

# STCE Newsletter

10 Sep 2012 - 16 Sep 2012



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The Solar-Terrestrial Centre of Excellence (STCE) is a collaborative network of the Belgian Institute for Space Aeronomy, the Royal Observatory of Belgium and the Royal Meteorological Institute of Belgium.

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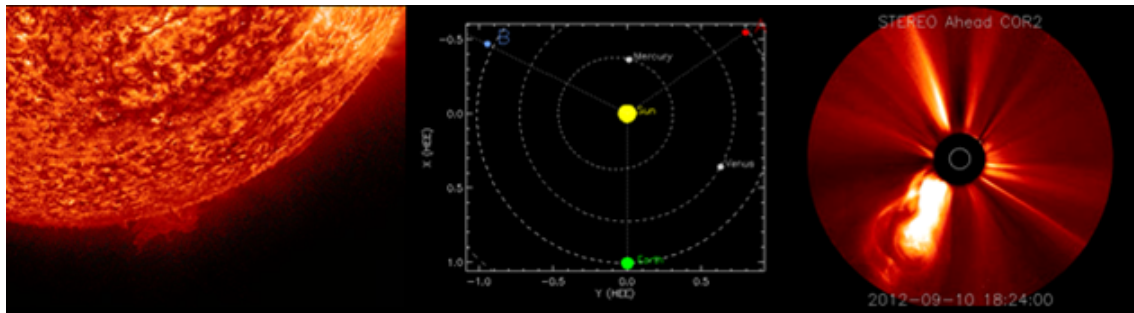
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## 1. A filament's jump to fame (10 Sep 2012 - 16 Sep 2012)

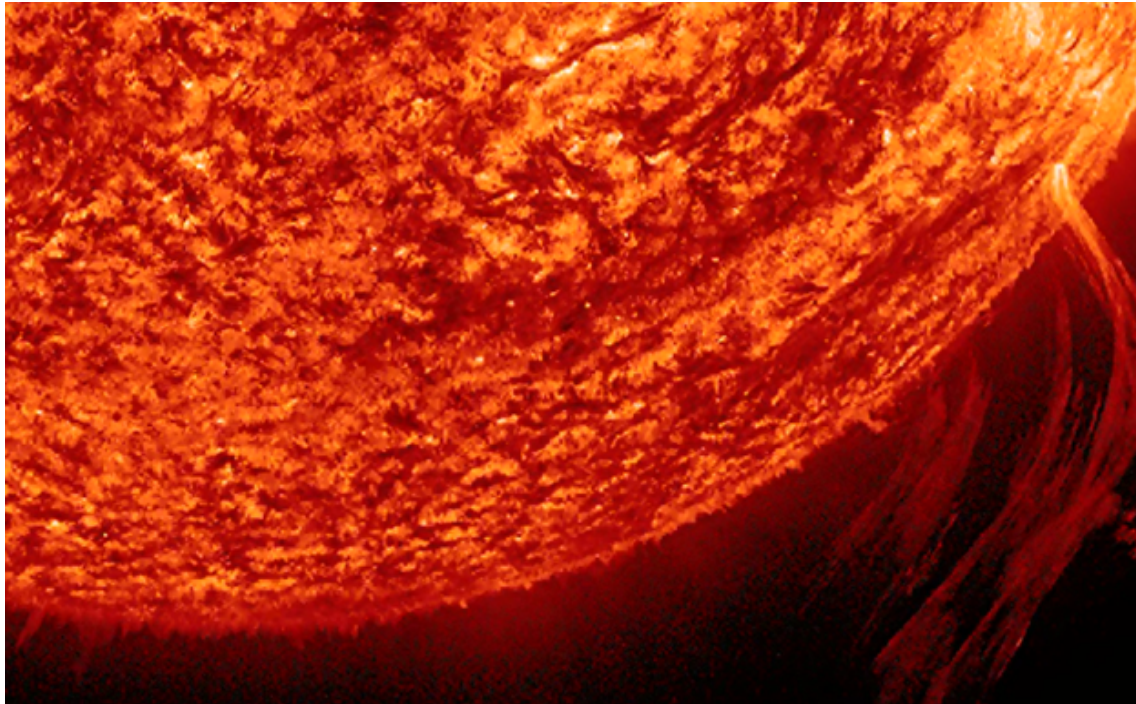
Filaments are clouds of cooler gas trapped between magnetic fields of opposite polarity. Seen in suitable filters, they look like dark lines and strands against the hotter solar disk. Near the limb, when their silhouette is observed, they glow as towering, torches, hedges and arches. They are then called prominences.

During the evening hours of September 9th, a small but dynamic filament turned around the southwestern solar limb, very near the southern solar pole. Only a few hours later (morning of September 10th), the magnetic regions surrounding the prominence became unstable, and an ejection of the material took place. This can be seen in images from the Sun's chromosphere made by the GONG-observatories (<http://halph.nso.edu/>).

A few hours later, the coronal mass ejection (CME) was also observed with the coronagraphs onboard STEREO-A (<http://stereo.gsfc.nasa.gov/>), showing a pear-shaped cloud of ionized gas (plasma) moving away from the Sun. Such CME's have a mass comparable to that of a well-sized Alp mountain, and a speed in excess of 1.5 million kilometers per hour. A good thing this CME was not directed towards Earth!



Interestingly, some of the erupting material was captured by the Sun's magnetic field and graciously guided back into the lower solar atmosphere. This can be seen as a brightening south of an active (bright) region near the southwestern limb. The brightening is only seen in the EUV-clips, not in H-alpha, meaning that the crashing of the ejected material into the denser lower atmosphere of the Sun took place in the lower corona (above the chromosphere). The speed of the plasma at the end of the 750.000 km long loop is on the average half a million kilometers per hour!



A clip of the event can be seen at <http://www.youtube.com/watch?v=aafHnjAhxEM> It shows:

- the filament and subsequent prominence eruption in H-alpha (GONG);
- the CME as seen by STEREO-A's coronagraph. Note the CME is on the southeast part of the Sun (lower left), because of the satellite's position;
- the part of the material that is flowing back to the Sun. It consists of a combination of EUV-images by SDO (<http://sdo.gsfc.nasa.gov/> ) and by the wider field PROBA2/SWAP instrument (<http://proba2.oma.be/> );
- zoom-in on the area with SDO-images (first AIA 171, then AIA 304). The beginning of both clips still show some part of the filament (dark, swinging strands,) very well before the final eruption.
- the EUV-view by STEREO-A where the ejected material can be seen returning to the Sun, albeit weakly (lower left, "east").

## 2. The 5th Solar Orbiter Workshop

It is official: the 5th Solar Orbiter Workshop was a success!

177 (!) people from 17 countries discussed the scientific and technological challenges of the ESA-NASA Solar Orbiter satellite that will be launched in 2017.

It was a challenge indeed. How will all the instruments onboard operate in harmony and in what form will the data be transmitted to the Earth? We learned that also data on the board computer can get stuck in a traffic jam: if you need 10 lanes and only 5 are available, creative solutions need to be thought of.

- HOME
- PROGRAM
- GOOGLE AGENDA
- COMMITTEES
- REGISTRATION
- LOCAL INFORMATION
- SOCIAL PROGRAM
- POSTER
- PAST EDITIONS
- PRESS
- CONTACT



## Fifth Solar Orbiter Workshop

September 10 - 14, 2012 - Brugge, Belgium

We are pleased to announce that the fifth Solar Orbiter Workshop will take place in Brugge, Belgium from Monday September 10 to Thursday September 13. Friday September 14 will be dedicated to a Science Working Team (SWT) meeting.

The workshop will focus on the science questions addressed by this exciting and recently approved mission, which is a partnership between ESA and NASA. The scientific synergy of Solar Orbiter with Solar Probe Plus and other missions will also be highlighted.




Solar Orbiter is a partnership of





This Workshop is sponsored by



Solar Orbiter 5 on twitter  
**#solorb5**

 niclabrosse  
Cool, (almost?) all the presentations (talks and posters) from the #solorb5 meeting will be soon online.  
about a day ago

 Ruimteweer  
Break down of #solorb5 has begun. The end of the workshop is near.  
about 6 days ago

 niclabrosse  
RT @petertgallagher: 1 overhead projector, 3 acetates, and 8 decades of insight. Gene Parker brings #solorb5 to a fitting close. [http:// ...](http://...)  
about 6 days ago

### What were the opinion of the participants about the workshop?

Let's scroll through some tweets

Enjoying Manolis Georgoulis talk at #solorb5 -- how we might predict solar eruptions and the challenges that face us

....he's looking at estimating mass in moving prominences. Interesting stuff!

Looking forward to more #solorb5 tomorrow: lots of great talks ahead on eruptive processes in solar atmosphere and their impact on heliosphere

No speeches at the #solorb5 conference dinner! + lots of very good beers and very good food. I wish conference dinners were always like this

Can't see the wood for the trees in your data? Check out Skytek/TCD FOREST poster <http://shar.es/usNYL>

Solar Energetic Particles - it seems the more we understand, the more we have to learn #solorb5

#solorb5 - Erosion in space does exist: magnetic clouds are sensible things.

Loving Benoit's talk on erosion of magnetic clouds - my fave topic!!!

#solorb5 Feeling a bit dizzy after Zhang's talk about magnetic helicity

I'm free (ie no one from LOC asked me) to say that the #solorb5 meeting is great. Nice poster session with lots of beer-powered discussions



### **Eugene Parker, the solorb5 top of the bill, was THE tweet hit.**

Parker's conclusion of the #solorb5 meeting was impressive. I felt like tweeting each of his remarks! 1 overhead projector, 3 acetates, and 8 decades of insight. Gene Parker brings #solorb5 to a fitting close. Genuinely excited like a little kid to hear Gene Parker's take on #solorb5 meeting. I've never heard him speak at all!

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Veronique Delouille has the unenviable task of being warm-up act for Gene Parker at #solorb5 Eugene Parker, father of solar wind and interplanetary magnetic field?, speaks at #solorb5 today. Should b fascinating.

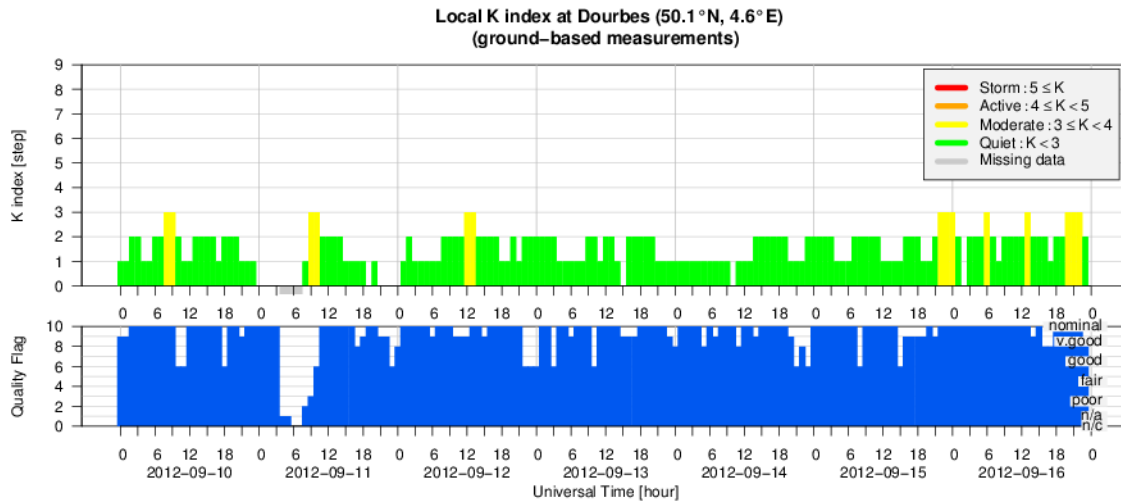
### **3. Review of solar activity (10 Sep 2012 - 16 Sep 2012)**

Solar activity was very low during the past week with only moderate C-class flares. The most significant solar event was probably a filament eruption that took place close to NOAA Active Region 1566 on September 13 (around 06:00 UT), together with a Coronal Mass Ejection (CME).

### **4. Review of geomagnetic activity (10 Sep 2012 - 16 Sep 2012)**

Geomagnetic activity was very low during the week. The only noticeable event took place on September 12, when the Earth entered a mild fast solar wind stream (speed of about 450 km/s). No significant increase of the geomagnetic activity was detected.

## 5. Geomagnetic Observations at Dourbes (10 Sep 2012 - 16 Sep 2012)



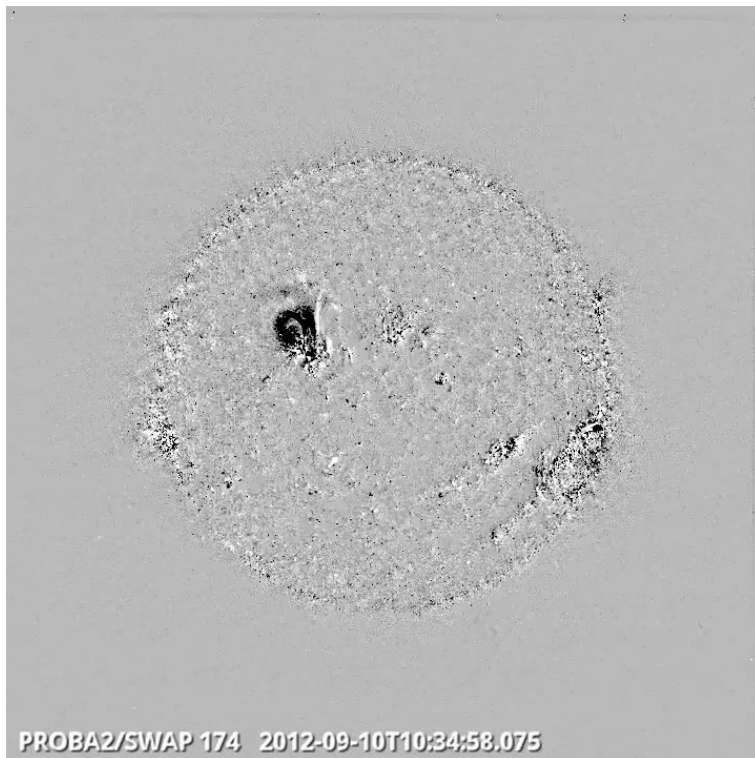
## 6. PROBA2 Observations (10 Sep 2012 - 16 Sep 2012)

### Solar Activity

This week, the Sun's activity level was \*Low\*, evolving to \*Very Low\* during the last 3 days of the week.

In order to view the activity of this week in more detail, we suggest to go to the following website from which all the daily (normal and difference) movies can be accessed: <http://proba2.oma.be/ssa>. This page also lists the recorded flaring events.

On September 10th, an eruption from AR 11567 is prominent in the daily difference movie (see image below).



At approximately the same time as the above eruption, one can slightly distinguish the start of a prominence eruption close to the Southern Pole - in Western direction, some of its ejected material will be moving along magnetic field lines towards AR 11563. Below is a picture showing the end phase of the eruption, where material is dumped along the magnetic field lines. This eruption starts to be visible around 10:08 UT.

SWAP movies showing the above events can be found @ [http://proba2.oma.be/swap/data/mpg/movies/20120910\\_swap\\_diff.mp4](http://proba2.oma.be/swap/data/mpg/movies/20120910_swap_diff.mp4) (difference movie) and @ [http://proba2.oma.be/swap/data/mpg/movies/20120910\\_swap\\_movie.mp4](http://proba2.oma.be/swap/data/mpg/movies/20120910_swap_movie.mp4) (normal movie).



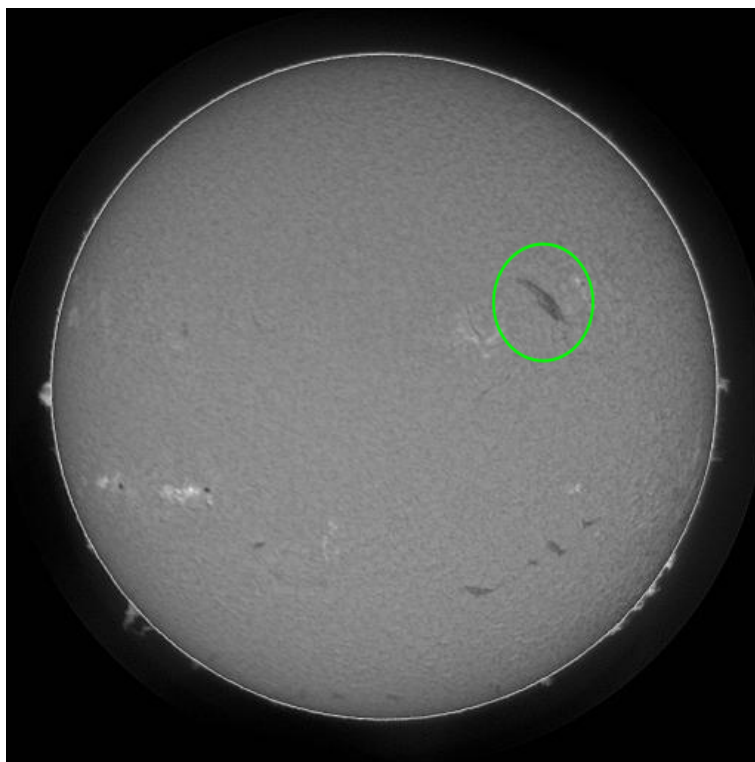
At other energy levels, this prominence eruption is more spectacular (see Helioviewer.org SDO/AIA/304 at the aforementioned time).

On Thursday 13th, two events can be observed in the early morning (UT).

In the North West quadrant, a filament located between AR 11566 and 11567 erupts around 06:13 (see pictures below and movie here: [http://proba2.oma.be/swap/data/mpg/movies/campaign\\_movies/2012\\_09\\_13\\_BothErupt\\_NW\\_SE\\_SWAP\\_diff.mp4](http://proba2.oma.be/swap/data/mpg/movies/campaign_movies/2012_09_13_BothErupt_NW_SE_SWAP_diff.mp4)).

The first picture below is the SWAP difference image while the eruption is on-going. In the second one, the same can be seen in H-alpha (picture extracted from a GONG movie @ [http://halph.nso.edu/keep/ham/201209/20120913/20120913000000Lh\\_ALL.html](http://halph.nso.edu/keep/ham/201209/20120913/20120913000000Lh_ALL.html) ). In SDO/AIA/304 (see Helioviewer.org), this erupting filament can be seen to move over more than half the Sun's surface before dissipating.





While the above eruption is ongoing (see the North West quadrant below), around 07:13, in the South East quadrant, an eruption (C1.8 flare) in AR 11569 blows material away towards a non active location with opposite polarity close to the center of the disk, right

above the equator (see pictures below and movies @ [http://proba2.oma.be/swap/data/mpg/movies/campaign\\_movies/2012\\_09\\_13\\_BothErupt\\_NW\\_SE\\_SWAP\\_diff.mp4](http://proba2.oma.be/swap/data/mpg/movies/campaign_movies/2012_09_13_BothErupt_NW_SE_SWAP_diff.mp4)). Such material exchange between AR 11569 and its connection in the North happened several times during the day.



On Saturday 15th, a prominence eruption occurred on the North West limb, starting at 22:53 (see SWAP difference picture below):



On Sunday 16th, around 4:00 UT, material is being transferred along field lines from AR 11573 to a non active region north of it (see SWAP difference picture below):



## **7. New documents in the European Space Weather Portal Repository**

See <http://www.spaceweather.eu/en/repository>

### **Bright point study with SWAP**

PROBA2 Science Days May 2012

<http://www.spaceweather.eu/en/repository/show?id=242>

### **Time delays in quasi-periodic pulsations observed during the X2.2 solar flare on 2011 February 15**

<http://www.spaceweather.eu/en/repository/show?id=243>

### **Impact of the Particle Environment on LYRA Data**

PROBA2 Science Days May 2012

<http://www.spaceweather.eu/en/repository/show?id=244>

### **Energetic particle environment as seen by SphinX**

PROBA2 Science Days May 2012

<http://www.spaceweather.eu/en/repository/show?id=245>

### **Two studies with LYRA: Ly-alpha flare observations and Long-term trend**

PROBA2 Science Days May 2012

<http://www.spaceweather.eu/en/repository/show?id=246>

### **Impact of particles on SEM and EVE data**

PROBA2 Science Days May 2012

<http://www.spaceweather.eu/en/repository/show?id=247>

### **Energetic particle environment as seen by RESIK**

PROBA2 Science Days May 2012

<http://www.spaceweather.eu/en/repository/show?id=248>

### **The Venus Transit**

PROBA2 Science Days May 2012

<http://www.spaceweather.eu/en/repository/show?id=249>

### **Observing “EIT waves” with SWAP, EIS and AIA**

PROBA2 Science Days May 2012

<http://www.spaceweather.eu/en/repository/show?id=250>

### **Using Proba2 for coronal seismology**

PROBA2 Science Days May 2012

<http://www.spaceweather.eu/en/repository/show?id=251>

### **ESWW9 SWWT SALE abstracts**

The SALE Executive is pleased to announce that a set of high level talks on various aspects of the energetic particle radiation hazard to aviation crews and personnel aboard spacecraft in LEO will be presented at a meeting of the Spacecraft, Aircraft and Launcher Environments group during Space Weather Week in Brussels, Belgium (8 November, 2012). Abstracts of these talks are attached and EVERYONE is cordially invited to attend on this very special occasion.

<http://www.spaceweather.eu/en/repository/show?id=252>

## **Solar Orbiter 5 Workshop - Session 1: Review on Helioseismology and Helioseismology with Solar Orbiter**

Invited talk in the session Solar Magnetism and the Solar Cycle.  
<http://www.spaceweather.eu/en/repository/show?id=253>

## **8. Future Events**

**For more details, see <http://www.spaceweather.eu/en/event/future>**

### **RADECS 2012 in Biarritz, France**

Start : 2012-09-24 - End : 2012-09-28

The 21st European Conference on RADIATION AND ITS EFFECTS ON COMPONENTS AND SYSTEMS will be held in Biarritz, France, on September 24-28, 2012.

The aim of RADECS conferences is to provide an annual European forum for the presentation and discussion of the latest advances in the field of radiation effects on electronic and photonic materials, devices, circuits, sensors, and systems. The scope of the conference encompasses technological processes and design techniques for producing radiation tolerant systems for space, aeronautical or terrestrial applications, as well as relevant methodologies for their characterization and qualification. The conference features a technical program, an Industrial Exhibit, and one day meeting on ground effects offered on September 24 (RADGROUND). The technical program includes oral and postersessions.

The areas of interest for contributions to be submitted to RADECS 2012 include, but are not limited to:

- \* Basic mechanisms of radiation effects in electronic and optical materials
- \* Space, atmospheric and terrestrial environments
- \* Radiation effects on electronic and photonic devices, circuits and systems
- \* Radiation effects on sensors and emerging devices
- \* Technology and design hardening
- \* Radiation hardness assurance
- \* Irradiation facilities and testing

Website: <http://radecs2012.org>

### **63rd International Astronautical Congress in Naples, Italy**

Start : 2012-10-01 - End : 2012-10-05

At the forthcoming 63rd International Astronautical Congress in Naples a special session on the theme 'Effects of Space Weather on GEO Satellites' will be held as part of the 25th Symposium on Space Policy, Regulations and Economics.

This session will discuss case histories and mechanisms of effects of space weather on GEO satellites, models for prediction, and mitigation approaches. We would like to invite you to consider submitting abstracts for this session.

The call for papers can be found at [The deadline for abstract submission is 29 February 2012.](http://www.iafastro.org/docs/2012/iac/IAC2012_CallForPapers)

[http://www.iafastro.org/docs/2012/iac/IAC2012\\_CallForPapers.](http://www.iafastro.org/docs/2012/iac/IAC2012_CallForPapers)

Website: <http://www.iac2012.org/>

### **UN/Ecuador Workshop on the International Space Weather Initiative in Ecuador**

Start : 2012-10-08 - End : 2012-10-12

Initiated in 1990, the United Nations Basic Space Science Initiative (UNBSSI) has contributed to the international and regional development of astronomy and space science through annual workshops organized under the umbrella of the United Nations, focusing specifically on the International Heliophysical Year 2007 (IHY, 2005-2009) and the International Space Weather Initiative (ISWI, 2010-2012). UNBSSI has led to the establishment of planetariums, astronomical telescope facilities, and IHY/ISWI instrument arrays worldwide, particularly in developing nations. ISWI is envisioned to continue the tradition of IHY in the worldwide deployment of space weather monitoring instrument arrays. To date,

ISWI contributes to the observation of space weather through 18 instrument arrays with close to 1000 operating instruments in more than 100 nations supported by designated national ISWI coordinators.

The first workshop on ISWI was held in Helwan, Egypt and hosted by the Helwan University, Egypt, in 2010, particularly for the benefit of nations in Western Asia. In 2011 the United Nations/Nigeria Workshop on ISWI was hosted by the Centre for Basic Space Science of the University of Nigeria at Nsukka, Nigeria, particularly for the benefit of nations in Africa. The third ISWI workshop will be hosted by Ecuador in 2012 for the region of Latin America and the Caribbean.

Website:

<http://iswiececuador.epn.edu.ec/>

## **Space Weather and Challenges for Modern Society in Oslo, Norway**

Start : 2012-10-22 - End : 2012-10-24

2012 - 2013 is expected to be years with high solar activity. This can trigger larger solar storms which can generate geomagnetic induced currents (GIC ) on the earth. GIC can affect the normal operation of specific industrial operations and critical infrastructure (e.g power grids, telecom, navigation systems, etc).

During space weather events, like solar storms, electric currents in the magnetosphere and ionosphere experience large variations, which manifest also in the earth's magnetic field. These variations induce currents (GIC ) in conductors operated on the surface of the earth. Electric transmission grids and buried pipelines are common examples of such conductor systems. GIC can cause problems, such as increased corrosion of pipeline steel and may disturb and possibly damage high-voltage power transformers and it can also have damaging effects on communication systems, navigation systems and oil and gas operations.

Vulnerable industries are the oil and gas industry, railways, telecommunication industry, navigation industry and not at least the society, which is very vulnerable concerning short or long term interruption of critical infrastructure.

The conference will focus on increasing the general knowledge of solar storms, space weather and GIC and the possible consequences for different industries and critical infrastructure, and look into reasonable means of protection, and consider possible early warning solutions.

Website:

<http://www.tiems.info/about-tiems/oslo-conference-2012.html>

## **Ninth European Space Weather Week in Brussels, Belgium**

Start : 2012-11-05 - End : 2012-11-09

We are pleased to announce that the Ninth European Space Weather Week will take place at the Académie Royale de Belgique, Brussels, Belgium between 5 and 9 November 2012.

This meeting is being jointly organised by the Solar-Terrestrial Centre of Excellence (STCE), ESA , the SWWT and the COST ES0803 communities. The local organisation is done by the STCE. This event will continue to build on the advances made during the first eight European Space Weather Weeks held between 2004 and 2011.

Website:

<http://www.sidc.be/esww9/>

## **International Symposium on Solar-Terrestrial Physics in Pune, India**

Start : 2012-11-06 - End : 2012-11-09

The International Symposium on Solar-Terrestrial Physics will be held during November 6 - 9, 2012 at the Indian Institute of Science, Education and Research, Pune, India. This meeting under the aegis of the SCOSTEP is expected to draw leading scientists from around the world in the increasingly important, interdisciplinary fields of Solar activity and its impact on geospace and life on the Earth. With major observational solar facilities being planned in India, this meeting is especially pertinent in the Indian context.

The meeting is expected to involve professional scientists as well as graduate students, and will have a mixture of invited and contributed talks and posters. There will also be a one-day tutorial for the benefit of young people beginning work in the field of solar-terrestrial physics.

Website:

<http://www.iiserpune.ac.in/~isstp2012/>

### **Eclipse on the Coral Sea: Cycle 24 Ascending in Palm Cove, Queensland (Australia)**

Start : 2012-11-12 - End : 2012-11-16

As we emerge from one of the deepest and longest solar minima on record, with a new and powerful eye on the Sun -SDO- we invite all those with an interest in solar activity to gather in beautiful Palm Cove, Australia to review and assess our current knowledge and understanding of our magnetic star, and to experience the awe and wonder of a total solar eclipse on November 14, 2012.

Website:

<http://moca.monash.edu/eclipse/>

### **Total solar eclipse**

Start : 2012-11-13 - End : 2012-11-13

For more information:

<http://eclipse.gsfc.nasa.gov/OH/OH2012.html#SE2012Nov13T>

### **EC Space Conference in Larnaca, Cyprus**

Start : 2012-11-15 - End : 2012-11-16

The European Commission will organise the 'Let's embrace space - FP7 Space Conference 2012', in cooperation with the Cypriot EU Presidency, on 15 and 16 November 2012 in Larnaca, Cyprus.

This scientific conference will present the current status and results of the 3rd call of FP7 space research, and also discuss future options for European research in the space field. In doing so, the conference will aim at demonstrating the evolution and use of space tools for a sustainable economic and environmental development in a European and global context.

Website:

<http://www.fp7-space.eu/news-119.phtml>

### **Solar Physics with Radio Observations in Aichi, Japan**

Start : 2012-11-20 - End : 2012-11-23

Nobeyama Radioheliograph (NoRH) has been observing the Sun since 1992. This year is the 20th year of science operation. Instruments are still in good shape and producing images of the Sun every day with the same quality as the beginning. Due to the nature of the instrument and long and uniform observations, data can be used for wide variety of solar physics and also for solar terrestrial physics. To mark the 20 years of operation, we will organize a symposium to summarize what has been done with NoRH and to discuss what we should do in the future. Papers to be presented in the meeting will be mainly concerned with the results from NoRH and future plans.

Website:

<http://st4a.stelab.nagoya-u.ac.jp/SPRO2012/>

### **Tracing the Connections in Solar Eruptive Events in Petaluma, CA, USA**

Start : 2012-11-30 - End : 2012-12-05

The overarching objective of the conference is to examine the connections amongst the phenomena that lead to solar eruptive events. The current state of themes includes:

- \* Measuring the Coronal Magnetic Field;
- \* Connections to, and Reactions of, the Large-Scale Corona;
- \* Large-scale Magnetic Connectivity of Active Regions;
- \* Transfer of Energy to, and Storage of Energy in, the Corona;
- \* The High-Energy Particle - Flare - CME connection.

Working groups will address topics such as:

- \* Energy Transfer throughout a Solar Eruptive Event;
- \* Global Energetics of an Ensemble of Events;
- \* Coronal Influences to the Lower Atmosphere;
- \* CME Initiation and Type II Bursts;
- \* The Release of Energetic Particles in the Low Corona;
- \* Flows vs. Waves;
- \* Microflares/Nanoflares.

Website:

<http://hessi.ssl.berkeley.edu/petaluma/index.shtml>

## **Earth-Sun System Exploration 5 in Kona, Hawai'i USA**

Start : 2013-01-13 - End : 2013-01-19

Information coming soon!

Website:

<http://sd-www.jhuapl.edu/Aurora/ESSE/index.html>

## **2013 LWS Solar Dynamics Observatory Science Workshop in Cambridge, MD (USA)**

Start : 2013-03-03 - End : 2013-03-08

Living With a Star 's Solar Dynamics Observatory invites you to its 2013 Science Workshop to be held March 3-8, 2013 at the Hyatt Regency Chesapeake Bay in Cambridge, MD (<http://chesapeakebay.hyatt.com/>). The workshop is a follow-on to the 'Many Spectra of Solar Activity' workshop held May 1-5, 2011 in Squaw Valley, CA.

Scientific sessions will feature a broad spectrum of science topics fundamental to SDO's science investigations: Atmospheric Imaging Assembly (AIA), EUV Variability Experiment (EVE), and Helioseismic and Magnetic Imager (HMI), as well as the overlap between SDO and other scientific missions and activities.

Website:

<http://lws-sdo-workshops.org/>

## **Chapman Conference on Fundamental Properties and Processes of Magnetotails in Reykjavik, Iceland**

Start : 2013-03-10 - End : 2013-03-15

Spacecraft observations have established that all magnetized planets in our solar system interact strongly with the solar wind and possess well-developed magnetotails. Magnetotails are the site for many dynamic processes critical to the circulation of mass, energy and magnetic flux. The great differences in solar wind conditions, planetary rotation rates, ionospheric conductivity, and physical dimensions from Mercury's small magnetosphere to the giant magnetospheres of Jupiter and Saturn provide an outstanding opportunity to extend our understanding of the influence of these factors. Therefore, this Chapman conference will provide a forum in which various communities can come together and discuss recent achievements of observational, theoretical, and modeling studies with the objective to develop a deeper understanding of fundamental properties and processes of planetary magnetotails through a comparative examination.

## **Annular solar eclipse**

Start : 2013-05-10 - End : 2013-05-10

For more information:

<http://eclipse.gsfc.nasa.gov/SEplot/SEplot2001/SE2013May10A.GIF>

## **IAU Symposium: Nature of prominences and their role in space weather in Paris, France**

Start : 2013-06-10 - End : 2013-06-16



Topics:

- \* Prominences : formation, dynamics
- \* Prominence plasma properties, including prominence seismology
- \* Magnetic field : measurements, topology, support
- \* Large-scale patterns and cyclic evolution
- \* Prominence destabilization, CMEs, reconstruction in 3D
- \* ICMEs in the heliosphere, magnetic clouds; their impact on the Earth environment
- \* Stellar quiescent and eruptive prominences and stellar CME
- \* Requirements for future instrumentation and prospects for future missions

Website:

<http://www.iau.org/science/meetings/future/symposia/1065/>

### **CESRA Workshop 2013: New eyes looking at solar activity: Challenges for theory and simulations in Prague, Czech Republic.**

Start : 2013-06-24 - End : 2013-06-29

Solar cycle 24 has opened a new era in solar radio physics as we now have instruments that can probe solar processes from sub-millimeter to kilometer waves. ALMA and LOFAR are entering full-operation state and observations of the Sun will be made in the near future.

At the same time extensive use is being made of radio spectrometers in space, STEREO /WAVES and Wind -WAVES, and existing and upgraded ground-based instruments like Nobeyama Radioheliograph, Nancay Radioheliograph, Ratan, SSRT, and many others. These instruments provide data that enable studies of both energetic particles and thermal plasma , enhancing our knowledge of solar eruptions and acceleration and propagation of particles, all through the solar chromosphere and corona and into interplanetary space.

The CESRA 2013 Workshop will highlight these new observational capabilities and discuss the theoretical issues connected to solar radio emission and interplanetary radio physics.

Website:

<http://wave.asu.cas.cz/cesra2013/>

### **2013 Meeting of the Solar Physics Division of the AAS**

Start : 2013-07-08 - End : 2013-07-11

The 2013 meeting of the AAS/SPD will be July 8-11 (and possibly July 12), hosted by the Solar Physics Group of Montana State University, in Bozeman, Montana.

Website:

<http://solar.physics.montana.edu/SPD/>

### **Hybrid solar eclipse**

Start : 2013-11-03 - End : 2013-11-03

For more information:

<http://eclipse.gsfc.nasa.gov/SEplot/SEplot2001/SE2013Nov03H.GIF>