STCE Newsletter

18 Feb 2013 - 24 Feb 2013

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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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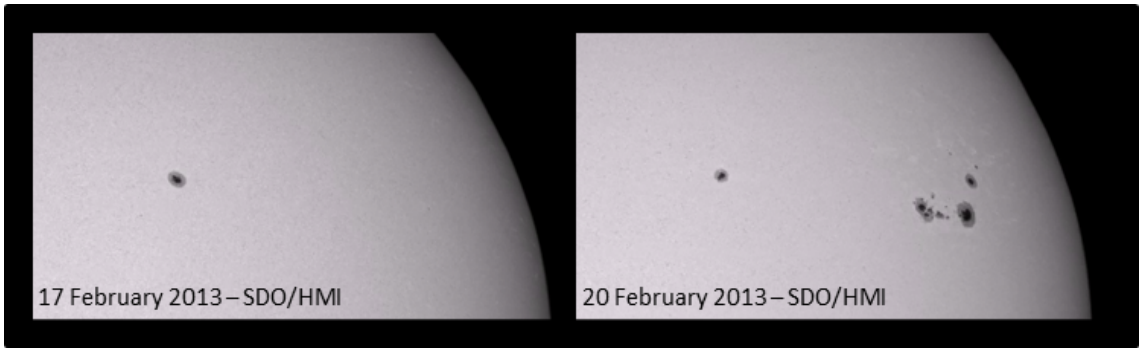
1. Fast rise of NOAA 1678 (18 Feb 2013 - 24 Feb 2013)

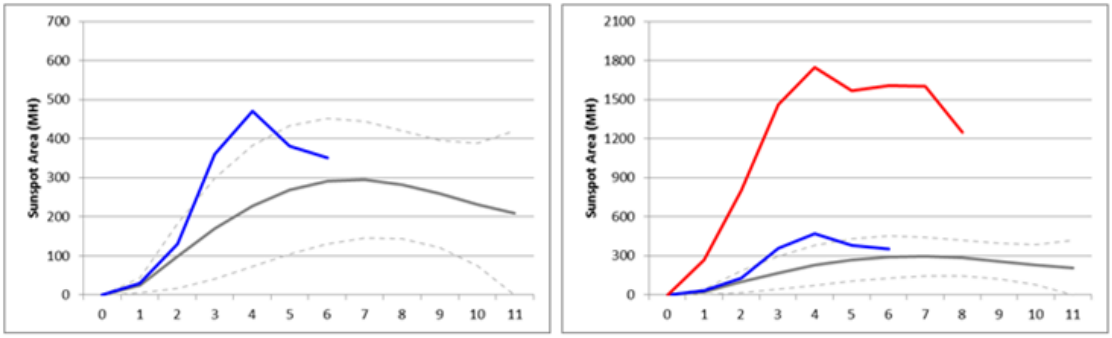
On 18 February, a sunspot group quickly developed to the southeast (bottom left) of NOAA 1671. According to the daily NOAA reports (http://www.swpc.noaa.gov/today.html), fresh NOAA 1678 already reached its maximum sunspot area on 21 February, being nearly three times as large as the total area of the planet Earth.

This movie (http://www.youtube.com/watch?v=rl-7eFnDCh4) and picture underneath show the fast development of the sunspot group. Notice the merge of several sunspots, in particular in the leading portion of the group. Only in the trailing part there was some clustering of spots with opposite magnetic polarity, but they were quite small and resulted only in some small flares, the strongest a C8 on 20 February.

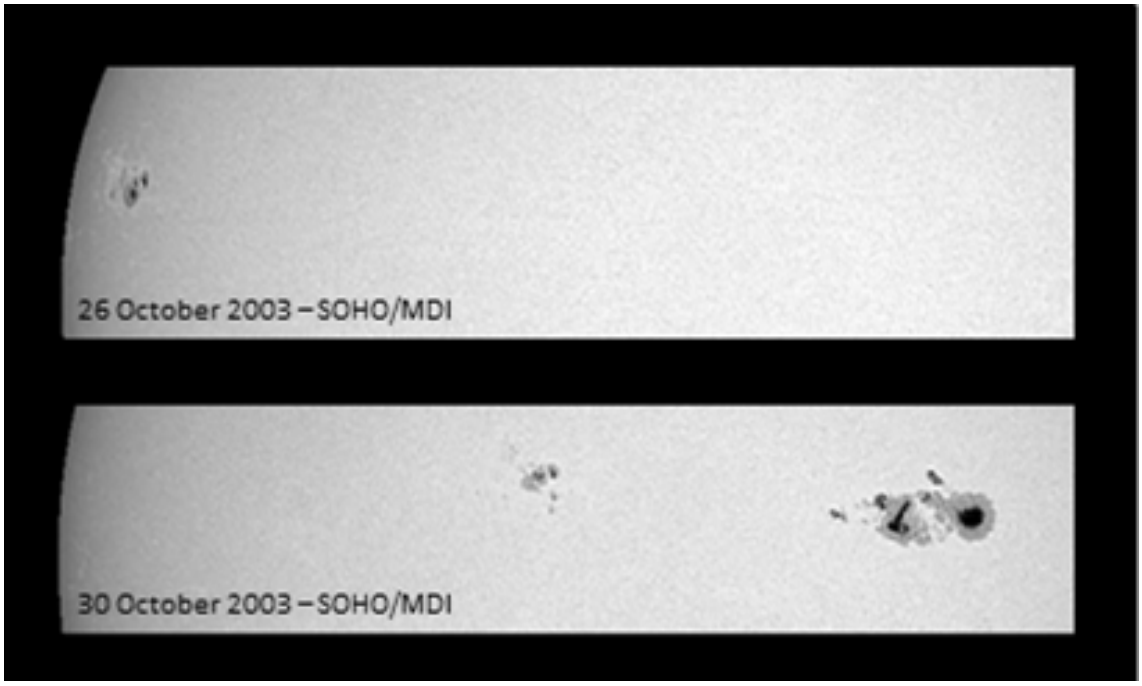


It's always nice to have some material to compare a "fast" developing group to. Therefore, using NOAA-data, about 20 sunspot groups "born" on disk in 2011 or 2012 and reaching an area between 300 and 750MH were selected. Note that 1000 MH ("millionths of a solar hemisphere") correspond to about 3000 million square kilometers, or roughly 6 times the entire surface of the Earth.

The graphs underneath show the average evolution of the sunspot areas (grey) for each day following the first appearance of the sunspot group (= day 1). As can be seen, such sunspot groups reach their maximum area of about 300MH on day 6-7. The dashed lines indicate margins with respect to this average evolution, as some of the selected sunspot groups reach different maximum areas at different days.



Compared to this average evolution, the rise of NOAA 1678 (blue) was indeed a bit faster than usual. However, there have been much faster rising sunspot groups in the past. A notorious case was NOAA 0488 (red in figure above), one of the Halloween groups that appeared late October 2003. As the images underneath show, it rose out of nothingness to a sunspot area 10 times that of the Earth in only 4 days. That's a really fast rise!



2. Review of solar and geomagnetic activity (18 Feb 2013 - 24 Feb 2013)

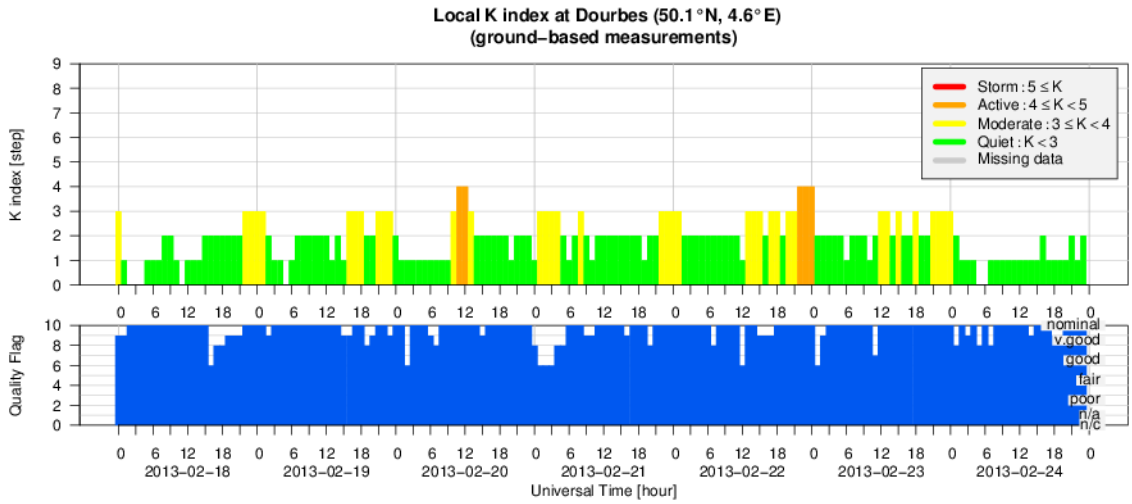
Solar Activity

Solar activity was quiet in the beginning of the week, but with the emergence of AR Catania 95 (NOAA 11678) that quickly evolved into a beta-gamma-delta magnetic configuration became more eruptive. On Sunday February 24, this AR started disappearing on the west limb. On Saturday February 23, CACTus detected a partial halo CME directed to the west. The CME came in the field of view of LASCO/C2 at 19:00UT. (check http://sidc.oma.be/cactus/catalog/LASCO/2_5_0/qkl/2013/02/latestCMEs.html - event nr 80). The CME was possibly associated with a C-flare from AR 1678 just behind the west limb. The CME is classified as back-sided.

Geomagnetic Activity

Geomagnetic activity was mainly quiet on the planetary level. On a local level, the K index reached active levels on February 20 and 22. In situ solar wind data of ACE indicate that the active conditions on February 20 were caused by a sector boundary crossing and a slow solar wind inhomogeneity. On February 22 was no particular solar wind structure like a coronal hole, an ICME or sector boundary crossing visible in the ACE data. It was just an inhomogeneity in the solar wind that was at the base of the local K of 4 on that day.

3. Geomagnetic Observations at Dourbes (18 Feb 2013 - 24 Feb 2013)



4. PROBA2 Observations (18 Feb 2013 - 24 Feb 2013)

Solar Activity

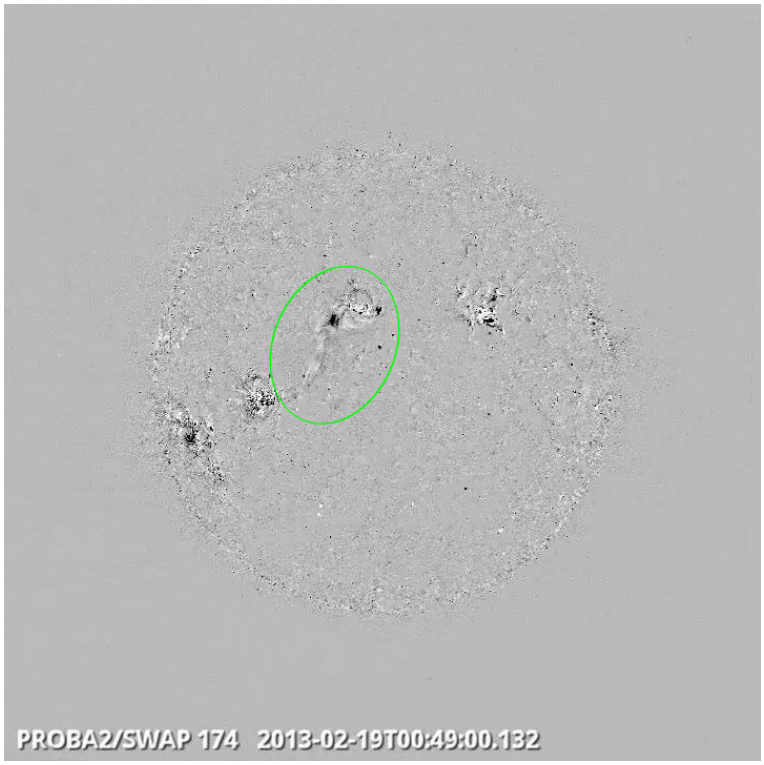
Solar (flaring) activity was *low* during the whole week, the biggest flare being a C8.2 on Wednesday, originating from AR 11678.

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.

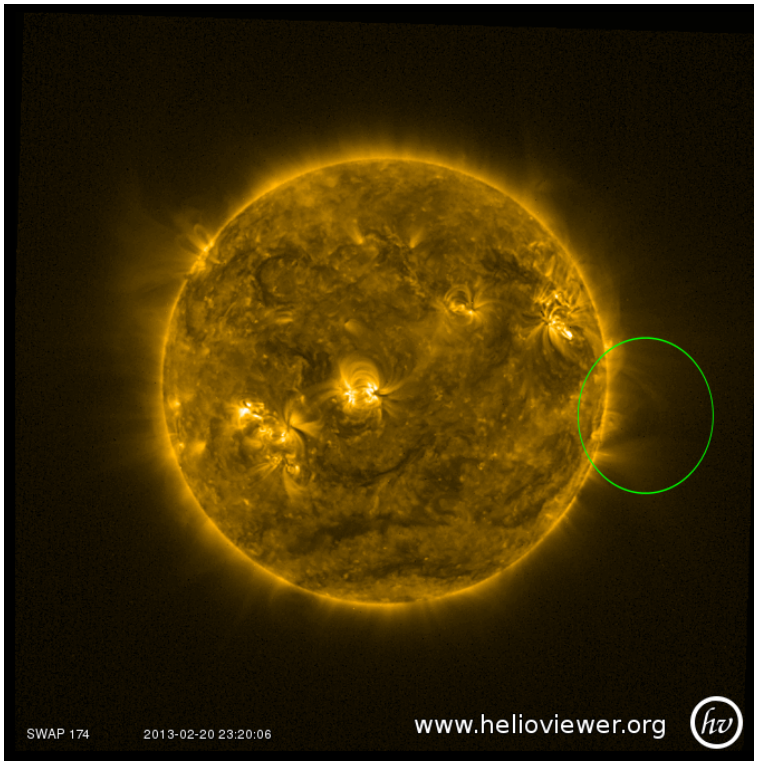
A weekly overview movie can be found here: http://proba2.oma.be/swap/data/mpg/movies/WeeklyReportMovies/WR152/2013_02_18_00_00_31_2013_02_24_22_52_43_SWAP_174__AIA_304-hq.mp4 (SWAP174/AIA304 combination; HelioViewer.org).

Details about some of the events in this movie can be found further below (limited to SWAP imaging).

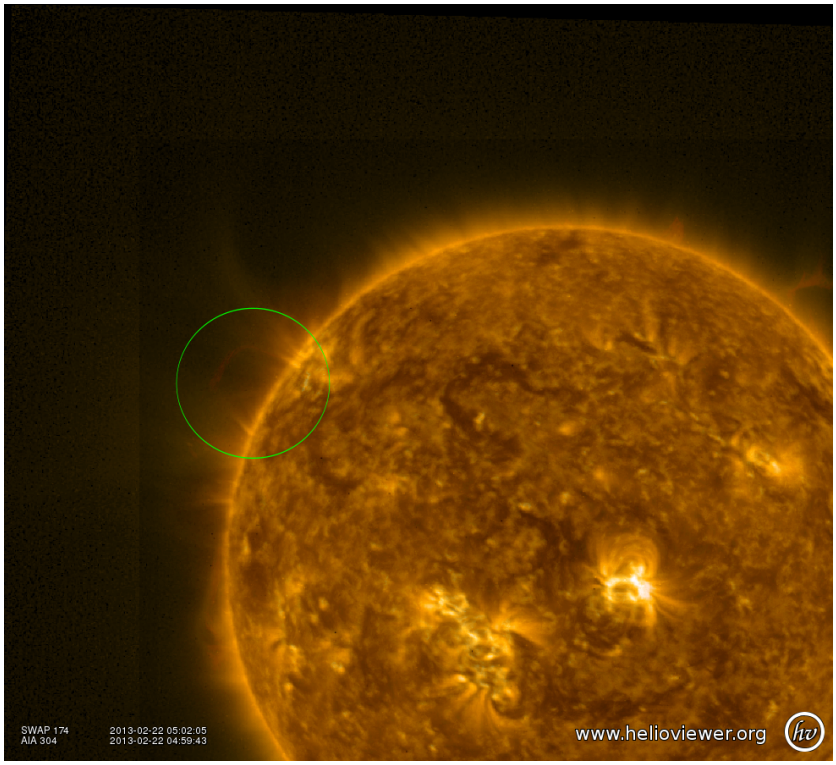
On Tuesday 19th, the following eruptions were seen by SWAP (difference images):



On Wednesday 20th, prominence eruption on the West limb:

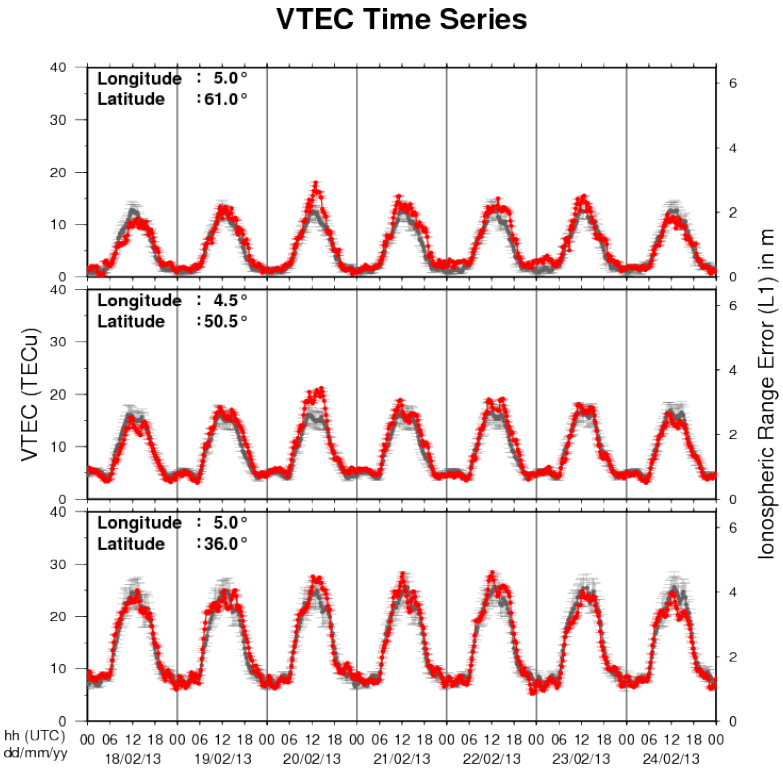


On Friday 22nd, eruption on the NE limb (SWAP difference image and SWAP/AIA304 combination image):



Several additional filament, prominence eruptions occurred during the week, but these were not or hardly visible by SWAP.

5. Review of ionospheric activity (18 Feb 2013 - 24 Feb 2013)



The figure shows the time evolution of the Vertical Total Electron Content (VTEC) (in red) during the last week at three locations:
a) in the northern part of Europe(N61°, 5°E)
b) above Brussels(N50.5°, 4.5°E)
c) in the southern part of Europe(N36°, 5°E)
This figure also shows (in grey) the normal ionospheric behaviour expected based on the median VTEC from the 15 previous days.

The VTEC is expressed in TECu (with TECu=10^16 electrons per square meter) and is directly related to the signal propagation delay due to the ionosphere (in figure: delay on GPS L1 frequency).
The Sun's radiation ionizes the Earth's upper atmosphere, the ionosphere, located from about 60km to 1000km above the Earth's surface.The ionization process in the ionosphere produces ions and free electrons. These electrons perturb the propagation of the GNSS (Global Navigation Satellite System) signals by inducing a so-called ionospheric delay.

See http://stce.be/newsletter/GNSS_final.pdf for some more explanations ; for detailed information, see http://gnss.be/ionosphere_tutorial.php

6. Future Events

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

9th GEANT4 space users' workshop in Barcelona, Spain

Start : 2013-03-04 - End : 2013-03-06

Geant4 Space Users' Workshop -G4SUW- is focused on new results on space radiation interaction with components, sensors and shielding analysis, as well as on Geant4-based tools and developments applicable to space missions.
The Geant4 particle transport toolkit is jointly developed by a world-wide collaboration and is intended for a wide range of applications in HEP, medical field, and space physics and engineering. In recent years, space and astrophysics has become a significant user category, with applications ranging from instrument and detector response verification to space radiation shielding optimization, component effects, support of scientific studies, and analysis of biological effects.
Main topics for next G4SUW will include:
* Single Event Effects (SEE) simulation.Geant4-TCAD coupling.
* Microdosimetry.
* Planetary exploration applications.
* Space electronics and science detectors.
* Simulation of astronaut radiation hazards.
* Interfaces and tools to space environment analysis tools such as SPENVIS.
* Cosmic ray magnetospheric propagation analysis.
* Large-scale simulations requiring event biasing and/or GRID capabilities.
* General shielding optimization applications.
Website:
http://www.inta.es/g4suw2013/index.html

19th SPINE Meeting, SPIS Final Presentations & SPIS training at ESTEC, The Netherlands

Start : 2013-03-19 - End : 2013-03-21
Between 19 and 21 March 2013, ESTEC will host the 19th SPINE meeting and the final presentations of three activities funded through ESA's TRP (Technology research Programme), developed with the SPIS (Spacecraft Plasma Interaction System) software, followed by training on the SPIS-GEO and AISEPS applications.
During the SPINE meeting on 19th March the intention is to discuss standards in the area of spacecraft plasma interactions, ESA's Technology development plans and new results and current issues in the area of spacecraft plasma interactions. Proposals to make presentations are welcome.
Final presentations will be made on 20th March for the SPIS-GEO, SPIS-Science and AISEPS (Assessment of the Interactions between Spacecraft and Electric Propulsion Systems) studies. A short training course on the new features of SPIS-GEO will follow. On 21th March there will be a whole-day course on AISEPS.
Website:
http://dev.spis.org/projects/spine/home/meeting/mxix

Space Weather Workshop: 'Effects on Aviation - Building a proportionate response in Europe' in KÃ¶ln, Germany

Start : 2013-03-20 - End : 2013-03-20
The Sun goes through a periodic rise and fall in activity and solar cycles vary in length from 9 to 14 years. Solar maximum or solar max is a normal period of greatest solar activity in the cycle. Recent projections say the next solar max should arrive in the last half of 2013.
For aviation, disturbed ionosphere currents during geomagnetic storms can be the cause of considerable communications and navigation problems. There are measures that can be taken to reduce the risk of aviation infrastructure failures during geomagnetic disturbances.
This workshop, jointly organised by EUROCONTROL and the European Aviation Safety Agency (EASA), is to help aviation, manage the safety risk, increase awareness of the effects and elaborate on possible mitigation actions.
Target audience are representatives of airlines, air navigation service providers (ANSPs), Civil Aviation Authorities (CAAs), airports, military and original equipment manufacturers (OEMs). Through bringing

together speakers who are premier specialists in the field from airlines, pilots, ANSPs, research organizations etc.
The workshop will identify priorities, share knowledge and encourage cooperation and harmonisation.
Website:
http://www.eurocontrol.int/events/space-weather-workshop

1st Solar Probe Plus Workshop in Pasadena, CA (USA)

Start : 2013-03-26 - End : 2013-03-29
The first Solar Probe Plus Workshop will take place at the Beckman Institute auditorium, California Institute of Technology, Pasadena, from March 26th to 29th, 2013. SPP1 will introduce the Heliophysics community to the mission and prepare for the exciting discoveries that the Solar Probe Plus mission will make. The Workshop will explore the scientific objectives of the Solar Probe Mission and how the direct exploration of the corona and inner heliosphere will lead to advances in our understanding of coronal heating and solar wind acceleration, the magnetic and plasma structure of the heliosphere, and the acceleration of energetic particles at shocks and flares. The workshop will inspire research that will make use of the SPP observations within the context of the NASA Heliophysics Observatory System and identify key areas for preparatory research. Synergistic observations from other ground based and space based assets will also be addressed.
Website:
http://www.solarprobeplus.org/

European Geosciences Union General Assembly 2013 in Vienna, Austria

Start : 2013-04-07 - End : 2013-04-12
The EGU General Assembly 2013 will bring together geoscientists from all over the world into one meeting covering all disciplines of the Earth, Planetary and Space Sciences. Especially for young scientists, it is the aim of the EGU to provide a forum where they can present their work and discuss their ideas with experts in all fields of geosciences. The EGU is looking forward to cordially welcoming you in Vienna.
Website:
http://www.egu2013.eu/home.html

Causes and Consequences of the Extended Solar Minimum Between Solar Cycles 23 and 24 (4CESM) in Key Largo, FL (USA)

Start : 2013-04-08 - End : 2013-04-12
The most recent solar minimum, solar cycle 23-24 minimum, was unusually long (266 spotless days in 2008, the most since 1913), and the magnetic field at the solar poles was approximately 40% weaker than the last cycle; and unusually complex (the solar wind was characterized by a warped heliospheric current sheet, HCS, and fast-wind streams at low latitudes: the fast-wind threads the ecliptic more commonly in 2008 than 1996.) This complexity resulted in many effects observed from Sun to Earth, with many observations indicating unusual conditions on the Sun, in the heliosphere , and in the magnetosphere , ionosphere , and upper atmosphere of the Earth.
This remarkable set of conditions provide the scientific community with an exceptional opportunity to assess the nature and structure of a very quiet Sun, and an upper atmosphere relatively devoid of solar influences, helping to provide a better understanding of the relative roles of solar activity and internal variability in the dynamics of the Earth's upper atmosphere and ionosphere . Such an understanding requires a multidisciplinary approach.
The main goal of the conference is to bring together the solar, heliospheric, magnetospheric, upper atmosphere, and ionospheric communities to debate and discuss interdisciplinary work and reach a better understanding of the nature and structure of a very quiet Sun, and of an upper atmosphere relatively devoid of solar influences, and in doing so, to help clarify the role of solar activity in the dynamics and variability of the Earth's upper atmosphere and ionosphere relative to the internal variations.
Website:
http://chapman.agu.org/solarminimum/

The physics of flares in the lower solar atmosphere in London, UK

Start : 2013-04-12 - End : 2013-04-12
Solar flares are impulsive releases of energy in the Sun's corona and yet it is emission from the lower atmosphere (the photosphere and chromosphere) that contains the bulk of the energy. This radiation also provides some of the best diagnostics of the flaring process. The availability of optical, UV/EUV and hard X-ray observations, made with the current fleet of space-based (SDO, Hinode, RHESSI, etc.) and ground-based (ROSA, IBIS, Big Bear, etc.) observatories, combined with recent developments in flare modelling, presents a timely opportunity to study the cause and effect of energy deposition in the lower solar atmosphere. The combination of multi-wavelength observations with advanced numerical simulations can provide key insights into the processes of particle acceleration, plasma heating, energy transport, and wave propagation.
This Royal Astronomical Society discussion meeting will focus on work investigating the response of the solar and stellar atmospheres during a flare's impulsive phase and we welcome contributions from both observation and theory.
Website:
http://www.astro.gla.ac.uk/?page_id=827

Space Weather Workshop 2013 in Boulder, CO (USA)

Start : 2013-04-16 - End : 2013-04-19
The 2013 Space Weather Workshop will be held April 16 - 19, in Boulder, Colorado. This meeting will bring together the customer, forecaster, vendor, and research communities to focus on the impacts of space weather, on forecasting techniques, and on recent scientific advances in predicting conditions in the space environment.
The program will highlight space weather impacts in several areas, including ionospheric disturbances, geomagnetic storms and their solar drivers, radiation belts, and solar energetic particles. Representatives from industries impacted by space weather will be invited to attend, including those from commercial airline, electric power, satellite operations, and navigation/communication industries.
Website:
http://www.swpc.noaa.gov/sww

Synoptic Network Workshop in Boulder, USA

Start : 2013-04-22 - End : 2013-04-24
The workshop is being held to discuss and gather community input on science requirements, capabilities and instrumentation for a next-generation synoptic network of solar observing instruments. It is highly probable that such a network should obtain multi-wavelength data, and the intended targets include space weather, helioseismology and solar magnetic fields.
Website:
https://www2.hao.ucar.edu/synoptic-network-workshop

Space Weather And Plasma in Space in Tel Aviv, Israel

Start : 2013-04-28 - End : 2013-05-03
Space weather is a new emerging field of space science focused on understanding societal and technological impacts of the solar-terrestrial relations. The Sun has tremendous influence on Earth's space environment, releases energy in the form of electromagnetic and particle radiation that can damage or destroy satellite, navigation, communication and power distribution systems, influence on atmosphere state, magnetosphere and ionosphere activity. Our workshop IsraSWAPS-2013 will be dedicated to the origin, evolution and predictability of physical processes that lead to the space weather hazards. Particular attention will be devoted to application of plasma physics methodologies and achievements to space weather problems. The meeting will also focus on using of plasma understanding as a test bed for astrophysics and space physics. Contributions in observations, theory, numerical simulations, and experiment are welcome.
Website:
http://www.tau.ac.il/institutes/advanced/cosmic/Conferences/20013_IsraSWAPS/SWAPS-2013.htm

5th EISCAT_3D User Meeting in Uppsala, Sweden

Start : 2013-05-06 - End : 2013-05-08
The 5th EISCAT_3D User Meeting is intended to focus on data analysis and management, while on Tuesday and Wednesday pre-noon (May 7-8) all science topics to be studied by EISCAT_3D shall be covered.
Website:
http://www.space.irfu.se/workshops/EISCAT-3D_User2013/

NSO Workshop #27: 50 Years of the Seismology of the Sun and Stars in Sunspot, NM (USA)

Start : 2013-05-06 - End : 2013-05-10
In the last 50 years, helioseismology has made significant contributions to the knowledge of the Sun's interior physics and has led the way to asteroseismology. We have now reached an era where more sophisticated questions are being asked to understand the subtle properties of the Sun and other stars due to the synoptic and high-resolution observations available from BISON, GONG and space missions such as SOHO , SDO, CoRot and Kepler.
On this occasion, a workshop on the theme of '50 years of the seismology of the Sun and stars' is being organized to reflect the progress that has been made as well as to focus on future goals. We plan to bring together helio- and asteroseismologists, theorists and observers in a journey that will take us from the interior of the Sun and its magnetism towards the structure of distant stars and activity cycles.
Website:
http://www.nso.edu/workshops/2013

AGU Meeting of the Americas, in Cancun, Mexico

Start : 2013-05-14 - End : 2013-05-17
Welcome to the Meeting of the Americas, a Joint Assembly that covers topics in all areas of the geophysical sciences. Join your colleagues, including Earth and space scientists, educators, students, and other leaders at the Cancun Center in Cancun, Mexico, 14-17 May 2013 as they connect to present groundbreaking research. Sandy beaches and turquoise waters together with Mexican hospitality make this a unique site for another successful Joint Assembly!
Session 'SH10: Solar eruptions from the photosphere to the heliosphere' focuses on observational, modeling and theoretical studies of coronal mass ejections (CMEs) from their formation and initiation at the Sun to their interaction with the solar wind and other eruptions in the interplanetary medium. We are particularly interested in recent advancements on i) the formation or pre-existence of flux ropes as revealed by numerical simulations and SDO observations, ii) the rotation, expansion, deflection, deformation and deceleration of CMEs as they propagate in the corona and heliosphere as revealed by STEREO, IPS and radio observations and simulations, and, iii) the understanding and predicting of CME geo-effectiveness and how it could be improved by future missions.
Website:
http://moa.agu.org/2013/scientific-program/sessions/sh10/

SPENVIS User Workshop in Brussels, Belgium

Start : 2013-05-22 - End : 2013-05-24
The SPENVIS User Workshop will be held at the Royal Library of Belgium, Belgium's national and scientific library. It is one of the most important libraries in Europe since its history goes back to the 15th century. It is located in the heart of Brussels at walking distance from the Central Railway Station.
The main objective of this event is to bring the SPENVIS users together to share their experience and to identify their requirements. The workshop will focus on the current and the forthcoming Next Generation SPENVIS systems.
Topics include:
* Current and future SPENVIS overview
* Space Radiation Models and their accuracy

* Space Environment Effects (charging, SEE, degradation, micro-particle impacts)
* Geant4 Tools
* Educational use of SPENVIS
* SPENVIS and other tools
Website:
http://www.spenvis.oma.be/workshop/2013/

2013 UAHuntsville Space Weather Summer School in Huntsville, Alabama, USA

Start : 2013-05-29 - End : 2013-06-07
Website:
http://swssuah2013.pbworks.com/w/page/60509553/FrontPage

Meeting on Solar Wind Turbulence in Kennebunkport, Maine, USA

Start : 2013-06-04 - End : 2013-06-07
Our goal is somewhat different from more familiar conferences and is designed with the SHINE model in mind. We are inviting very few speakers who we are asking to give review and introductory talks for each topic we hope to discuss. Those invited review talks will be largely non-controversial and focus upon agreed-upon results. They are also likely to contain challenges for the participants to explain. Then, the bulk of the time is left unscheduled and we ask the participants to give short, focused talks that lead to discussion and debate on the fundamental aspects of the subject at hand.
We expect that everyone who attends will have ample opportunity to enter into the debate and we hope to stimulate a lively discussion of fundamental physics.
We hope you will join us. Bring multiple 5-minute talks that attempt to make specific points so you can enter into the debate clearly and propel the discussion forward. No one is expected to be given a large block of time to speak. The goal is meaningful and focused debate. Remember, you may not convince everyone, but there will be many participants who want to understand your point of view. Our goal is to debate and illuminate, providing inspiration to all.
Website:
http://www-ssg.sr.unh.edu/mag/Kennebunkport2013/Kennebunkport2013.html

Space Climate Symposium-5 in Oulu, Finland

Start : 2013-06-11 - End : 2013-06-15
Space Climate is an interdisciplinary science that deals with the long-term change in the Sun, and its effects in the heliosphere and in the near-Earth environment, including the atmosphere and climate. A special focus will be on studies of the causes, consequences and implications of the present, unusually low solar activity since solar cycle 23 that, most likely, indicates the imminent end of the Modern Grand Maximum of solar activity. Other topics include solar dynamo, solar irradiance variations, solar wind, geomagnetic field and activity, cosmic rays and cosmogenic isotopes, and solar effects on different layers of the atmosphere and on local and global climate, as well as possible solar effects on human health and on the development of human cultures.
Website:
http://www.spaceclimate.fi/

ISEST (International Study for Earth-Affecting Solar Transients) Workshop in Hvar, Croatia

Start : 2013-06-17 - End : 2013-06-20
The workshop is to improve the scientific understanding of the origin and propagation of solar transients, and develop the prediction capacity of these transients' arrival and potential impact on the Earth.
This workshop is the activity of the ISEST program in CAWSES-II / Task Group 3. The workshop engages coordinated international activities in observation, theory and modeling, and involves scientists in both developed and developing countries, and provides an online platform for educational opportunities for students.
Website:

http://spaceweather.gmu.edu/meetings/ISEST/Home.html

SWWT Plenary Meeting

Start : 2013-06-19 - End : 2013-06-19
The SWWT is a forum open to European experts in a variety of both scientific and application oriented fields relating to space weather. The SWWT plays an important role in advising ESA in space weather strategy and acts as a forum for discussion amongst the European space weather community. The SWWT is responsible for promoting coordinated European space weather activities at both national and industry levels. The SWWT seeks to identify and discuss potential collaborations and/or synergies with other structures or organisations such as the EC FP7 & COST programmes and others.
Each year they organise a Plenary Meeting.

Atomic physics, plasma spectroscopy, and space solar physics: Celebrating the achievements of Alan Gabrie at Orsay, France

Start : 2013-06-20 - End : 2013-06-20
This conference aims at presenting the status of atomic physics, plasma spectroscopy, and solar physics from space, put in the perspective of the achievements made with SOHO and the missions that followed. In addition, our friend and colleague Alan Gabriel will celebrate his 80th birthday. In anticipation of this, it will be an excellent opportunity to celebrate his many (and continuing) contributions to science in various fields. They range from atomic physics and plasma spectroscopy (theta-pinch machine) to solar and space physics - from Skylab, SMM (PI of XRP), Spacelab2, to SOHO (GOLF, CDS, EIT, SUMER) - as well as science management, including RAL (UK), IAS (France), ESA SSWG (and SSAC), NASA/ ESA Solar Orbiter/Sentinels.
Presentations addressing new results in atomic physics, plasma spectroscopy and solar physics are welcome, along with reminiscences related to Alan, which are warmly encouraged.
Website:
http://www.ias.u-psud.fr/AHG/

ILWS Science Workshop in Irkutsk, Russia

Start : 2013-06-23 - End : 2013-06-29
The 2013 ILWS Science Workshop will take place June 23-29, 2013 in Irkutsk, Russia and will be hosted by the Institute of Solar-Terrestrial Physics of the Russian Academy of Sciences
Website:
http://en.iszf.irk.ru/ILWS_2013

Asia Oceania Geosciences Society (AOGS) Annual Meeting in Brisbane (Australia)

Start : 2013-06-24 - End : 2013-06-28
Asia Oceania Geosciences Society (AOGS) was established in 2003 to promote geosciences and its application for the benefit of humanity, specifically in Asia and Oceania and with an overarching approach to global issues.
Asia- Oceania region is particularly vulnerable to natural hazards, accounting for almost 80% human lives lost globally. AOGS is deeply involved in addressing hazard related issues through improving our understanding of the genesis of hazards through scientific, social and technical approaches.
AOGS holds annual conventions providing a unique opportunity of exchanging scientific knowledge and discussion to address important geo-scientific issues among academia, research institution and public. Recognizing the need of global collaboration, AOGS has developed good co-operation with other international geo-science societies and unions such as the European Geosciences Union (EGU), American Geophysical Union (AGU), International Union of Geodesy and Geophysics (IUGG), Japan Geo-science Union (JpGU), and Science Council of Asia (SCA).
Website:
http://www.asiaoceania.org/aogs2013/public.asp?page=home.htm

2013 Heliophysics Summer School in Boulder, Colorado (USA)

Start : 2013-07-12 - End : 2013-07-19

Applications are invited for the 2013 Heliophysics Summer School, which will be held in beautiful Boulder, Colorado. We are seeking students and undergraduate level teachers and instructors to join us this coming summer for a unique professional experience. Students and teachers will learn about the exciting science of heliophysics as a broad, coherent discipline that reaches in space from the Earth's troposphere to the depths of the Sun, and in time from the formation of the solar system to the distant future. At the same time, a goal of the Summer School is for the group of instructors to develop materials from Heliophysics that can be applied in their classes.

The Heliophysics Summer School focuses on the physics of space weather events that start at the Sun and influence atmospheres, ionospheres and magnetospheres throughout the solar system. The solar system offers a wide variety of conditions under which the interaction of bodies with a plasma environment can be studied: there are planets with and without large-scale magnetic fields and associated magnetospheres; planetary atmospheres display a variety of thicknesses and compositions; satellites of the giant planets reveal how interactions occur with subsonic and sub-Alfvenic flows whereas the solar wind interacts with supersonic and super-Alfvenic impacts.

Encompassed under a general title of comparative magnetospheres are processes occurring on a range of scales from the solar wind interacting with comets to the interstellar medium interacting with the heliosphere. The school will address not only the physics of all these various environments but will also go into the technologies by which these various environments are being observed. The program is complemented with considerations of the societal impacts of space weather that affects satellites near Earth and elsewhere in the solar system.

The school will be based on lectures, laboratories, and recitations from world experts, and will draw material from the three textbooks Heliophysics I-III, published by Cambridge University Press.

Several teachers along with about 35 students will be selected through a competitive process organized by the UCAR Visiting Scientist Programs. The school lasts for eight days, and each participant receives full travel support for airline tickets, lodging and per diem costs.

Website:
http://www.vsp.ucar.edu/Heliophysics/

Space weather summer school in Alpbach, Austria

Start : 2013-07-16 - End : 2013-07-25

The Summer School Alpbach enjoys 36 years of tradition in providing in-depth teaching on different topics of space science & technology, featuring lectures and concentrated working sessions on mission studies in self-organised working groups. 60 young highly qualified European science and engineering students converge annually for stimulating 10 days of work in the Austrian Alps. 4 teams compete to design a space mission judged by a jury of experts. Students learn how to approach the design of a satellite mission and explore new and startling ideas supported by experts. The Summer School 2013 will focus on Space Weather .

The purpose of the Summer School is to foster the practical application of knowledge derived from lectures, to develop organisational and team-work skills and to encourage creativity. Teams will compete to design the best project, judged by an independent jury. The teams themselves are responsible for the selection of the subject of the project and for the team structure and working methods.

Website:
http://www.summerschoolalpbach.at/

2013 CISM Summer School, in Boulder, Colorado, USA

Start : 2013-07-22 - End : 2013-08-02

The CISM Summer School is intended to give students a comprehensive immersion in the subject of space weather: what it is, what it does, and what can be done about it. Space weather is many things: beautiful when seen through the eyes of a sun-viewing telescope, fascinating when studied for its alien worlds of magnetic structures and phenomena, awesome when witnessed as a solar eruption or auroral storm, and devastating to the users of services it disrupts. Space weather links the Sun, the Earth, and

the space in between in a branching chain of consequences. Weather systems on the Sun can spawn interplanetary storms of colossal size and energy that envelop the whole planet in electrical hurricanes. Such storms attack high-tech, complex, and expensive technological systems that provide much of the infrastructure that allows modern society to function.
Website:
https://www2.hao.ucar.edu/docs/2013-cism-summer-school

XIIth IAGA Scientific Assembly in Merida, Yucatan, Mexico

Start : 2013-08-16 - End : 2013-08-31
The Local Organising Committee and the Mexico National Committee of IUGG have the great pleasure to welcome you to the 11th Scientific Assembly of the International Association of Geomagnetism and Aeronomy (IAGA) which is held in MÃ©rida YucatÃ¡n, Mexico from 26 to 31 August 2013 with the motto: "Living on a Magnetic Planet". Our Magnetic Planet Capricious (Changeable or Unpredictable) Field.
In order to increase the visibility and attractiveness of IAGA to young researchers, to motivate them to play active role within IAGA and to create (and enhance) their awareness of IAGA and sense of belonging to IAGA, the first IAGA Summer School will be organized just prior the Assembly. The summer school will provide overview of the activities carried out within all the IAGA divisions, with subjects from paleomagnetism and magnetic anisotropy through observatories and geomagnetic field modeling to ionospheric and aeronomic research. At least 20 young scientists from all around the world will be invited based on the nominations from Working Groups and Divisions. Special call and more information will be published before the end of 2012.
Website: http://iaga2013.org.mx/

7th International Workshop on Solar Polarization in Kunming, China

Start : 2013-09-09 - End : 2013-09-14
We gain information about the universe through analysis of the spectra from celestial objects. However, while the intensity spectrum represents a scalar quantity but electromagnetic radiation occurs in the form of transverse waves, the polarized spectrum provides us with a 4-vector, the Stokes vector. The increased amount of information space opens new windows to the universe, in particular for the exploration of magnetic fields. It is well recognized that the magnetic field is a primary agent responsible for structuring and the source of all variability on intermediate time scales, which manifests itself in all forms of solar and stellar activity.
It is therefore not surprising that every year there are many scientific meetings organized with the objective of studying the role of magnetic fields in cosmic objects. What is largely missing in these meetings is however an in-depth investigation of the fundamental aspects of how magnetic fields can be determined by the means of spectro-polarimetry, our main gateway to cosmic magnetism. The primary aim of our series of Workshops is to address these fundamental aspects, with less emphasis on the morphological and physical properties of cosmic magnetic fields.
Website: http://spw7.ynao.ac.cn/

Space science training week: data driven modeling and forecasting in Leuven, Belgium

Start : 2013-09-16 - End : 2013-09-19
This summer school targets to introduce a generation of young researchers (advanced master students, PhDs, and junior postdoctoral researchers) to the diverse aspects of space weather related research.
It will introduce theoretical approaches to space weather and its drivers, present modern solar data analysis tools, and cover state-of-the-art solar and space science simulations. Participants will learn about forecasting aspects and their quality control for space weather events, but also experience hands-on training in scientific proposal writing and receive do-and-don't tips for scientific presentations.
The scientific program is enriched by a public evening lecture on the solar influence on our climate, and the lecturers are invariably expert scientists with international standing.
The school is open to a maximum of 40 participants, and can benefit from its embedding within two international research network activities: an Interuniversity Attraction Pole P7/08 CHARM connecting

heliospheric to astrophysical communities with 7 partner institutes, and a European FP7 Project eHeroes with 15 different partner institutes. Participation from outside both network activities is strongly encouraged. Within Belgium, the school links up expertise from universities (KU Leuven, ULB, Gent University) to federal research institutes (the Solar-Terrestrial Centre of Excellence, the Royal Observatory of Belgium and the Belgian Institute for Space Aeronomy).
Website:
http://stce.be/SpSTraining/

International CAWSES-II Symposium in Nagoya, Japan

Start : 2013-11-18 - End : 2013-11-22
This International CAWSES-II Symposium hosted by SCOSTEP (Scientific Committee on Solar-Terrestrial Physics) will provide an excellent opportunity to discuss the scientific accomplishments of CAWSES-II and look forward to SCOSTEP's future programs at a moment toward the end of its five-year period. The symposium will cover the six major themes of CAWSES-II tasks: 1) What are the solar influences on the Earth's climate?, 2) How will geospace respond to an altered climate?, 3) How does short-term solar variability affect the geospace environment?, 4) What is the geospace response to variable inputs from the lower atmosphere?, 5) Capacity Building, 6) Informatics and eScience. The main functions of CAWSES-II are to help coordinate international activities in observations, modeling, and applications crucial to achieving this understanding, to involve scientists in both developed and developing countries, and to provide educational opportunities for students of all levels. The symposium offers keynotes/lectures that will be interesting for all participants every morning and more specific sessions of presentations in the afternoon. We welcome all those who are involved and/or interested in CAWSES-II to Nagoya in the autumn when we will have the pleasure of being surrounded by beautiful colorful leaves of this season.
Website:
http://www.cawses.org/CAWSES/leaflet_CAWSES-II_120229.pdf

European Space Weather Week in Belgium

Start : 2013-11-18 - End : 2013-11-22
The 10th Edition of the European Space Weather Week will take place on 18-22nd November 2013 in Belgium. The venue will be confirmed early next year, but mark your calendars now for the 10th Anniversary of this growing European event.
The ESWW will again adopt the central aim of bringing together the diverse groups in Europe working on different aspects of Space Weather . This includes but isn't limited to the scientific community, the engineering community, applications developers, service providers and service end users. The meeting organisation will again be coordinated by the Belgian Solar-Terrestrial Centre of Excellence (STCE), ESA and the Space Weather Working Team. The local organisation will be done by the STCE.
Website:
http://www.stce.be/esww10/

40th COSPAR Scientific Assembly in Moscow, Russia

Start : 2014-08-02 - End : 2014-08-10
The 40th COSPAR Scientific Assembly will be held in Moscow, Russia from 2 - 10 August 2014. This Assembly is open to all bona fide scientists.
Website:
http://www.cospar-assembly.org/

7. New documents in the European Space Weather Portal Repository

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

eHEROES - Sources of CME Material - Presentation to Solar Orbiter 5 Workshop

Mass Estimates of Rapidly-moving Prominence Material We present a new method for estimating the column mass (the mass contained within a pixel) of non-fully ionised hydrogen and helium (H I, He I and He II) using the properties of the bound-free photo-absorption cross section at multiple wavelengths. Until now, such estimates have not been reliable with imaging-only techniques, but the near-simultaneity of the images taken by the Solar Dynamics Observatory Advanced Imaging Assembly means that we can now estimate the opacity due to erupting filament material that passes through a previously unobscured patch of Sun. To test this idea, we use data from the spectacular filament eruption that was seen on 2011 June 07, when visual inspection of the erupting material indicated that the material returning to the Sun's surface was highly opaque. The best-fit maps column density and filling factor reveal both high hydrogen column densities in the centre of this test blob, in line with the higher end of measurements previously made, and suggest that the filling factor of this material approaches unity. The technique converges quickly and we plan to extend it to measuring both the full filament mass and the mass of non-erupting filaments on the Sun.
http://www.spaceweather.eu/en/repository/show?id=420

eHEROES - Junior College: De Zon, ruimteweer en PROBA2

Presentation given at the kick-off of Junior College in Leuven on January 8, 2013 - 200 students - and January 10, 2013 - 80 students. Junior College is an interdisciplinary educational project in Belgium (Flanders), organized by the University of Leuven (KU Leuven). It provides a challenging program to high school students in their last year of high school. The aim is to create a create a first bridge between high school and university and to spark their interest in science. The lecture fits in the frame of eHEROES, an FP7 project that incorporates a work package 'dissemination'. The STCE is a partner within the eHEROES project.
http://www.spaceweather.eu/en/repository/show?id=421

eHEROES - Jr College: De Zon, het weer en PROBA2

Presentation given at the kick-off of Junior College in Kortrijk on January 8, 2013 and January 10, 2013, each time for 100 students. Junior College is an interdisciplinary educational project in Belgium (Flanders), organized by the University of Leuven (KU Leuven). It provides a challenging program to high school students in their last year of high school. The aim is to create a create a first bridge between high school and university and to spark their interest in science. The lecture fits in the frame of eHEROES, an FP7 project that incorporates a work package 'dissemination'. The STCE is a partner within the eHEROES project.
http://www.spaceweather.eu/en/repository/show?id=422

eHEROES - Comparison of MHD Simulations of the Solar Wind with In-Situ Measurements

Knowledge of the background solar wind is an important input for CME propagation studies. Since in-situ measurements of the background solar wind are only available at 1 AU, we have to rely on heliospheric models to derive the distribution of solar wind parameters in IP space and hence, to do space weather forecasting. We test the performance of the solar wind models ENLIL/MAS, ENLIL/WSA (CCMC) and MAS (Predictive Science) by comparing model results with in-situ measurements from ACE and Wind. For the study we chose the years 2005 and 2007 as a time period with low solar activity. We found that the general structure of the background solar wind is well reproduced by the models. The best model

results were obtained for the parameter solar wind speed. However, the predicted arrival times of high speed solar wind streams have typical uncertainties of the order of 1 – 1.5 days.
http://www.spaceweather.eu/en/repository/show?id=339

eHEROES - Cooling of flare loops of the X1.4 class flare of 22 September 2011

Coronal mass ejections (CMEs) and flares are transient phenomena with huge energy releases originating from the solar corona. They can immensely influence the conditions of the heliosphere and the space weather at Earth. We investigate the evolution of the X1.4 class flare observed on 22 September 2011 that was also connected with a CME and a coronal wave event. From Earth, the event was observed on the solar limb and thus allows measurements of the height of the loops tops and obtaining the height-time curve of the evolving loops. Identifying and tracking loop tops in different wavelengths covering a wide temperature range further allows to derive the cooling rate of flare loops. For the multi-wavelength study, we use SDO/AIA data as well as H-alpha data from the Kanzelhoehe Observatory.
http://www.spaceweather.eu/en/repository/show?id=423

eHEROES - Evolution of CMEs in the inner heliosphere – observations versus models

With the SECCHI instrument suite aboard STEREO, coronal mass ejections (CMEs) can be observed from multiple vantage points during their entire propagation all the way from the Sun to 1 AU. The propagation behavior of CMEs in the interplanetary space is mainly influenced by the ambient solar wind flow. CMEs that are faster than the ambient solar wind get decelerated, whereas slower ones are accelerated until the CME speed is finally adjusted to the solar wind speed. On a statistical basis, empirical models taking into account the drag force acting on CMEs, are able to describe the observed kinematical behaviors. For several well observed events, we aim to do a comparative study showing the kinematical evolution of CMEs derived from remote sensing and in situ data, as well as from empirical models using 2D and 3D input parameters. From this we will be able to obtain the distance regime at which the solar wind drag force is dominating the CME propagation. We present the first steps in the analysis as well as first results.
http://www.spaceweather.eu/en/repository/show?id=424

Background solar wind modeling and its relevance for the propagation of interplanetary coronal mass ejections

The background solar wind (SW) characteristic is a key ingredient for the study of CME propagation in interplanetary (IP) space, in particular for the prediction of interplanetary coronal mass ejection (ICME) arrival time and arrival speed at Earth. Since in-situ measurements of the background solar wind are only available at 1 AU, one has to rely on heliospheric models and/or empirical relationships to derive the SW distribution in IP space. We tested different empirical and MHD models to predict the SW characteristics at 1 AU, including MAS/MAS, MAS/ENLIL, WSA/ENLIL, and an empirical model based on the size and location of coronal holes (CH) on the Sun. The modeled SW parameters were compared with in-situ measurements from ACE and Wind at 1 AU for a year of low ICME activity during the last solar minimum.
http://www.spaceweather.eu/en/repository/show?id=425

eHEROES - Effects of the background solar wind speed modeled with ENLIL on the propagation behavior of CMEs

http://www.spaceweather.eu/en/repository/show?id=426

eHEROES - Propagation behavior of interplanetary CMEs: driving versus drag force

http://www.spaceweather.eu/en/repository/show?id=427

STCE Annual Report 2011

The STCE Annual Report 2011 is a compilation of the activities done in 2011 within the frame of the STCE. This report has an obviously different style compared to the previous editions. This is because it is now targeting a more general public. Hence, it presents only a selection of the 2011-activities in easy-to-digest summaries. These summaries emphasize the intense collaboration between the institutes at the Space Pole, as well as with our external partners. We hope you enjoy this new style report, which features articles on the evolution of the solar activity, the 8th European Space Weather Week, Solar Orbiter, the Heliophysics Event Knowledge database, user applications for the monitoring of the solar radiation and the ionosphere,... just to name a few. Happy reading!
http://www.spaceweather.eu/en/repository/show?id=428