

## **Press release**

### **When did Solar Cycle 25 start?**

Patrick Geryl and Jan Alvestad developed a new theory (A Formula For the Start of a New Sunspot Cycle) to calculate the start of a new sunspot cycle: the paper will be published in *Astrophysics and Space Science*. Determining the start of a solar cycle is one of the most followed questions in astrophysics because it may be important to professionals like astronauts, astrophysicists, engineers responsible for protecting the power grid, etcetera.

The latest NASA prediction panel considers April 2020 as likely to become the starting month of the new cycle. The authors disagree and point to October 2019 as a central point to calculate the start. Why? Since 1947 a radio telescope in Canada has been measuring solar flux. The authors found something peculiar: in most of the previous 6 cycle transitions, the lowest daily solar flux values were near 64. The new solar cycle started a few months before or after these clusters of minimum values. In October 2019 there was another cluster of measurements below 66. A preliminary conclusion was that Cycle 25 was going to start between August 2019 and January 2020.

Co-author Jan Alvestad has a widely followed website *Solar Terrestrial Activity Report* and maintains high resolution sunspot counts based on images from the SDO NASA spacecraft. If you look (indirectly) at the Sun with telescopes, most days will be spotless near solar minimum, and those spots that can be observed are small and usually disappear quickly. However, there are plenty of tiny spots in high resolution images. For instance when other observers using traditional resolution telescopes see 1 sunspot at minimum, Jan Alvestad observes and documents 4-6 times more at the highest image resolution. This gives a new perspective on the 300 year old method of counting sunspots.

Meanwhile the authors found more markers (under review) and their latest calculations point to November-December 2019, and especially December 2019 as the likely start of Solar Cycle 25.

Shortly after the authors found that Solar Cycle 25 started in November or December 2019, they discovered something that at first seemed hard to believe. Using 365 days smoothing, 4 out of 5 of the data series available all had the solar minimum on the same day. The NOAA sunspot number, solar flux at 1 AU as well as both the STAR 1K and 2K high resolution sunspot numbers all had their lowest value on November 17, 2019. They sent a paper on this discovery for peer review knowing it would not be published before the official announcement of the start of Solar Cycle 25. Anyway, co-author Jan Alvestad added this important information to the STAR web site in June 2020. The pre-print was published on ResearchGate as the last in a trilogy of papers that could change how we determine when a new solar cycle begins.

Contact information

Patrick Geryl

Email: [Patrick.geryl@skynet.be](mailto:Patrick.geryl@skynet.be)

Tel: 0032489633931 No affiliation

DOI: 10.1007/s10509-020-03800-x

For high resolution sunspot calculations

Jan Alvestad

[Jan@solen.info](mailto:Jan@solen.info)