

Developing Space Weather Products and Services in Europe

ES0803

Start date: 16/11/2008

End date: 15/11/2012

Anna Belehaki

Chair

National Observatory of Athens, Greece



Scientific context and objectives

- **Background / Problem statement:**

Space Weather can affect ground and space technological systems as well as humans in space. Extreme conditions have economical consequences and may threaten safety and security of the technological infrastructures. In the US, important progress in developing Space Weather prediction systems has been made. Although Europe has much scientific expertise on the physics and effects of Space Weather, its optimal use suffers from a lack of coordination between the national research programmes.

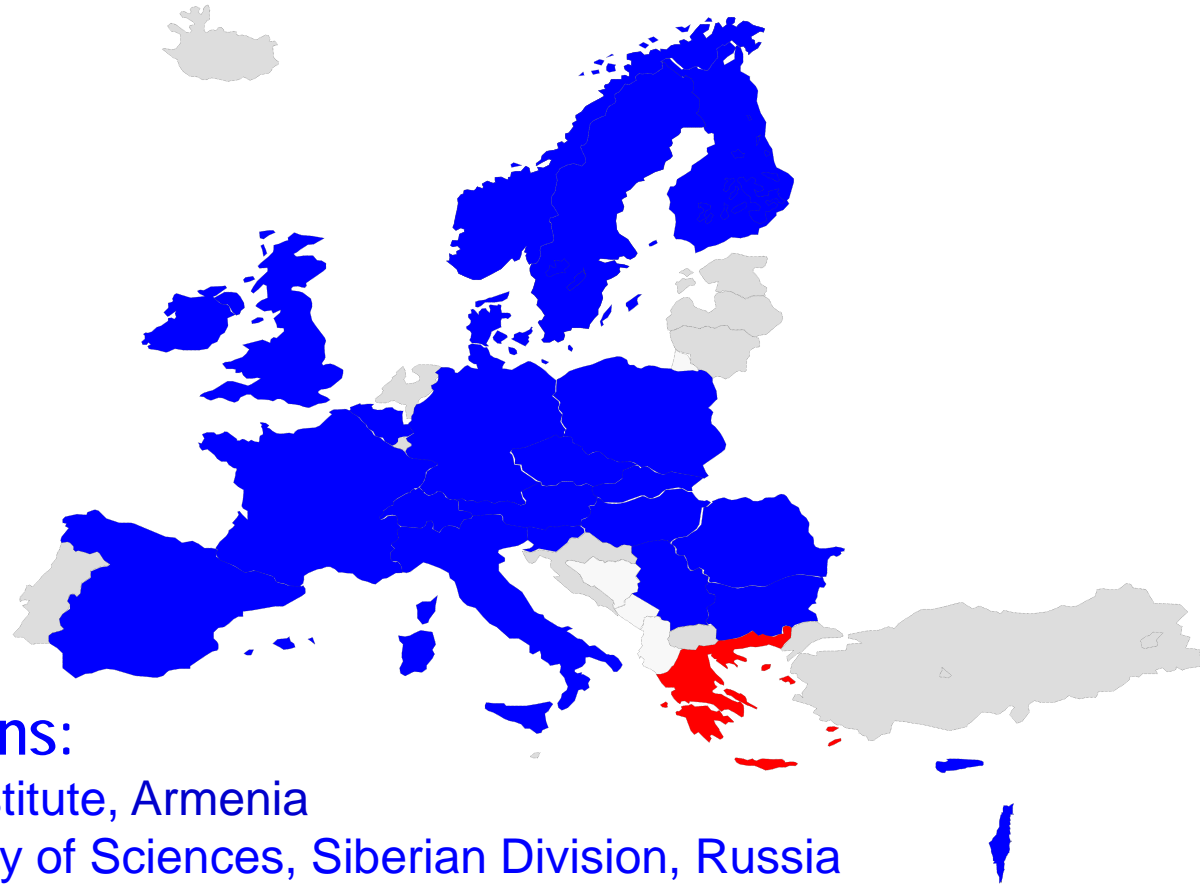
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Chair : **GR**

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Geographical impact



Non-COST institutions:

- Alikhanyan Physics Institute, Armenia
- ISTP, Russian Academy of Sciences, Siberian Division, Russia
- Space Research Institute, IKIRAS, Russia
- Institute of Terrestrial Magnetism, Izmiran, Russia
- Institute of Ionosphere, National Academy of Science, Ukraine (under approval)
- Institute of Geodesy, National University “Lviv Polytechnic” , Ukraine (under approval)

Scientific context and objectives (2/3)

- **Brief reminder of MoU objectives:**

This COST Action has **the primary goal to form an interdisciplinary network between European scientists dealing with different issues of geospace, as well as warning system developers and operators**, to:

- foster the ties between European geospace research and space technology establishments,
- assess the European potential in advanced Space Weather observational and modeling techniques and in reliable products and services,
- define the needs of a broad range of users and
- determine and recommend the specifications for new products and services that best meet the users requirements.

Scientific context and objectives (3/3)

Research directions:

- Detailed review of existing scientific knowledge and SW services
- Recommendations on the improvement of existing prototype services (European Space Weather Portal - ESWP, SWENET, DIAS, SPENVIS, etc.)
- Evaluation and validation of models and the standardization of SW products
- Networking of important stake holders (ISES RWCs, ESA, SWENET, SWWT, and European industry) for the ongoing analysis of user needs, the specification of new products and services and the dissemination of relevant information.
- Systematic contacts with users (European Space Weather Week - ESWW)
- Demonstration of models and prototype services through the ESWP, DIAS and SWENET portals

Working groups

Working group 1:

Advanced methods to model and predict SW effects

Leaders: Jurgen Watermann (FR), Consuelo Cid (ES)

Working group 2:

Space weather products and services

Leaders: Ronald Van der Linden (BE), Mike Hapgood(UK)

Working group 3:

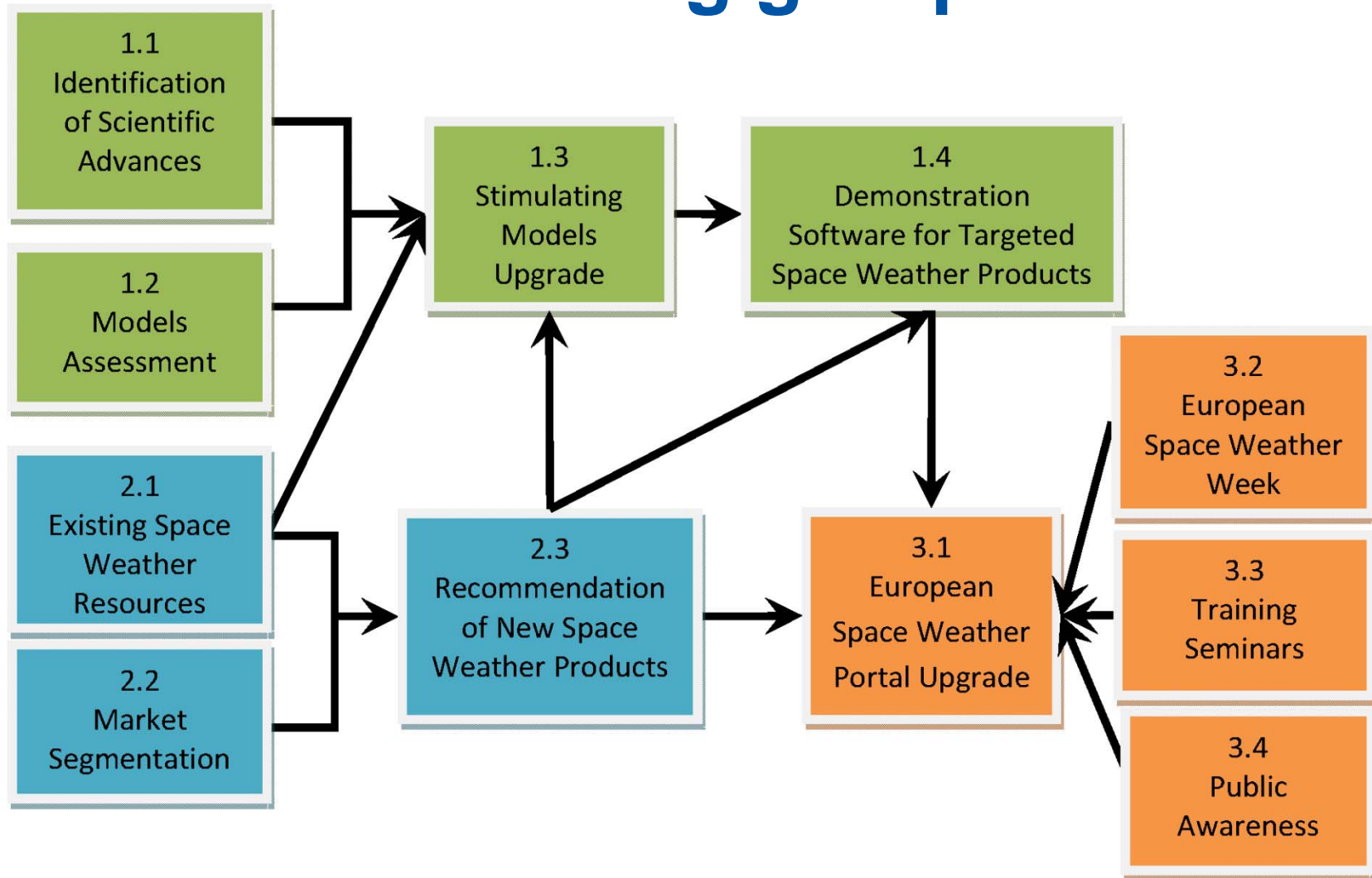
Exploitation, Dissemination, Education, Outreach

Leaders: Mauro Messerotti (IT), Vida Zigman (SI)

Chair: Anna Belehaki (GR)

Co-Chair: Mauro Messerotti (IT)

Working groups – Flow chart





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Space Weather originates mainly in solar activity and affects the interplanetary space and planetary magnetospheres, ionospheres and atmospheres. It can affect ground and space technological systems as well as humans in space. Extreme space weather conditions have economical consequences and may threaten safety and security of the technological infrastructures. In the US, important progress in modeling and predicting Space Weather effects has been made through the launch of large-scale research projects and the implementation of national prediction systems.

Although Europe has much scientific expertise on the physics and effects of Space Weather, its optimal use suffers from a lack of coordination between the national research programmes. This COST Action has the primary goal to form an interdisciplinary network between European scientists dealing with different issues of Geospace, as well as warning system developers and operators, to:

- Foster the ties between European Geospace research and space technology establishments,
- Assess the European potential in advanced Space Weather observational and modeling techniques and in reliable products and services
- Define the needs of a broad range of users and
- Determine and recommend the specifications for new products and services that best meet the user's requirements.

MoU : 229/08

CSO Approval date : 18/06/2008

Entry into force : 07/08/2008

End of Action : 15/11/2012

News

[International Advanced School on Space Weather Modelling and Applications \(Call is Open\)](#)

Apr 16, 2010

[WG2 Workshop 22-23 March 2010](#)

Mar 09, 2010

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COST ES0803 main web serves as a portal to all the activities related to the Action:

- Meetings
- Working Group Activities
- Main reports released by the SGs
- Community news
- Documents repository

Outcome and achievements (1/3)

The 6th European Space Weather Week was jointly organized by our Action, ESA, and SIDC-STCE.

It was attended by 247 participants, having the central aim to bring together diverse communities working on all elements of Space Weather with a strong focus on the users' involvement.

Our Action is also one of the main drivers of the next ESWW7 that will be held in Brugge from 15 to 19 November 2010.



Sixth European Space Weather Week

16-20 November, 2009
Brugge, Belgium

Science-Models-Applications-Services-Users
Space Situational Awareness
Impacts on Communication Systems
Health Issues

<http://sidc.be/esww6>

Programme committee:

- A. Belchak (Co-Chair, NOAA, COST ES0803)
- A. Glover (Co-Chair, ESA)
- M. Haggood (RAL/STFC, SWWT)
- J.-P. Luntama (FMI)
- R. Van der Linden (SIDC-STCE)
- P. Vanlommel (STCE)
- A. Thomson (BGS)
- T. Dudok de Wit (Univ. Orleans, SOTERIA)
- B. Zolesi (INGV)
- J. Watermann (CNRS)
- M. Messerotti (INAF, COST ES0803)
- M. Meier (DLR)

Local organisation:

SIDC@Solar-Terrestrial Centre of Excellence, Belgium





The Abdus Salam
International Centre for Theoretical Physics



INTERNATIONAL ADVANCED SCHOOL ON SPACE WEATHER MODELLING AND APPLICATIONS

18 - 29 October 2010

Miramare, Trieste, Italy

The School is organised jointly by ICTP, the EC COST Action ES0803 "Developing Products and Services for Space Weather in Europe", and the EC FP7 Project SOTERIA "SOLar-TERrestrial Investigations and Archives".

PURPOSE AND NATURE

Space Weather is the physical and phenomenological state of natural space environments under the effect of solar and non-solar driven perturbations.

In Europe the study of Space Weather has been promoted by the European Space Agency (ESA) and this triggered various cooperation initiatives like the former EC COST Action 724 "Developing the Scientific Basis for Monitoring, Modelling and Predicting Space Weather", the new EC COST Action ES0803, and the EC FP7 Project SOTERIA.

This school is a follow-up to the "International Advanced School on Space Weather" co-organized in 2006 by ICTP, EC COST Action 724, USNSWP, SCOSTEP/CAWSES, INAF, and INFN.

It is aimed at providing the scientific knowledge and the applied aspects of Space Weather, i.e., the monitoring and modelling resources based on advanced data handling, and it will address the following topics: a. Space Weather Drivers and the Relevant Physical Environments; b. Space Weather Impacts on Technological Systems and Humans; c. Space Weather Monitoring and Data Handling; d. Space Weather Modelling Techniques. Morning sessions will be focused on theory and afternoon sessions to practicals with the direct participation of the attendees.

PARTICIPATION

Scientists and students from all countries that are members of the United Nations, UNESCO or IAEA may attend the School. Although the main purpose of the ICTP is to help researchers from developing nations through a programme of training activities within a framework of international cooperation, students and postdoctoral scientists from developed countries are also welcome to attend. As the School will be conducted in English, participants must have a good working knowledge of that language.

As a rule, travel and subsistence expenses of the participants are borne by the home institution. However, limited funds are available for some participants (not more than 45 years of age) from, and working in, developing countries, to be selected by the organizers. Such financial support is available only for those who attend the entire activity. Every effort should be made by candidates to secure support for their fare (or at least half fare) from their home country. There is no registration fee to attend the School.

HOW TO APPLY FOR PARTICIPATION

The application form can be accessed at the activity website:

<http://agenda.ictp.it/smr.php?2171>

Once in the website, comprehensive instructions will guide you step-by-step, on how to fill out and submit the application form.

Telephone: +39-040-2240226 Telefax: +39-040-22407226

E-mail: smr2171@ictp.it
ICTP Home Page: <http://www.ictp.it>

Outcome and achievements (2/3)

“International Advanced School on Space Weather Modelling and Applications”

jointly organized by ICTP, COST ES0803 and SOTERIA, from 18 to 29 October 2010.

The final programme will be available soon.

DIRECTORS

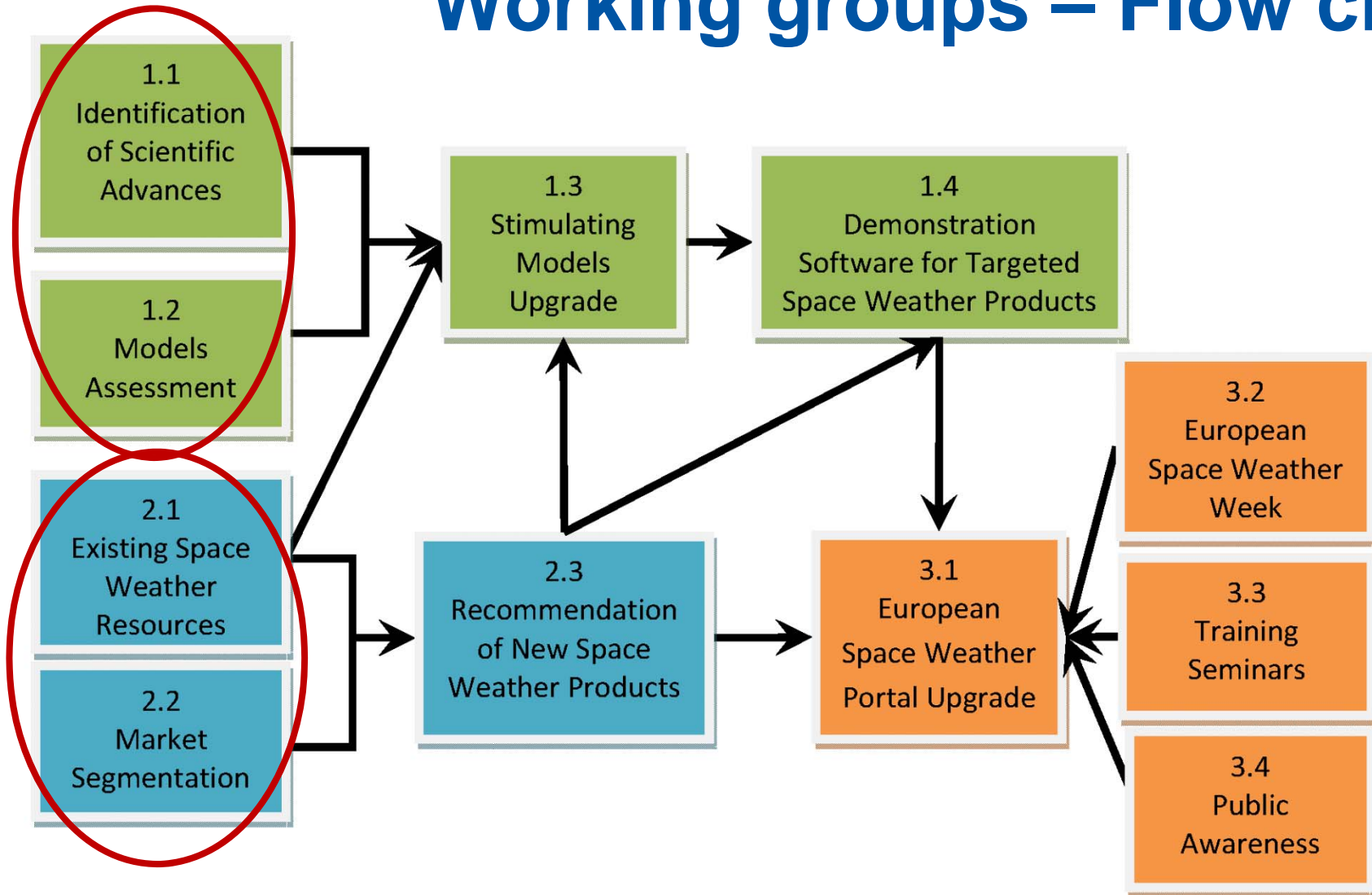
A. Belehaki (NOA, GR)
M. Messerotti (INAF, IT)
G. Lapenta (KU Leuven, BE)
S. Radicella (ICTP, IT)

MAIN CO-SPONSORS

- the Abdus Salam International Centre for Theoretical Physics (ICTP)
- EC COST Action ES0803 "Developing Products and Services for Space Weather in Europe"
- EC FP7 Project SOTERIA "SOLar-TERrestrial Investigations and Archives"
- National Institute for Astrophysics (INAF) (Italy)
- European Space Agency (ESA)

APPLICATION DEADLINE
31 May 2010

Working groups – Flow chart



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Meetings

COST ES0803 Meetings

Meetings

- Workshop dedicated to WG2 activities "Recent advances in Space Weather products and services", Scientific Center of the Polish Academy of Sciences in Paris, 22-23 March 2010.
 - [Programme](#), [List of participants](#), [Abstracts](#), [Presentations](#), [Venue](#)
- Core Group Meeting, Royal Observatory of Belgium, Brussels, 26-28 January 2010.
- Third MC Meeting, Brugge, Belgium, 16-17 November 2009.
 - [Minutes](#) ([Minutes](#), Attachment [1](#) , [2](#) , [3](#) , [4](#) , [5](#) , [6](#) , [7](#) , [8](#) , [9](#) , [10](#) , [11](#) , [12](#) , [13](#) , [14](#) , [15](#) , [16](#) , [17](#))
- WG3 meeting, Programme Committee of the ESWW6, Observatoire de Paris, 28-29 September 2009.
 - [Minutes](#)
- WG3 meeting, Programme Committee of the ESWW6, Observatoire de Paris, 28-29 May 2009.
 - [Minutes](#)
- **Second MC Meeting and Workshop** , Frascati, Italy, 1-3 April 2009, Local Organiser: Ermanno Amata, INAF
 - [Minutes](#) ([Minutes](#), Attachment [1](#) , [2](#) , [3](#) , [4](#) , [5](#) , [6](#) , [7](#) , [8](#))
- Steering Committee Meeting, ROB, Brussels, 29 January 2009
 - [Minutes](#) ([Minutes](#), Attachment [1](#) , [2](#) , [3](#) , [4](#) , [5](#))
- Kick off meeting, Brussels, Belgium, 16-17 November 2008
 - [Minutes](#) ([Minutes](#), Annex [1](#) , [2](#) , [3](#) , [4](#) , [5](#) , [6](#) , [7](#) , [8](#) , [9](#) , [10](#) , [11](#) , [12](#))

News

 [International Advanced School on Space Weather Modelling and Applications \(Call is Open\)](#)

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COST ES0803 Workshop: "Recent advances in Space Weather products and services" held in the Scientific Center of the Polish Academy of Sciences in Paris, 22-23 March 2010.

Aim of the workshop:

- Review of recent advances in providing SW products and services by European systems and organizations
- Presentation of users' needs and assessment of their satisfaction from existing services

Set up of the new International Journal on Space Weather

Two years of negotiations with several publishers and with the COST Office:

The new journal is now a reality:

SPACE WEATHER INTERNATIONAL - SWI

Publisher: EDP SCIENCES

The journal for the first four years is co-funded by COST and EDPS.

It is an open access journal, and authors will publish at no charge for the first two years.

Space Weather International - SWI

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News

- Accreditation of EDP Sciences by the SCEREN-CNDP (2010-06-11)
- A new journal: "International Journal of Metrology and Quality Engineering" (2010-05-03)
- The scientific publishing - Vision and perspectives 2015 (2010-04-27)
- OAI-PMH and EDP Sciences (2010-03-05)
- EPJ Web of Conferences now indexed in DOAJ and NASA ADS (2010-03-08)

Featured Articles

ACE-inhibitory activity and ACE-inhibiting peptides in different cheese varieties
Dairy Sci. Technol.

Food-derived peptides exert numerous functionalities in vitro and in vivo. At present, milk proteins are considered the most important source of bioactive peptides. Milk products containing hypotensive peptides are of interest for maintaining good health of humans with moderate hypertension ... [More](#)

A&A special feature: Science with AKARI
A&A

Astronomy & Astrophysics is publishing a special feature devoted to the new results obtained with the infrared satellite AKARI, a JAXA project with the participation of ESA. It includes 17 articles dealing with various subjects. Some papers are based on the AKARI all-sky survey, which has just been released ... [More](#)

Compact Stark slower for polar molecules
Eur. Phys. J. D

Stark deceleration has emerged over the last decade as a leading technique for obtaining packets of quantum-state-selected molecules whose velocity can be tuned all the way down to zero ... [More](#)

Numerical simulation of blood flows through a porous interface
ESAIM: M2AN

This highlight paper represents an excellent example in which advanced mathematical methods are applied to the study of a problem of medical and engineering relevance; i.e., the treatment of cerebral aneurysms ... [More](#)

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Journal of oral medicine and oral surgery's four annual issues propose scientific articles, clinical cases and journals of bibliography dedicated to the study, the diagnosis, and treatment of buccodental illnesses: illnesses and oral surgery, implantodontics, anesthesia ... [View the journal](#)

Therapeutic patient education
Editor-in-Chief: Jean-François d'Ivernois

Therapeutic patient education is the Journal of the European society for therapeutic patient education (SETE). It promotes the development of research and practices in the field of therapeutic patient education ... [View the journal](#)

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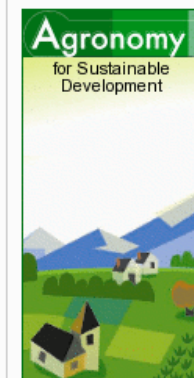
Conferences

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Space Weather International

Space Weather International (SWI) is an international multi-disciplinary and interdisciplinary **open access journal** which publishes papers on all aspects of **space weather and space climate** including but not limited to

- fundamental and applied scientific research including theory, observation, modeling and prediction
- technical applications and engineering solutions
- impact on humans and technology in space, in the air, at sea and on land
- societal and economic implications
- educational and dissemination concepts and experiences
- development of user-targeted products and services
- scientific, technical, political and commercial initiatives

Space Weather International

Editors-in-Chief: Jean Lilensten and Anna Belehaki

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Consuelo Cid (ES)

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Susan McKenna (IE)

Alexi Glover (ESA)

Esa Turunen (EISCAT)

The Editorial Board will be assisted by the Advisory Board

**The official announcement with call for papers is expected in
September 2010.**

Next steps until the end of 2010:

- Development of an online catalogue service for space weather resources http://www.spaceweatherservices.com/spw_catalogue/ (Heynderickx, 2010). This prototype online catalogue database and web interface is currently undergoing evaluation and testing.
- Validation of space weather models: The determination and the maintenance of space weather metrics is fundamental to this effort, as metrics-based testing can establish the absolute model performance as well as the model performance in respect to other models with comparable outputs and can keep track of the progress in space weather modeling capabilities with time.
- Joint activities with BISA for the upgrade of the European Space Weather Portal with models, catalogues and outreach material. An agreement is under discussion.

Use of COST instruments

	YR 1 Nov. 08 – Apr. 09	YR 2 May. 09 – Apr. 10	YR 3	YR 4
No. of MC / WG meetings / Steering Group meetings	2 MCM 1 WGM 1 SGM	1MCM 3 e-vote MC decisions 1WGM 4 SGM		
No. of STSMs	4 applications approved by MC	5 STSM		
No. of workshops / conferences	1	1		
No. of joint publications	1	91		
No. of training schools	-	1 (approved by ICTP)		
GASG (activities)	Website development	Website upgrade / update		