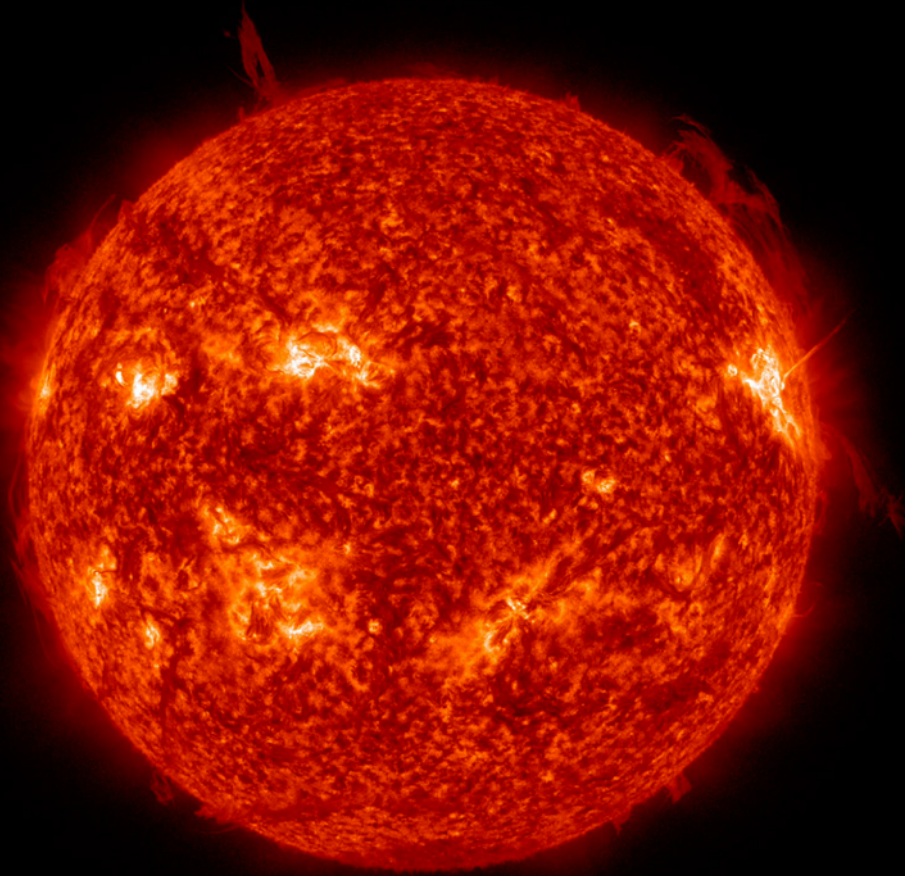


# SUN & SOLAR ACTIVITY

# THE SUN, OUR STAR



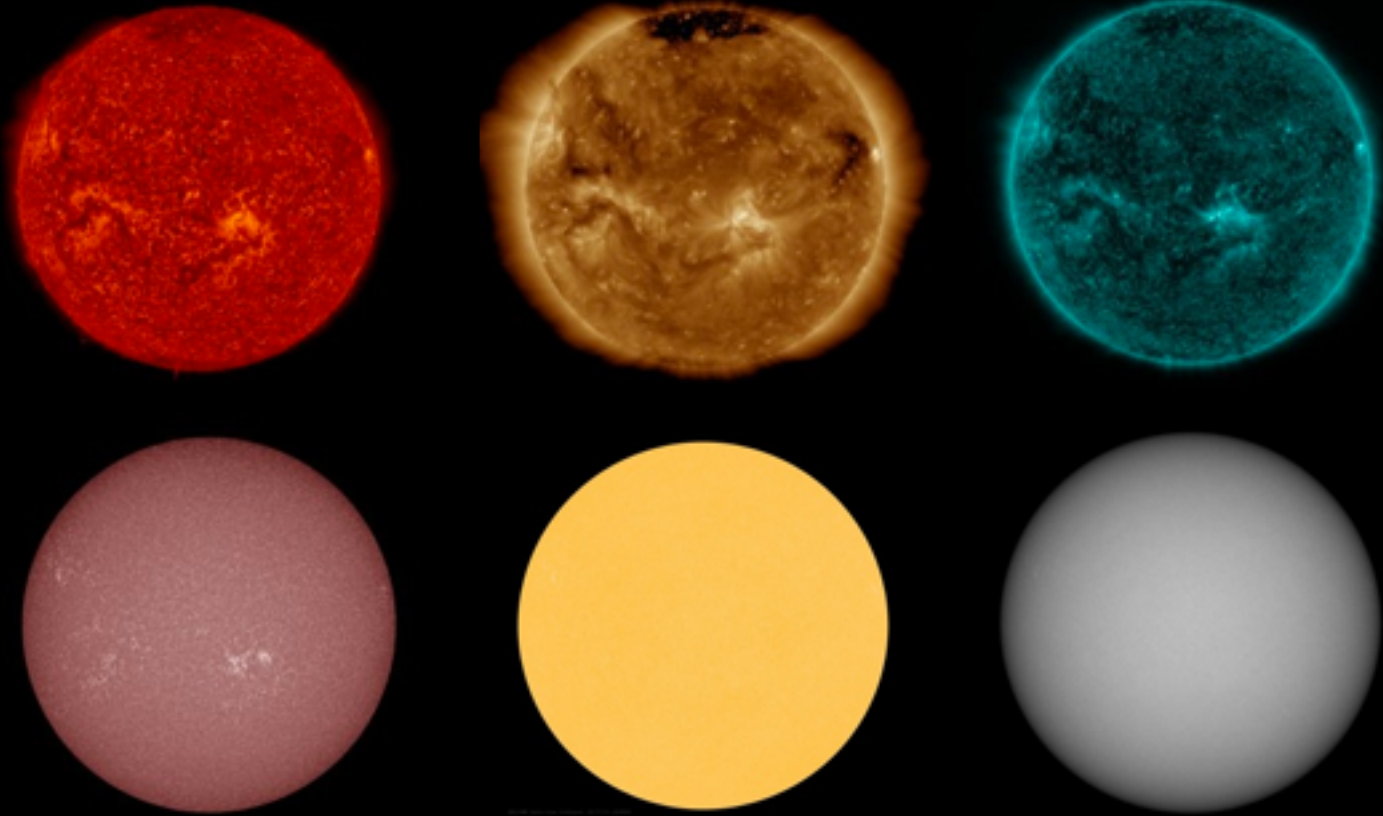
The Sun is a relatively average star: not the biggest, not the smallest.

Surface temperature: 5500 °C

Core temperature: 15,000,000 °C

The heat comes from the nuclear fusion in its core: hydrogen atoms are combining to create helium atoms. This emits a lot of energy ( $E=mc^2$ ).

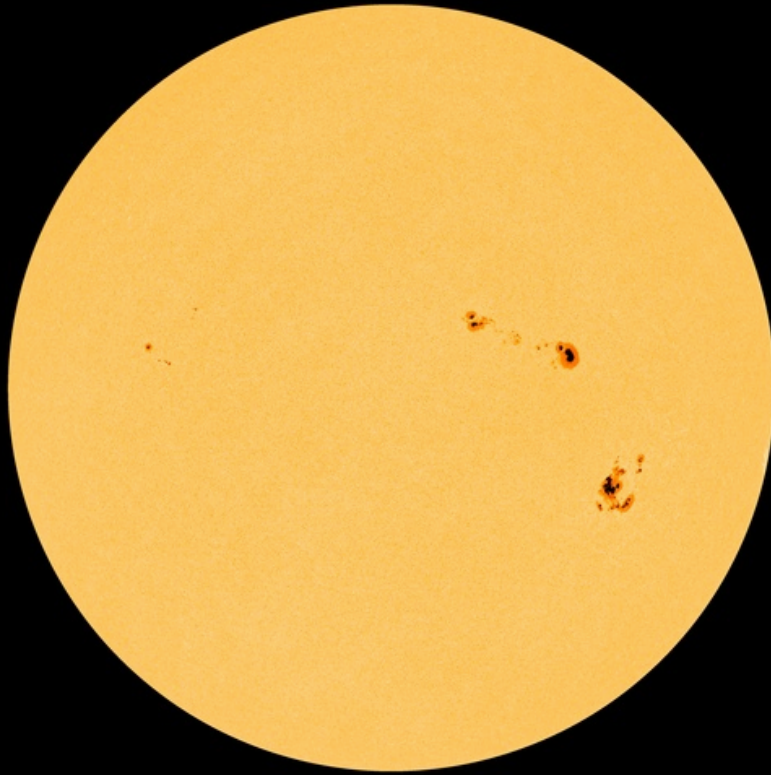
# WHAT DOES THE SURFACE OF THE SUN LOOK LIKE?



What is the real colour of the Sun?

The Sun would look white from space, but its luminosity peak is in the green part of the spectrum!

# SUNSPOTS



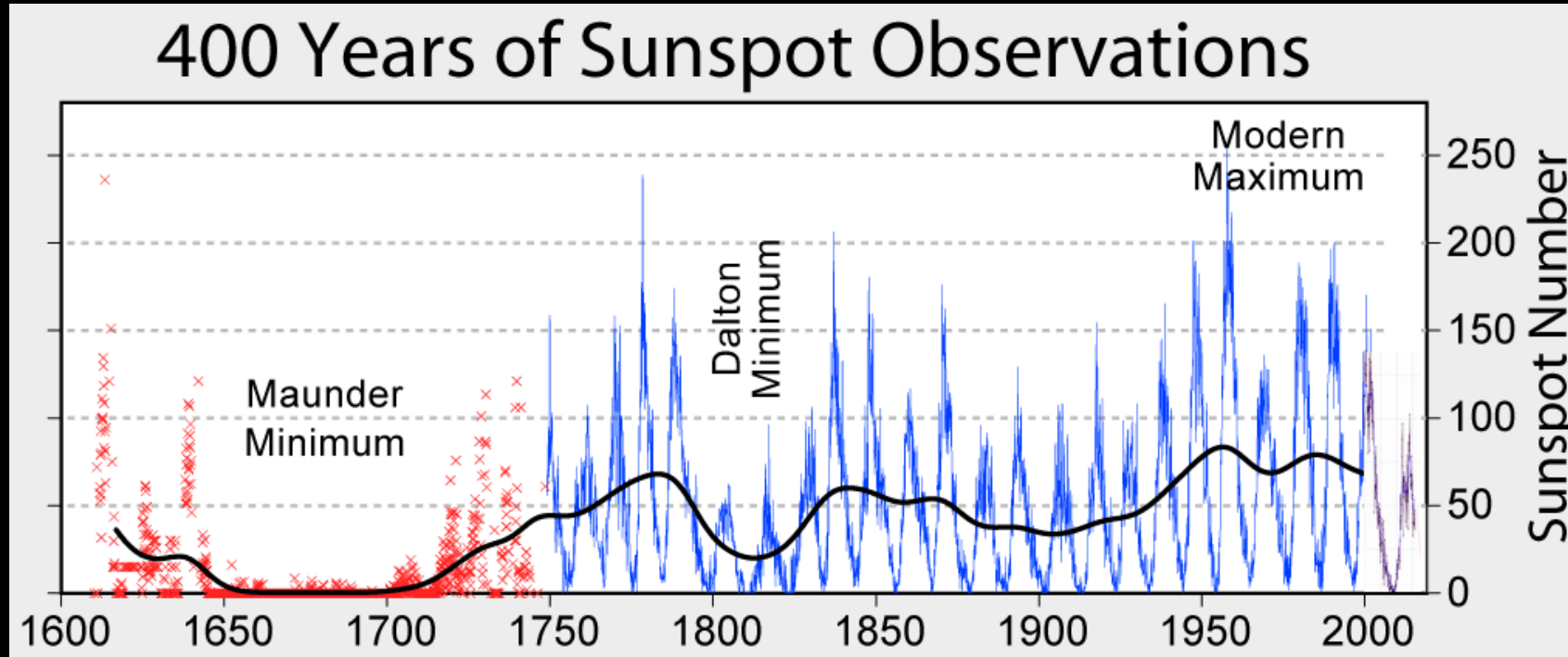
30/988 Quick-Look Continuum 20170906\_130000

In visible light, we can see sunspots.

The number of sunspots varies with time.



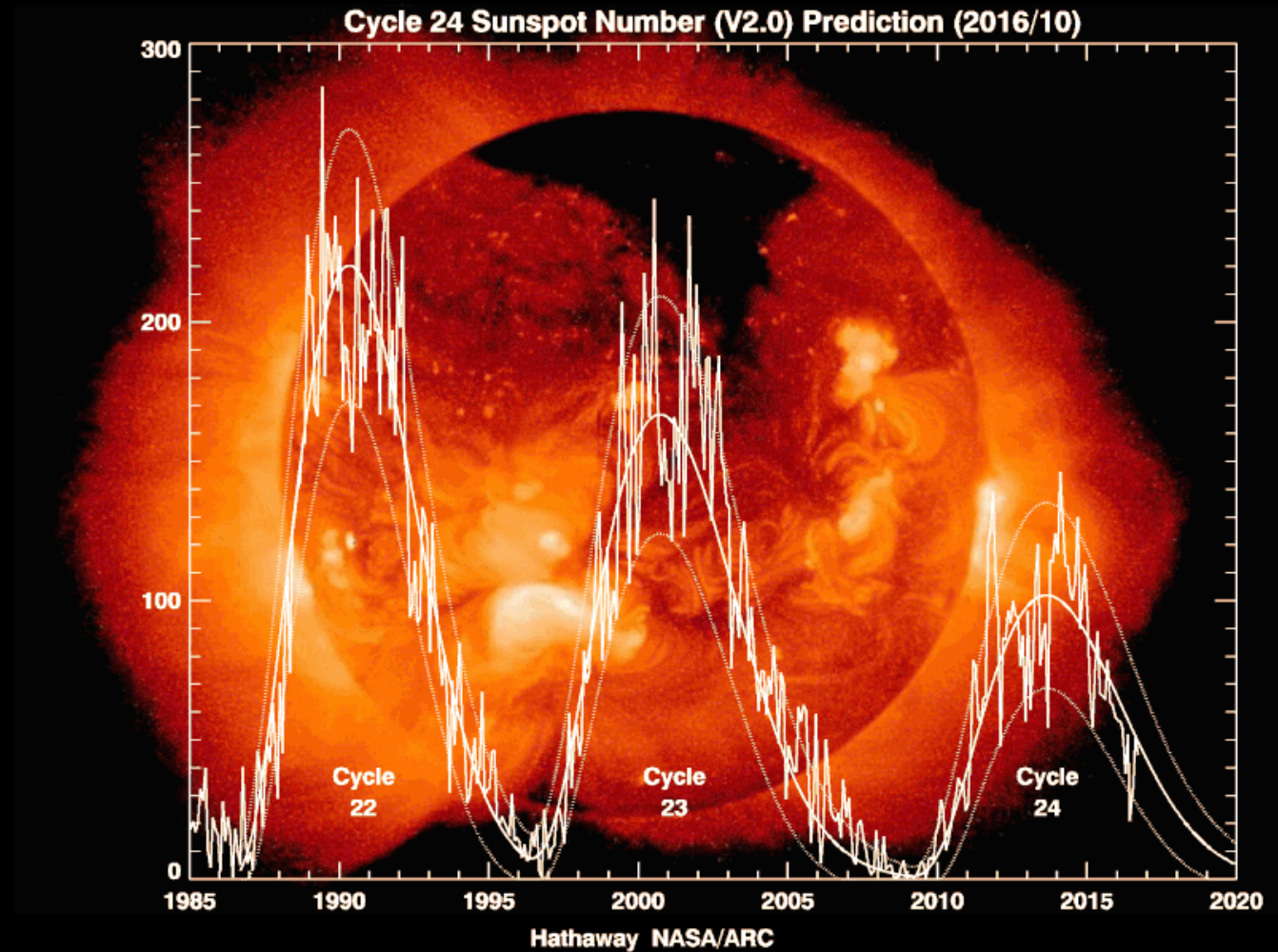
# SOLAR CYCLE



Solar activity varies with a 11-year cycle.

# SOLAR CYCLE

The solar activity should intensify in the coming years.

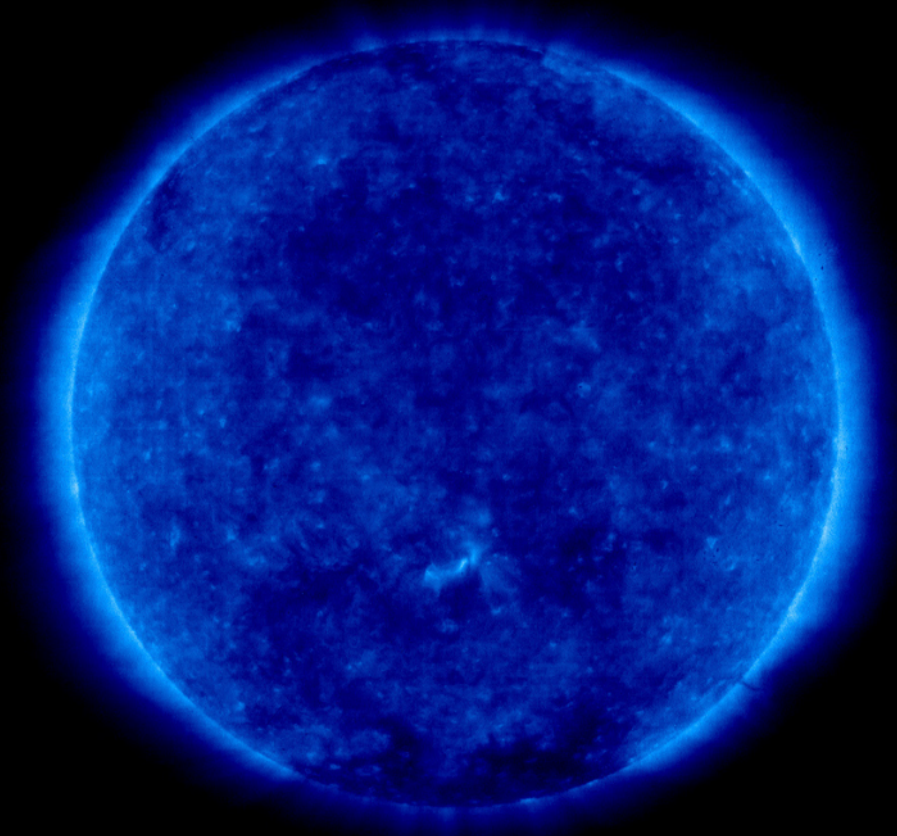


Credit: David Hathaway/NASA

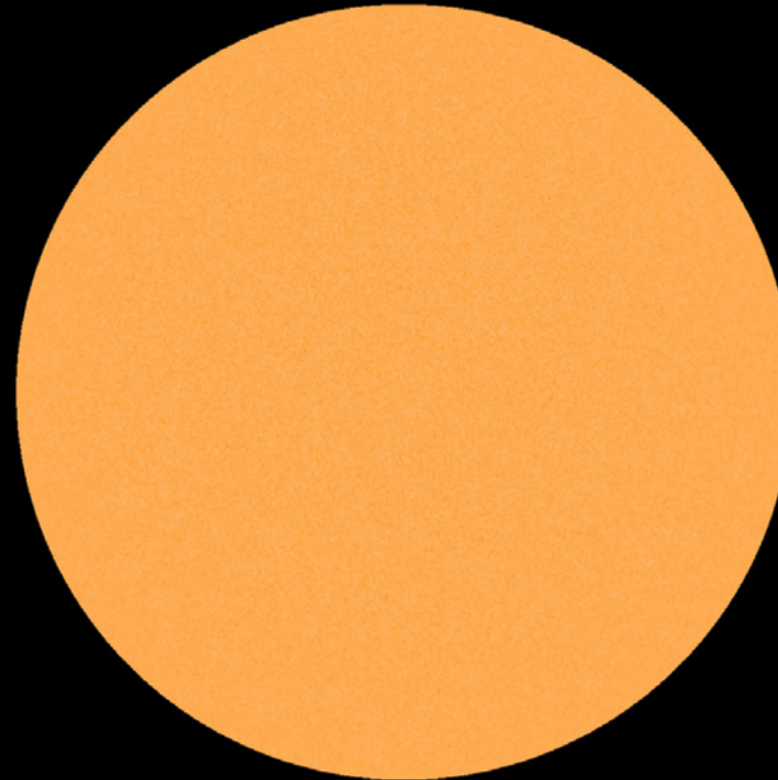
<https://solarscience.msfc.nasa.gov/images/Cycle22Cycle23Cycle24big.gif>

# SOLAR MINIMUM

(inactive period)



ultraviolet

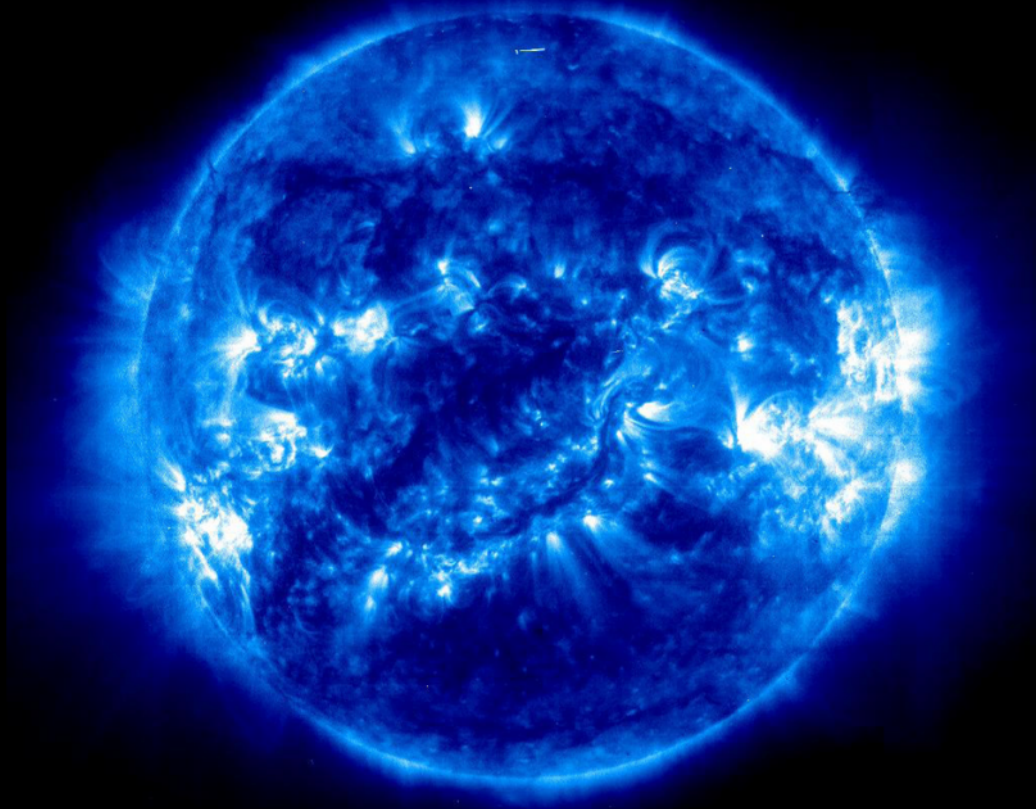


visible light

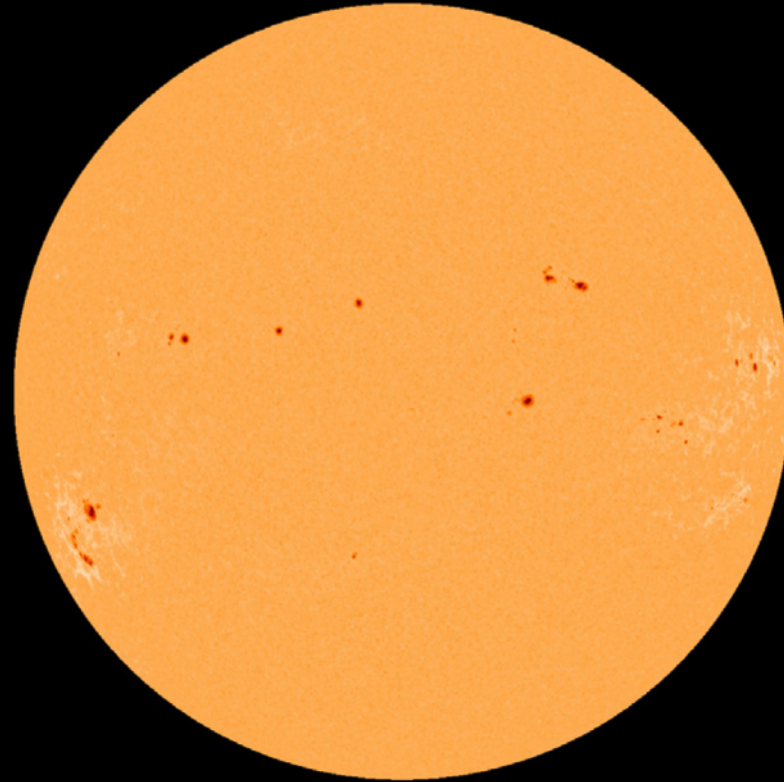


# SOLAR MAXIMUM

(active period)

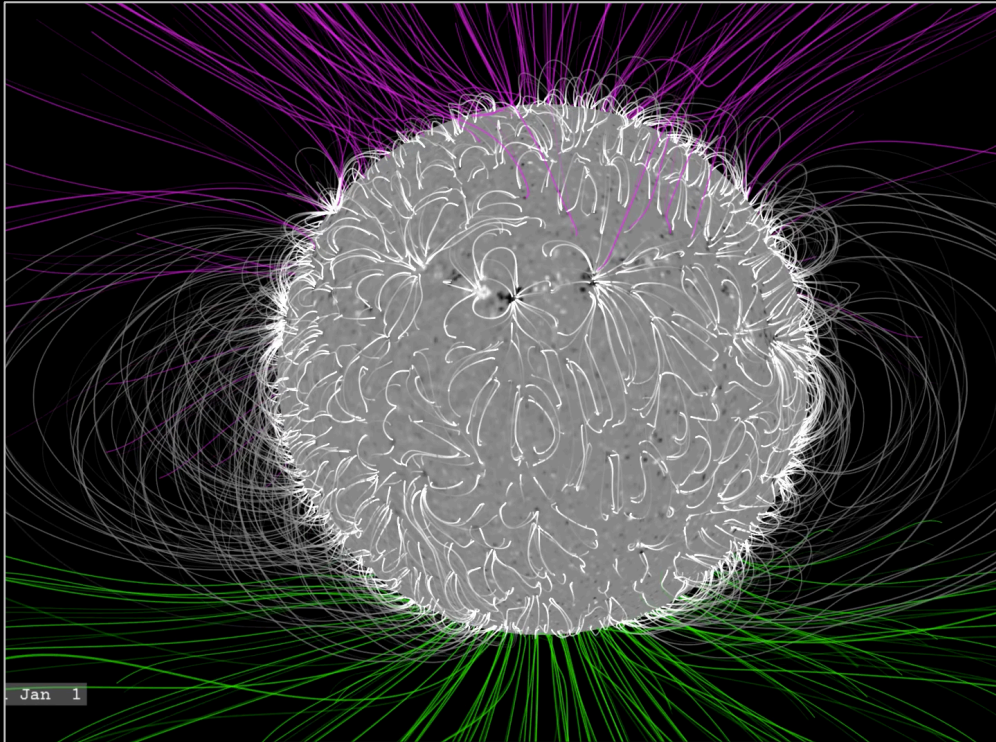


ultraviolet

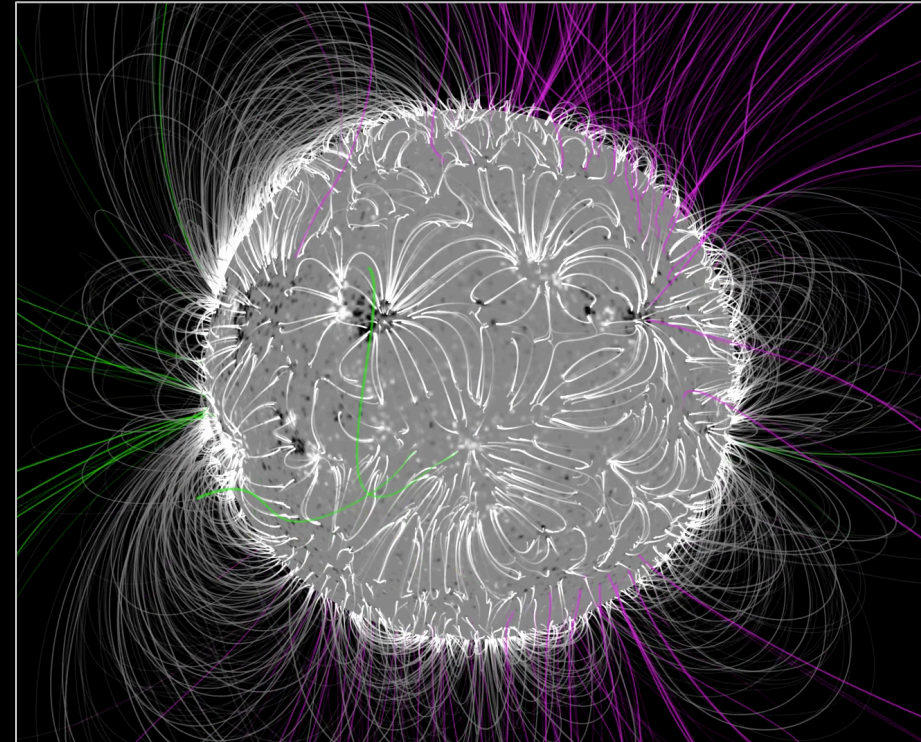


visible light

# MAGNETIC FIELD OF THE SUN



"Simple" magnetic field during solar minimum

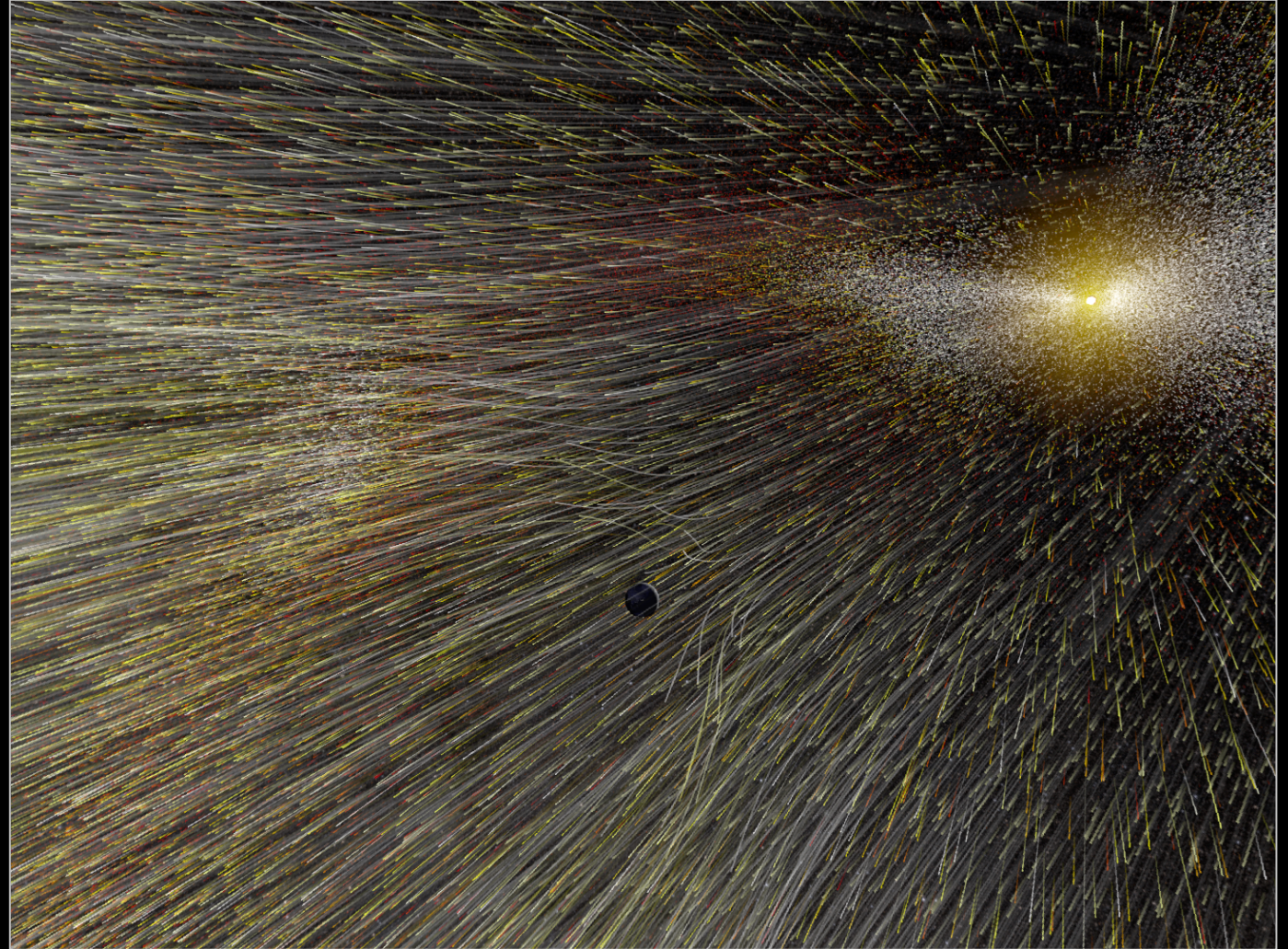


Tangled magnetic field during solar maximum



# SOLAR WIND

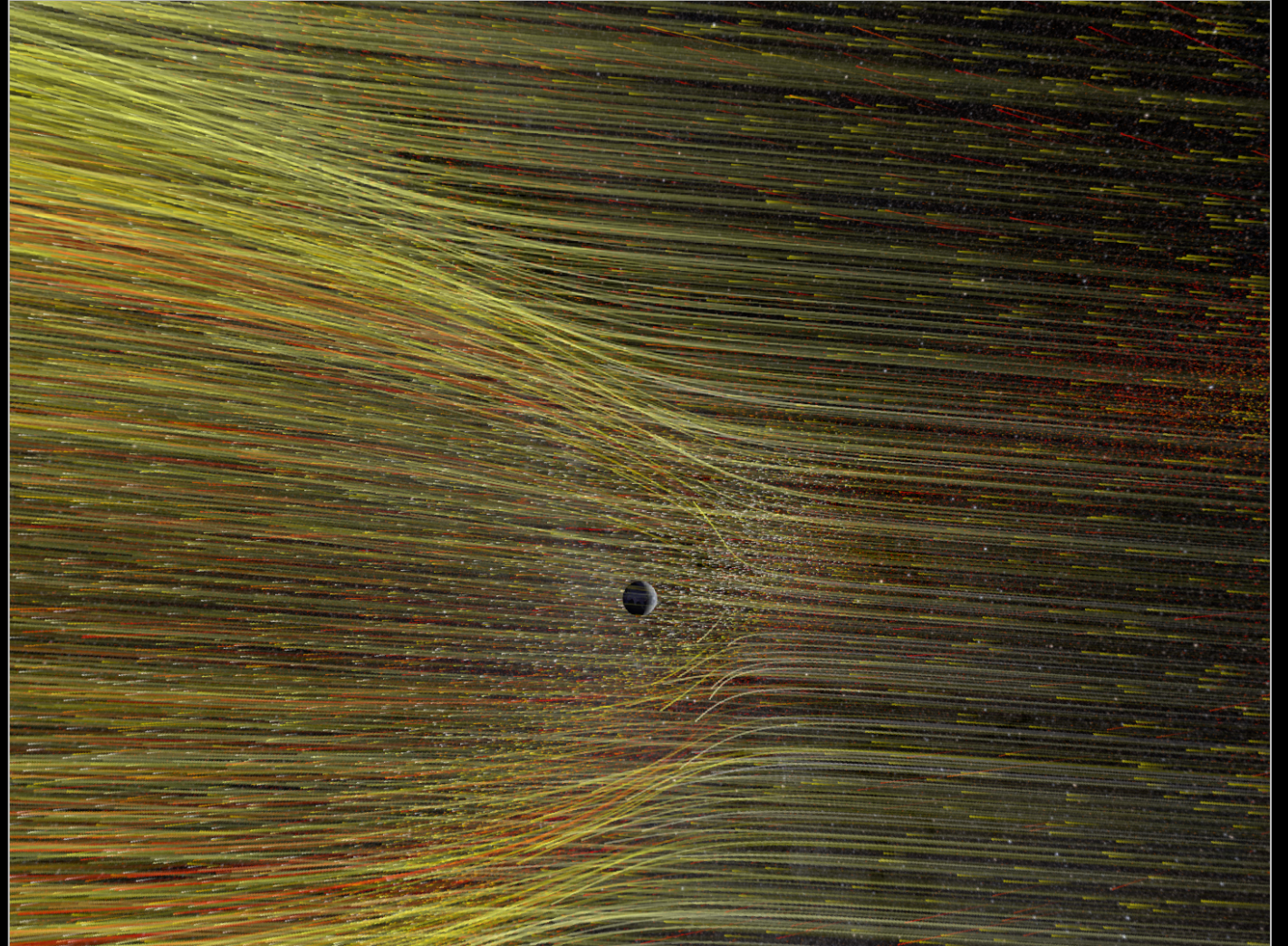
The Sun emits a constant stream of particles. The solar wind becomes more intense when the Sun is more active (solar maximum).





# SOLAR WIND

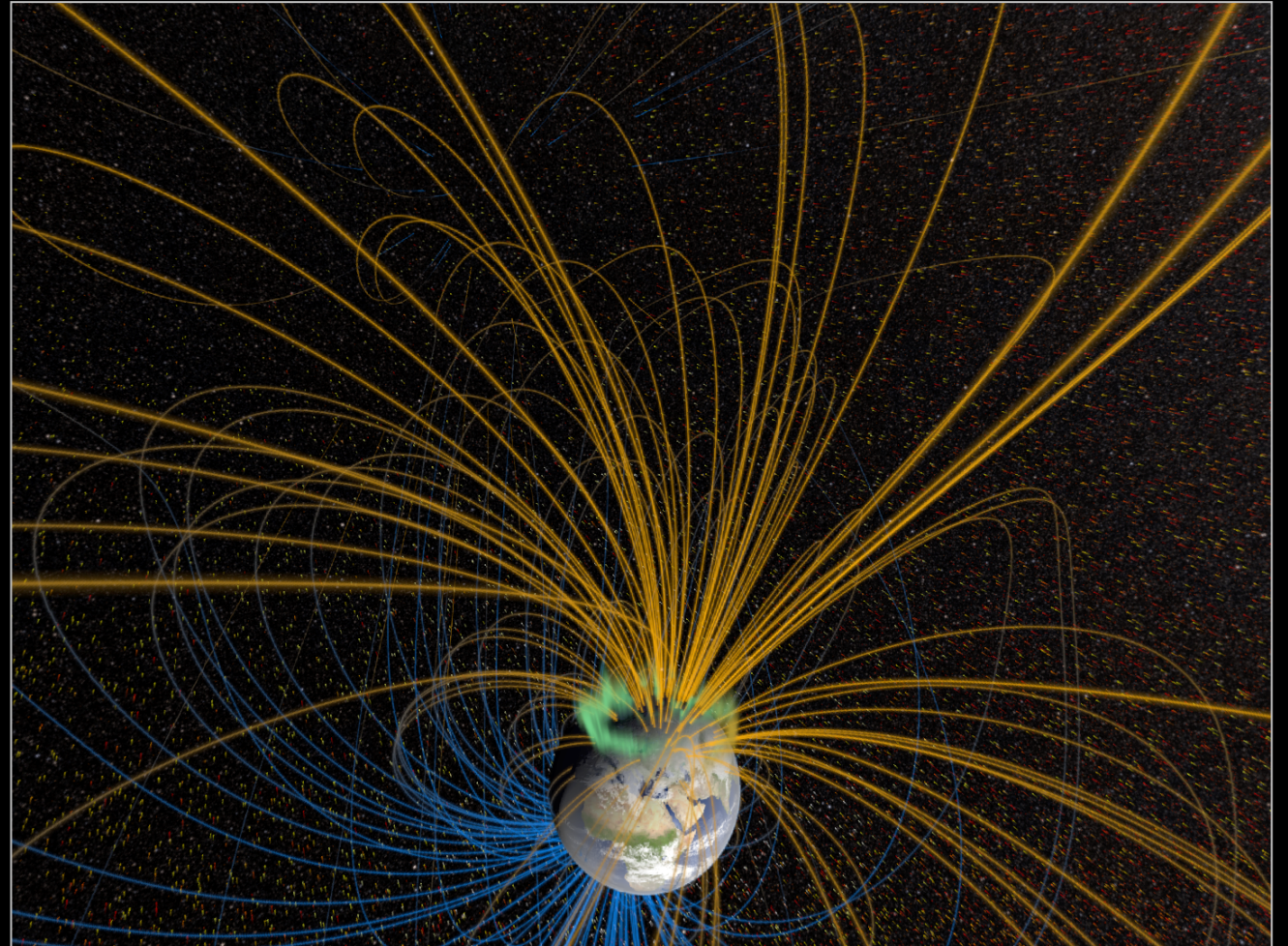
The Earth's magnetic field acts like a shield and protects us from the solar wind.





# NORTHERN LIGHTS

At the poles, the solar wind can reach lower in the atmosphere and it makes the gases in our atmosphere glow, creating auroras (borealis and australis) or northern/southern lights.







Credit: U.S. Air Force

[https://commons.wikimedia.org/wiki/File:Polarlicht\\_2.jpg](https://commons.wikimedia.org/wiki/File:Polarlicht_2.jpg)





Credit: Dominique Lebrun

<https://www.facebook.com/watch/?v=2314563798800282>