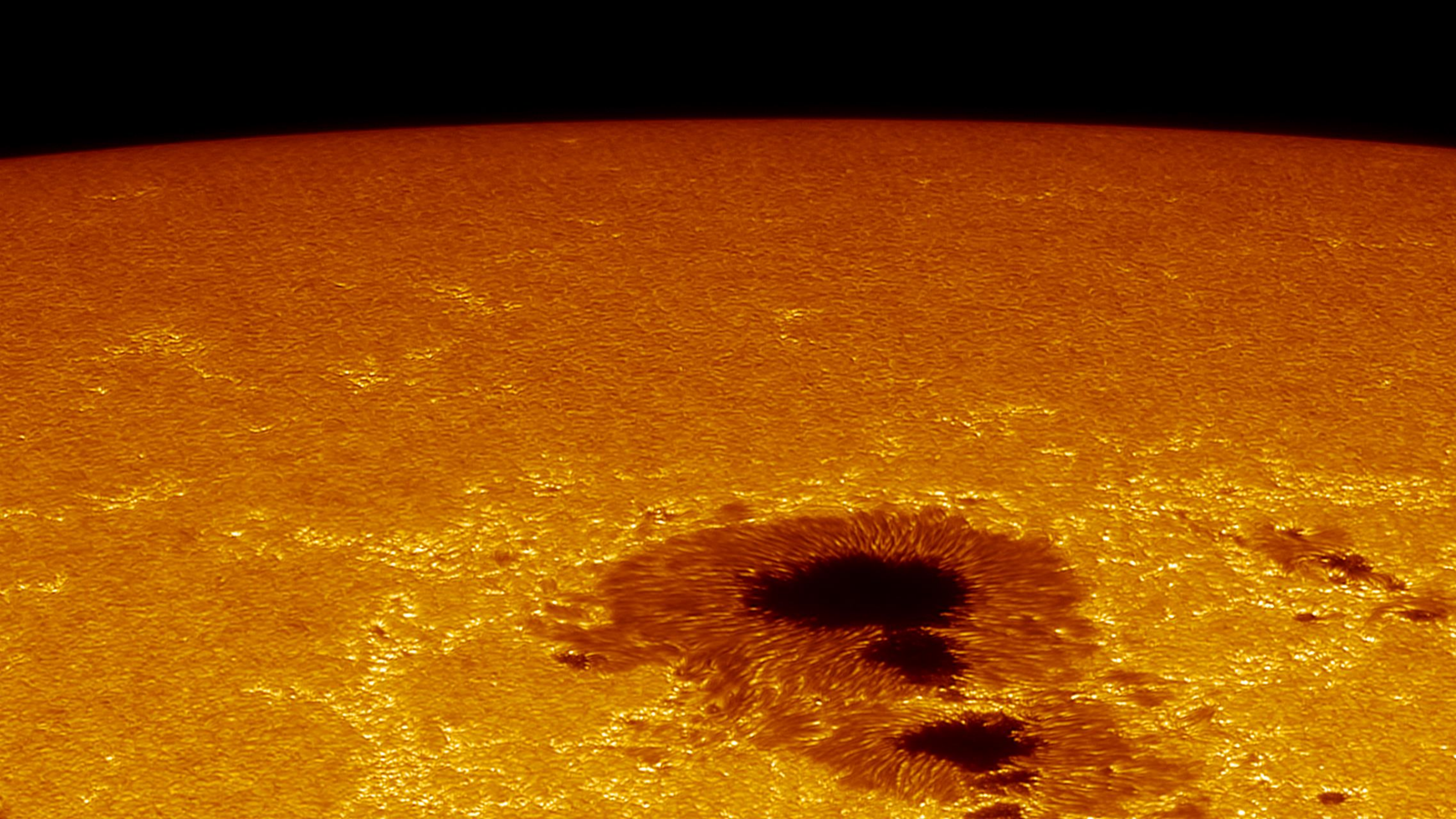
SOLEYE 300

NEXT GENERATION SOLAR TELESCOPE

NEVER LOOK

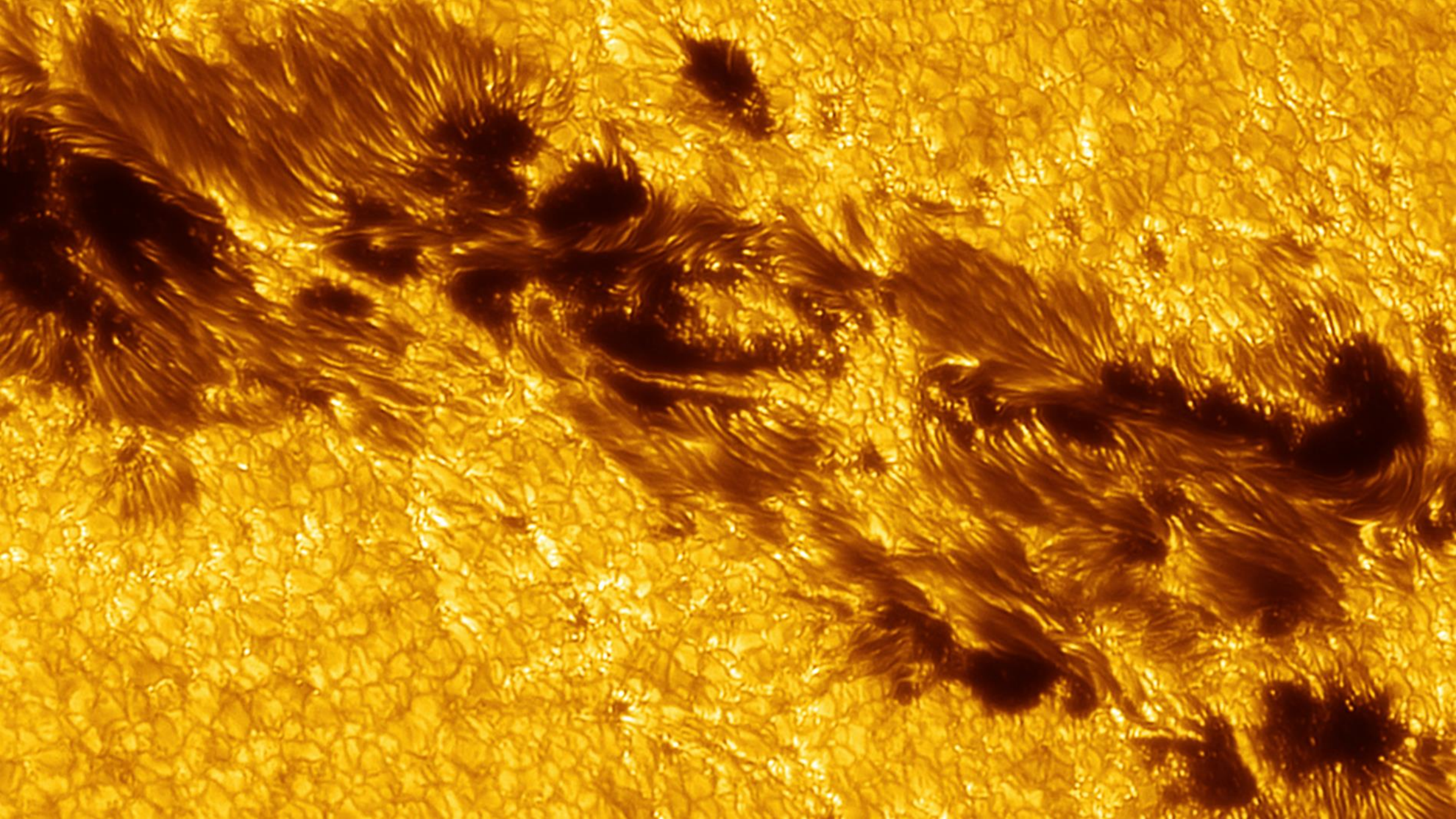
or take photos in the sun with any optics without

a proper filter system!

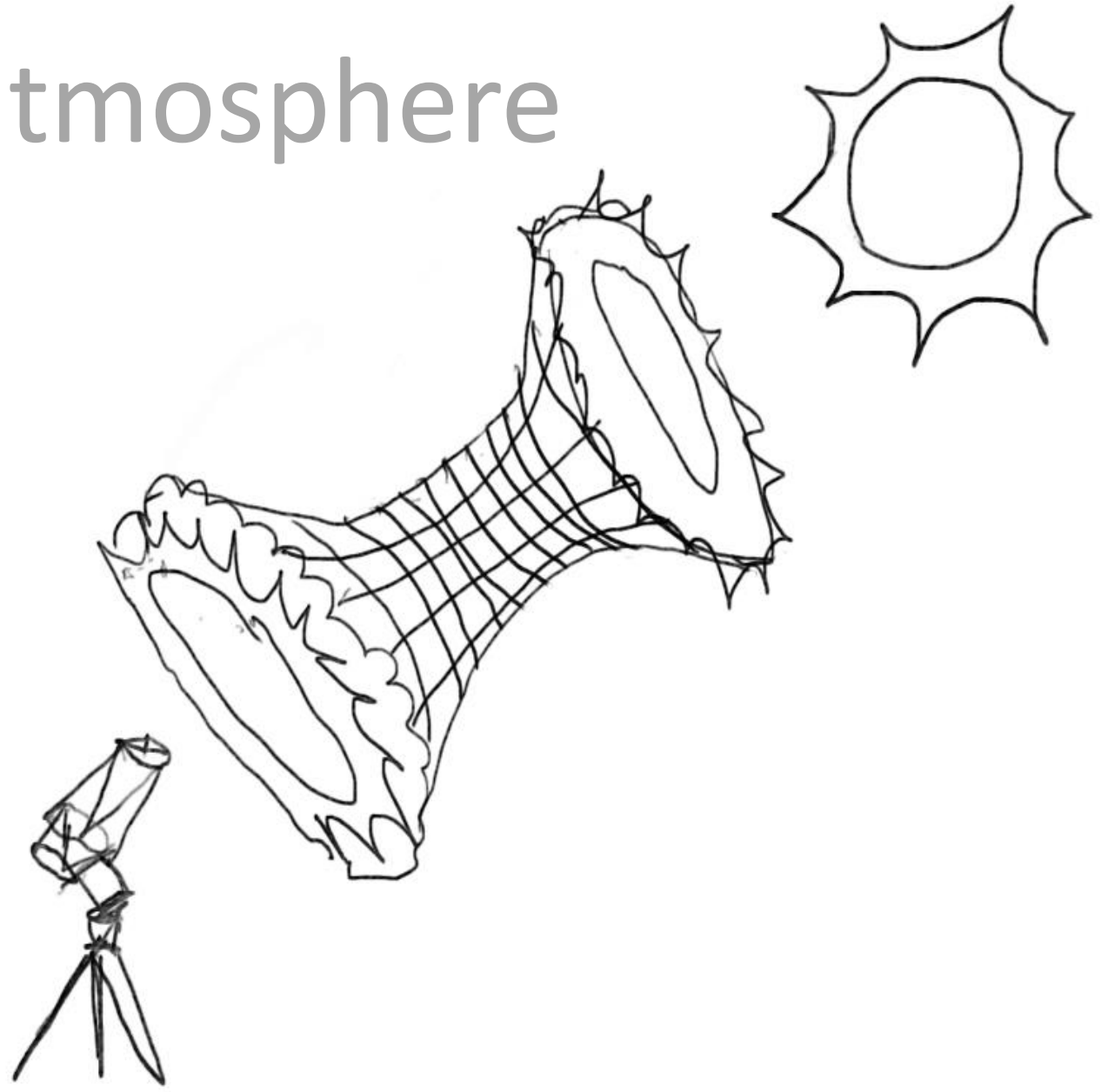




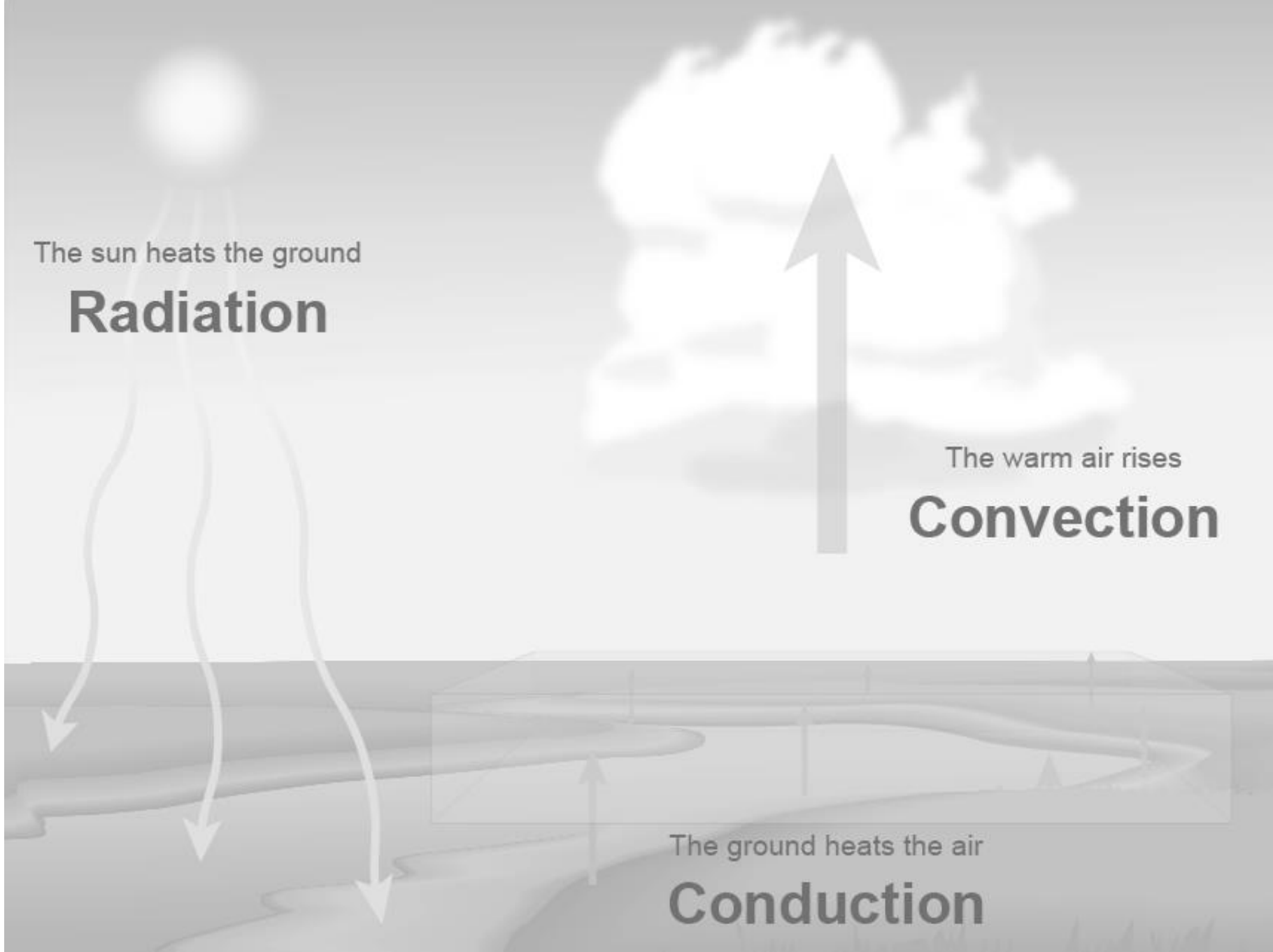


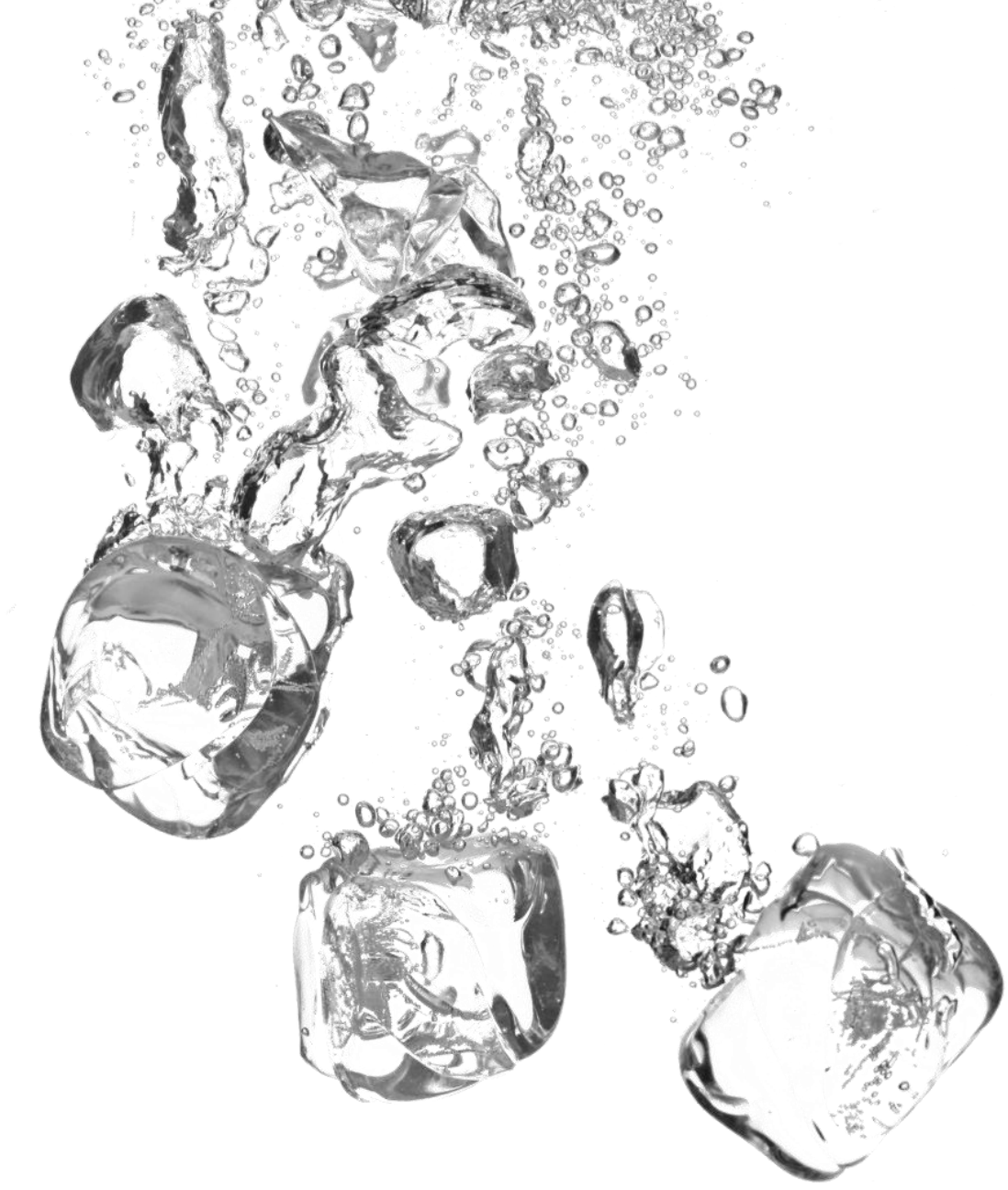
Eliminating the atmosphere



Eliminating the atmosp

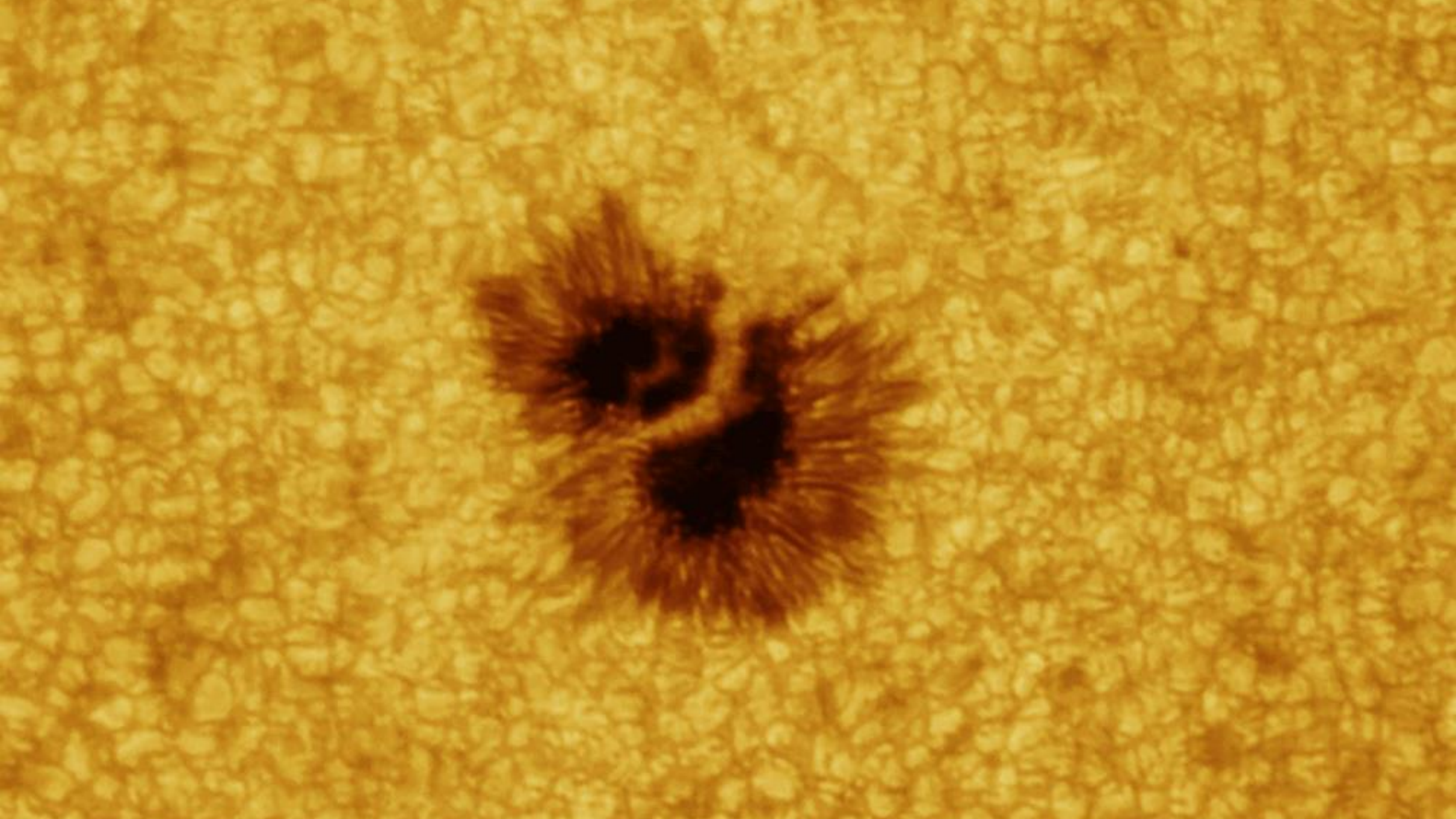

The sun heats the ground
Radiation
The warm air rises
Convection
The ground heats the air
Conduction

Air, Ice & Water



From deepsky into solar


CSODÁLATOS
MAGYARORSZÁG



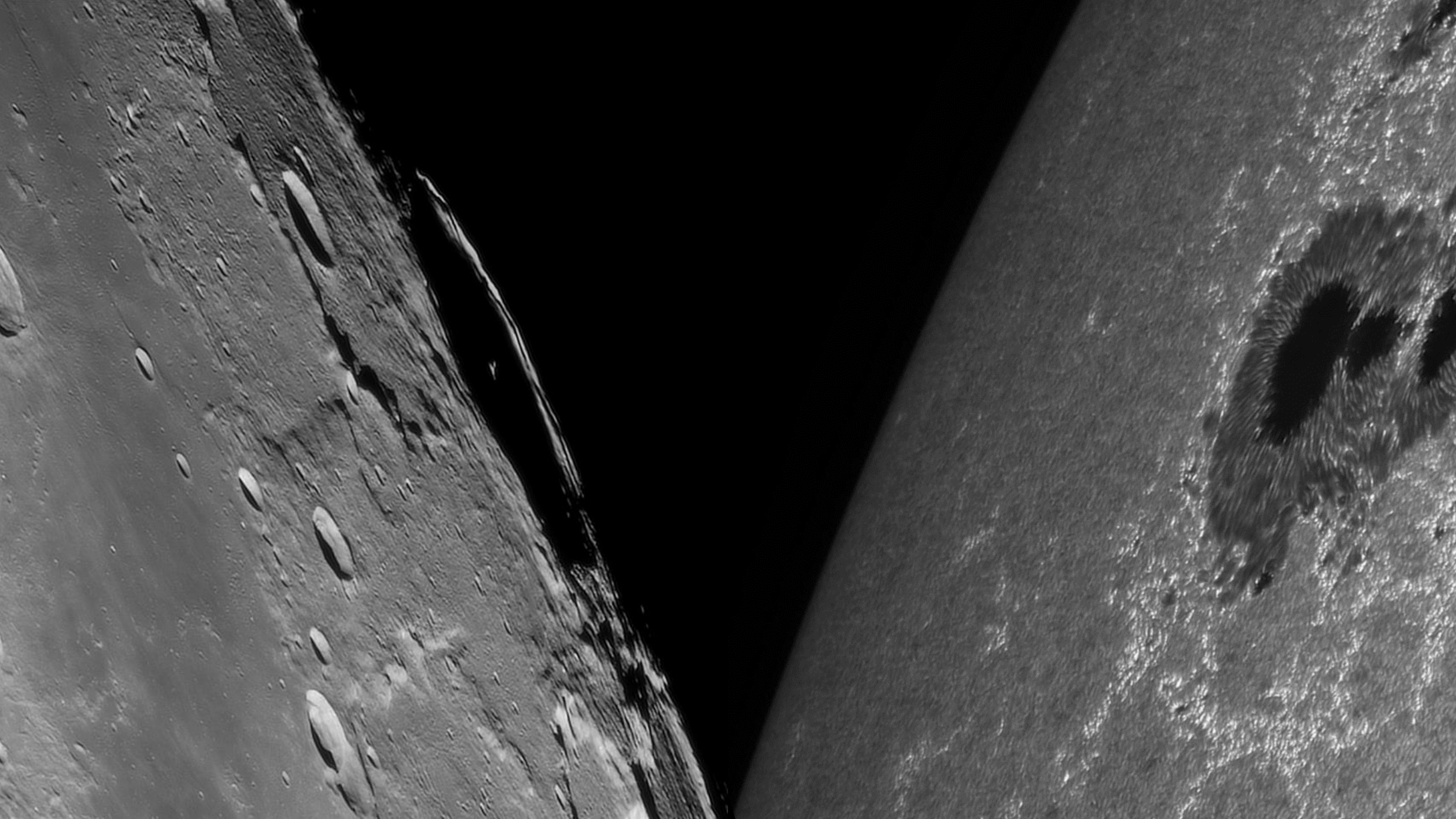
Easier to capture at full resolution of a 30 cm telescope?

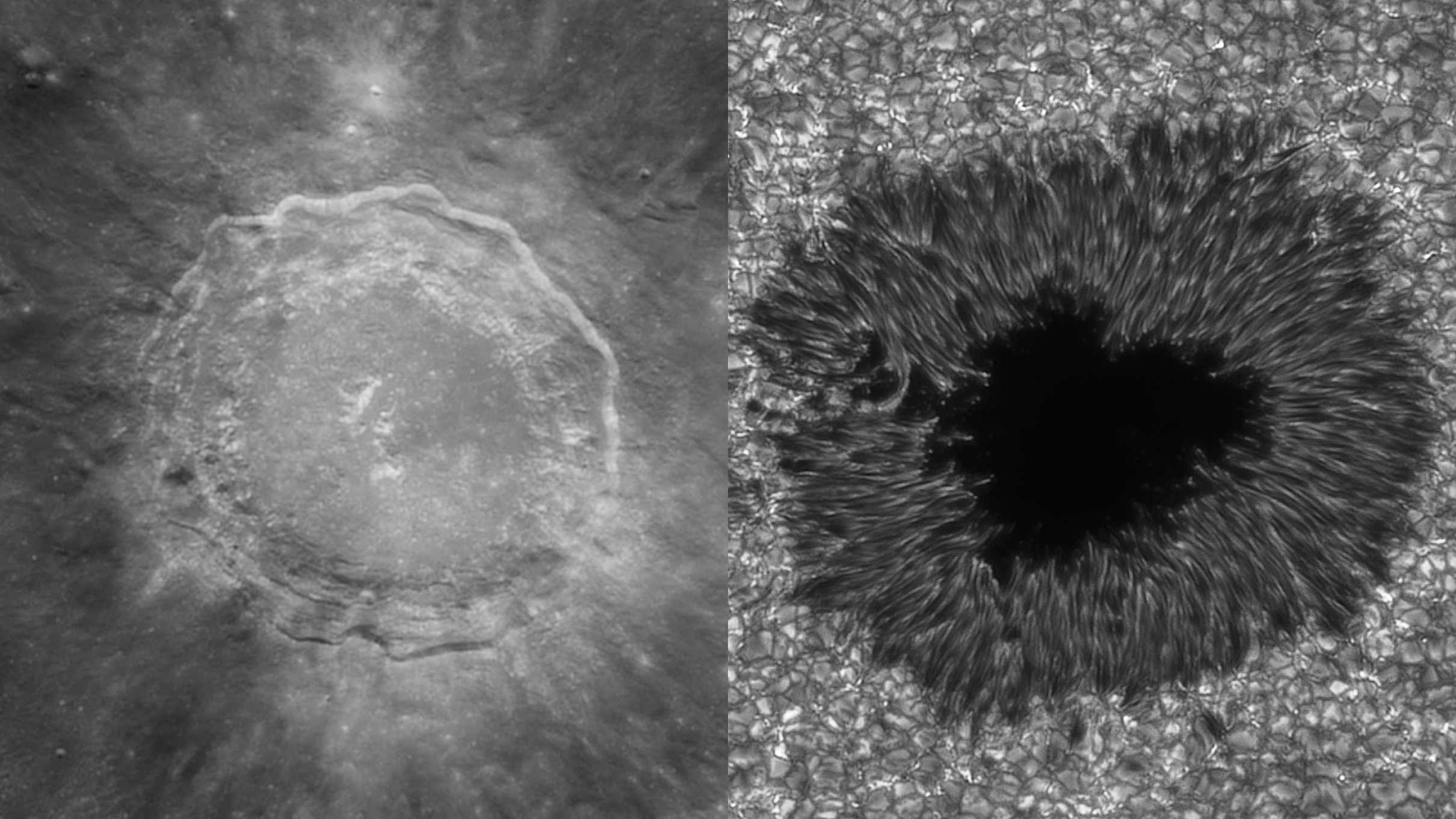
Moon

550 nm – 0,35”

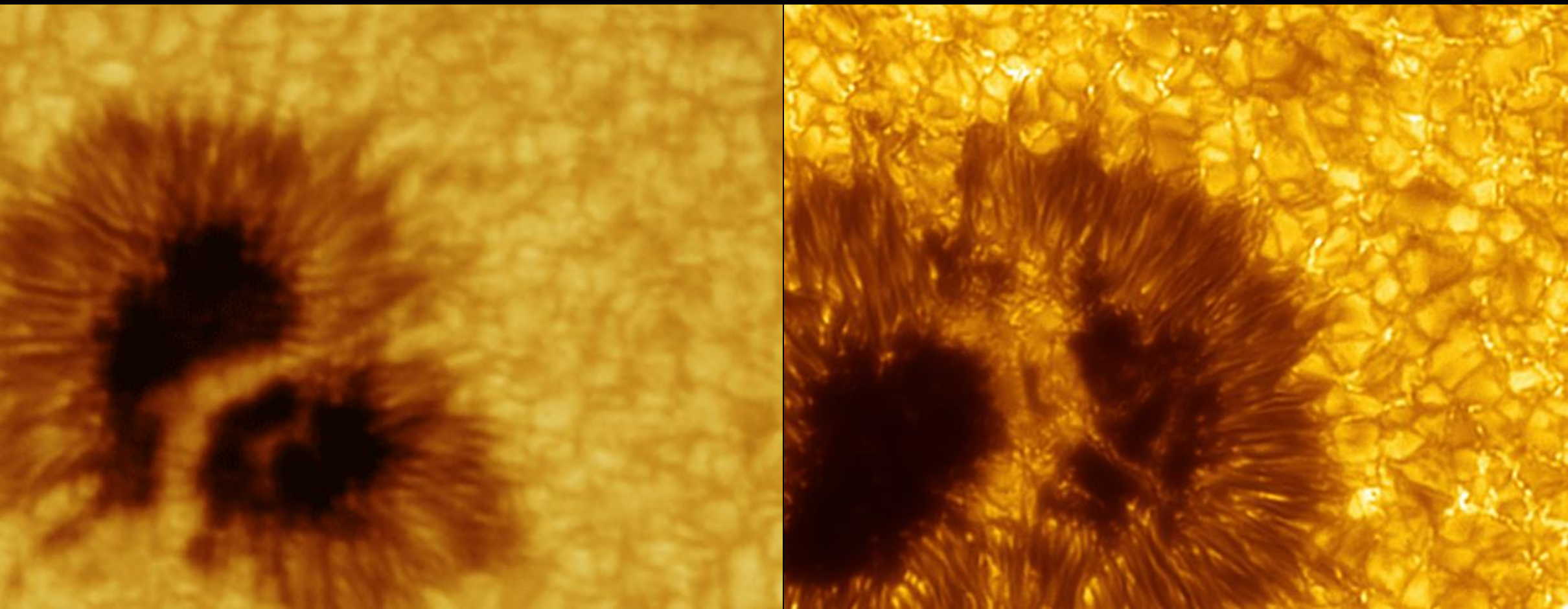
Sun

393 nm – 0,28”





Two pillars: site and telescope



photospheric solar telescope

Solar Newtonian

Sunspot structures
Solar granule
Intergranular filigries

photospheric solar telescope

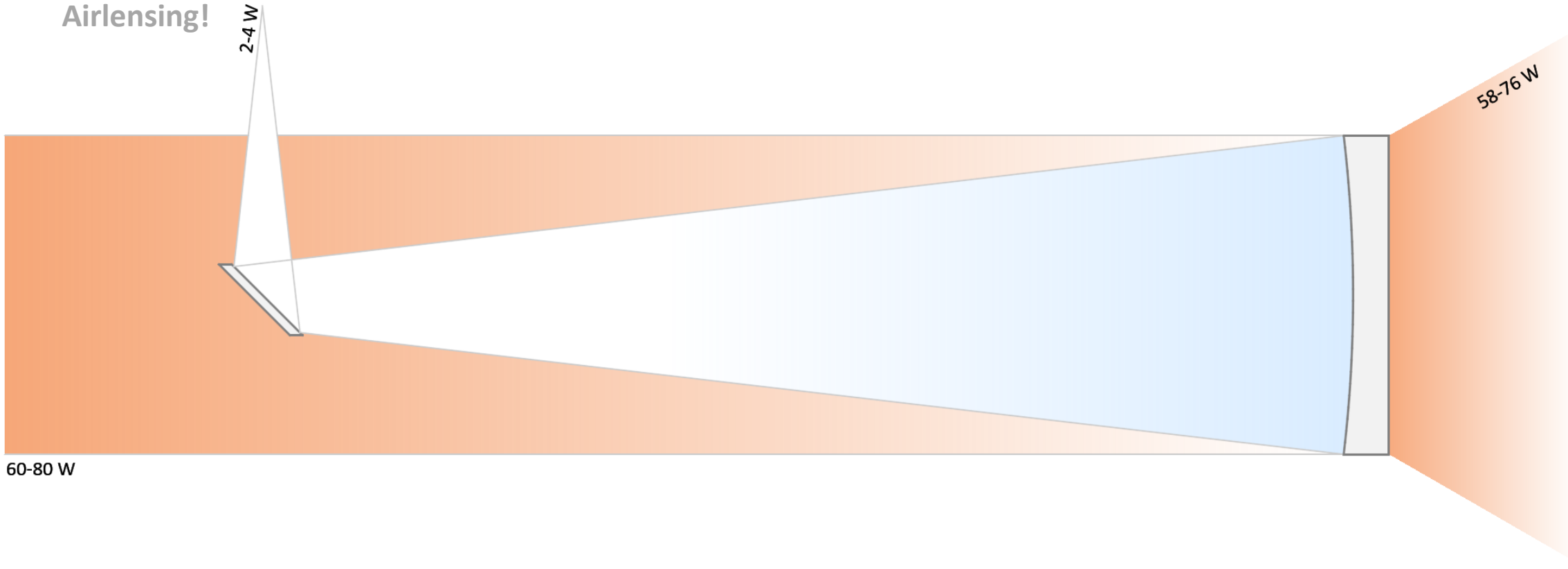
Range of use
Continuum imaging 700-400 nm
Broadband filters between 10-1 nm HBW
Exposure time: 0,03 ms – 1 ms (gain 0)
Resolution: 0,47 – 0,28 arcsec

PRINCIPLE

Uncoated fused silica primary

Astrosital, Zerodur, Pyrex, Clearceram?

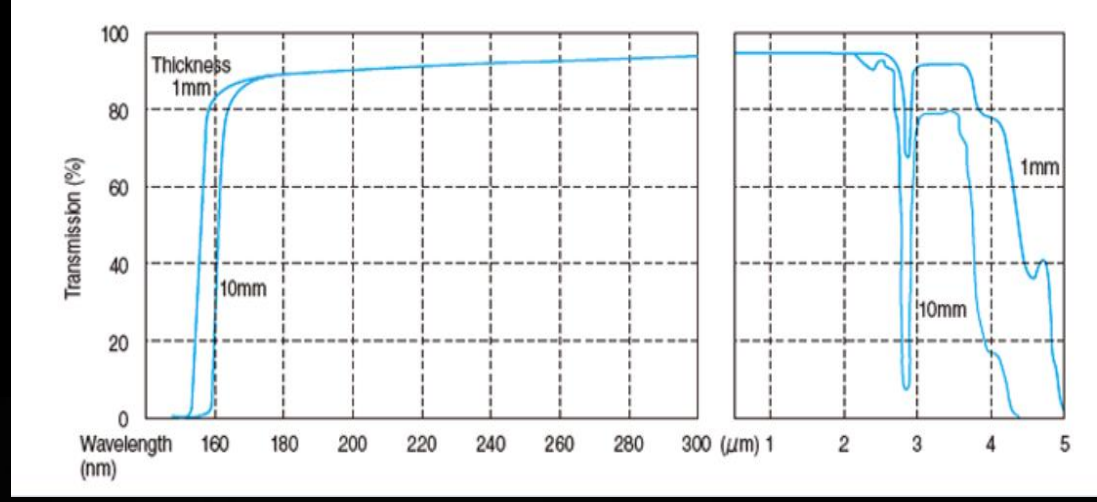
Airlensing!

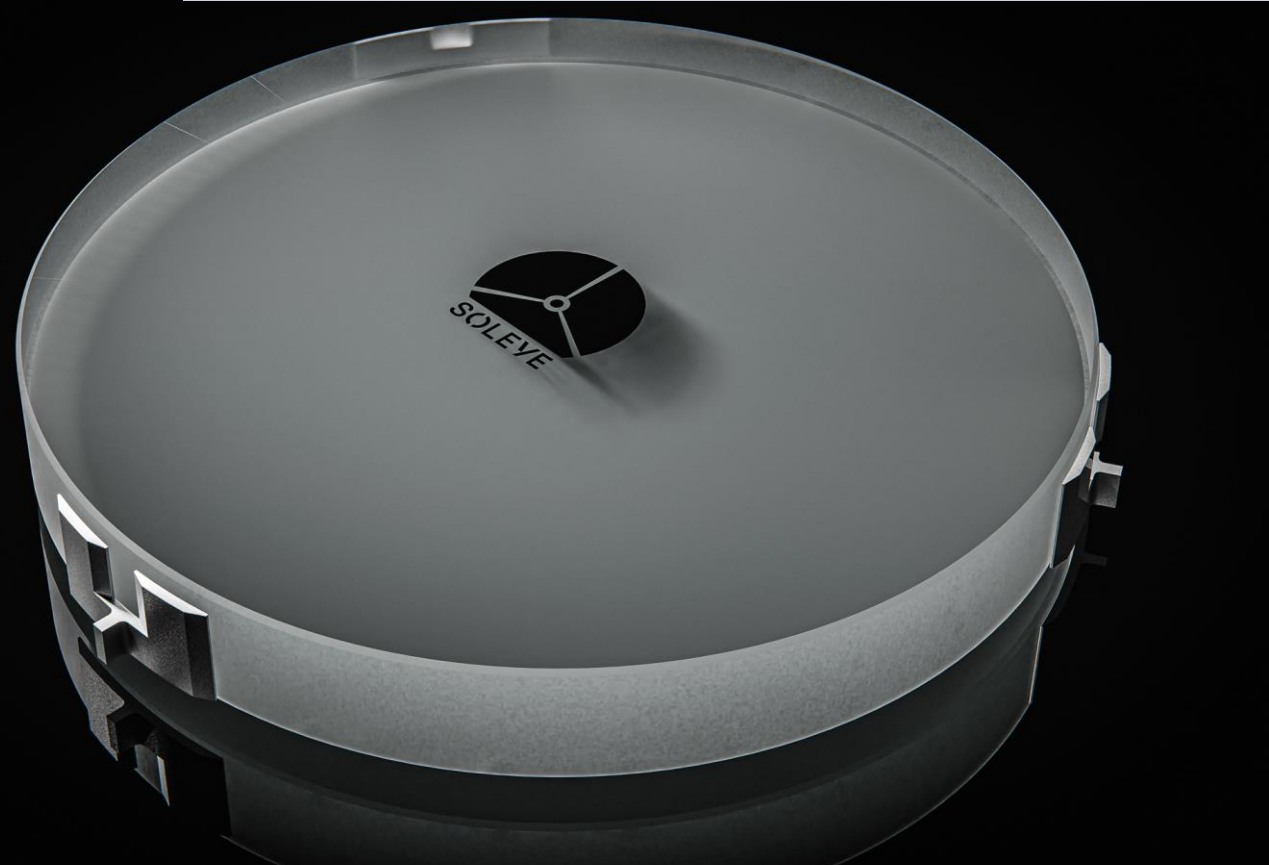


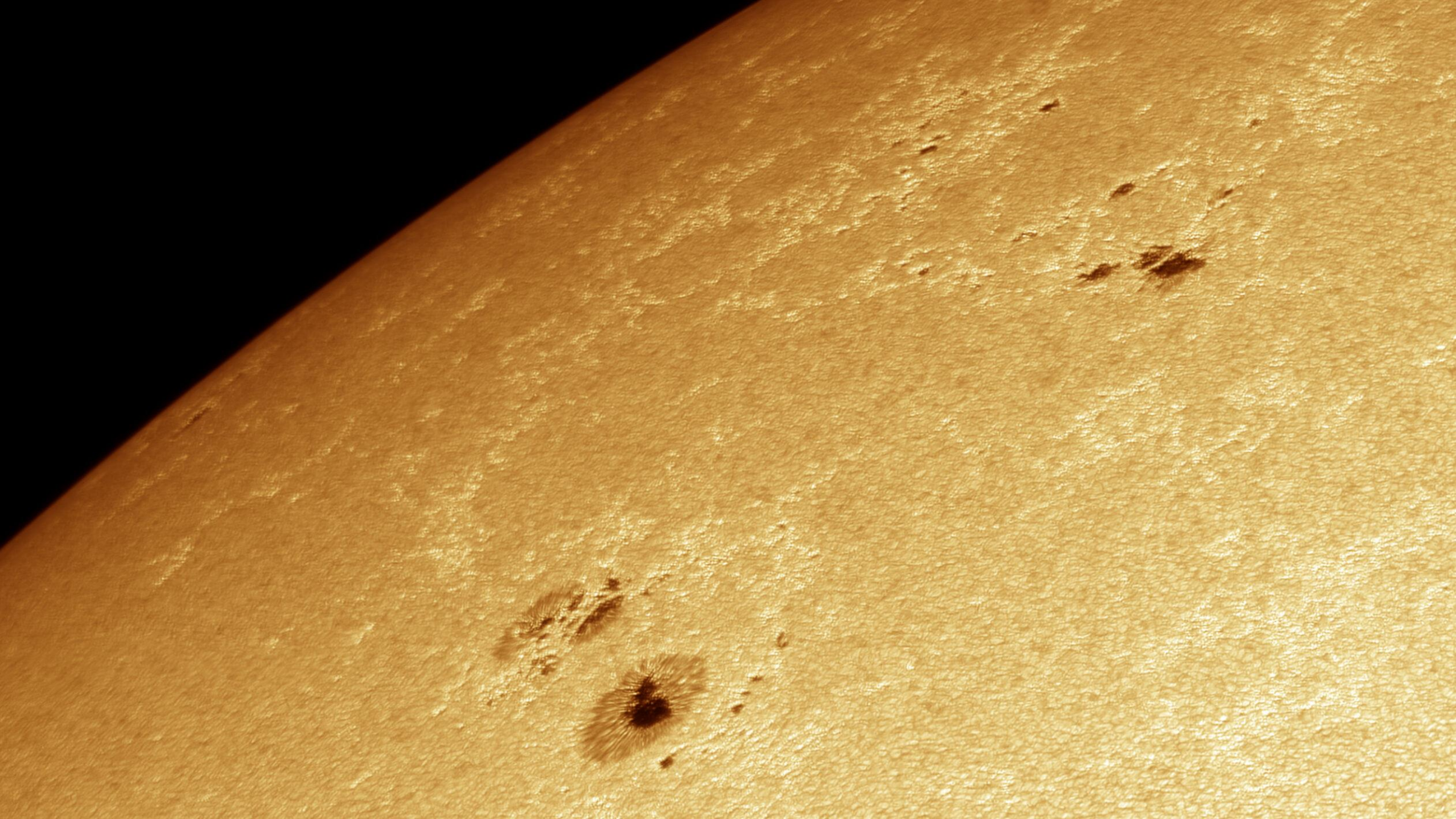
BASIC ELEMENT

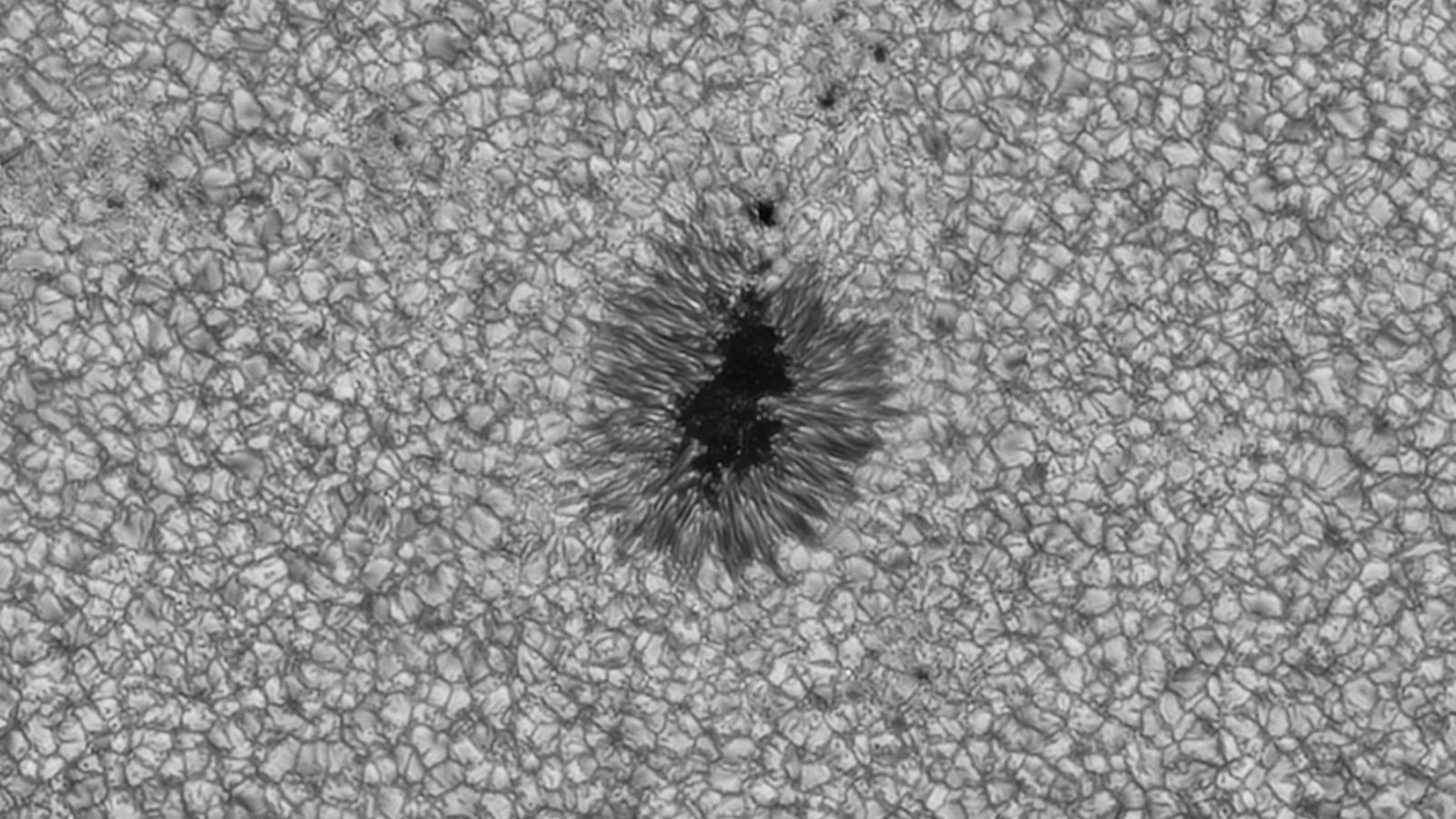
Uncoated fused silica primary

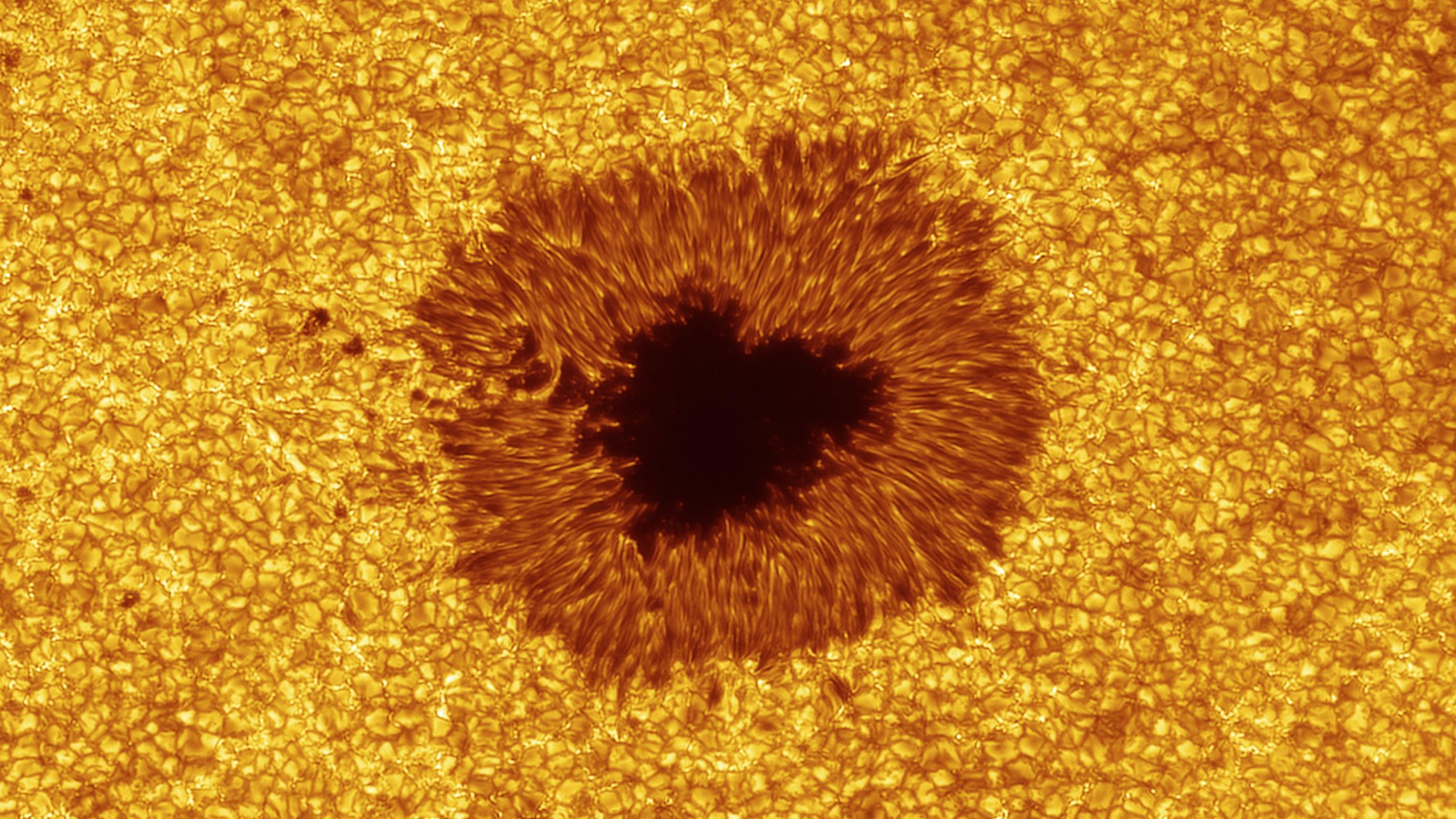
12” – 30 cm diameter
1200 mm focal length
Fused silica/quartz substrate
Thermal expansion: $5x10^{-7}K^{-1}$
Astrosital, Zerodur, Pyrex, Clearceram?

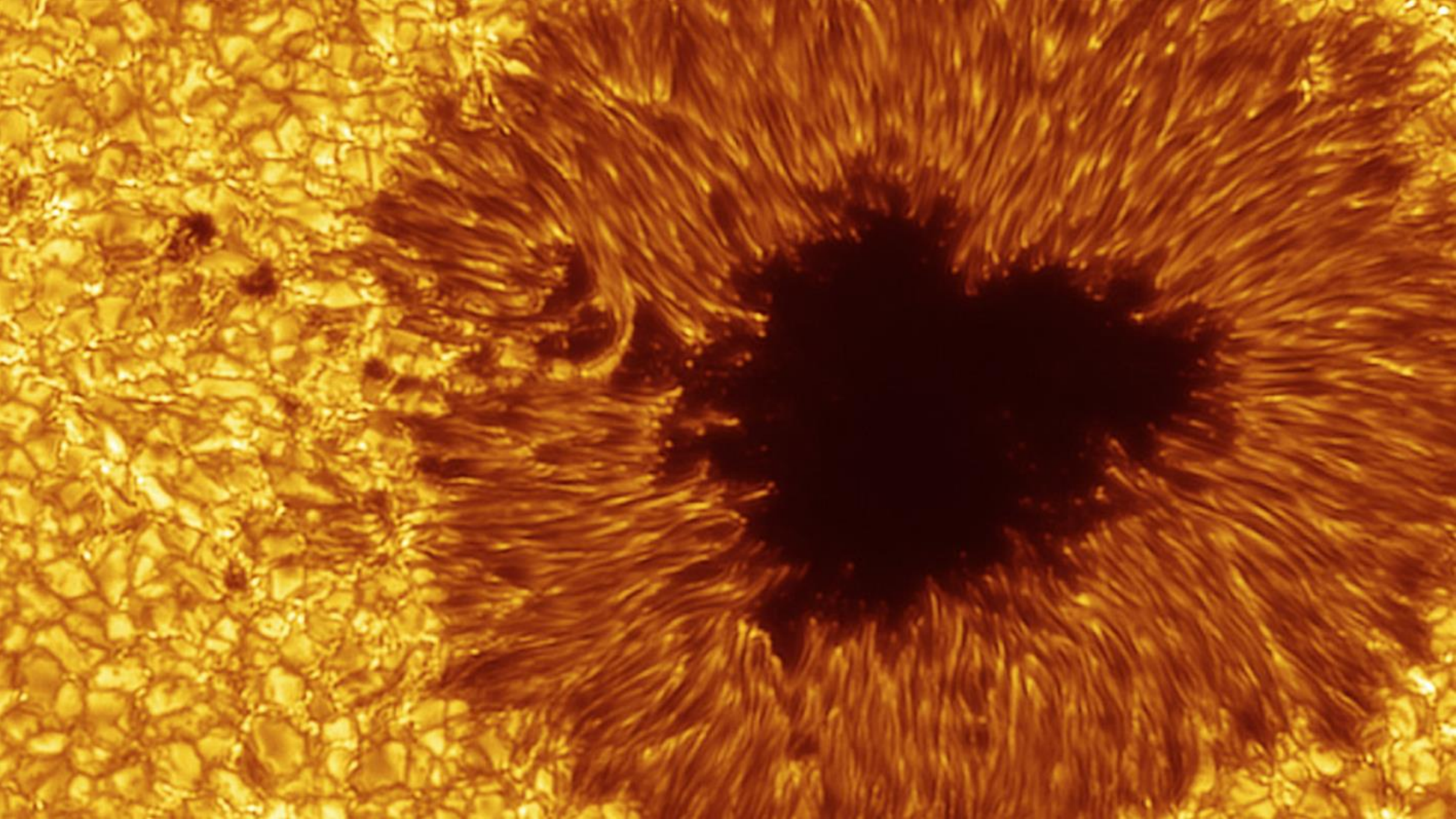


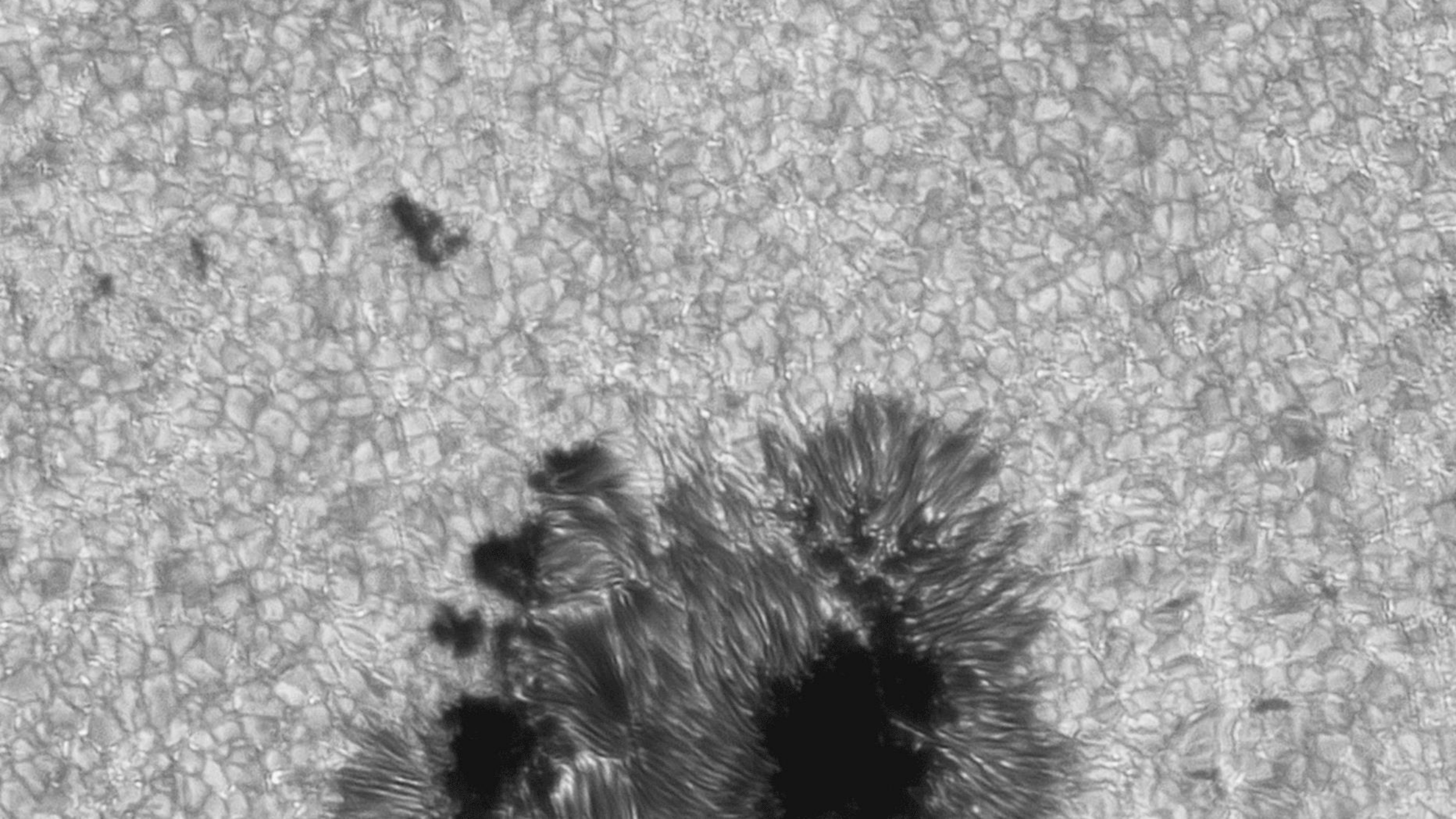










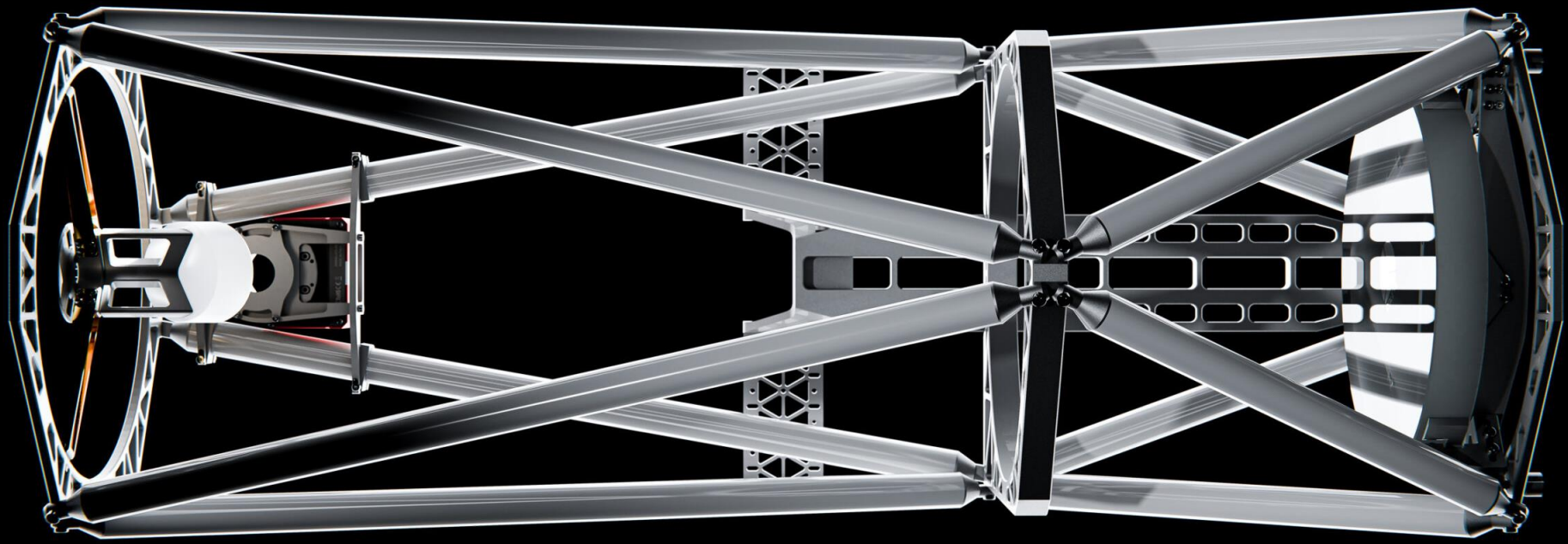


Limitations

Low light under 1 nm HBW

Next-generation

SOLEVE



Next-generation?

Next-generation?

Next-generation?

Aperture

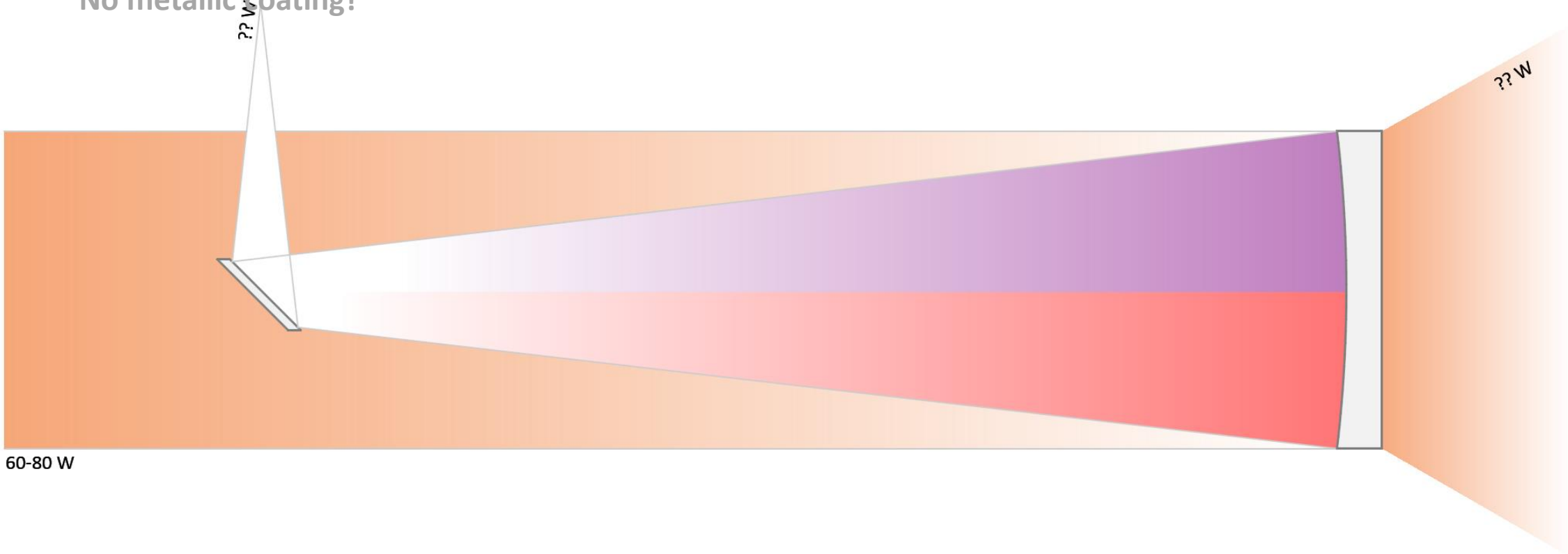
Energy

EXTENDING the PRINCIPLE

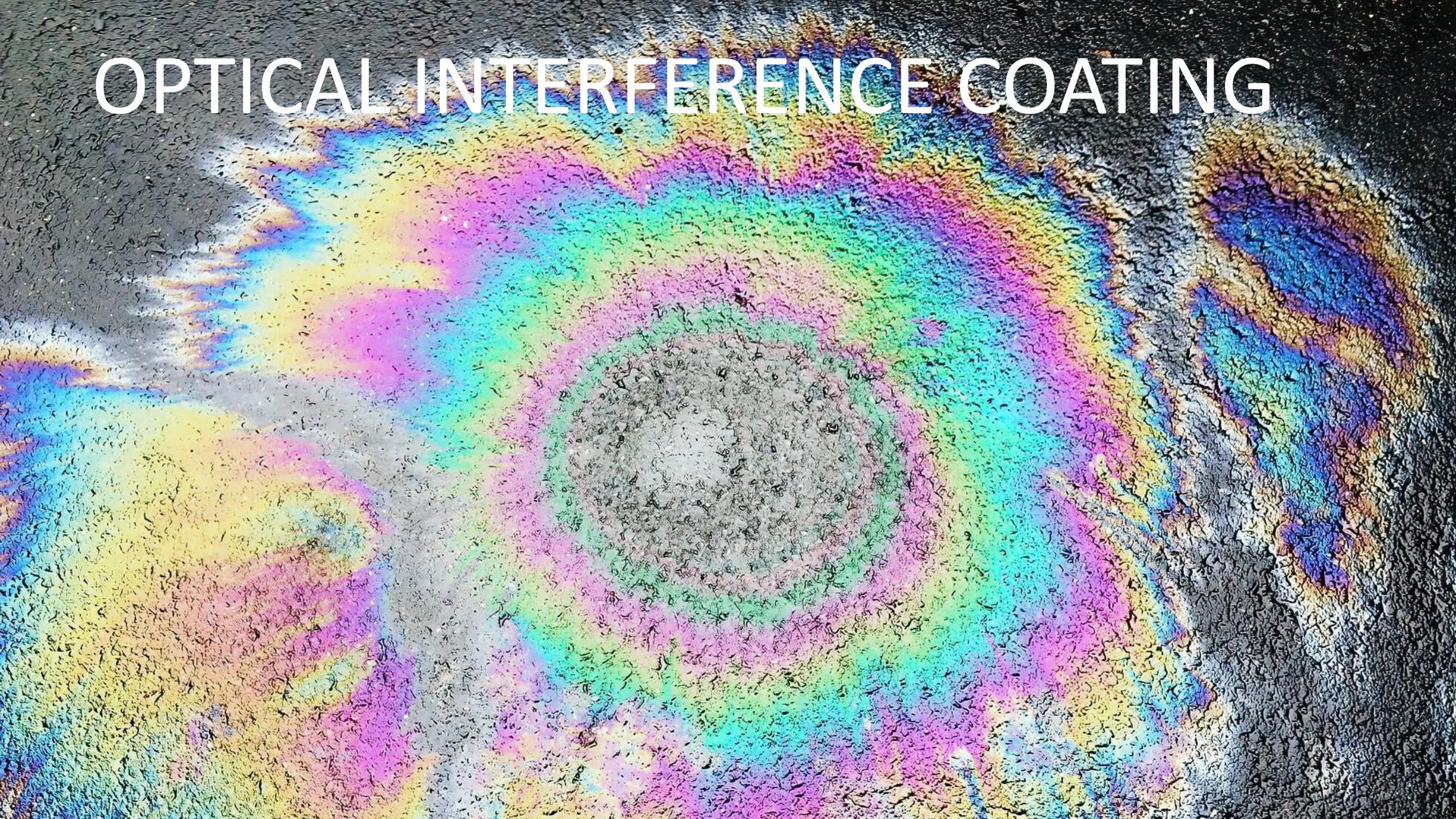
Which coating?

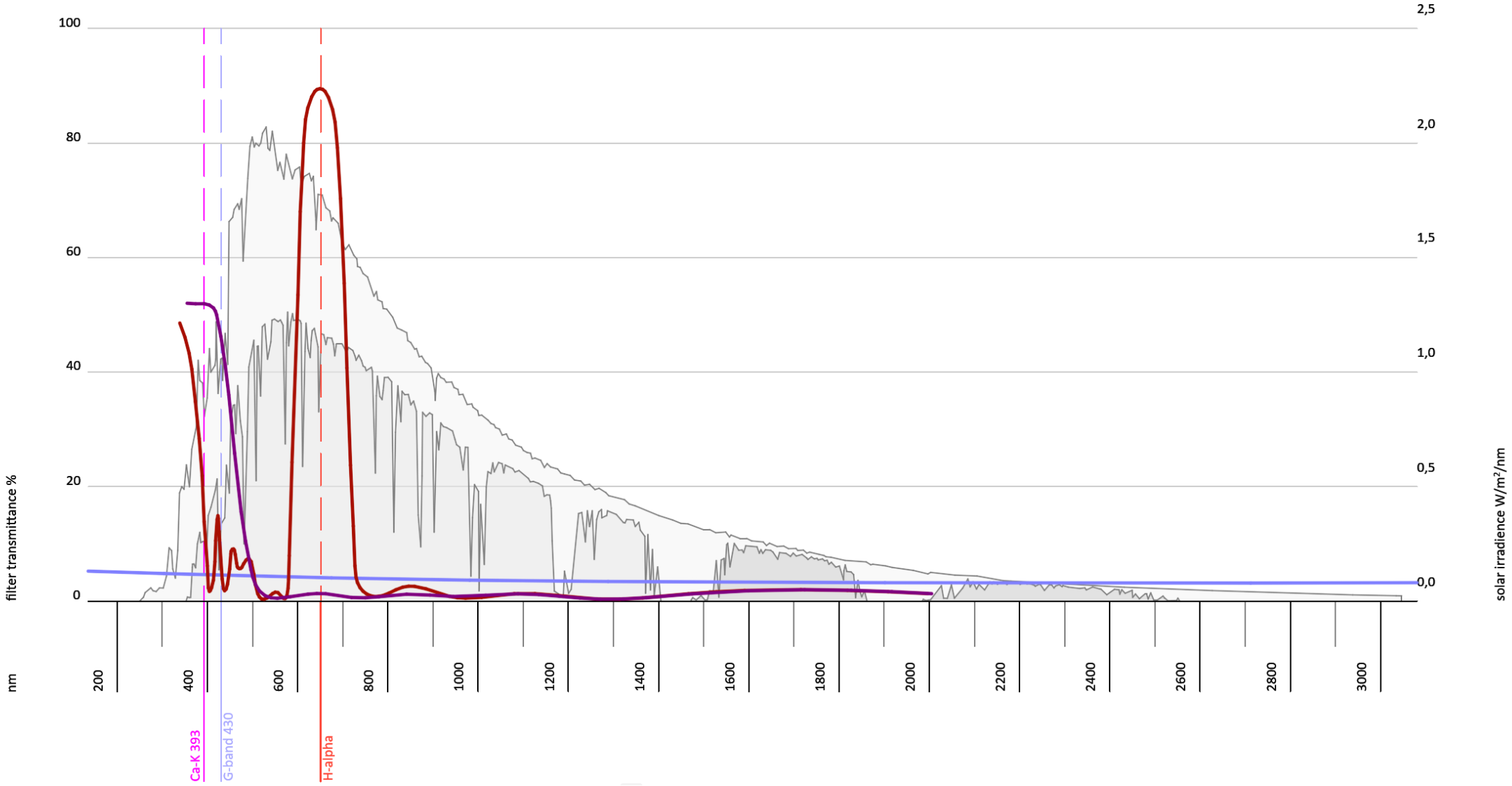
Aliminium, gold, copper? Ø

No metallic coating!

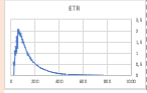


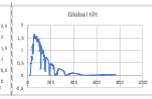
OPTICAL INTERFERENCE COATING

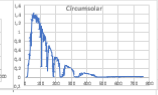


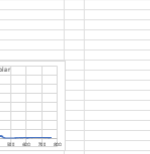

filter transmittance %
100
80
60
40
20
0
2,5
2,0
1,5
1,0
0,5
0,0
solar irradience W/m²/nm
nm
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
2600
2800
3000
Ca-K 393
G-band 430
H-alpha

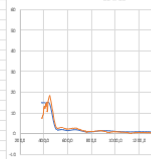
ASTM G173-03 Reference Spectra Derived from SMARTS v. 2.9.2

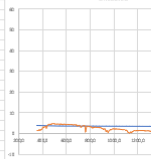


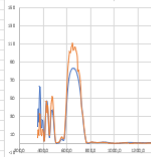


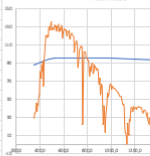


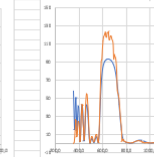












SOLEYE „RED” & „VIOLET”

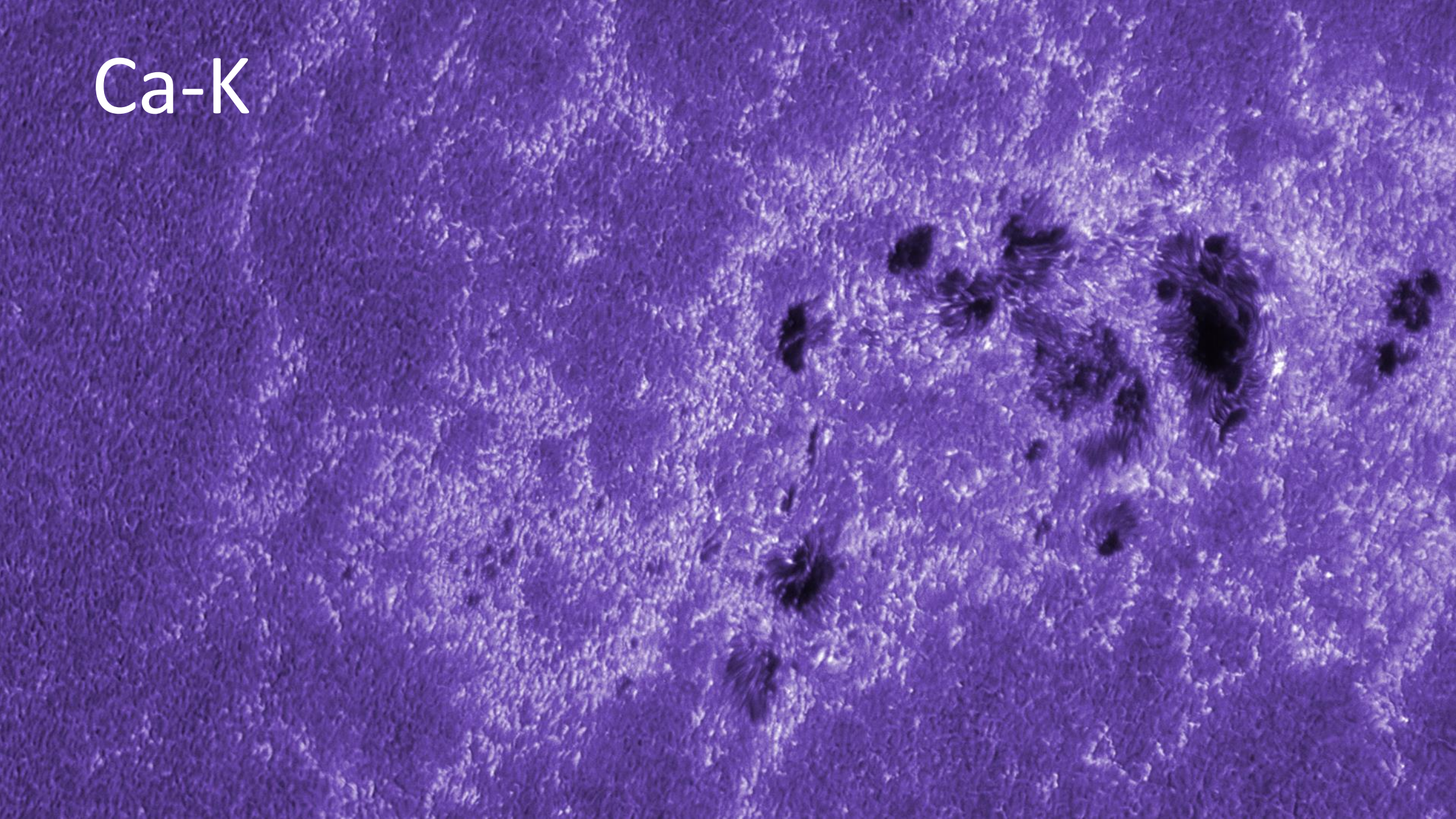
SOLEYE „RED” & „VIOLET”

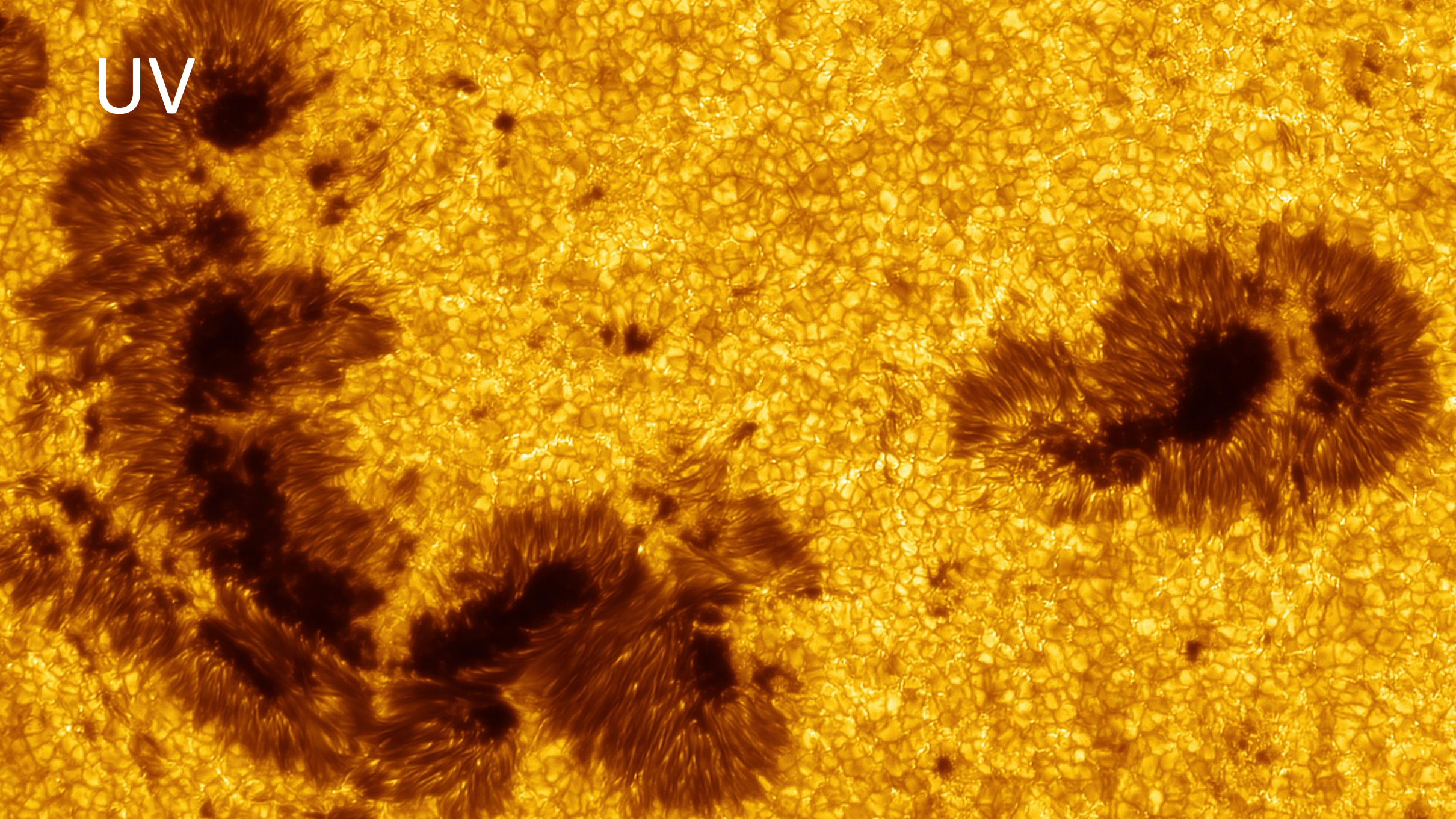
„Violet”

+-4 nm coating accuracy
15/50% pk in Ca-K
40% pk at 350nm
4-7W transmitted

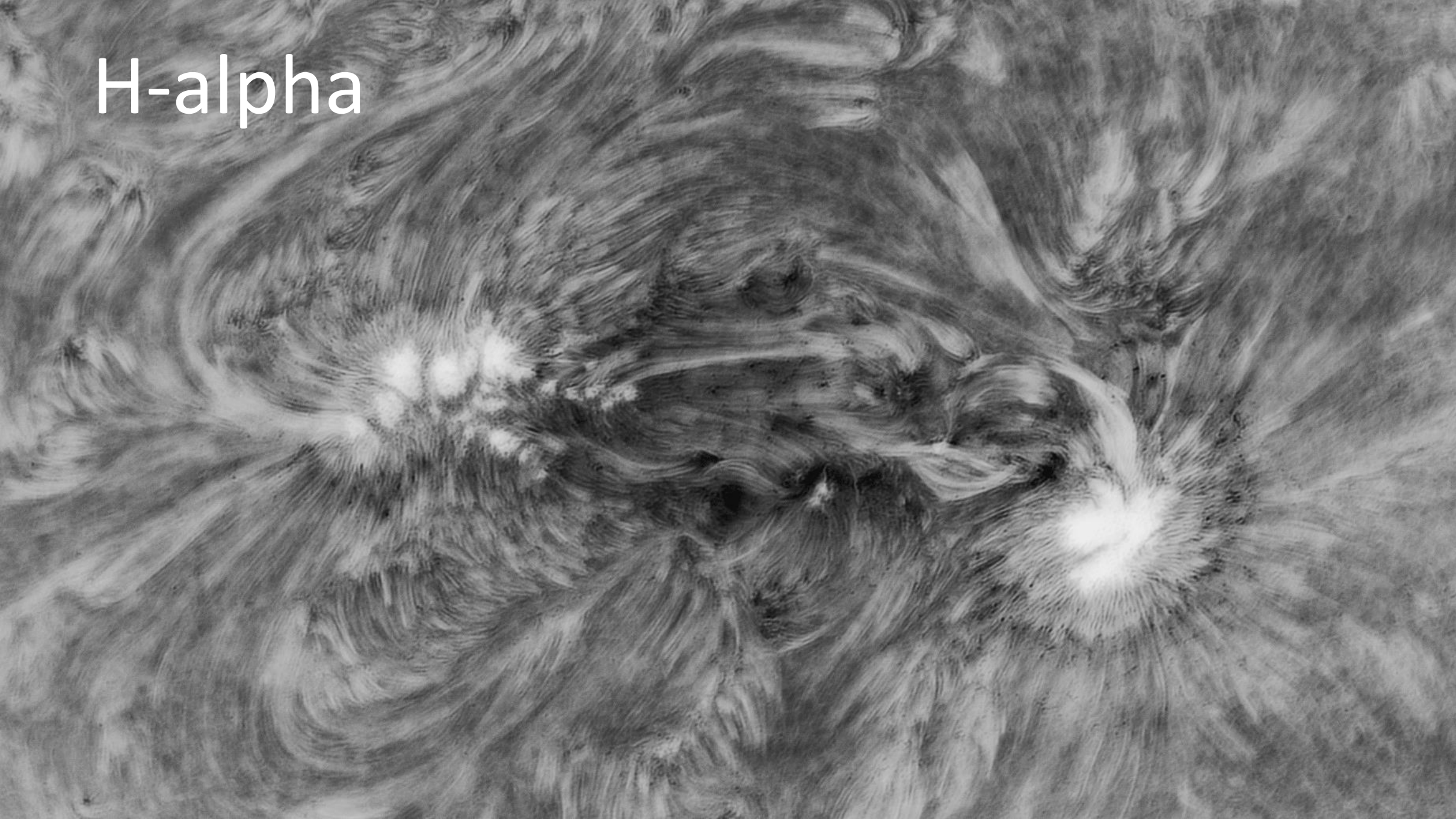
„RED”

+-10 nm coating accuracy
90% pk at H-alpha
10-17W transmitted
Additional ERF needed.

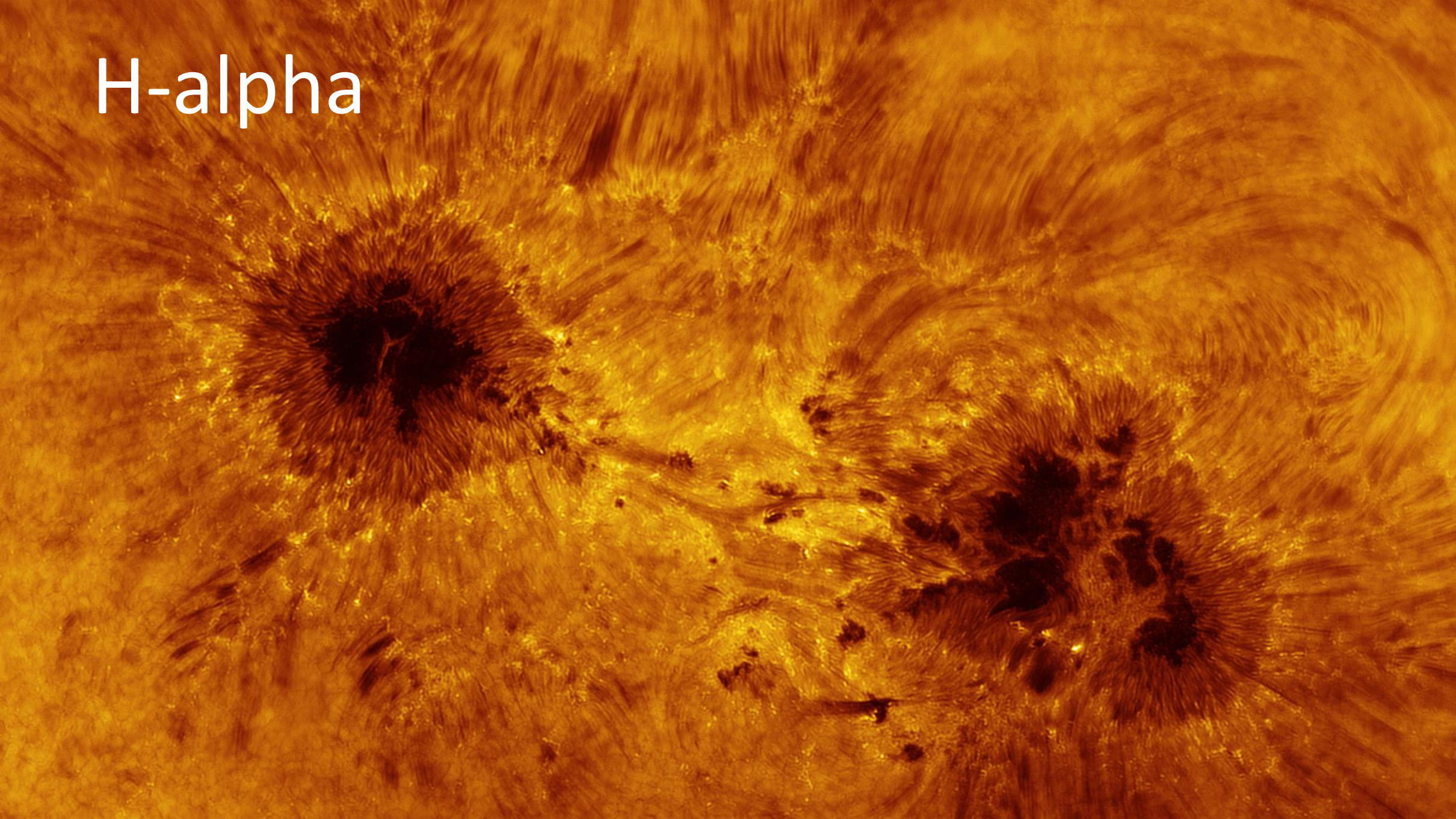

Ca-K


UV

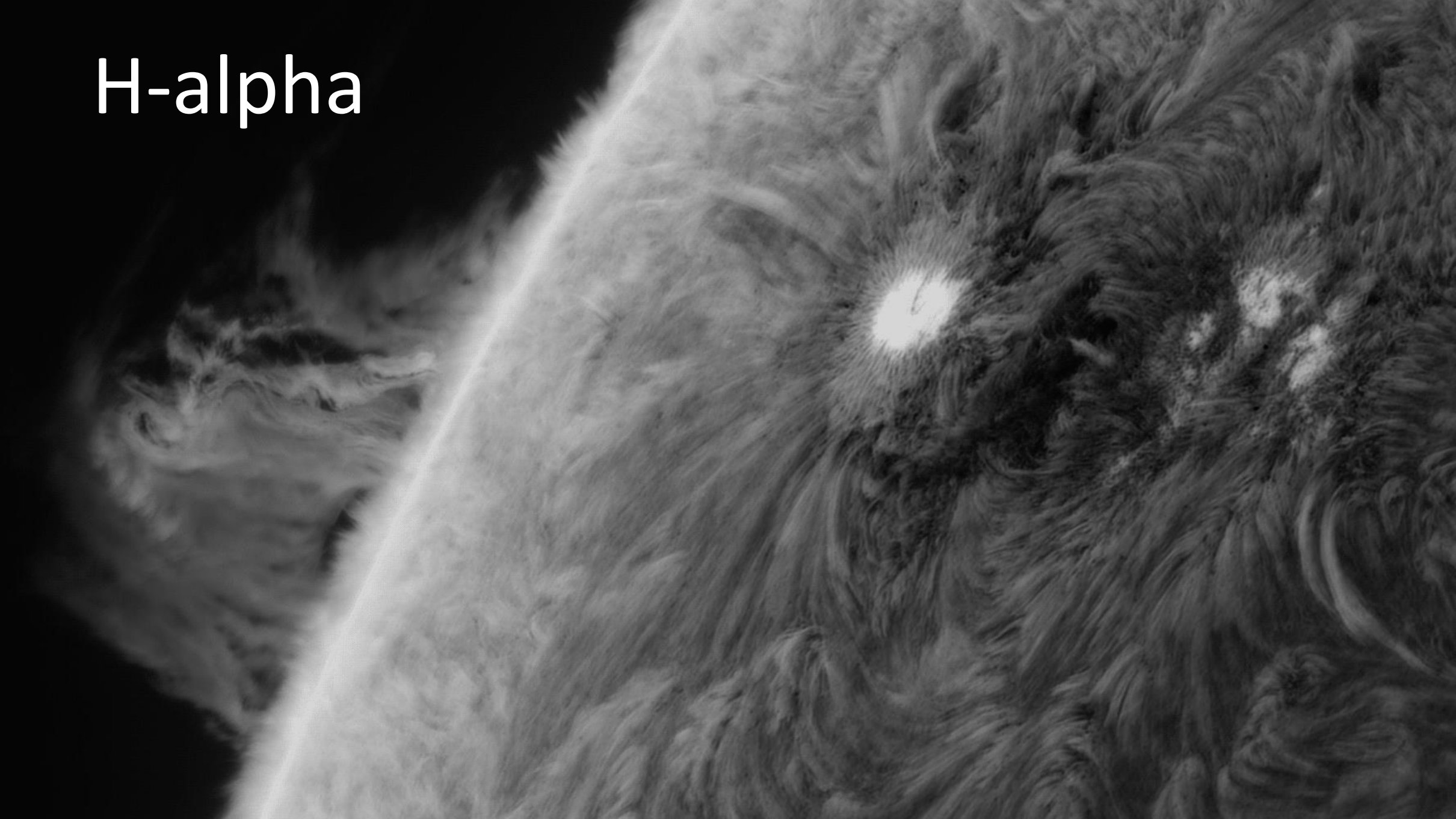
H-alpha

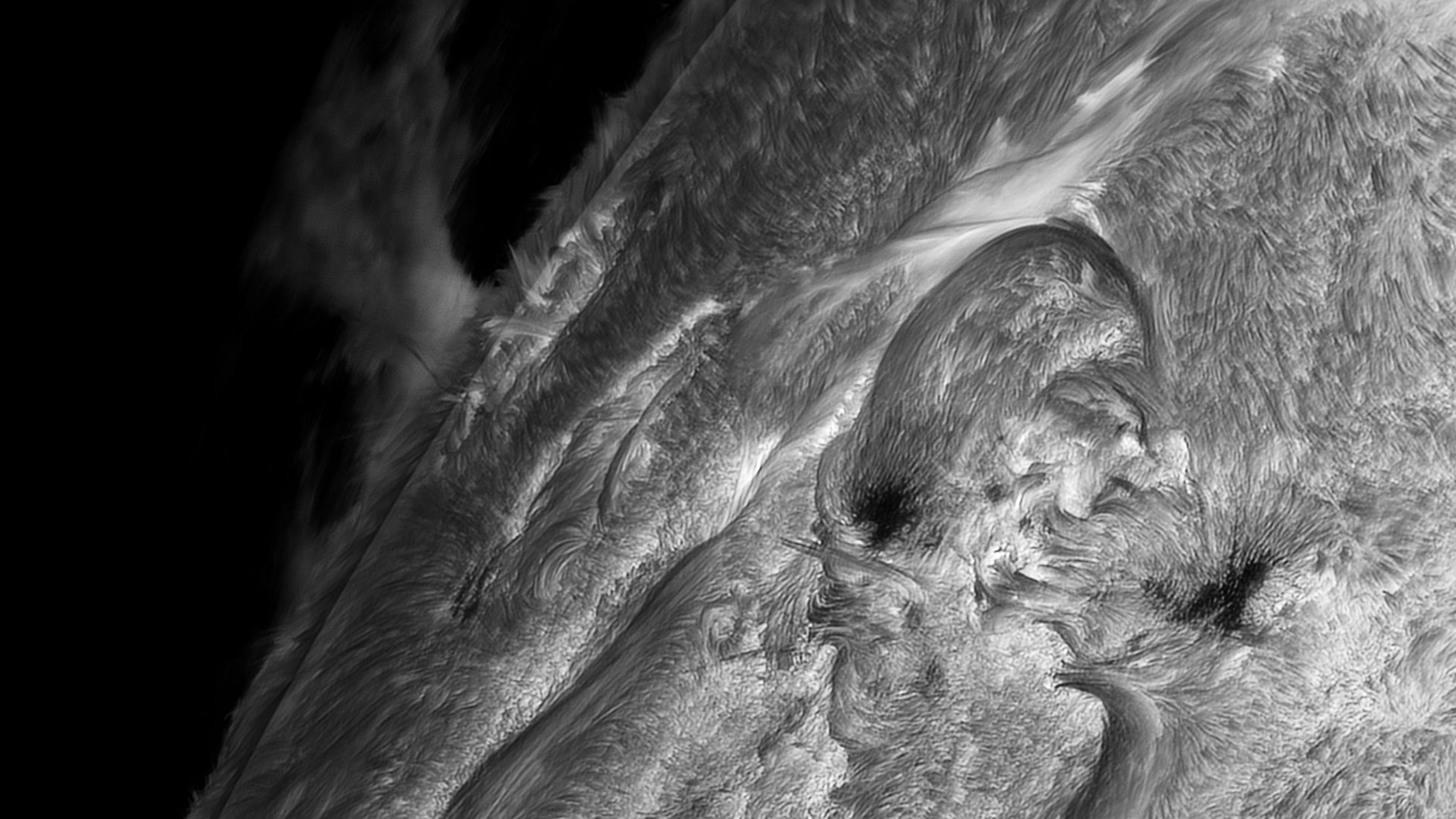


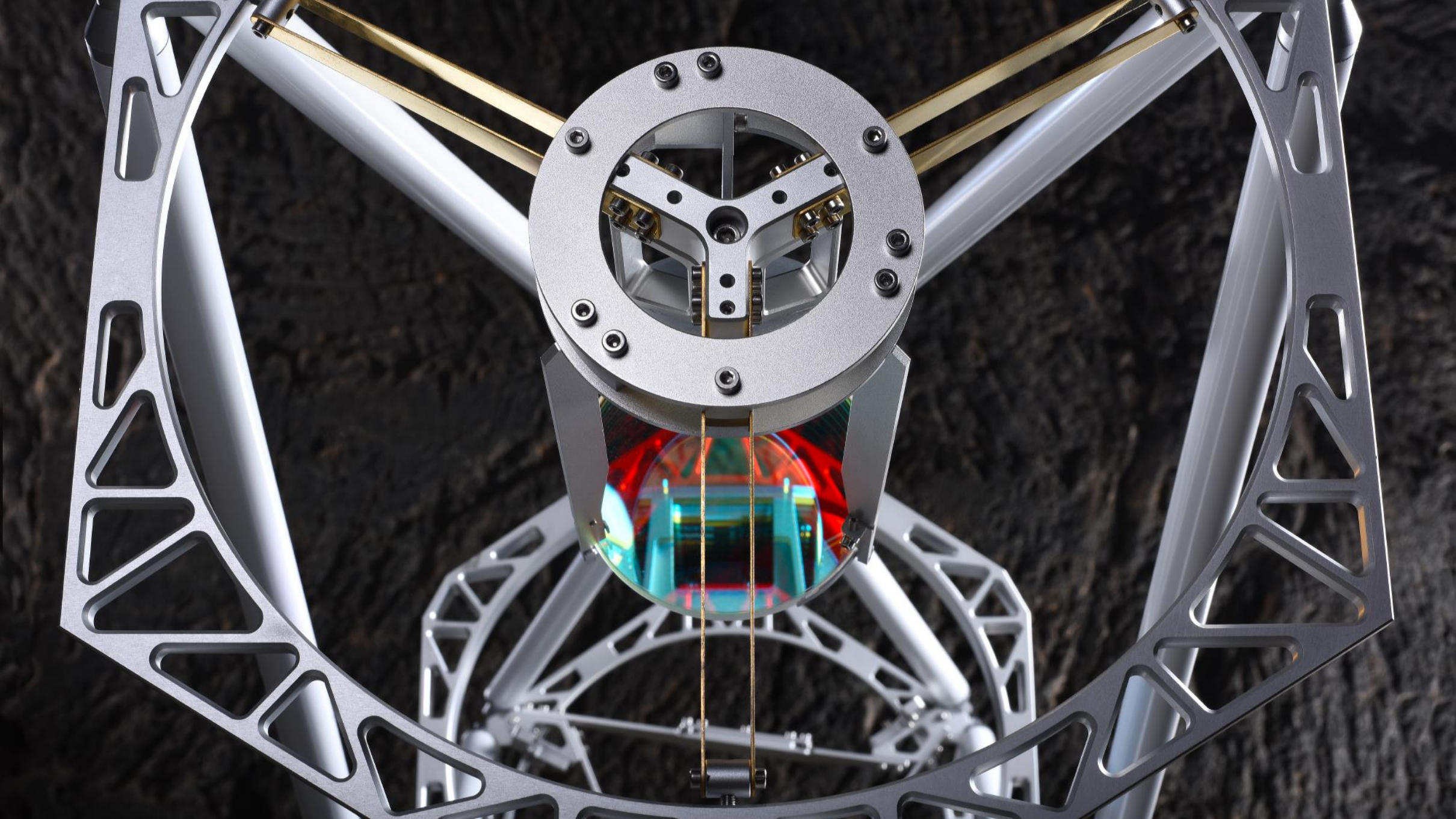
H-alpha



H-alpha







SOLEYE 300

Energy control

Tube seeing

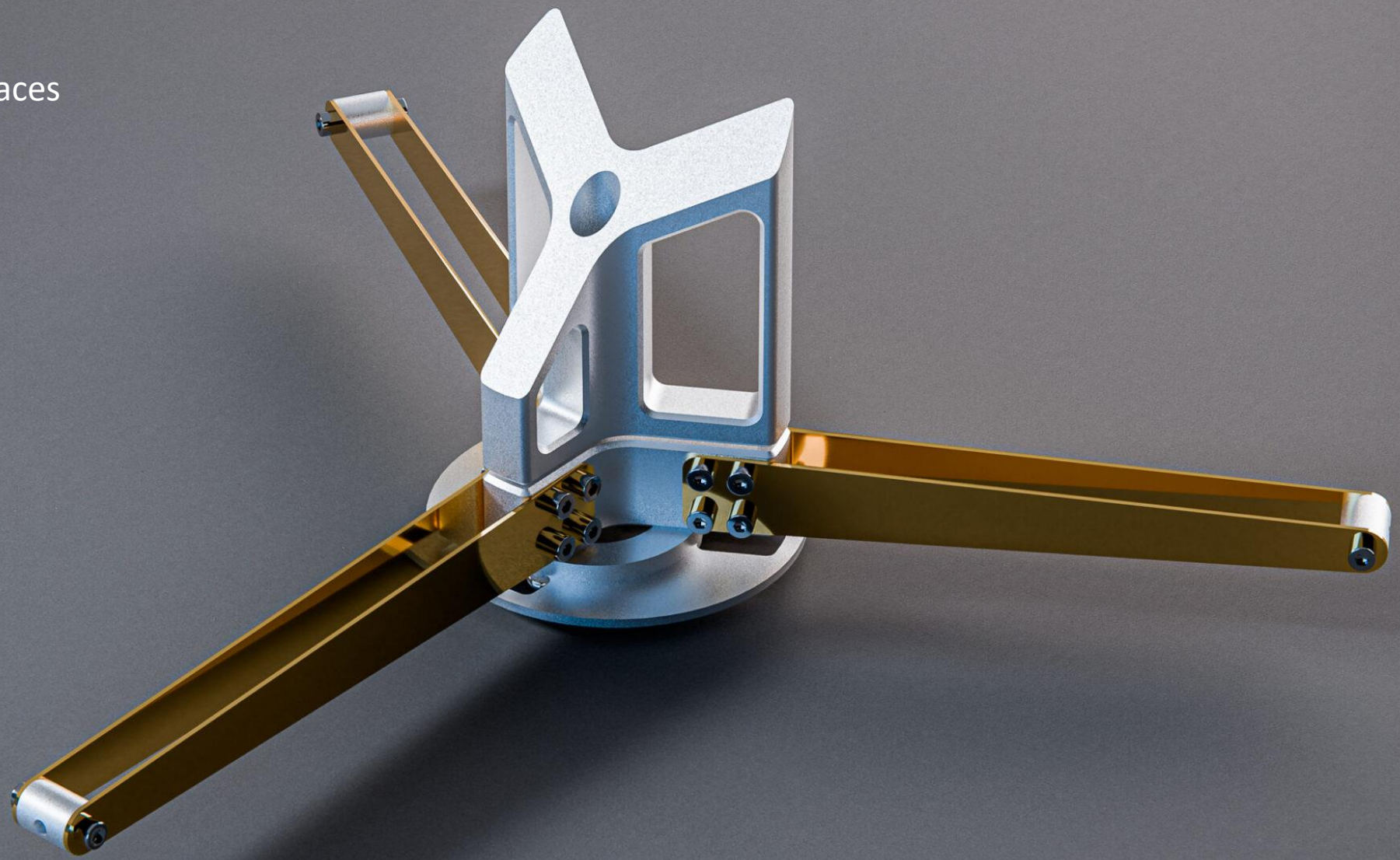
Stability

ENERGY CONTROL

Nothing gets hot
Passive cooling on the main geometric elements
Small surface illuminated by the sun

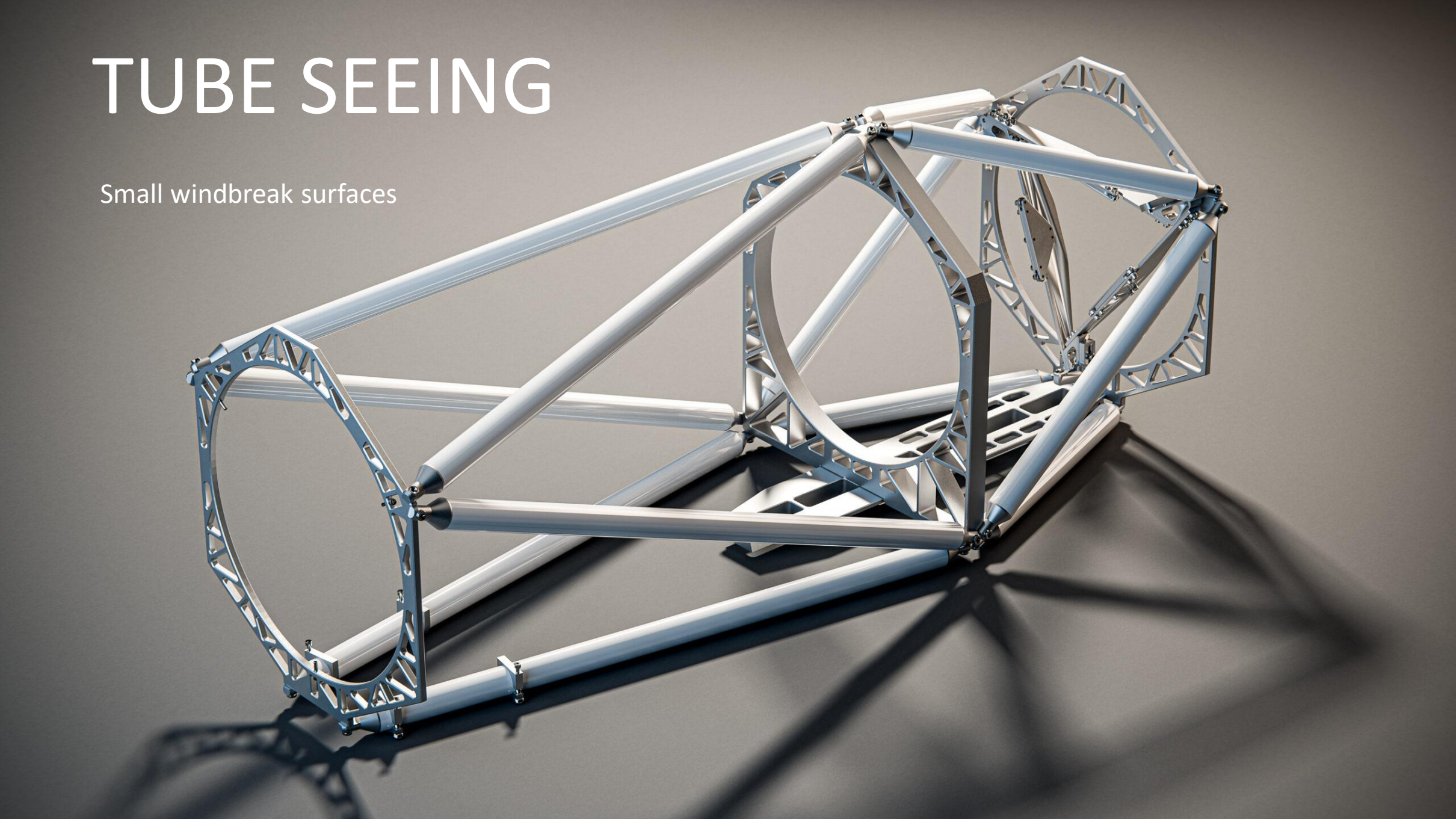
ENERGY CONTROL

IR reflective surfaces



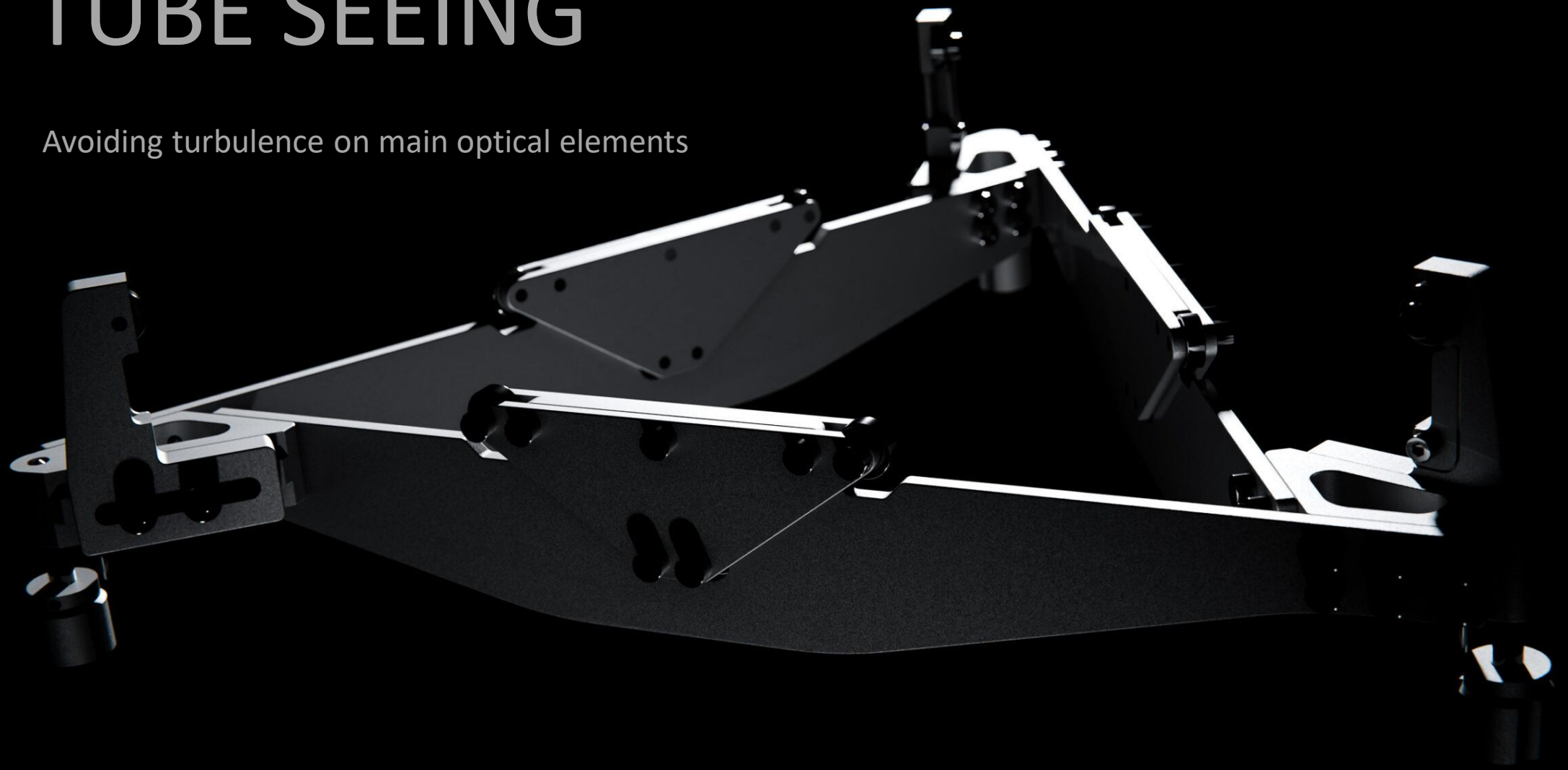
TUBE SEEING

Small windbreak surfaces



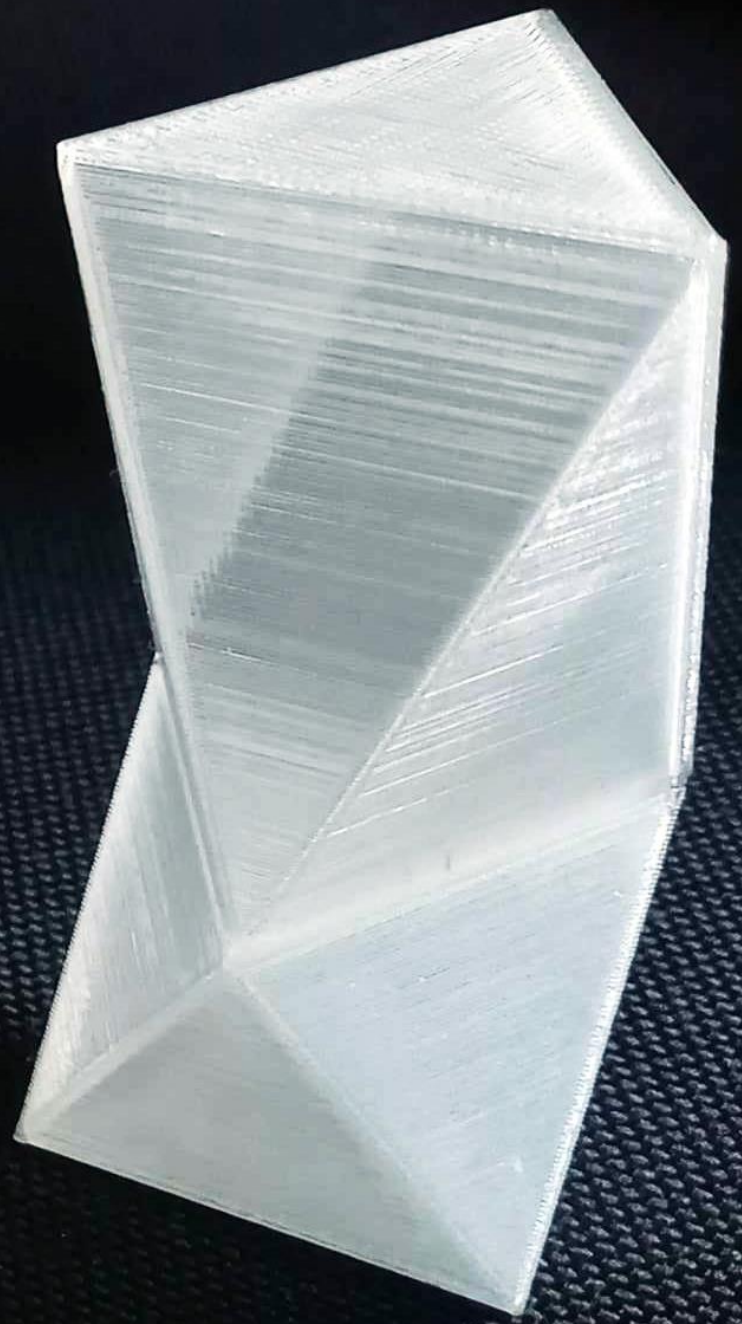
TUBE SEEING

Avoiding turbulence on main optical elements



STABILITY

Double octahedron frame



STABILITY

Frame with low thermal expansion
Small deflection
Optical element mounts are stable
Sturdy and light

STABILITY

Ultraprecise Robotic Focuser

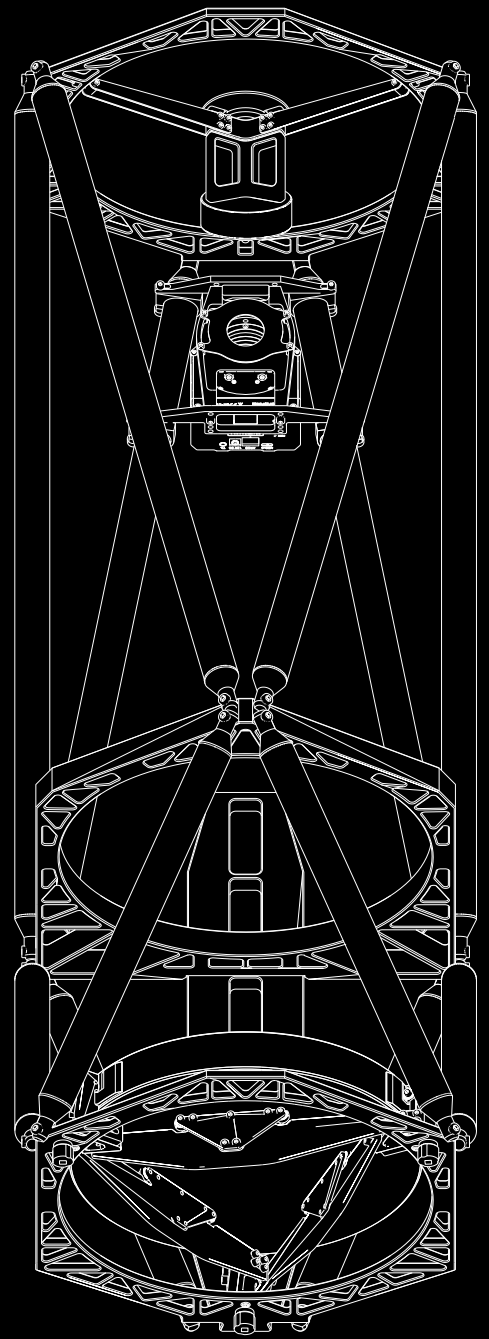
PROS & CONS

+

Large aperture (30 vs 28)
NUV - UV imaging – highest Res.
Collimation stability, easy to collimate
Robotic focuser included
Light

-

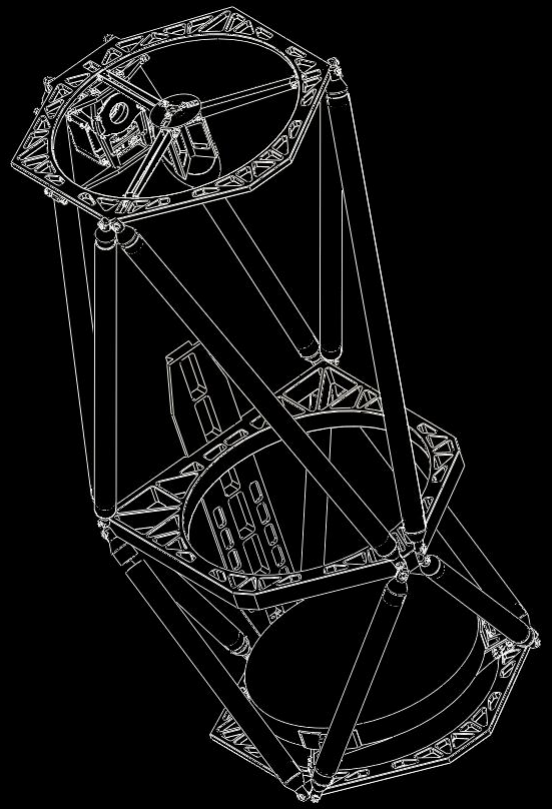
Big
expensive

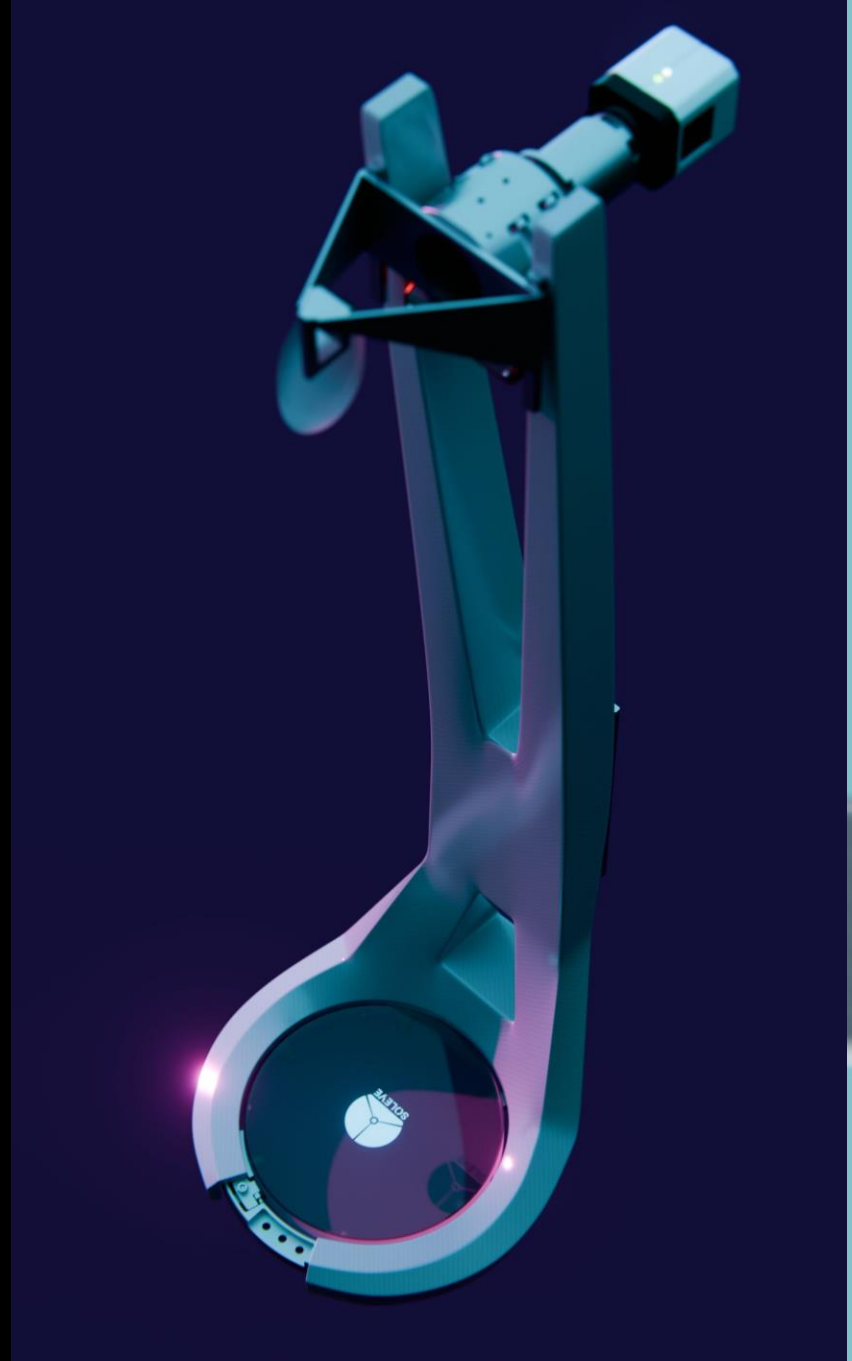


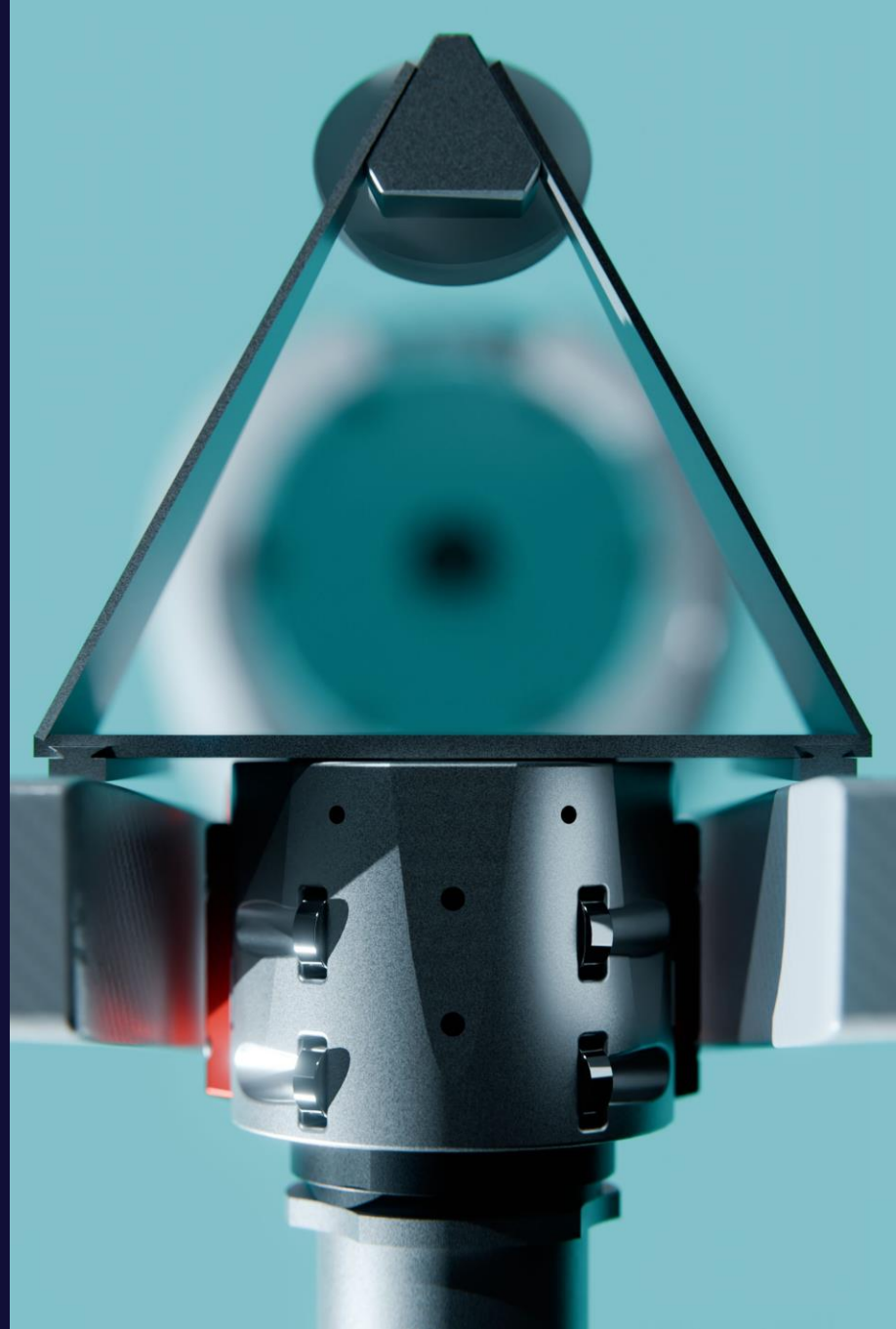
MORE

Soleye 230

Soleye 350







Q&A