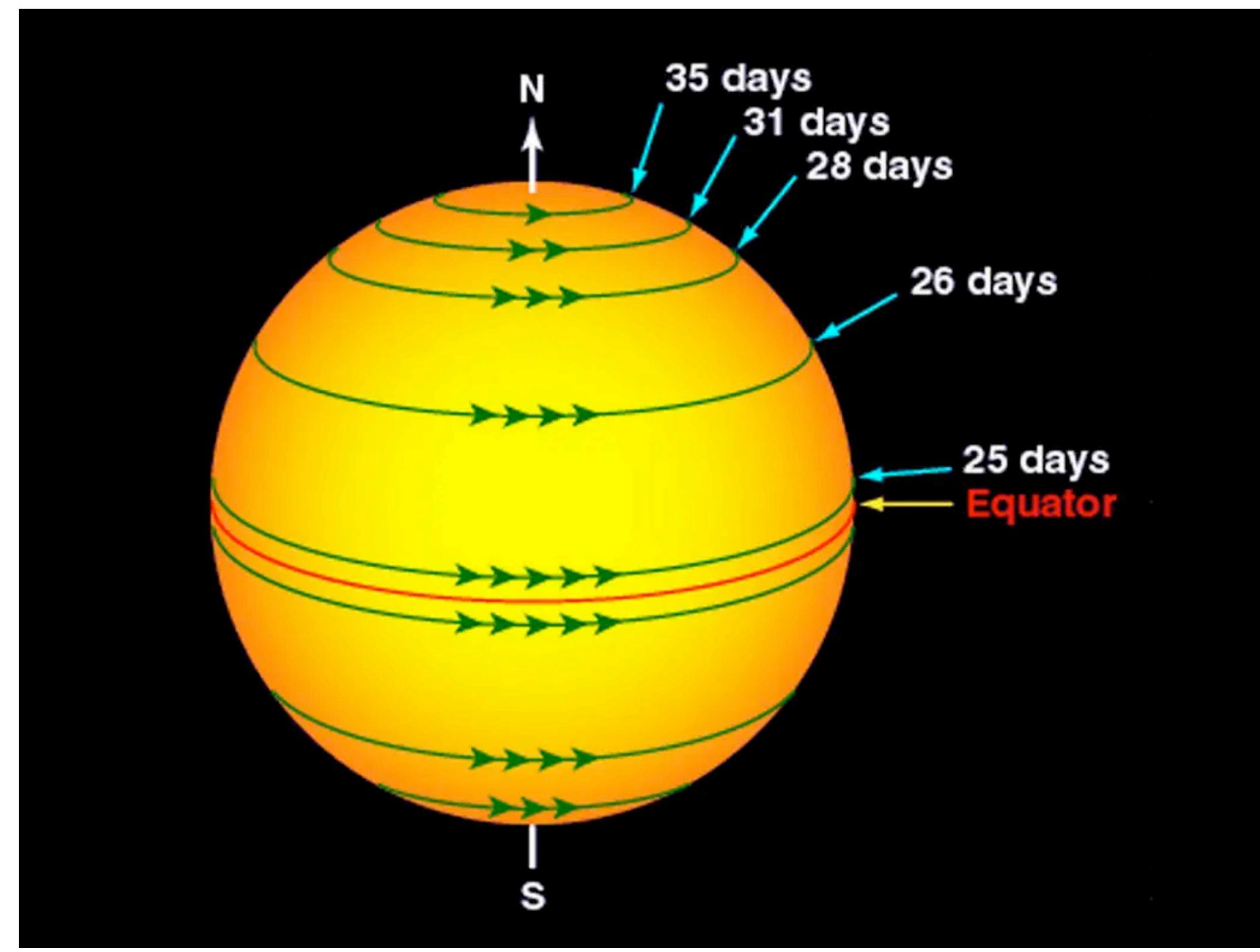
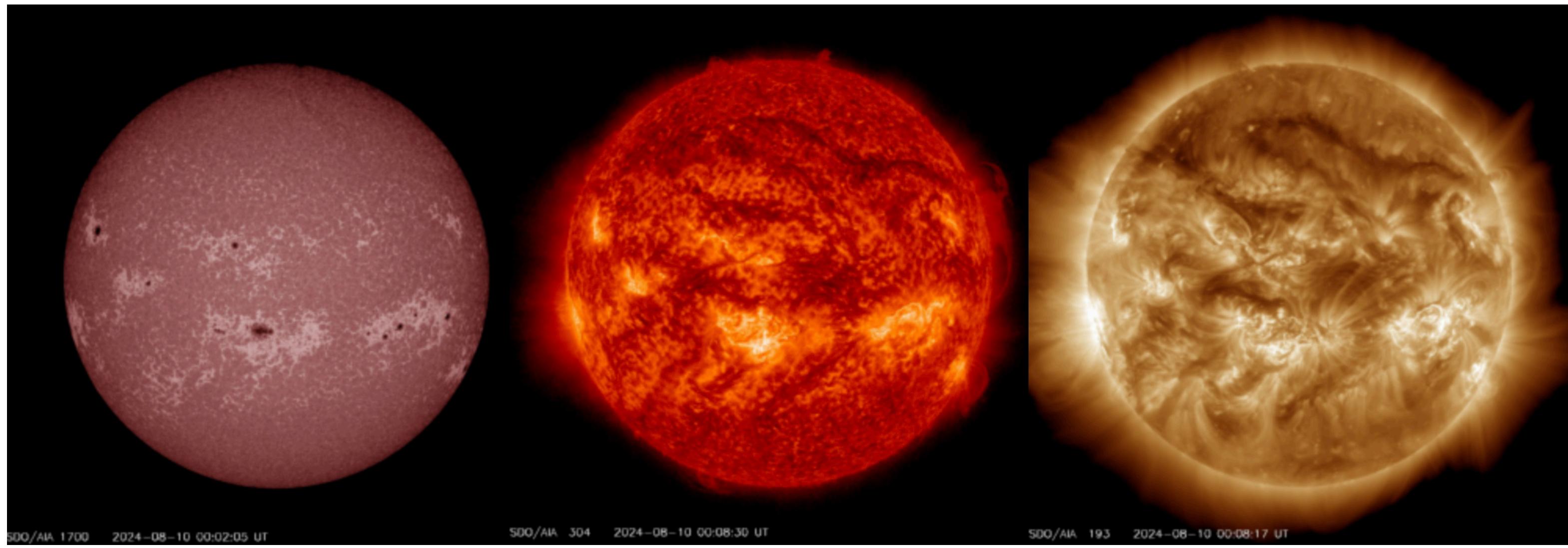
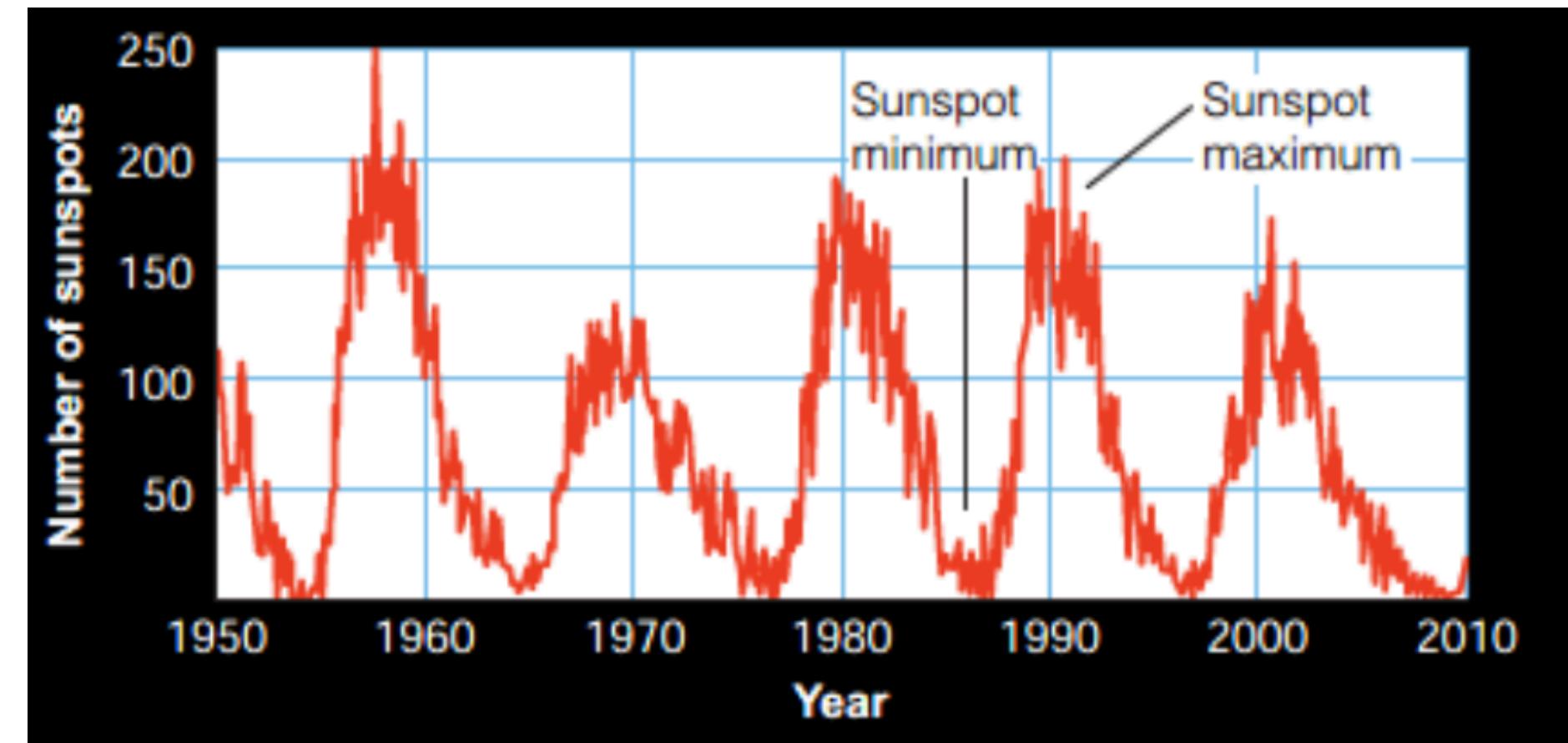

The Sun

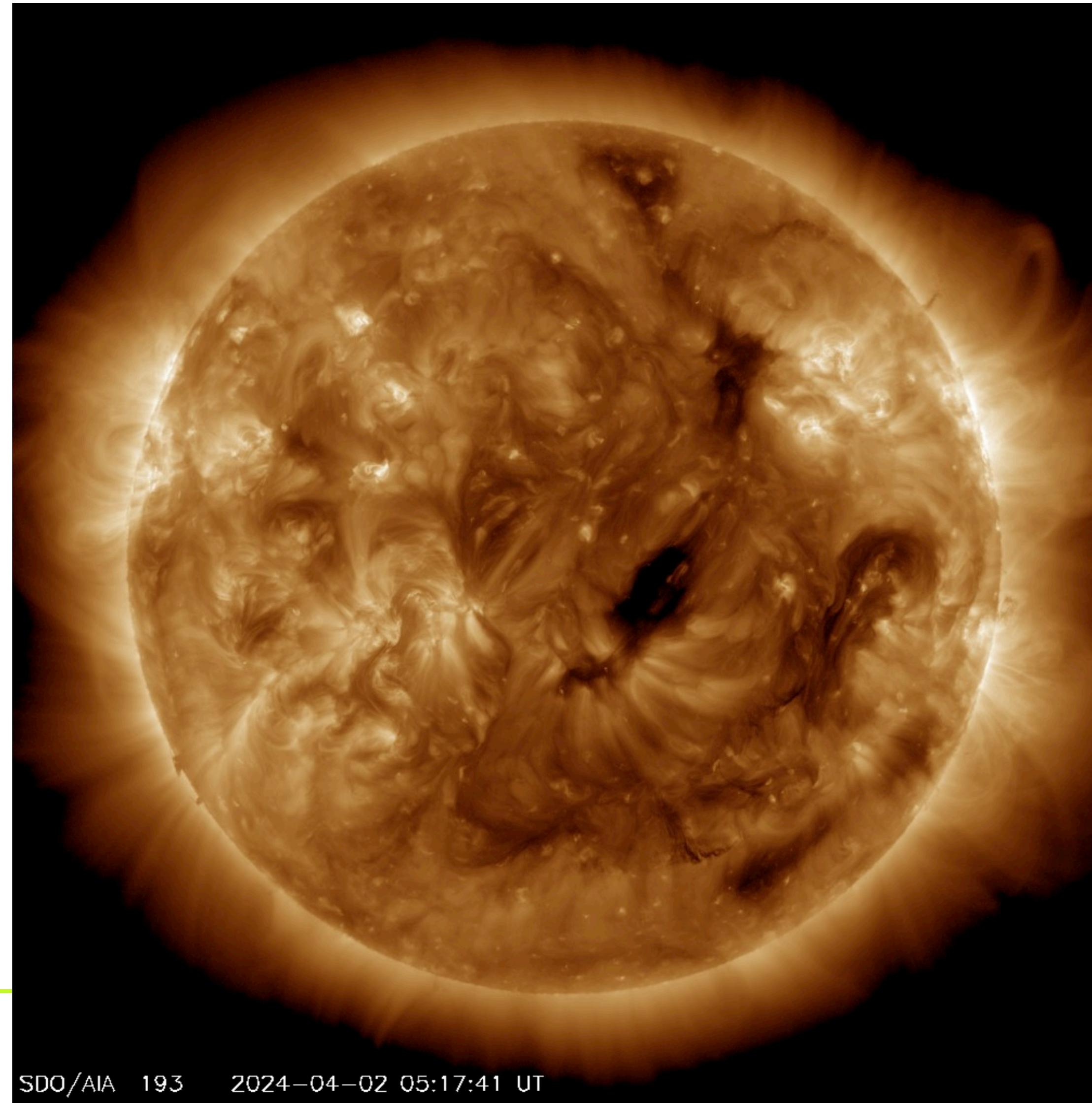
2025.04.01

Goal

- Understanding the sun based on the **multi-wavelength** and **time-domain observation**



What do you see?



SEUNGWU YOO, LAEL SHIN

SDO/AIA 193 2024-04-02 05:17:41 UT

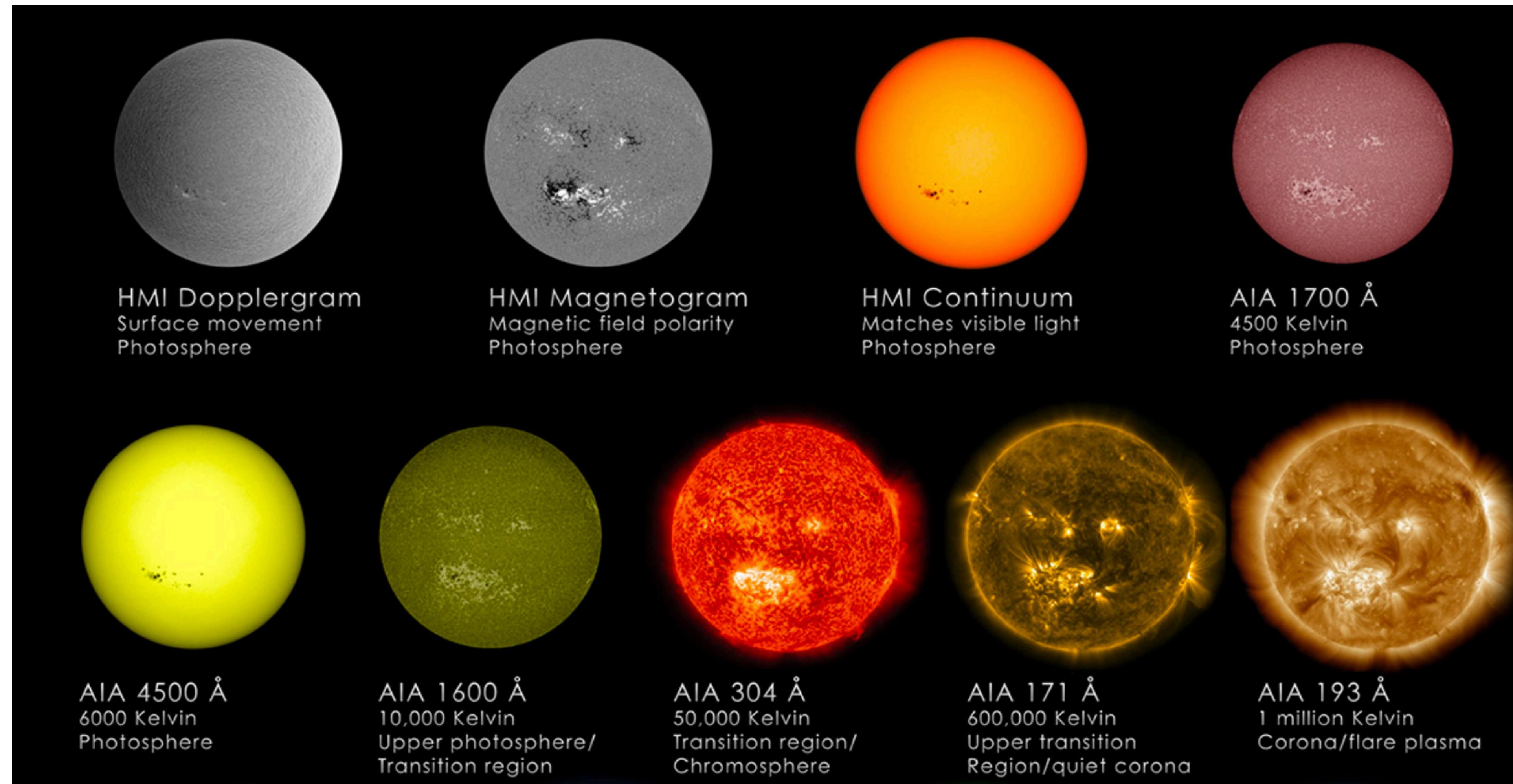
Cecilia Payne (1900~1979)



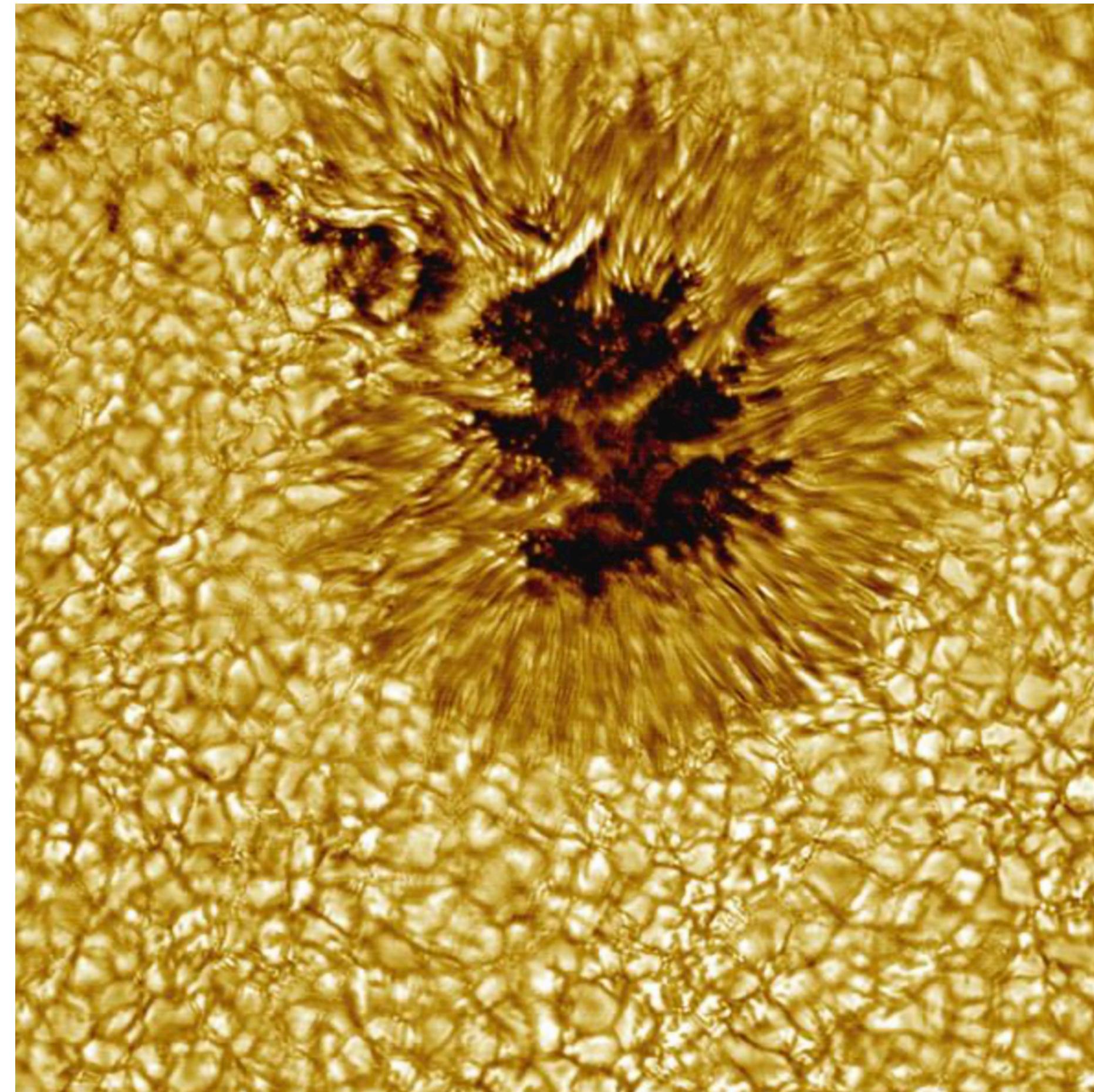
“The Sun is mainly composed of ionized hydrogen”

- Ionization at different temperature
- Composition of stars
- ‘Spurious’ PhD Thesis

What do you see?



Structure of the Sun



Photosphere (~ 6,000 K)

- The deepest observable surface of the Sun
- Sunspots and solar granules

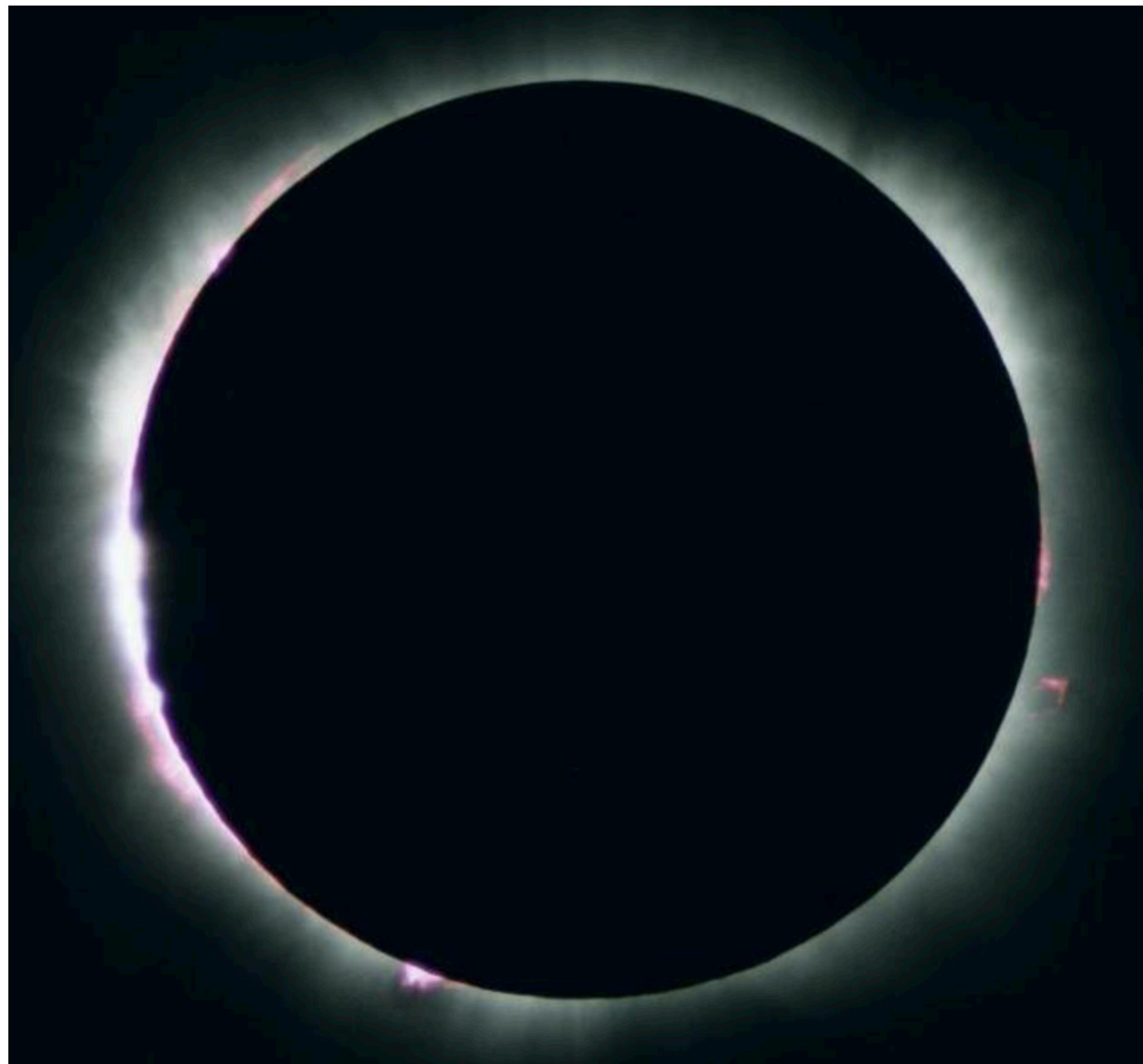
Structure of the Sun



Chromosphere (~ 10,000 K)

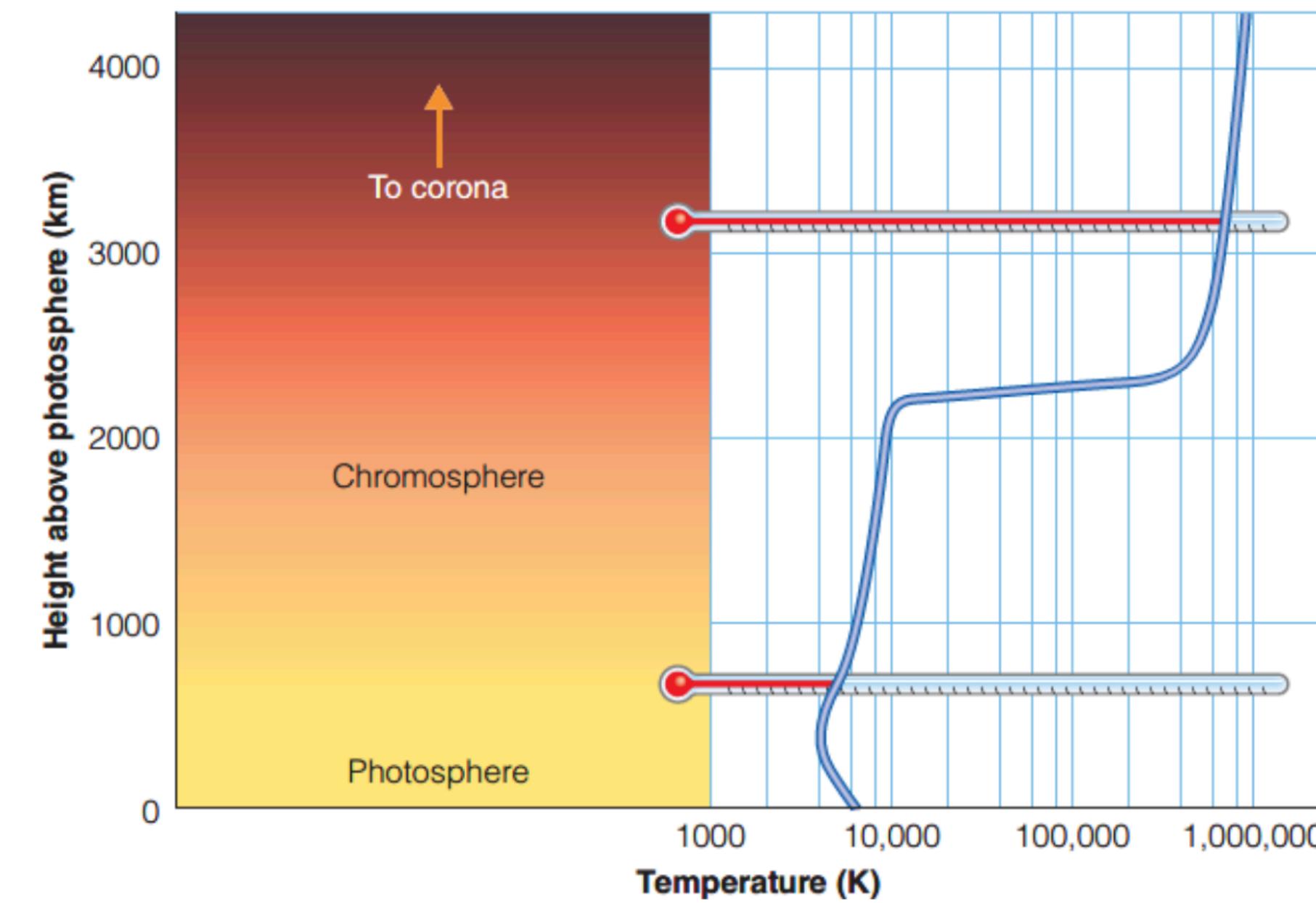
- Thin gas layer, hydrogen lines
- Solar prominence

Structure of the Sun

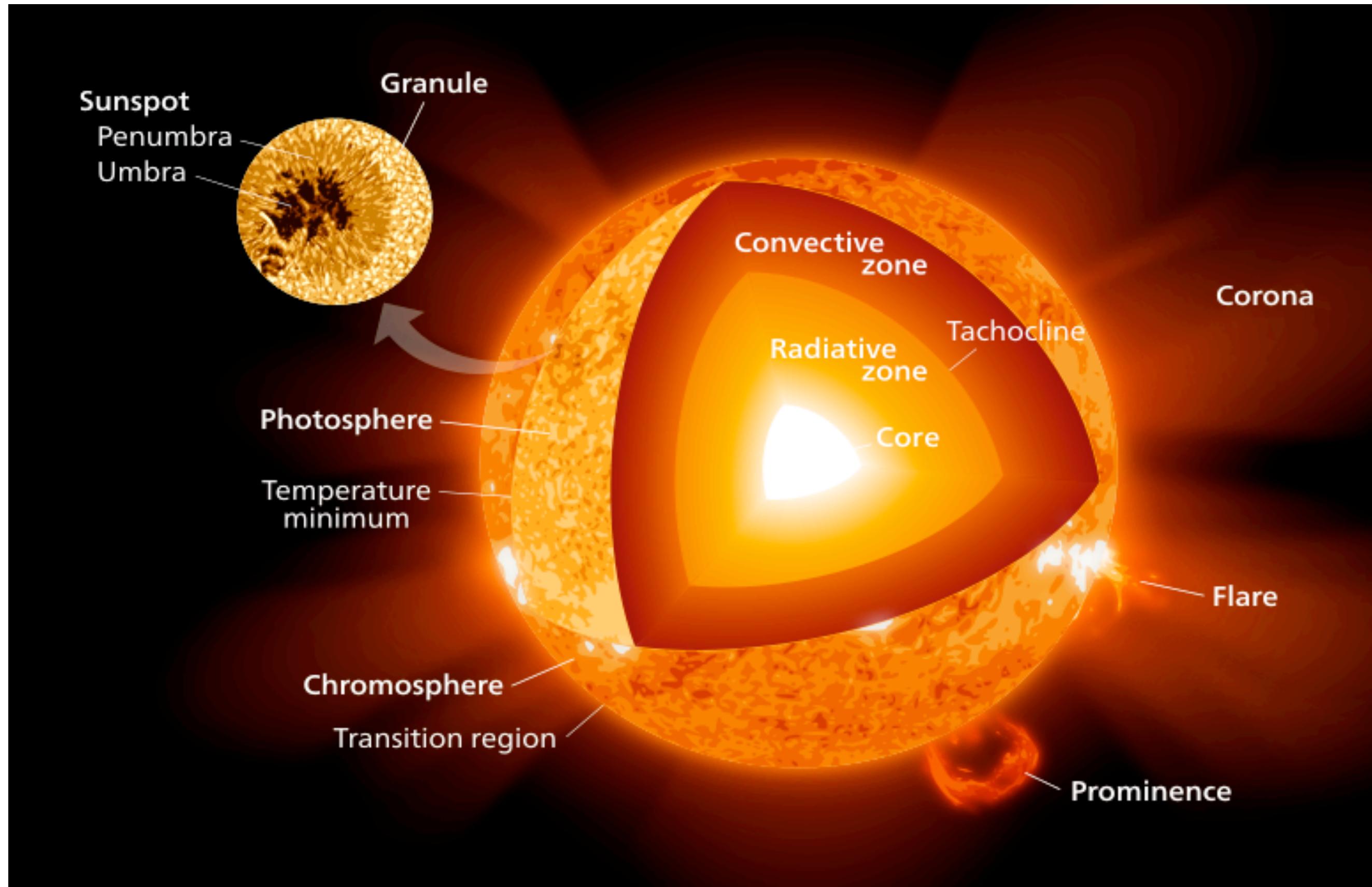


Corona ($> 10,000$ K)

- The upper-most gas layer
- Solar wind



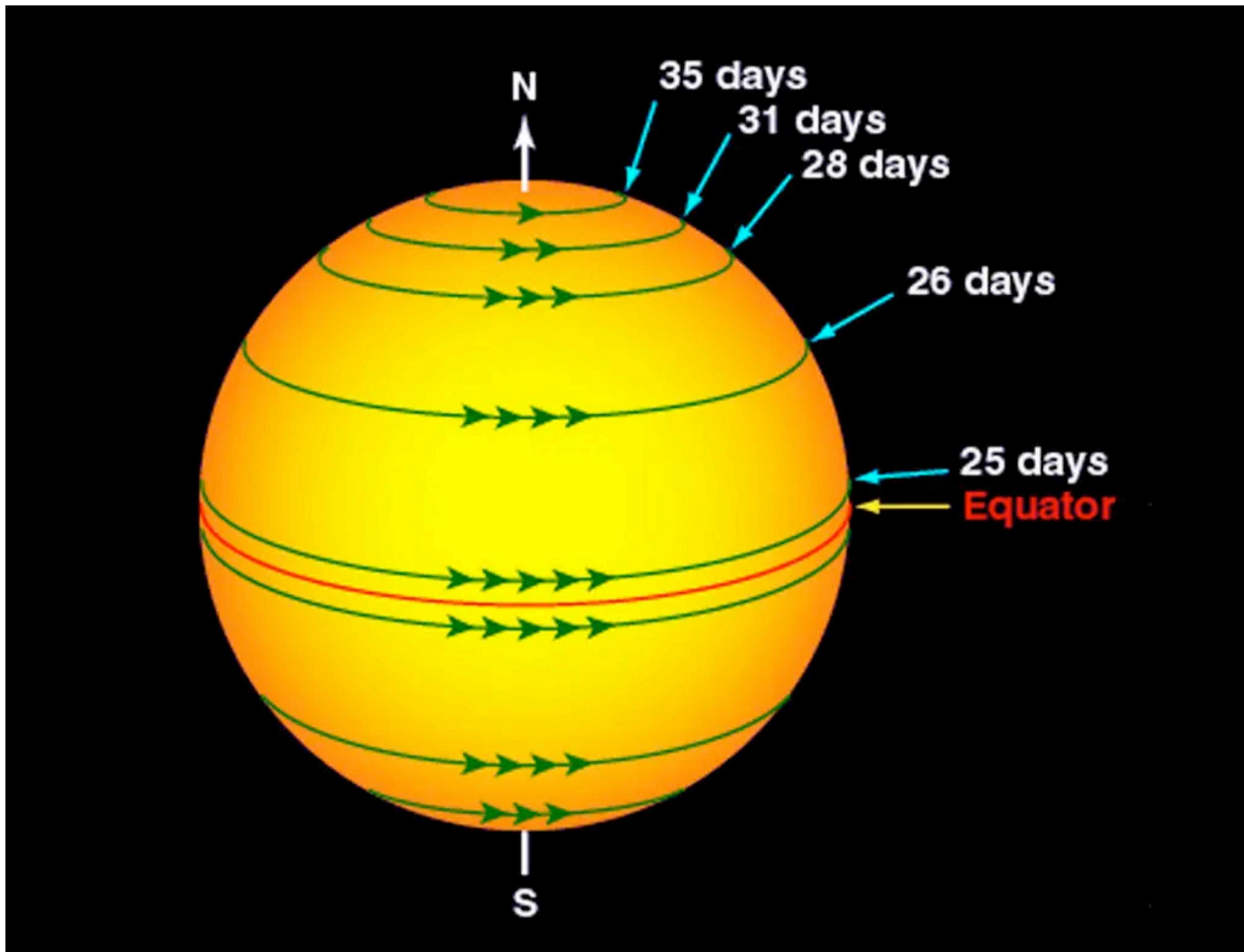
Structure of the Sun



Inner structure?

- Numerical simulations do the job

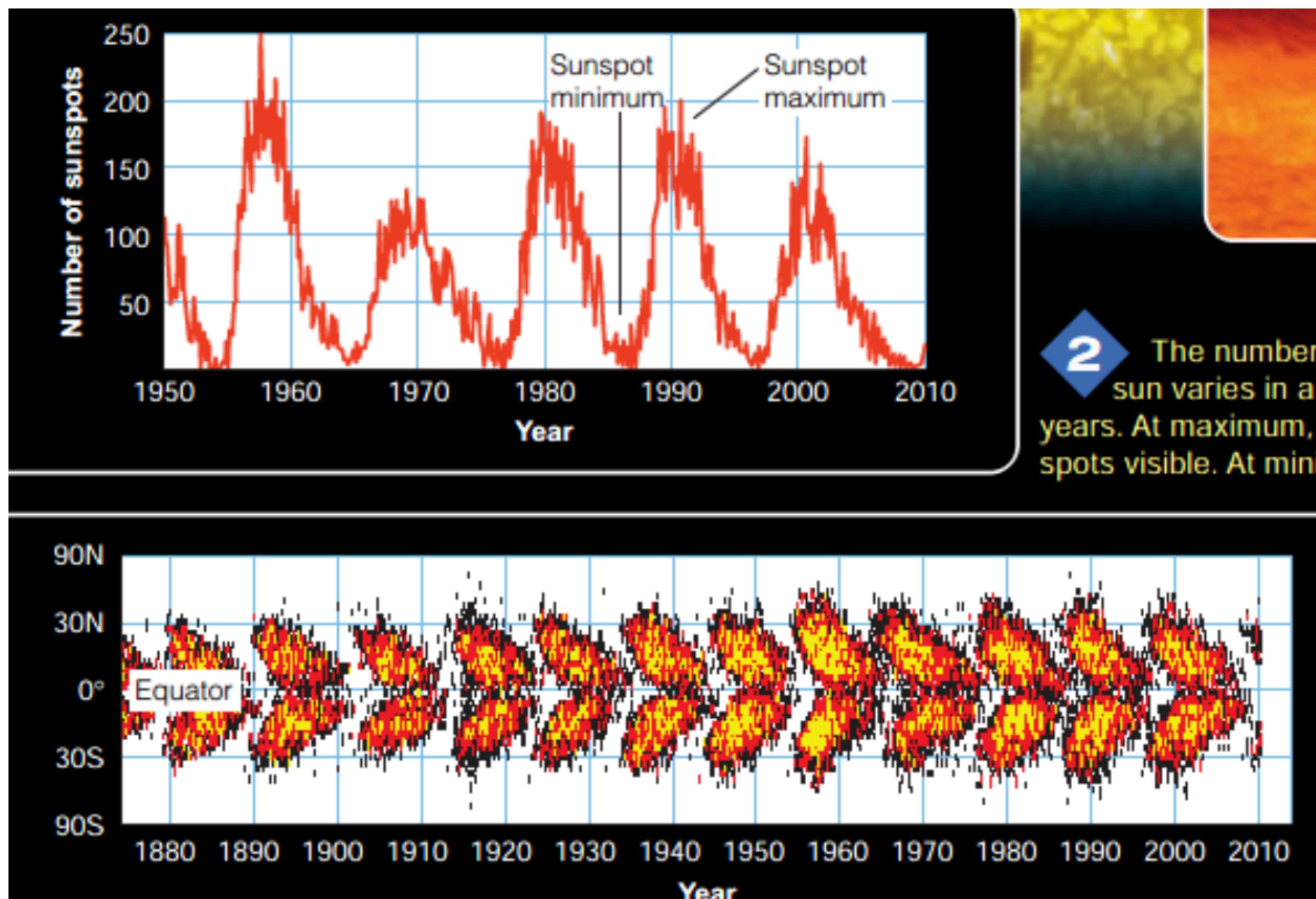
Rotation of the Sun



Differential rotation

- ~28 days periods

Solar Cycles

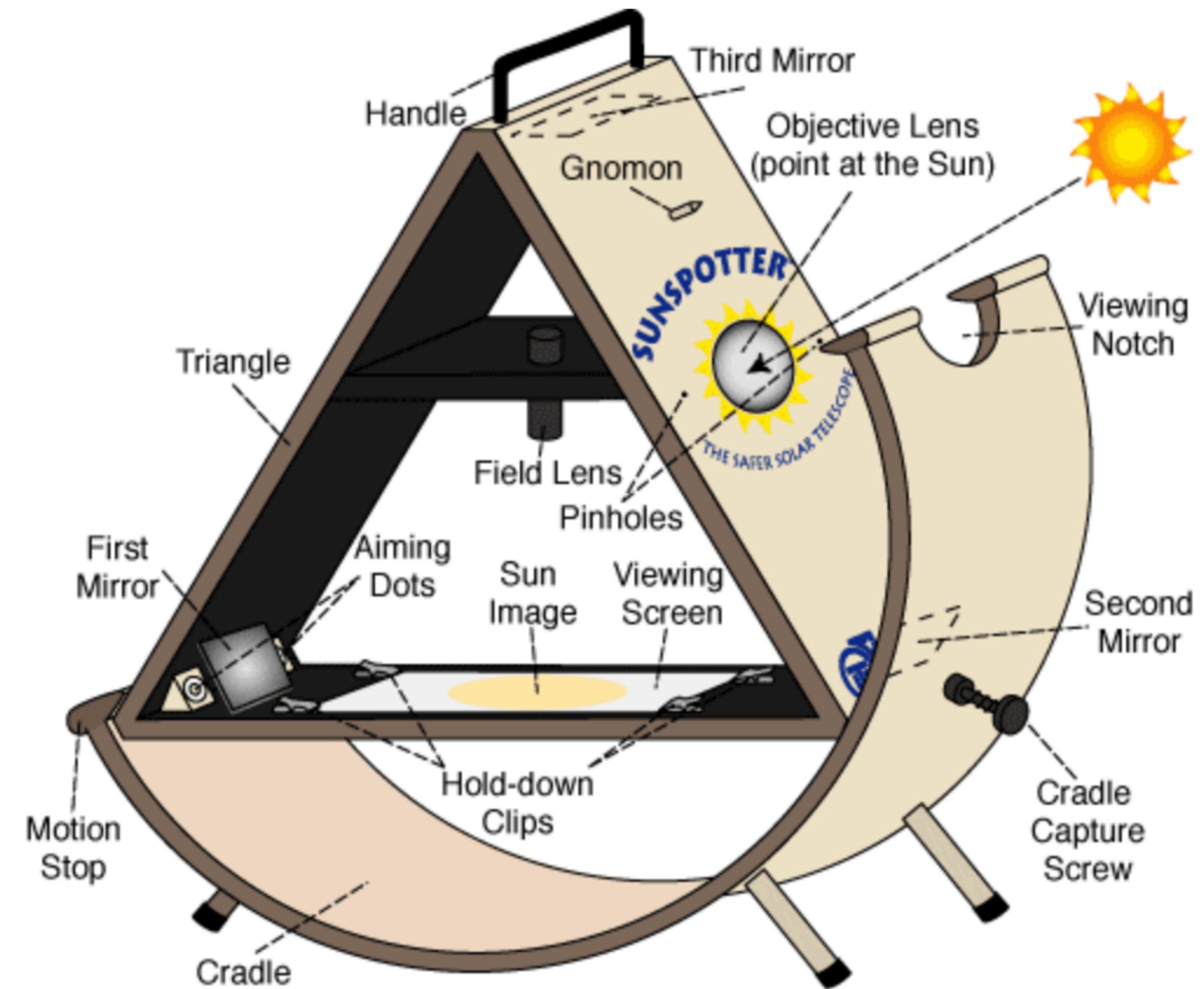


Magnetic Activity of the Sun

- Variation in the strength of the Solar activities
- ~ 11 years period

Practice

- The Period of the Solar Activity
- The Rotation of Sunspots
- Sunspotters



HW

- Please check the Jupyter notebook file ‘The_sun.ipynb’
- **Measure The Period of the Solar Activity**
 - How can you reliably measure the solar cycle period?
- **Measure The Rotation of Sunspots**
 - Please measure the rotation period of sunspots with **different latitudes.**

Reference

- sdo.gsfc.nasa.gov
- https://en.wikipedia.org/wiki/Spherical_coordinate_system
- www.spaceweather.com
- <https://www.sidc.be/SILSO/datafiles>