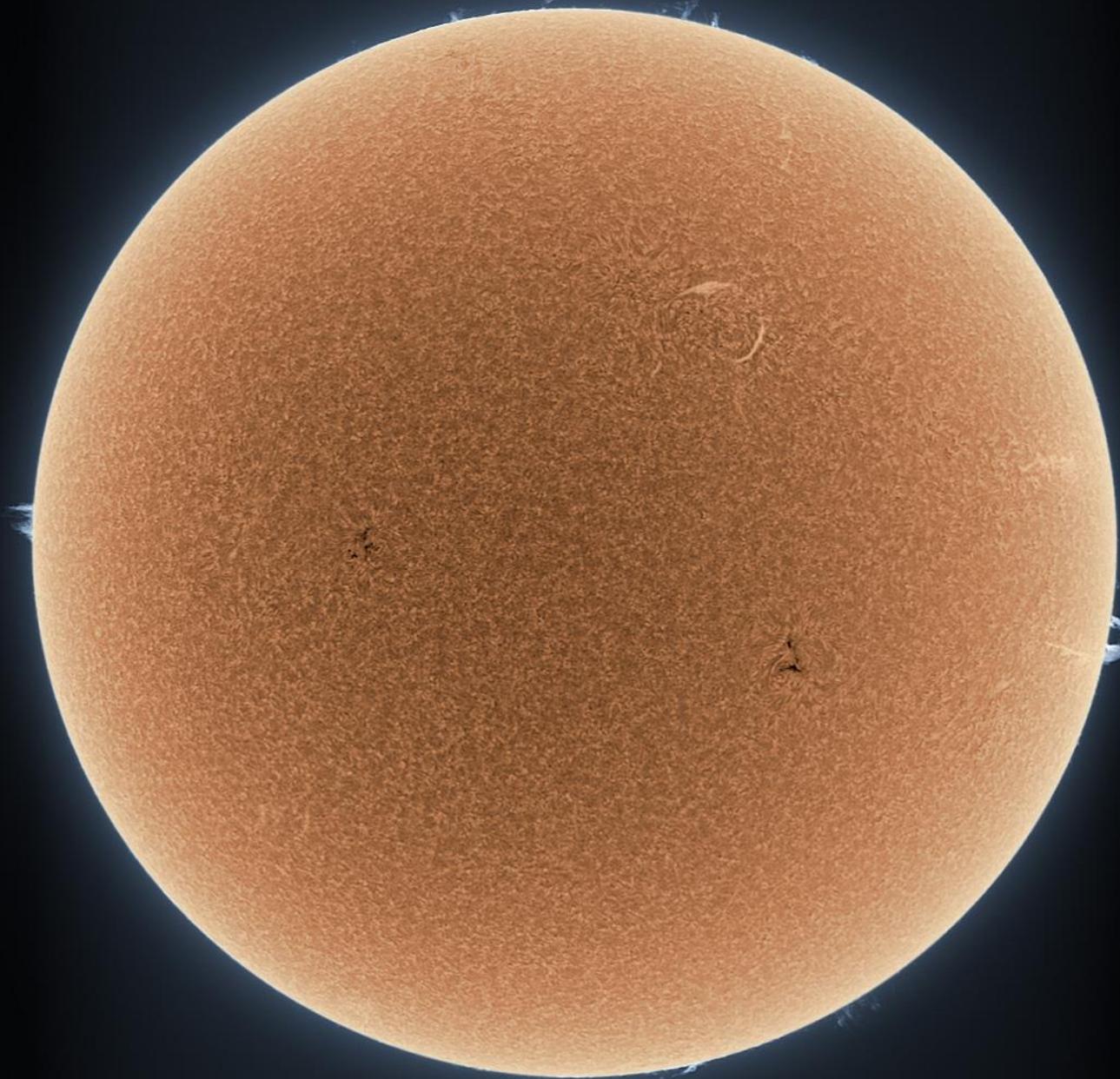


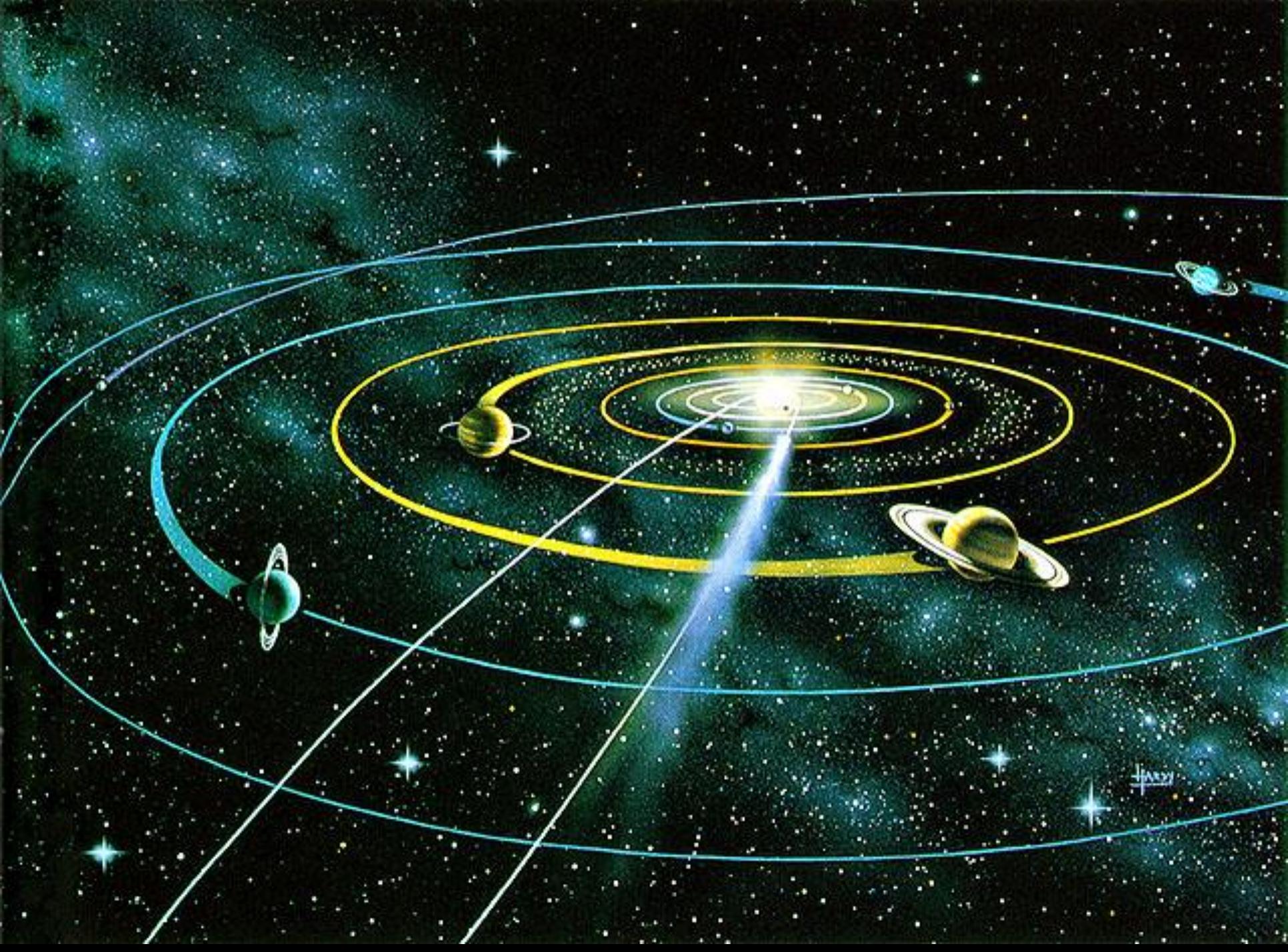


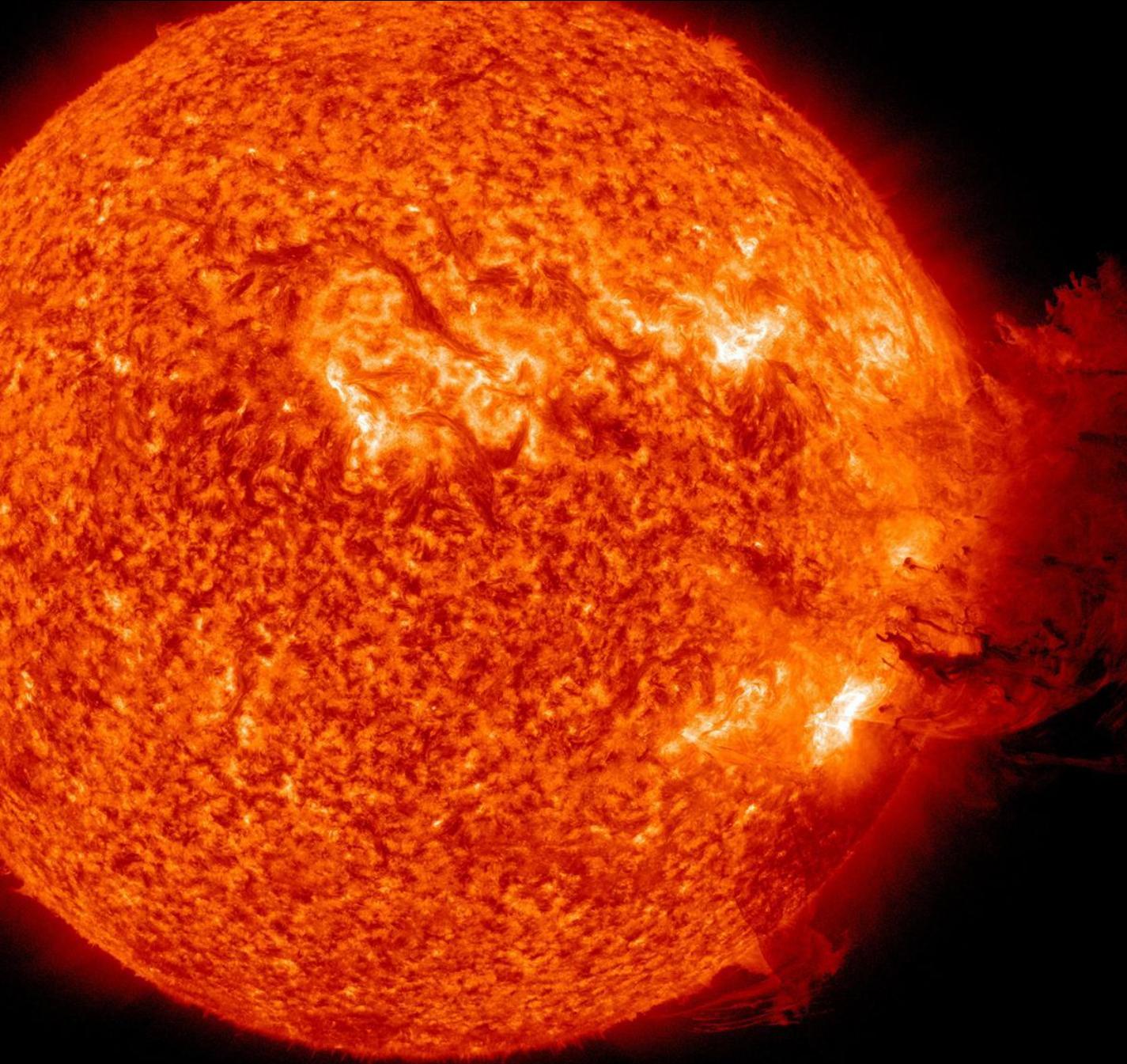
THE SUN, OUR NEAREST STAR

CAROLIN CRAWFORD
GRESHAM PROFESSOR OF ASTRONOMY

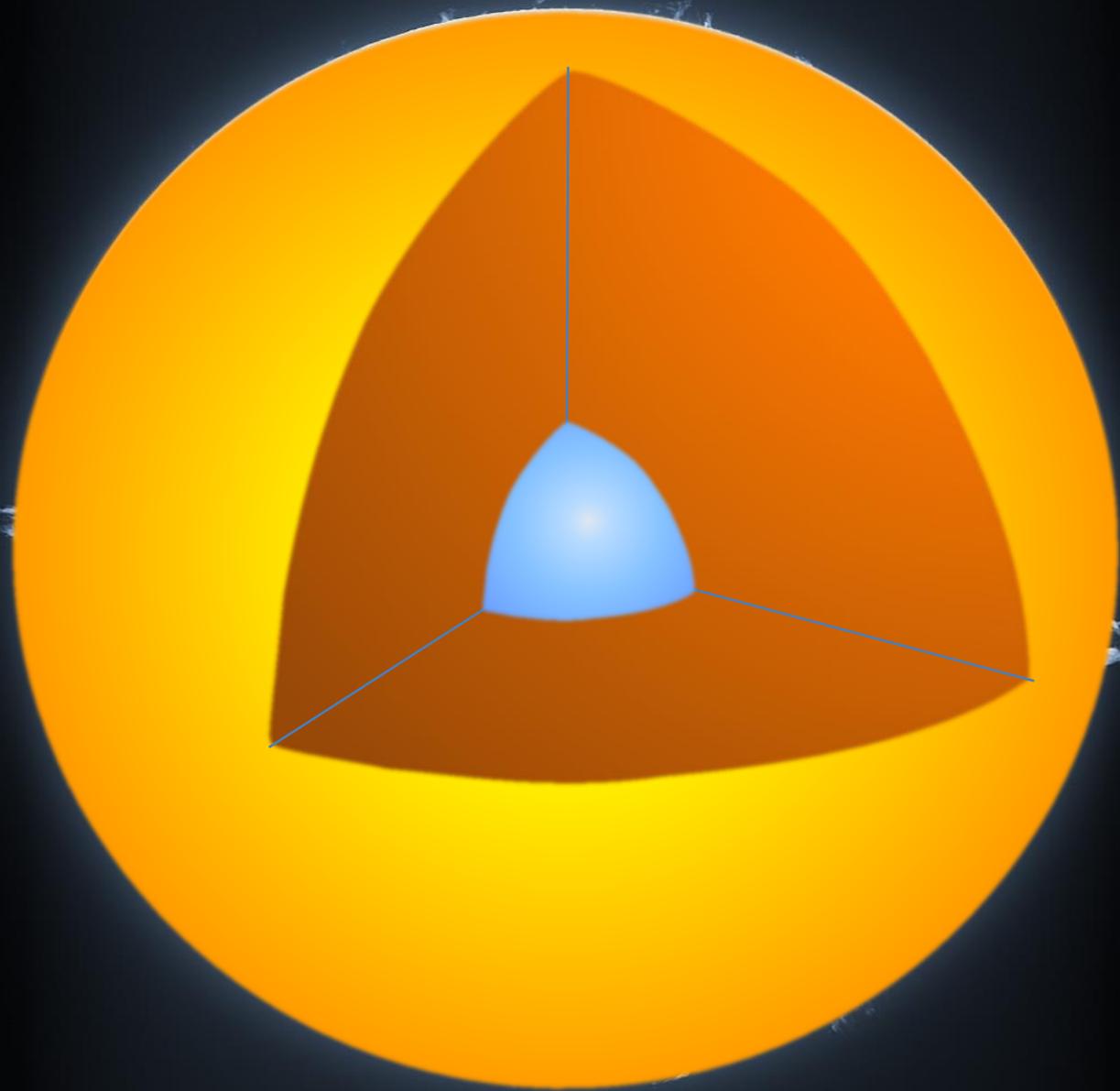


Alan Friedman (Averted Imagination)

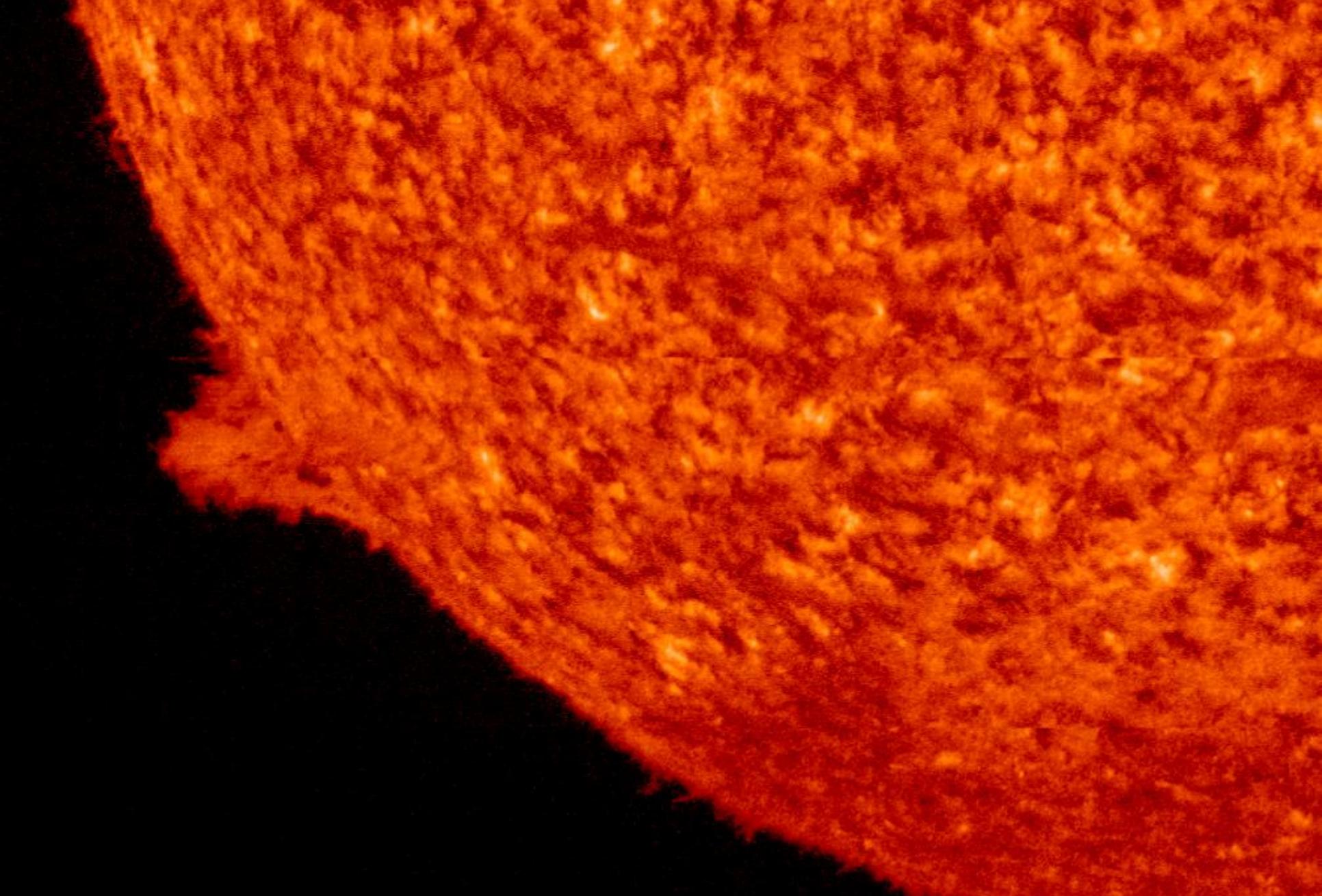




NASA's GSFC, SDO AIA Team

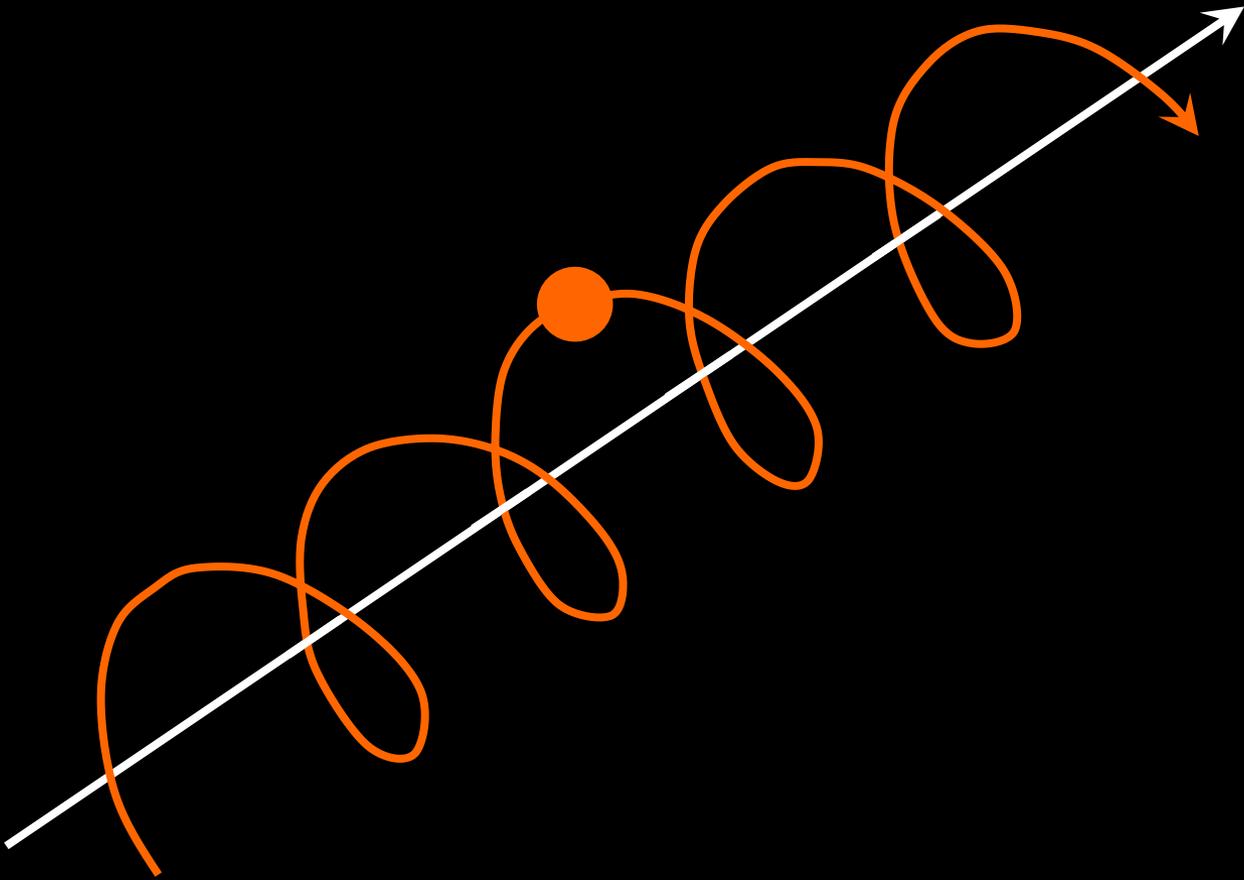


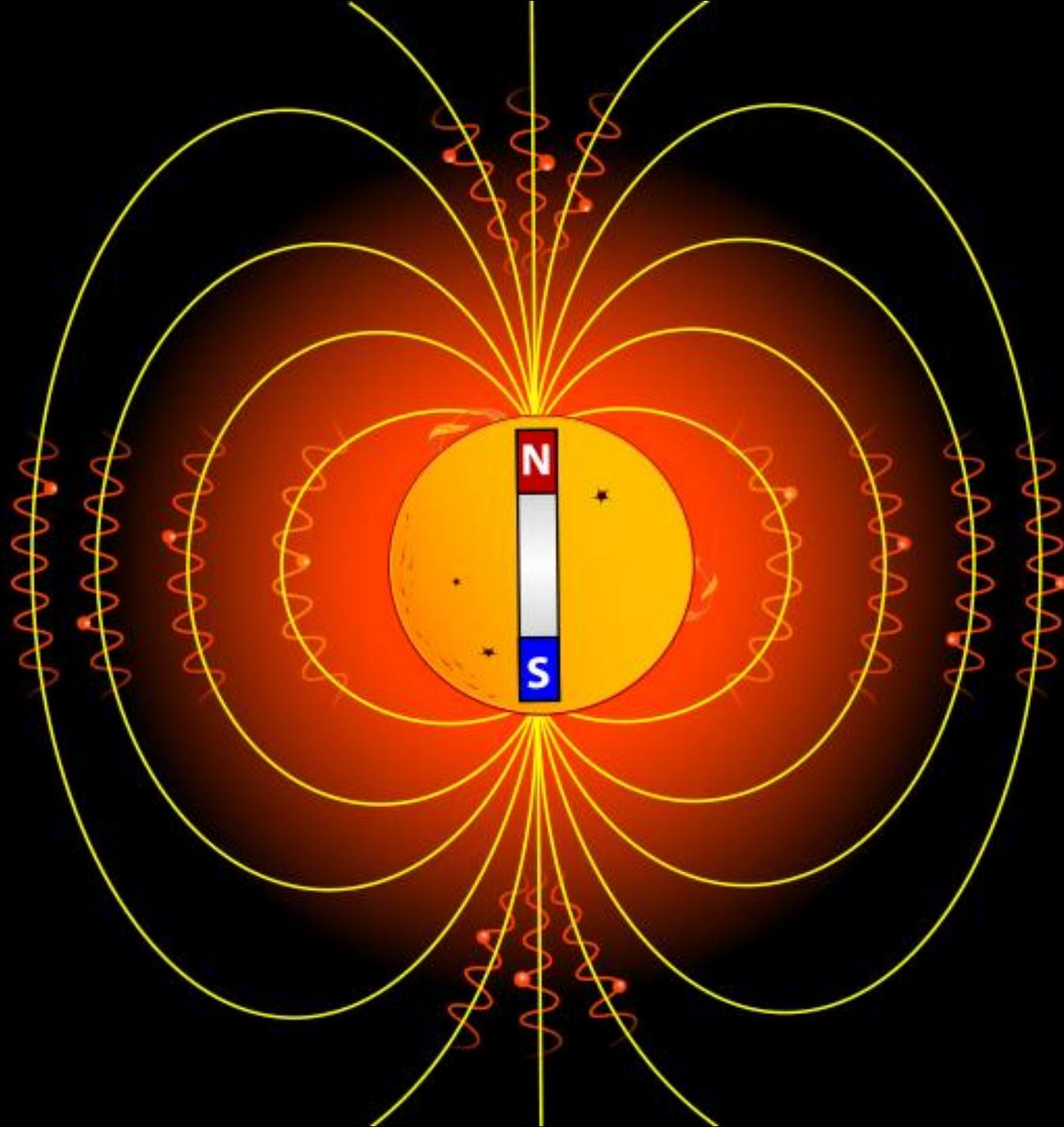
Alan Friedman (Averted Imagination)



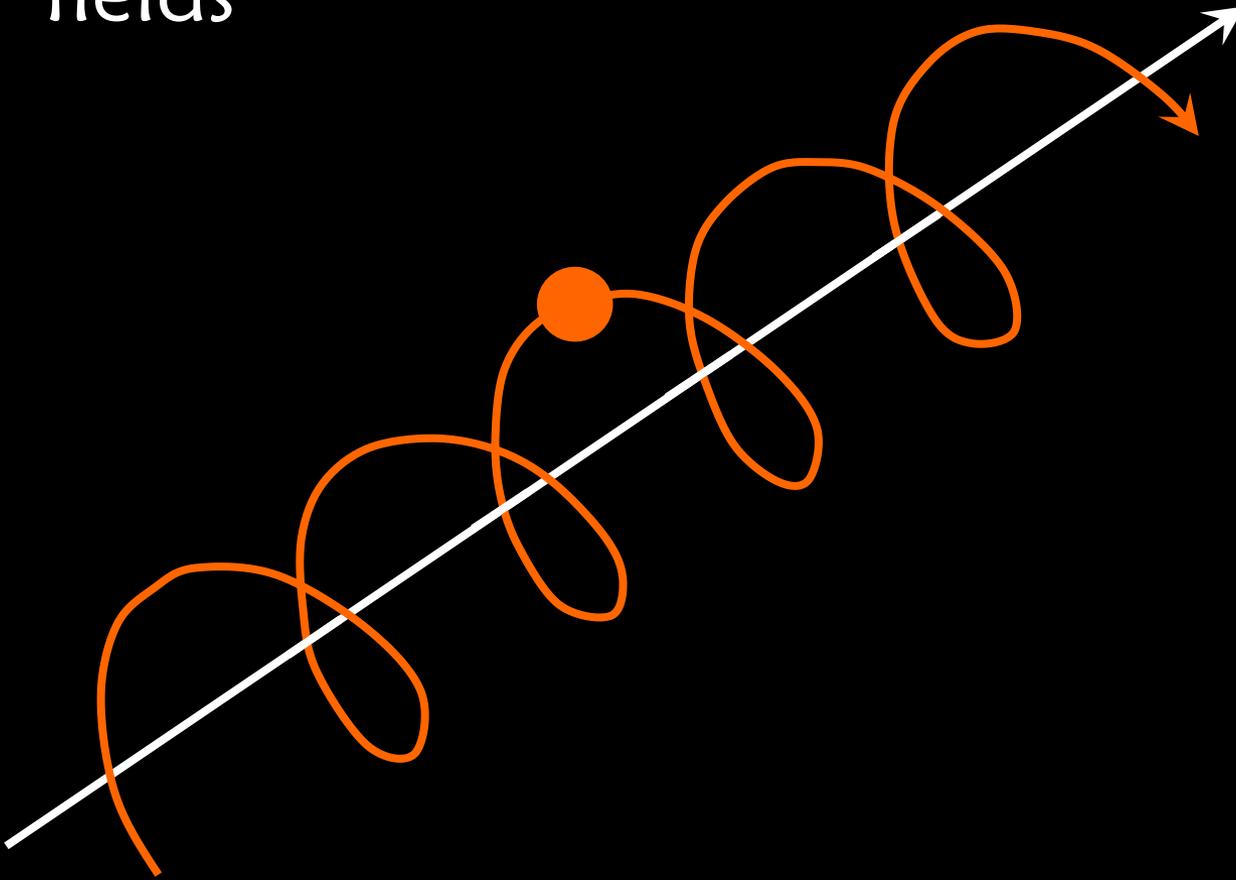
IE Dammasch & K Wilhelm

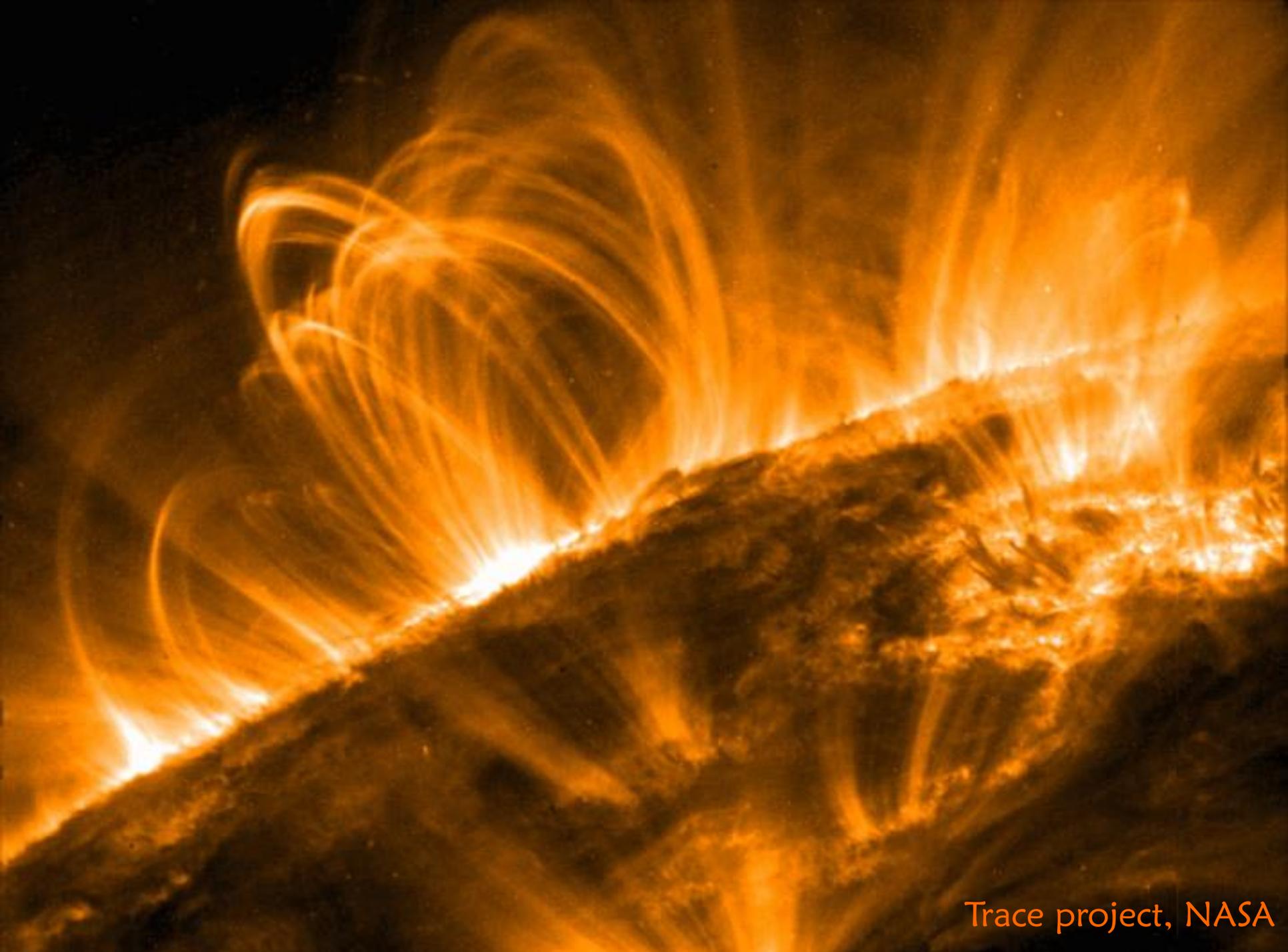
- charged particles move along magnetic field lines





- charged particles move along magnetic field lines
- moving charged particles generate magnetic fields





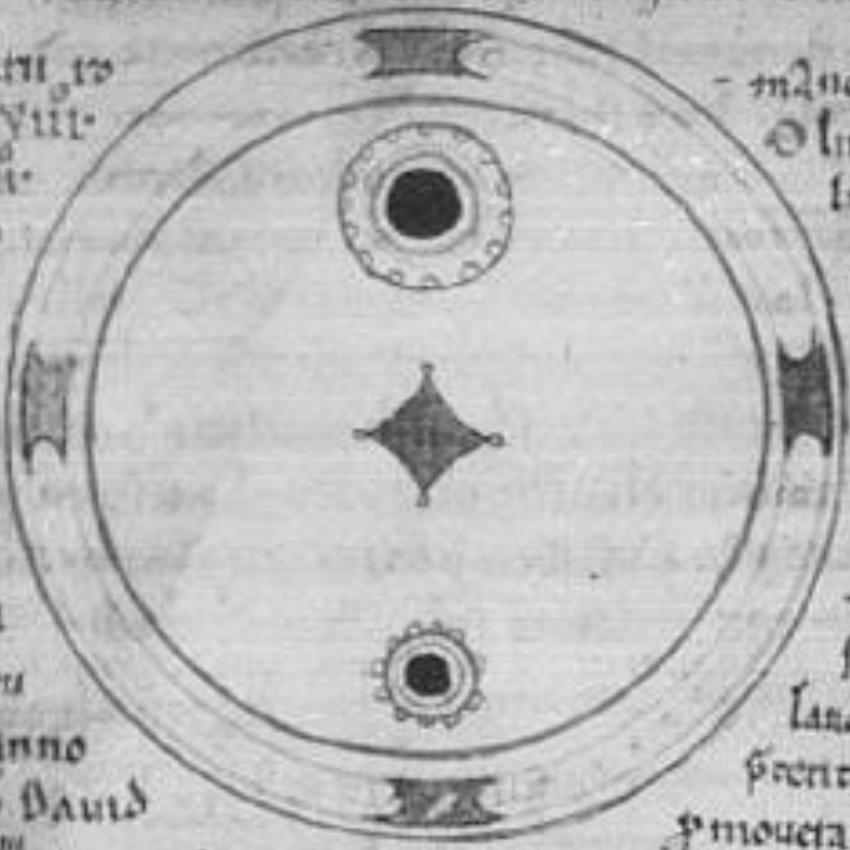
Trace project, NASA



Juan Manuel Pérez Rayego

omnia ut bene scire. / uniuersis dicit melius uult in misericordia & miserationibus: ut optime nouerit
 cuncta disponat. / post madicium tempus rex anglorum mare transit.

nno regni. 111. leodegari rex
 anglorum henrici. 22. viii.
 Anno. ii. iudicatione. 2. ii.
 i. s.º decembris. Sabbo
 apparuerunt quasi due
 orbitam. Vna insupe-
 rior. AL
 fer. 1. 01. 1.
 erat 2.
 dist. 2. a. 014
 Ad huius 01. e. 01
 Urbanus lanergantensis seu
 da. rerum. querens. qual. anno
 Bernardum. epm. de. s.º David
 sensorat. emensa. festinate. purificatio. nis. s.º MARIE. MARIE. transit. 014.



- manouum / impatoris. Regis /
 Olympidis. ecc. Lxx.
 luna. xv. existere /
 a mane usq; ad uespam
 ingre pile infra solis
 ueni parte. / erat
 2. 1111
 / s.º minor
 v. traq. v. e.
 tra alter a. 01
 fig. 1. 1.

Landatiensis
 p. nento in gen
 p. mouetate il iul

吾術池水變為血色數日四年六月癸卯
 方有赤氣七月戊寅乾方有赤氣五年
 丁酉夜赤氣發東南至庚子滅六年正月
 亥夜北方有赤白氣入紫微宮十一月
 自戌地至未赤氣衝滿十二月戊辰夜赤
 起自辰方經斗杓入紫微宮七年九月丙

仁宗元年四月癸巳

1128

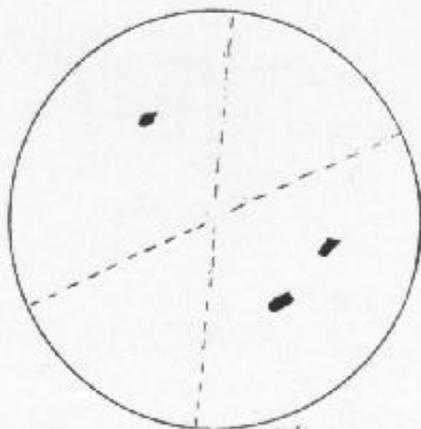
1610. Syn.

Dec-1. 8^h morn
5.

The altitude of the
Sun being 7 or 8
degrees. It being
a host of a mile. I saw
the same in this manner.

Instrument. $\frac{10}{1}$. B.

I saw it twice or thrice. once
with the right eye & other times
with the left. In the space of a minute time, after the Sun ^{was} to clear.

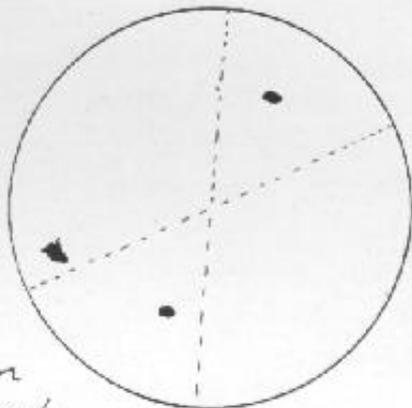
1610
1611. Syn.

January. 19. 7. a notable mist. I observed diligently at
sundry times when it was fit. I saw nothing but the clear
Sun both with right and left eye.

Syn.

1611. Dec-1. 1. morn 5. 10. 0.
for eclipsing of the Sun.

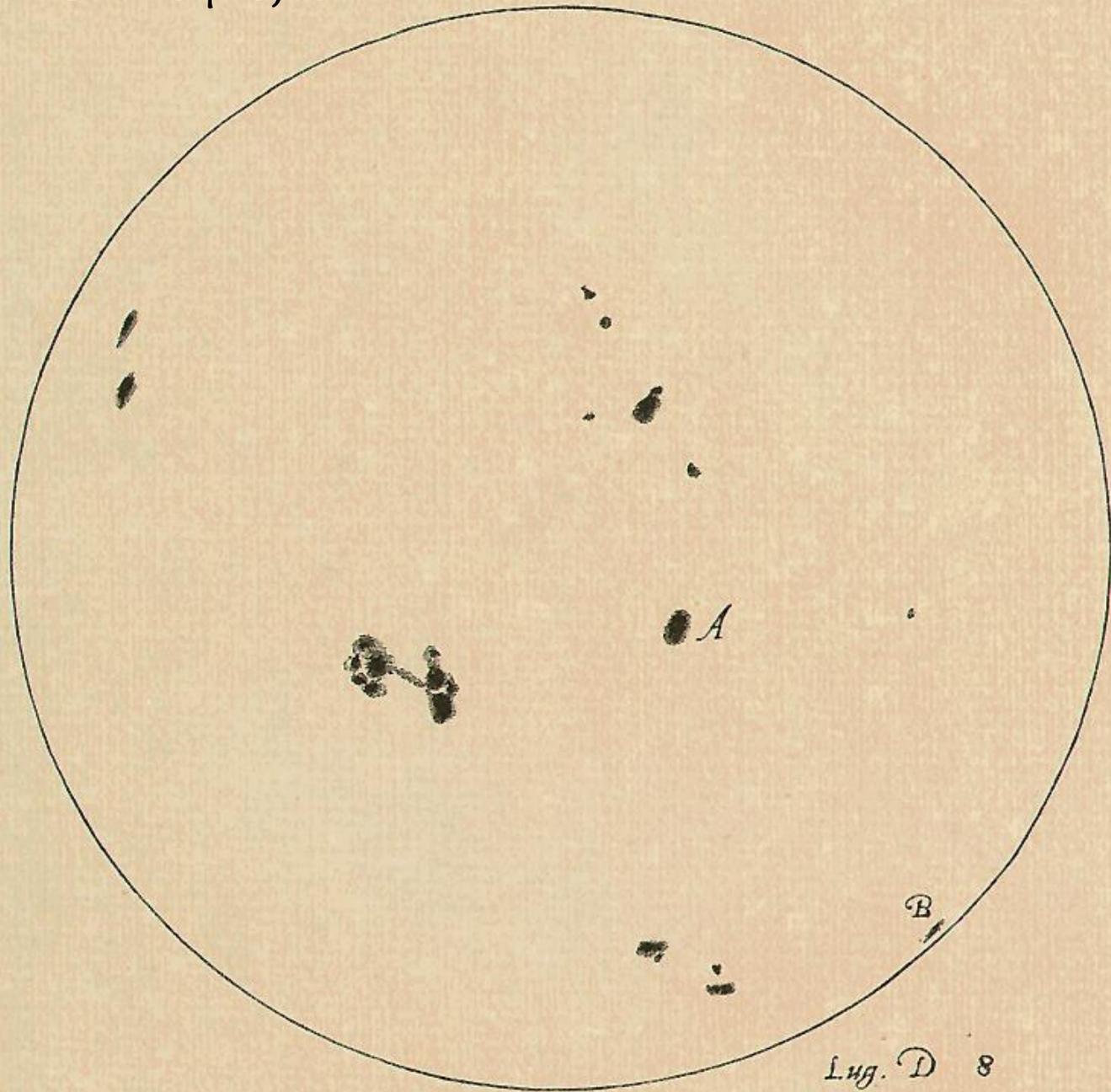
I saw three black spots in such
order as is here expressed, as near
as I could judge. observed $\frac{10}{10}$
5^h or there. with the eye also saw
the same at sundry times all these
days it came for half an hour space
at sundry times and all the morning before
it was misty. ^{appearing somewhat larger,}
the greatest was with refraction, ^{with} most crisped
& it appeared single about 2'. the other
two, were near of our height, & of 1' magnitude.
as here shews



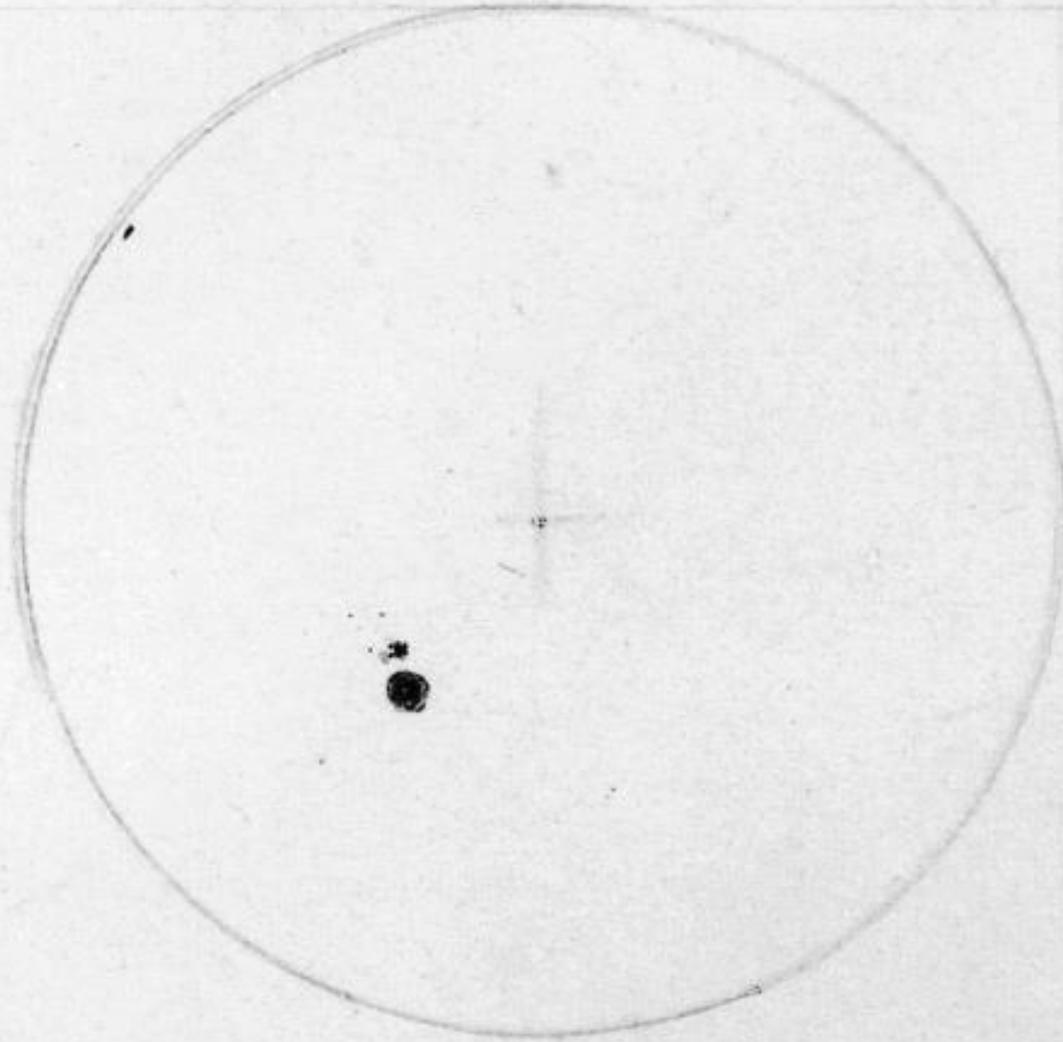
509

1610

The Galileo project



Day Telescope
May 25
1837

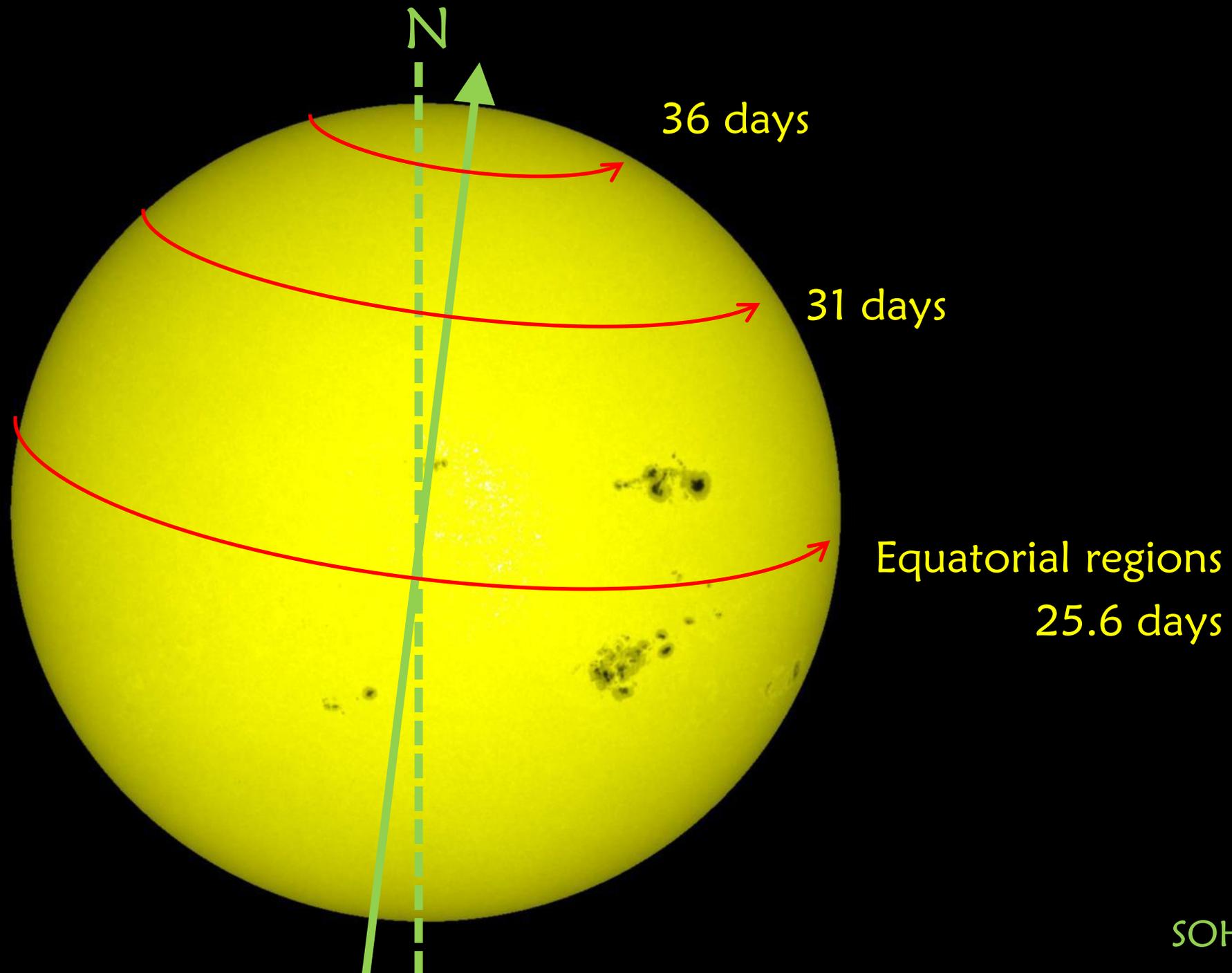


This figure to be
used
best glimpses
striated appearance
of fern^a
& misty
light over
the bluntest spots



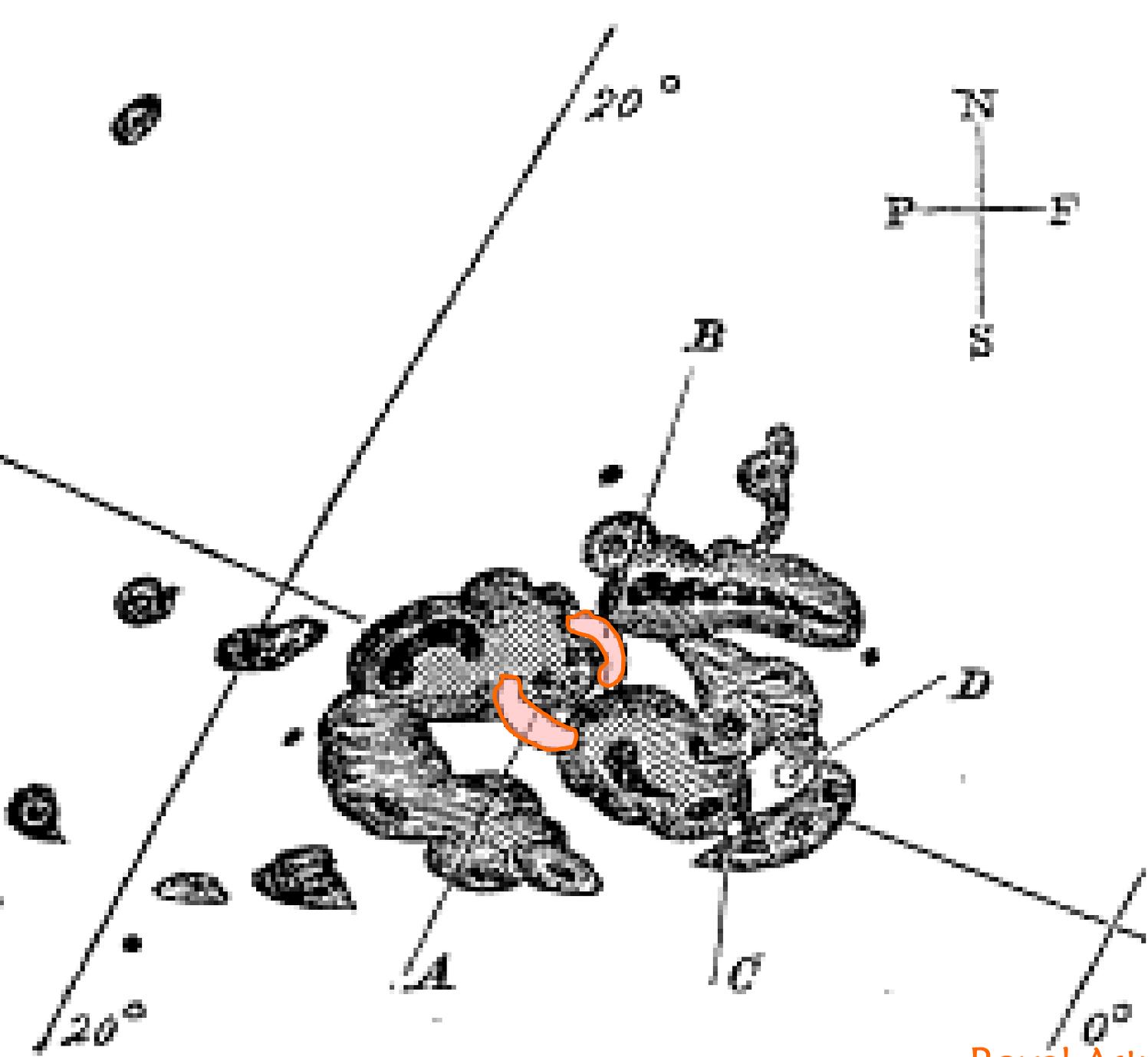
In general

1837



*Description of a Singular Appearance seen in the Sun on
September 1, 1859.* By R. C. Carrington, Esq.

While engaged in the forenoon of Thursday, Sept. 1, in taking my customary observation of the forms and positions of the solar spots, an appearance was witnessed which I believe to be exceedingly rare. The image of the sun's disk was, as usual with me, projected on to a plate of glass coated with distemper of a pale straw colour, and at a distance and under a power which presented a picture of about 11 inches diameter. I had secured diagrams of all the groups and detached spots, and was engaged at the time in counting from a chronometer and recording the contacts of the spots with the cross-wires used in the observation, when within the area of the great north group (the size of which had previously excited general remark), two patches of intensely bright and white light broke out, in the positions indicated in the appended diagram by the letters A and B, and of the forms of the spaces left white. My





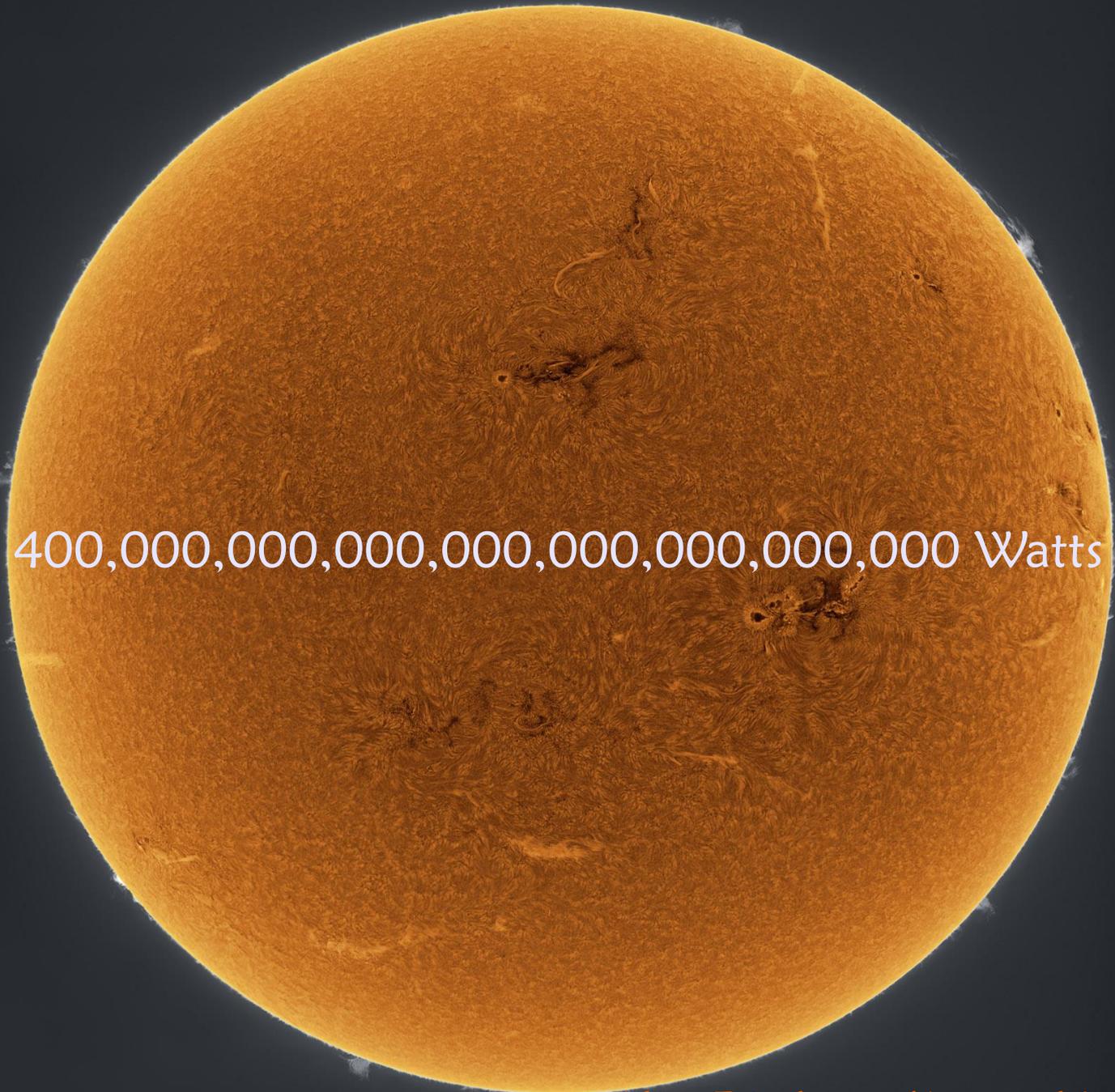
Frederic Edwin Church

Telegraph

OFFICE

POSTAL
TELEGRAPH
OFFICE



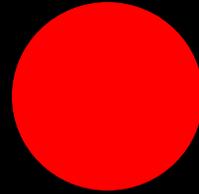
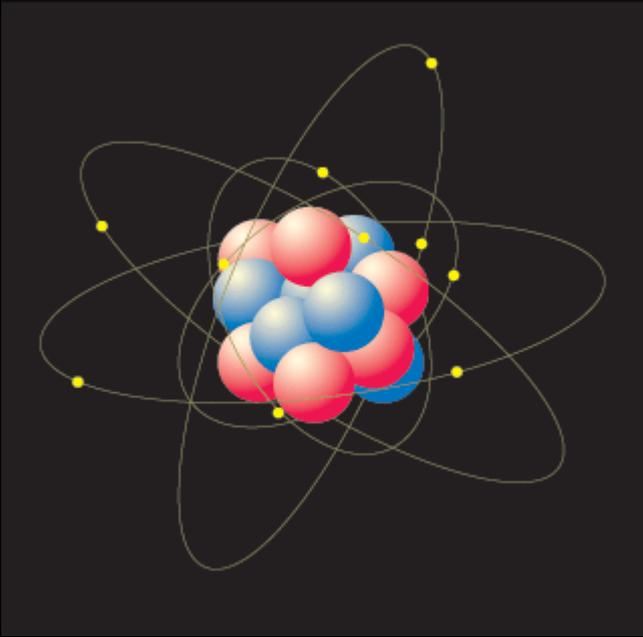


400,000,000,000,000,000,000,000 Watts

Alan Friedman (Averted Imagination)

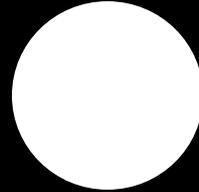
An atomic nucleus

consists of :



positively charged

protons



electrically neutral

neutrons

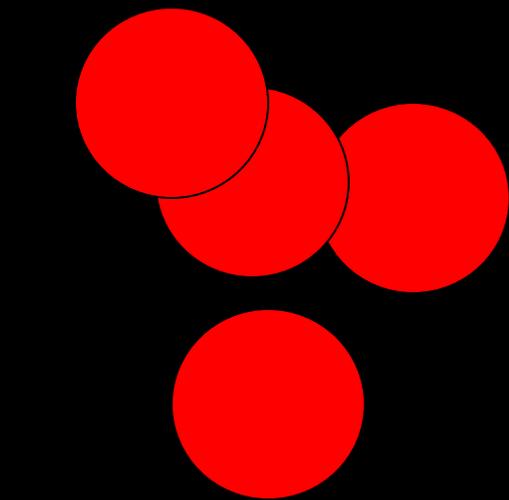
surrounded by a cloud of



negatively charged

electrons

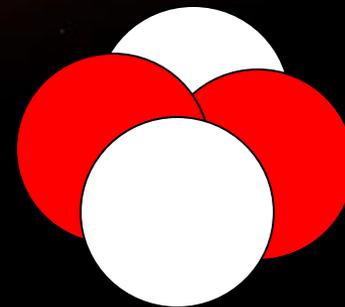
Atoms of different chemical elements have different numbers of **protons** in the nucleus

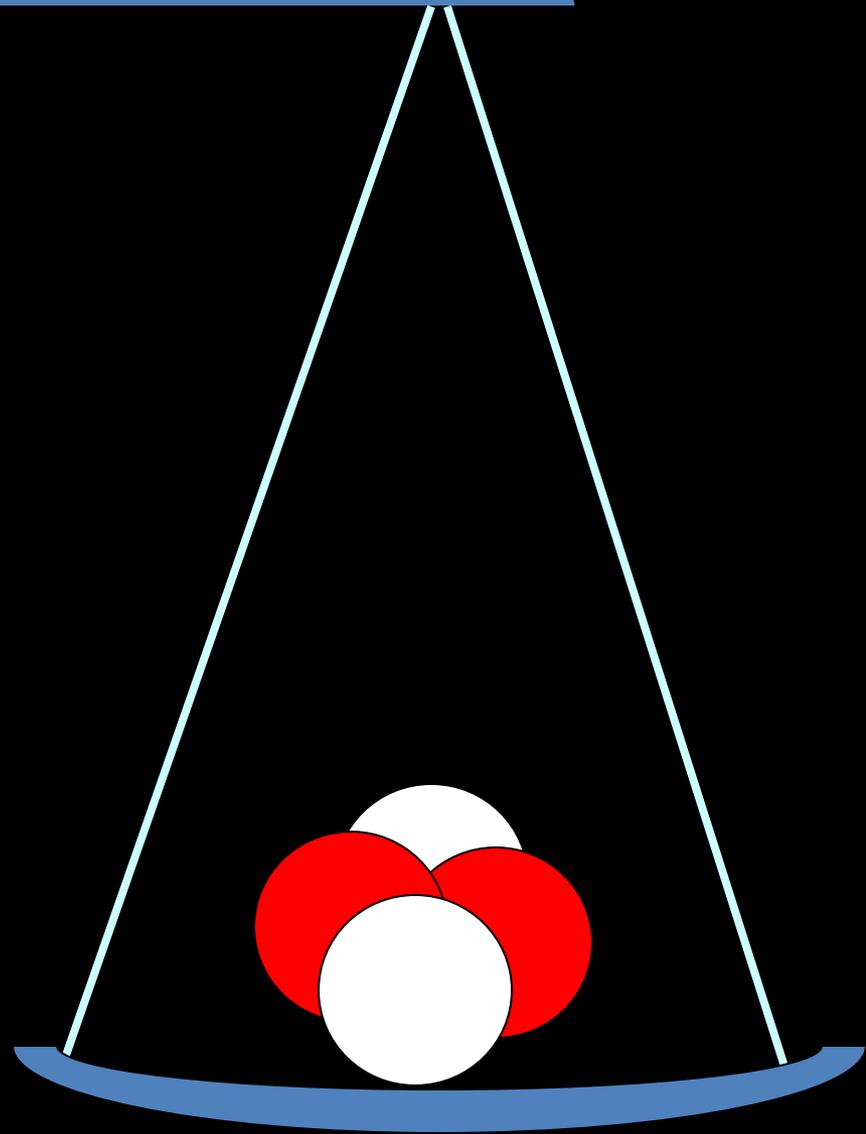
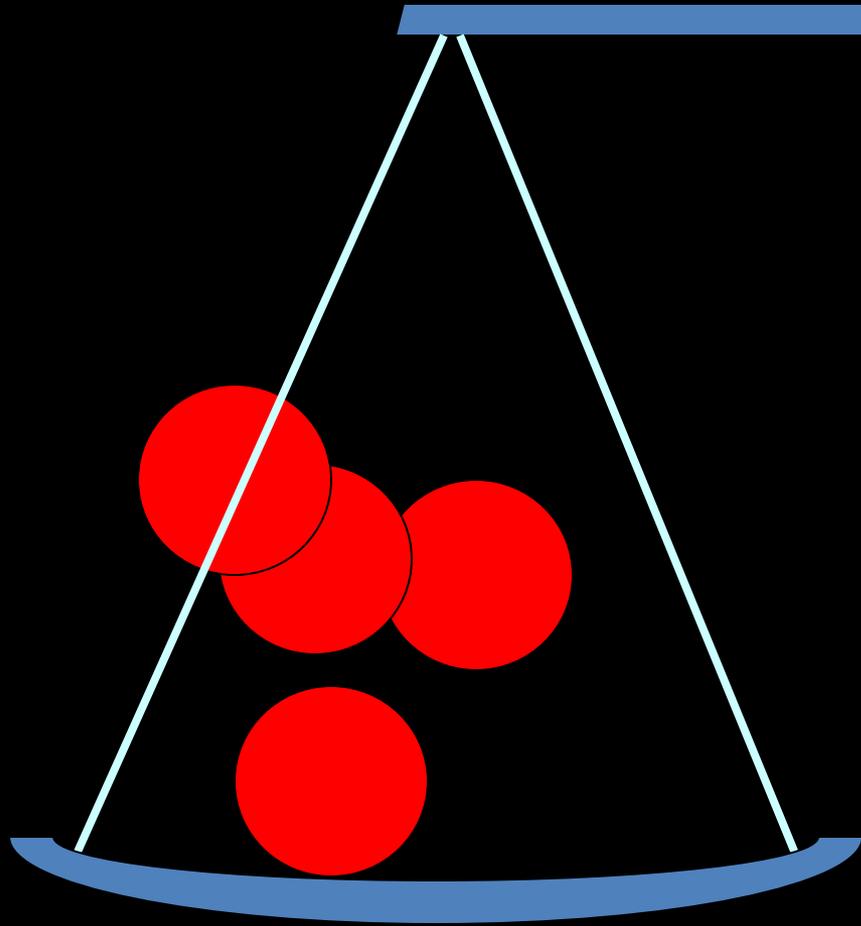


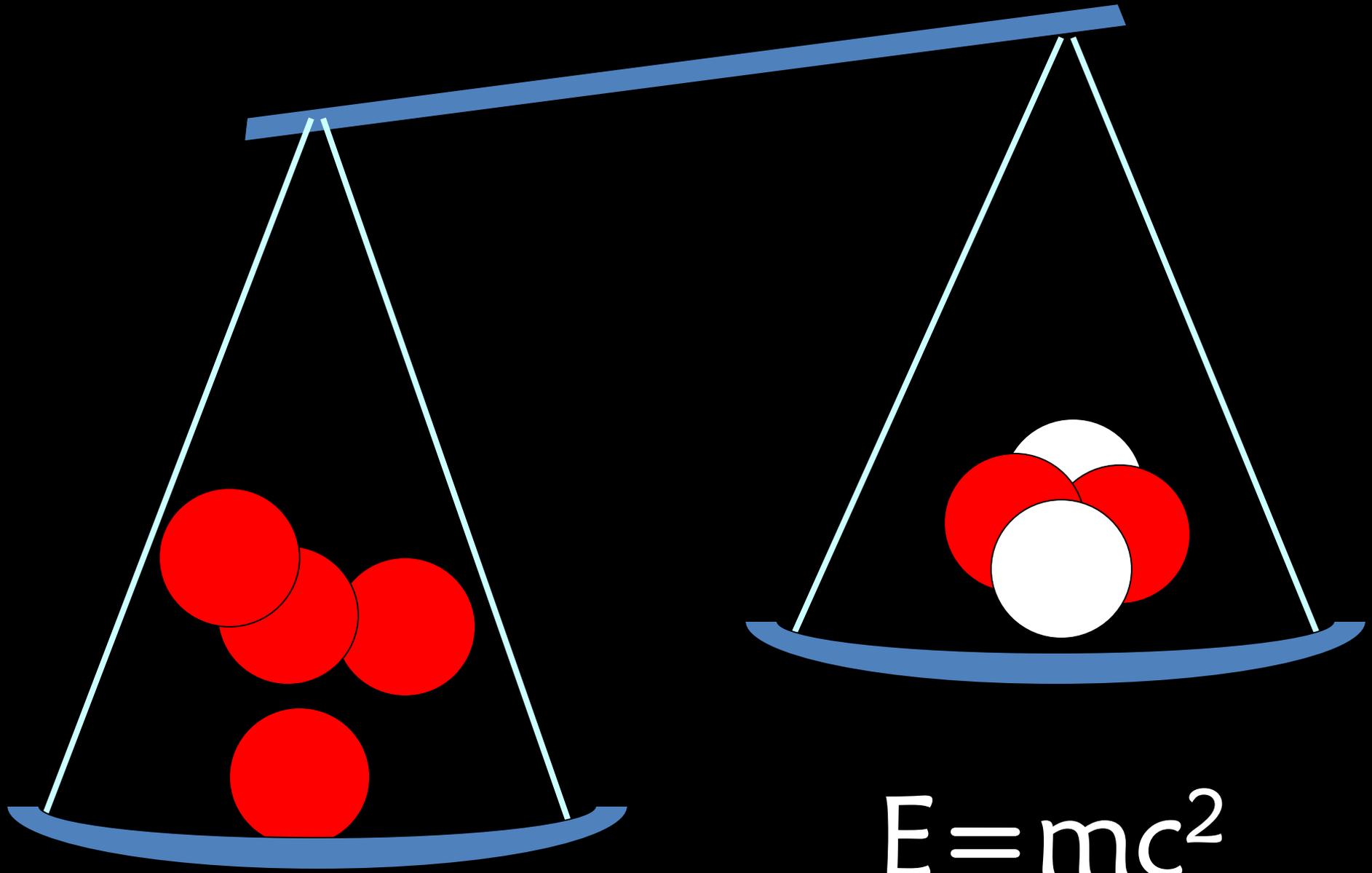
4 protons



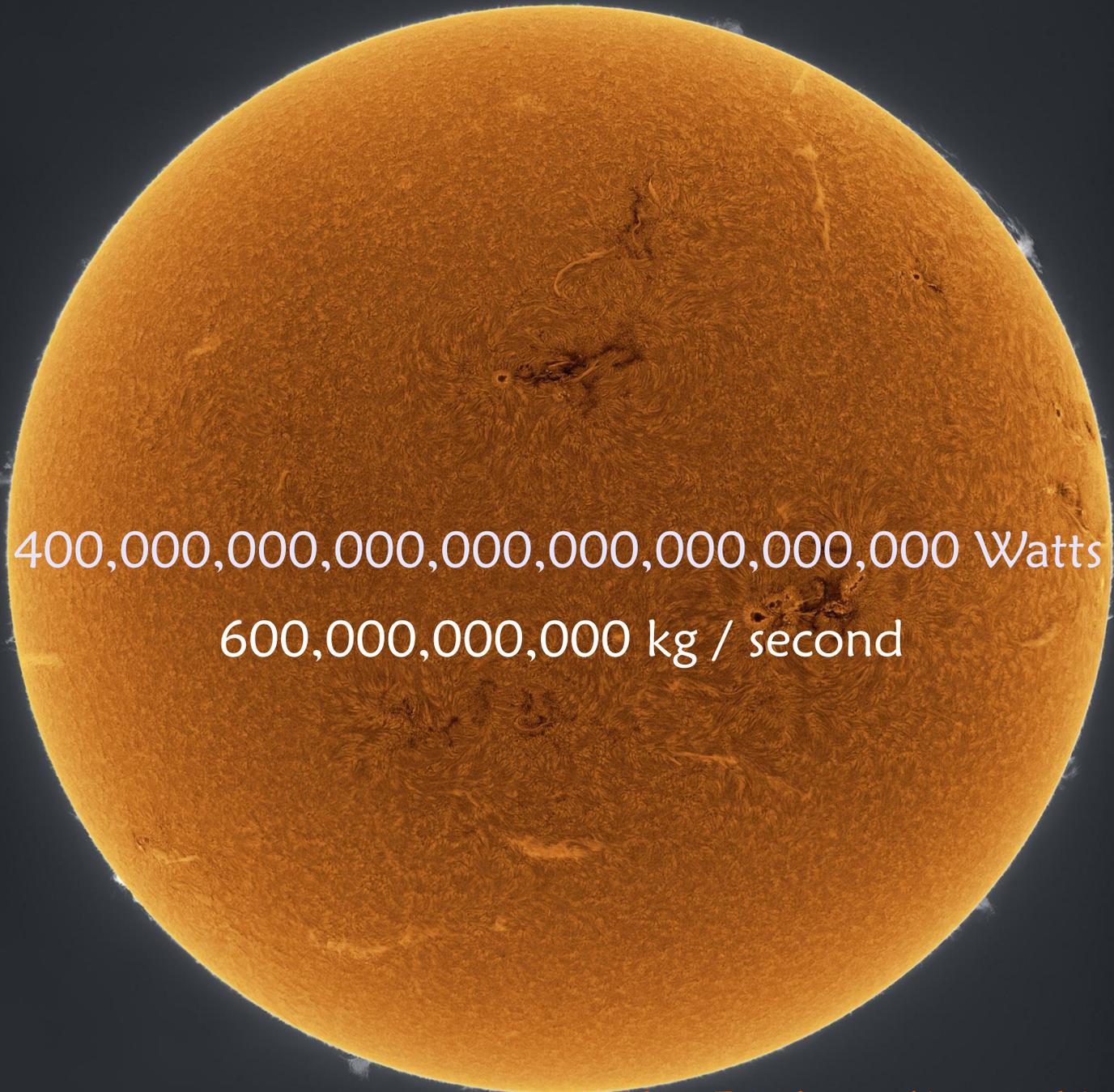
He nucleus
(α -particle)





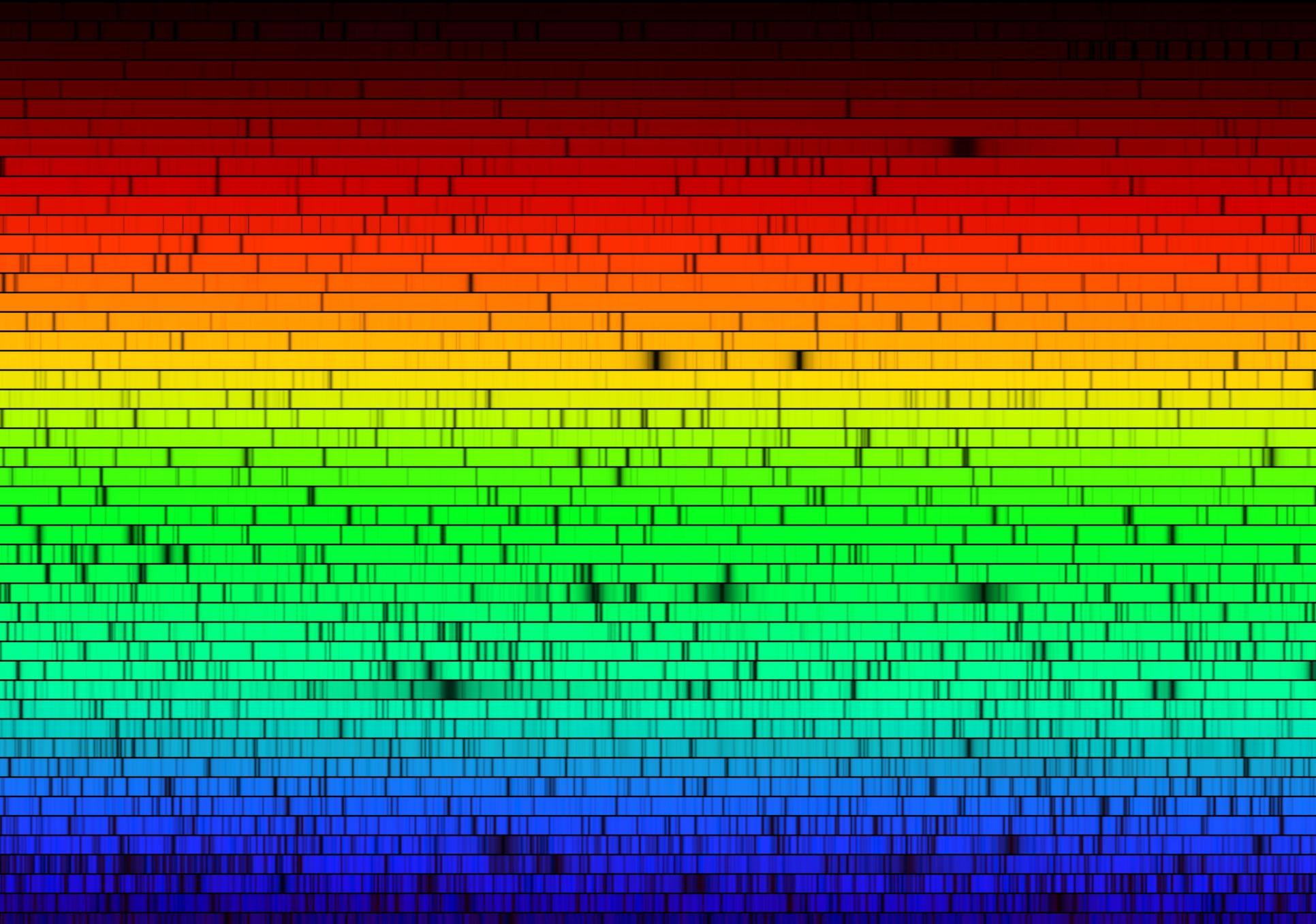


$$E = mc^2$$



400,000,000,000,000,000,000,000 Watts
600,000,000,000 kg / second

Alan Friedman (Averted Imagination)



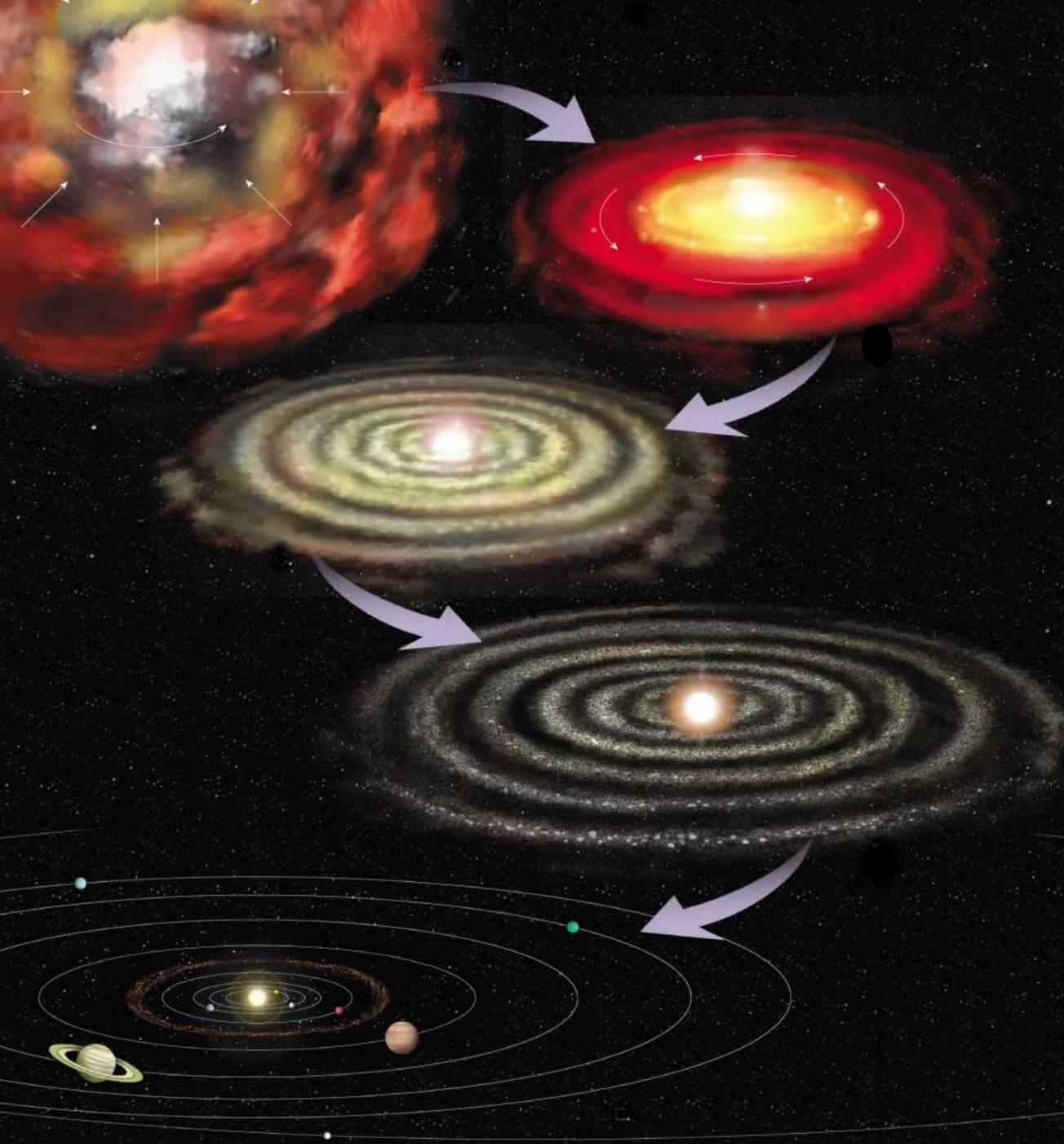
Nigel Sharp (NSF)

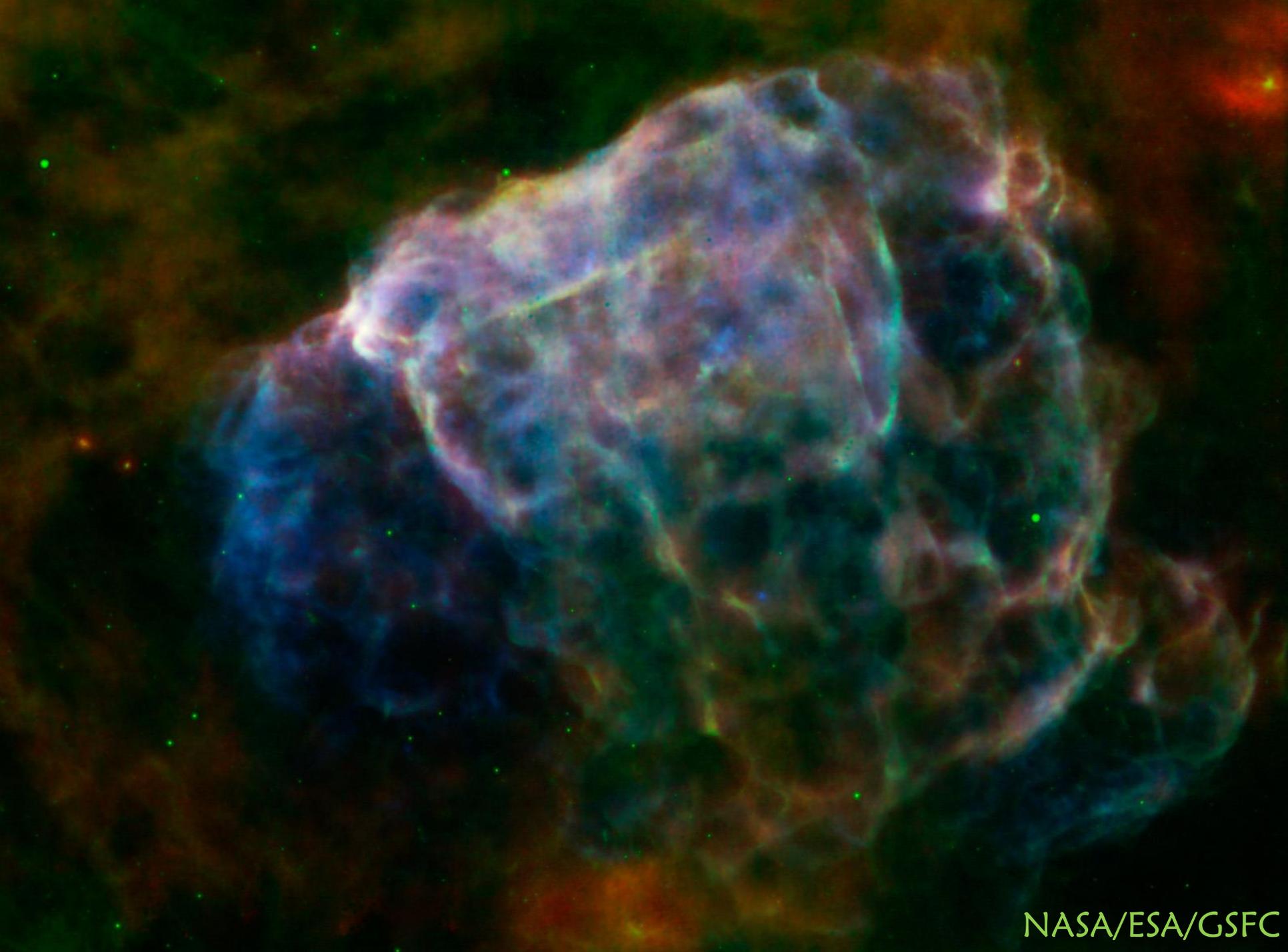
92.1%	hydrogen
7.8%	helium
0.1%	everything else...

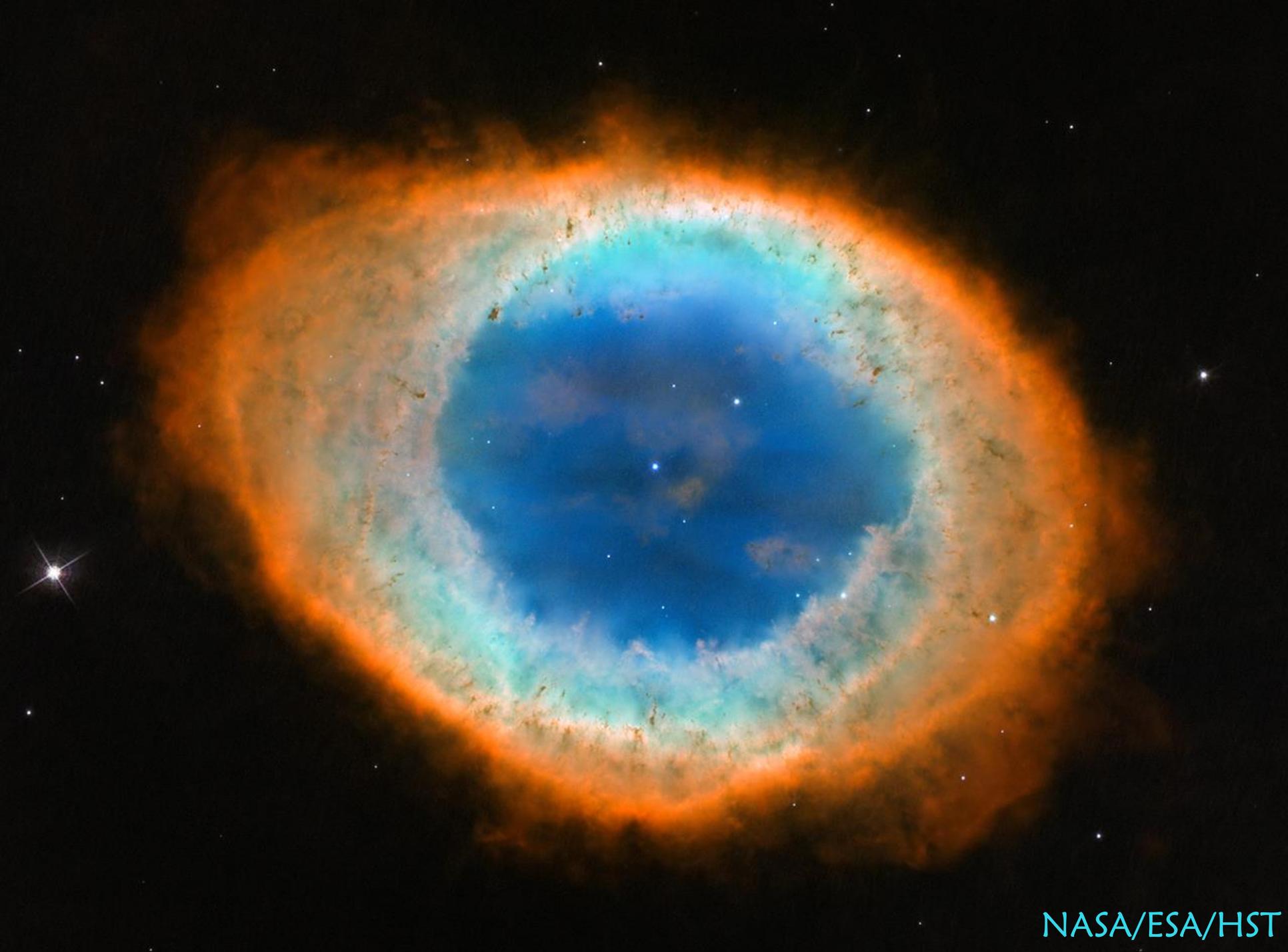


Bob Franke

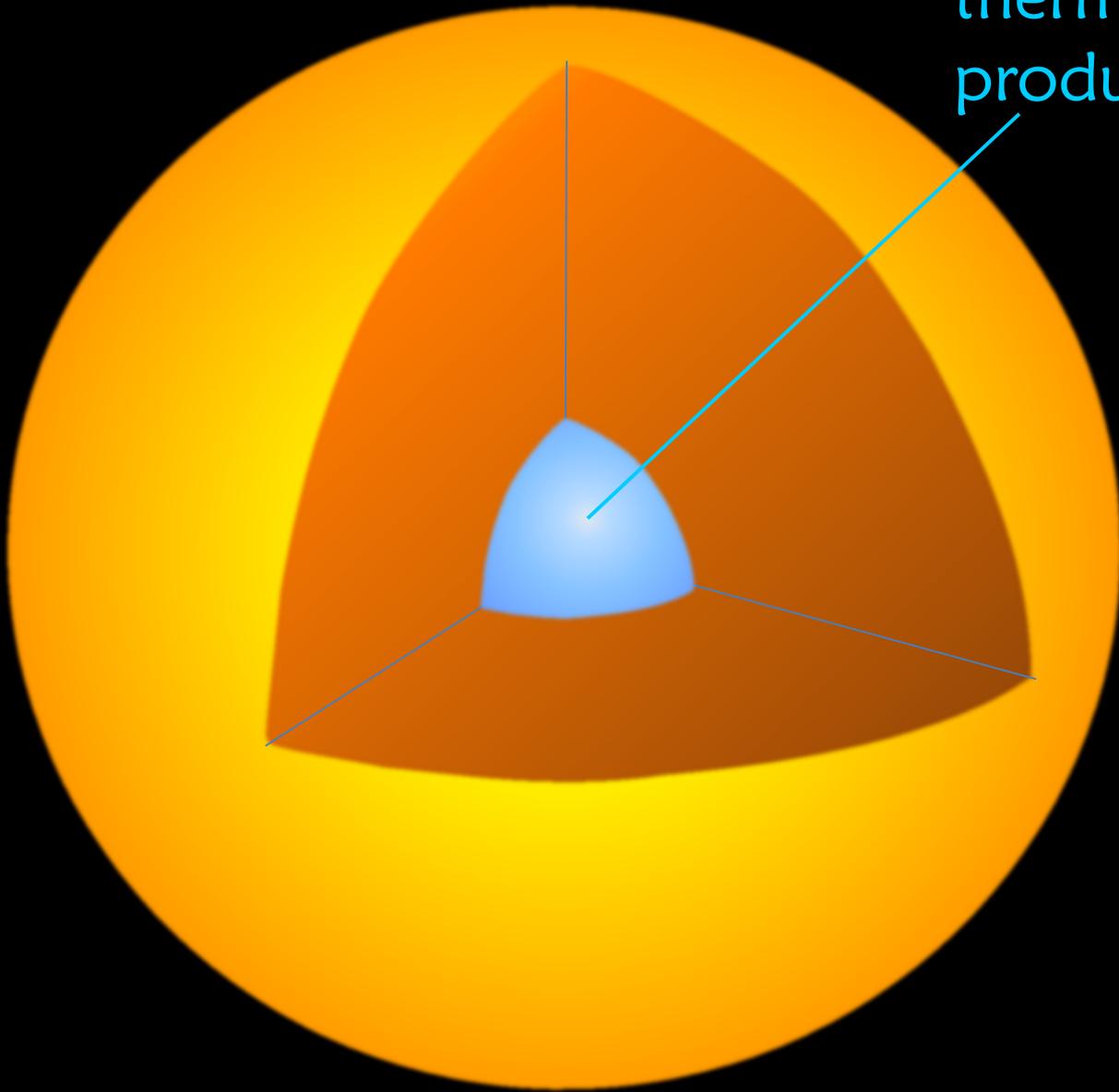


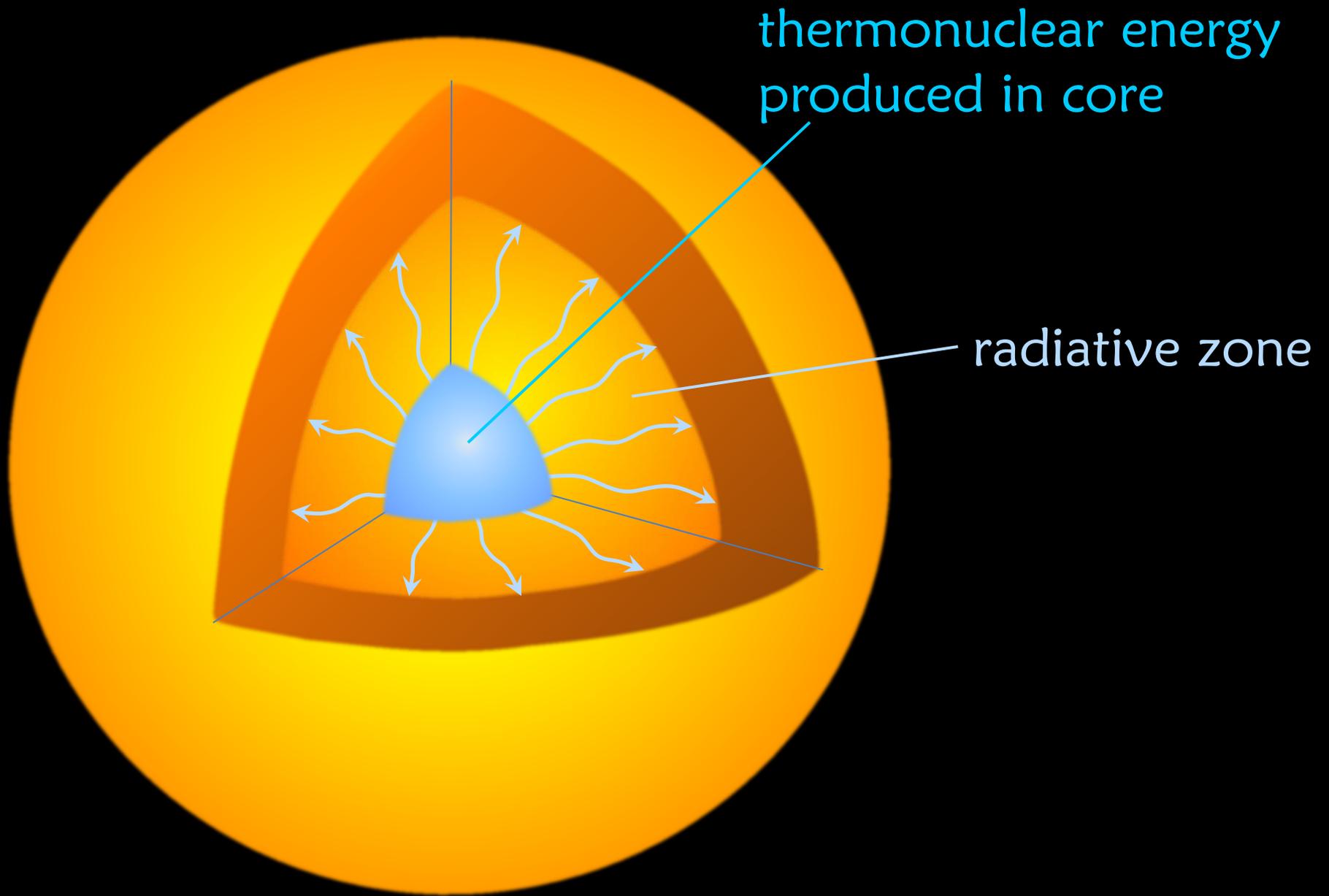


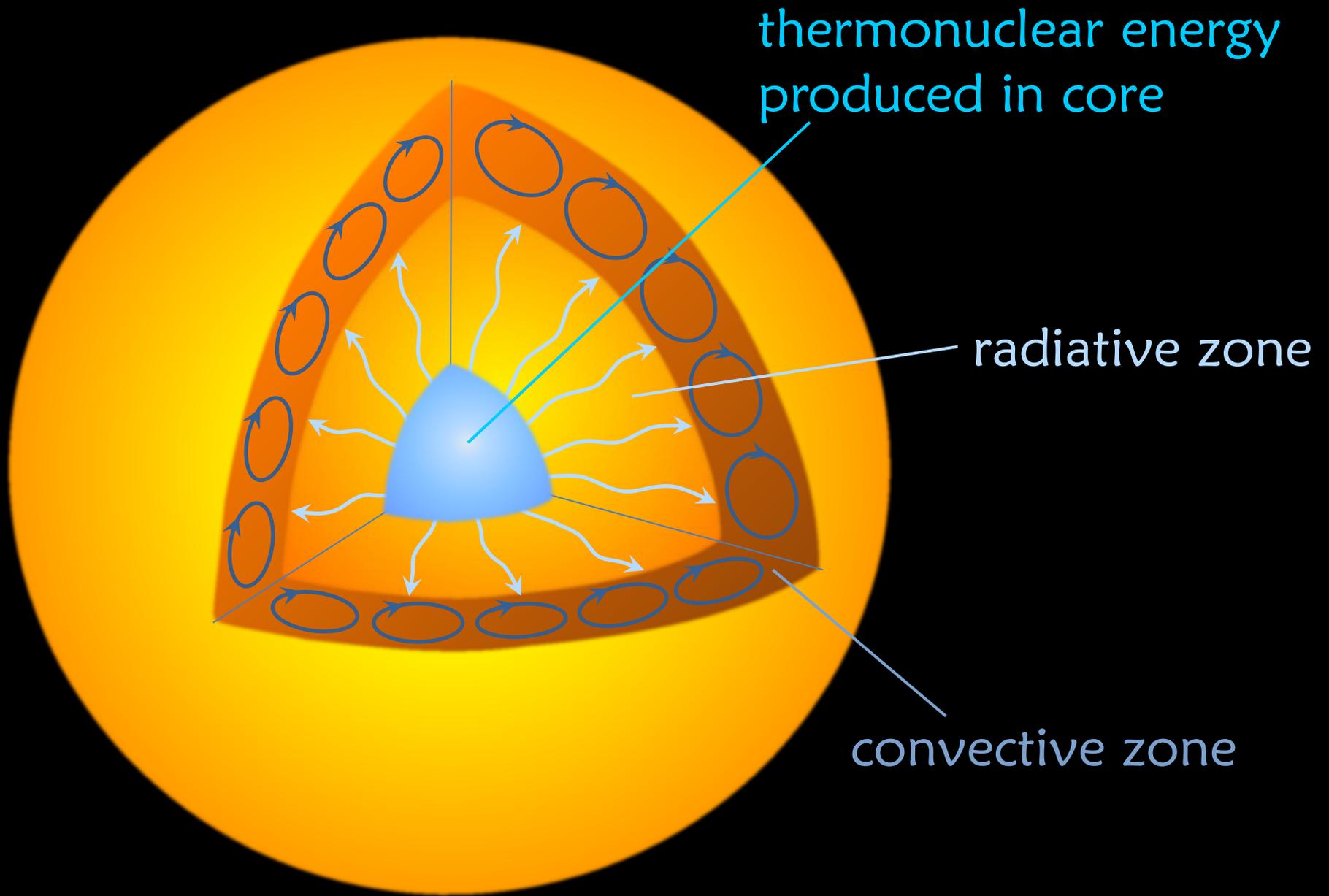




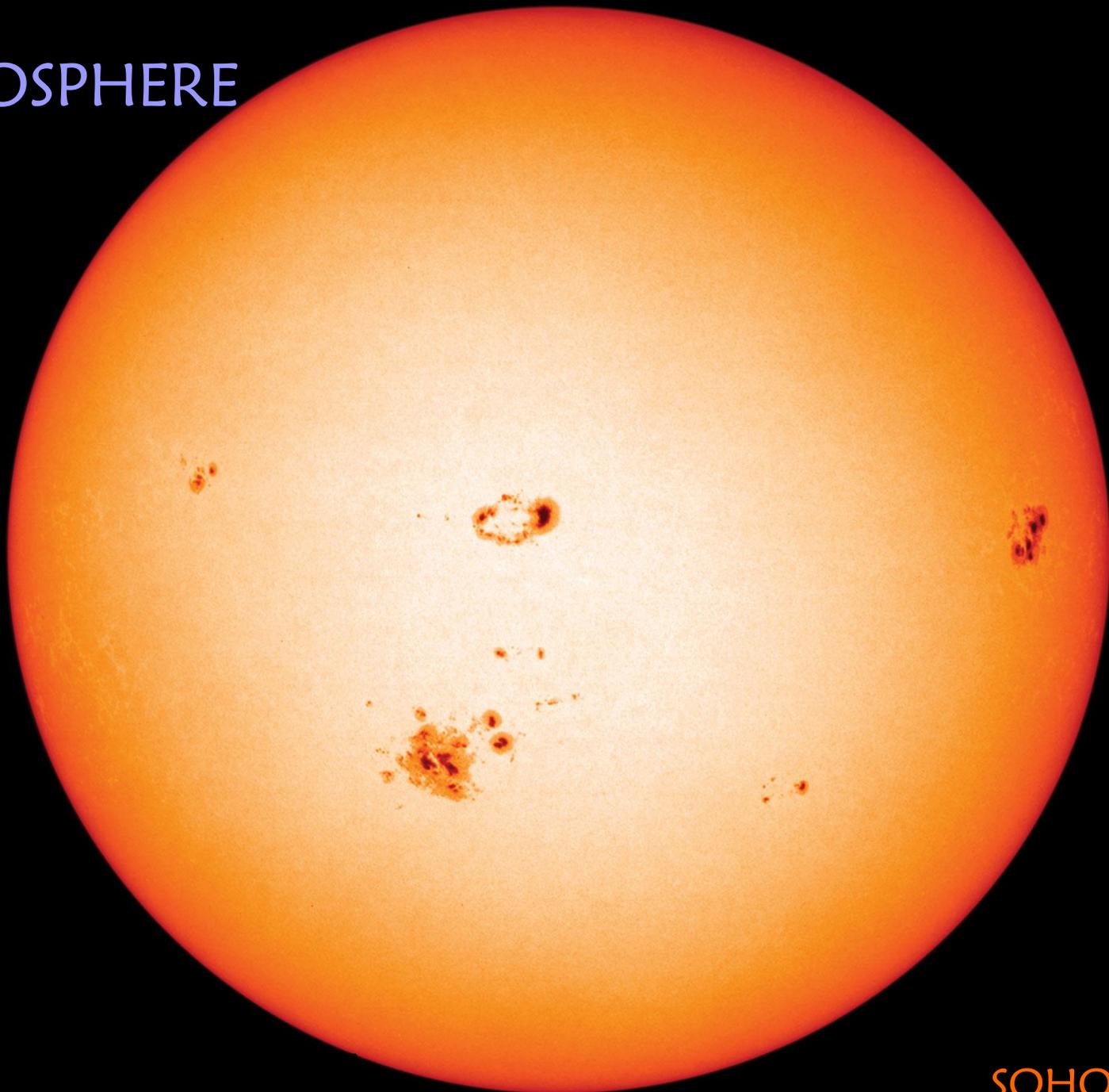
thermonuclear energy
produced in core



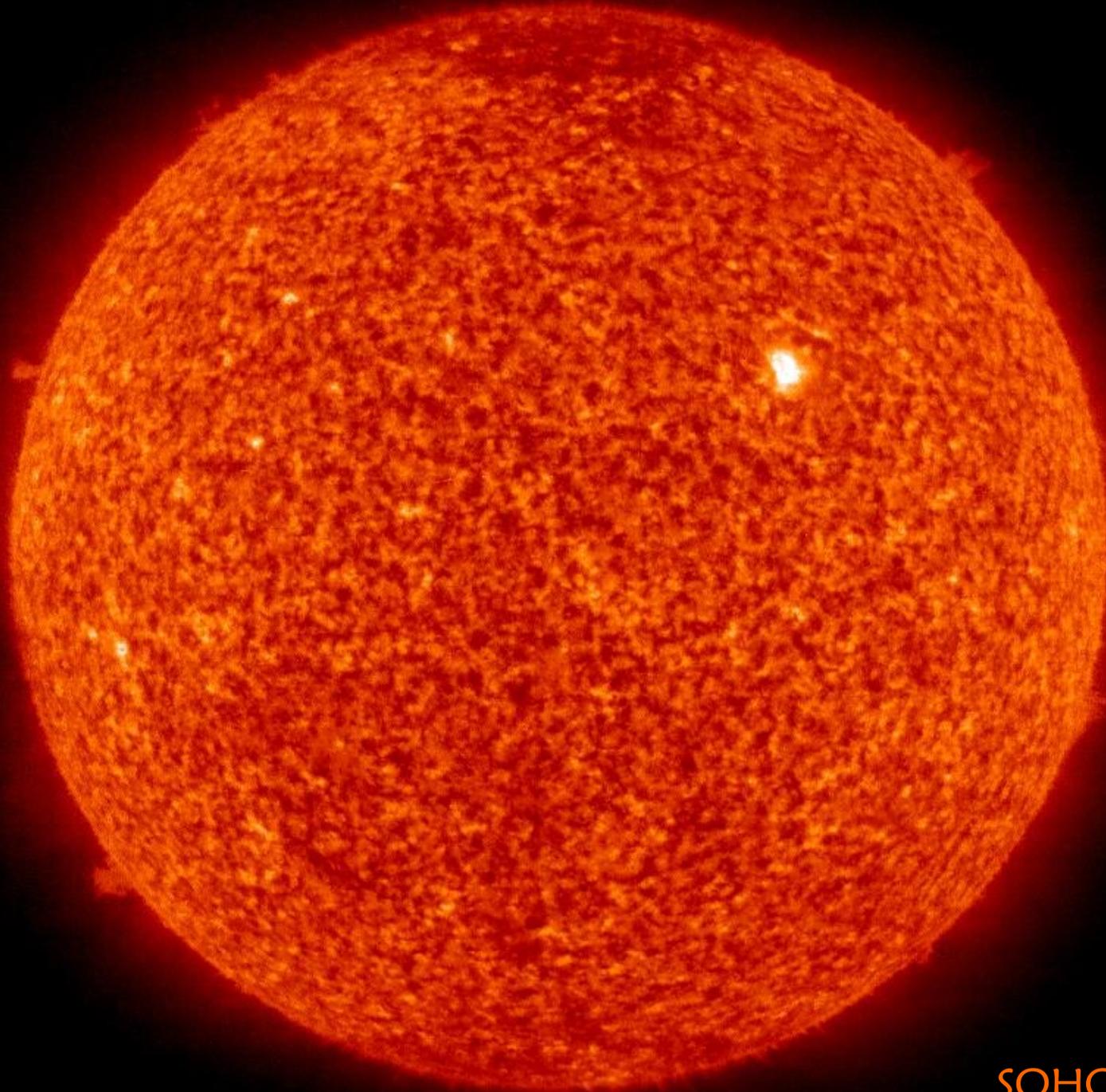


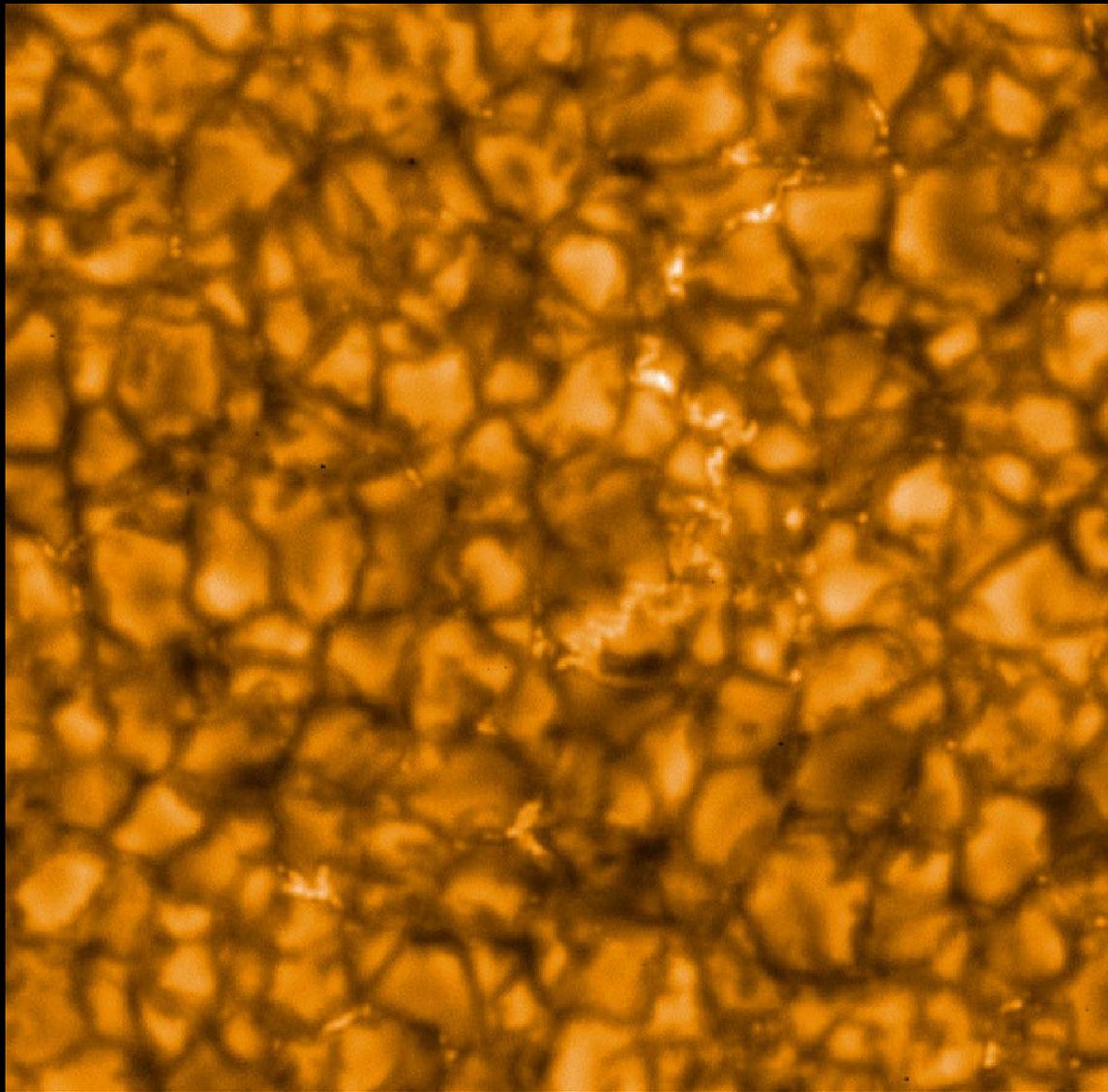


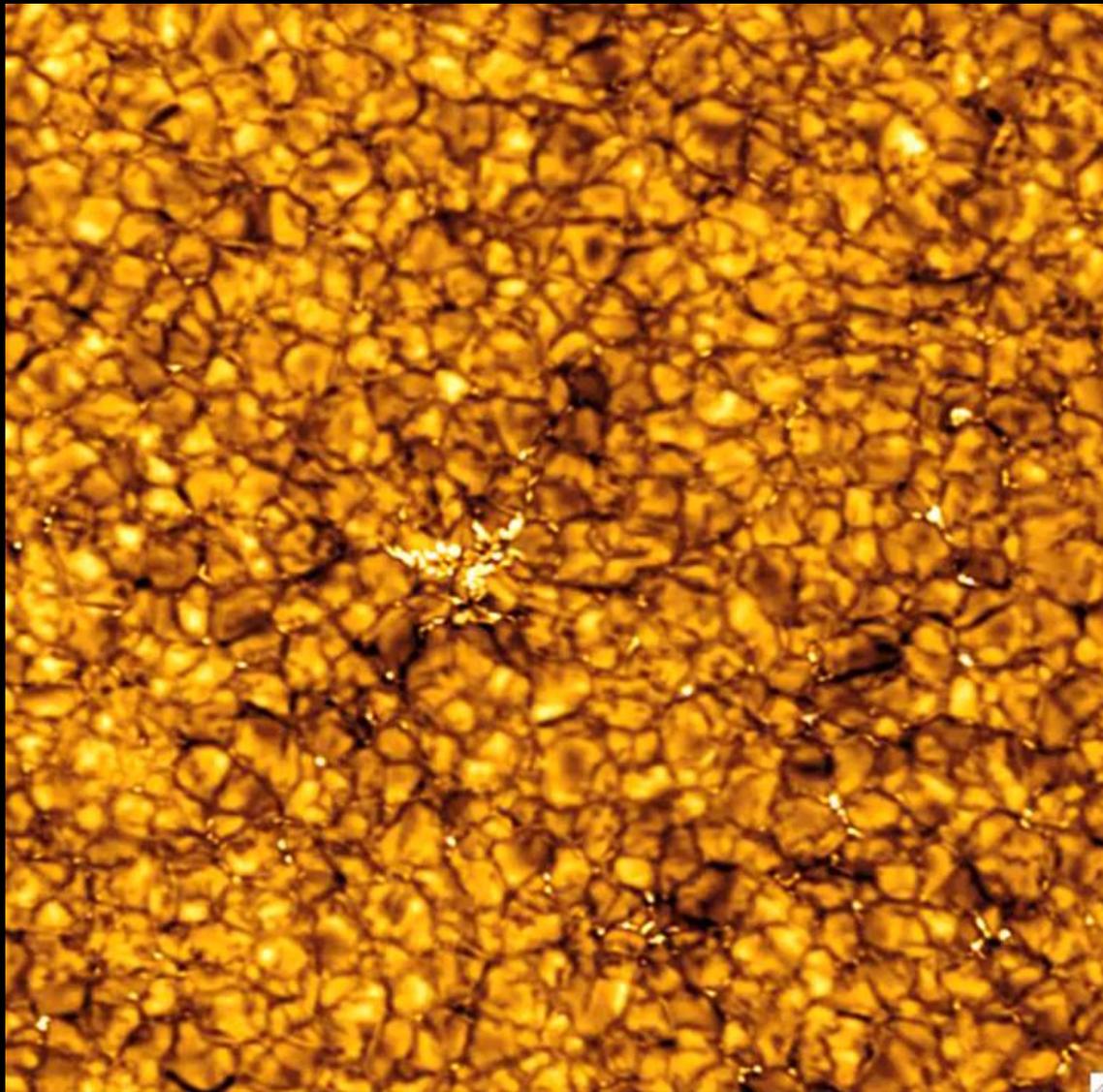
PHOTOSPHERE

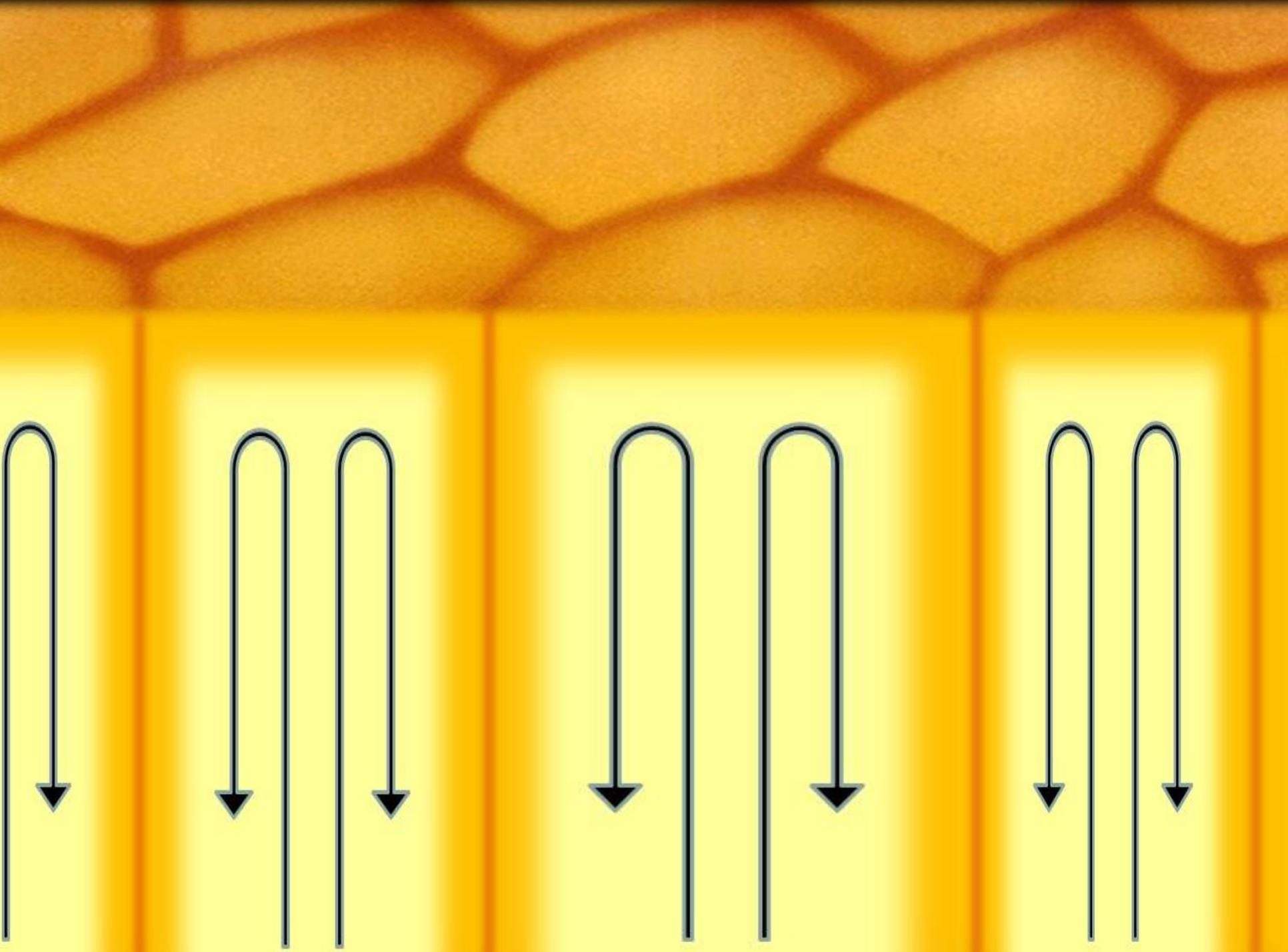


SOHO/NASA/ESA





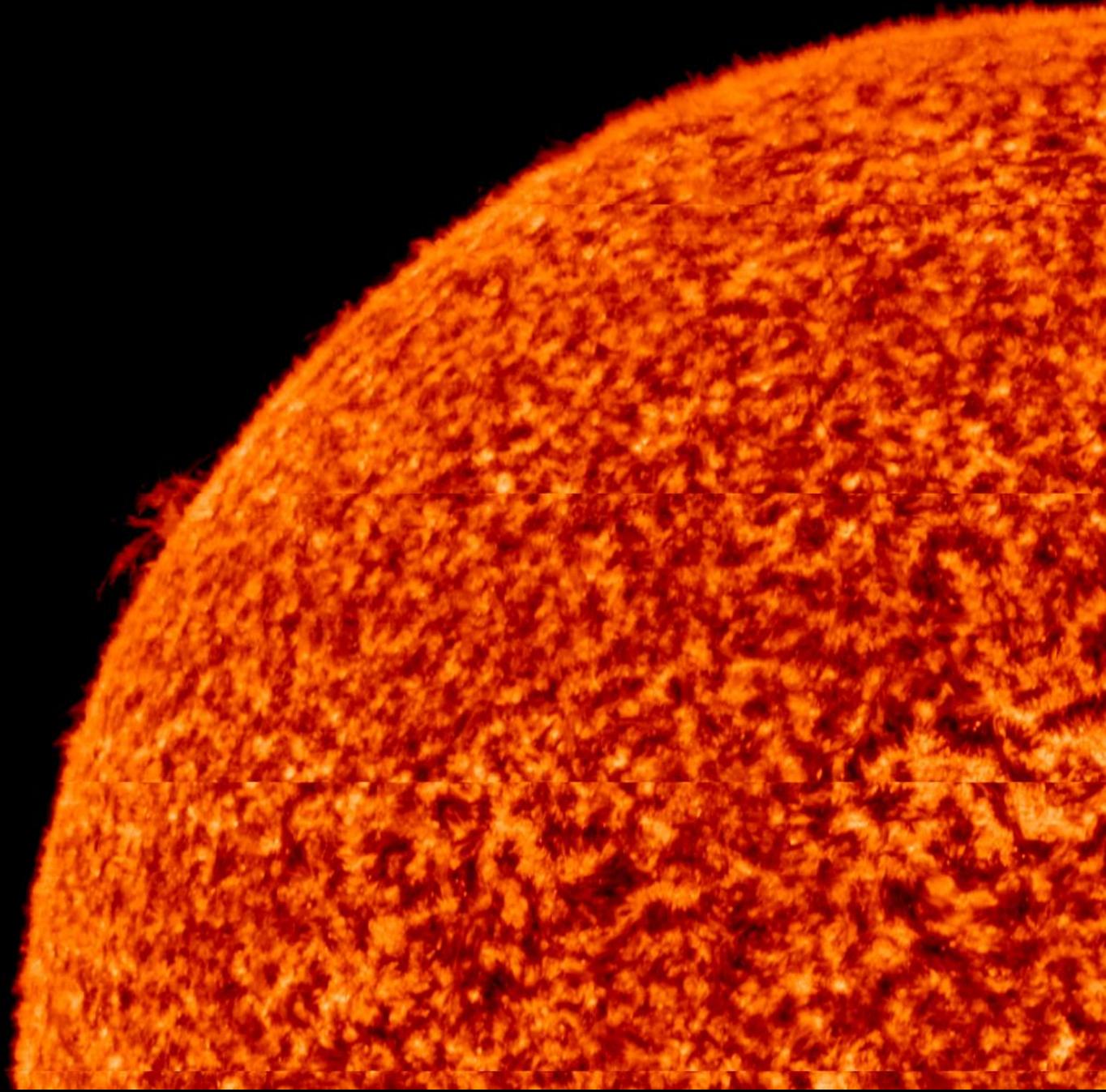


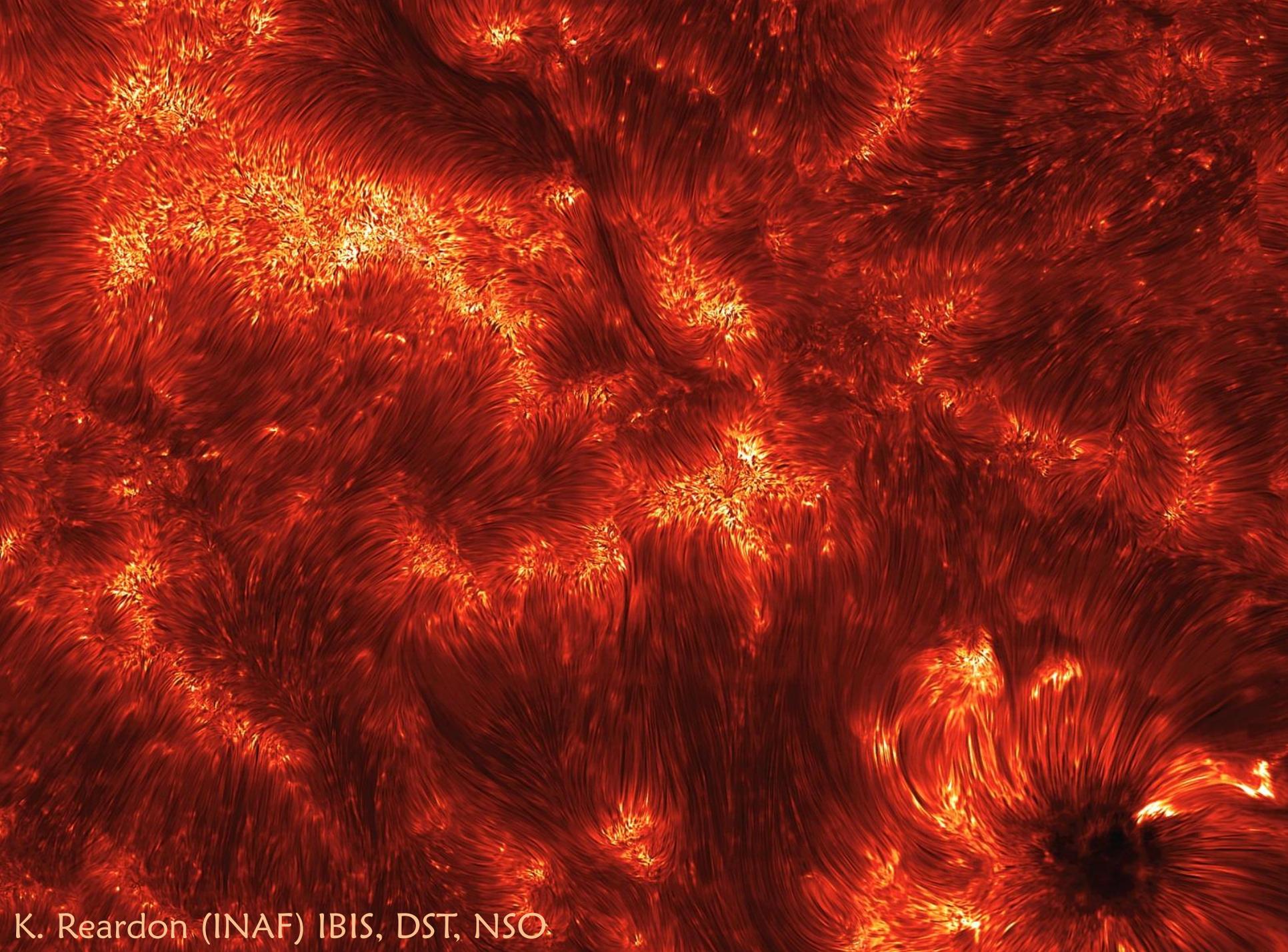


CHROMOSPHERE



Jaime Viltinga / IAP

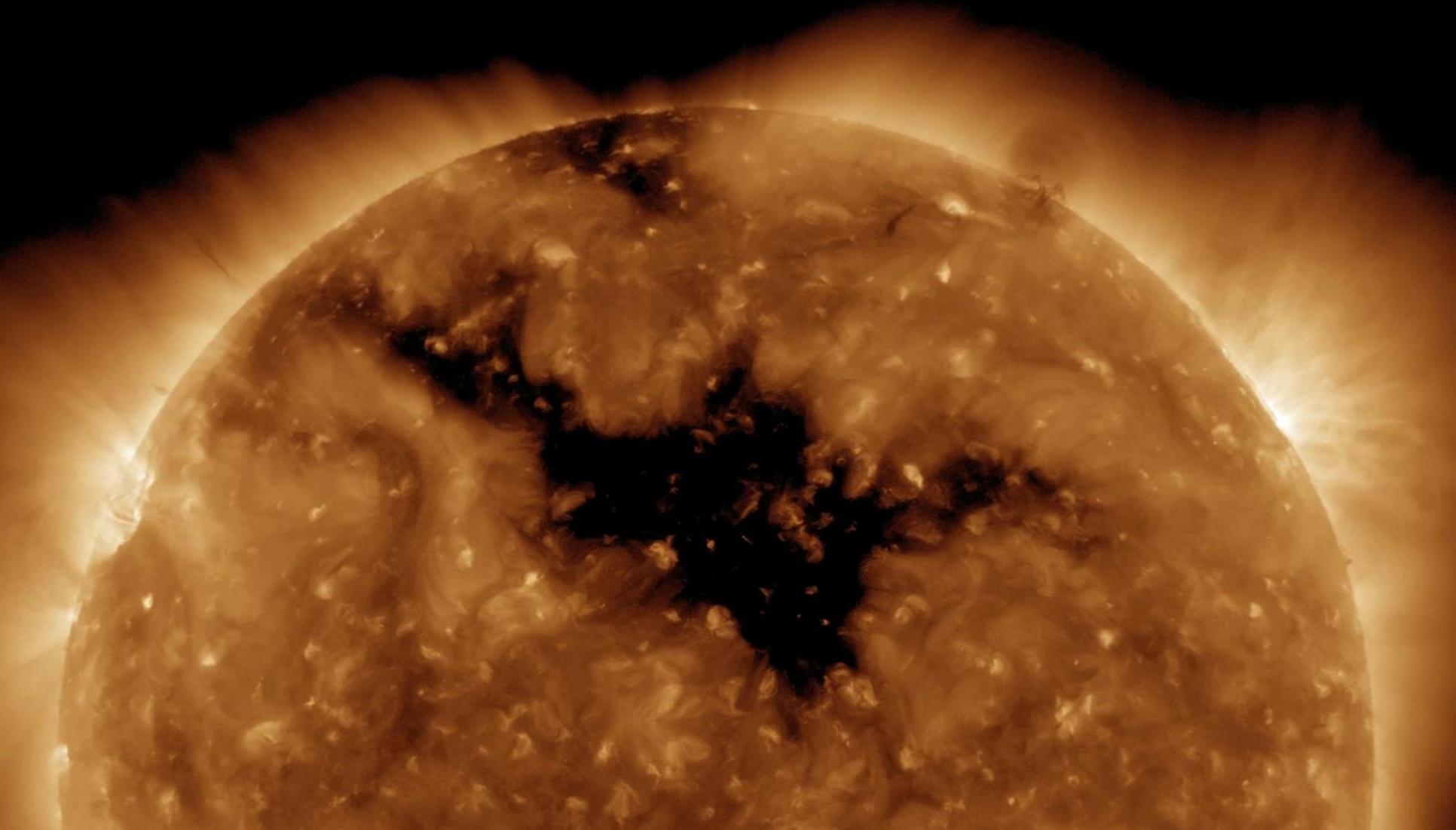


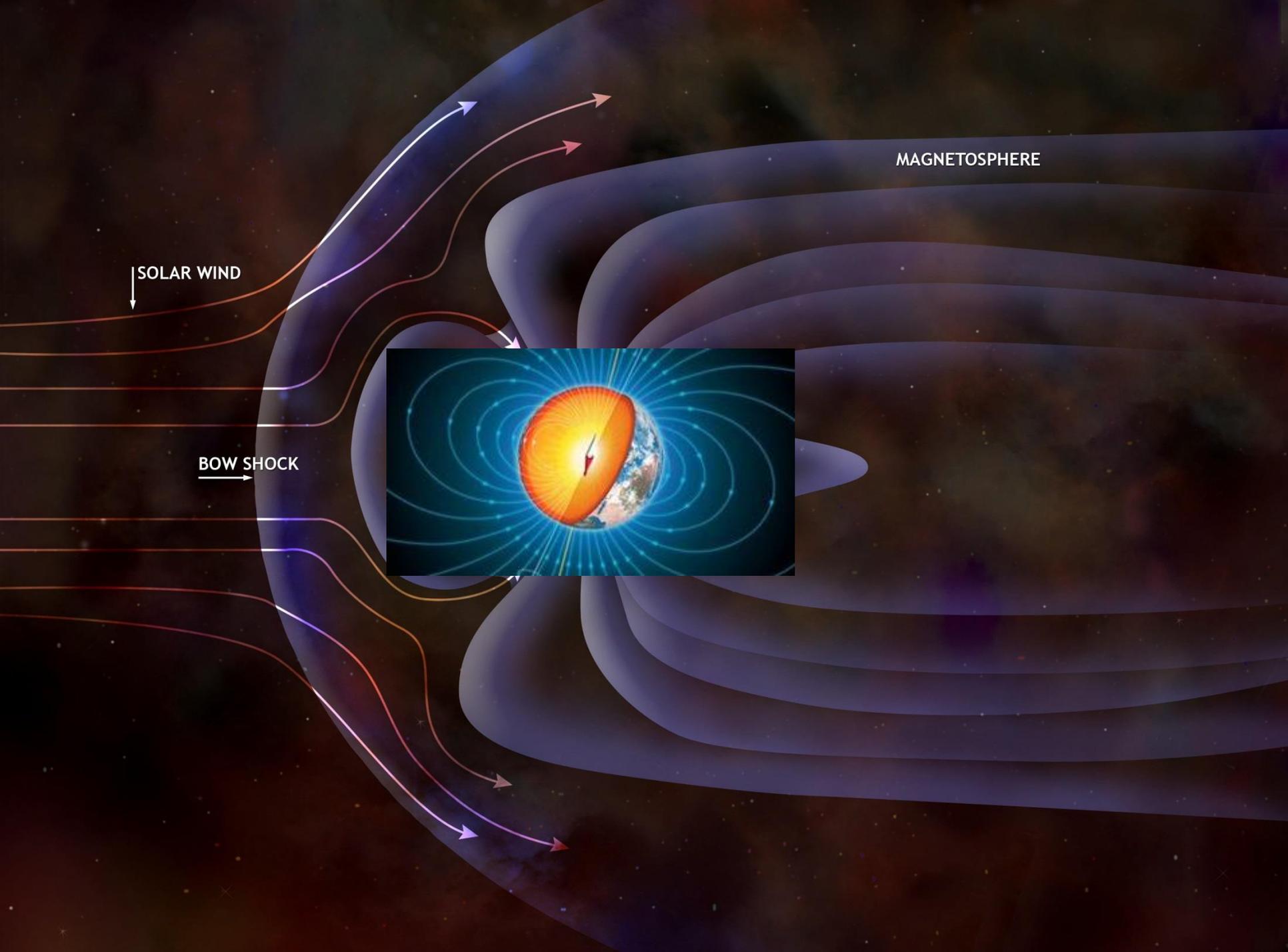


K. Reardon (INAF) IBIS, DST, NSO

CORONA



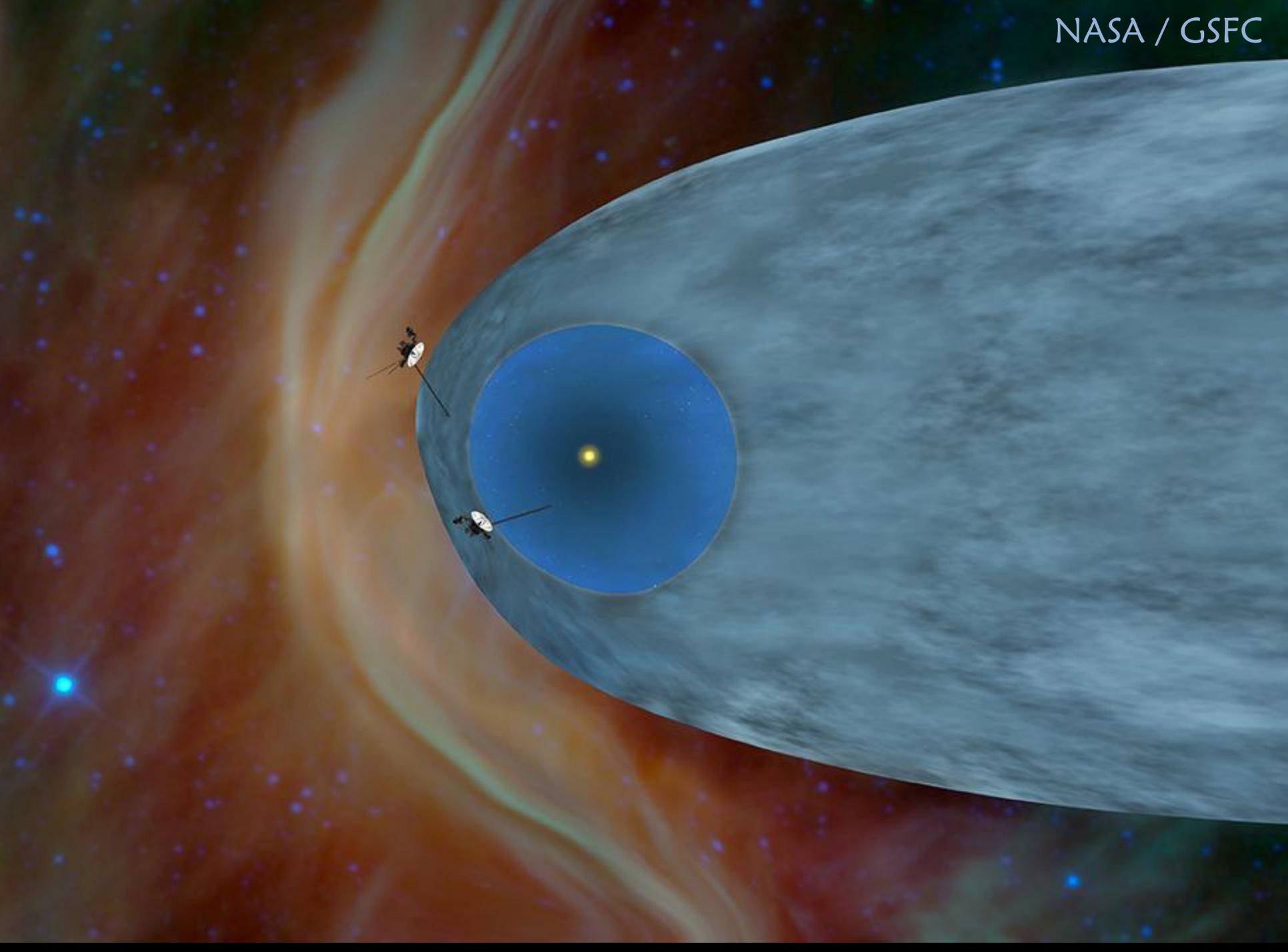


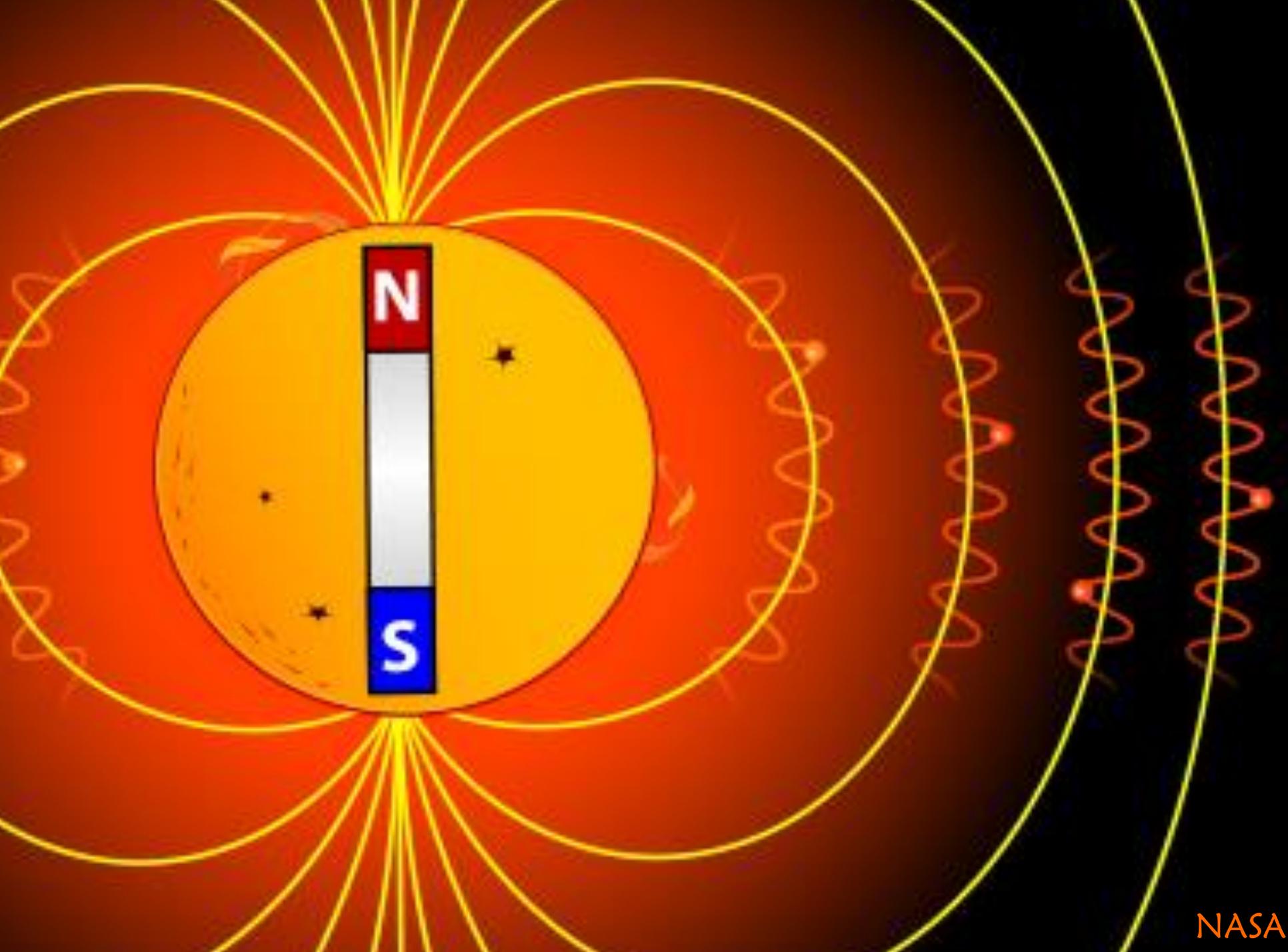


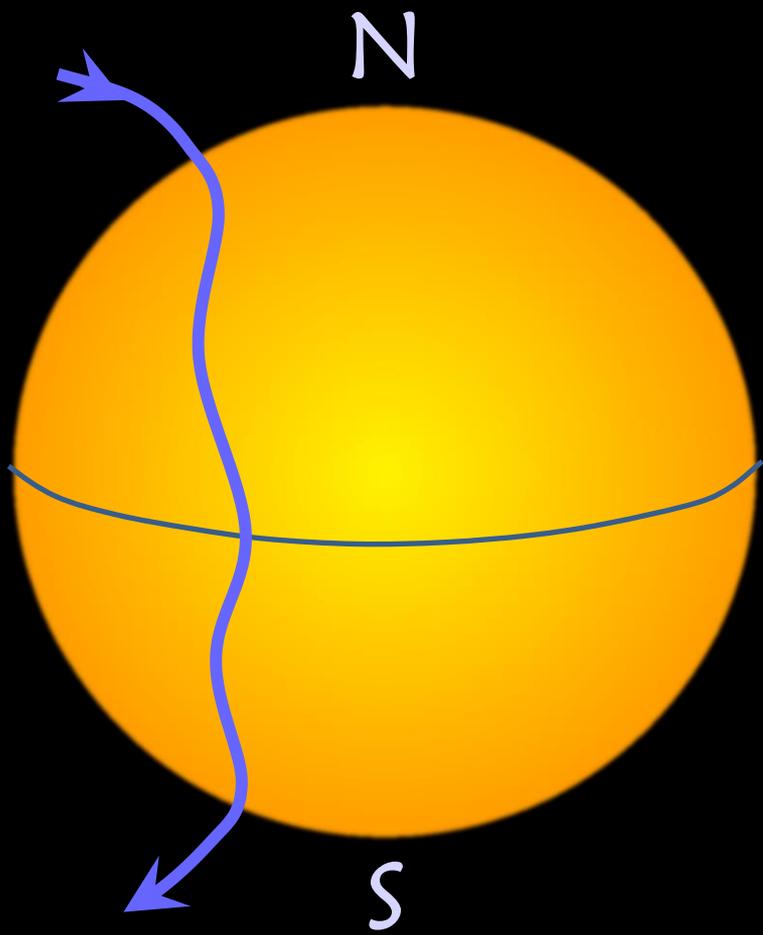
SOLAR WIND

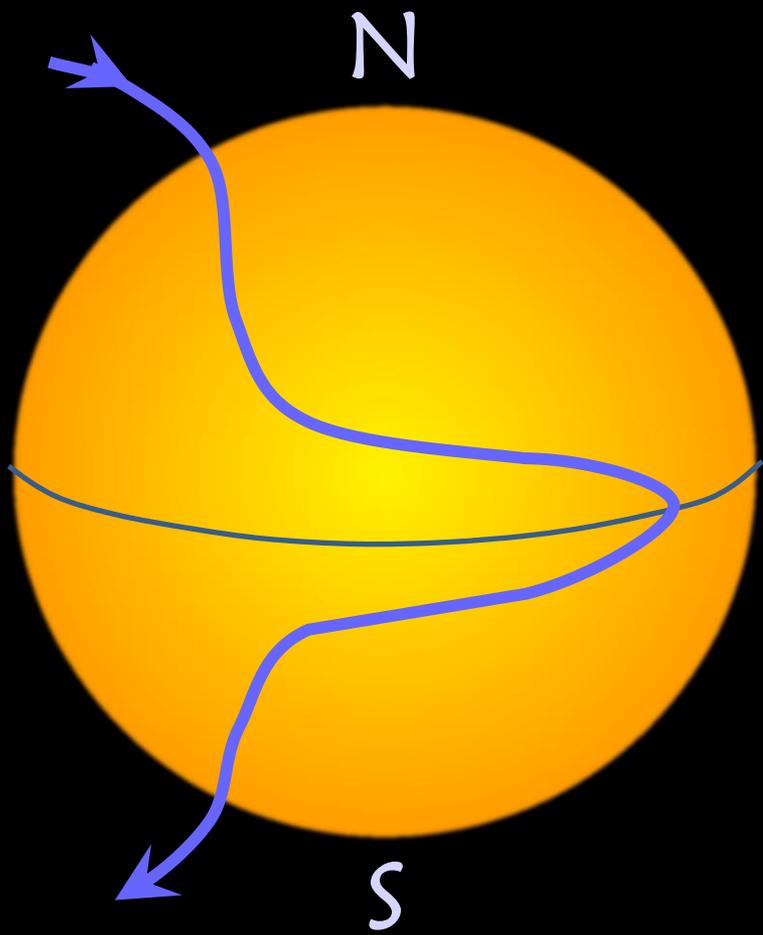
BOW SHOCK

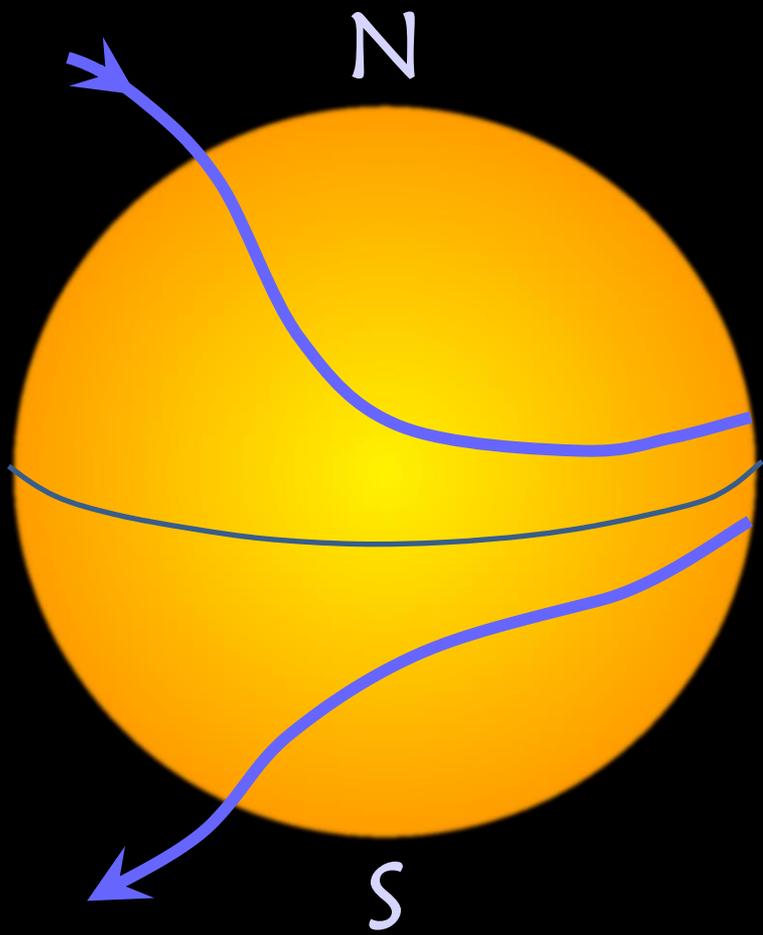
MAGNETOSPHERE

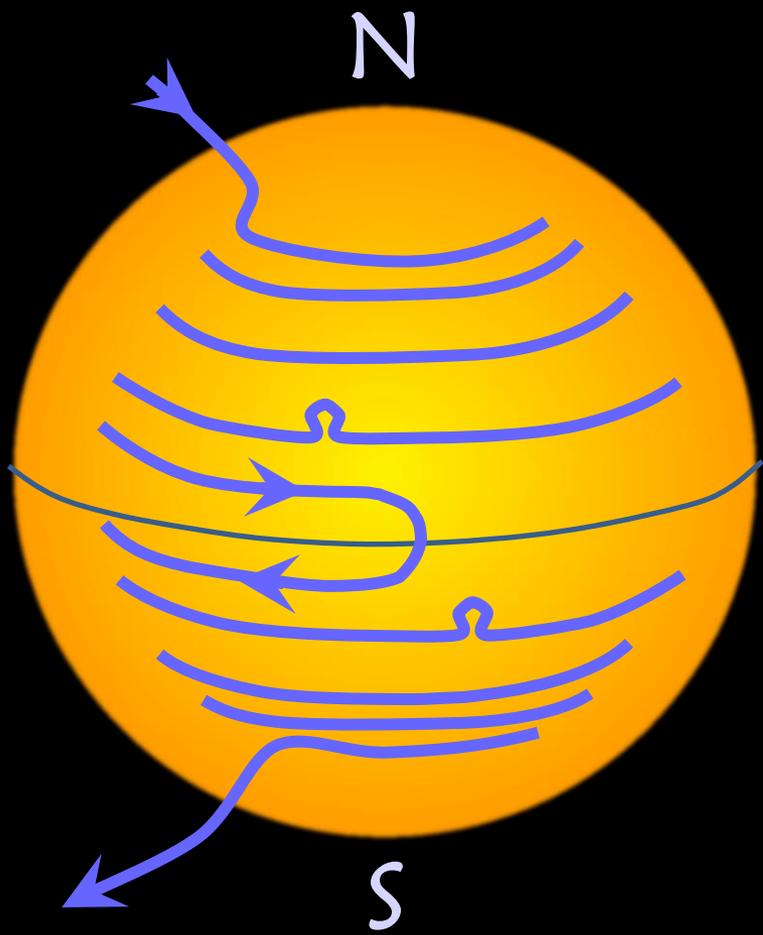


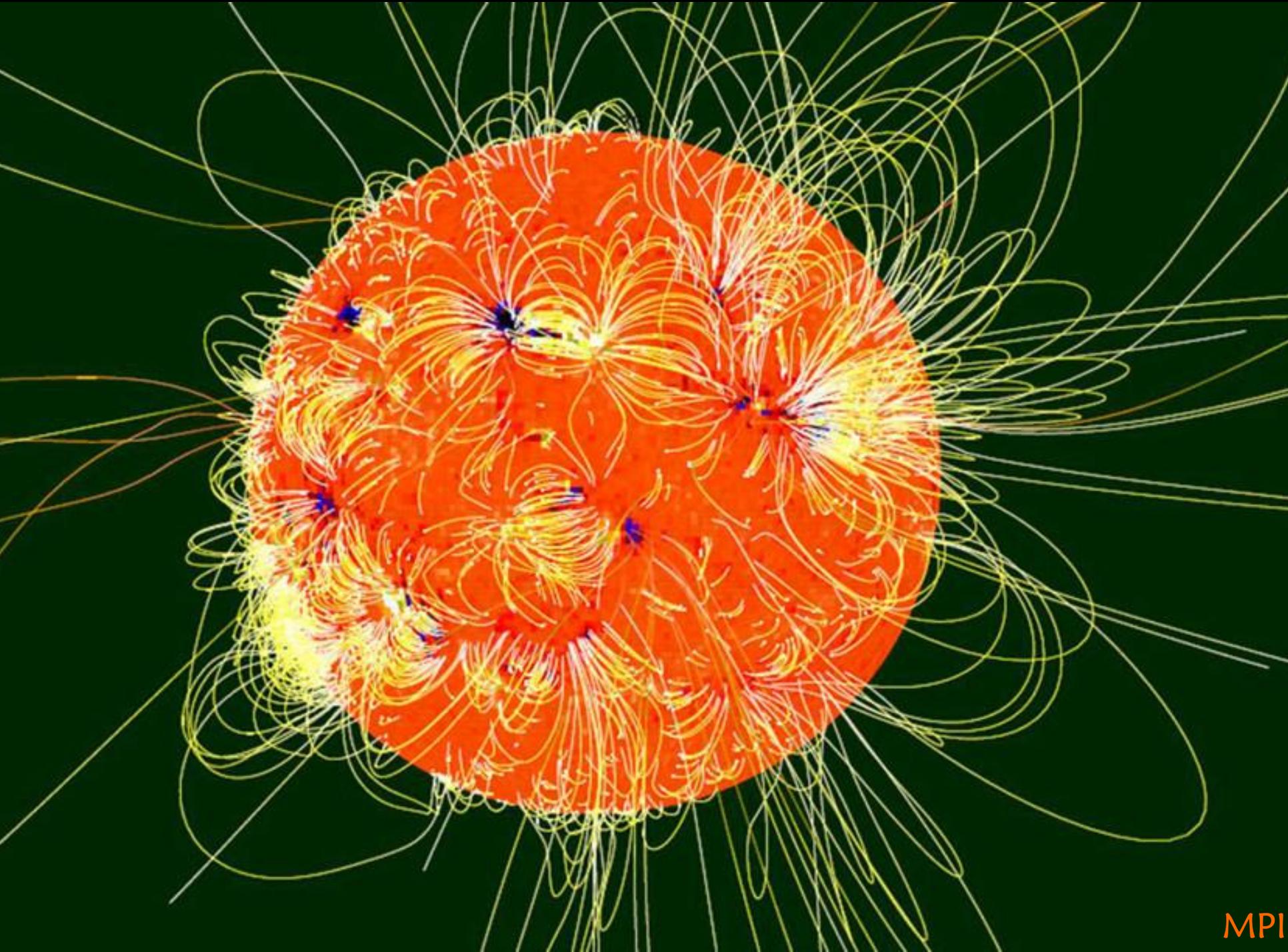


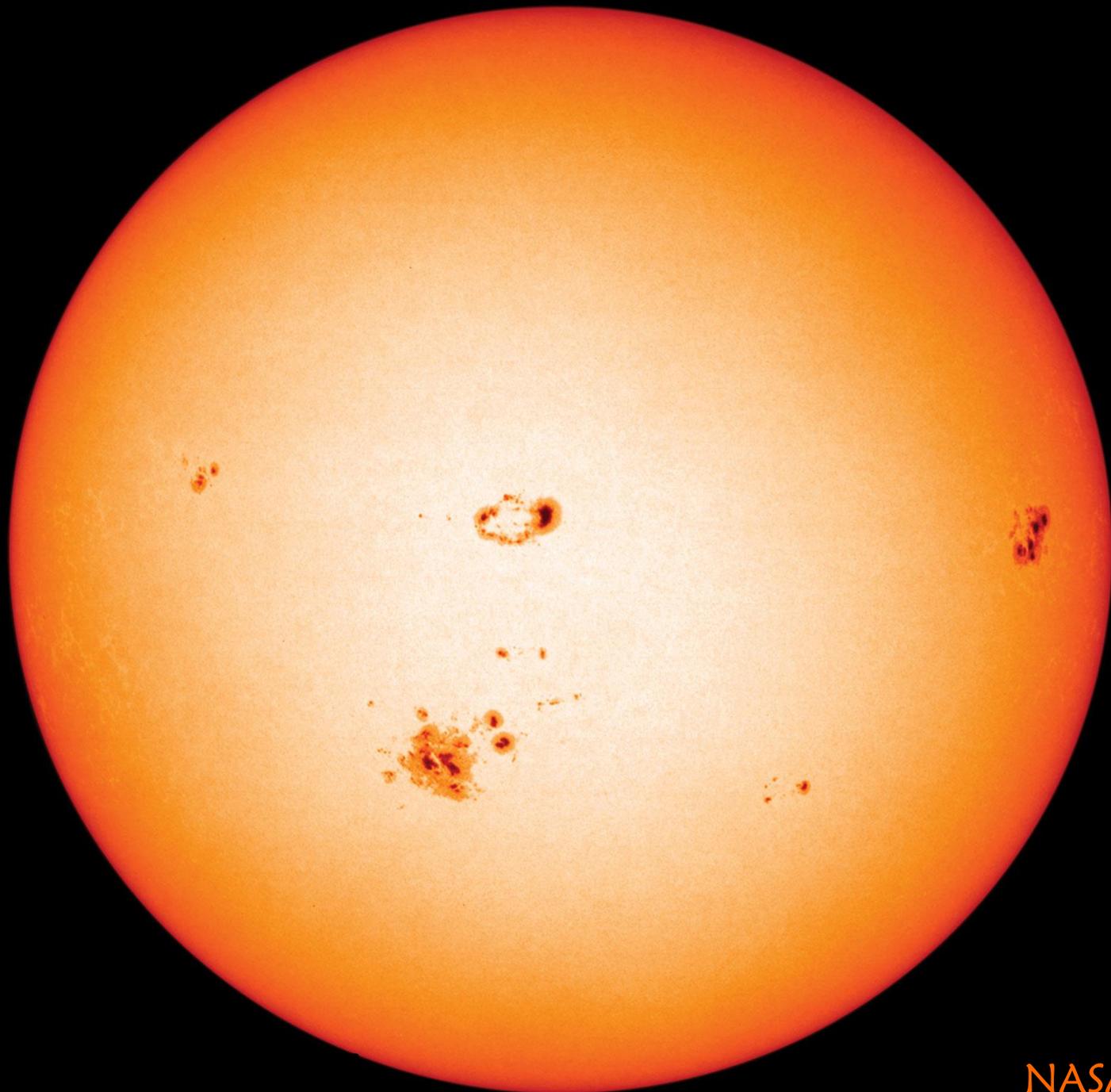




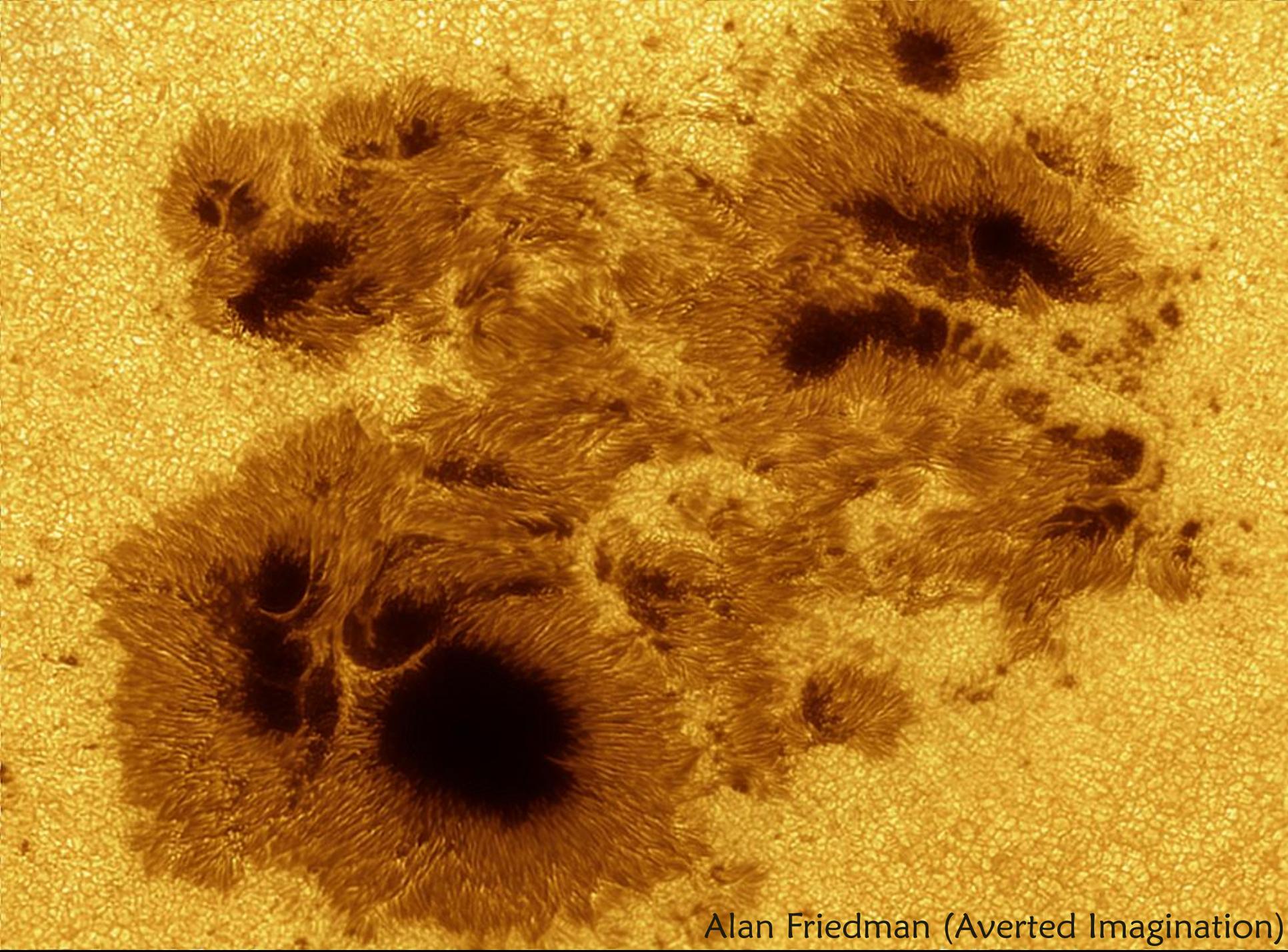




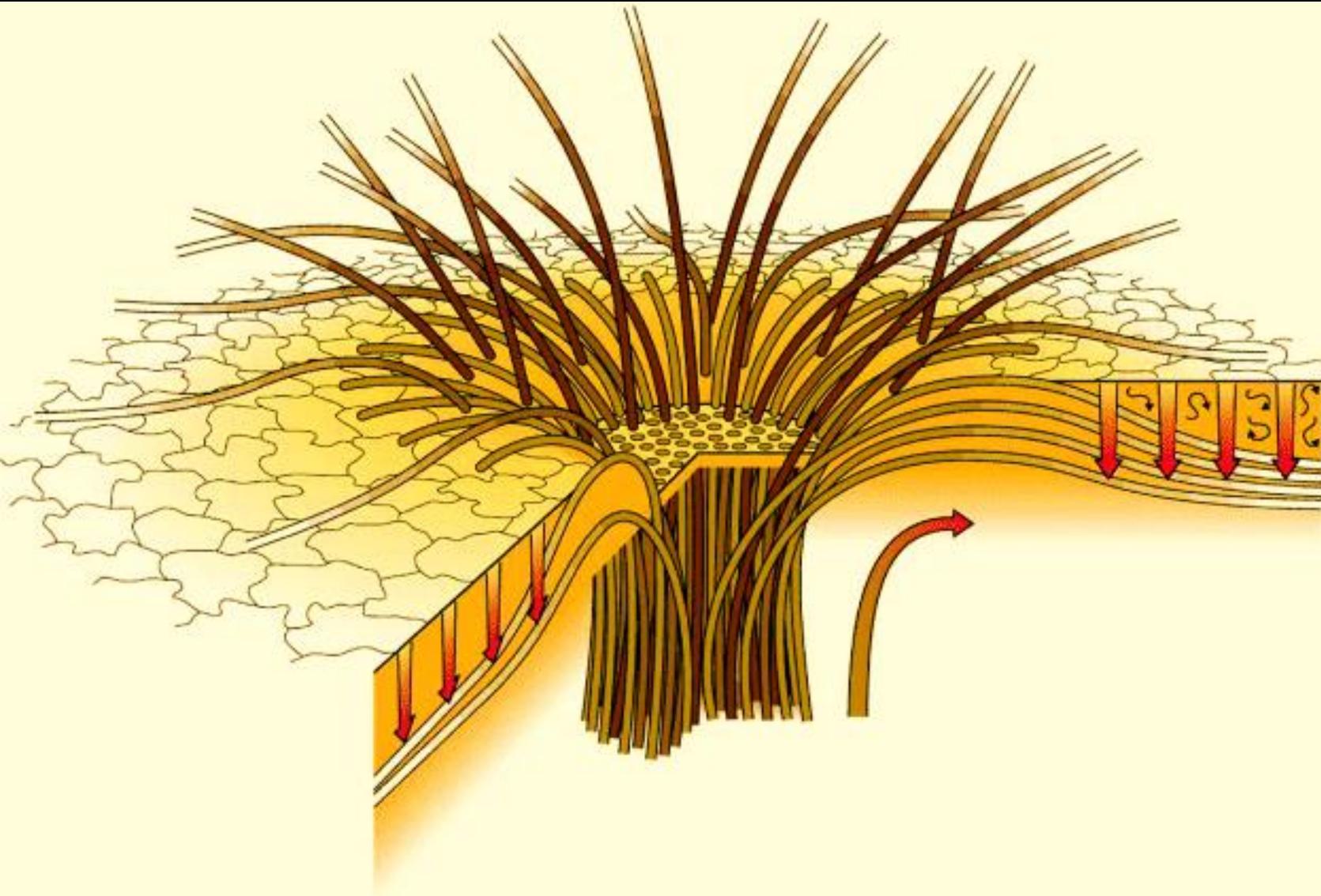


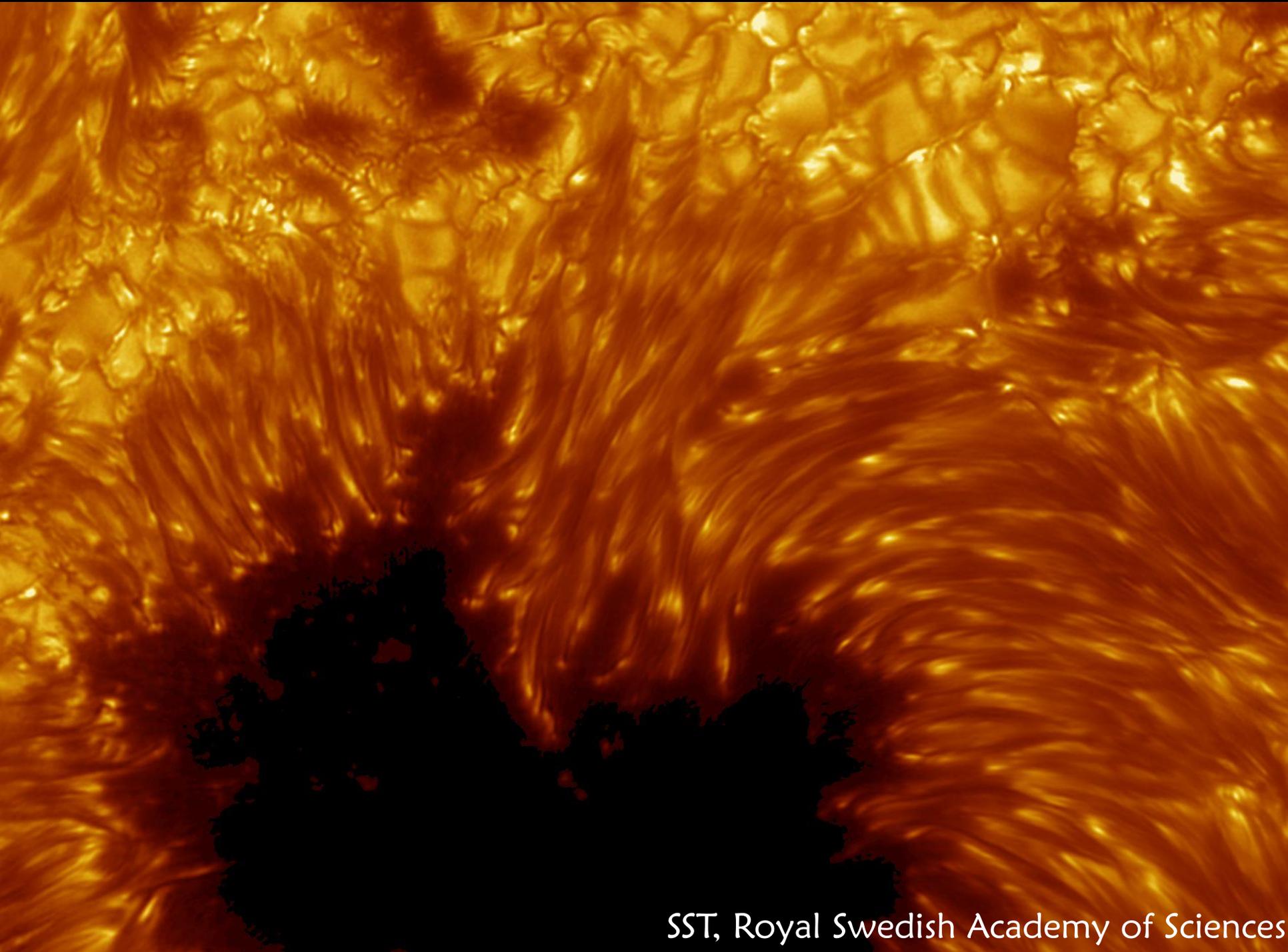




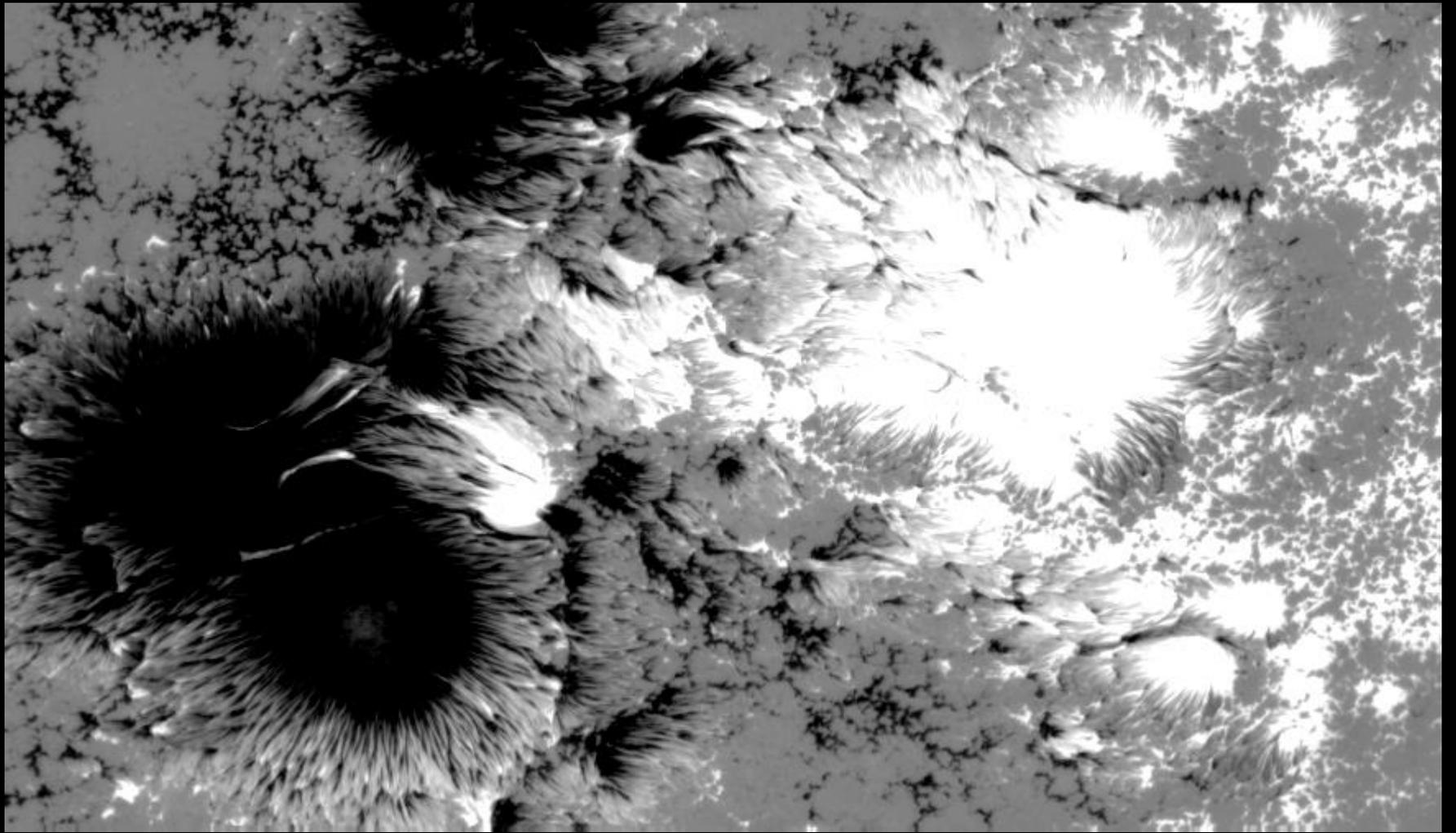


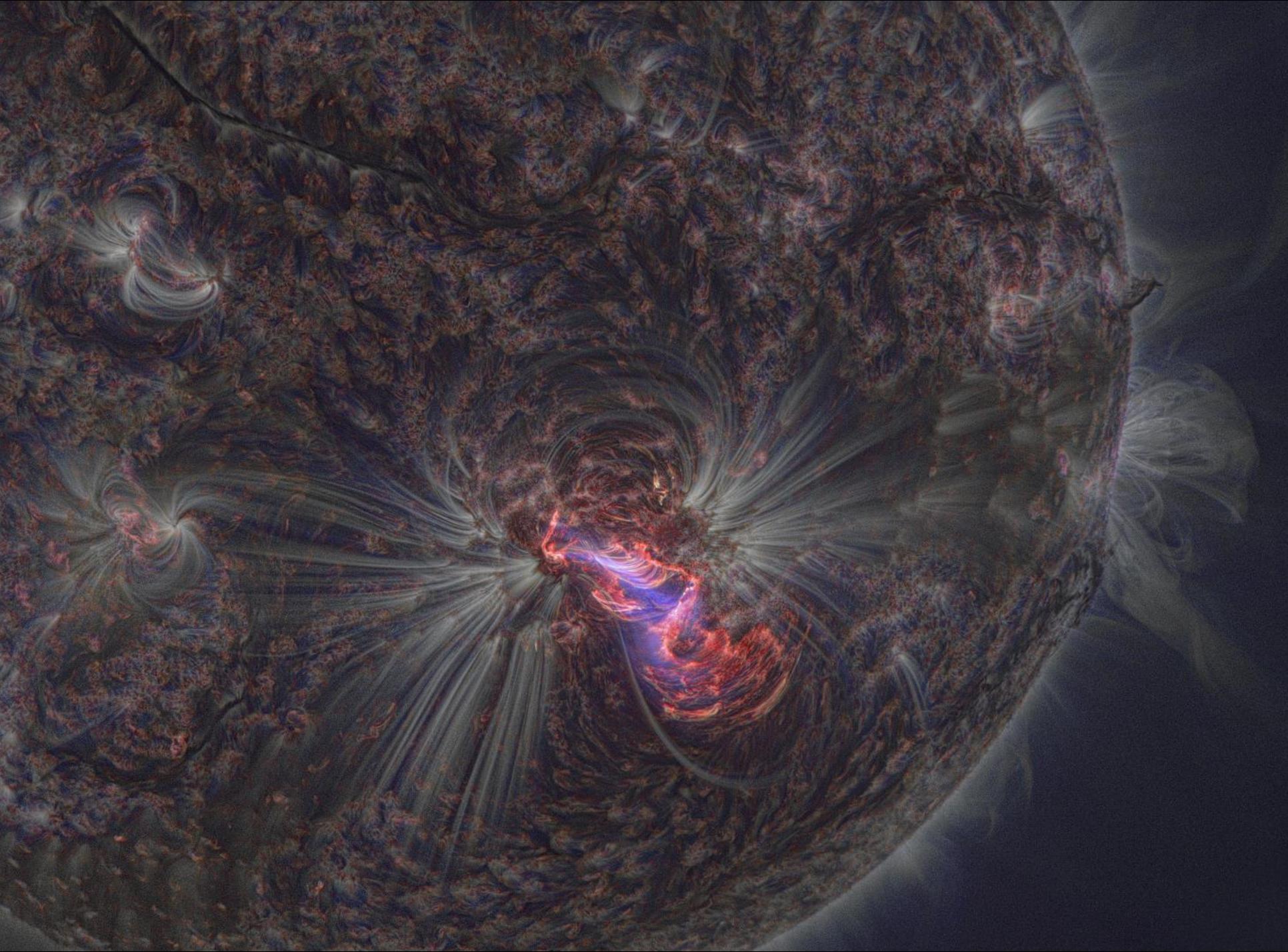
Alan Friedman (Averted Imagination)

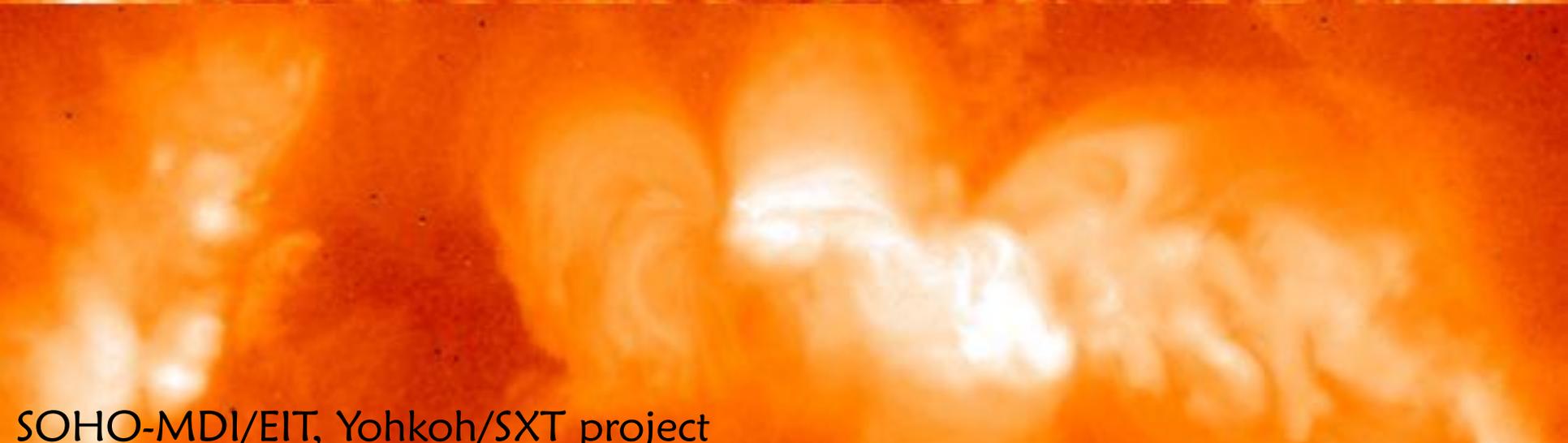
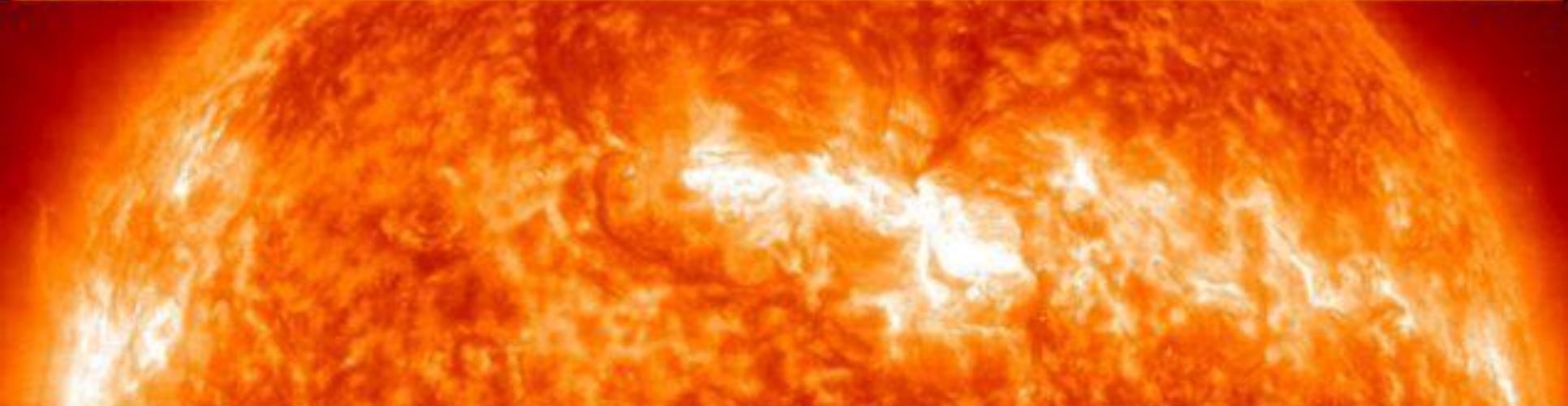


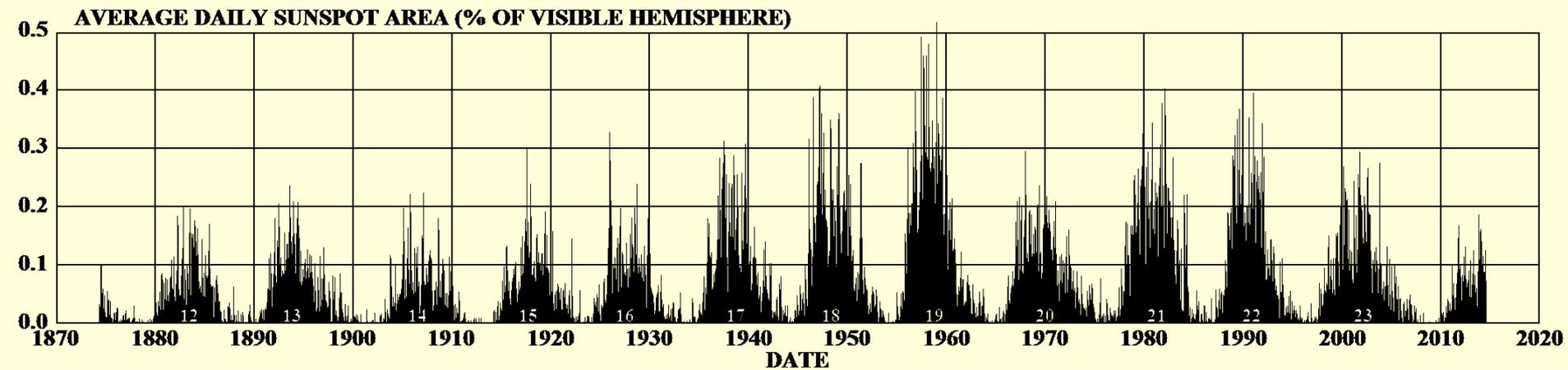
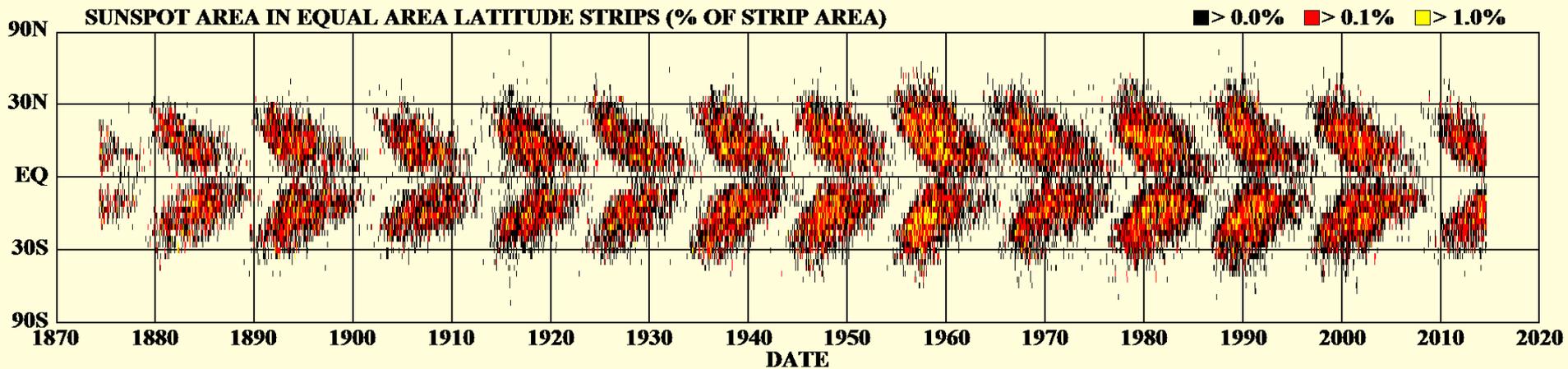


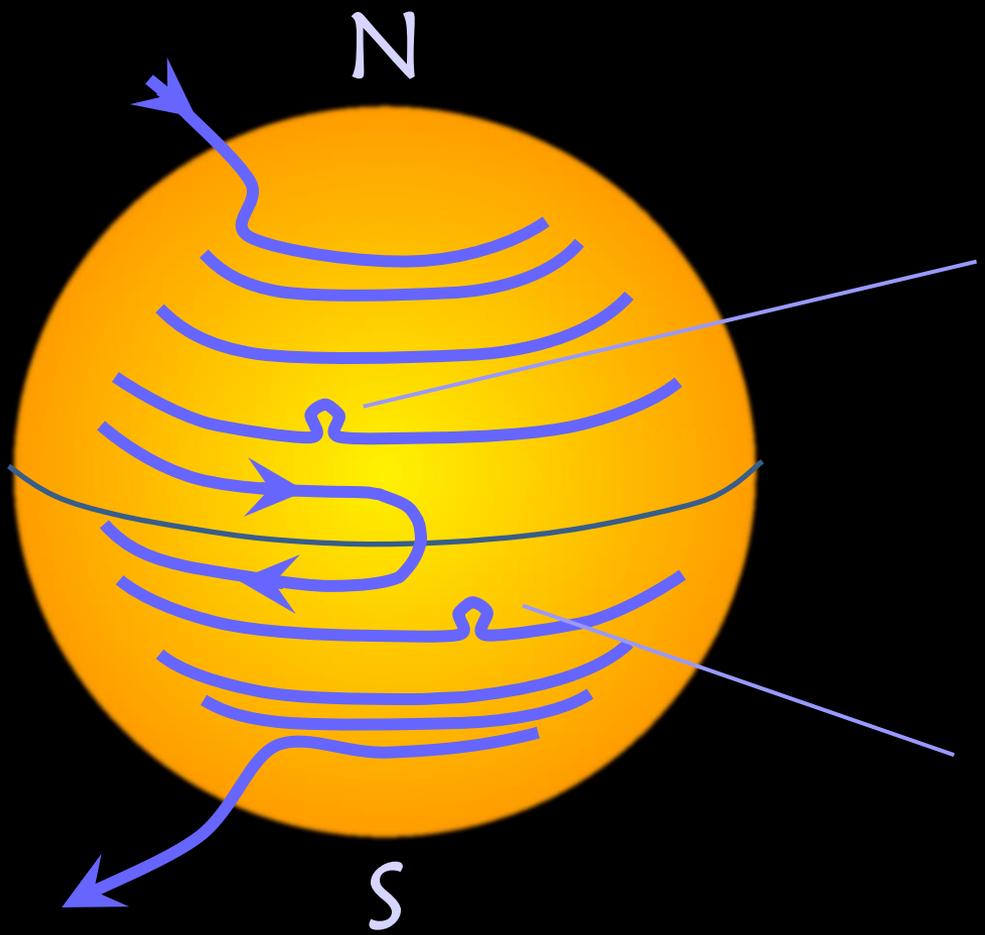
SST, Royal Swedish Academy of Sciences

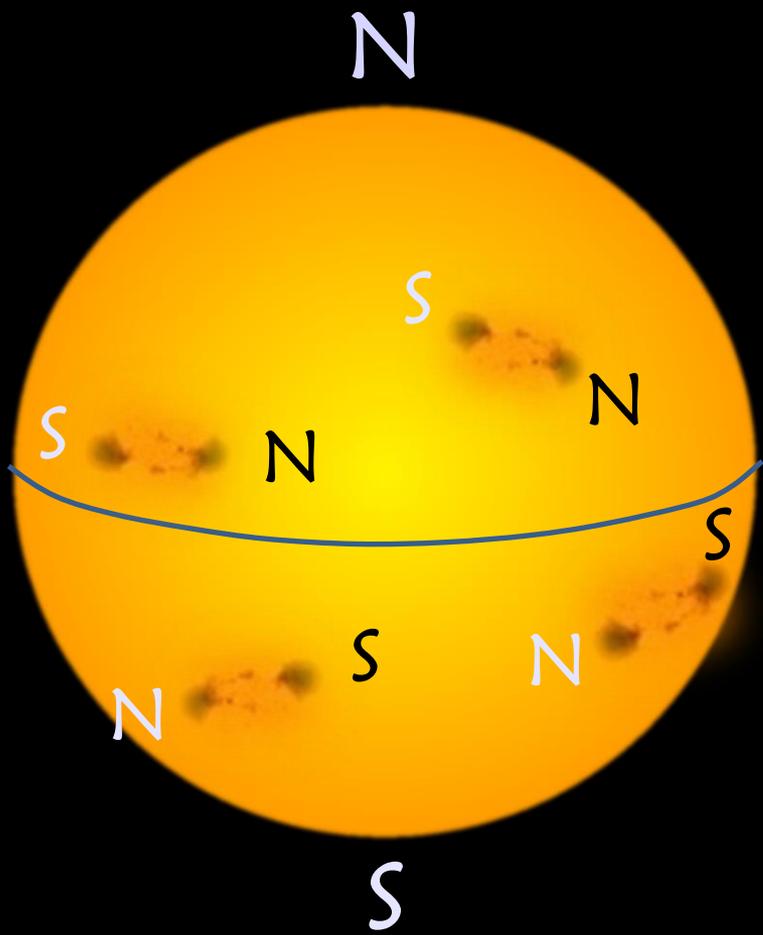






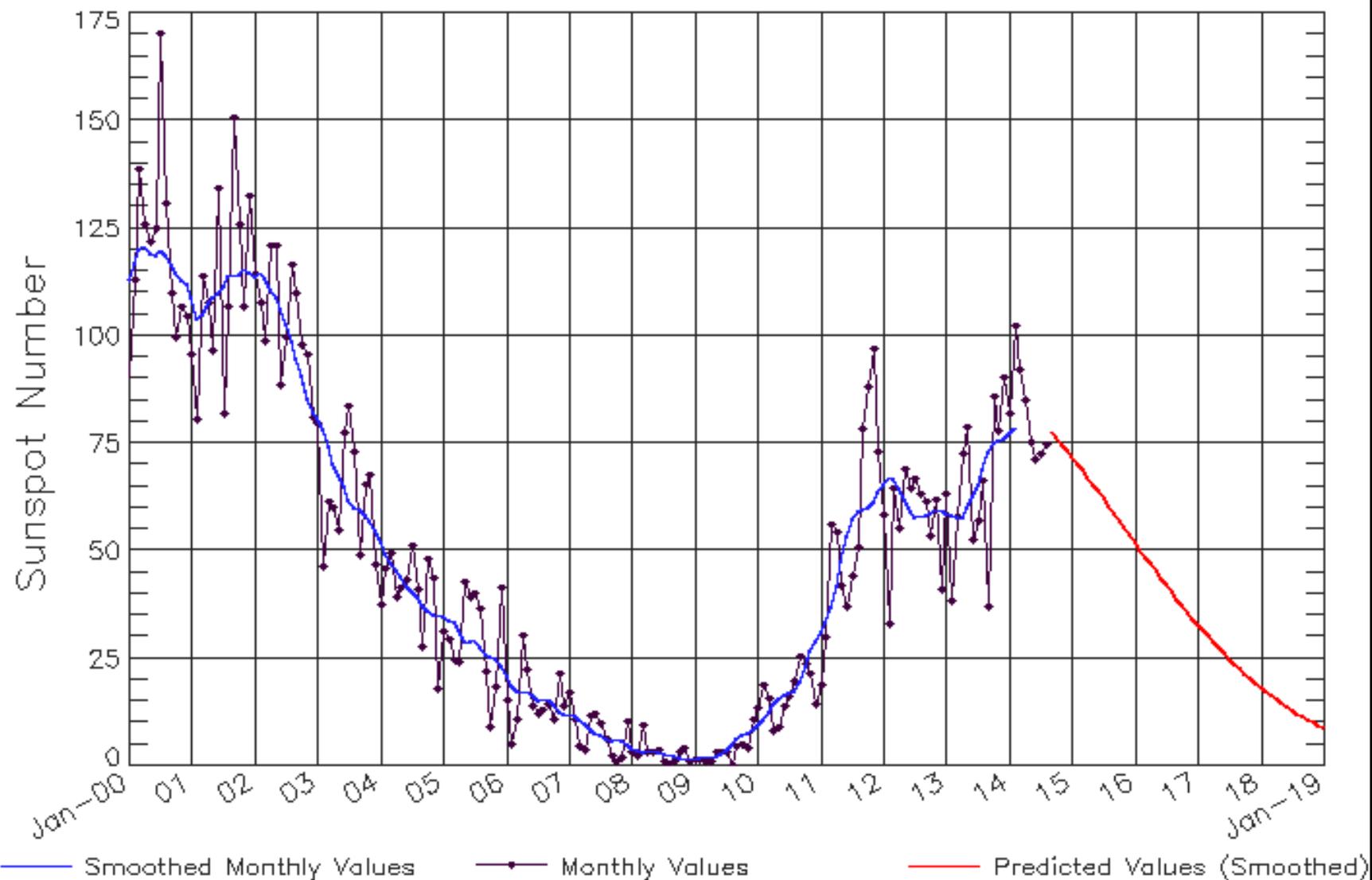


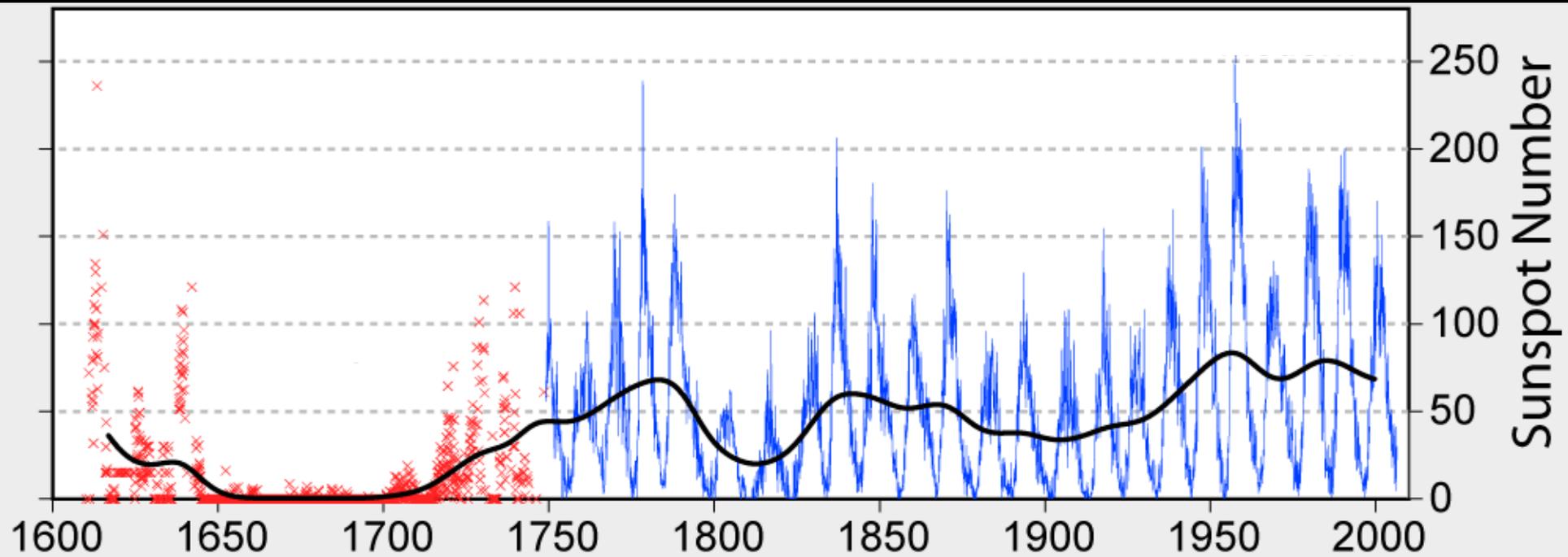




ISES Solar Cycle Sunspot Number Progression

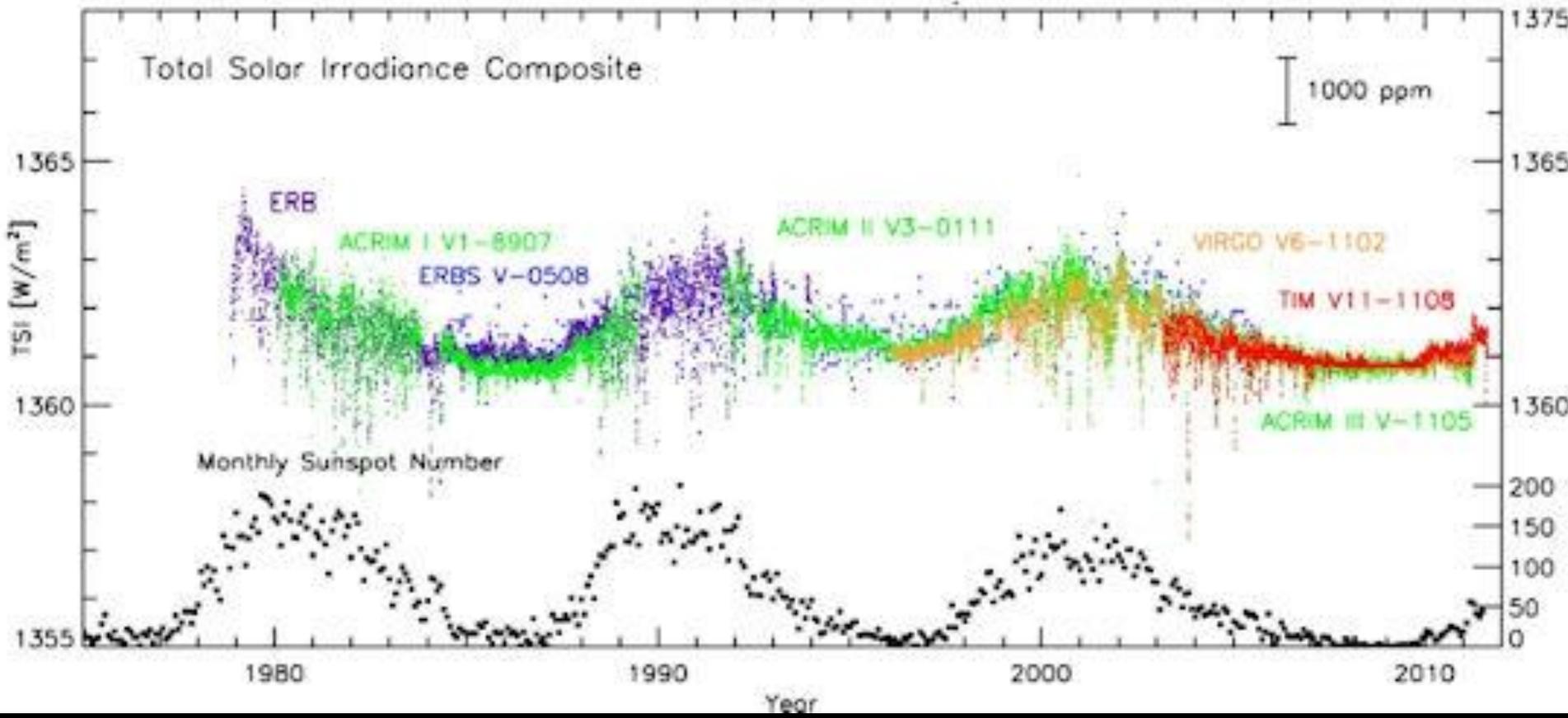
Observed data through Aug 2014

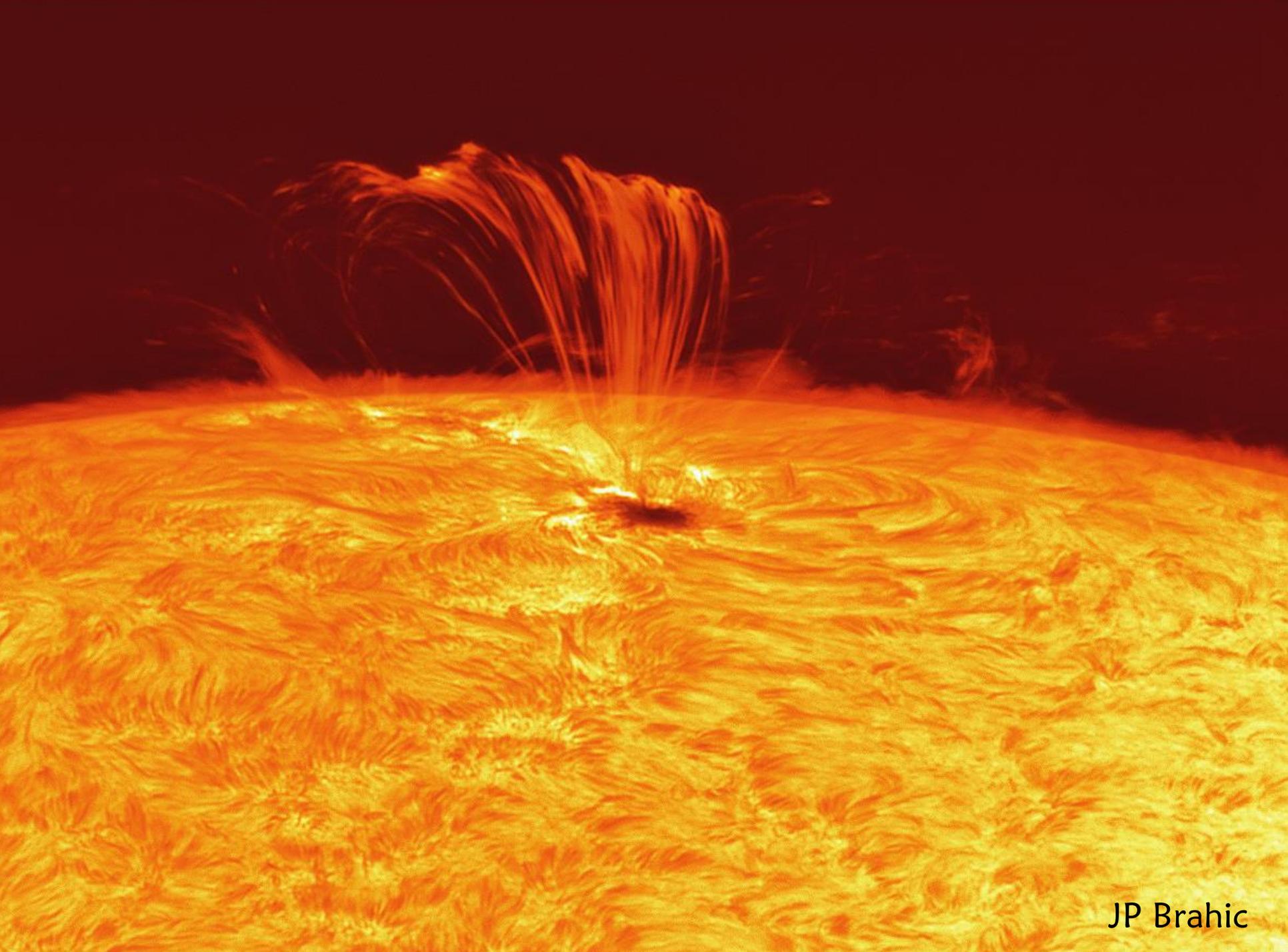






Abraham Hondius





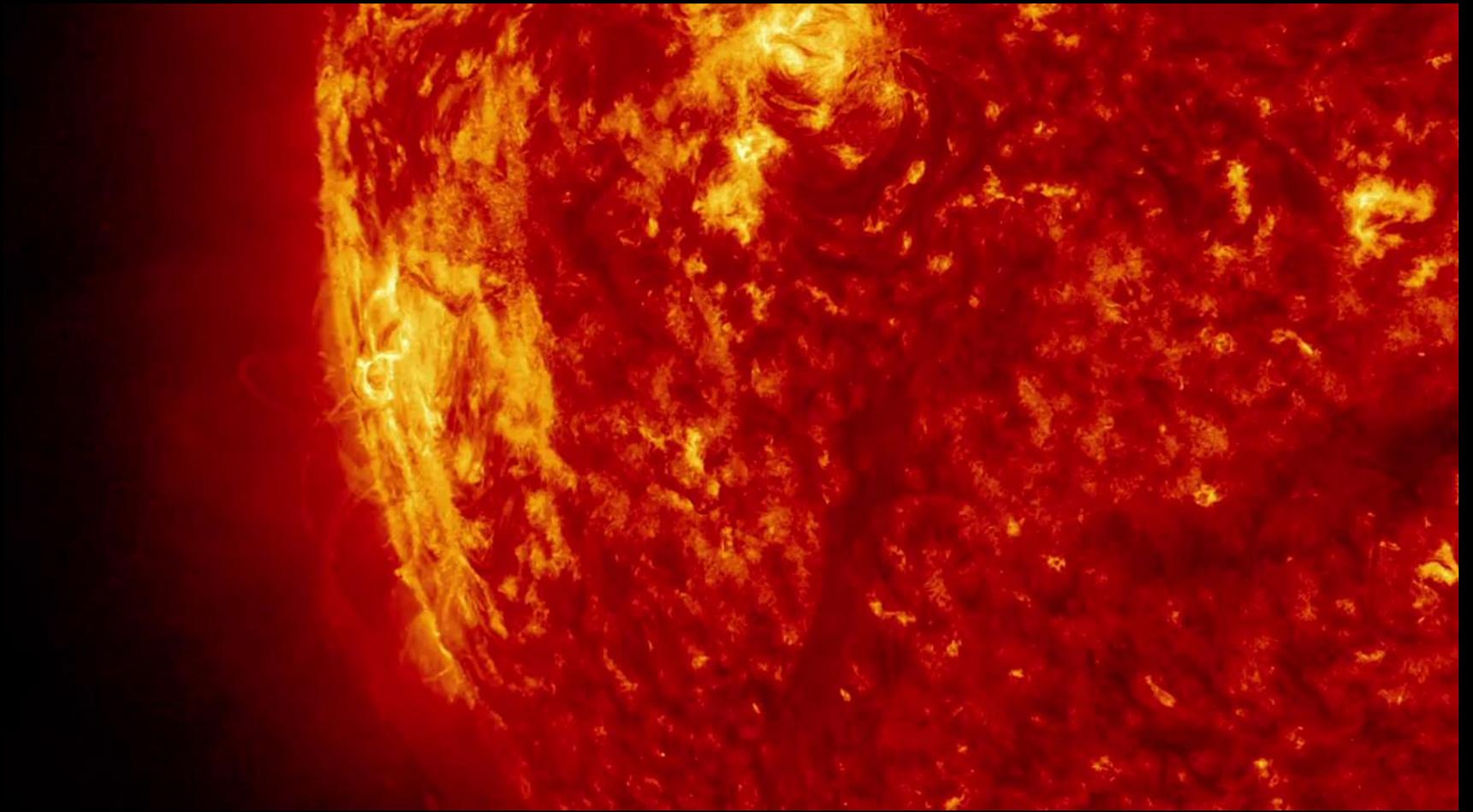
JP Brahic

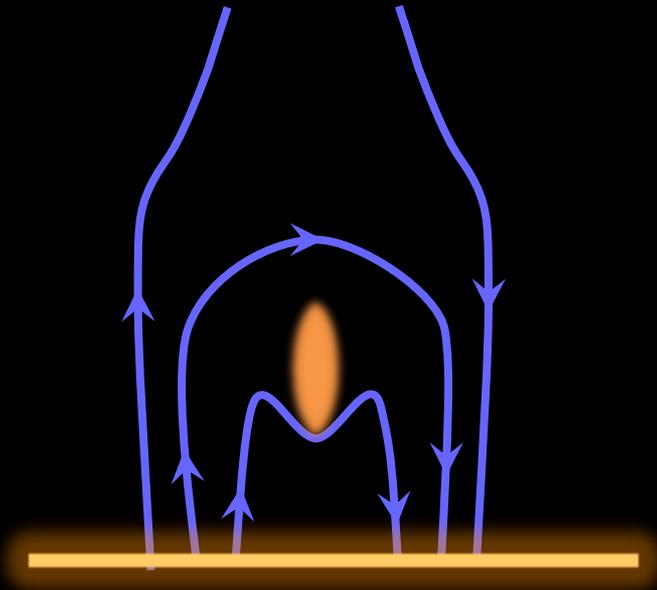


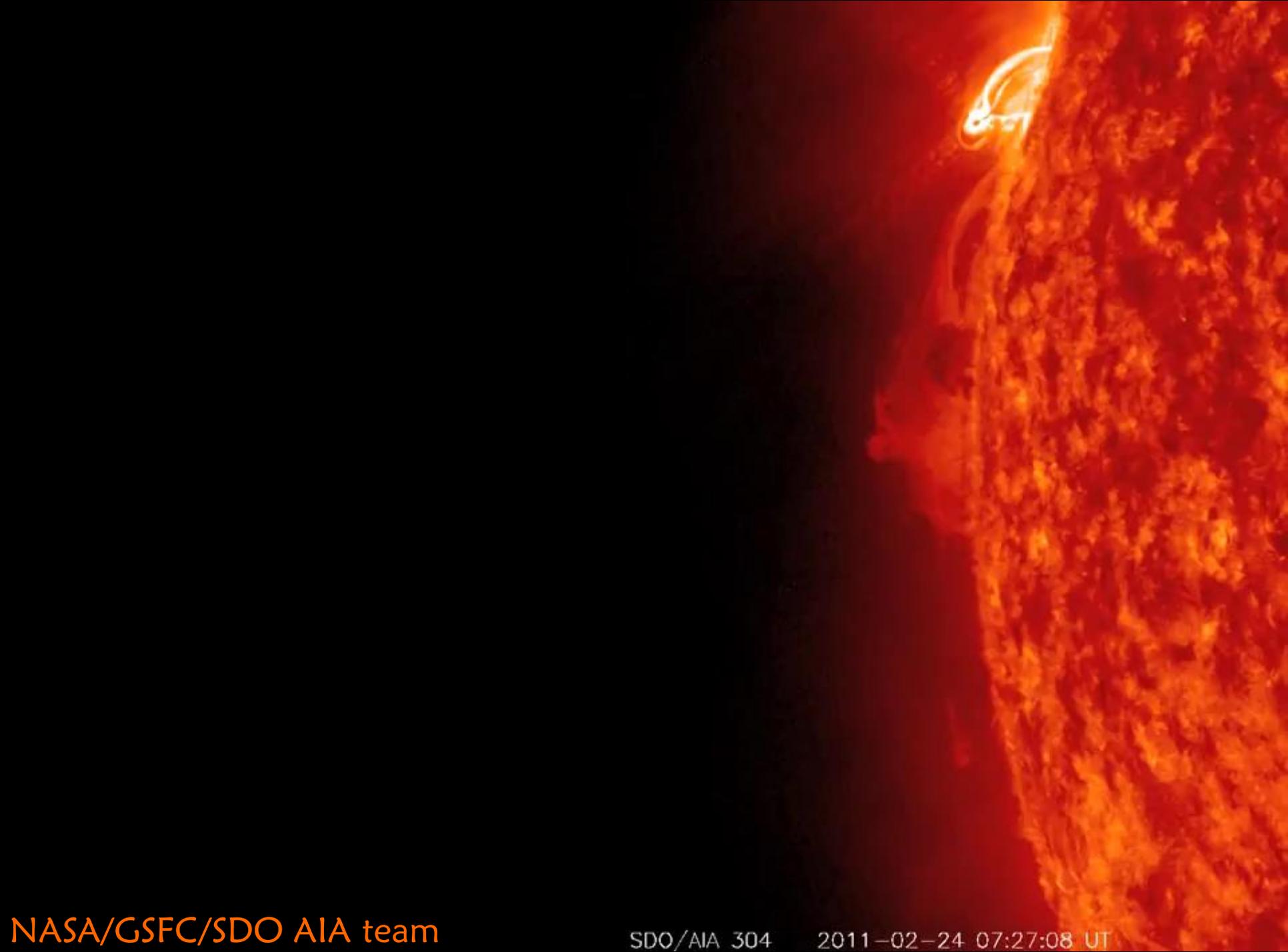
Greg Piepol

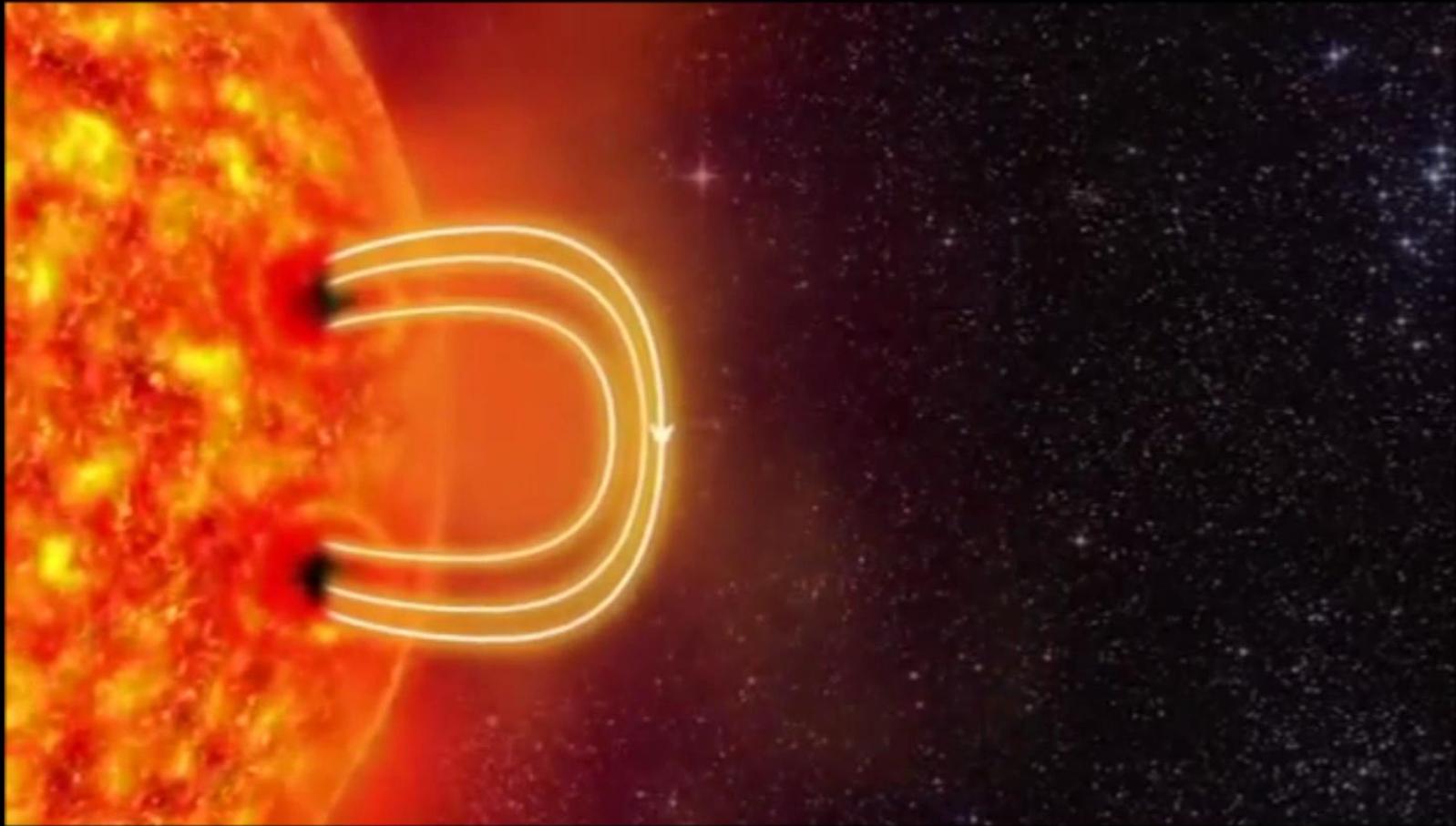


Solar Dynamics Observatory, SVS, GSFC, NASA









km

500

400

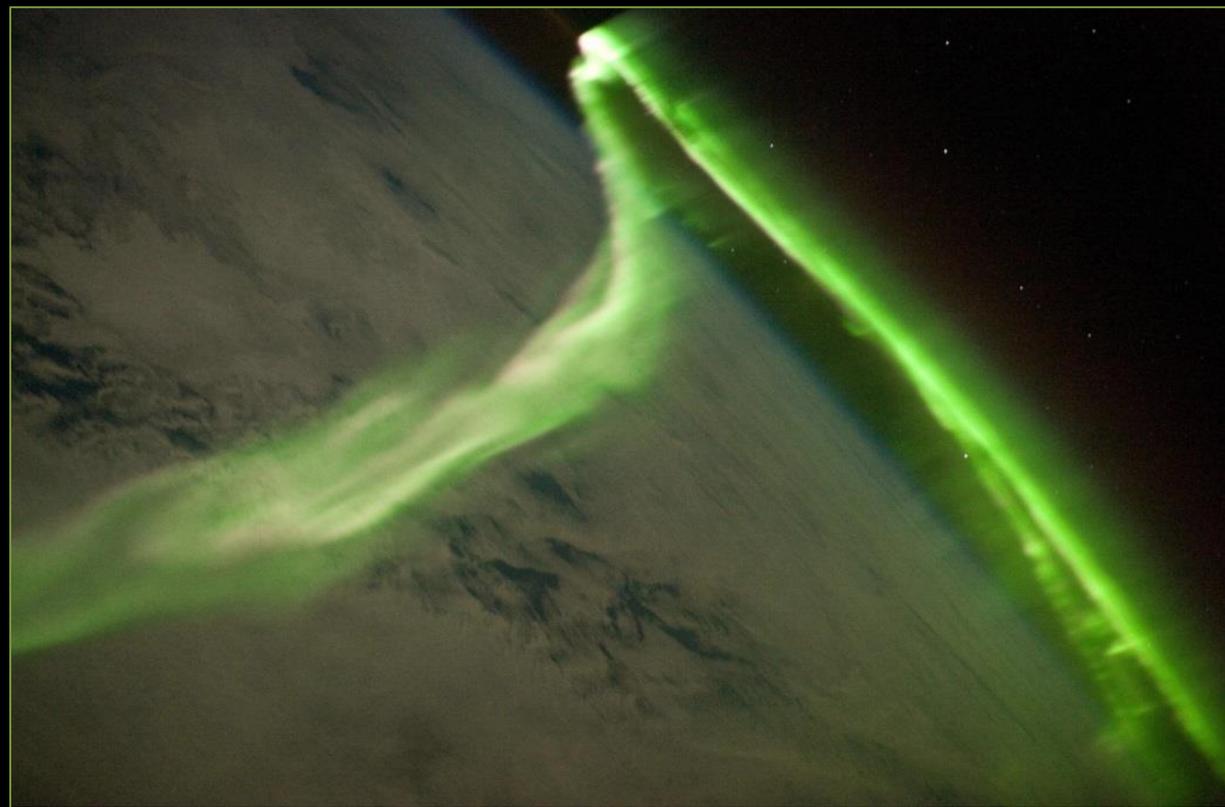
300

200

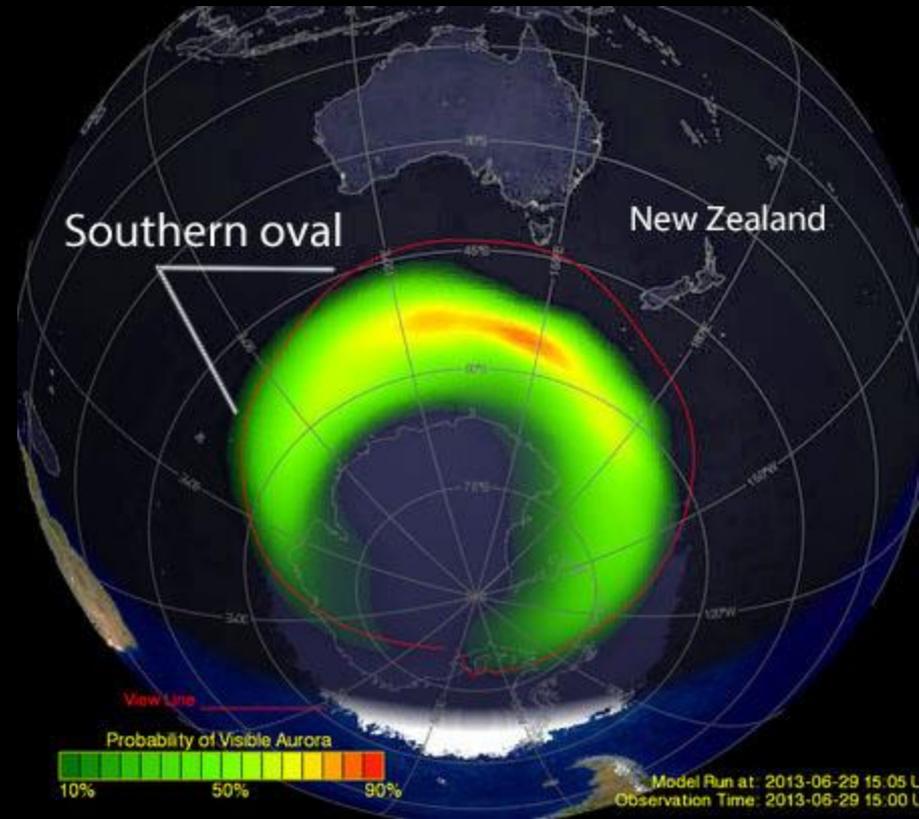
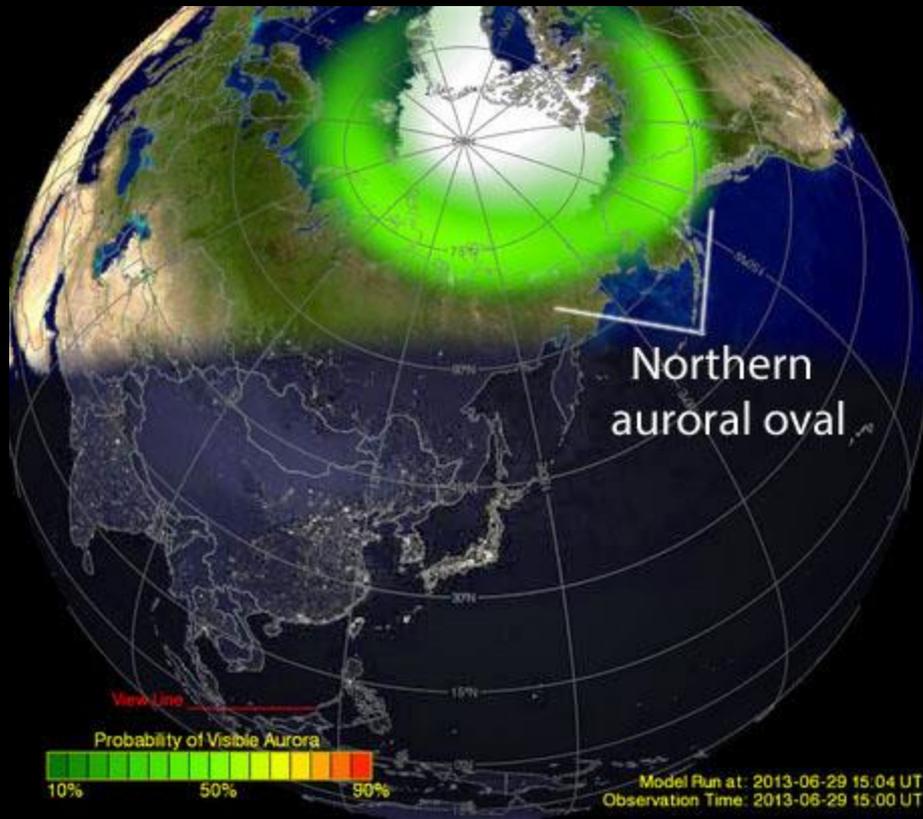
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Space Shuttle

Meteors



ISS Expedition 23 crew/NASA





Stan Richards

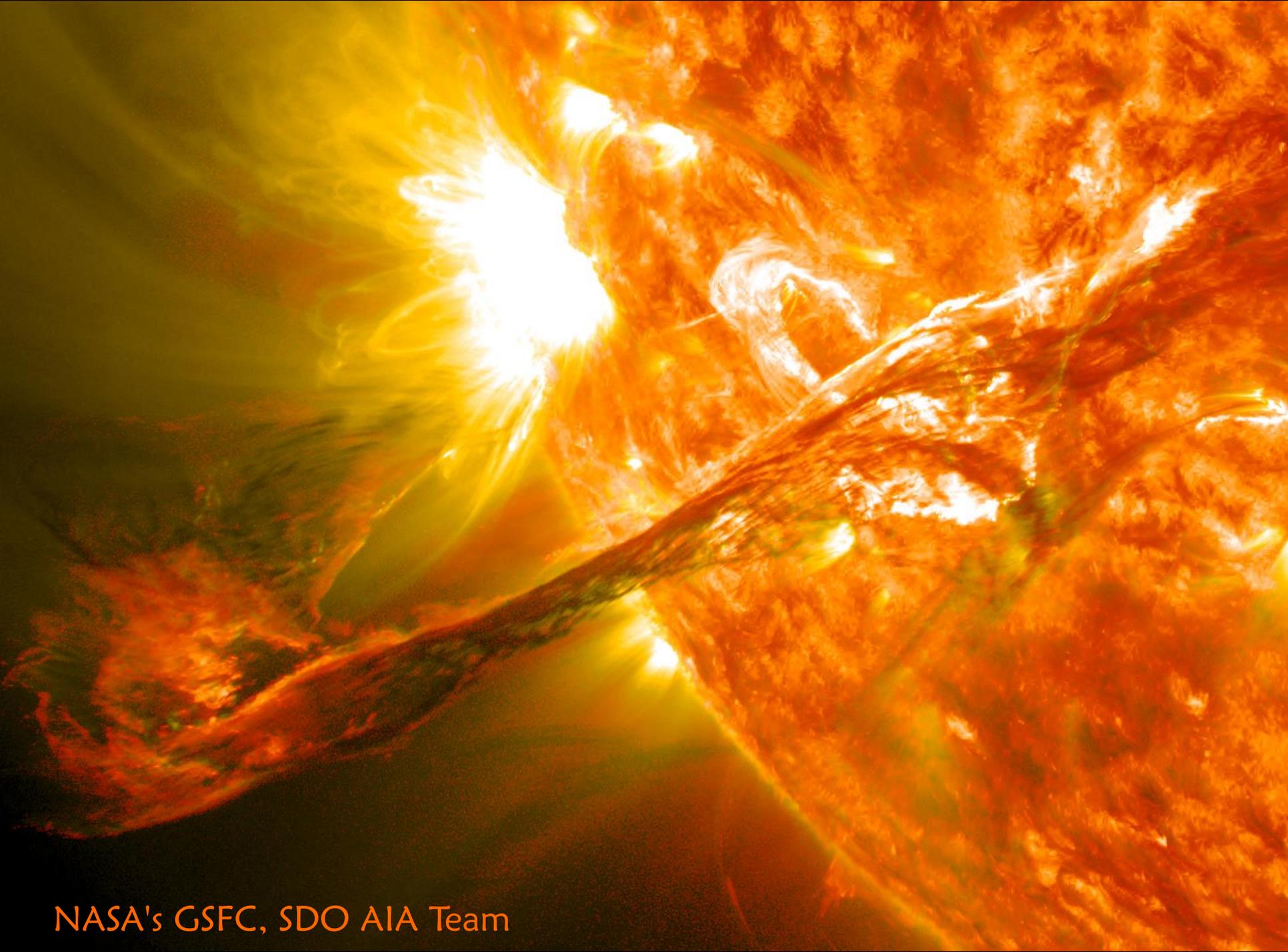
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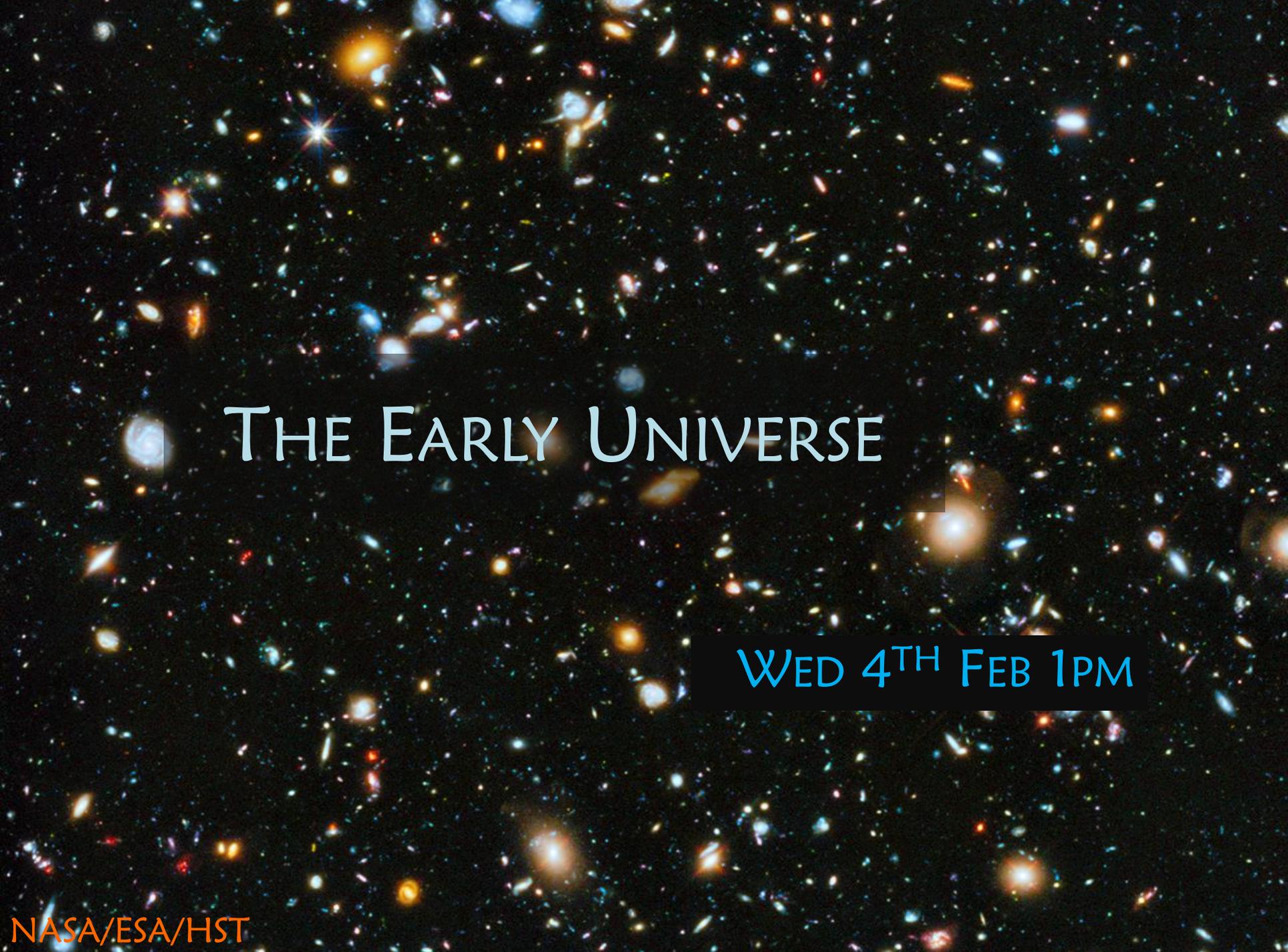
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