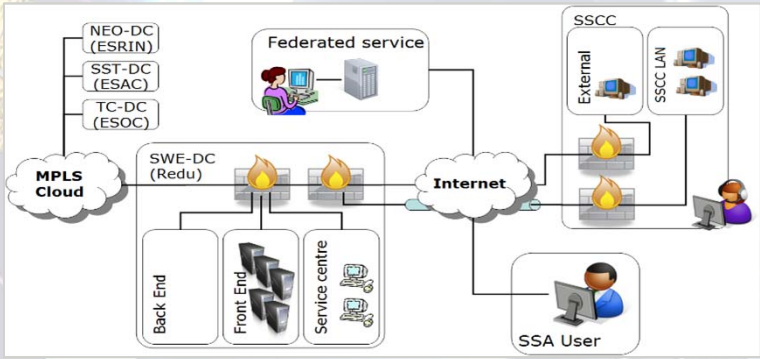
Begin transition towards operations

SWE Network System Design

- Merging top-down and bottom up approach
- Analyse P2 developments
- Attribute product levels
- Review and adapt role assignment
- Improved workflows and data exchange

- P3-SWE-VIII, Q1 2018





Ongoing/Upcoming developments 2018

For Deployment in 2018:

- P2-SWE-II: Services for SST domain users
- P2-SWE-XIII: Advanced Prototypes: Spacecraft Operations
- P2-SWE-XIV: VSWMC p2

Products, starting in 2018:

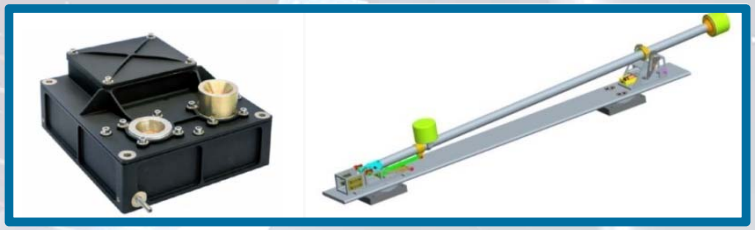
- P3-SWE-IX: Heliospheric Weather Focussed Application Developments
- P3-SWE-XVIII: Space Envt Nowcast & Forecast
- P3-SWE-XI: Solar Weather event Analysis
- P2-SWE-XXIV: Geomag Svcs.

Concept/facility Studies 2018:

- LOFAR Utilisation
- EISCAT-3D Utilisation
- Magnetometer network ext.

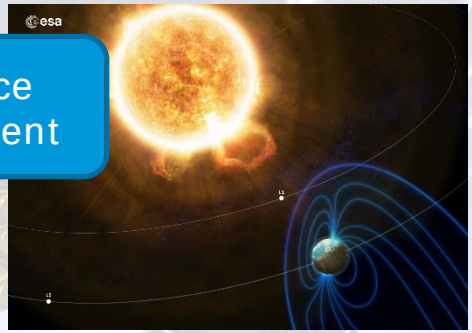
Space Segment Utilisation

- SWE Network forms the primary user group for the SWE Space Segment developments
- Increasingly engage the ESCs in prototyping studies to ensure maximum utilisation of data when available
- *First case studies:*
  - *Use of L5 data in CME propagation models*
  - *SOSMAG and NGRM hosted payloads*



- Phase A/B studies for SWE mission to L1/L5
- Develop Distributed SWE Sensor System (D3S)
- Develop SWE instruments required by L5 mission and D3S

Space Segment




esa
THANK YOU
swe.ssa.esa.int
www.esa.int
@esaspaceweather
European Space Agency

History

	Nr Sessions	Plenary	//	Keynotes	Working meetings	Closed meetings
Esww3	8	8		1	0	
Esww4	5	5		1	10	
Esww5	6	6		1	10	
Esww6	5	5		1	13	
Esww7	5	5		1	16	
Esww8	3	3		1	19	
Esww9	7	3	2*2	1	15	
Esww10	13	2	3*3+2*1	1	23	
Esww11	14	+/-2	+/-3*3+2*1	1	21	
Esww12	15	0	3*5	10	17	6
Esww13	15	0	3*5	11	20	9
Esww14	15	0	3*5	8	21	9

Pros and Cons of past Set-ups

- Issues with ESWW schedule:
  - Sessions are proposed not knowing of other sessions
  - We therefore have a lot of overlap
  - Some proposed sessions are **too broad**
  - Some sessions have few submissions
  - Some years there are **'missing' sessions**
  - Too many repeating sessions with same organisers
- Positive aspects
  - We have a broad community contribution
  - Allow for whole spectrum of space weather interests
  - Maximise the number of participants who can present

Pros and Cons of past Set-ups

- Issues with ESWW schedule:
  - Sessions are propo…ns
  - We therefore have…
  - Some proposed se…
  - …
  - …
  - …
- Po…
  - …
  - …sts
  - …sent

In 2015 (ESWW12) there was no ionosphere session, this year it had >40 submissions!

In 2016 (ESWW13) the following sessions were running in parallel [Monday 17:00 – 18:30]:

- **Solar Energetic Particle Events: Measurement, Modelling, Forecasting and Impact**
- **Flares, coronal mass ejections and solar energetic particles: Space Weather Impact**
- **SSA Space Weather Service Network**

Possible solution for esww15

- 6-8 fixed sessions
  - Titles are selected by the PC
  - Ensuring minimal overlap
  - Community proposes abstracts
  - PC selects best proposals
- 6-8 open sessions
  - Submitted as now
  - Submissions too close to fixed session theme will be excluded
  - More emphasis on year-on-year variability

Idea: max. 2 people per abstract and PC combine best proposals to encourage more of a mix of coordinators

Idea: fixed sessions would be ~3 hours, open sessions would be shorter

Solar Eruptions: Flares and CMEs
Interplanetary space weather
Solar-driven Radiation storms
Space Weather in the ionosphere
Ground Induced Currents
Space weather instrumentation

More Issues with the ESWW schedule

1. ESWW covers a wide range which makes it unique

    - Sun to Earth

    - Researchers, Operations/Services, End Users

    * But often the proposed Sessions do not quite match everyone's interests

    * Possible solution: introduce a blend of a few thematic sessions that cover the above areas, plus have a smaller number of contributed sessions

2. Plethora of oral sessions mean it is hard to see all talks or to find time for posters

    * Possible solution: thematic sessions to be plenary with associated longer poster sessions

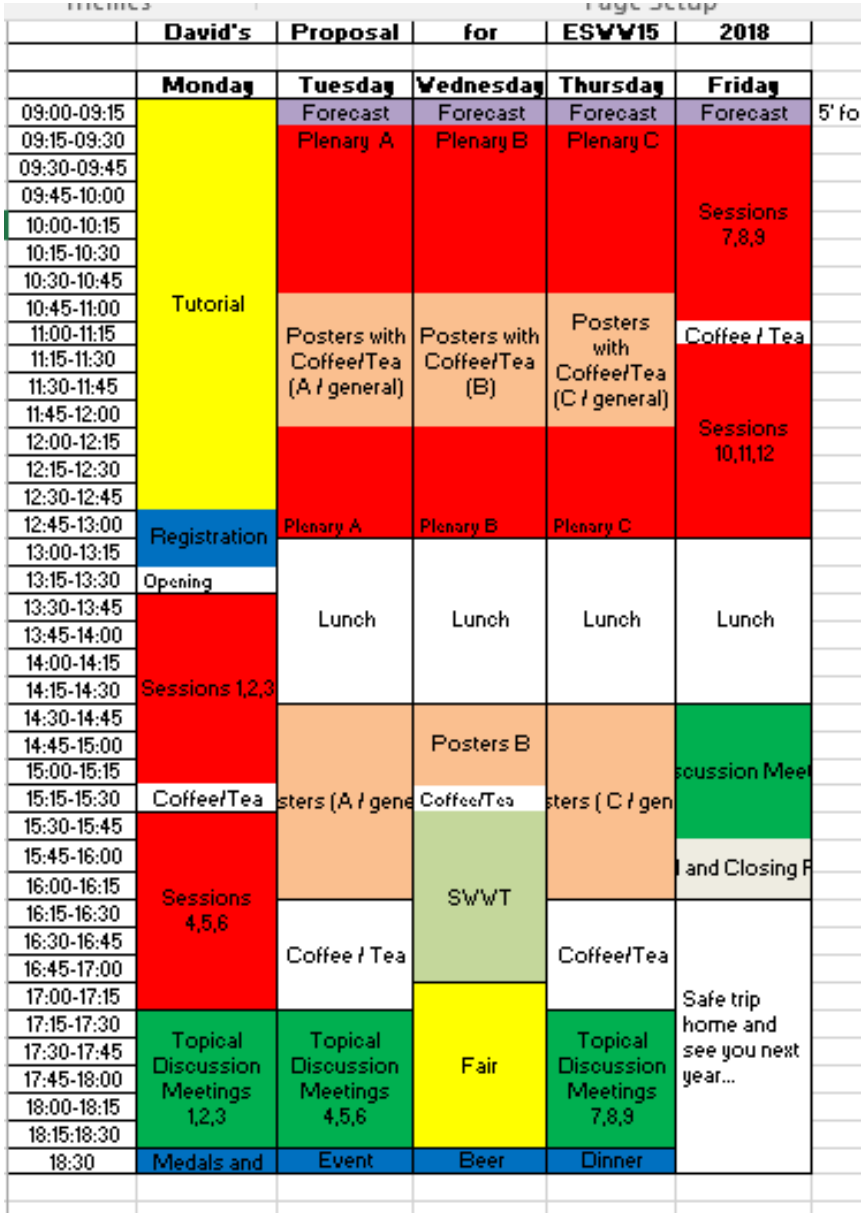
Possible solution for esww15

* Here there are 3 plenary thematic sessions and lots of time for posters (Tues-Thurs)

* Mon, Fri (and late Tues-Thurs) similar to now, with parallel sessions and TDMs

* No explicit slot for keynotes but these could be the 1st talks in the plenaries

Just a suggestion! – please provide feedback



	David's	Proposal	for	ESWW15	2018	
	Monday	Tuesday	Wednesday	Thursday	Friday	
09:00-09:15	Tutorial	Forecast	Forecast	Forecast	Forecast	5' fo
09:15-09:30		Plenary A	Plenary B	Plenary C	Sessions 7,8,9	
09:30-09:45						
09:45-10:00						
10:00-10:15						
10:15-10:30						
10:30-10:45						
10:45-11:00		Posters with Coffee/Tea (A / general)	Posters with Coffee/Tea (B)	Posters with Coffee/Tea (C / general)	Coffee / Tea	
11:00-11:15						
11:15-11:30						
11:30-11:45					Sessions 10,11,12	
11:45-12:00						
12:00-12:15						
12:15-12:30						
12:30-12:45						
12:45-13:00	Registration	Plenary A	Plenary B	Plenary C		
13:00-13:15		Lunch	Lunch	Lunch	Lunch	
13:15-13:30	Opening					
13:30-13:45	Sessions 1,2,3					
13:45-14:00						
14:00-14:15						
14:15-14:30			Posters B			
14:30-14:45		sters (A / gene	Coffee/Tea	sters (C / gen	scussion Mee	
14:45-15:00						
15:00-15:15						
15:15-15:30	Coffee/Tea		SWWT		and Closing F	
15:30-15:45	Sessions 4,5,6					
15:45-16:00						
16:00-16:15						
16:15-16:30		Coffee / Tea		Coffee/Tea		
16:30-16:45						
16:45-17:00						
17:00-17:15					Safe trip home and see you next year...	
17:15-17:30	Topical Discussion Meetings 1,2,3	Topical Discussion Meetings 4,5,6	Fair	Topical Discussion Meetings 7,8,9		
17:30-17:45						
17:45-18:00						
18:00-18:15						
18:15-18:30						
18:30	Medals and	Event	Beer	Dinner		

Don’t change

Piers proposal

Davids proposal

European Commission

#InvestEUresearch

Horizon 2020 Work Programme for Research & Innovation 2018-2020

Space weather topic in 2019 Space call

European Commission
Research Executive Agency
REA.B1 Space Research

Research and Innovation

EU Programmes 2014-2020

Search Topics

Updates

Calls

H2020

3rd Health Programme

Asylum, Migration and Integration Fund

Consumer Programme

COSME

European Statistics Programme

Hercule III Programme

Internal Security Fund - Borders

Internal Security Fund - Police

Justice Programme

Pilot Projects & Preparatory Actions

Calls for Proposals

Horizon 2020

Advanced search for topics
Calls for tenders on TED

- [ ] Nanotechnologies
- [ ] Advanced materials
- [ ] Biotechnology
- [ ] Advanced manufacturing and processing
- [x] Space
- [ ] Access to risk finance
- [ ] Innovation in SMEs

[ ] Societal Challenges

- [ ] Health, demographic change and wellbeing

Status [x] Calls with forthcoming topics [x] Calls with open topics [ ] Calls with only closed topics

Sort by ( ) Call title ( ) Call identifier (•) Publication date Filter a call FILTER

Industrial Leadership
Space 2018-2020
H2020-SPACE-2018-2020
Publication date:27 October 2017

Industrial Leadership
EGNSS market uptake 2019-2020
H2020-SPACE-EGNSS-2019-2020
Publication date:27 October 2017

Horizon 2020

Work Programme 2018-2020

5.iii. Leadership in Enabling and Industrial Technologies - Space

Important notice on the Horizon 2020 Work Programme

This Work Programme covers 2018, 2019 and 2020. The parts that relate to 2019 and 2020 are provided at this stage on an indicative basis. Such Work Programme parts will be decided during 2018 and/or 2019.

(European Commission Decision C(2017)7124 of 27 October 2017)

SU-SPACE-22-SEC-2019: Space Weather

Scope

- Proposals shall address the development of modelling capabilities and/or the delivery of prototype services able the interpretation of a broad range of observations of the Sun's corona and magnetic field, of the Sun-Earth interplanetary space and of the Earth magnetosphere/ionosphere coupling relying on existing observation capacities.
- The goal is to pave the way for forecasting horizons for space weather events in the order of tens of hours or days and to identify potential indicators (or proxies) of extreme events potentially through the joint analysis of interdisciplinary data.

European Commission

SU-SPACE-22-SEC-2019: Space Weather

Scope

- Proposals shall address application domains which may include space as well as terrestrial infrastructure.

- Proposals shall include architectural concepts of possible European space weather services in relation to the application domains addressed and they shall demonstrate complementarity to and, if relevant, utilize precursor Space Weather services already available through the Space Situational Awareness programme of ESA and take into account the global space weather service developments by the World Meteorological Organisation (WMO).

European Commission

SU-SPACE-22-SEC-2019: Space Weather

Impact

- Improved scientific understanding of the origin and evolution of space weather phenomena;
- New models and forecasting techniques capable of extending the time horizon of a future space weather forecasting capability to several days;
- Inventory of potential early indicators of extreme space weather events.

European Commission

SU-SPACE-22-SEC-2019: Space Weather

This action is also open to cooperation with international partners with relevant expertise.

European Commission

SU-SPACE-22-SEC-2019: Space Weather

Indicative budget 9 million EUR.

The Commission considers that proposals requesting a contribution from the EU of between EUR 2 and 3 million would allow this specific challenge to be addressed appropriately.

European Commission

SU-SPACE-22-SEC-2019: Space Weather

Indicative

Call opening: 16 October 2018

Call closing: 12 March 2019

A guidance document will be published (available when the call will be open).

Now ask National Contact Points for the slides presented during the last NCP Info Day related to 2018 Space Call.

European Commission

National Contact Points

The network of National Contact Points (NCPs) is the main structure to provide guidance, practical information and assistance on all aspects of participation in Horizon 2020. NCPs are also established in many **non-EU** and **non-associated** countries ("third countries").

Search for:

Select the country
------Member states-------
Austria
Belgium

Information and Communicatio
NMP
Space
Health
Food security

SEARCH

Sort by ○Country ◉Contact name ○Most recent ○Organisation

Ms Anna Casagrande - Belgium
Space - Secure, clean and efficient energy -
Organisation name: The Brussels Enterprise Agency - impulse.brussels
Address: Chaussée de Charleroi 110, 1060, Brussels, Belgium
Tel: +32 (0)2 800 00 50 - Fax: +32 (0)2 422 00 43
Send Mail - Website: **http://www.ncpbrussels.be**
Update date: 24-NOV-16 - **Record Control Number:** 4999004

Mr. André Pirlet - Belgium
Information and Communication Technologies (ICT) - Space - Inclusive, innovative and reflective societies - Security -
Organisation name: Union Wallonne des Entreprises (UWE)
Address: Chemin du Stocquoy, 3, 1300, Wavre, Belgium
Tel: +32 10 47 19 67 - Fax: +32 10 45 33 43
Send Mail - Website: **www.ncpwallonie.be**
Update date: 14-AUG-17 - **Record Control Number:** 5000206

Good luck!

#InvestEUresearch

www.ec.europa.eu/research

Participant Portal www

European Commission

ESA Space Environment and Effects Technology Developments in 2017

Piers Jiggens – ESA/ESTEC

29/11/2017

Space Environment and Effects Section (TEC-EPS)

ESA's Space Environment and Effects Section based at ESTEC in Noordwijk, The Netherlands is responsible for:

- Environment definitions (e.g. radiation, plasma, micro-particles, planetary atmospheres)
- Effects calculation (e.g. radiation dose, single event effects, charging, ESD, particle impacts)
- Project (mission) support (environment specification, impacts assessment, etc.)

The Research and Development (R&D) can be sub-divided into the main research area's of the Space Environment and Effects (TEC-EPS) section:

- Radiation environment and Instrumentation
- Space debris environment
- Plasma environment
- Atmosphere and planetary environments
- Atomic oxygen environment
- Space Weather Technology Development

Technology Readiness Levels (TRLs)

TRL 1 Basic principles observed and possible capability recognised

TRL 2 Technology concept and possible useful application identified

TRL 3 Active R&D initiated with proof-of-concept by analysis and experimentation

TRL 4 Technology implemented in breadboard and detailed characterisation performed including testing of critical elements

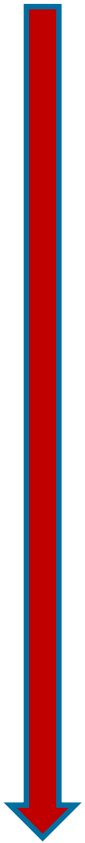
TRL 5 Validation in relevant environment integrated with realistic supporting elements for end-to-end testing

TRL 6 Representative model/prototype demo. in relevant environment

TRL 7 System prototype demonstration in a space environment (Opt.)

TRL 8 Actual system “flight qualified” through test and demonstration

TRL 9 Actual system “flight proven” through successful mission ops



See: ESA TRL Handbook (Sept. 2008)

ESA Technology Programmes

There are a wide range of technology programmes in ESA funding developments spanning the different TRL levels including:

Technology directorate (TEC)

GSP - General Studies Programme

TRP – Technology Research Programme

GSTP – General Support Technology Programme

Other directorates

Science (SCI): CTP – Core Technology Programme

Telecommunications (TIA): ARTES - Advanced Research in Telecommunications Systems

Human spaceflight and Robotic Exploration (HRE): MREP – Mars Robotic Exploration Preparation [to be replaced by **ExPeRT**]

Space Transportation (STS): FLPP - Future Launchers Preparatory Programme

Earth Observation (EOP): EOEP - Earth Observation Envelope Programme

Navigation (NAV): EGEP - European GNSS Evolution Programme

ESA Technology Programmes and SSA

Basic Technology Research Programme (TRP)

- Nominal TRL: 1-3
- Mandatory programme, budget from mandatory contribution of all member states
- EMITS – **http://emits.sso.esa.int**

General Support Technology Programme (GSTP) [1]

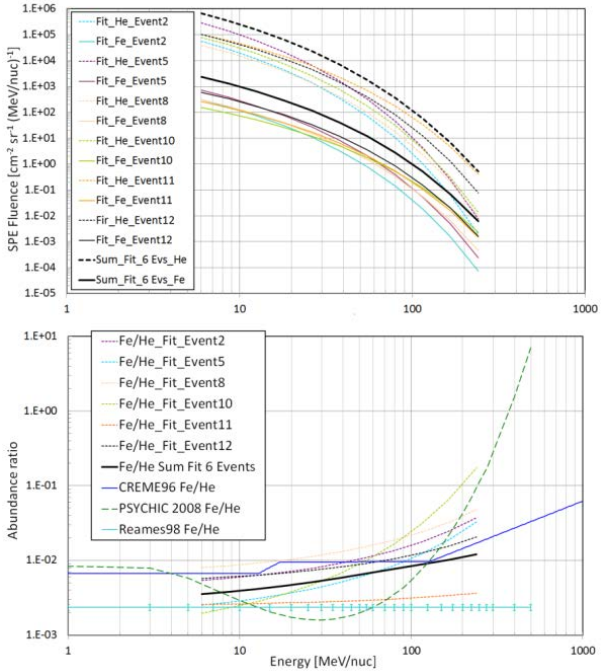
- Nominal TRL: 3-6
- Optional Programme, funding requested per activity
- Check EMITS, **GSTP-6 compendium of potential activities**

Space Situational Awareness (SSA) [2]

- Nominal TRL: 5-9
- Optional Programme, funding confirmed by the Member States separately for each 4-year period (presently in Period 3)
- EMITS - ITTs targeted to industry in participating Member States

TRP ongoing Activities (1)

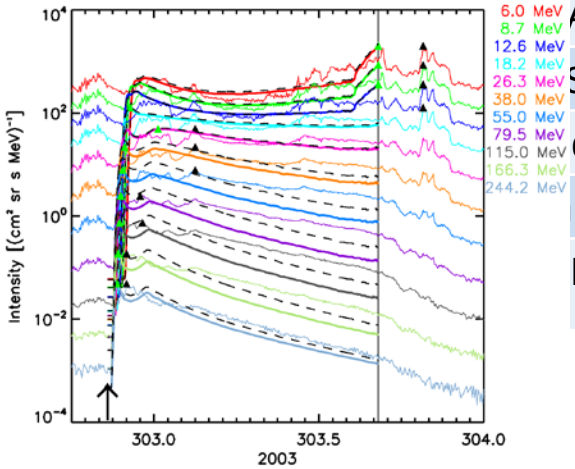
ESHIEM (an update of SEPEM)



	Prime Contractor
l thruster induced plasma plume	Onera [Fr]
or passive radiation shielding for	Thales Al
shielding optimisation system	RadMod F
ectron	ACEC [
on	SA [Gr
nely lo	dMod F
Analys	iv. Barcelona [Es]
heavy	llisto consultancy [UK]

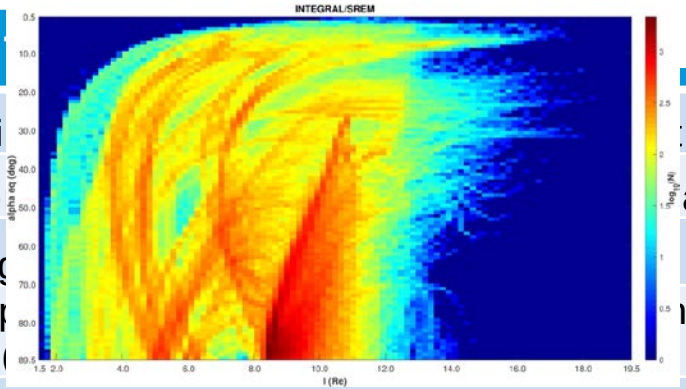
ALPHASAT / MFS

Update of SOLPENCO-2



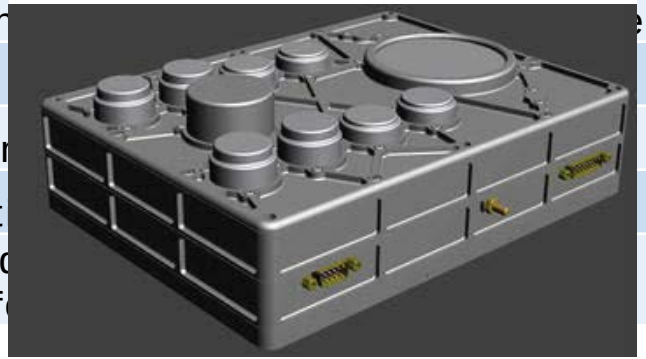
TRP ongoing Activities (2)

Activi	Prime Contractor
Three di tors	SINTEF [No]
Radiatio ation (VALIRENE)	DH Consultancy [Be]
Charging	
Data Exp ntal Monitoring Unit (EMUs)	
Meteoroid environr activity)	
Enhanced interplar el	
Space debris from	
Focussing of Micror	
MultiScreen Radiat	
MARS (Miniaturised wearable radiation monitor f	

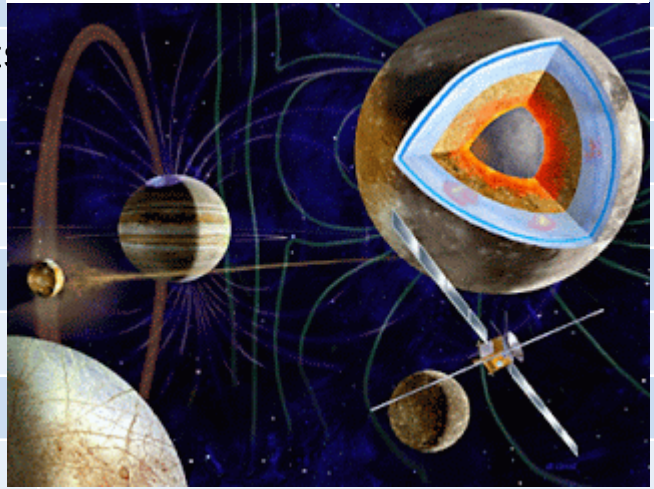


VALIRENE

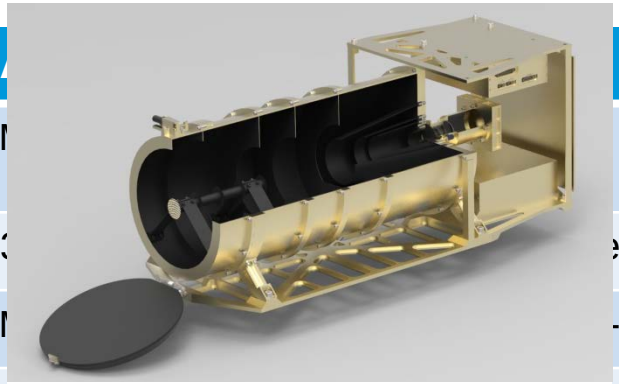
Galileo / EMU



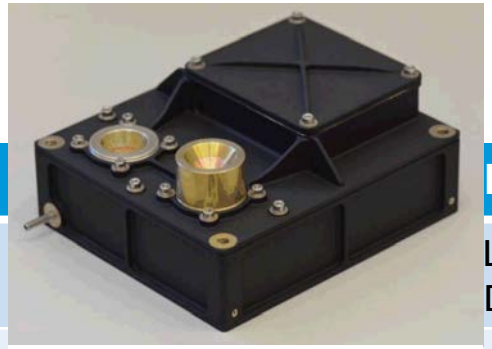
JUICE - JCAT



GSTP ongoing Activities

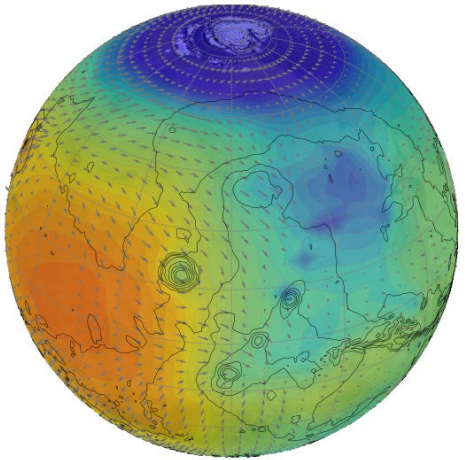


SCOPE



NGRM

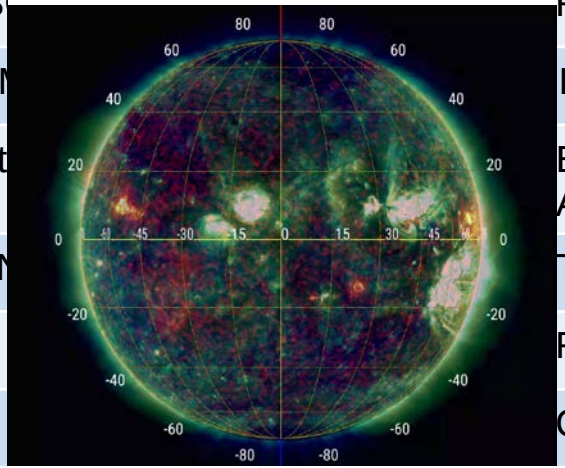
MCD



SPENVIS

The Space Environment Information System

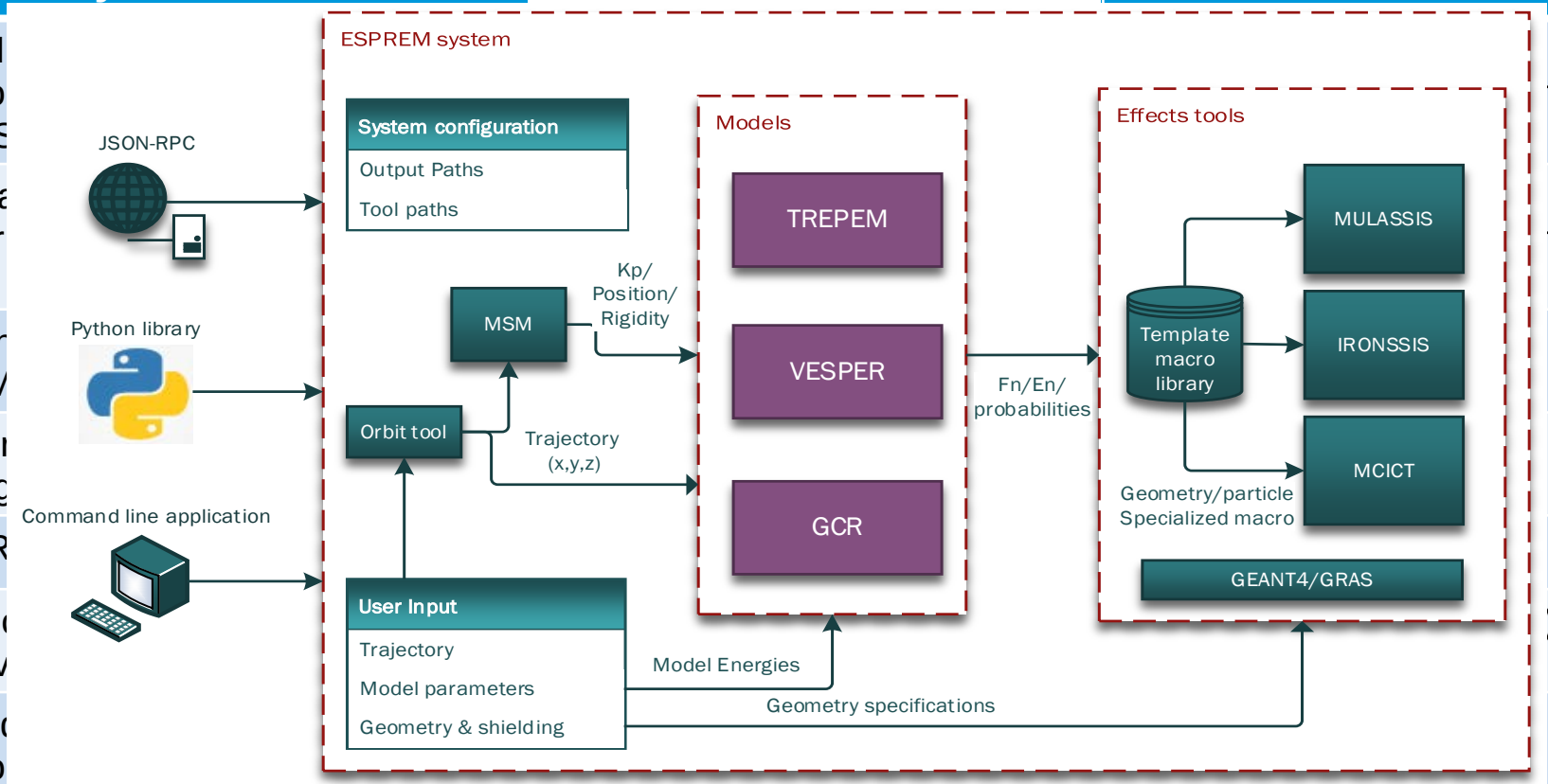
SWHV - JHv



X-Ray Flux Monitor for Cubesats (XFM	Isawa
tion Syst	Belgia
	Aeronomie [Be]
Monitor (M	Thales Alenia Space [Ch]
Space Weather Helioviewer (SWHV)	Royal Observatory of Belgium
RadMag on RADCUBE	C3S, Budapest [Hu]

GSP, CTP, ARTES and MREP ongoing Activities

Activity	HERMES	Prime Contractor
Hel pro in S		ns
Gea par		ns
MIr TIM		ity in
Mar Eng		
X-R		
Elec env		),
Moc pro		



GSTP Compendium Items (1)

Code	Title	Budget (k€)
GT17-072EP	Low resource spacecraft plasma monitor prototype	500
GT17-073EP	Radiation energy effects on electronic components with very high energy heavy ion and electron beams	500
GT17-074EP	Radiation monitor data analysis for radiation belt modelling	700
GT17-075EP	Microparticle model validation based on in-flight data	400
GT17-077EP	Large impact detectors for mm-particles resolving impact momentum vectors	500
GT18-001ED	Prototype Remote Interface Unit (RIU) for SWE hosted payloads	650
GT18-002EP	Solar Activity Onset Modelling	600
GT18-003EP	Radiation Monitor System in a Package	600

GSTP Compendium Items (2)

Code	Title	Budget (k€)
GT18-004EP	Heliospheric modelling techniques	1000
GT18-005EP	Virtual Space Weather Modelling Centre (VSWMC) - Part III	800
GT18-006EP	Fireball Monitor for Space Situational Awareness	800
GT18-008EP	Space Weather Instruments for SmallSat and H	1800
GT18-009EP	3I	600
GT18-010EP	G Geomagnetic Services	600
GT18-011L	Data Analytics for Early Warning of Space Weather Events	300
GT18-015MM	Compact EUV Imager for the Lagrange Space Weather mission	1200

Contact us and contact your GSTP Delegate

Planned activities

TRP	Multi-scale high accuracy engineering tools for single event effects analysis in modern technologies (€400k)
	Radiation Hazards and Scenarios System for Human Spaceflight (€300k)
	Prototype passive field effect electron emitter for charging elevation (€350 – contract placed)
	ROSSINI 3 Innovative Materials for Passive Radiation Shielding for Human Spaceflight (TAS-I Torino)
GSTP	Mini-Ion Emitters Technology for Spacecraft Potential Control and Thrusters applications (€400k Austrian Support)
	SPENVIS Extension (€300k Belgian Support)
ARTES	Electrostatic Discharge Monitor (€600k no proposals received – twice!)
	Solar Array Potential Monitor (€300k)

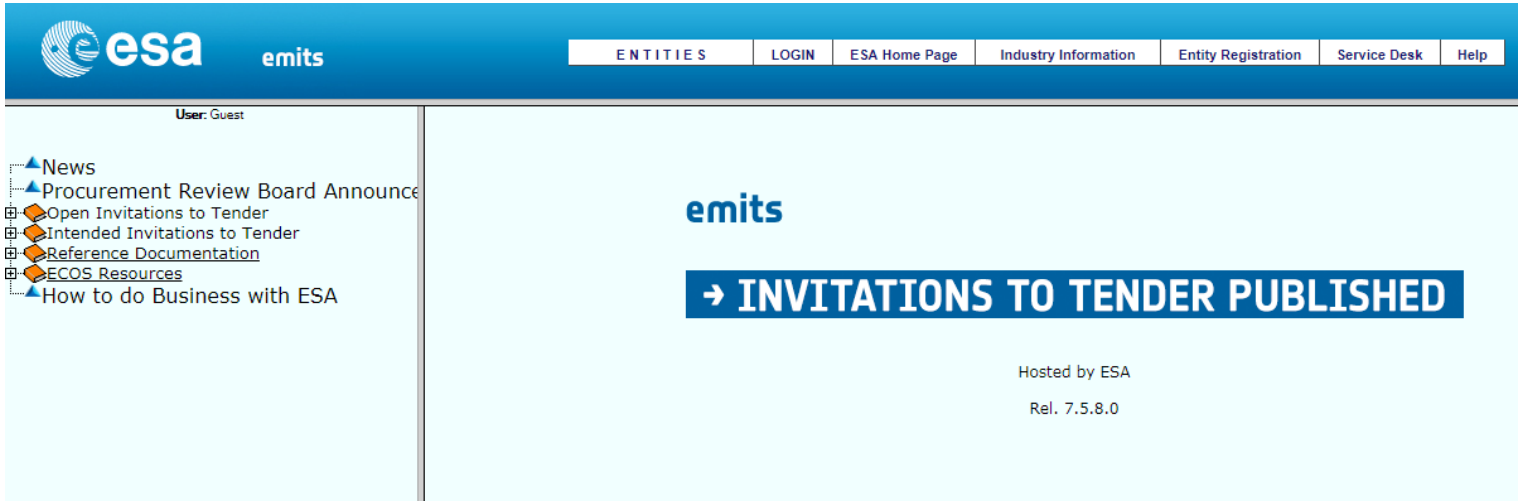
EMITS (Electronic Mail Invitation to Tender System)

For information on upcoming and open ITTs (Invitations To Tender) go to EMITS:

http://emits.sso.esa.int/

Any questions you can contact me and if I don't know I'll find someone who does:

Piers.jiggens@esa.int



ESA Space Weather Working Team (SWWT)

Topical Working Group :

'Drivers of Space Weather'

Subgroup 2:

Solar Storms (Solar Flares, CMEs & SEP events)

***Spokespersons*: N. Vilmer (Paris Observatory),**

O. Malandraki (National Observatory of Athens)

SWWT Plenary Meeting, Oostende, Belgium, 29 Nov 2017

SWSC | Journal of Space Weather and Space Climate

Journal of Space Weather and Space Climate

SWSC Journal of Space Weather and Space Climate

Topical Issue:

‘Flares, coronal mass ejections and solar energetic particles and their space weather impacts’

Topical Editors-in-Chief: *Nicole Vilmer* (LESIA, Paris Observatory), *Olga Malandraki* (National Observatory of Athens, NOA)

Guest editors: Kamen Kozarev, Luciano Rodriguez, Neus Agueda, Sergio Dasso, Manolis Georgoulis

SWSC **Journal of Space Weather and Space Climate**

11 papers submitted (unsolicited and not only participants from the session organized at ESWW13)

1 published

3 at the production office

6 in evaluation

1 rejected

Open Access

Flares, coronal mass ejections and solar energetic particles and their space weather impacts

Interplanetary transport of solar near-relativistic electrons on 2014 August 1 over a narrow range of heliolongitudes

Daniel Pacheco, Neus Agueda, Raúl Gómez-Herrero and Angels Aran

J. Space Weather Space Clim. 2017, 7, A30

SWSC Journal of Space Weather and Space Climate

Open Access

Flares, coronal mass ejections and solar energetic particles and their space weather impacts

The Coronal Analysis of SHocks and Waves (CASHeW) framework

Kamen A. Kozarev, Alisdair Davey, Alexander Kendrick, Michael Hammer and Celeste Keith

J. Space Weather Space Clim. 2017, 7, A32

Topical Discussion Meeting - Solar Flares, Coronal Mass Ejections and Solar Energetic Particle events: Impacts on the Space Environment

Olga E. Malandraki (SWWT-TWG1 Spokesperson, National Observatory of Athens/IAASARS, Greece); Nicole Vilmer (SWWT-TWG1 Spokesperson, LESIA, Observatoire de Paris); Norma B. Crosby (Royal Belgian Institute for Space Aeronomy)

Friday 01/12, 15:00 - 16:15, Permeke

Program

15h00- 15h20 : Arik Posner (NASA): 'Early Warning of Solar Energetic Particle Events and new Insights in Underlying Physical Causes'

15h20-15h40: Monica Laurenza (INAF): 'A Short-term Forecast Tool for Moderate-to-Extreme Solar Proton Events'.

15h40-16h00: Etienne Pariat (LESIA): 'Explorative researches of the FLARECAST project on new quantities to be used as improved flare predictors'

16h00-16h20: Mateja Dumbovic (Graz) : 'The effect of CME expansion on Forbush decreases'