

STCE Newsletter

30 Jan 2017 - 5 Feb 2017



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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. Nelson, 12y asks 'How does the house of the ISS look like?'



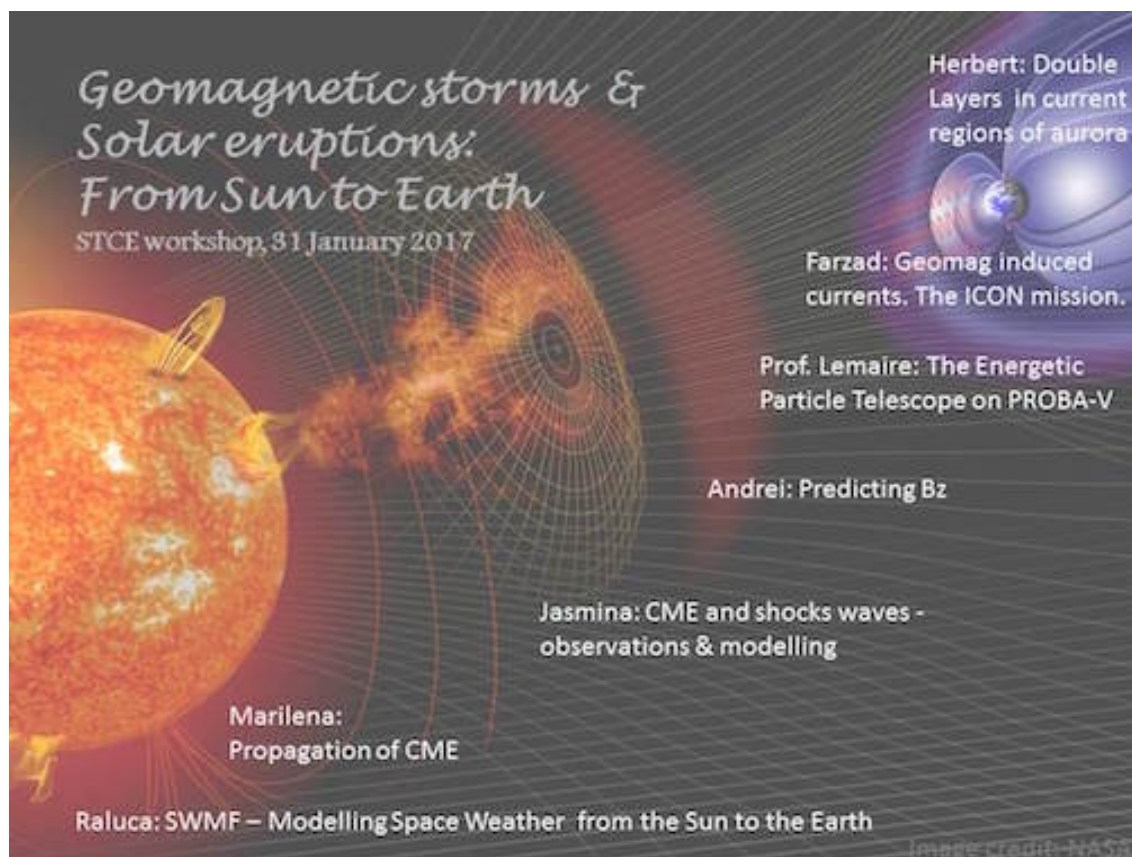
How does the floor plan of the International Space Station look like? Where is the bathroom, toilet, bedroom, gym, ...? Are they connected with corridors? Is there a first floor, second floor, third floor?

A scientist answers

Dear Nelson

This picture shows the configuration of the International Space Station (ISS):

2. Geomagnetic storms and solar eruptions



the STCE Workshop "Geomagnetic storms and solar eruptions: from Sun to Earth" took place in the cozy meeting room of the RMI. Thirty-nine (39!) participants got submerged in the modeling of drivers of geomagnetic storms and solar storms as well as their impact on the geospace environment. The workshop was chaired by Dr Véronique Delouille (ROB), and consisted of 7 talks each followed by a few minutes of Q and A.

The presentations are now online: <https://events.oma.be/indico/event/21/>

3. PROBA2 Observations (30 Jan 2017 - 5 Feb 2017)

Solar Activity

Solar flare activity remained very low during 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.

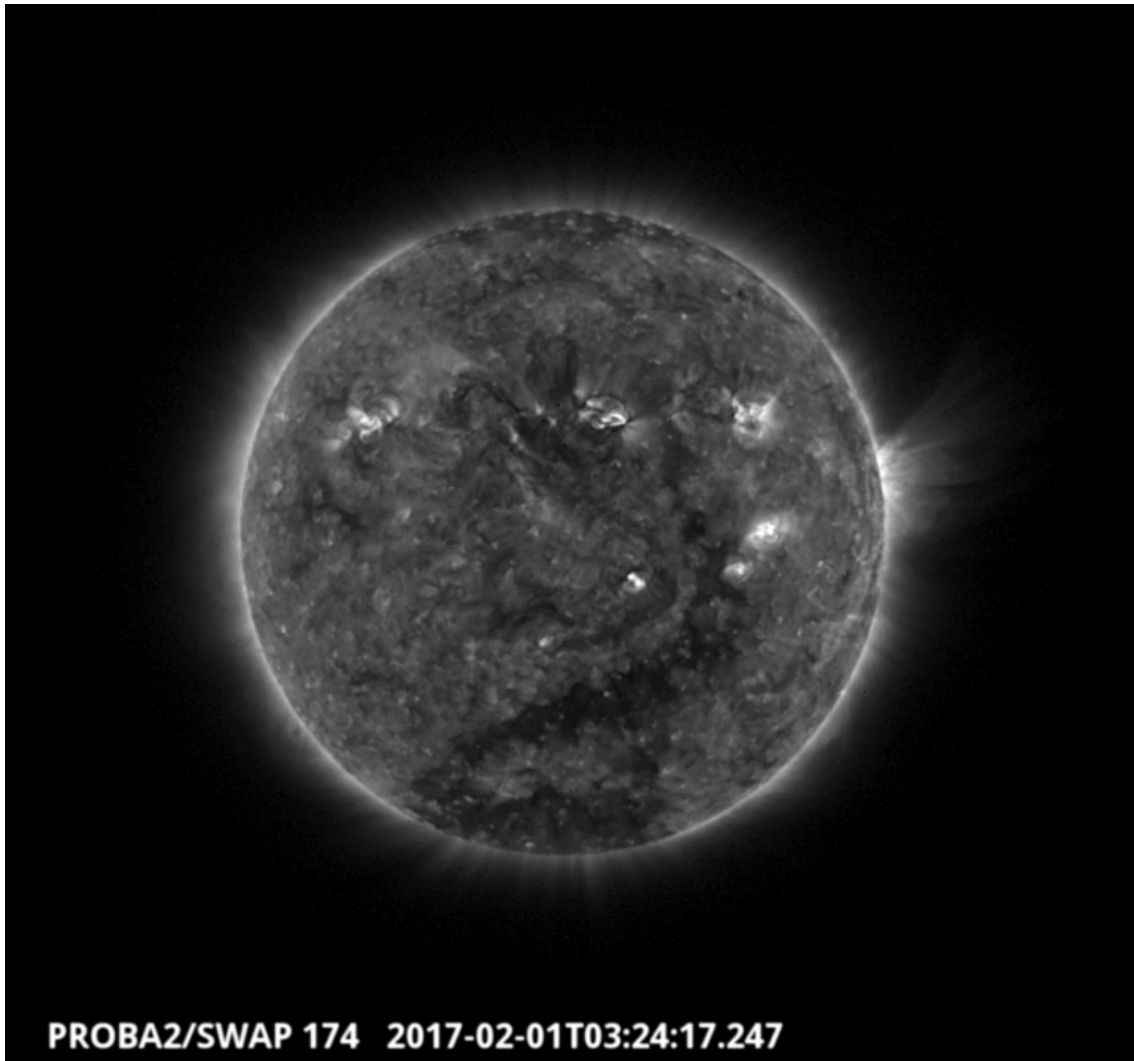
A weekly overview movie can be found here (SWAP week 358):

http://proba2.oma.be/swap/data/mpg/movies/weekly_movies/weekly_movie_2017_01_30.mp4

Details about some of this week's events, can be found further below.

If any of the linked movies are unavailable they can be found in the P2SC movie repository here: <http://proba2.oma.be/swap/data/mpg/movies/>

Wednesday Feb 1



A coronal hole in the southern hemisphere dominated the solar disk at the start of the week. This is clearly seen on 2017-Feb-01. Find a movie of the event here (SWAP movie):
http://proba2.oma.be/swap/data/mpg/movies/20170201_swap_movie.mp4

Saturday Feb 4



The active region that produced the largest flare of the week (B1.6 class flare) is shown here in the North-West of the Sun on 2017-Feb-04 at 13:06 UT. Find a movie of the events here (SWAP movie): http://proba2.oma.be/swap/data/mpg/movies/20170204_swap_movie.mp4

4. Review of solar and geomagnetic activity

Solar Activity

Solar activity was very low. The largest flare recorded was a B1.6 class flare produced by Active Region (AR) 2632. Solar protons have remained at background levels over the past week. No Earth directed Coronal Mass Ejections (CMEs) have been detected. A partial halo CME was visible from 15:24 UT onwards on 2017-Feb-01. The ejection was mostly directed towards the North and had an angular extent of approximately 150 degrees. The speed was measured to be approximately 250 km/s. The source region was unclear but believed to be back-sided. The CME is not expected to hit the Earth. A large negative polarity trans-equatorial coronal hole extending from the Southern pole dominated the solar disk throughout the week.

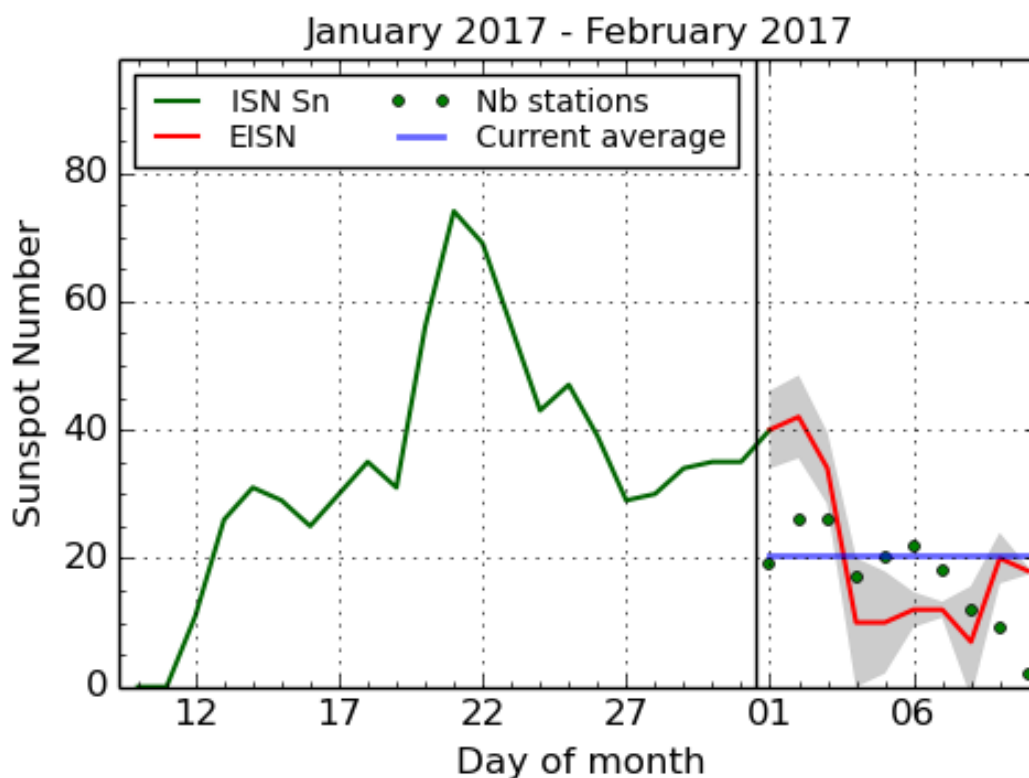
Geomagnetic Activity

The solar wind speed has fluctuated between 380 and 800 km/s over the past week. The total magnetic field strength has fluctuated between 5 and 17 nT peaking on 2017-Jan-31. The Bz component fluctuated between -12 and +9 nT. Geomagnetic conditions ranged between Kp index 1-5 (NOAA) and local K index 1-5 (Dourbes) over the past week. The occasional active conditions experienced by the Earth were created by the large trans-equatorial coronal hole, and the associated Co-rotating Interaction Region (CIR). The High-Speed Stream (HSS) associated with the hole reached speeds of 800 km/s, and enhanced Geomagnetic activity.

An running presentation can be downloaded here: http://www.stce.be/movies/Forecasting_30_Jan_2017.ppsm



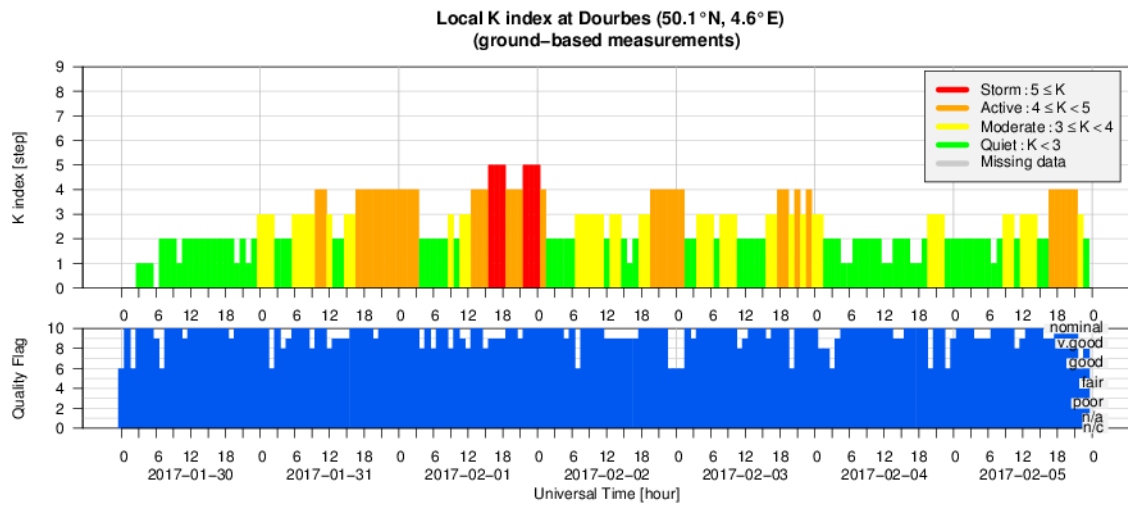
5. The International Sunspot Number



SILSO graphics (<http://sidc.be/silso>) Royal Observatory of Belgium, 2017 February 10

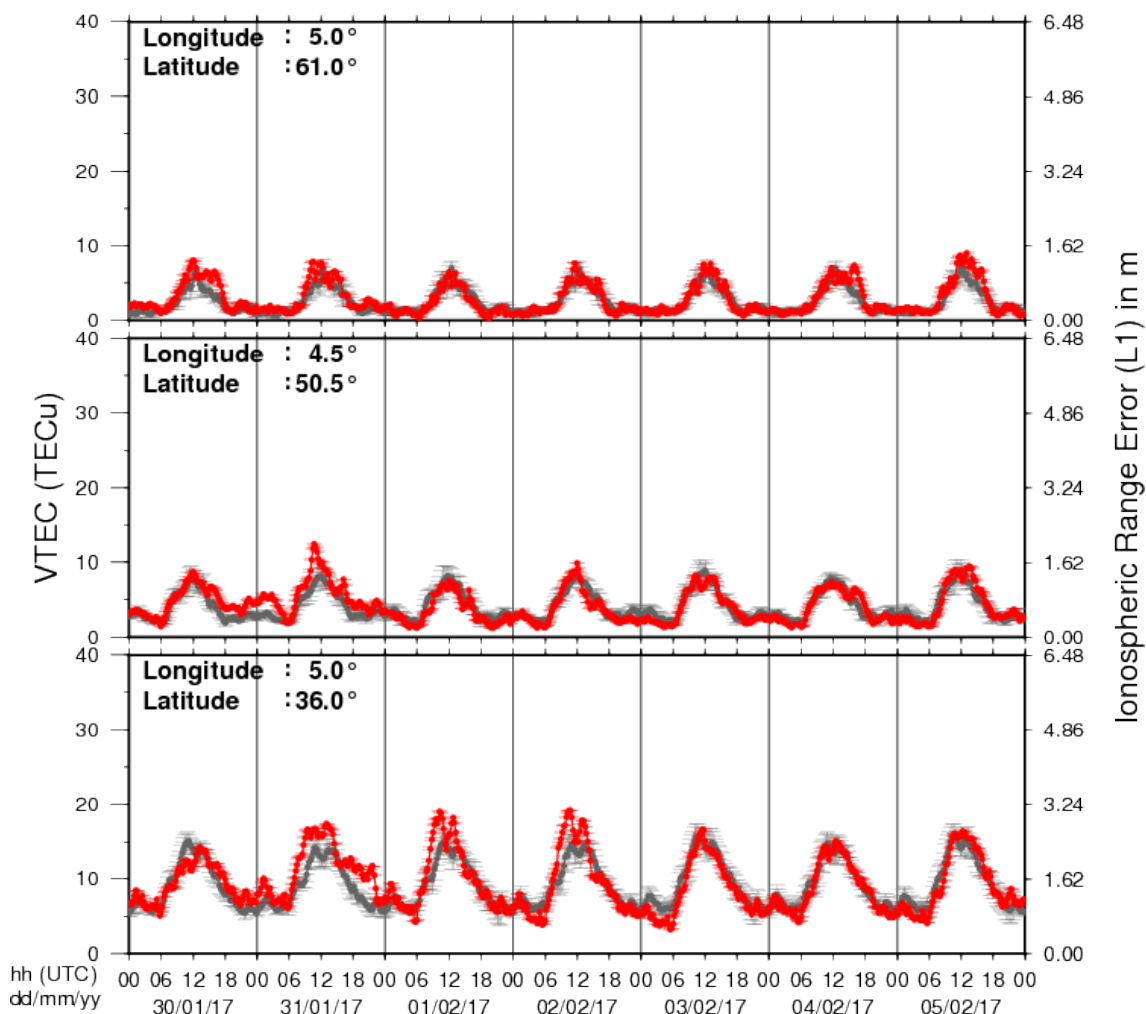
The daily Estimated International Sunspot Number (EISN, red curve with shaded error) derived by a simplified method from real-time data from the worldwide SILSO network. It extends the official Sunspot Number from the full processing of the preceding month (green line). The plot shows the last 30 days (about one solar rotation). The horizontal blue line shows the current monthly average, while the green dots give the number of stations included in the calculation of the EISN for each day.

6. Geomagnetic Observations at Dourbes (30 Jan 2017 - 5 Feb 2017)



7. Review of ionospheric activity (30 Jan 2017 - 5 Feb 2017)

VTEC Time Series



The figure shows the time evolution of the Vertical Total Electron Content (VTEC) (in red) during the last week at three locations:

- in the northern part of Europe (N61°, 5°E)
- above Brussels (N50.5°, 4.5°E)
- 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 $\text{TECu} = 10^{16}$ 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

8. Future Events

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

International CCMC-LWS Workshop in Cape Canaveral, Florida (USA)

Start : 2017-04-03 - End : 2017-04-07

The goal of this working meeting is to address the need to quantify and to track progress over time in the field of space weather and to establish internationally recognized metrics that are meaningful to end-users and developers. Defining a set of appropriate metrics is important to track advancements in space weather understanding and predictive capabilities.

This meeting is a part of the unfolding activities of the International Forum for Space Weather Capabilities Assessment that brings together space environment experts, model and application developers, data providers, forecasters and end-users. The goals of this community-wide forum include addressing challenges in model-data comparisons and evaluating the current state of space environment predictive capabilities. Workshop attendance is encouraged but is not a requirement for joining forum teams.

Website:

http://ccmc.gsfc.nasa.gov/CCMC-LWS_Meeting/

Solar Orbiter Workshop 7: Exploring the solar environs in Granada, Spain

Start : 2017-04-03 - End : 2017-04-06

This event will be hosted by the Instituto de Astrofísica de Andalucía - CSIC. Please mind that on April 7th the 20th SWT meeting will take place at the same venue.

Website: Unkown

URSI General Assembly in Montreal, Canada

Start : 2017-08-19 - End : 2017-08-26

For the thirty-second time since the inception of URSI, Radio Scientists from across the world will get together for the URSI General Assembly and Scientific Symposium. This triennial gathering will take place from 19th to 26th of August 2017, in Montreal, Canada. This conference is a unique opportunity to learn about recent advances in all fields of Radio Science, as covered by all ten URSI Commissions.

Among the different sessions, please note:

* 'Radio Science for Space Weather' Conveners: M. Messerotti, V. Pierrard

* 'Remote Sensing and Modeling of the Earth's Plasmasphere and Plasmopause' Conveners: A. M. Jorgensen, V. Pierrard, B. Heilig

The abstract deadline is 30 January 2017

Website: <http://www.ursi2017.org>

2017 Joint IAPSO-IAMAS-IAGA Assembly in Cape Town, South Africa

Start : 2017-08-27 - End : 2017-09-01

The Local Organising Committee is thrilled to welcome you to the 2017 Joint IAPSO-IAMAS-IAGA Assembly in Cape Town, South Africa. The Joint Assembly, endorsed by the University of Cape Town and the South African Department of Science and Technology, will take place from 27 August to 1 September 2017 at the Cape Town International Convention Centre (CTICC).

Website:

<http://iapso-iamas-iaga2017.com/index.php>

Workshops on Radiation Monitoring for the International Space Station in Torino, Italy

Start : 2017-09-05 - End : 2017-09-07

The Workshop on Radiation Monitoring for the International Space Station is an annual meeting to discuss the scientific definition of an adequate radiation monitoring package and its use by the scientific community on the ISS. Types of instruments and research topics need to be defined in order to optimise the radiation safety of the ISS crew.

Website: <http://wrmiss.org/>

European Space Weather Week 14

Start : 2017-11-27 - End : 2017-12-01

The ESWW is the main annual event in the European Space Weather calendar. It is the European forum for Space Weather as proven by the high attendance to the past editions. The agenda will be composed of plenary/parallel sessions, working meetings and dedicated events for service end-users. The ESWW will again adopt the central aim of bringing together the diverse groups in Europe working on different aspects of Space Weather.

Website:

<http://www.stce.be/esww14/>