Ground-based Solar Observations

Sunspots drawings in the 21st century

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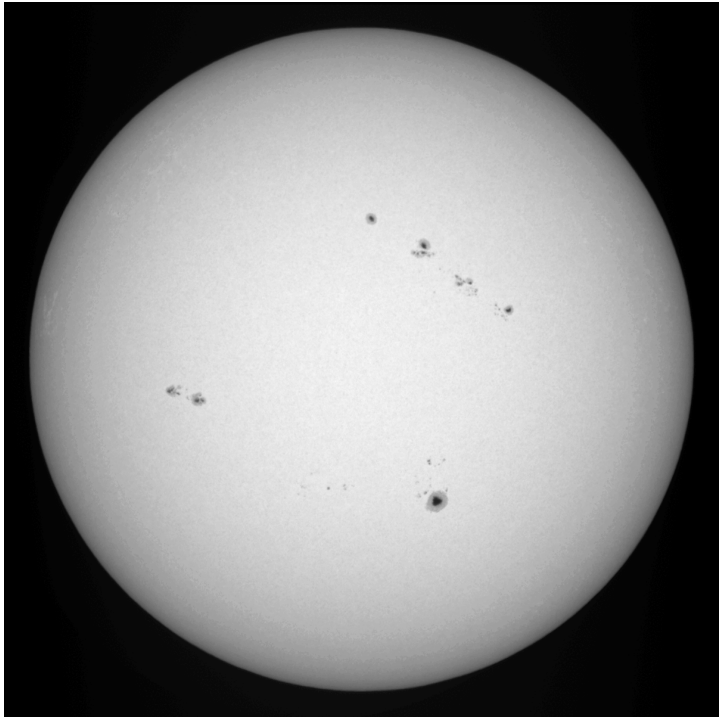
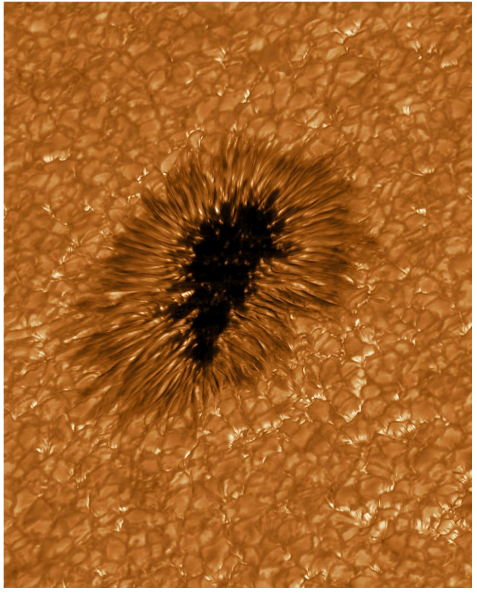
Solar Observer

- Technical expert at the Royal Observatory of Belgium
- Solar observer since 2008
- Sunspot specialist

Sunspots

- Sunspots are phenomena on the Sun's photosphere that appear as temporary spots that are darker than the surrounding areas.
- They are regions of reduced surface temperature caused by concentrations of magnetic flux that inhibit convection.
- Sunspots appear within active regions, usually in pairs of opposite magnetic polarity.Their number varies according to the approximately 11-year solar cycle. (source:Wikipedia)

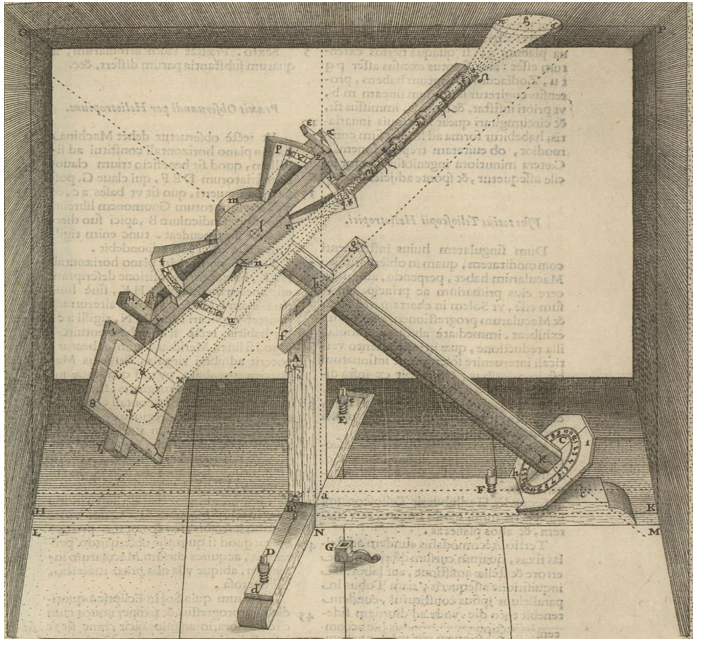




Sunspots Drawings

While Western astronomers of the Renaissance period were still arguing in 1615 about who was the first to discover sunspots, Chinese astronomers had already accumulated numerous records on sunspots.

On 10th May, 28 BC, a sunspot was observed by astronomers during the reign of Emperor Cheng of the Western Han Dynasty and was described as a black vapor as large as a coin at its center and at sunrise the Sun was yellow.

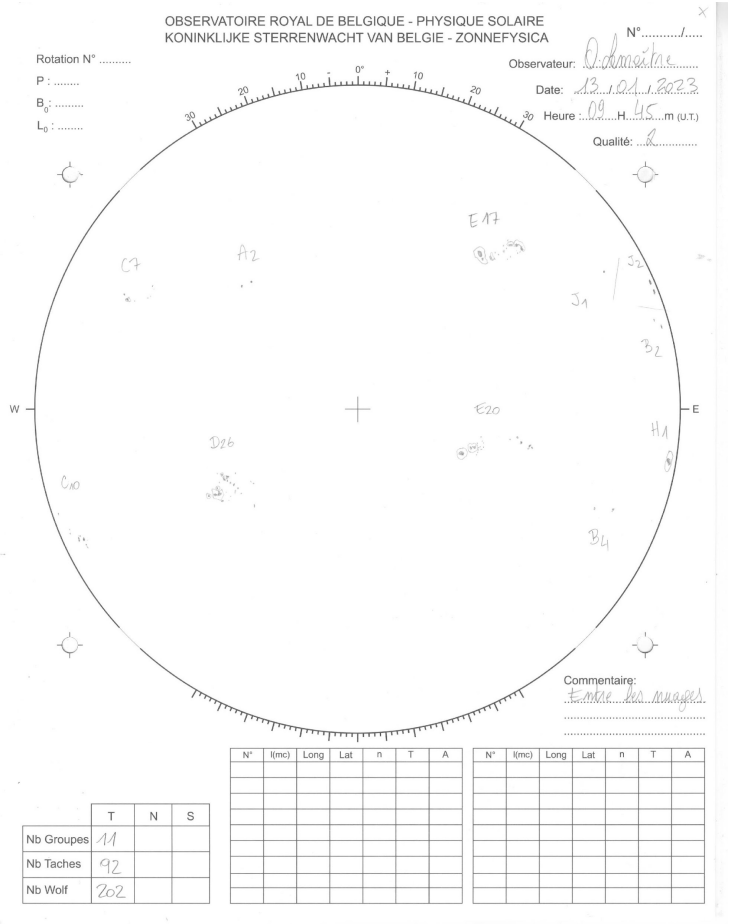


Galileo asserts in the “Lettere solari” that sunspots are part of the surface of the Sun and from this he deduced that the Sun orbited around its own axis. He also referred to the transience of sunspots. Thus Galileo proved that emergence and decay occurred on the Sun.

Drawing the sunspots at USET

Uccle Solar Equatorial Table

Drawing the sunspots at USET



We are a team of 6 observers

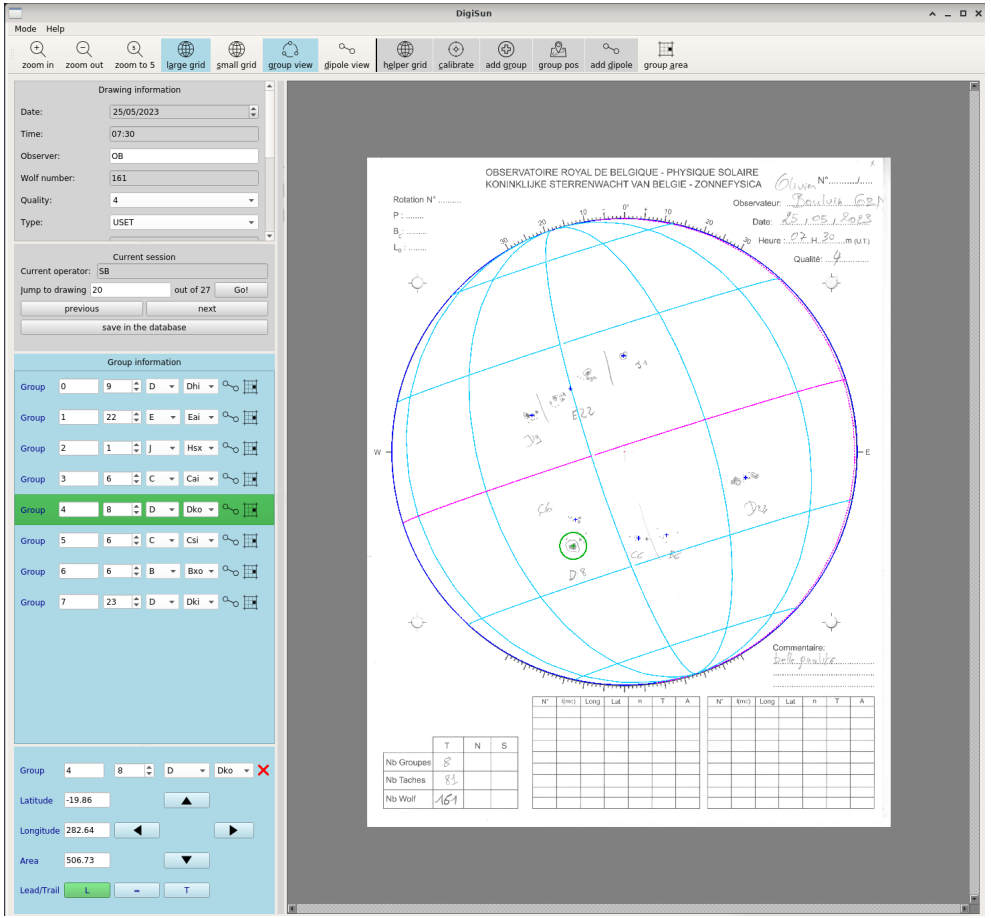
We try to observe every day, as the weather permits.

We have a satisfying yearly average of 250 drawings, even in Belgium.

Our digital set of scanned drawings goes back to 1941.

Our catalog of scanned and analyzed drawings is quite unique.

Sunspots drawings nowadays



- Digital scanning
- Group location/splitting
- Group classification
- Dipole length
- Dipole orientation
- Sunspots area

Sunspots drawings in 2023 ??

Sunspots drawings are being made in Europe since the 17th century, when Galileo first used his telescope to observe the sun.
Chinese and others civilizations knew for centuries that sunspots existed.

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CONTINUITY

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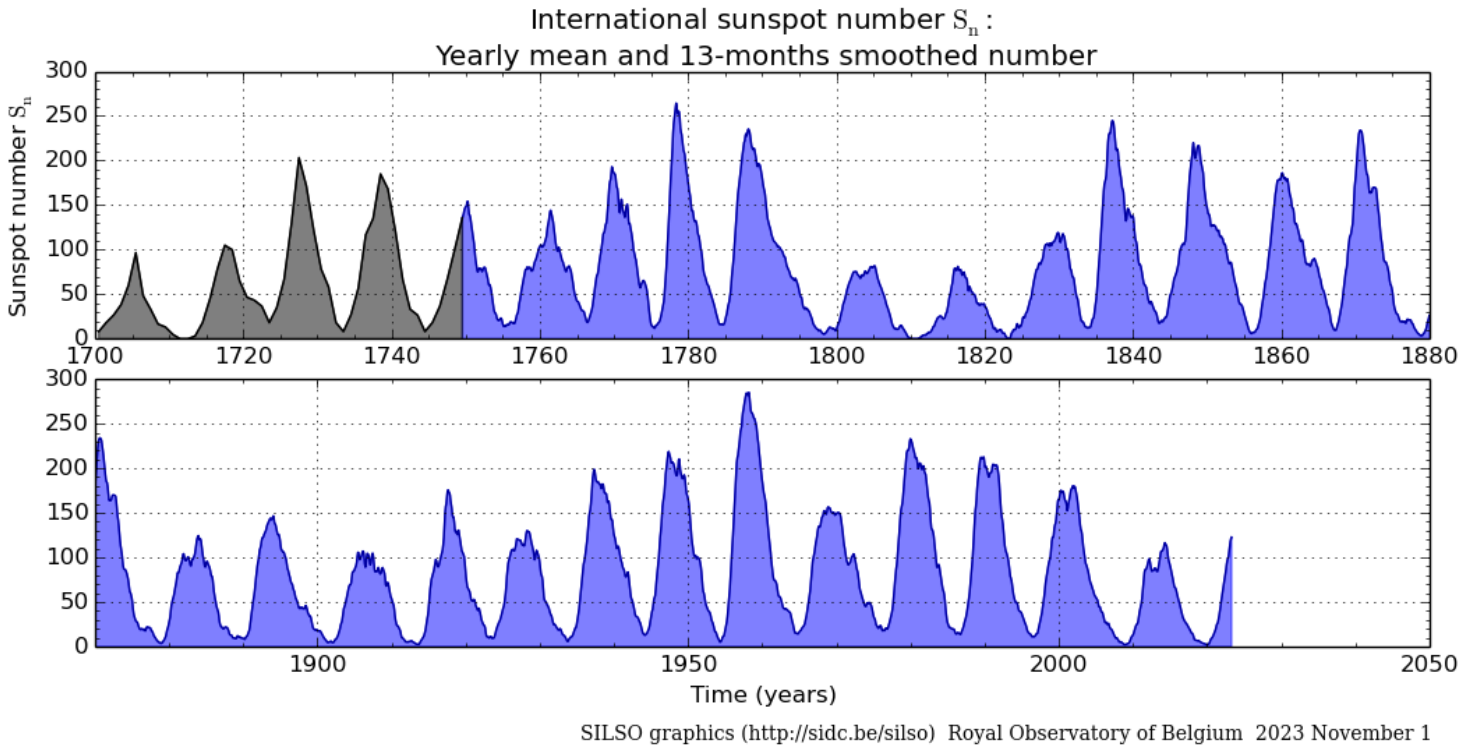
Sunspots drawings in 2023 ??

Sunspot Number is one of the oldest ongoing science dataset in the world.

- If we want to compare data, data must be of the same nature.
- By using the same drawing method, we can compare our actual observations with all the existing ones. Starting from the 17th century in Europe.
- To this day, probably a few hundred of amateurs and professionals observers around the world use the same methods to observe the sun and report on their Sunspot Number.

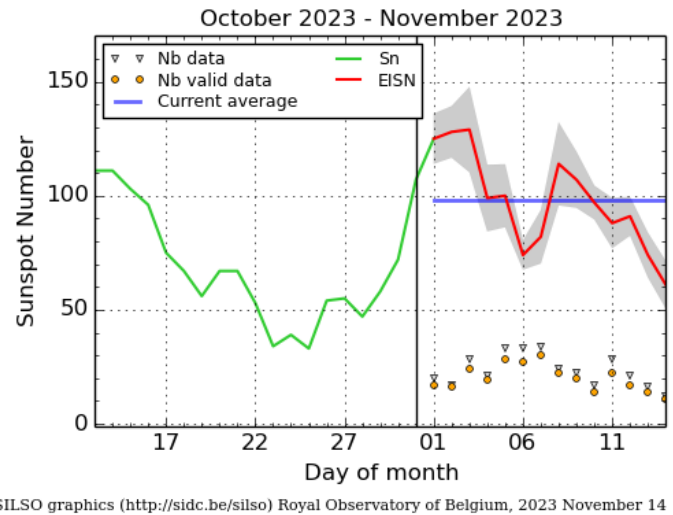
Sunspot number

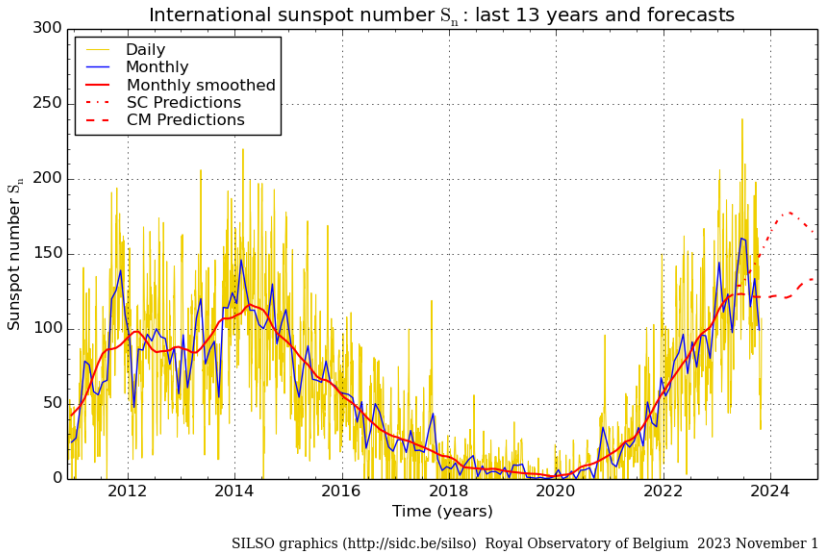
The Wolf number (also known as the relative sunspot number or Zürich number) is a quantity that measures the number of sunspots and groups of sunspots present on the surface of the Sun.



Observer's network

Every day, at SILSO, we gather and store solar observations coming from different observers scattered around the globe.





Those observations are then used, averaged to establish the official International Sunspot Number. Which is published monthly in the Sunspot Bulletin.