

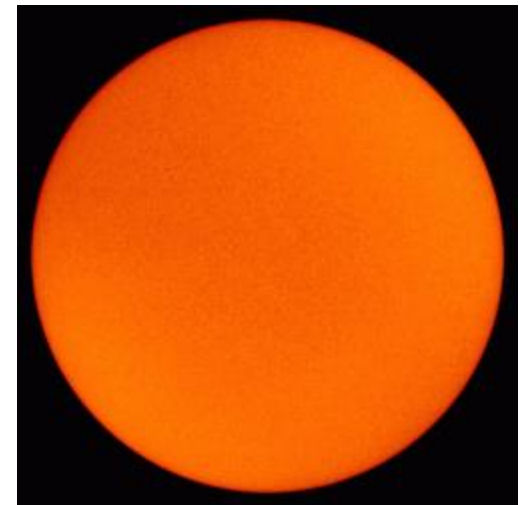
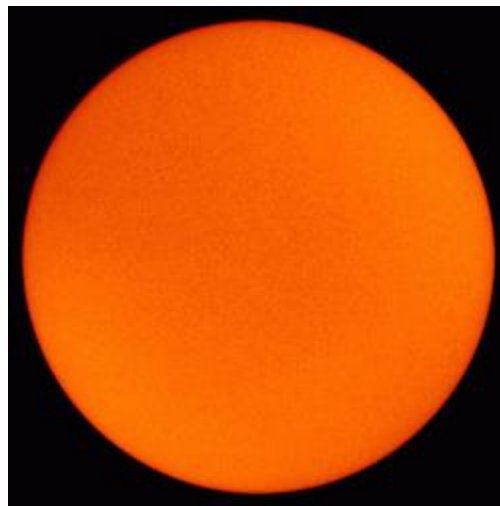
Sunspots, are they gone by 2020?

(title of talk: responsibility of CCF-organizers)

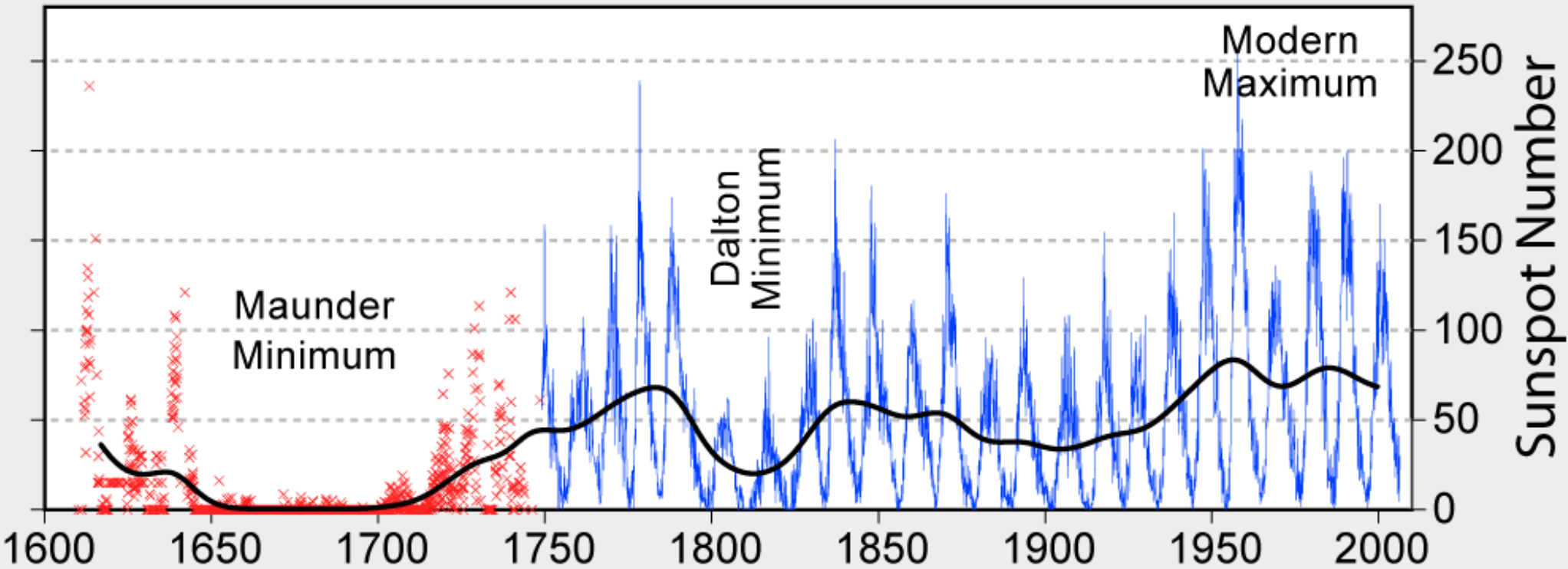
CCF Cruise 2015, 31.1.2015

Crystal Ball operations by "Zaba" OH1ZAA

€£\$€: No "money back" guarantees, £€\$\$

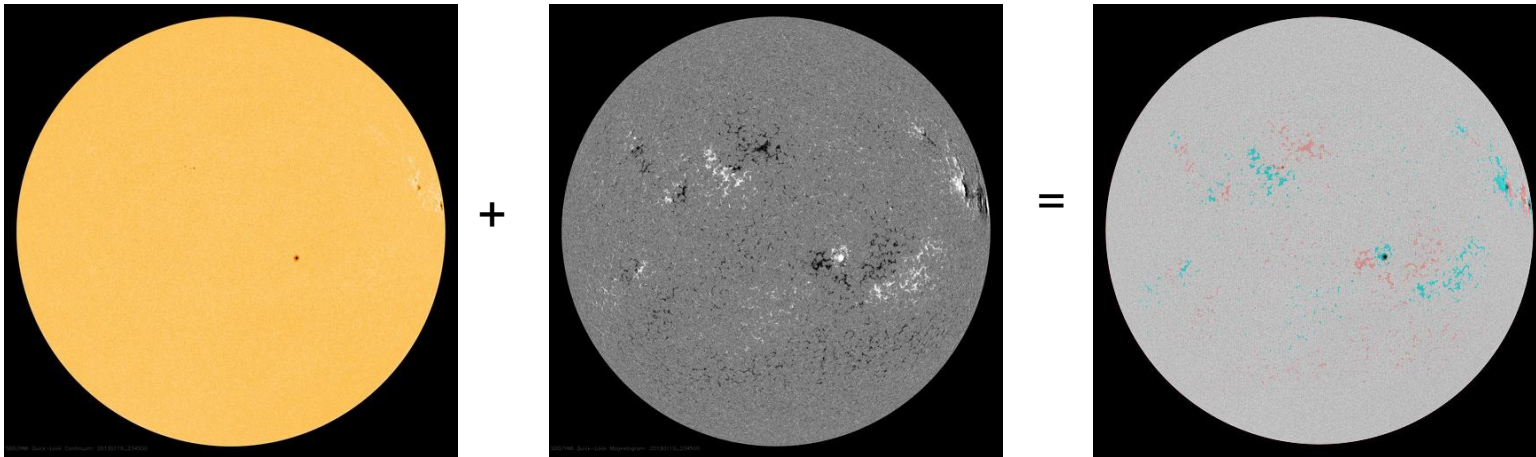


400 Years of Sunspot Observations



Sunspot photographs/images

Active areas of the sun at various optical wavelengths



Magnetic map can be constructed by addition or subtraction of images

of the solar disk using different optical filtering of the solar spectrum.

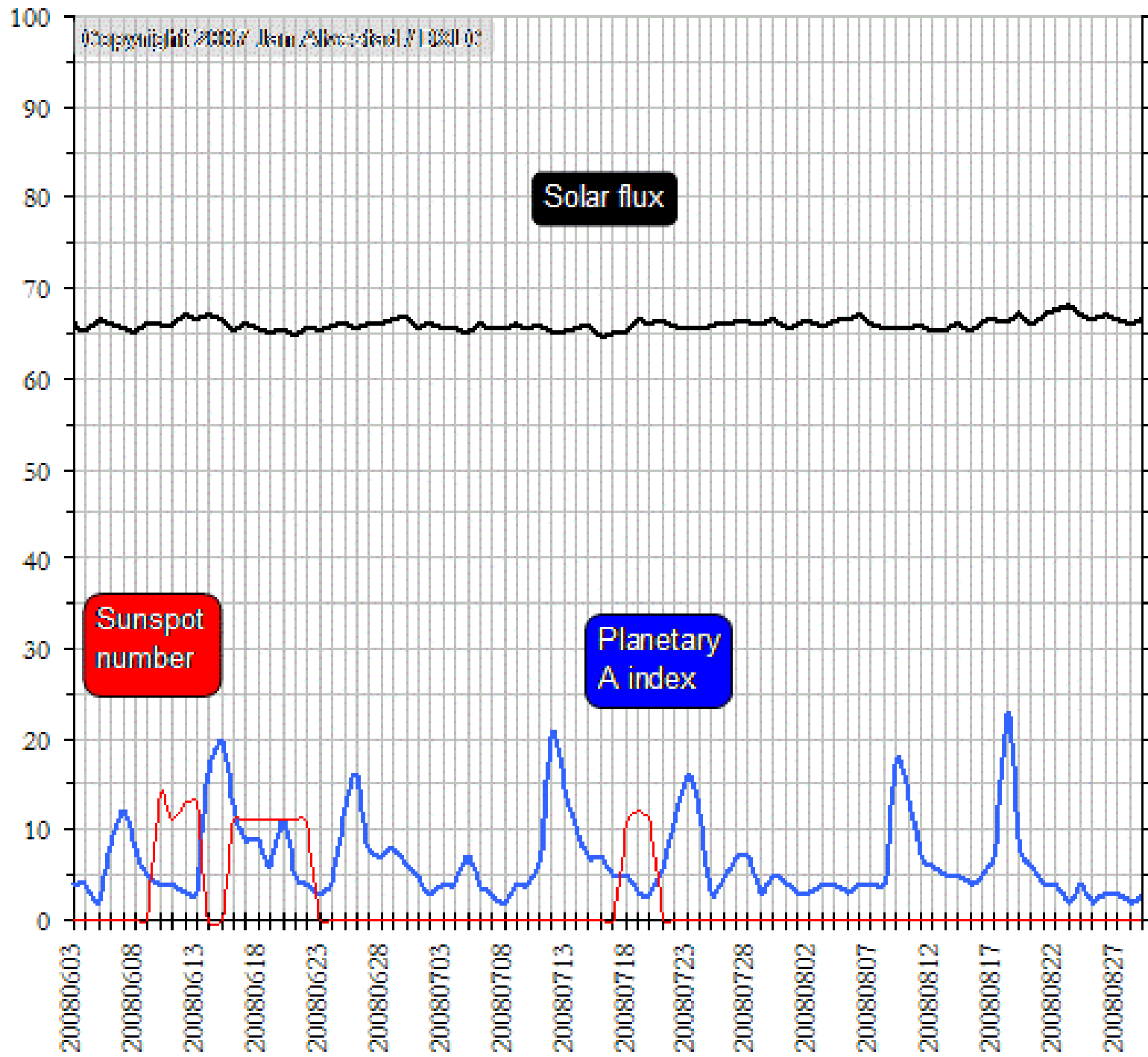
Sunspots in the year 2020?

Old news: Zero Sunspots - First Spotless Month in a Century

Sep 2008 – “The sun has reached a milestone not seen for nearly 100 years: an entire month has passed without a single visible sunspot being noted. (previous similar happening in the year 1913, June)

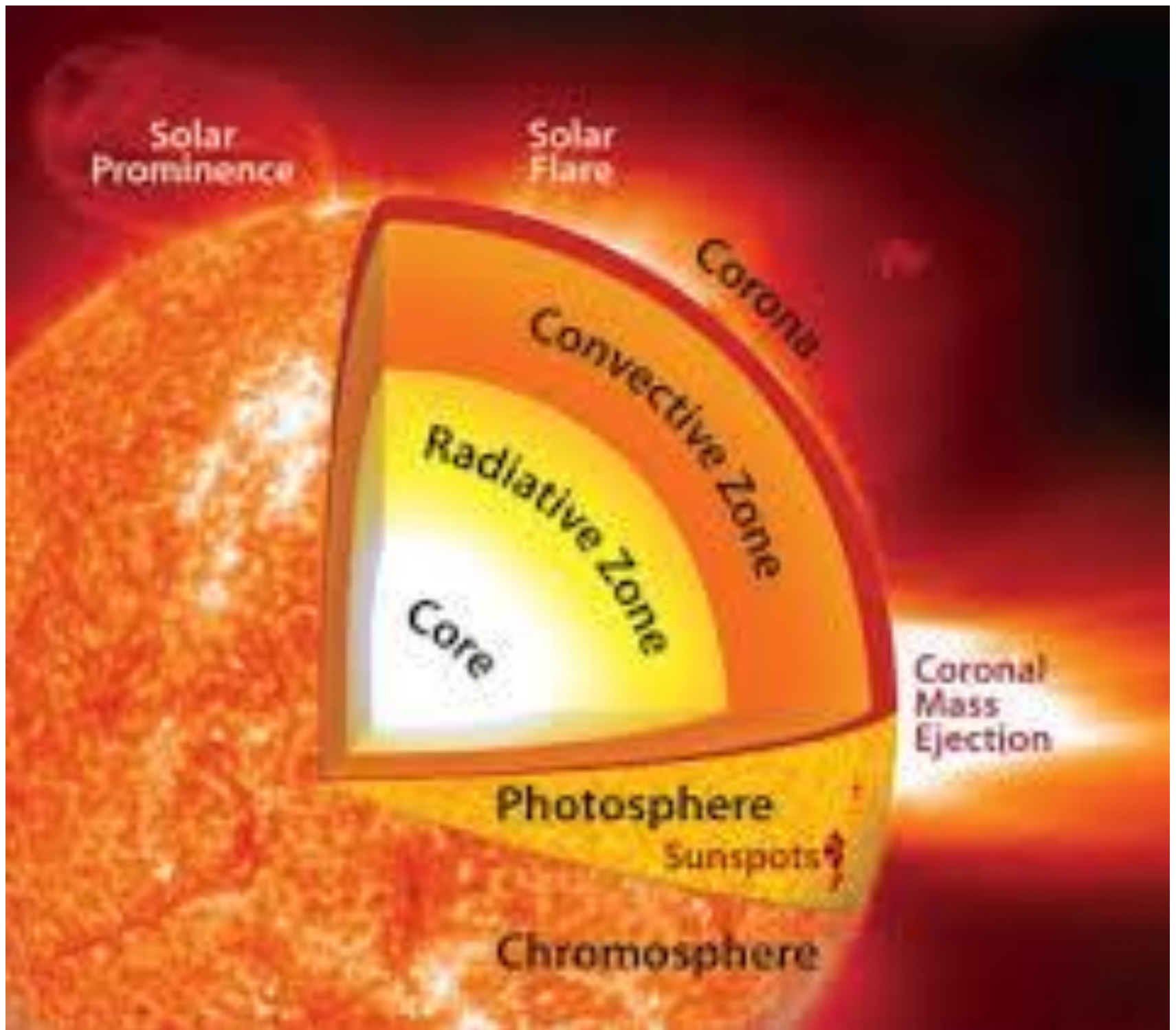
How about sunspots after 2020?

Definitely YES, but how many and when?



“In 2005, a pair of astronomers from the National Solar Observatory (NSO) in Tucson ... reached the startling result that, within 10 years, sunspots would vanish entirely. At the time, the sun was very active. Most of their peers laughed at what they considered an unsubstantiated conclusion.

It is now 2015 and we still have sunspots, but the Cycle 24 maximum was delayed from the 11 years average. Cycle duration varies 10–14 yrs.



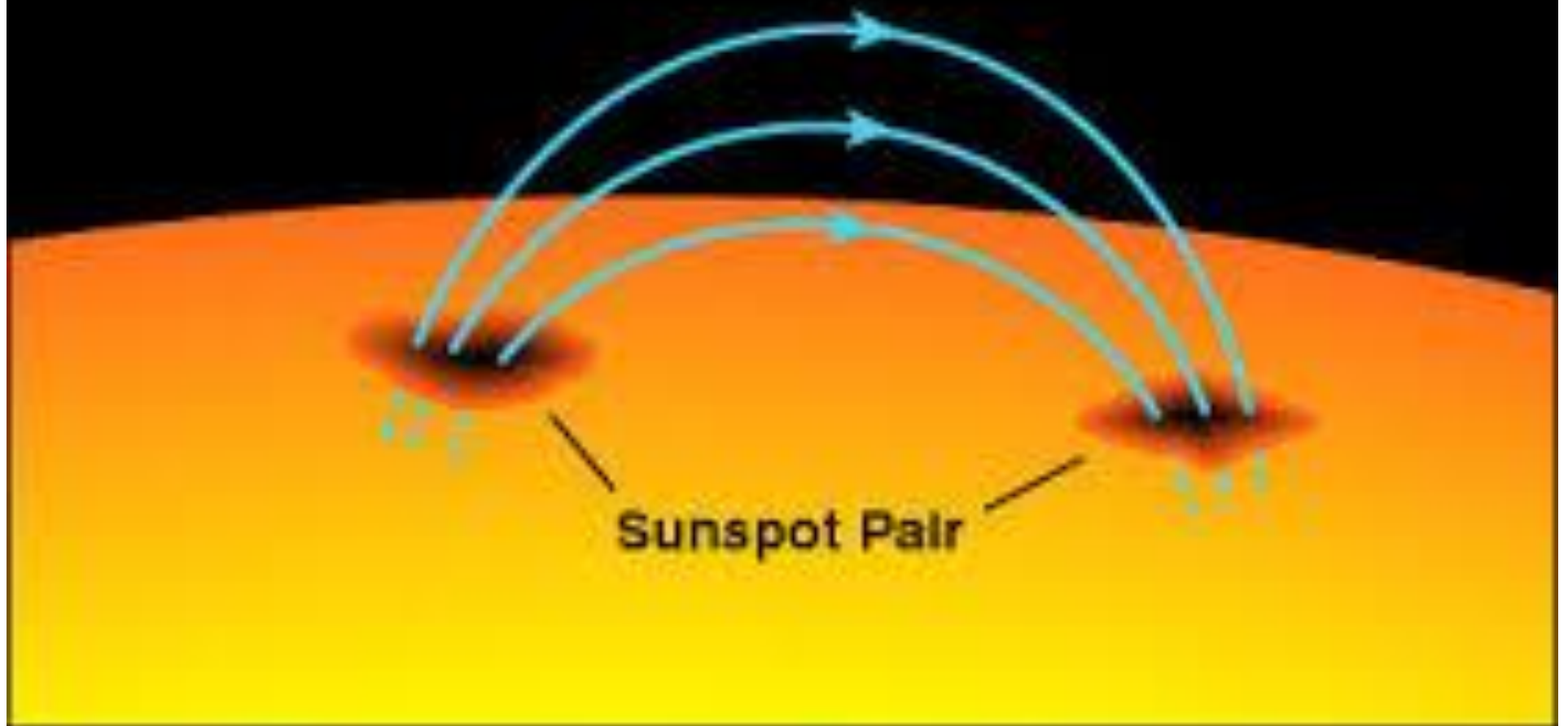
Maunder Minimum (history)

The sun went through a period of near zero sunspot activity from about the year 1645 to 1715.

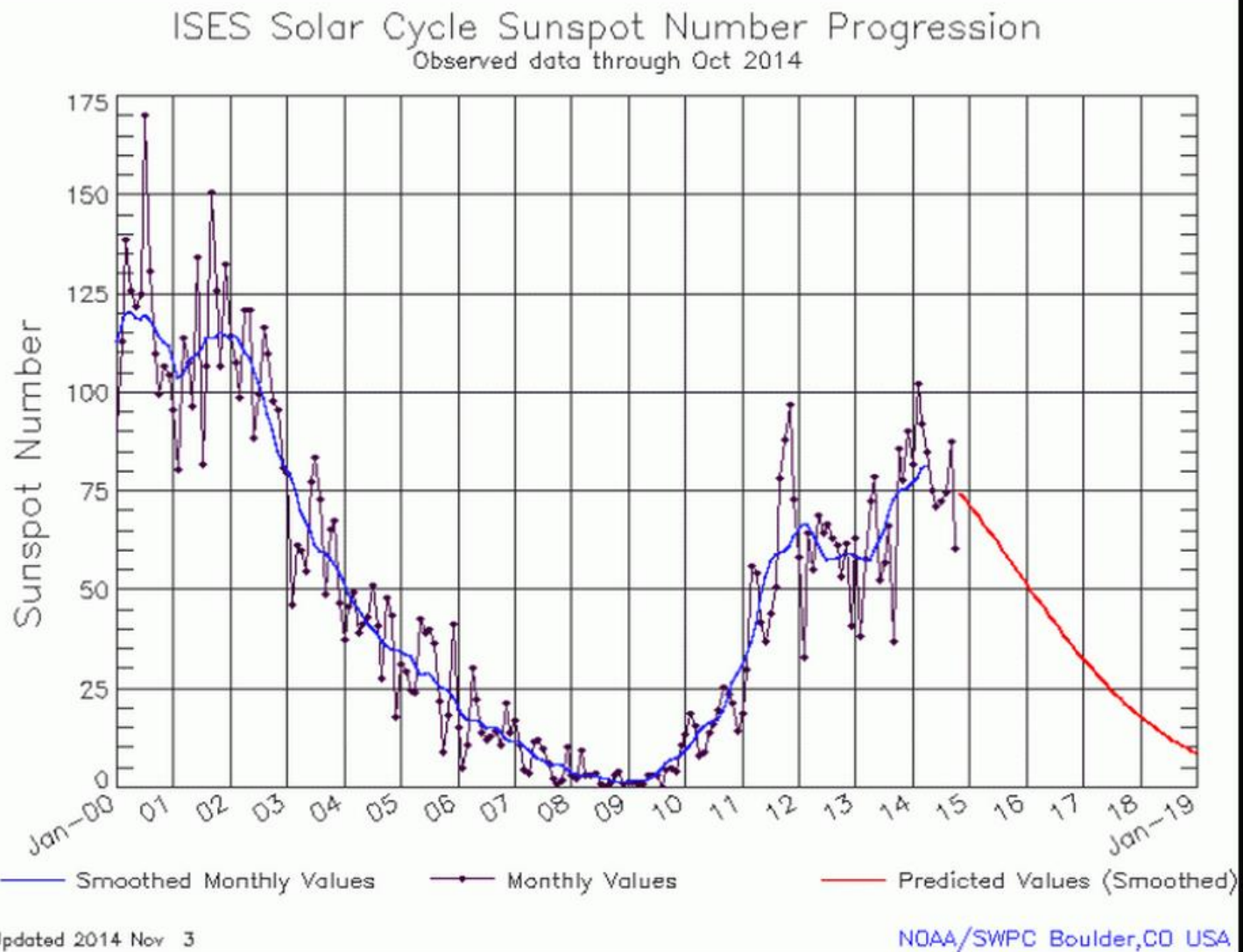
A Little Ice Age occurred at the same time.

(link to effects of Global Warming/Cooling)?

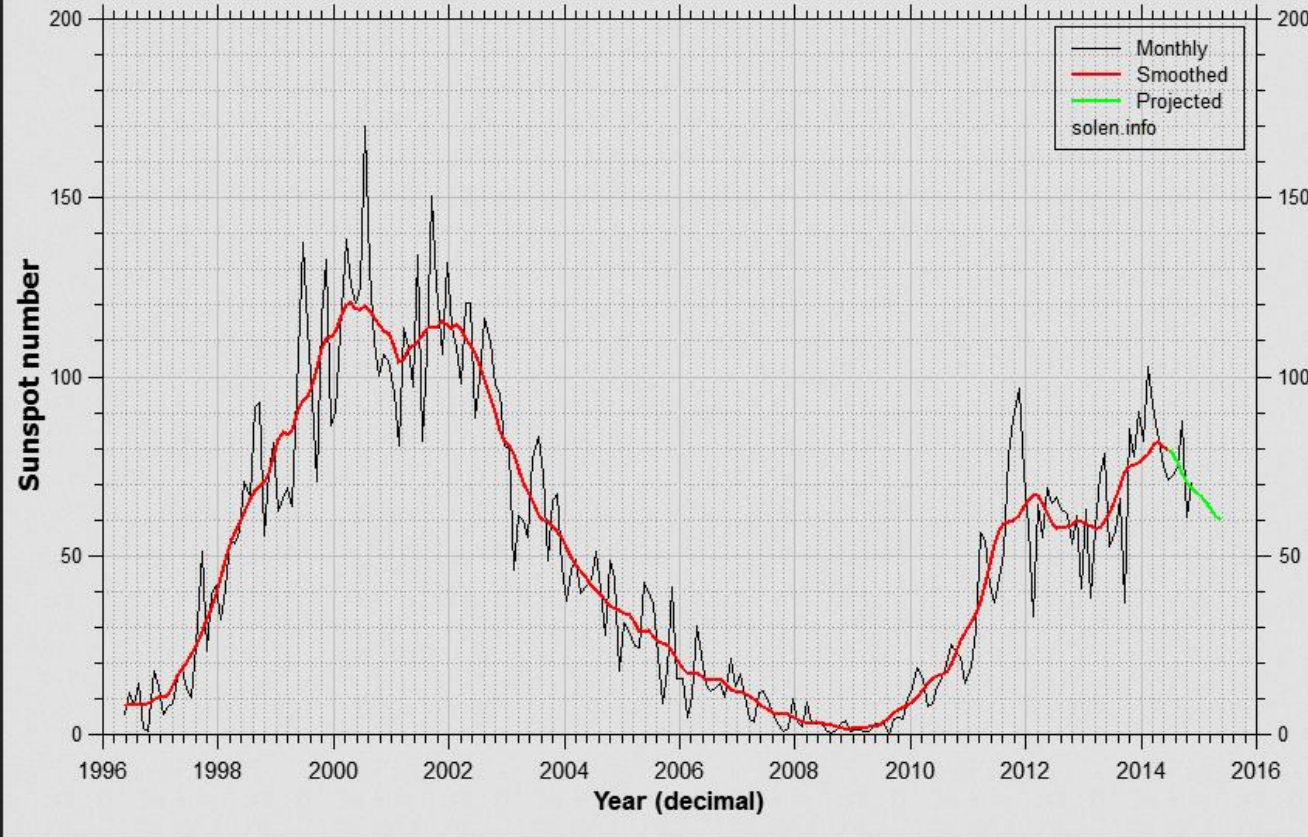
Magnetic Field Lines

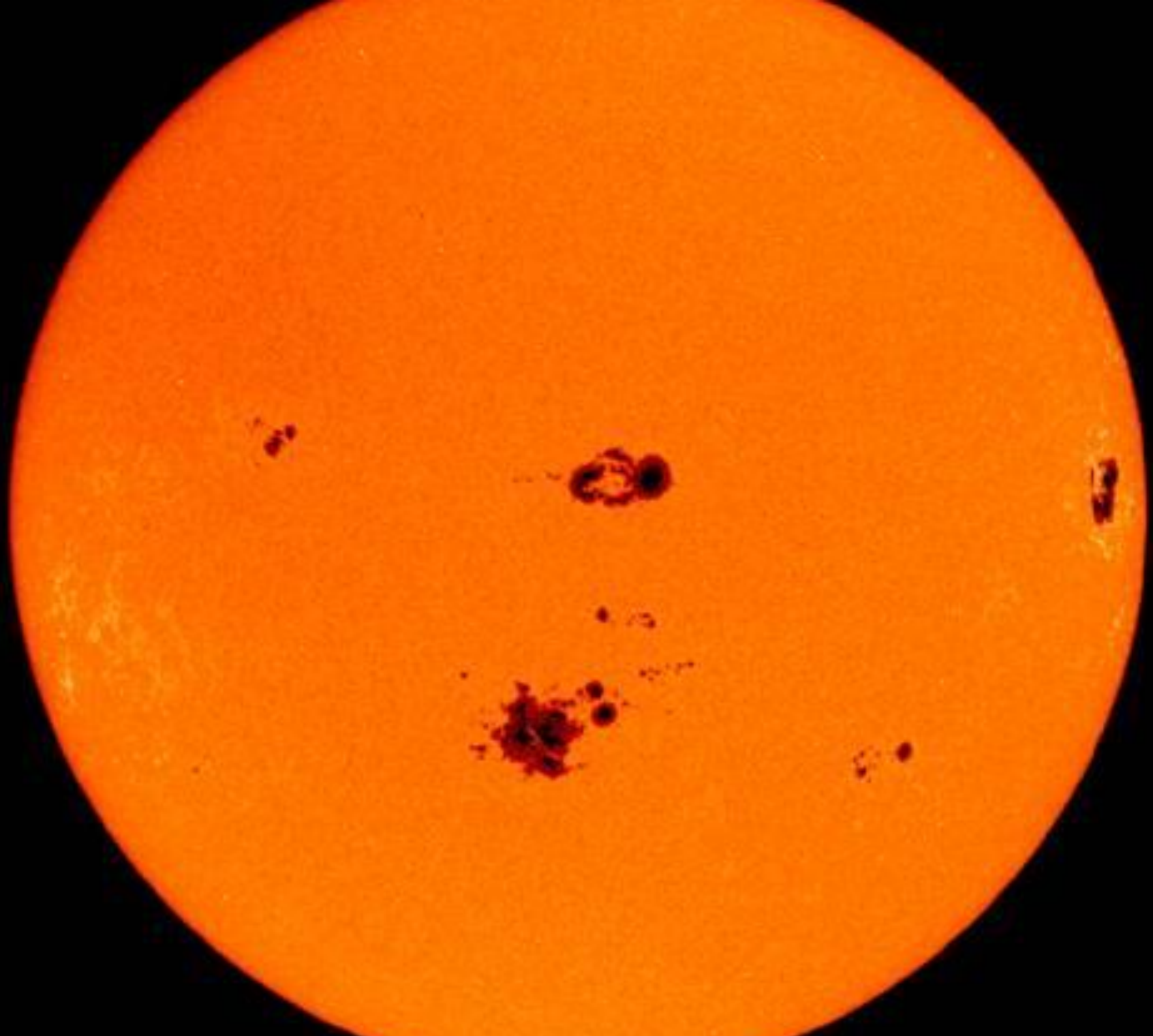


Cycle 24 history till Oct. 2014



Cycles 23-24





Professional vs. Amateur

If solar physicists make sunspot maximum forecasts that vary from near zero to 200 spots, then don't expect Zaba's crystal ball to predict any reliable value for a future solar peak.

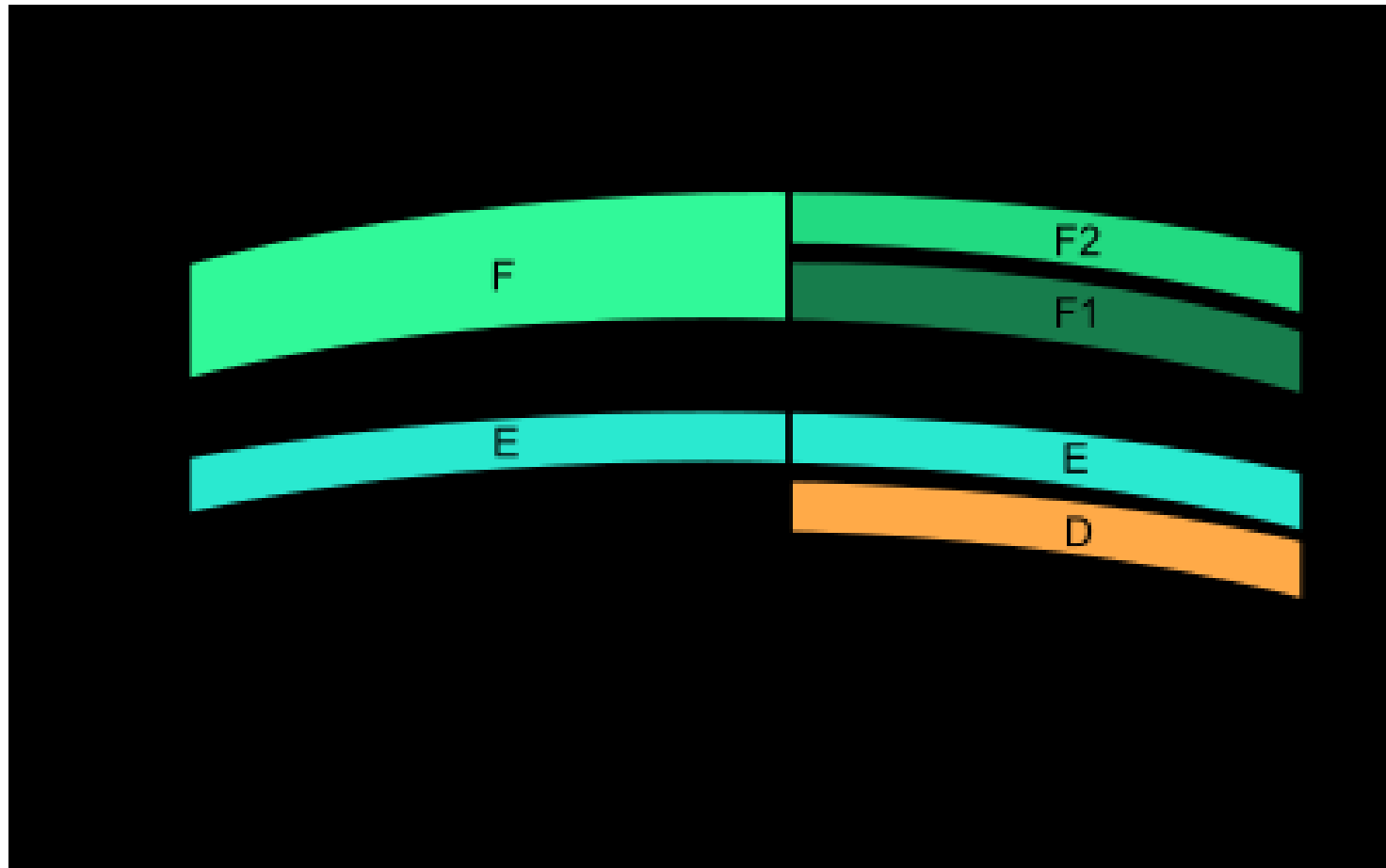
Maybe we should approach the subject from a "relativistic" viewpoint i.e. in relation to other uncertain, or long term (geo)physical processes, much similar to glacier melting, sea currents, formation of mountain ranges and drift of continents, if not expansion of the Universe.

Solar flux and UV-radiation

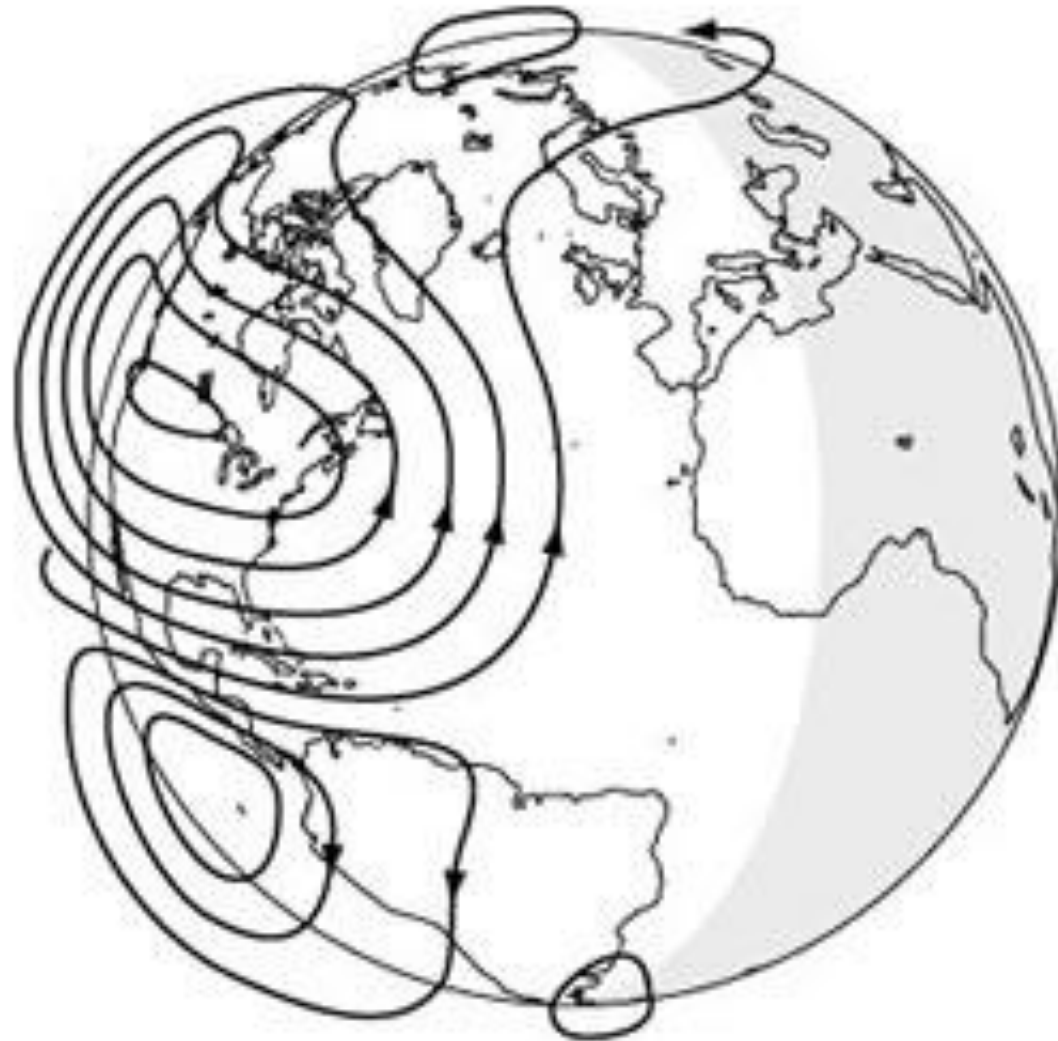
Solar flux is an indicator: it is not able to change the ionosphere of the Earth. It is noise power measured at 2800 MHz. An indicator for the general activity of the sun.

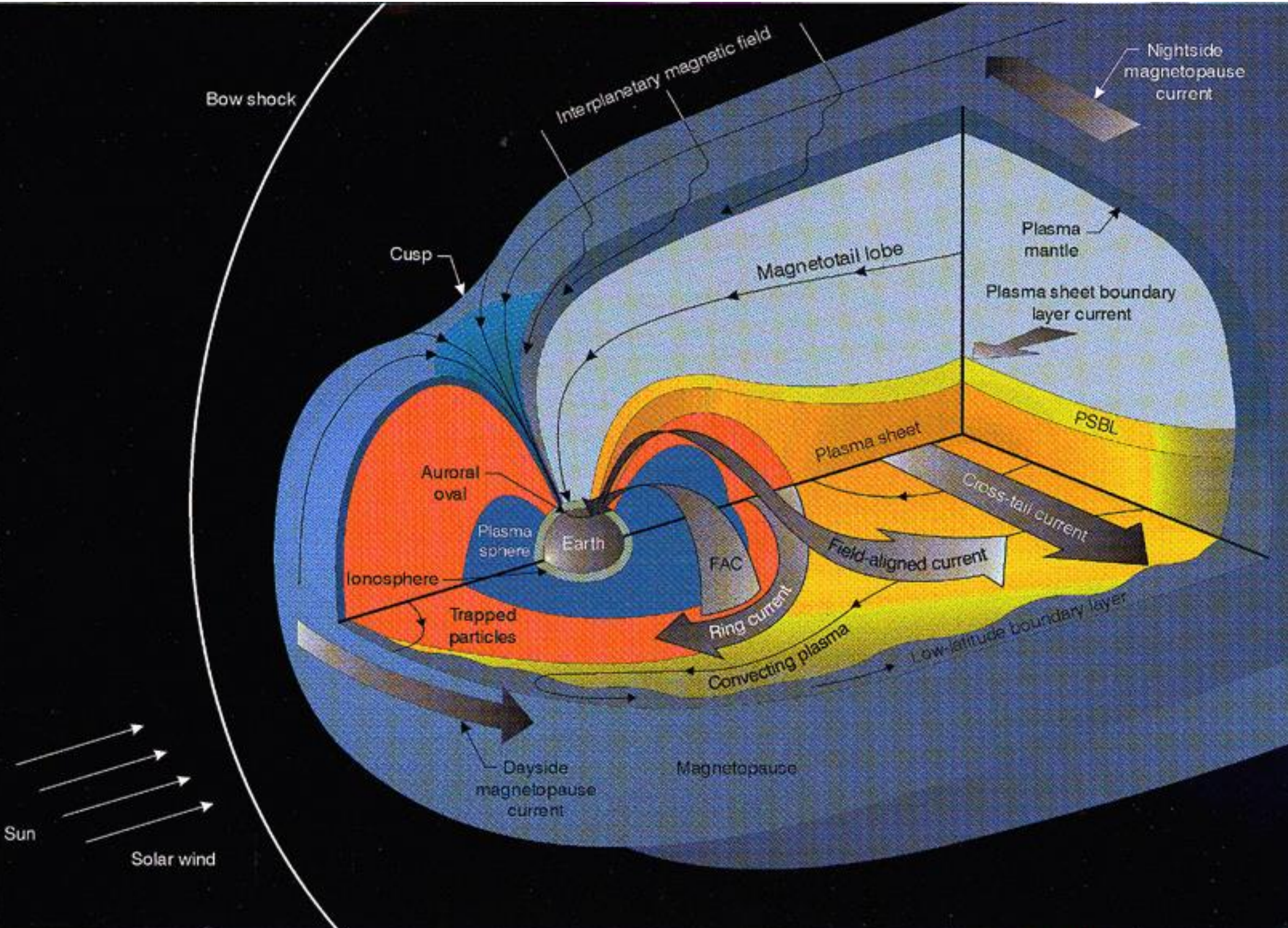
The solar energy generator is the transformation from Hydrogen into Helium, creating hard X-rays that softens to ultra-violet and visible light on the way out from the process core. Mainly the UV is ionizing the upper atmospheric layers of the Earth, to create the E- and F-layers usable for shortwave communication.

Night vs Day Ionosphere

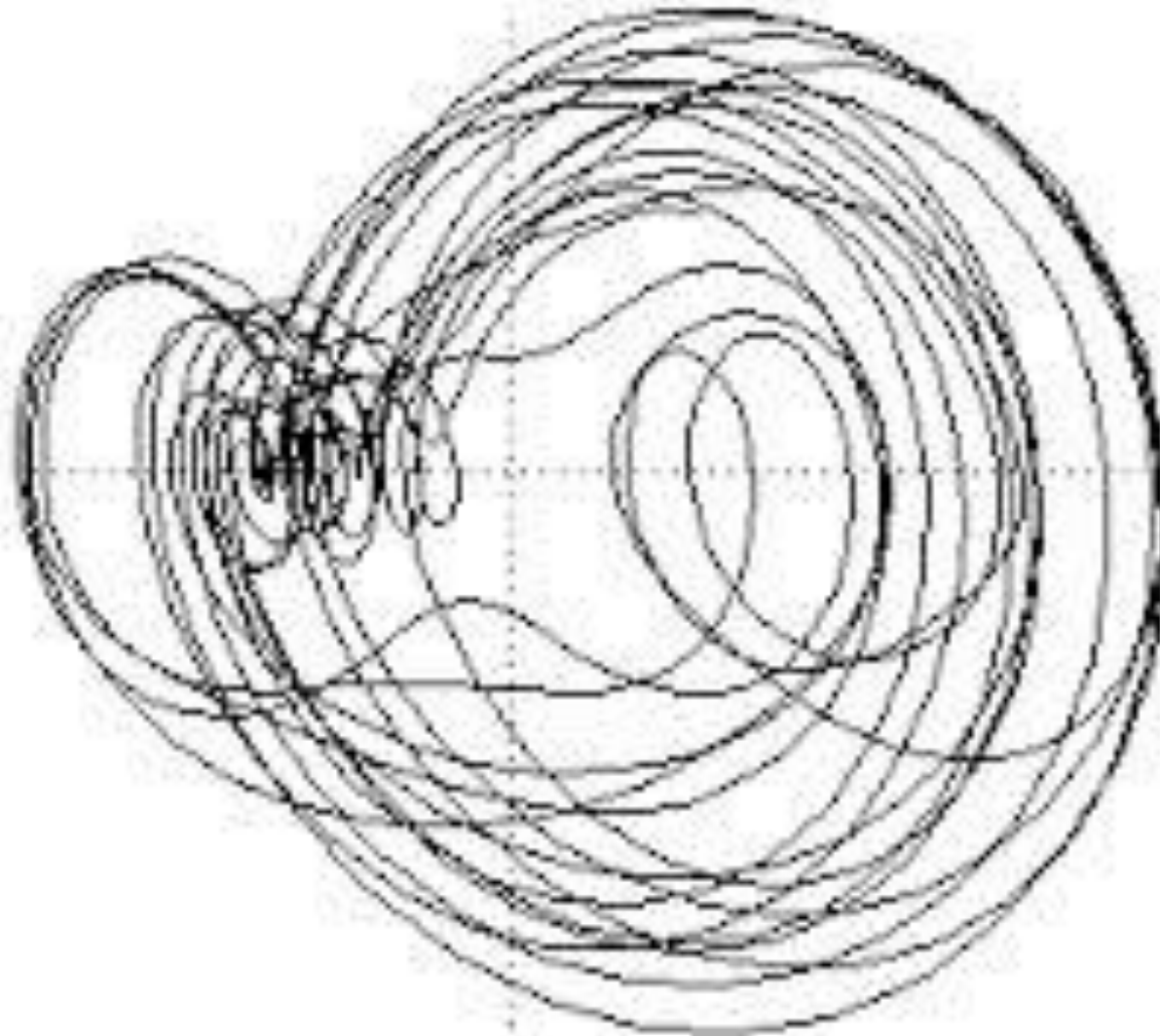


Electric currents in Sunward Ionosphere





Concept of a chaotic oscillator

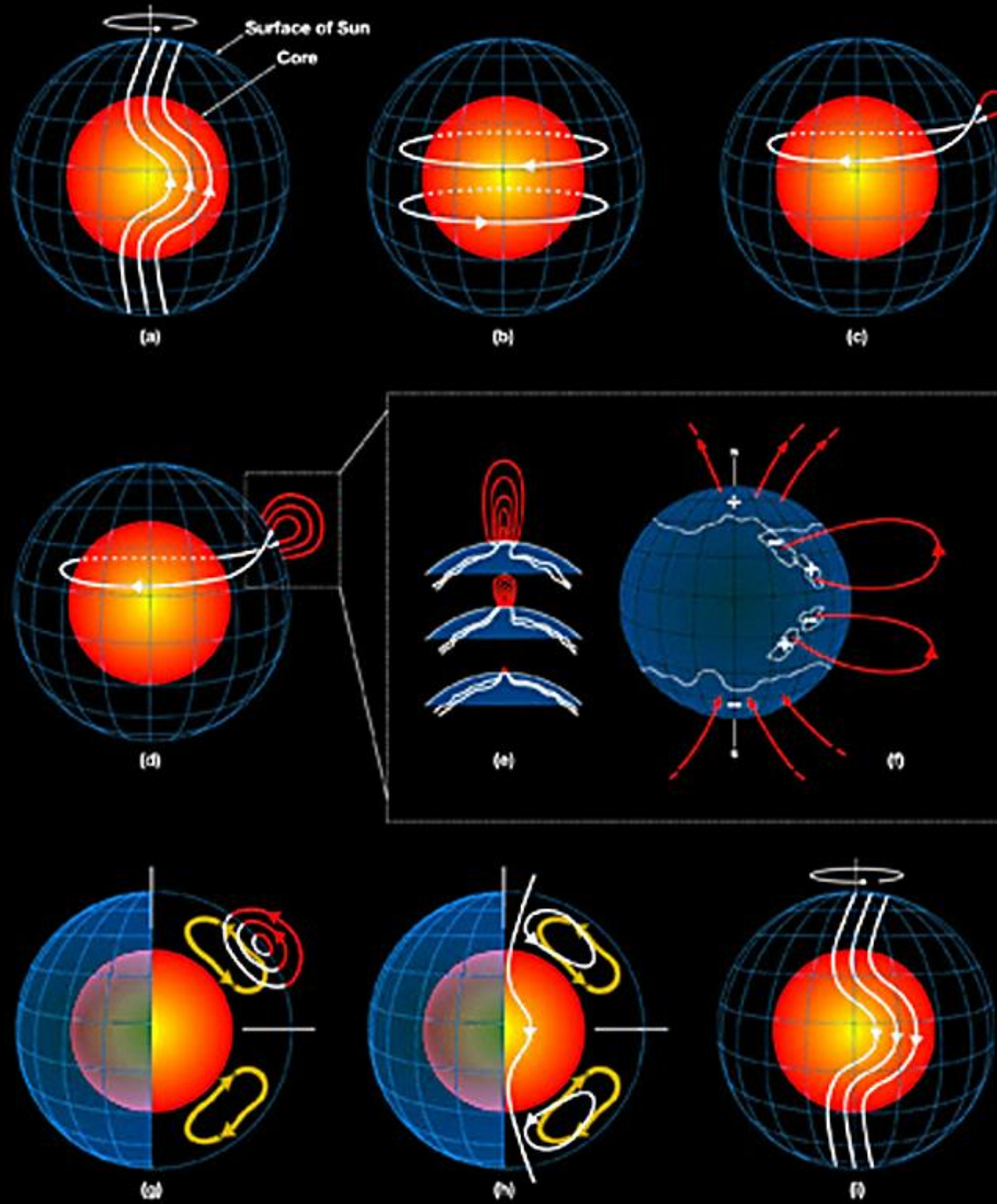


Question: steering of solar processes, internal/external, both?

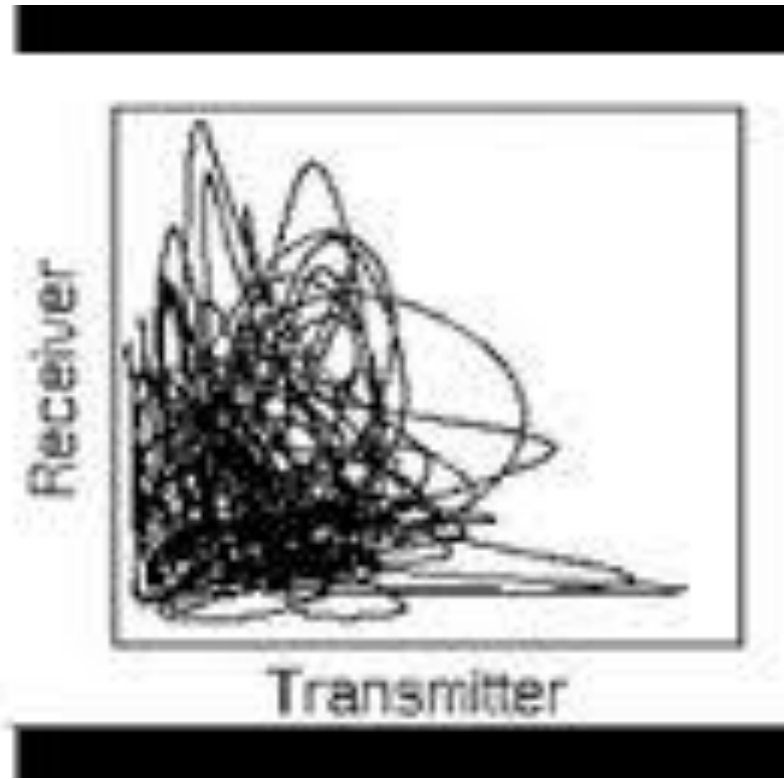
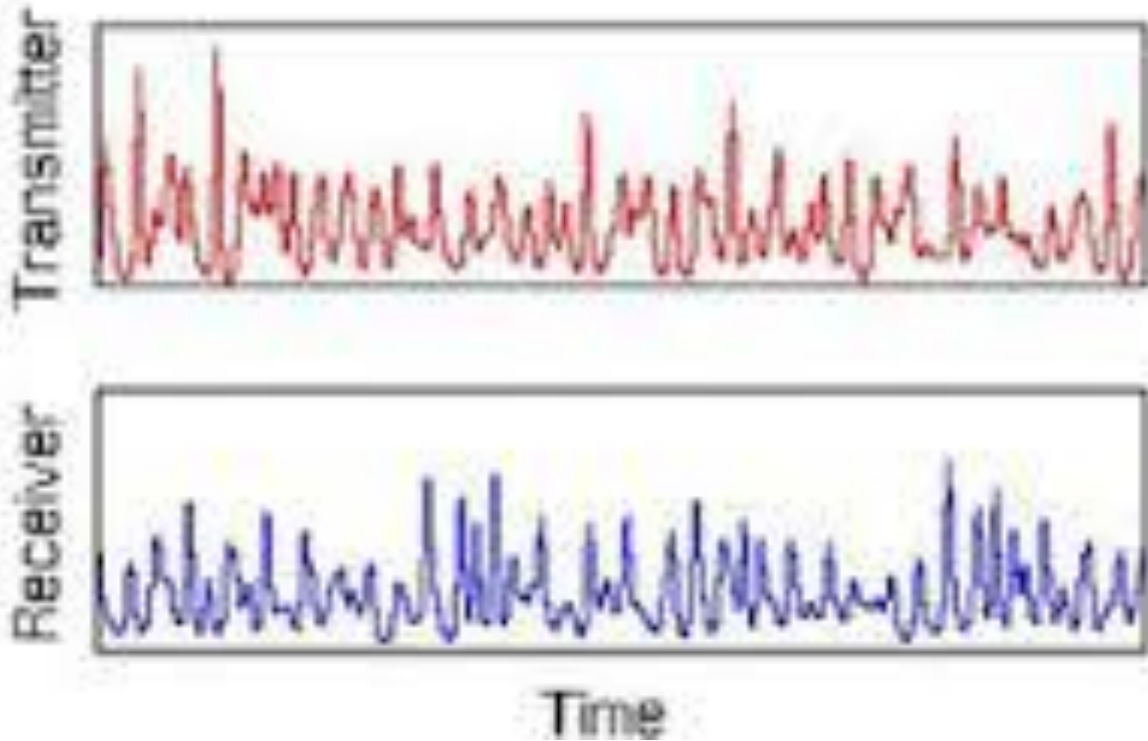
Zaba-theory: The periodicity of sunspots could be an externally synchronously triggered chaotic oscillatory process with a very long time constant relative to human aging. There will be no exact sequential repetition of occurrences.

There is an originally Oulu-based mathematical theory that the solar cycle is mainly modulated by the gravitational forces of the big planets (Saturn/Jupiter). On the other hand the gravitational force at distance is very low (one trillionth of local).

Physical processes in the flux-transport dynamo that simulates and predicts solar cycles



Time-plots of a chaotic oscillator (resemblance of a solar maximum sequence)



Advisory for the DX-er

Carpe Diem DX-ing

1. Don't wait for the best conditions or for past conditions to repeat: you may have to exercise 10000 years of patience, maybe more....
2. Expand your menu: operate 50/70 MHz Es, if 1.8 MHz is not carrying your signal. There is always some interesting part in the spectrum

And thanks for your attention,

CCF-members and visitors!

Stockholm, 31.1.2015

Happy DX-ing in 2015!

"Zaba" OH1ZAA/mm