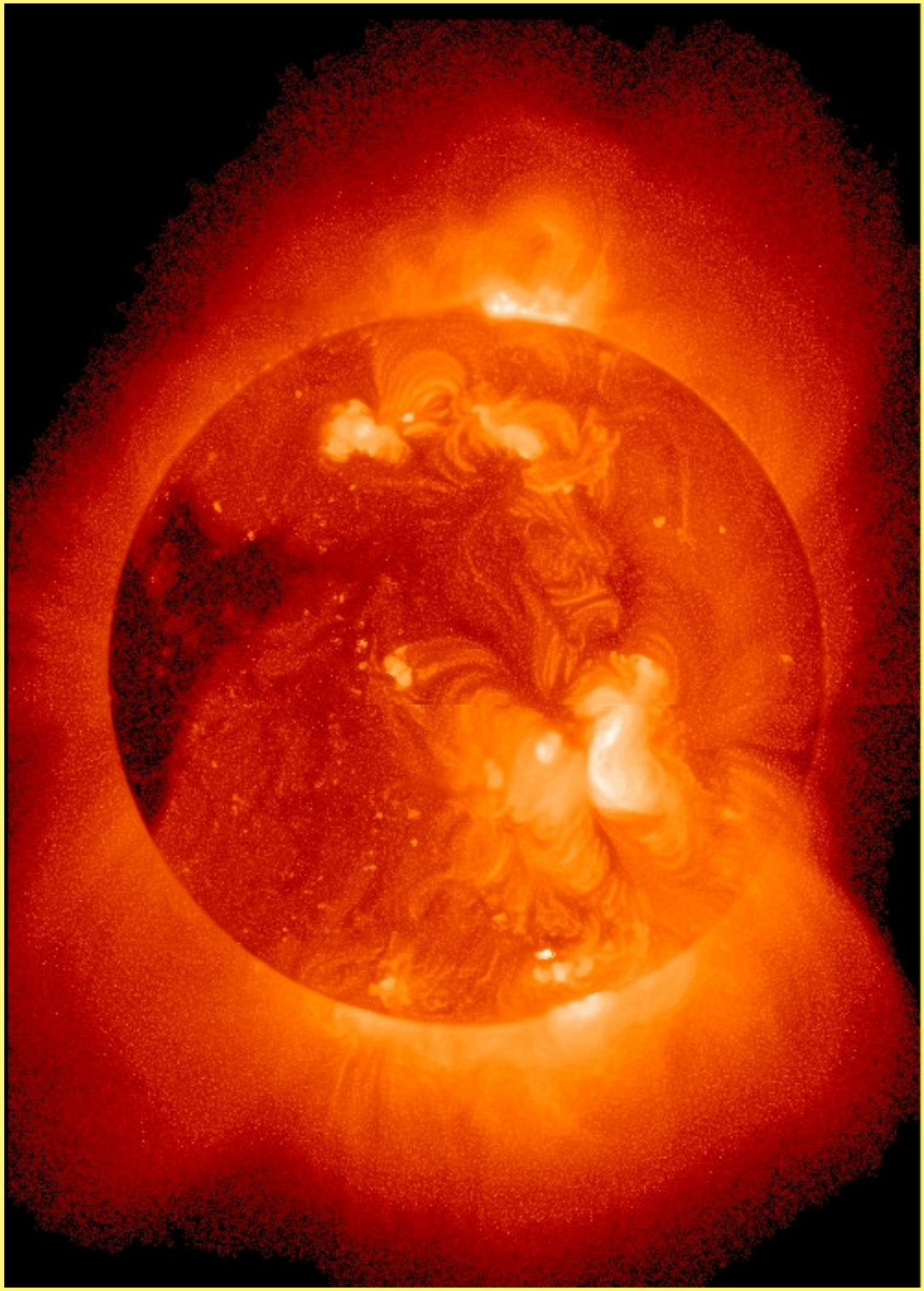

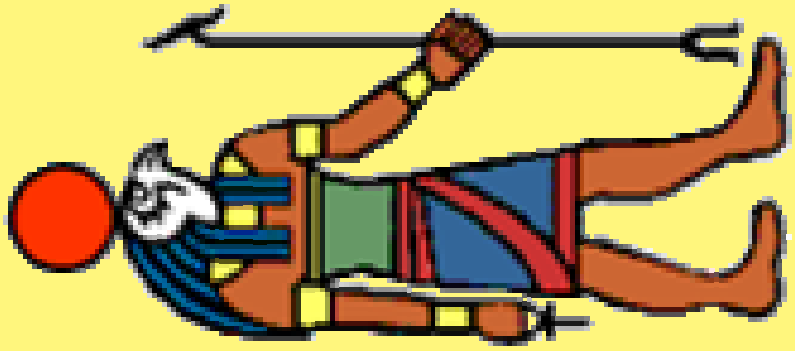

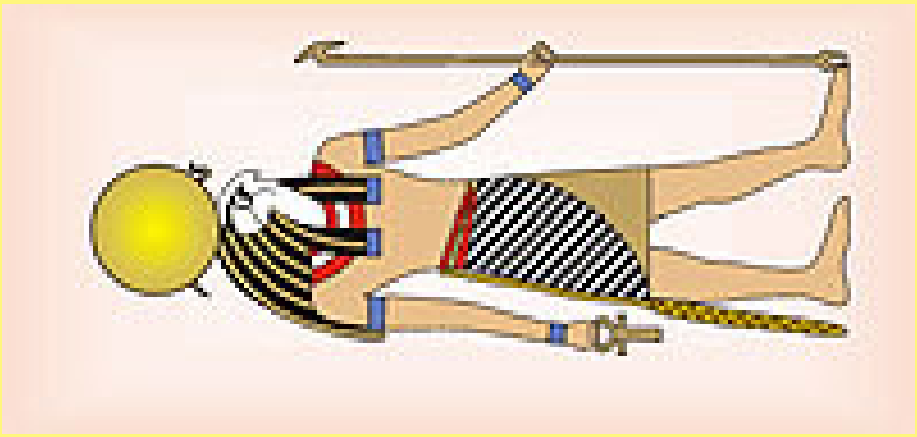

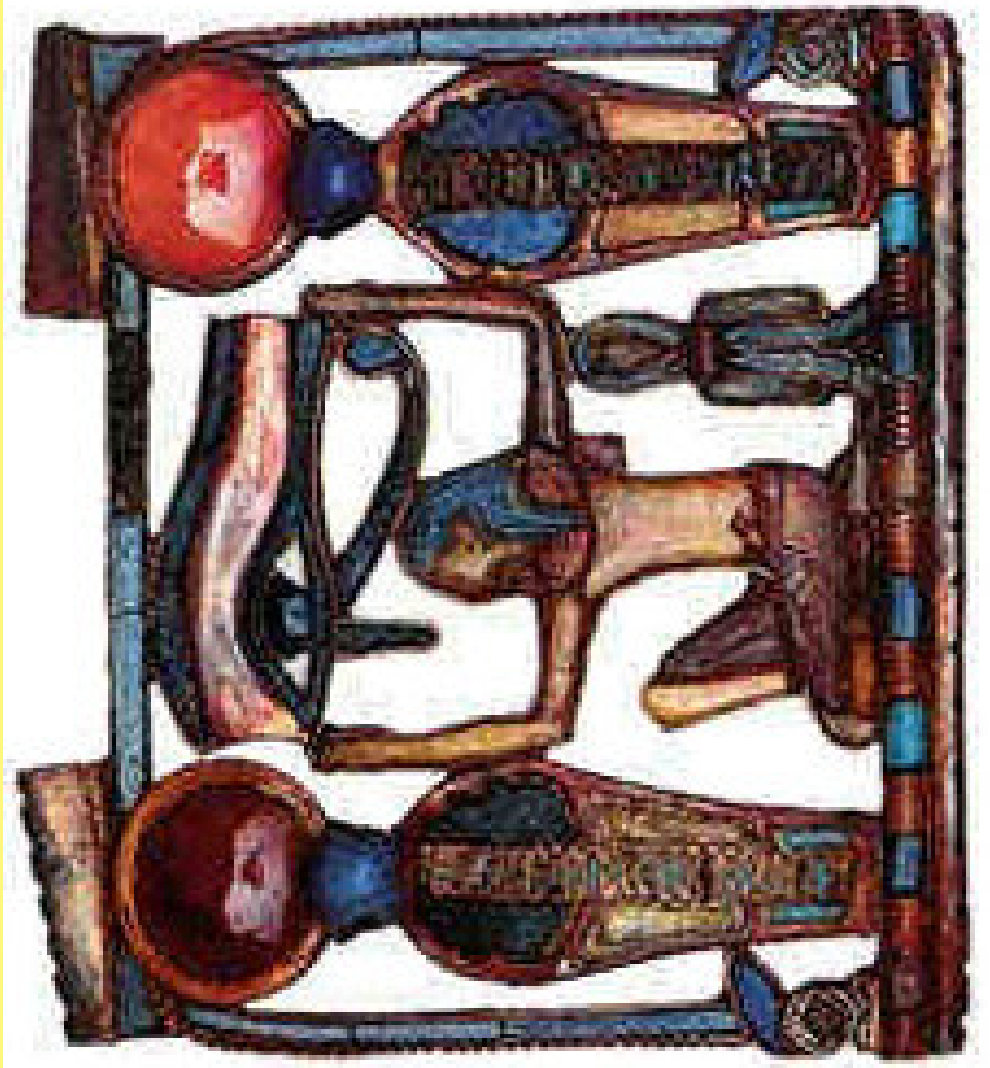

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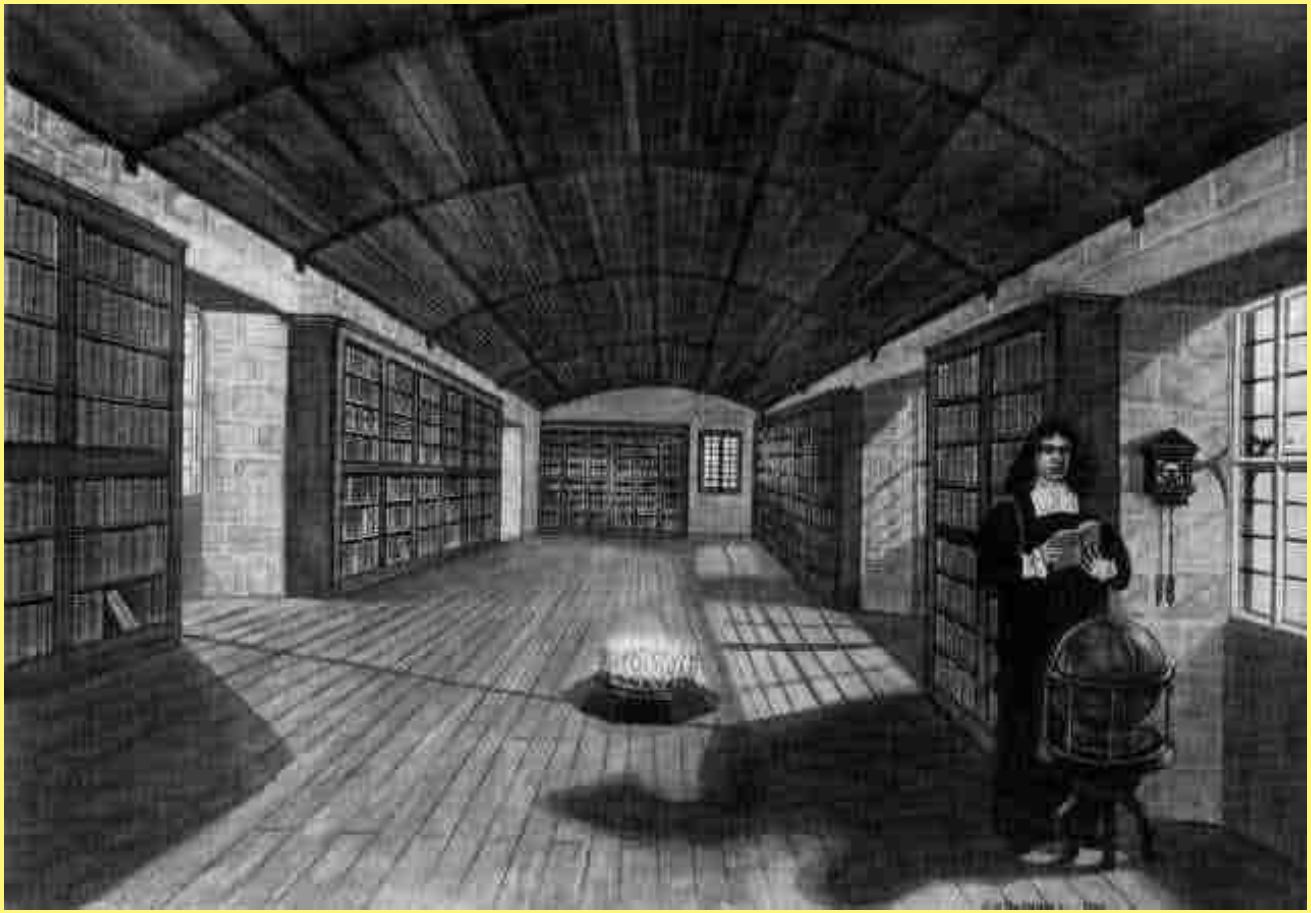
1. Of great scientific interest in own right

2. Influence on Earth

3. Important for Astronomy

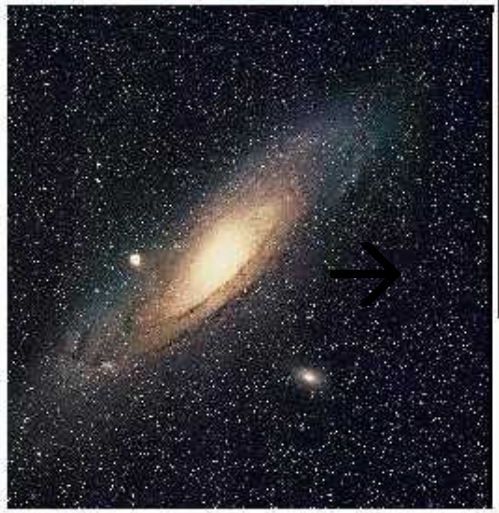
-- fundamental cosmic processes

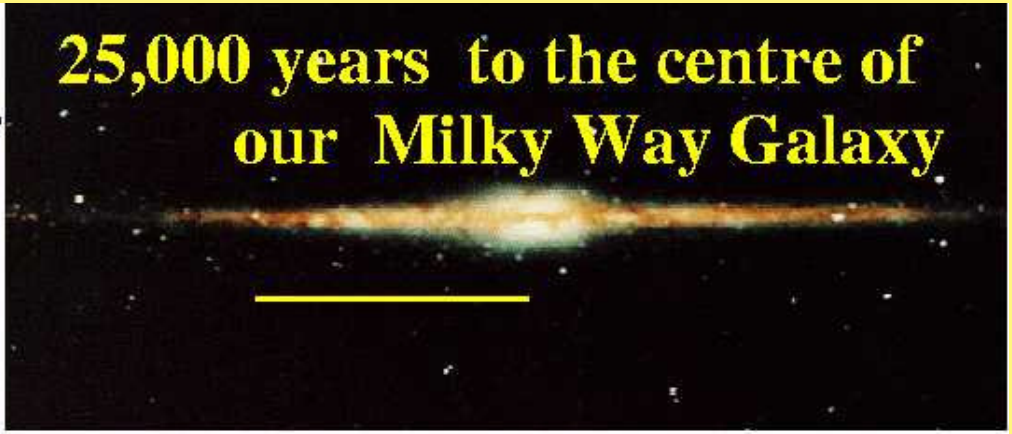
But -- Many basic properties still a mystery



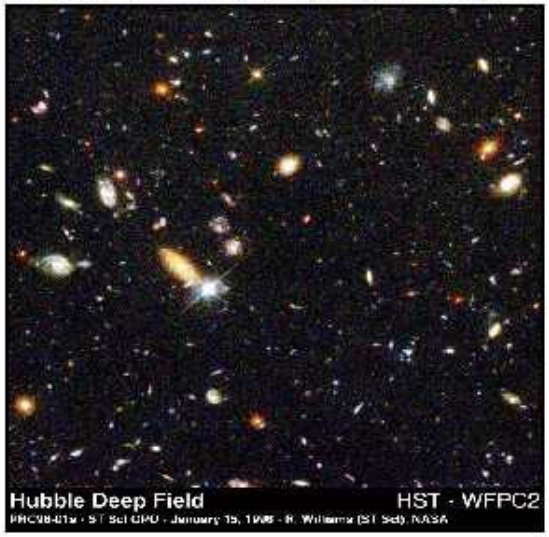
“ ”

July 1990: White Light
Mauna Loa Observatory, Hawaii

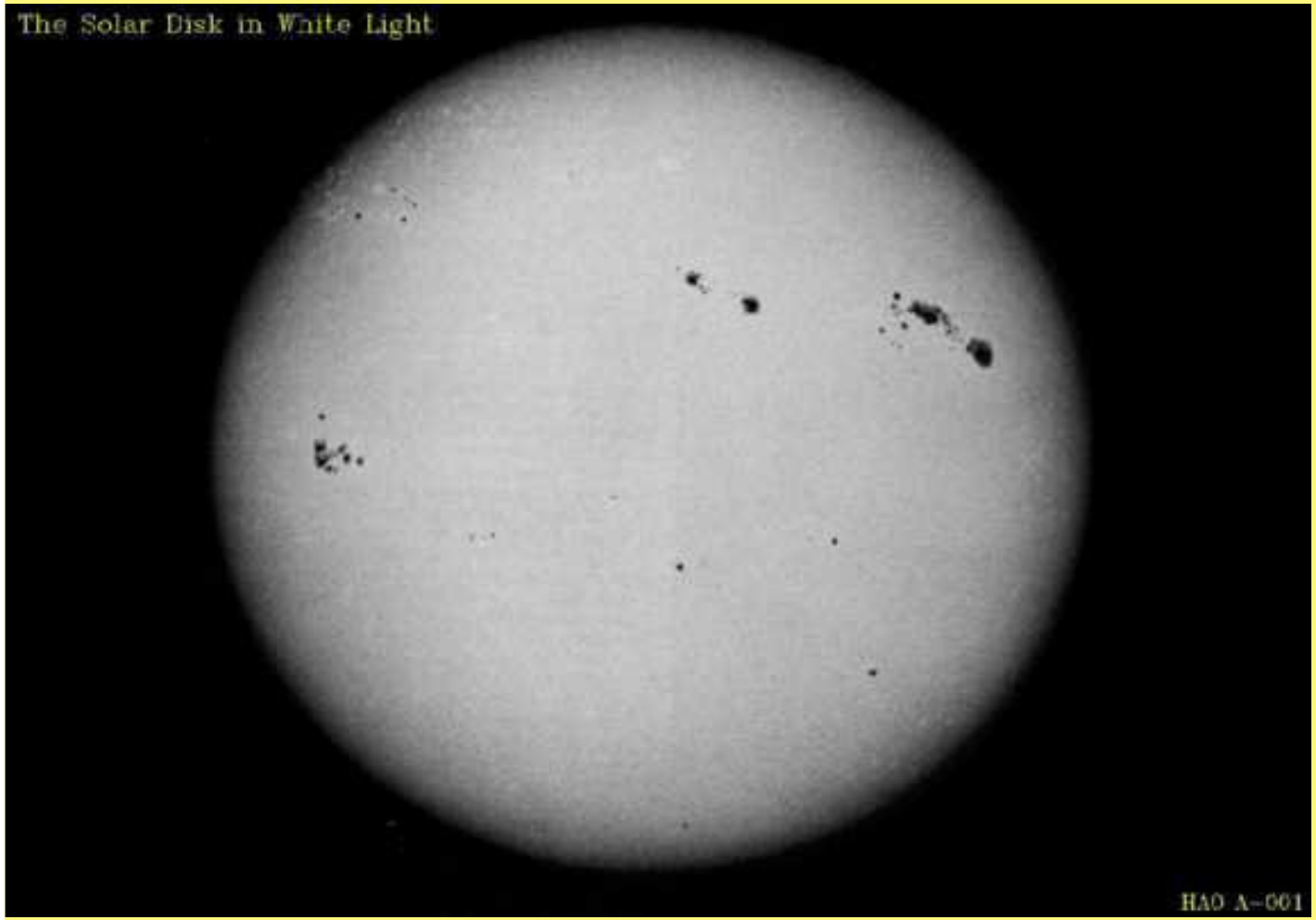


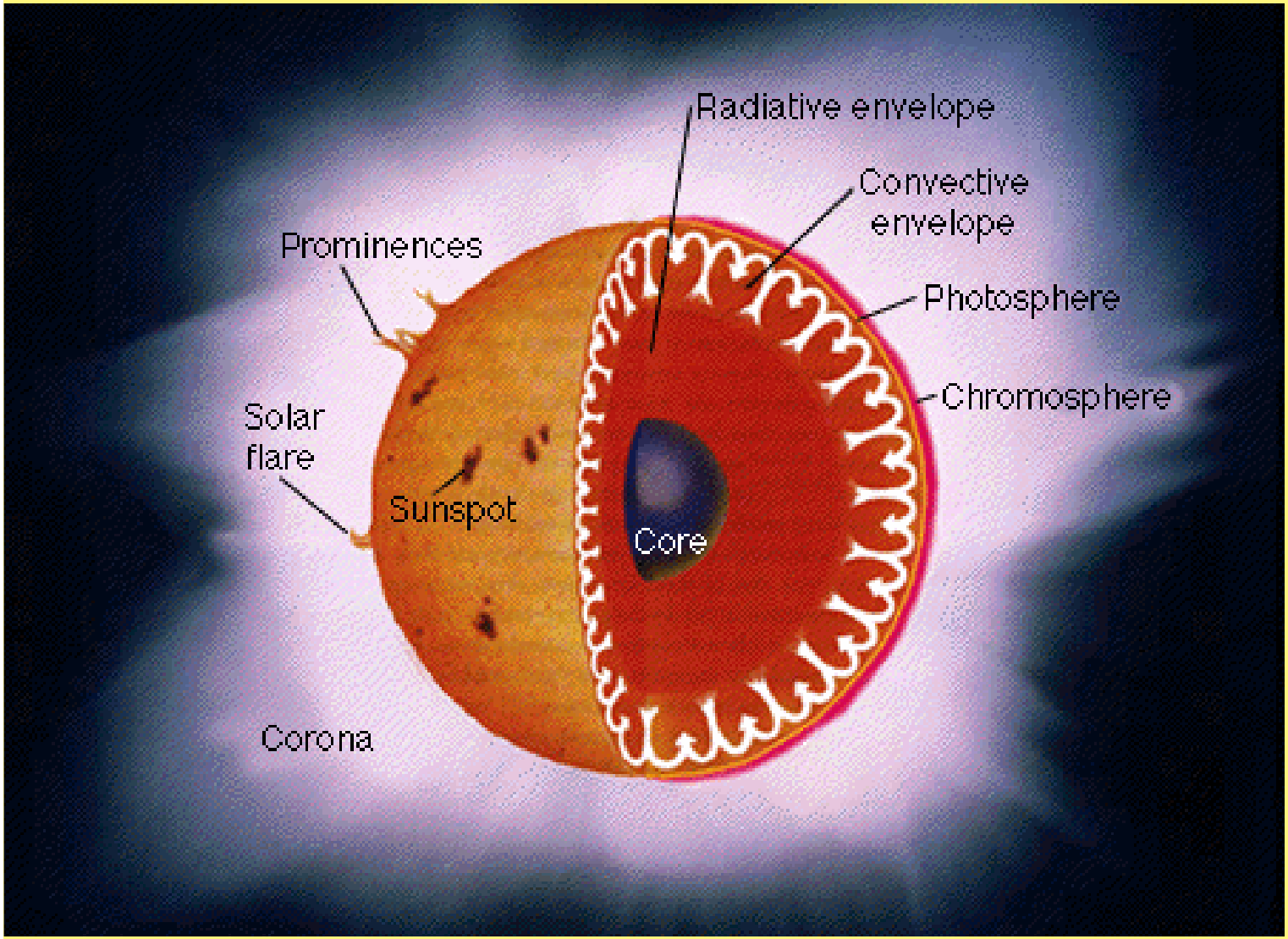


2,000,000 years to the
Andromeda Galaxy



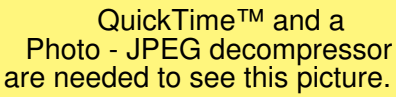
15,000,000,000 years to the
edge of the visible Universe


The Solar Disk in White Light
HAO A-001


Radiative envelope
Convective envelope
Prominences
Photosphere
Chromosphere
Solar flare
Sunspot
Core
Corona

QuickTime™ and a
YUV420 codec decompressor
are needed to see this picture.

“ ”


QuickTime™ and a
Photo - JPEG decompressor
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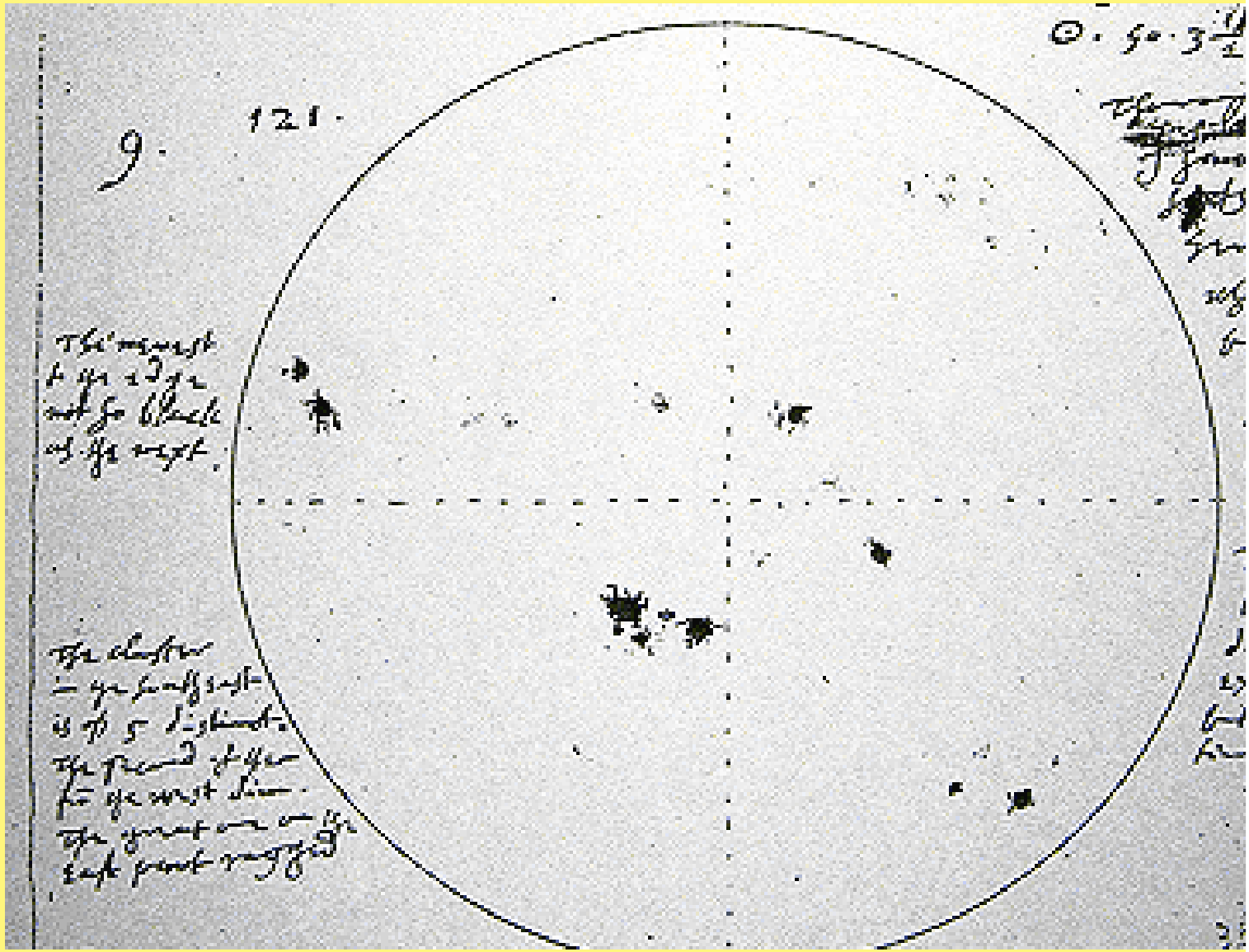
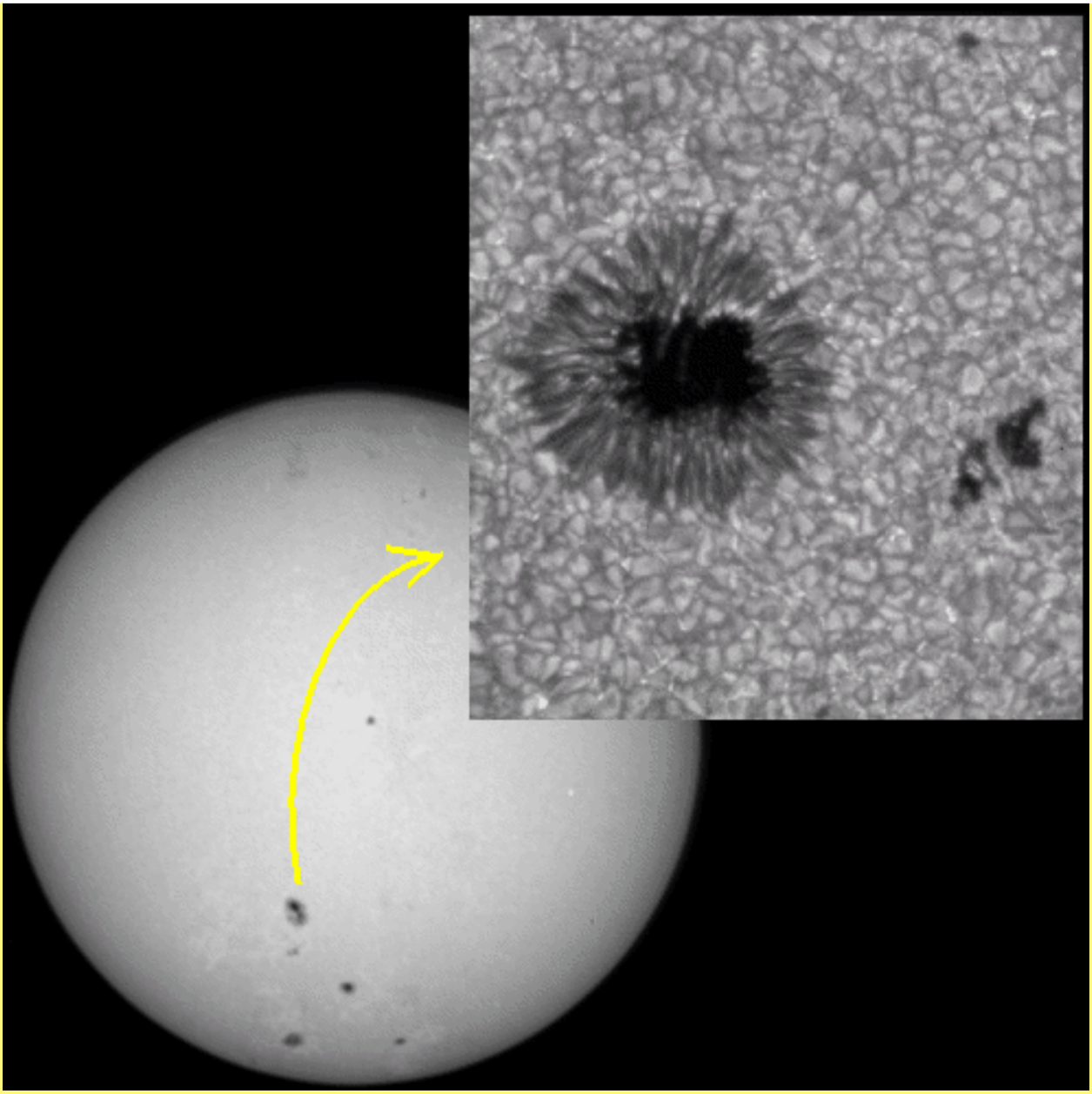
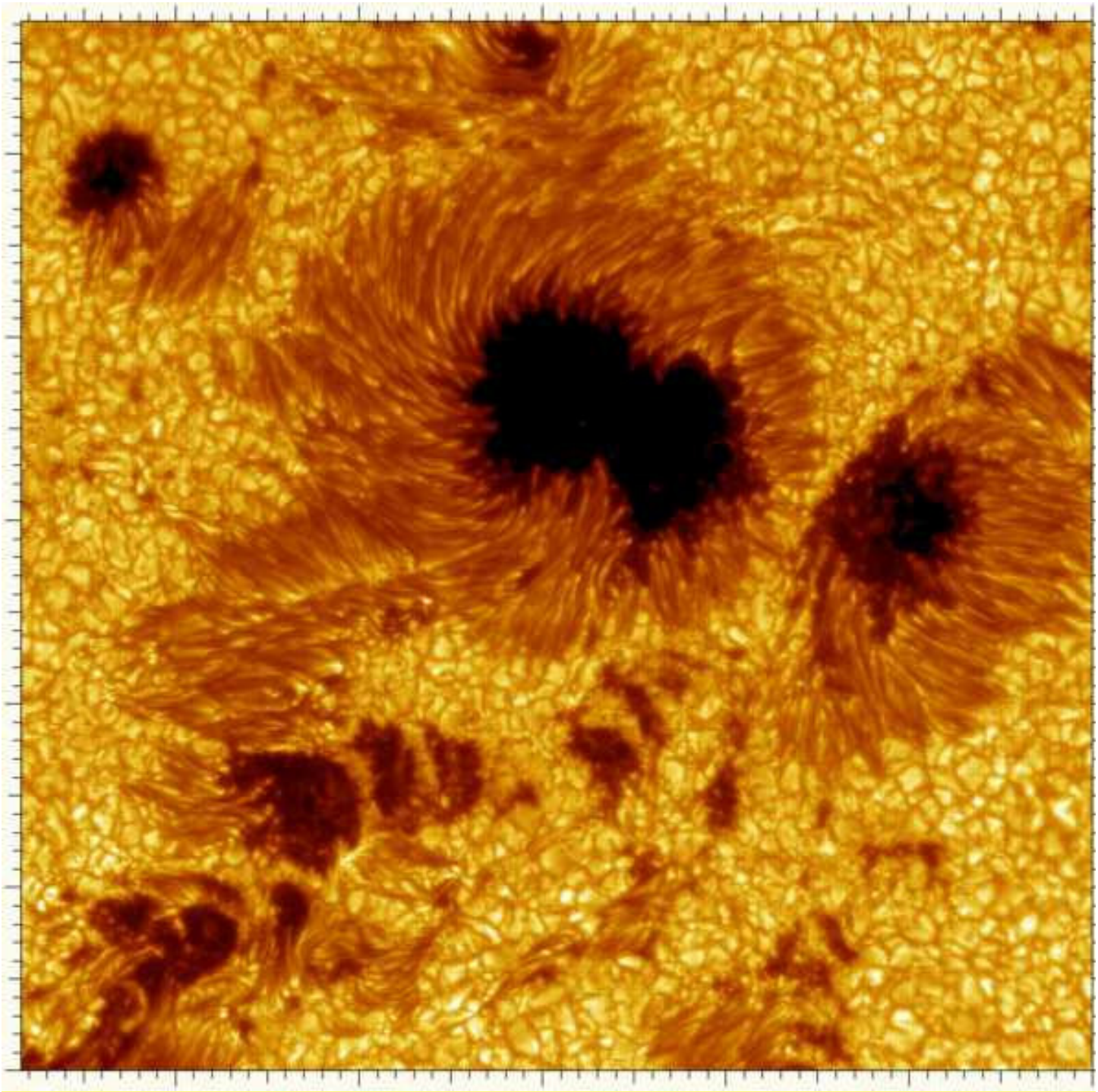
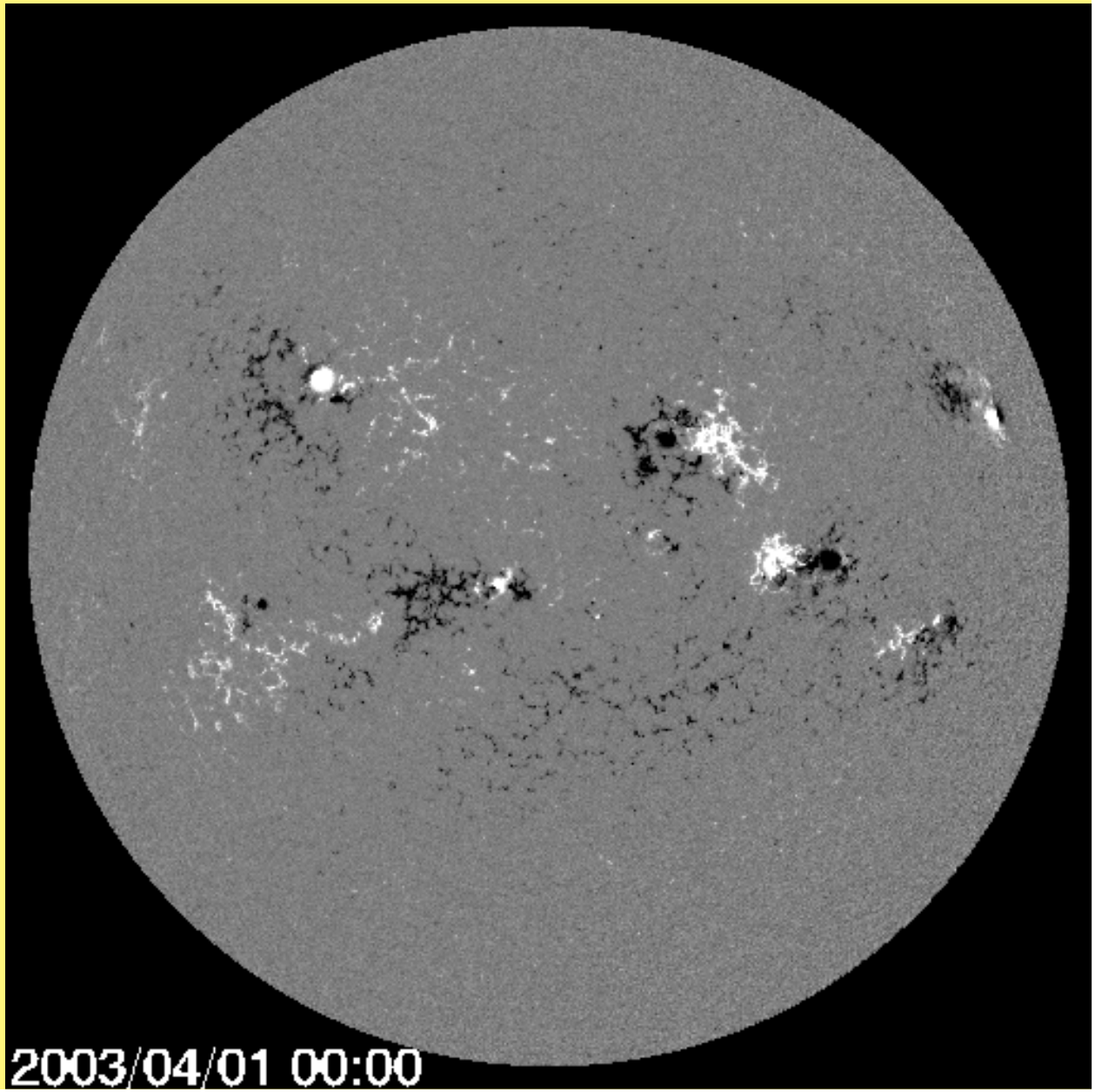

9. 121.

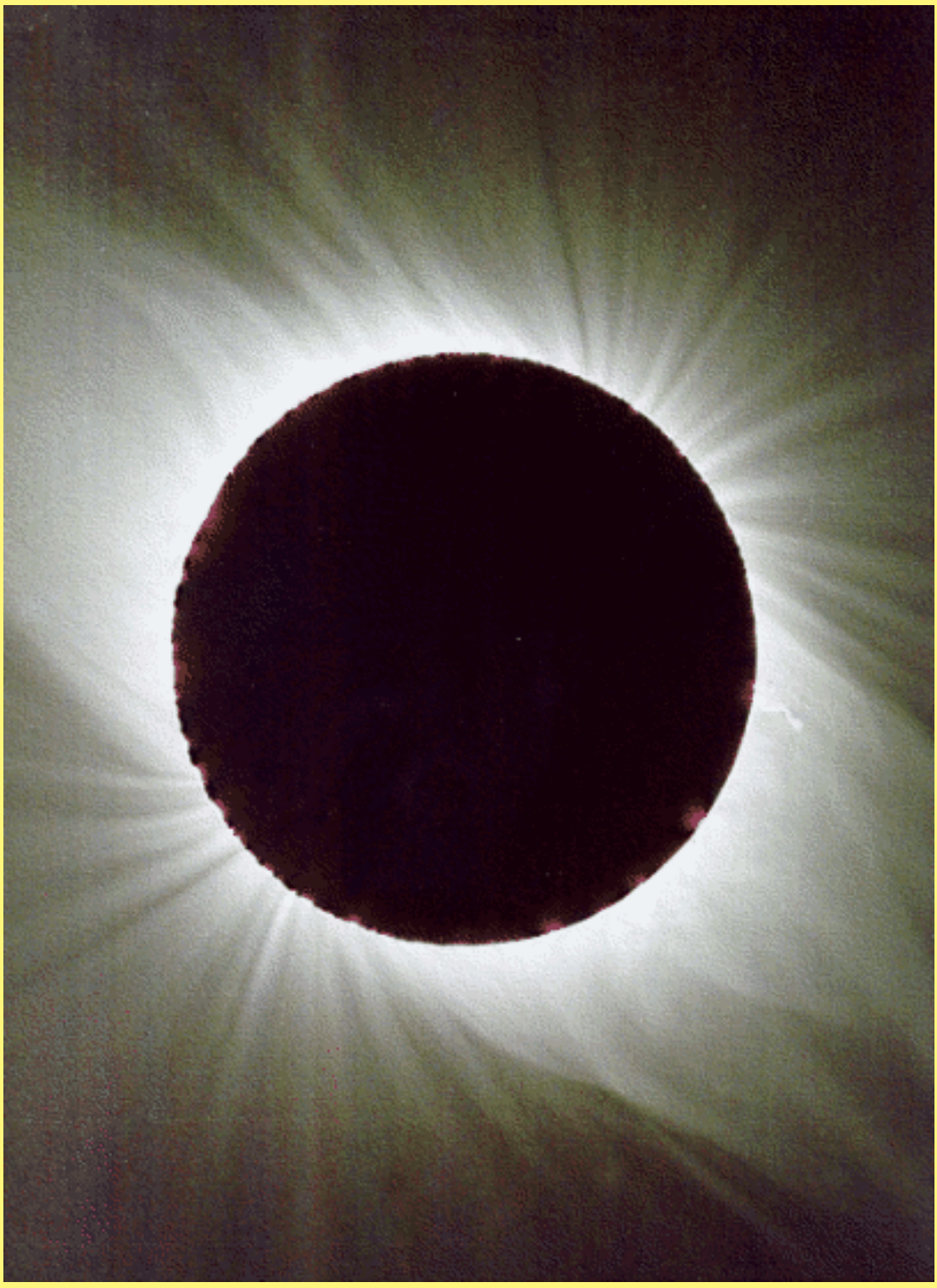


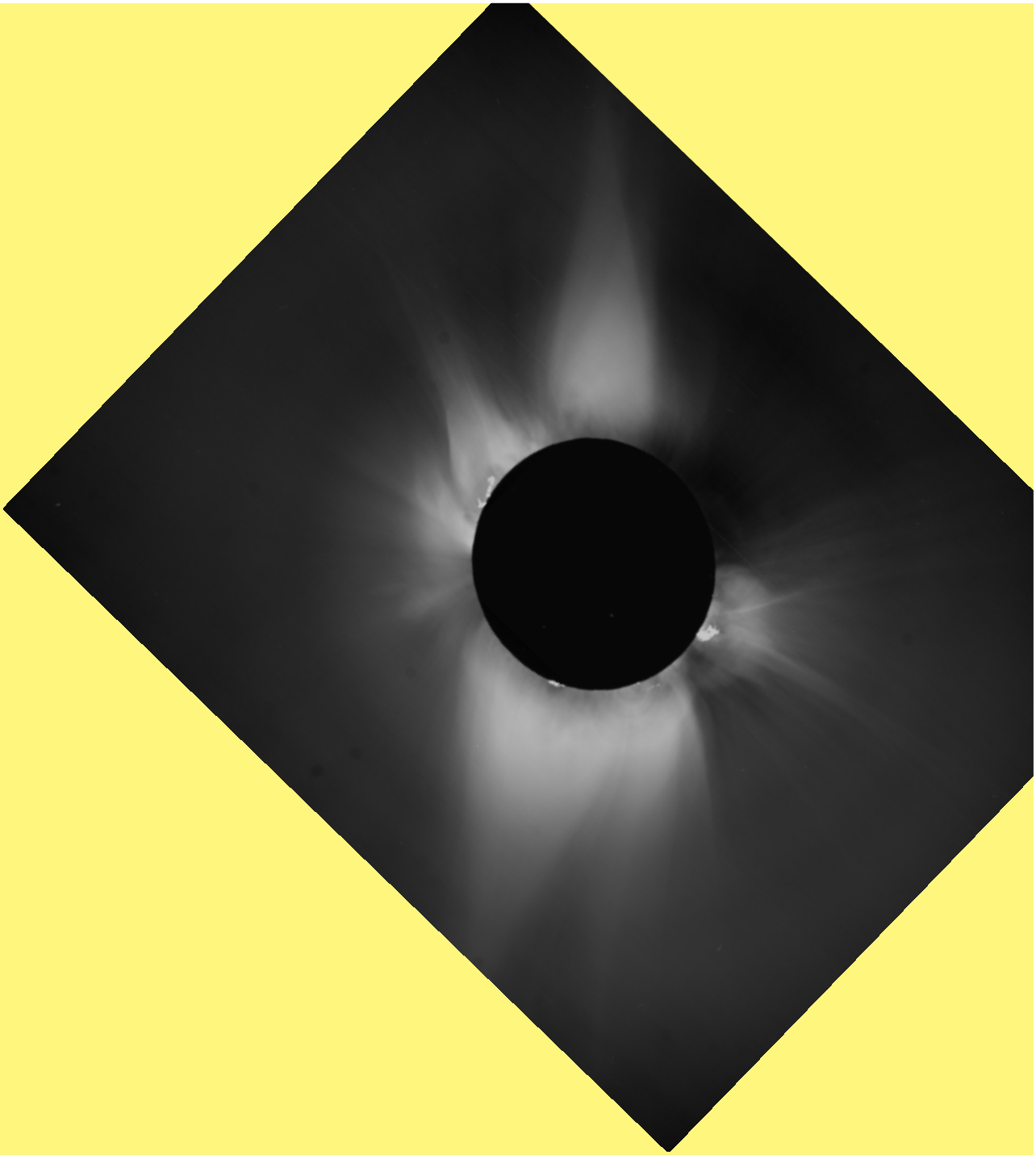


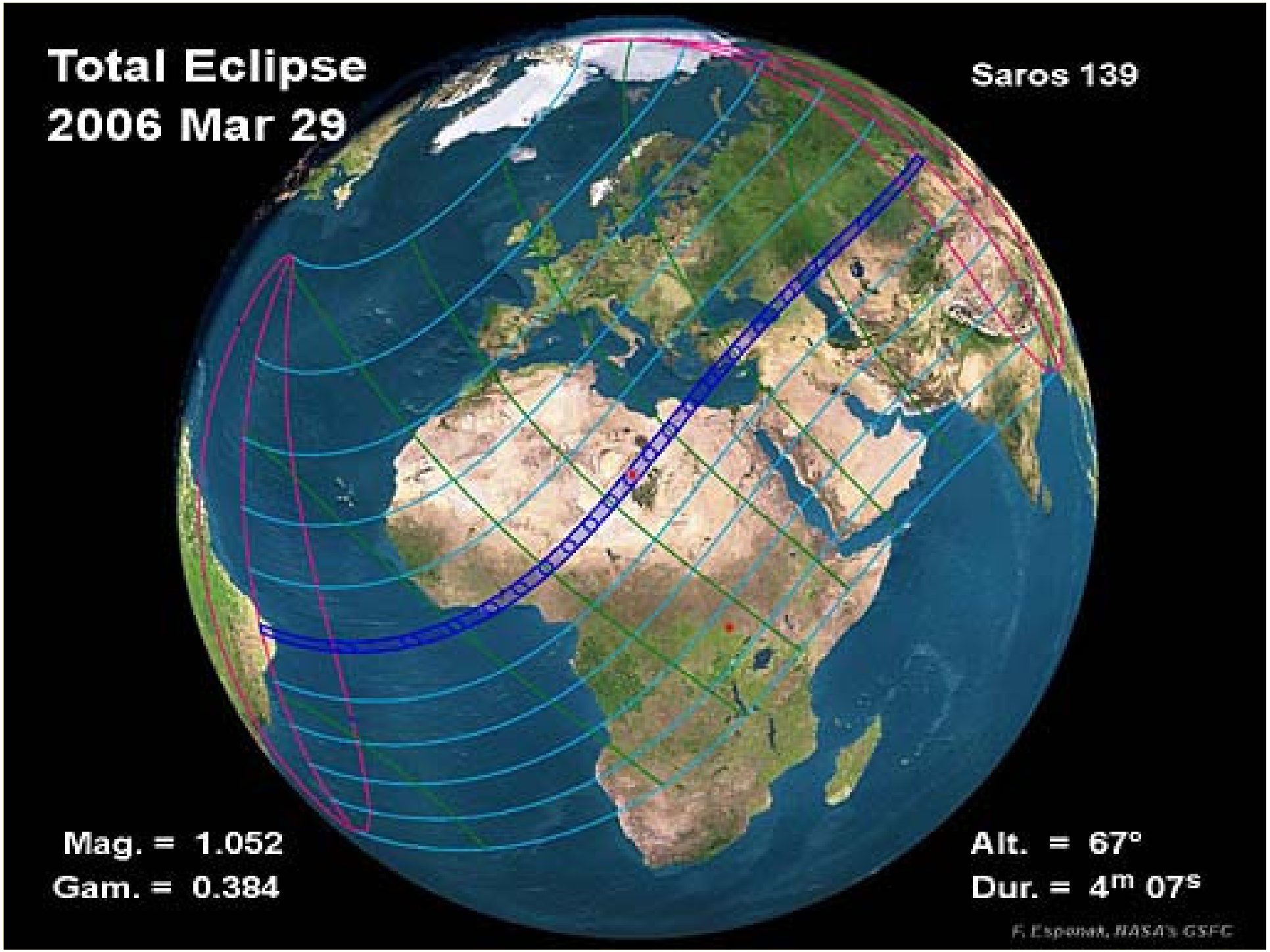

2003/04/01 00:00

QuickTime™ and a
YUV420 codec decompressor
are needed to see this picture.

QuickTime™ and a
GIF decompressor
are needed to see this picture.






Total Eclipse
2006 Mar 29
Saros 139
Mag. = 1.052
Gam. = 0.384
Alt. = 67°
Dur. = 4m 07s
F. Espenak, NASA's GSFC

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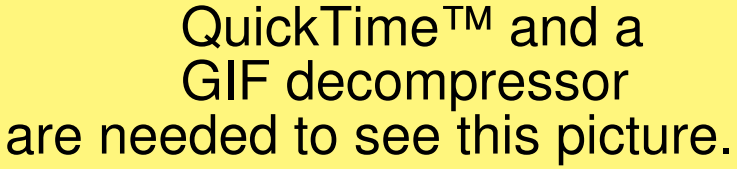
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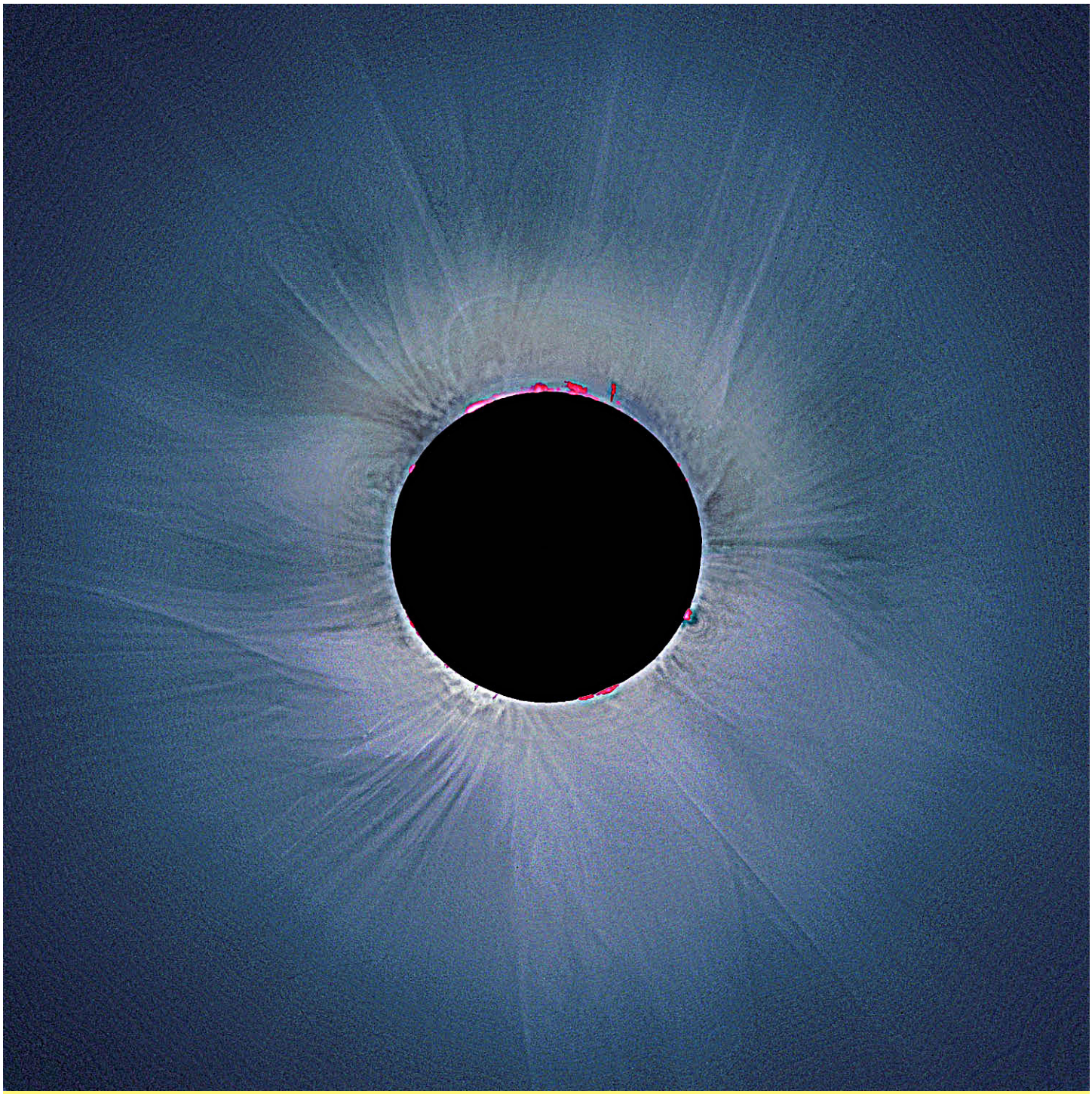
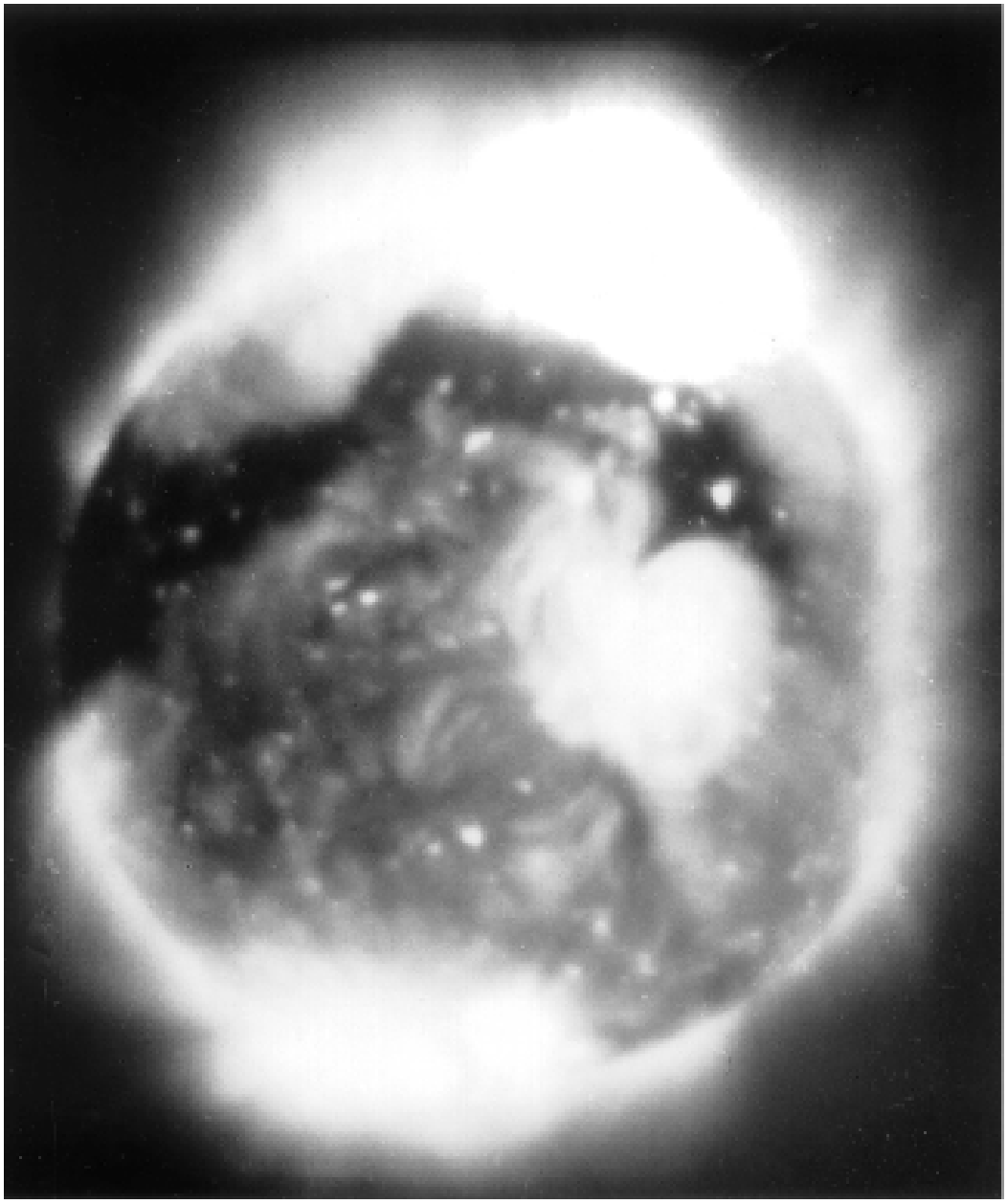
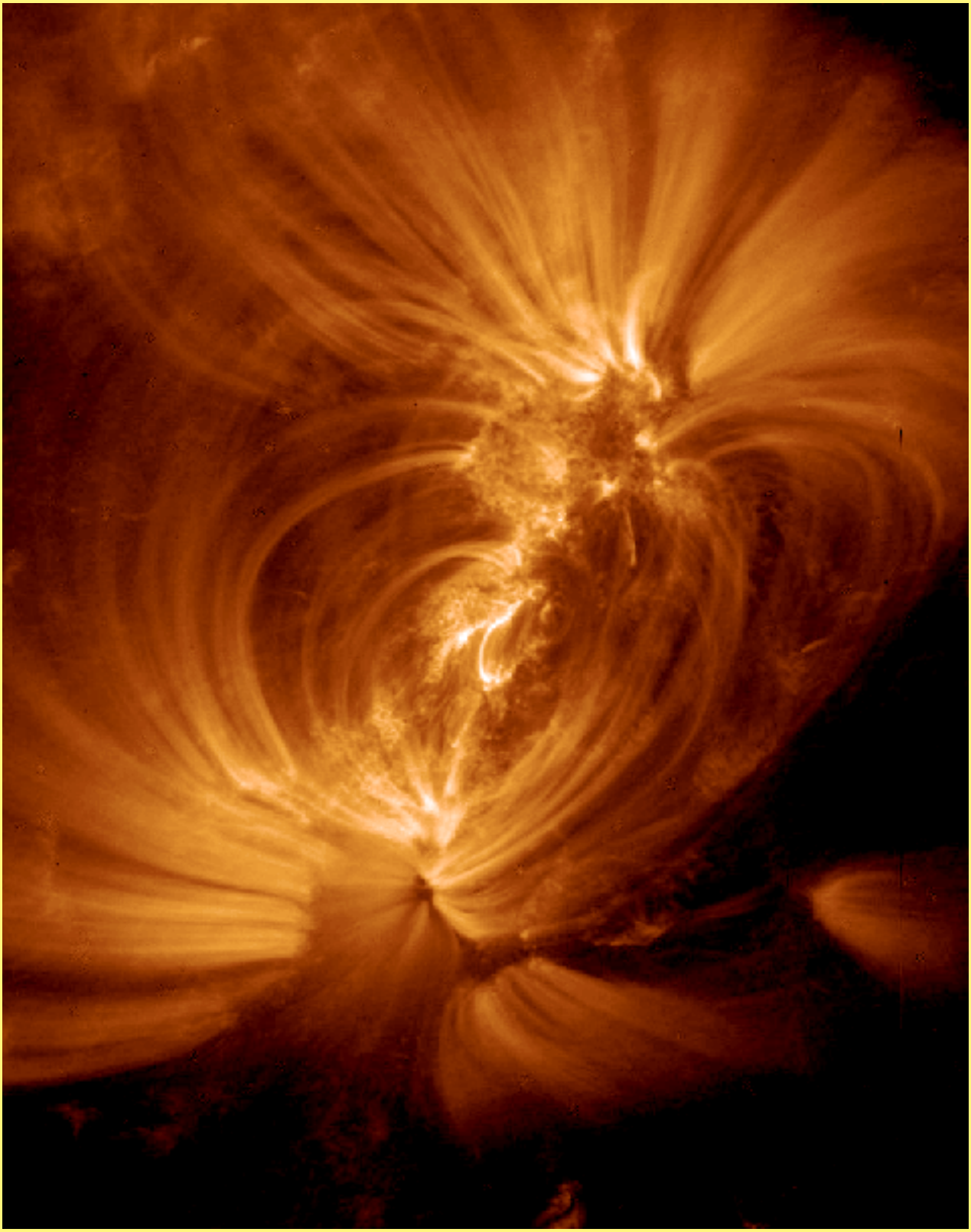
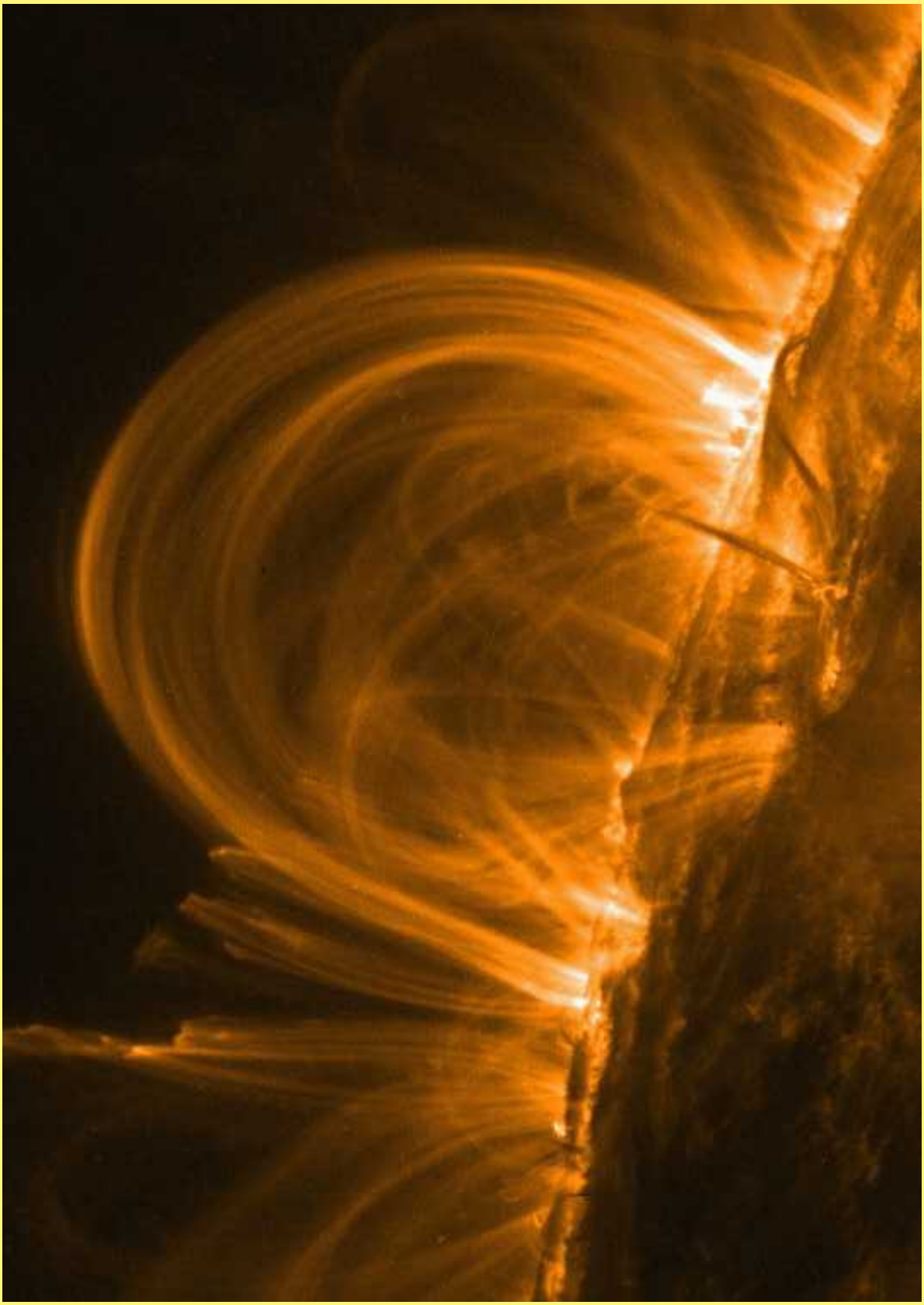
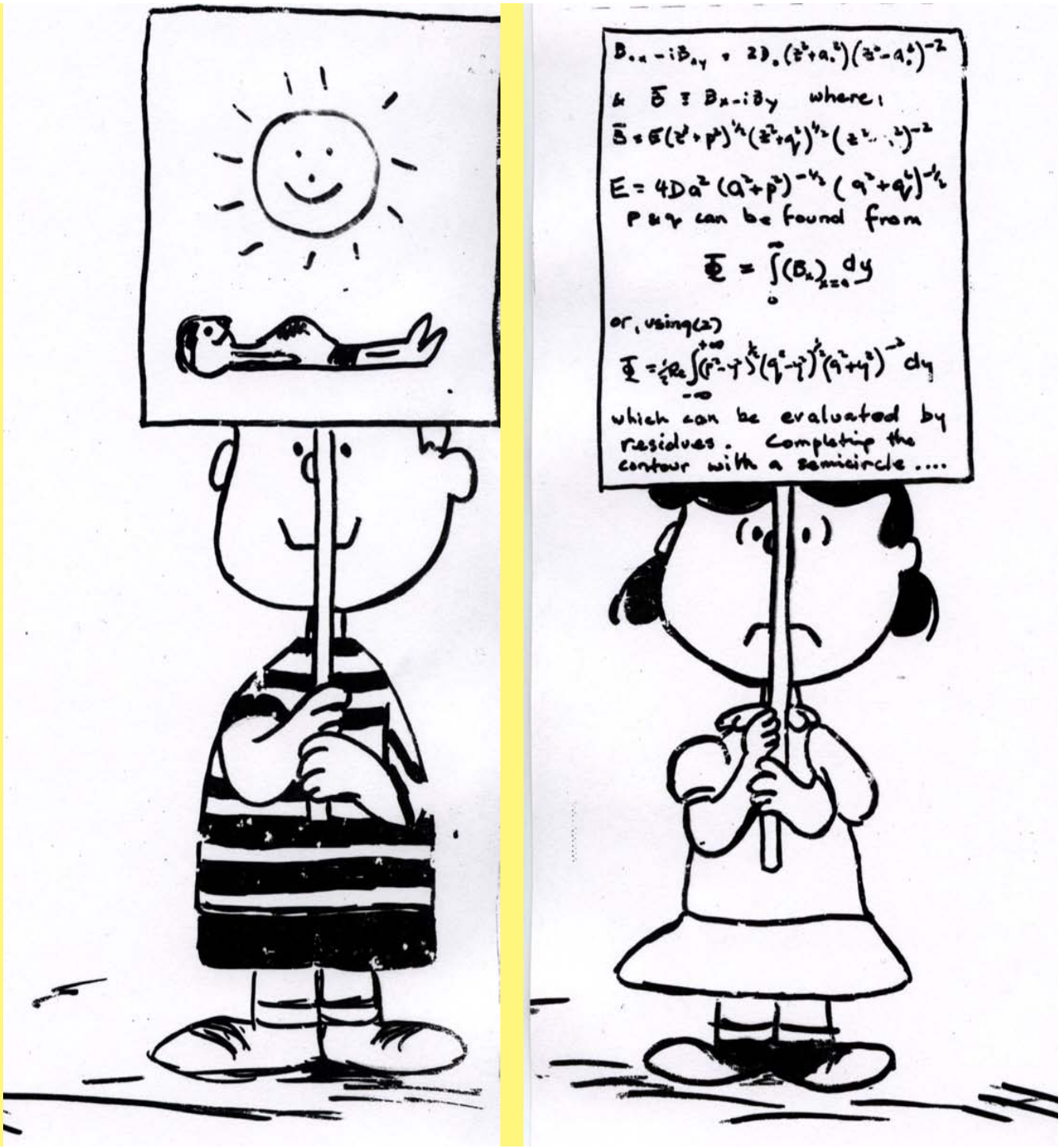


DAVID O. SELZNICK'S
MARGARET MITCHELL'S
GONE WITH THE SOLARWIND
WINNER OF 10 ACADEMY AWARDS®
INCLUDING 1939 BEST PICTURE








$B_{x_0} - iB_{y_0} = 2D_0(z^2+a_0^2)(z^2-q_0^2)^{-2}$
& $\bar{B} = B_x - iB_y$ where:
$\bar{B} = 8(z^2+p^2)^{1/2}(z^2+q^2)^{1/2}(z^2-\ldots)^{-2}$
$E = 4Da^2(a^2+p^2)^{-1/2}(q^2+q^2)^{-1/2}$
P & q can be found from
$\Phi = \int_0^\infty (B_x)_{z=a}\, dy$
or, using (2)
$\Phi = \frac{1}{2}Re\int_{-\infty}^{+\infty}(p^2-\ldots)^{1/2}(q^2-\ldots)^{1/2}(q^2+\ldots)^{-2}\, dy$
which can be evaluated by residues. Completing the contour with a semicircle ....

$$\frac{\partial \mathbf{B}}{\partial t} = \nabla \times (\mathbf{v} \times \mathbf{B}) + \eta \nabla^2 \mathbf{B}$$ Induction Equation

$$\frac{D\rho}{Dt} + \rho \nabla . \mathbf{v} = 0$$ Mass Conservation

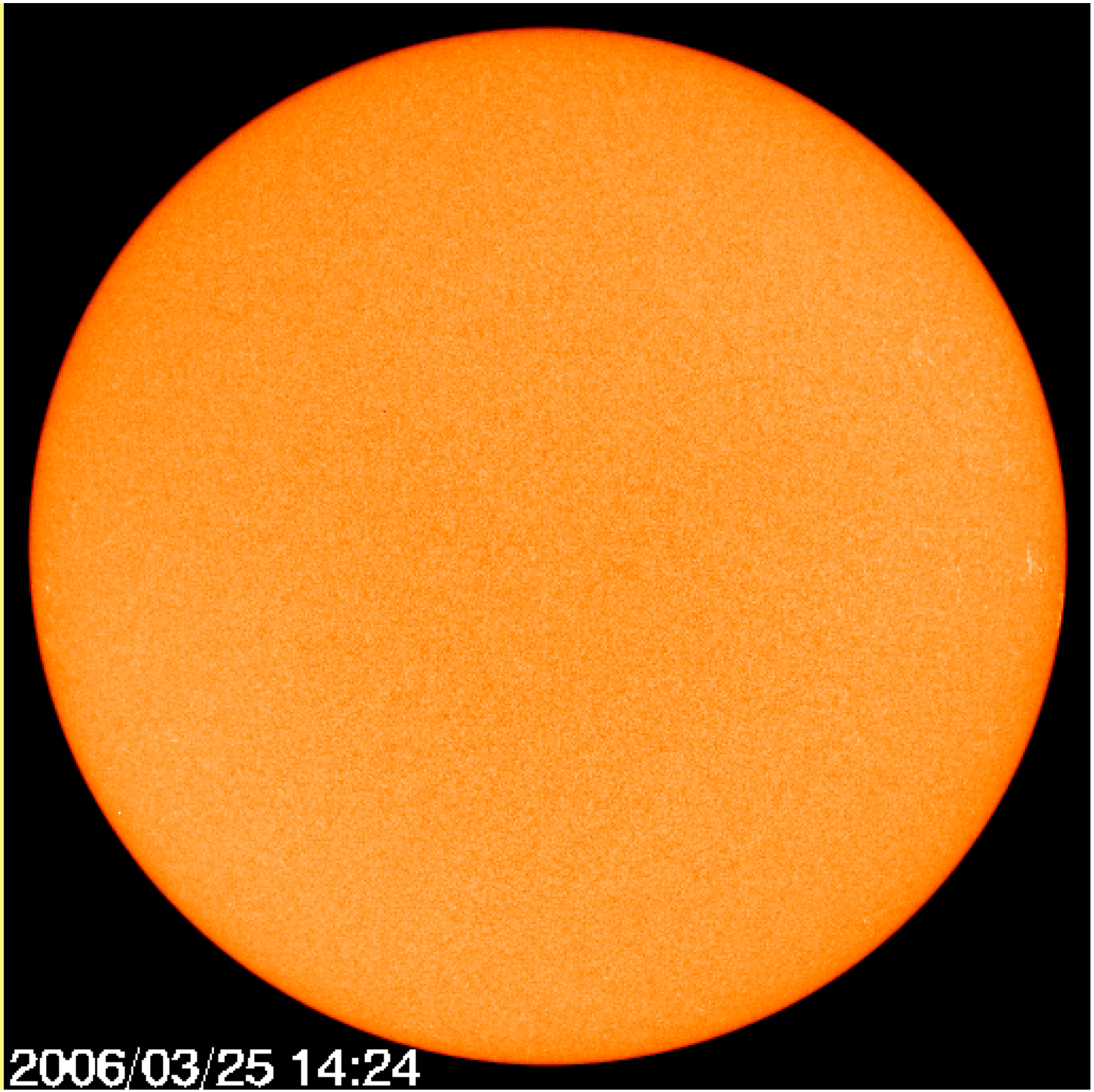
$$\rho \frac{D\mathbf{v}}{Dt} = -\nabla p + \mathbf{j} \times \mathbf{B} + \rho \mathbf{g} + \text{Viscous Terms}$$ Motion

$$\frac{\rho^\gamma}{\gamma - 1} \frac{D}{Dt}\left(\frac{p}{\rho^\gamma}\right) = \nabla.\left(\kappa_\parallel \nabla T\right) - \rho^2 Q(T) + H(s,t,\mathbf{B},\rho,T)$$ Energy

$$p = \frac{R \rho T}{\mu}$$ Gas Law

$$\nabla . \mathbf{B} = 0$$ Gauss' Law

QuickTime™ and a
Cinepak decompressor
are needed to see this picture.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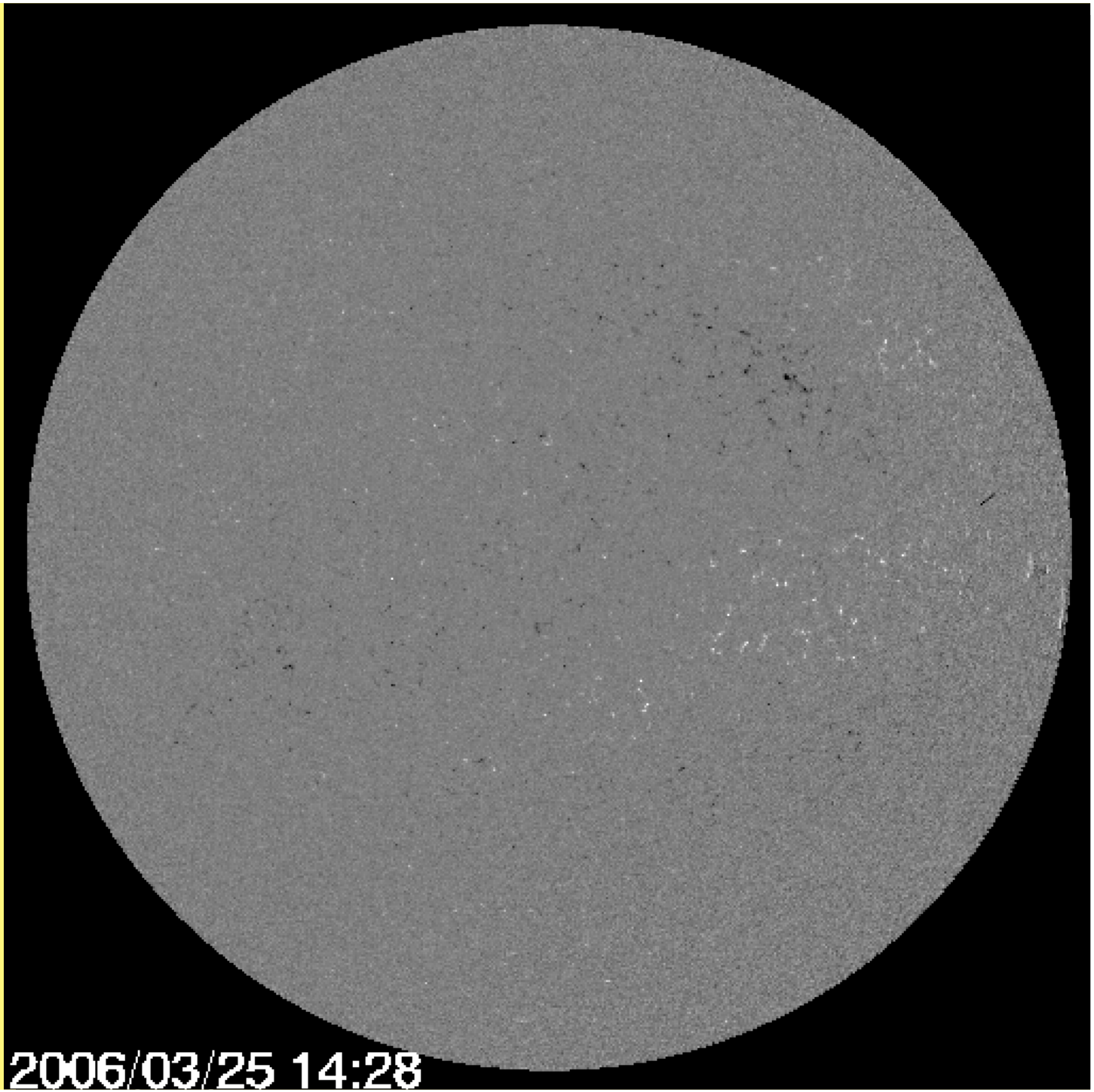
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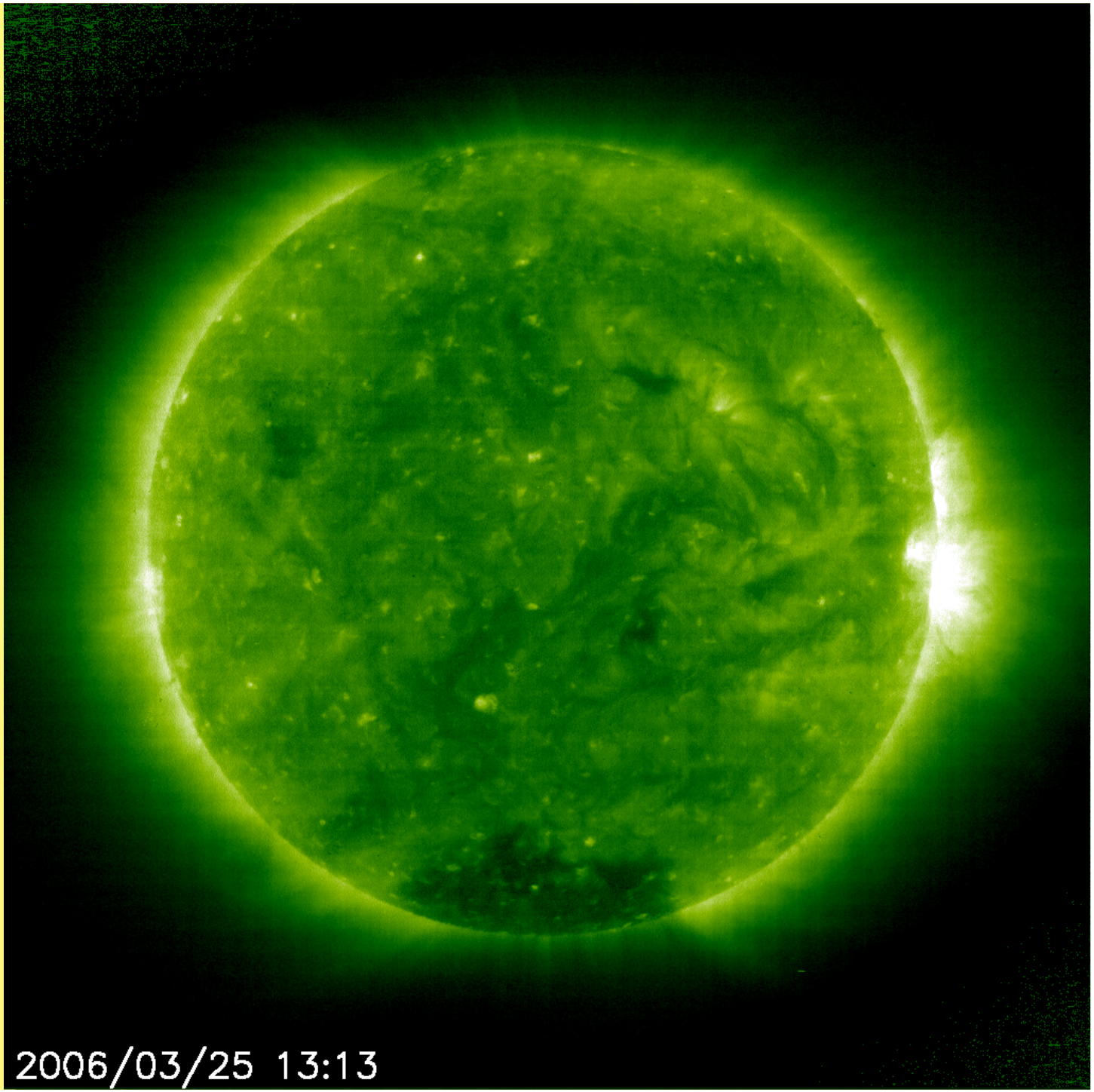
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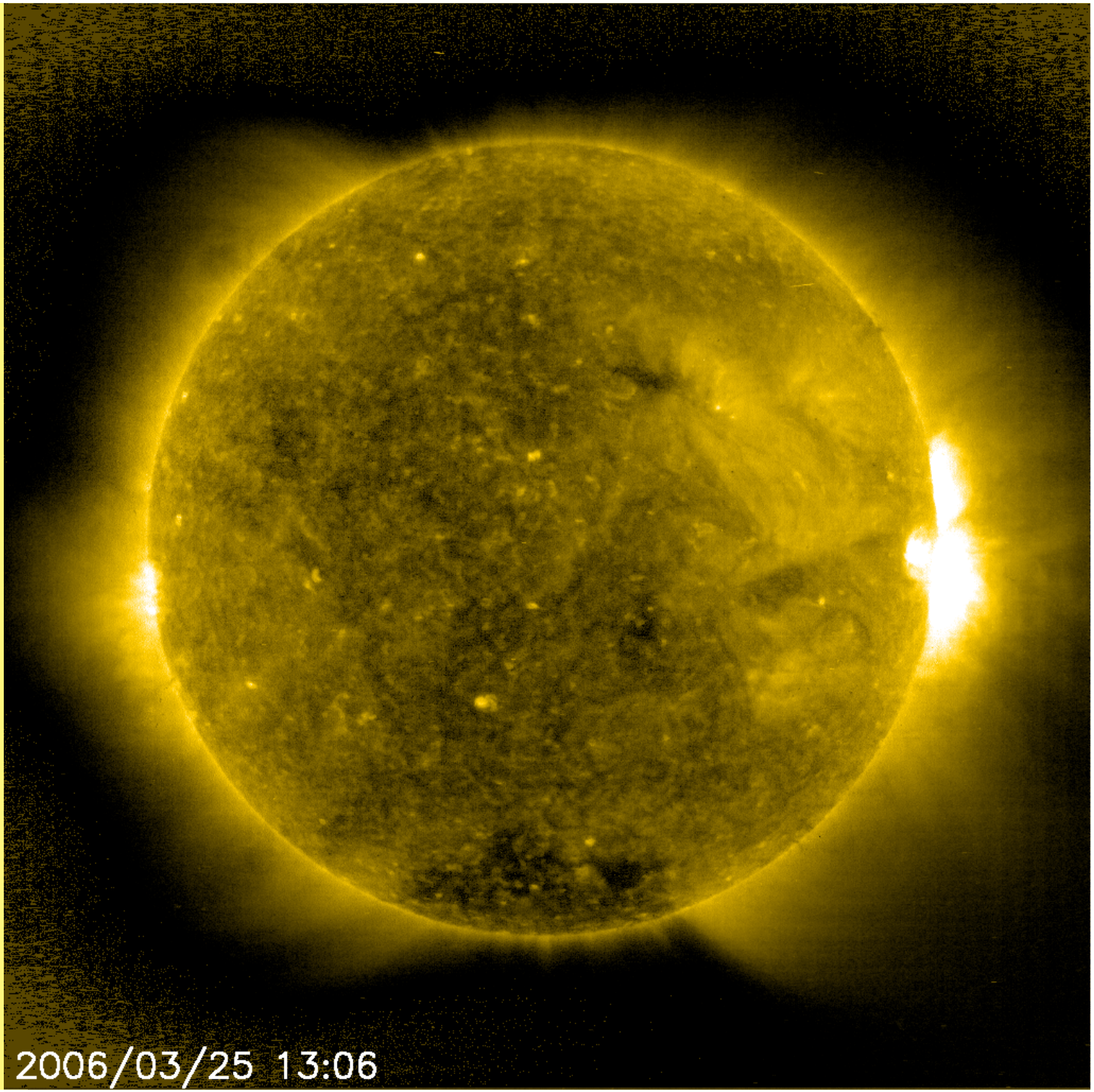
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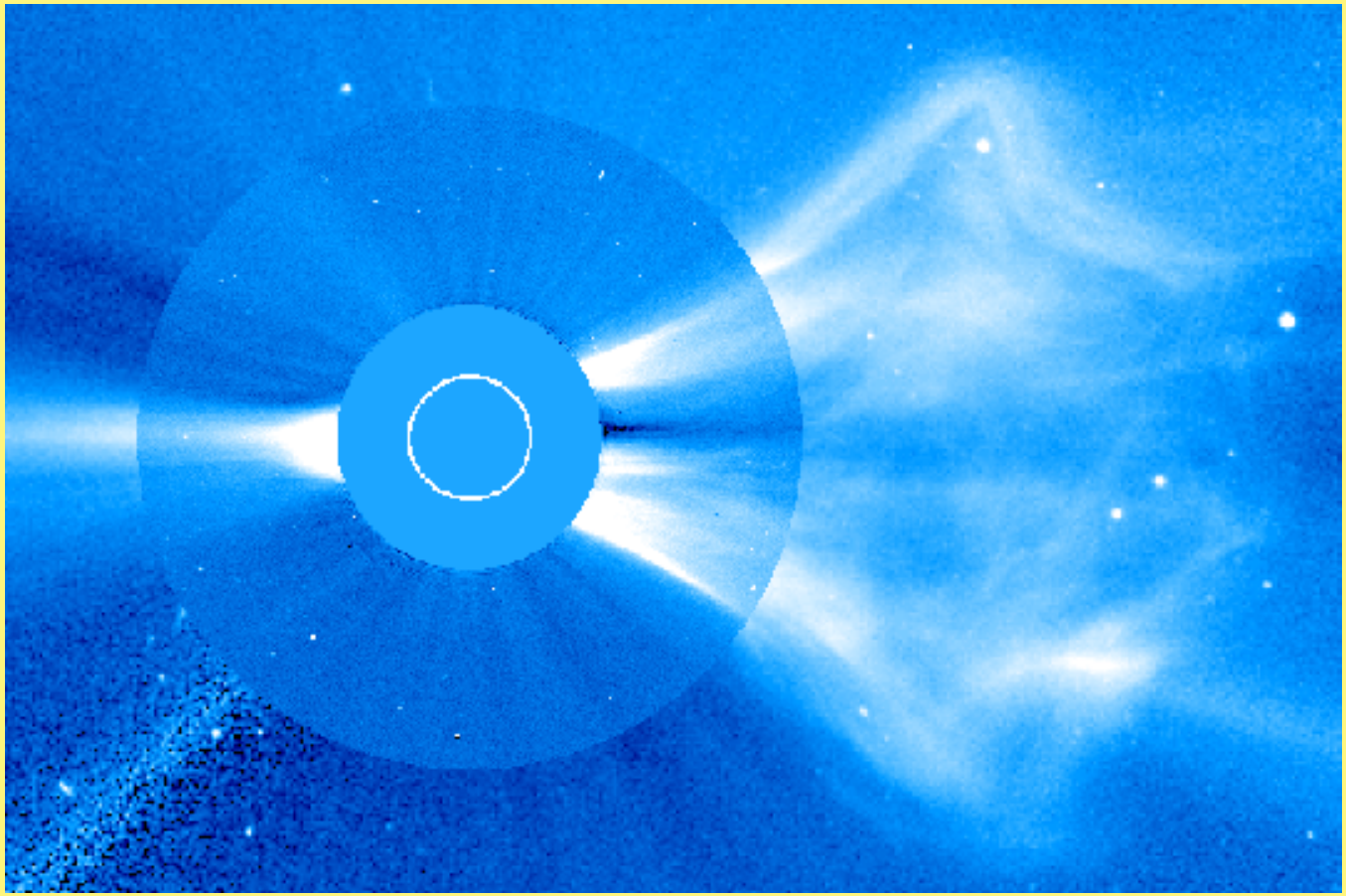

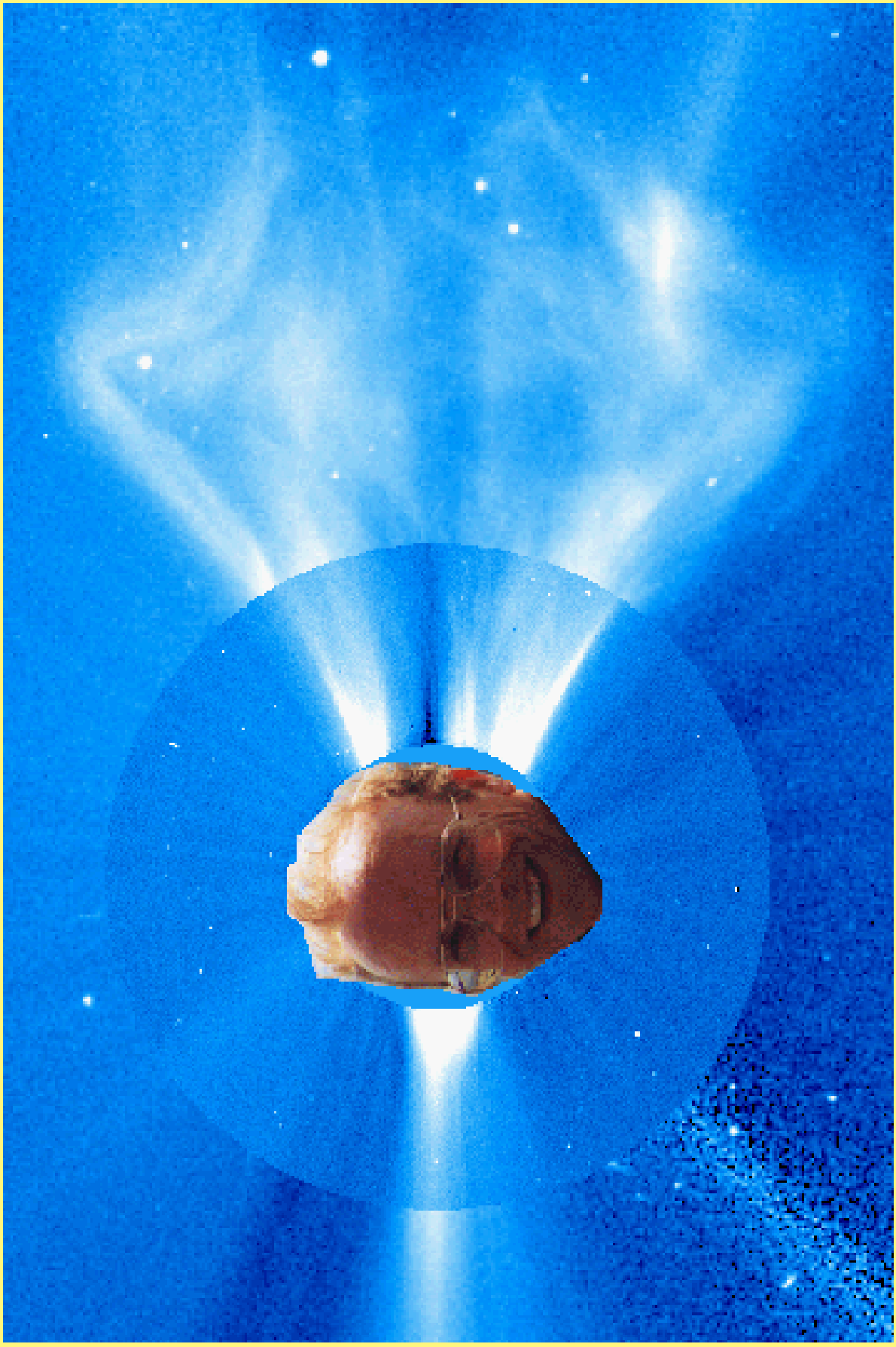

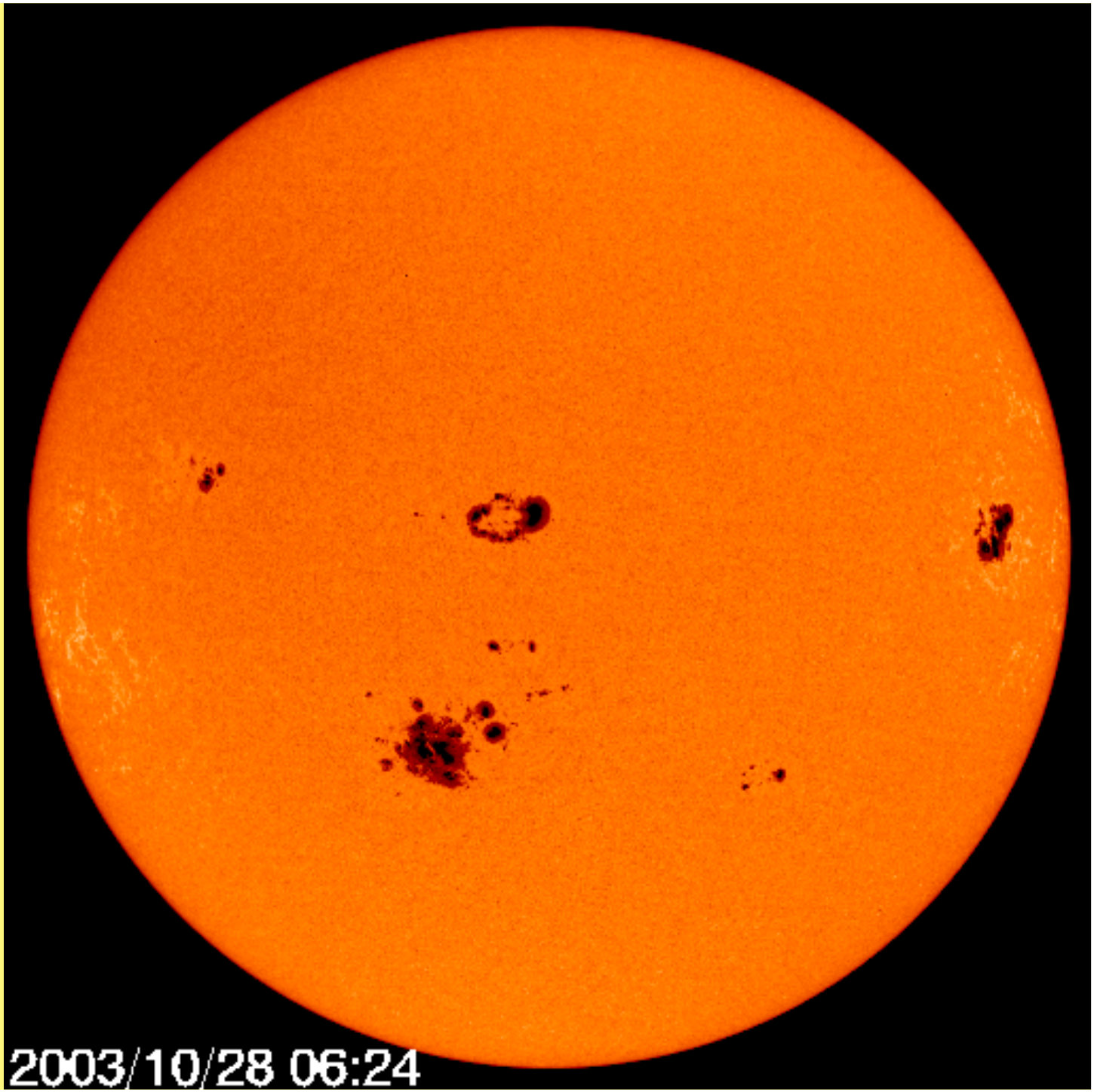
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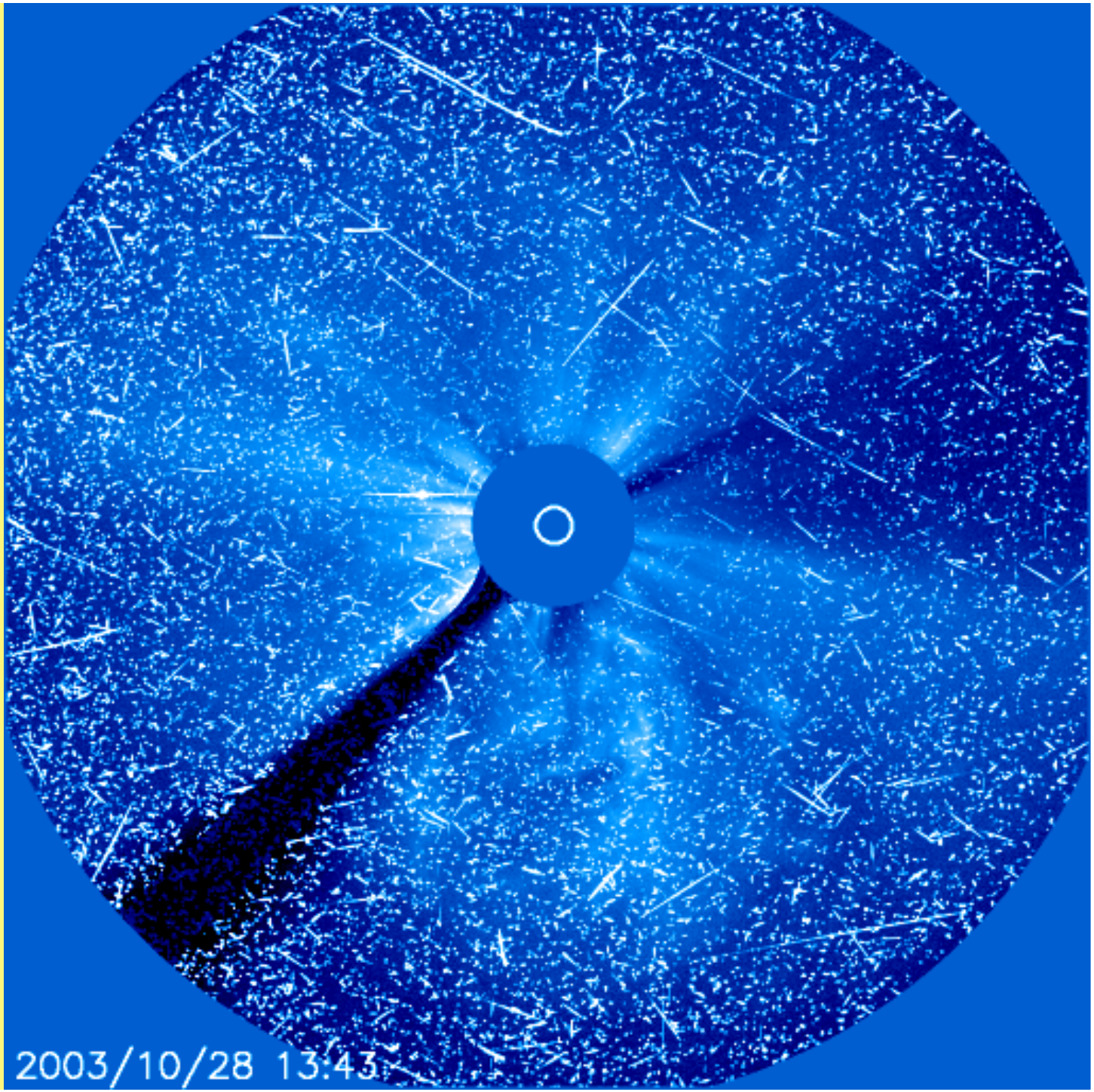
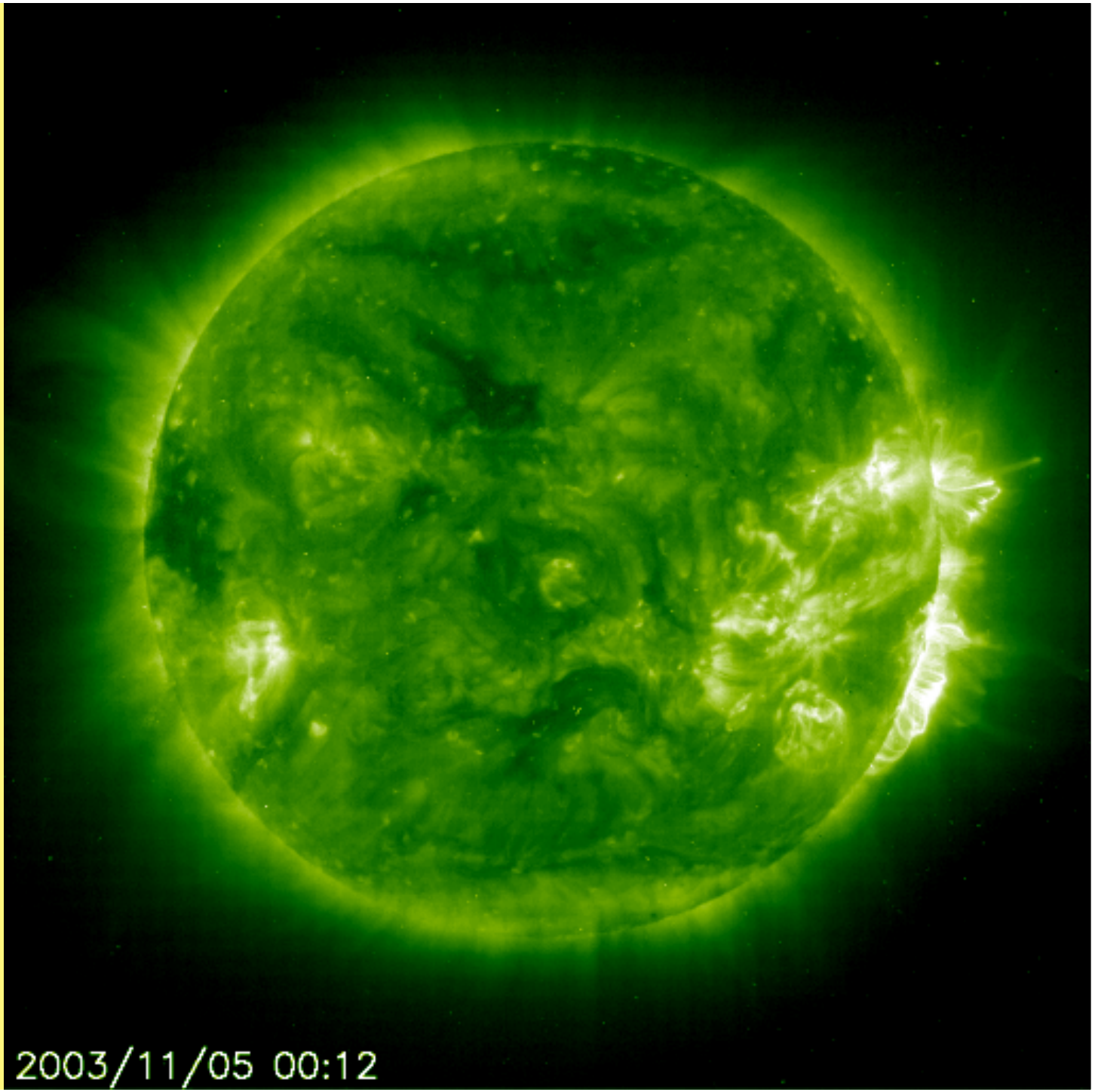

2003/10/28 13:43:

the biggest solar flare ever recorded !



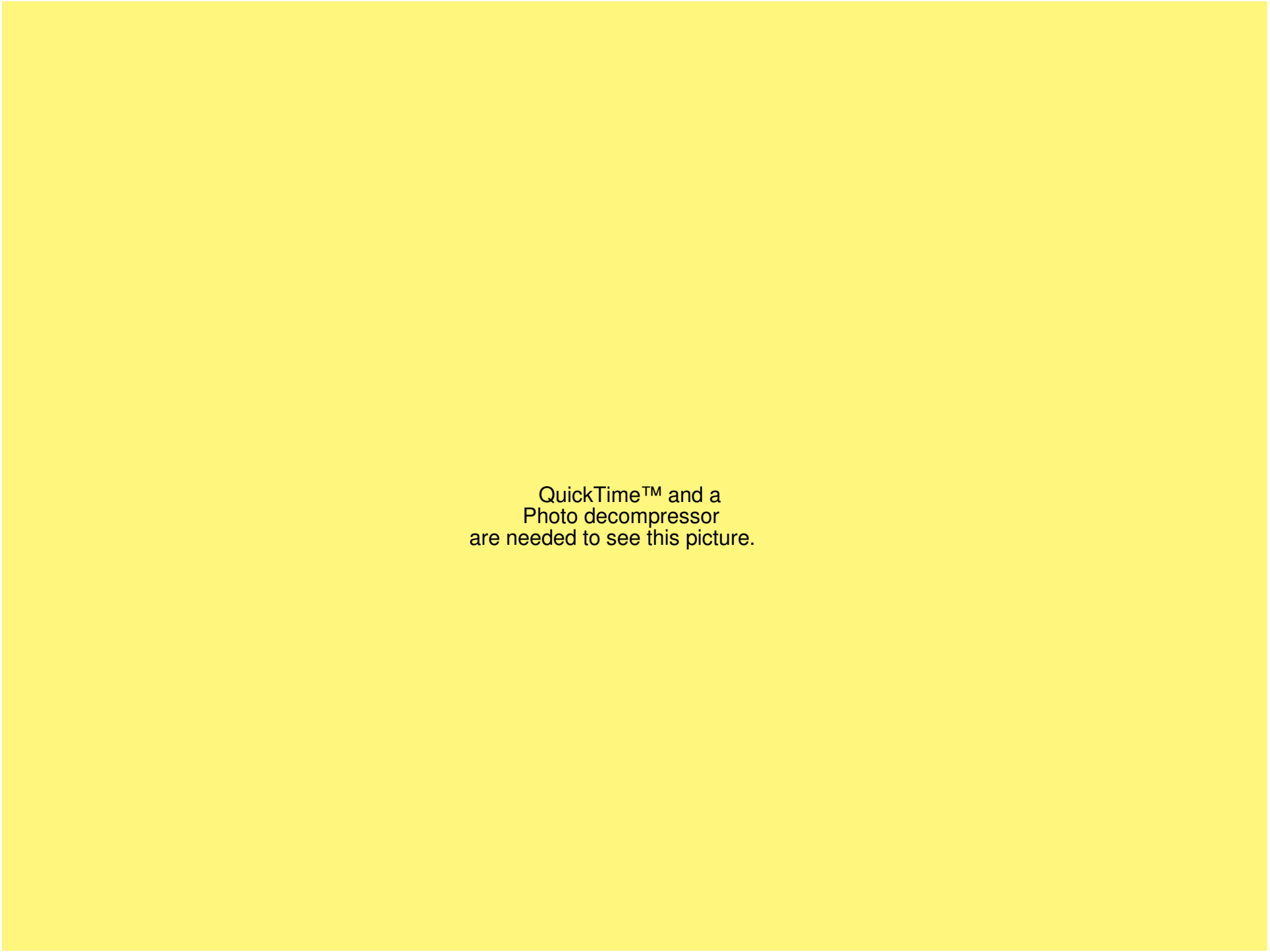

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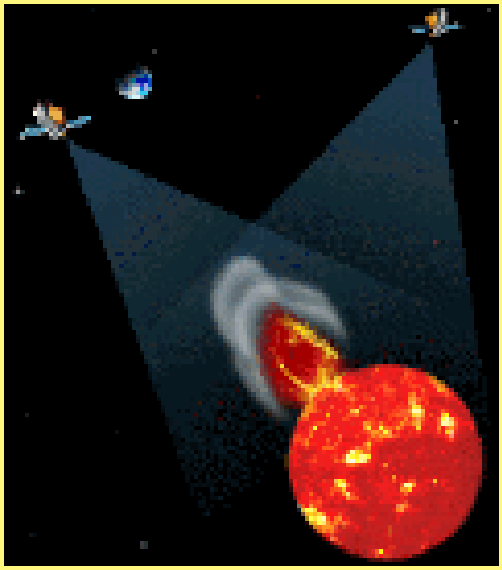
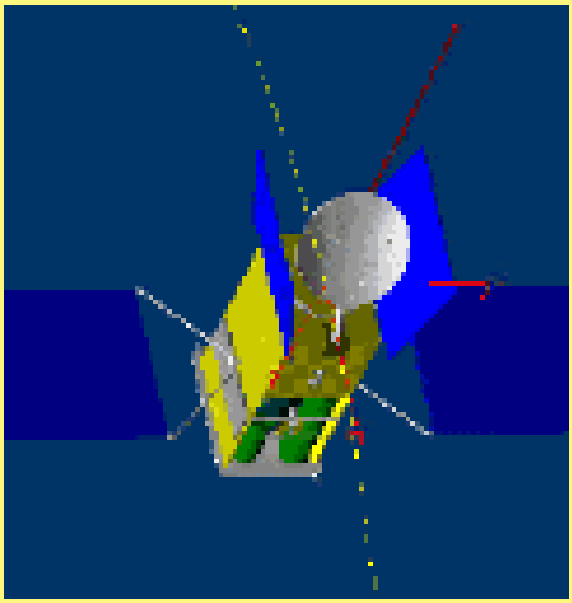
Photo decompressor
are needed to see this picture.

QuickTime™ and a
YUV420 codec decompressor
are needed to see this picture.





SOLAR INTERIOR
AND ATMOSPHERE