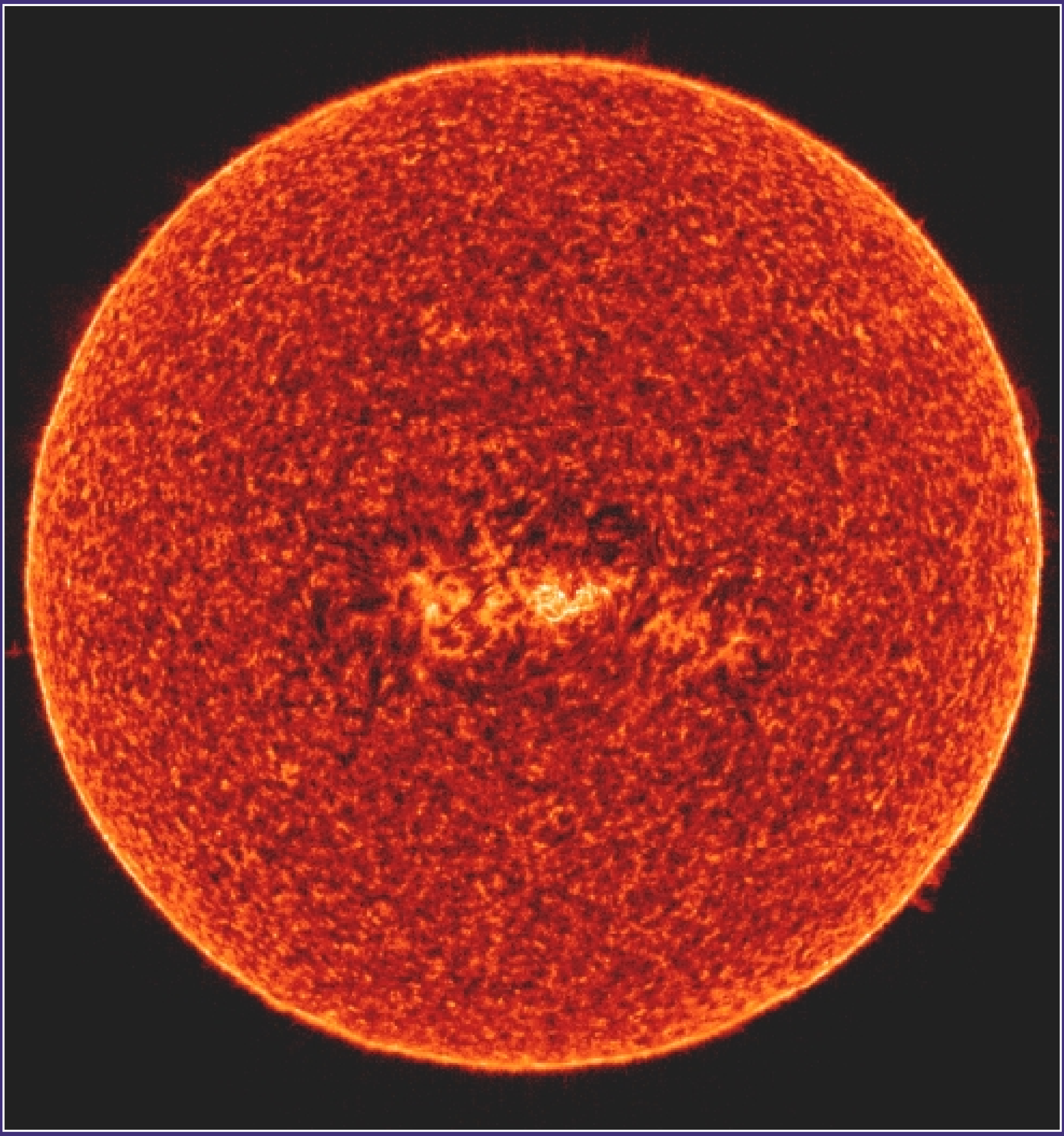
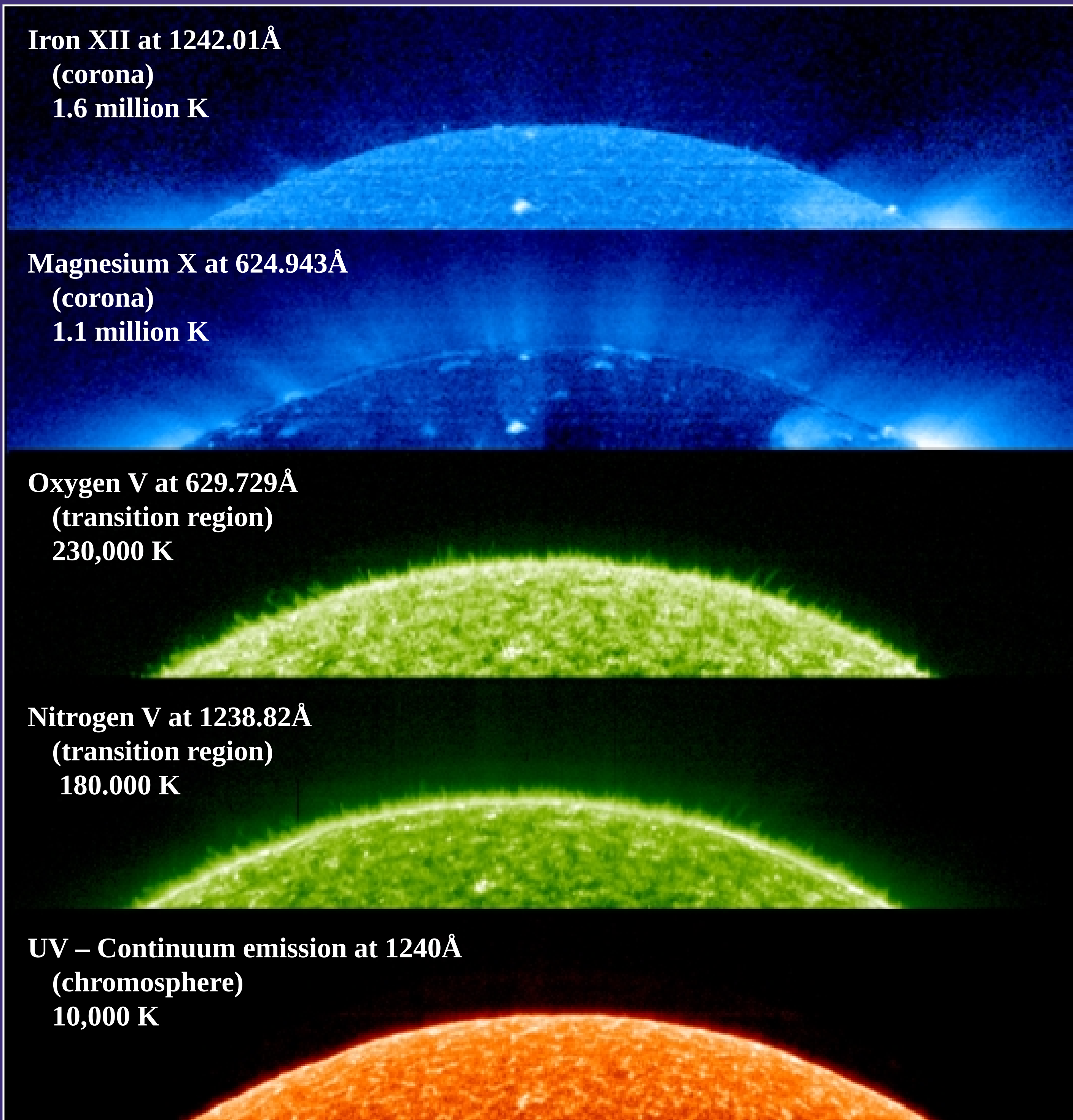
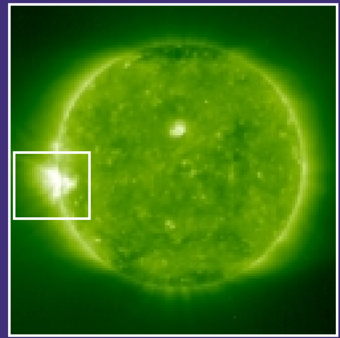


**SUMER image in S VI at 933 Å**
**on 12 May 1996**



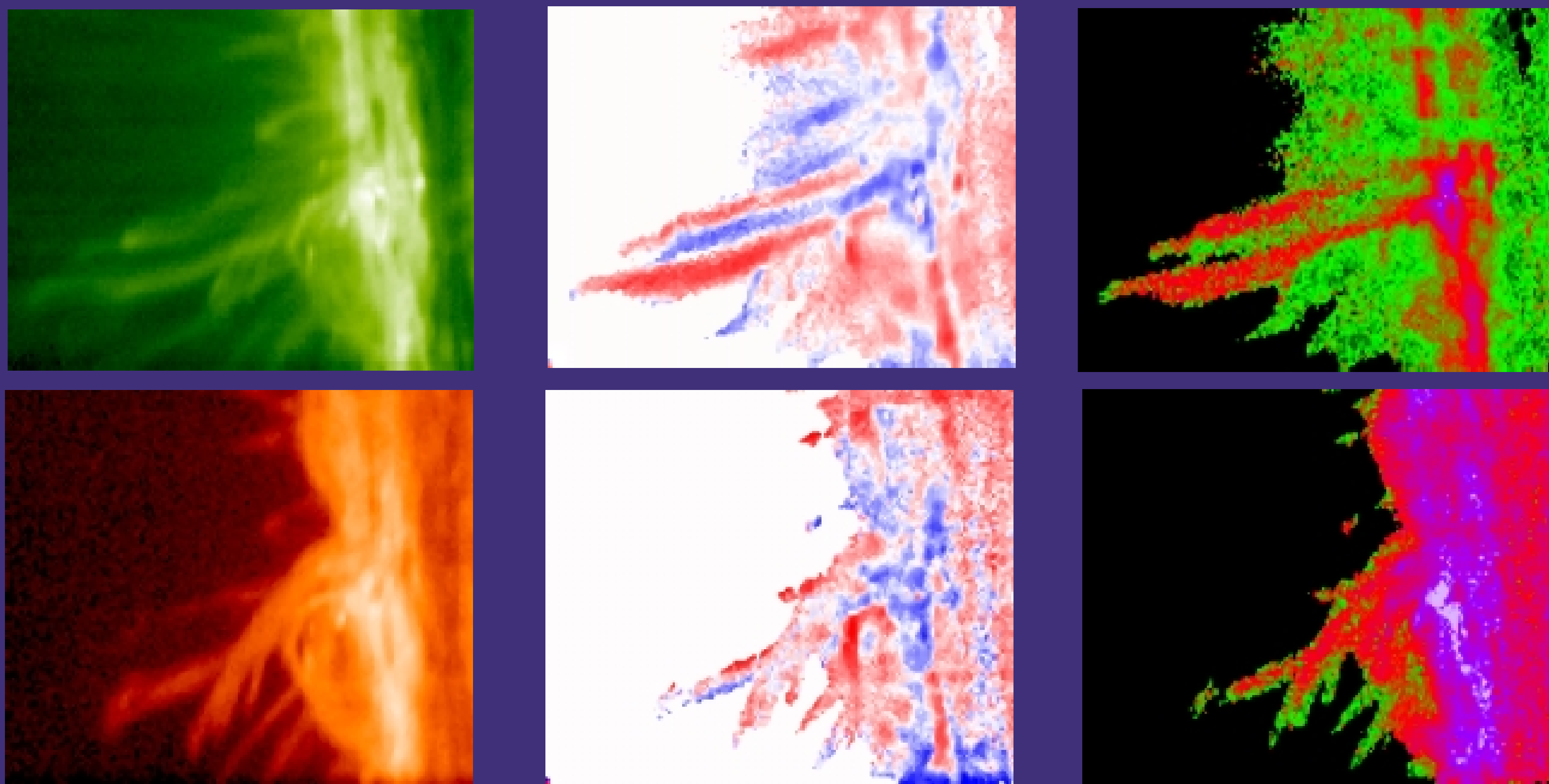

**SUMER scans of a north polar coronal hole in lines formed at temperatures from 10,000 to 1.6 MK**



EIT 195Å

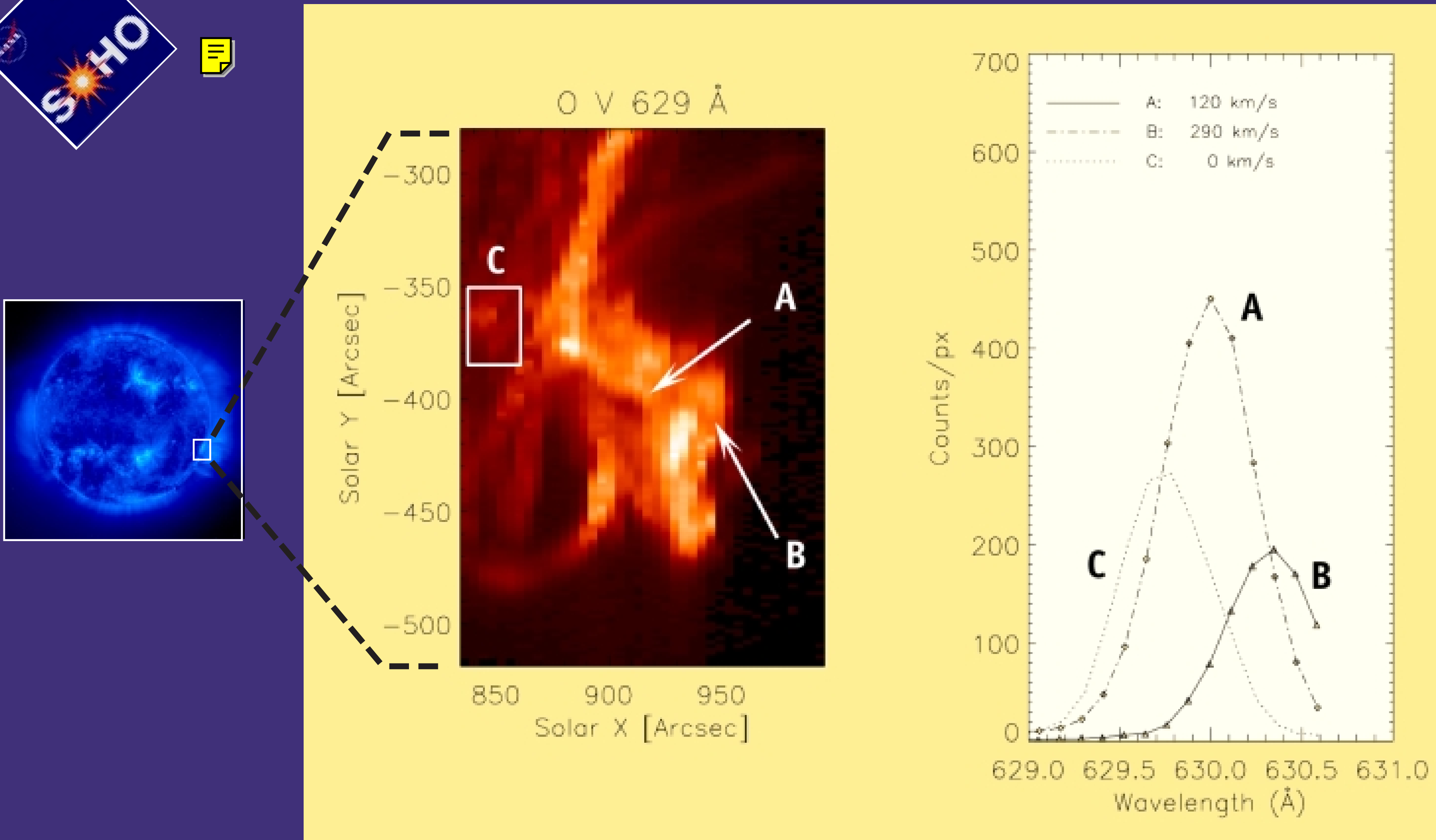
Oxygen VI

Lyman beta

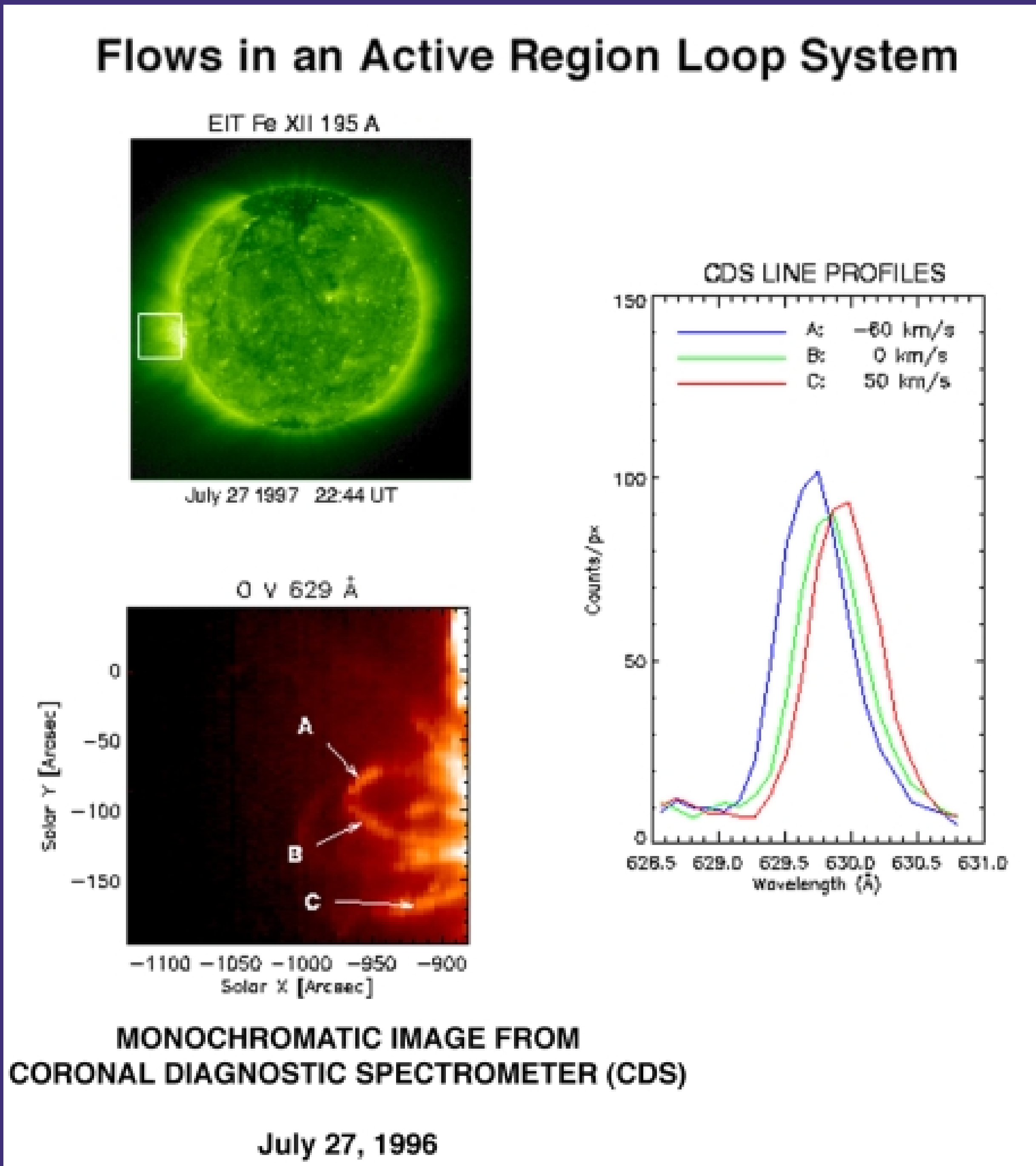


Intensity | Velocity | Line width

**Simultaneous imaging of UV emission, gas flow velocities, and spectral line width of active region loop structures observed with SUMER**

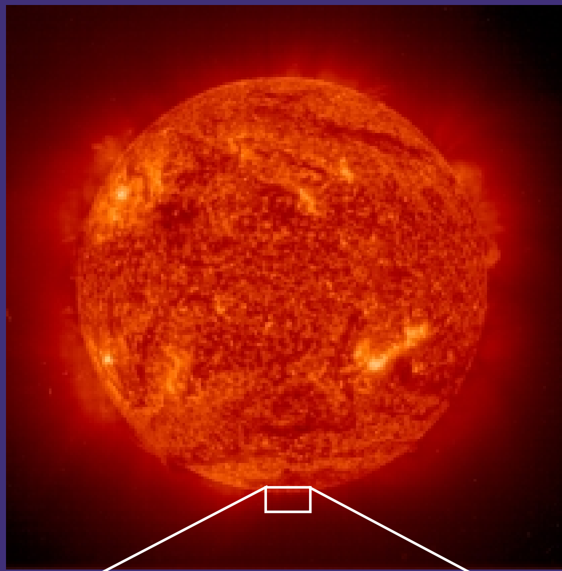



**Supersonic flow velocities observed by CDS during a solar eruption from the south west limb. The velocities approach 300 km/s at the leading edge (B).**

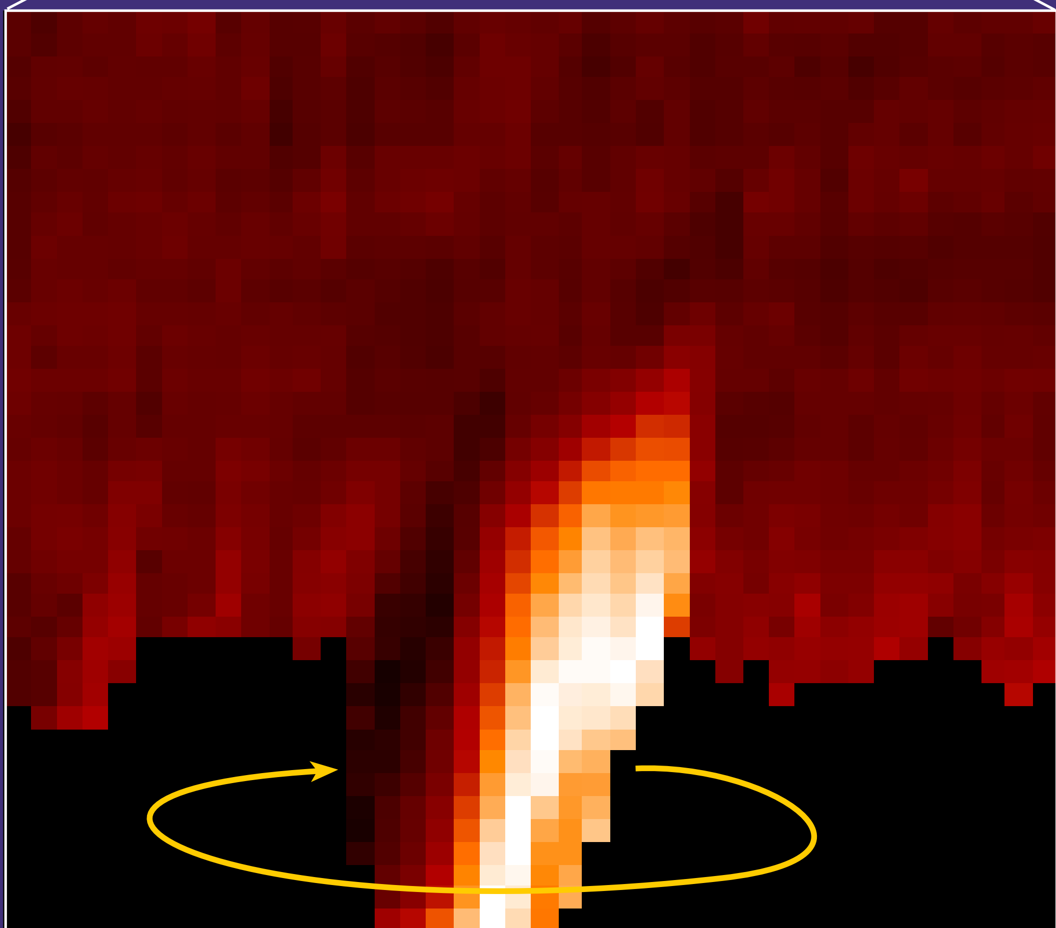



**Active region loop system above the east limb observed in O V on 27 July 1996 by CDS. The line profiles from three different spatial locations (A, B, and C) are displayed in the right panel.**

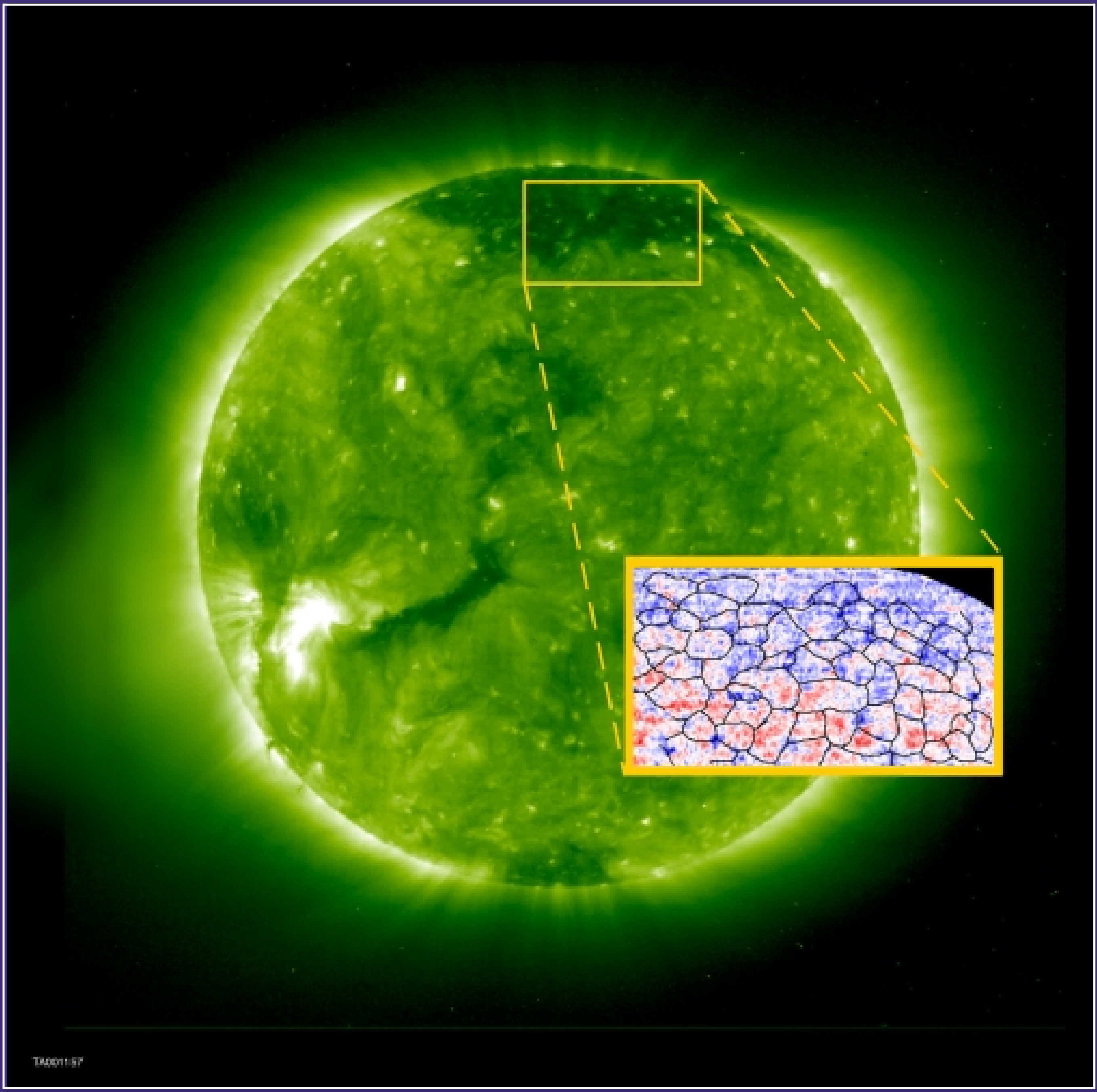
EIT 304 full disk image



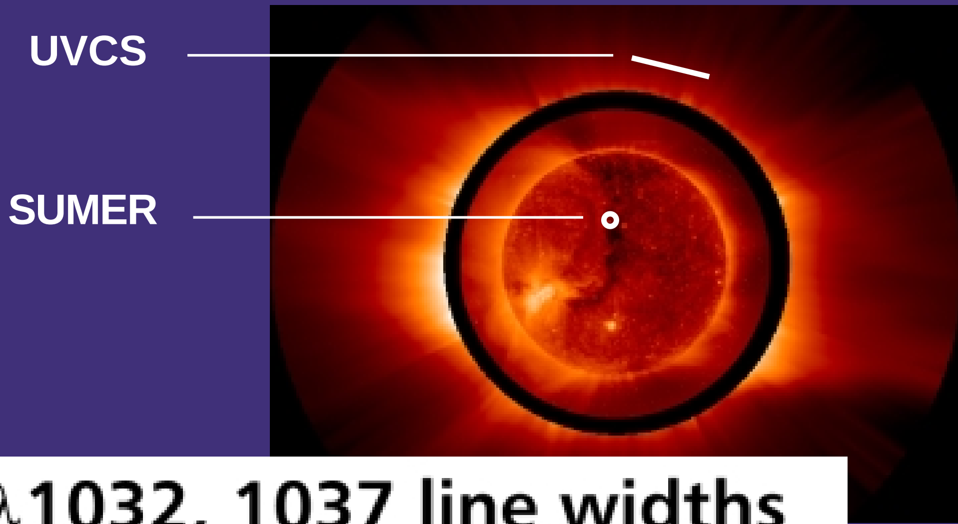
Velocity image CDS, OV (250,000º K)

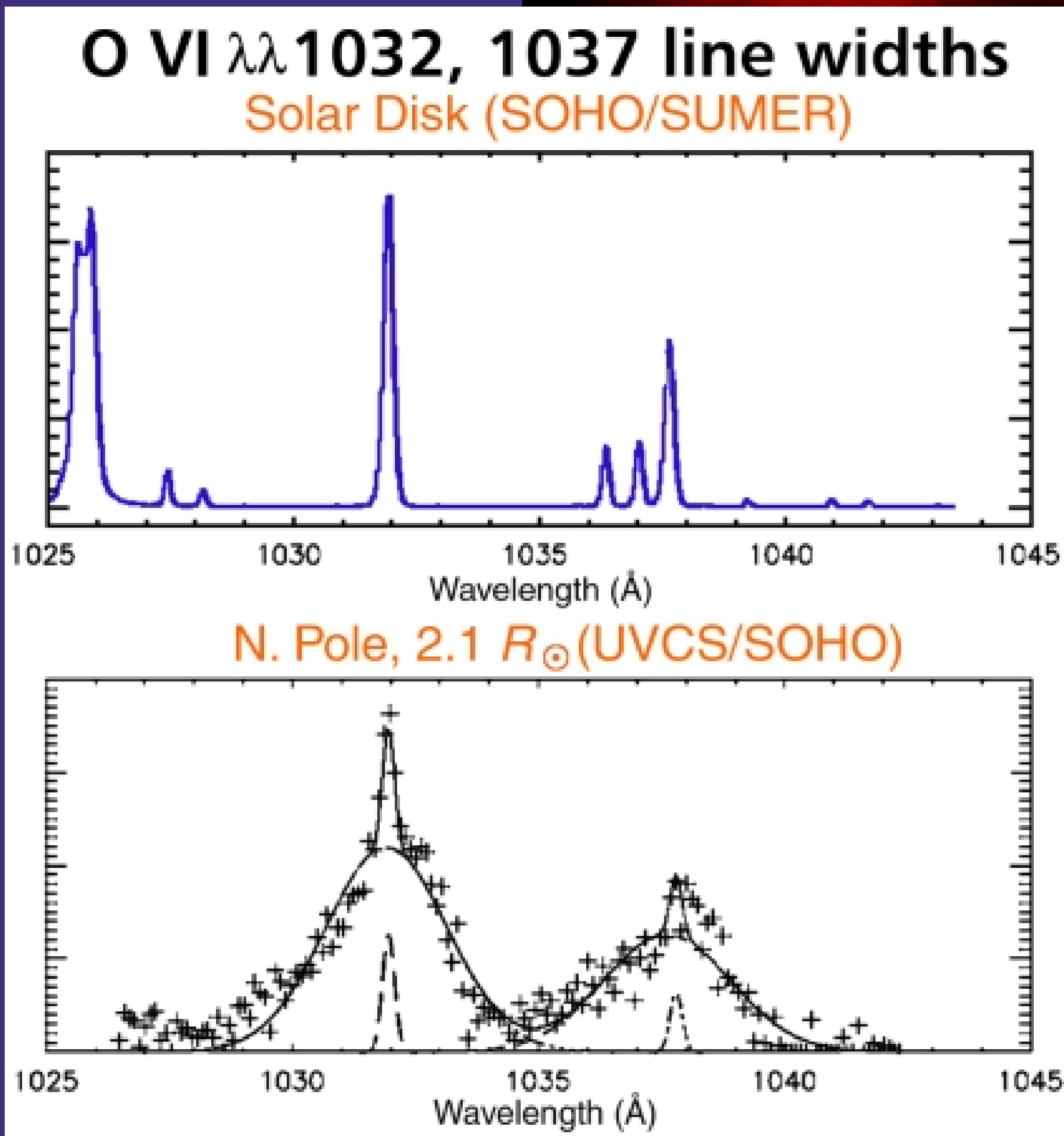


**Solar “tornado” observed by SOHO/CDS with speeds up to 500,000 km/h**

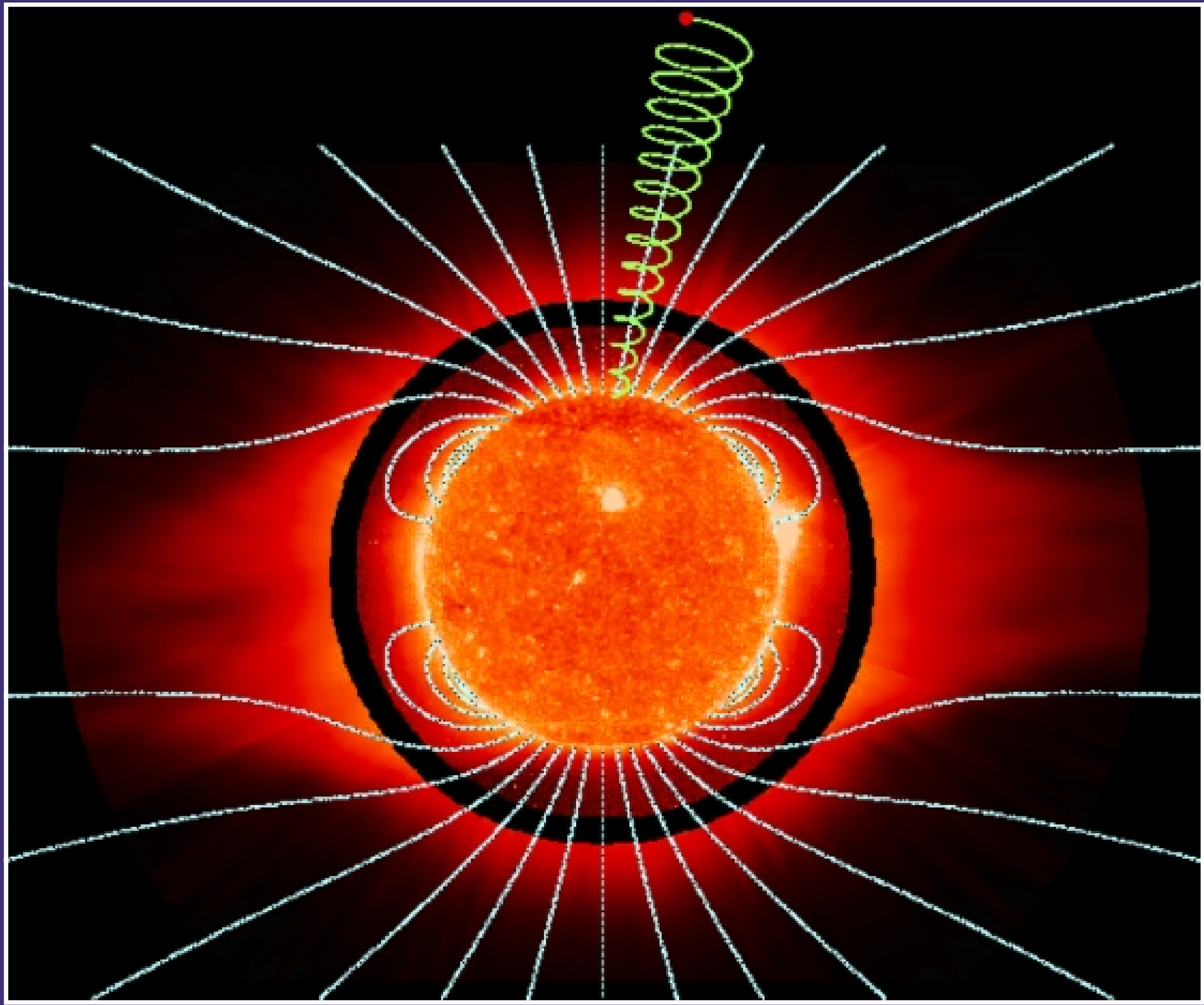


**SUMER Doppler velocity map (close-up) of a polar coronal hole region showing the source regions of the fast solar wind. The strongest flows occur near the boundary intersections of the supergranular network cells.**

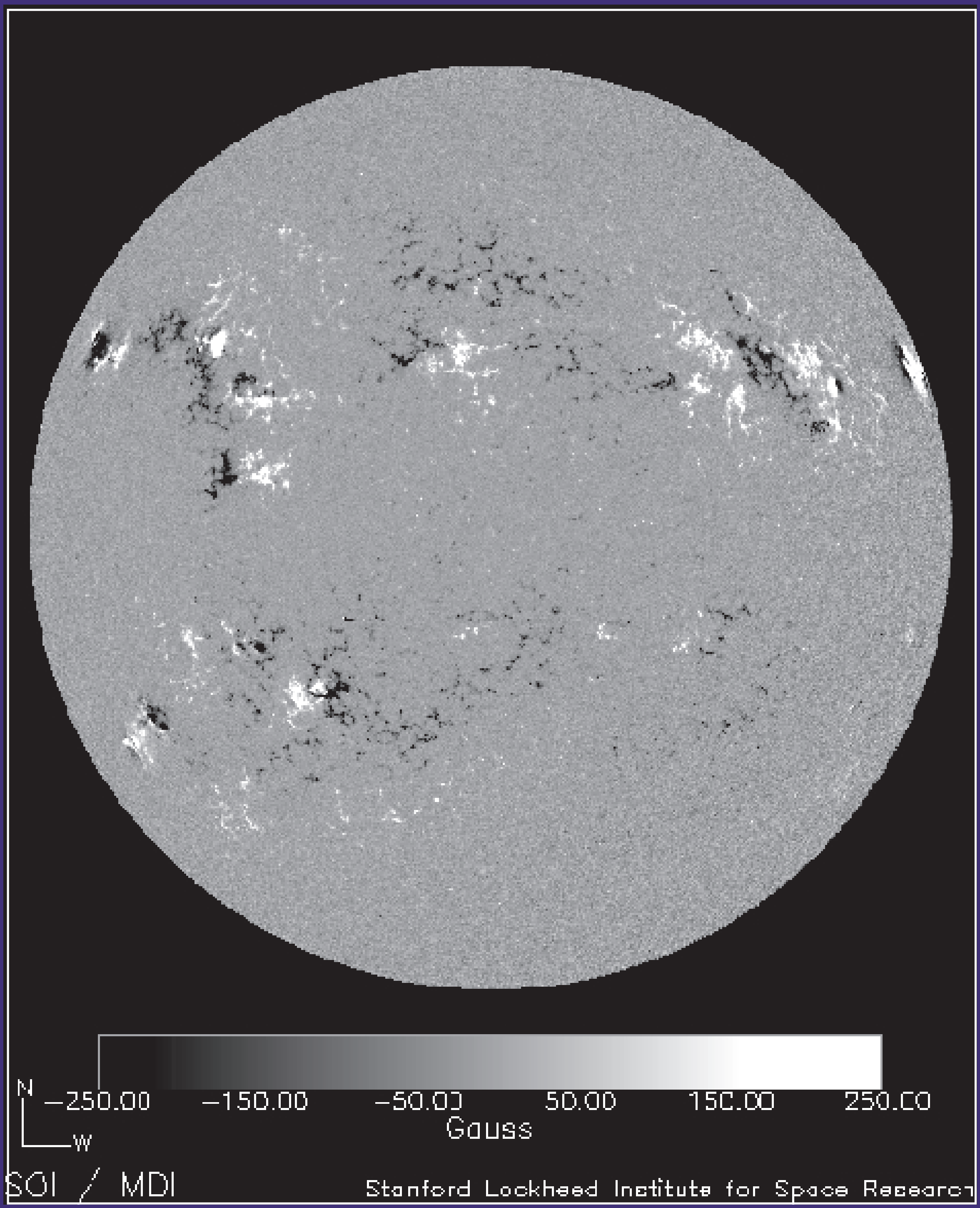


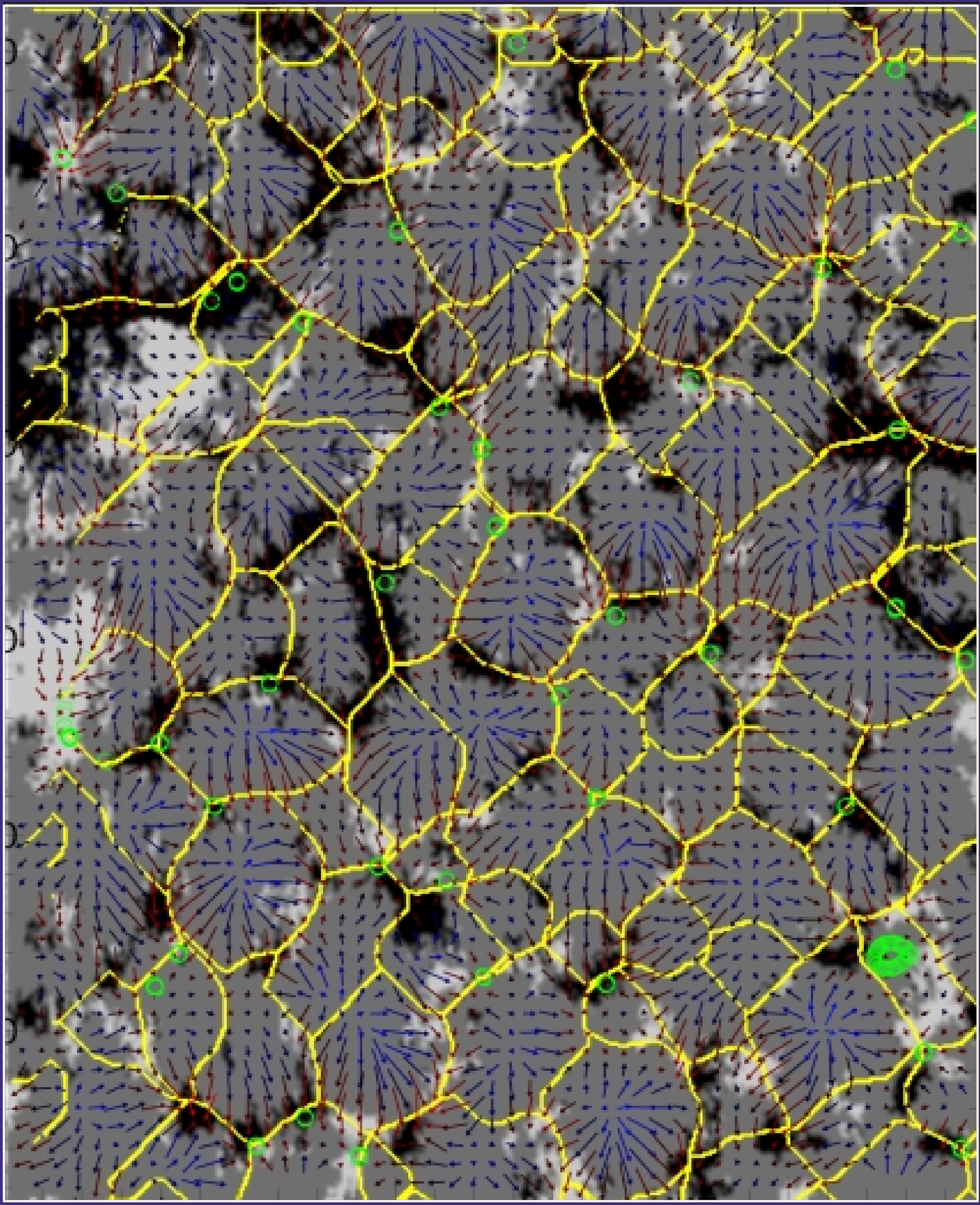

**Line profile of O VI from UVCS observed in a polar coronal hole (lower panel) compared to disk observation from SUMER. The extremely broad O VI line yields velocities up to 500 km/s, which corresponds to a kinetic temperature of 200 million K.**



UVCS/SOHO has discovered surprisingly fast spiraling motions for charged oxygen atoms (1.3 million Km/h) over the solar poles, as compared to hydrogen atoms (at about half this speed). The coiling speeds of oxygen atoms along the spirals are 20 times larger than were expected.

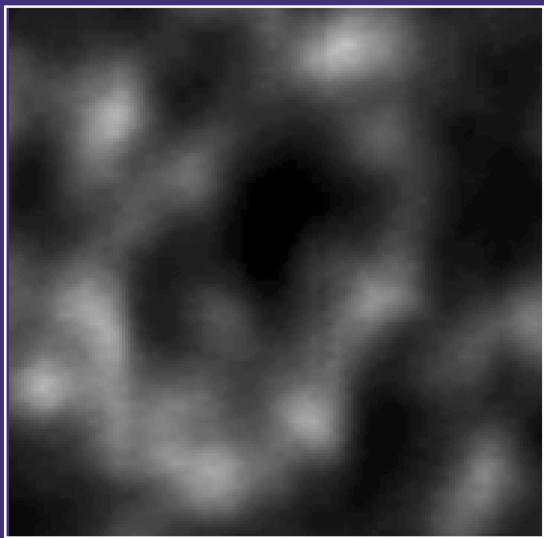



**MDI Full Disk Magnetogram**
**9 May 1999**

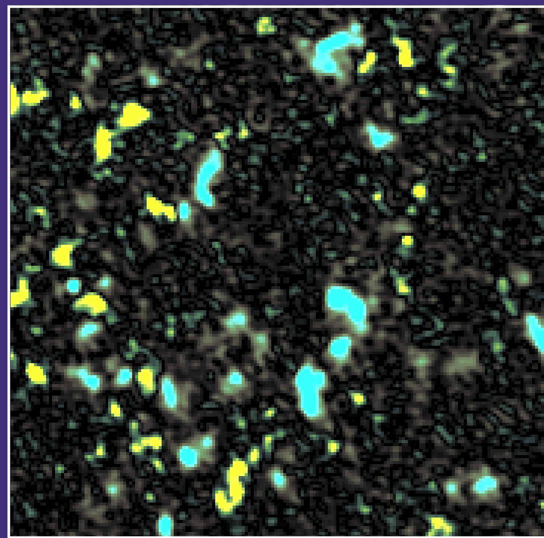


**MDI magnetogram overlay with lines of convergence of the horizontal flow. Green dots show the convergence points. Measured flow is shown as colored arrows (red= downflow; blue= upflow).**

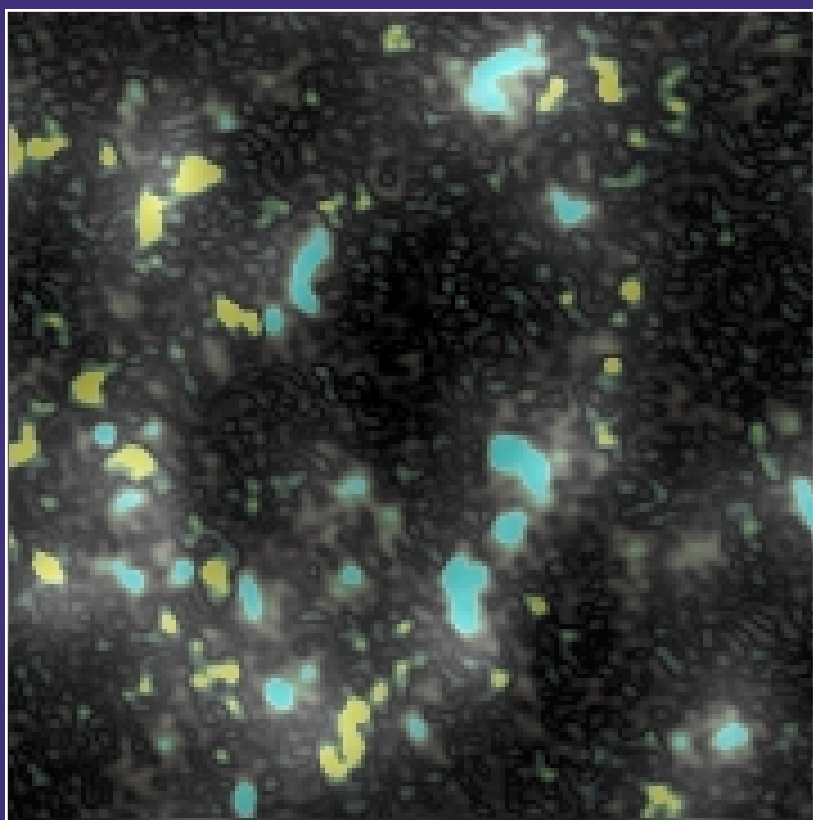
CDS OV intensity



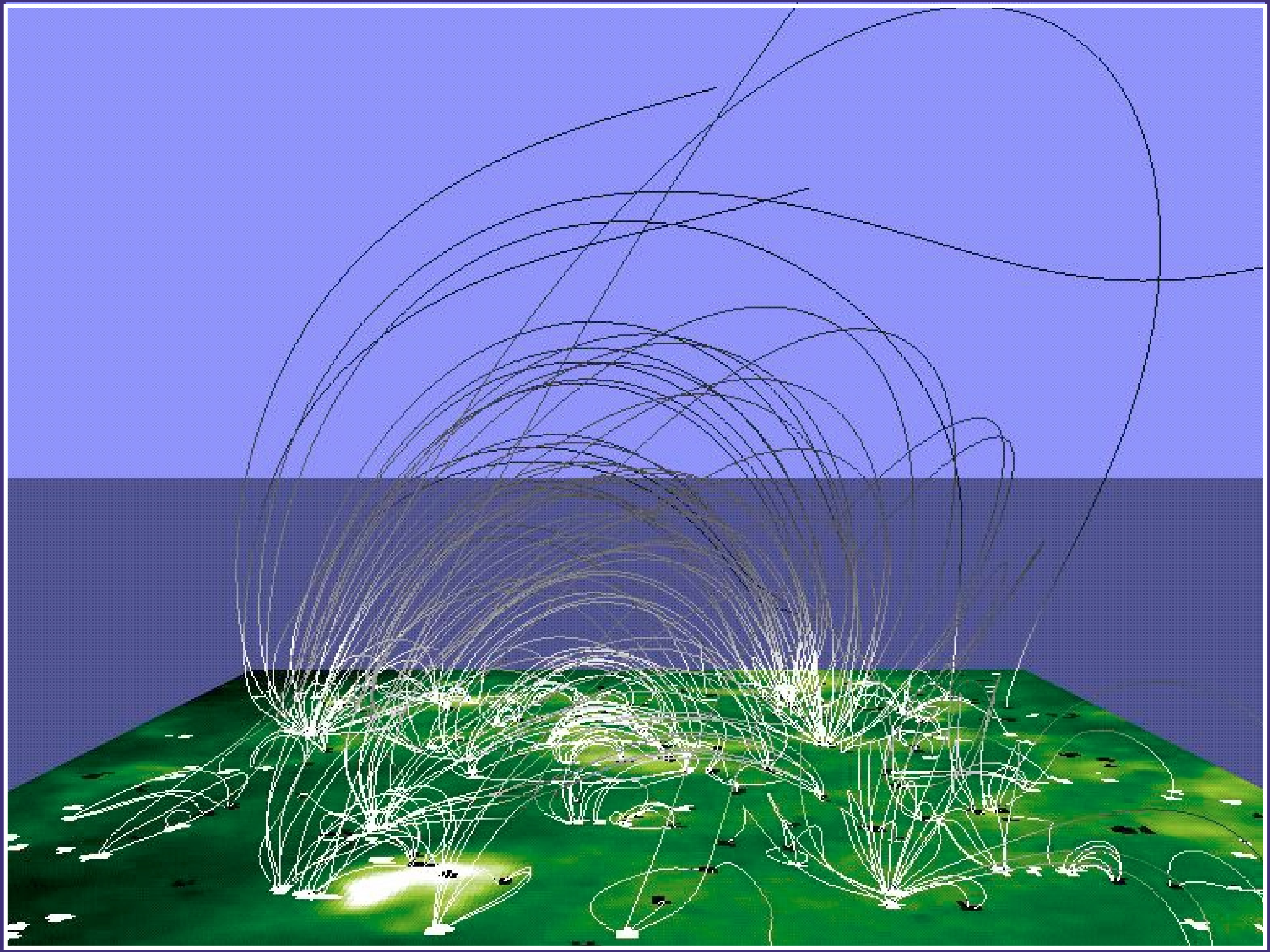
MDI magnetogram



Overlay of CDS and MDI

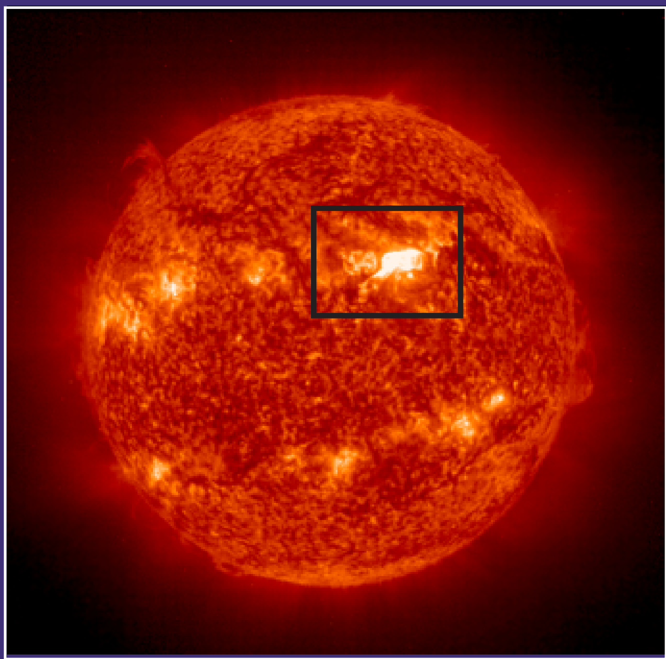


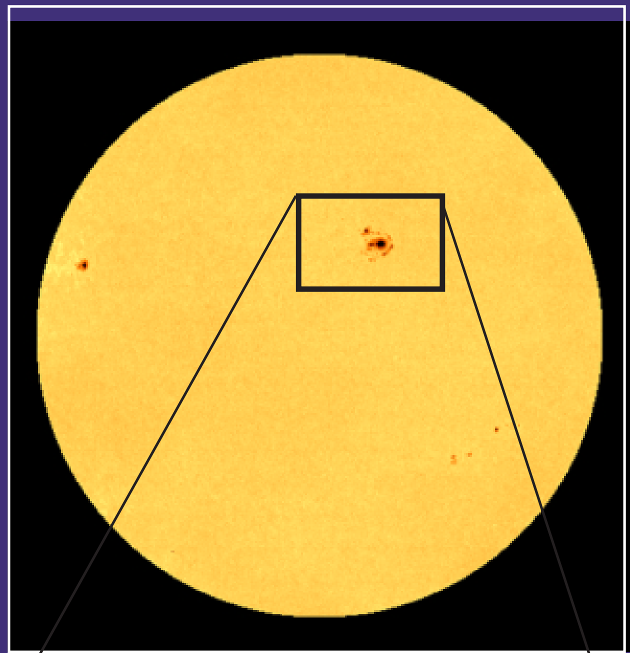
**Correlation of transition region EUV emission and photospheric magnetic fields from observations by CDS and MDI**

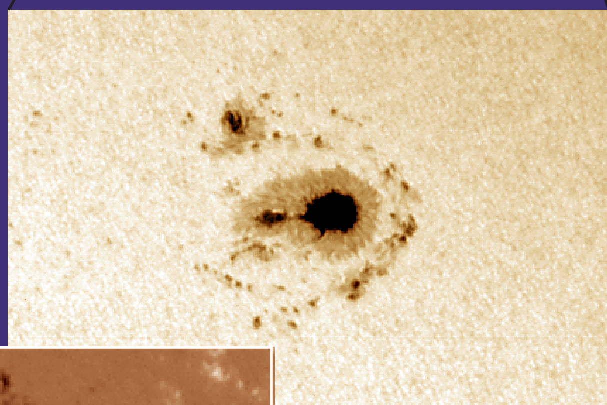


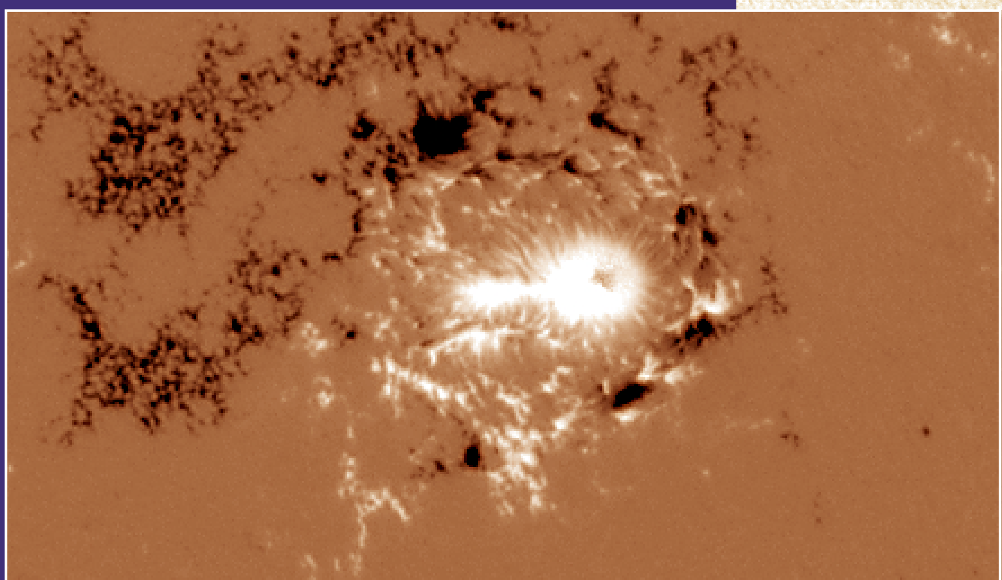
**Model of magnetic field lines above the solar surface based on MDI magnetic field measurements superimposed on EIT coronal emission observations**

5 November 1998









*Close-up magnetogram image of sunspots*

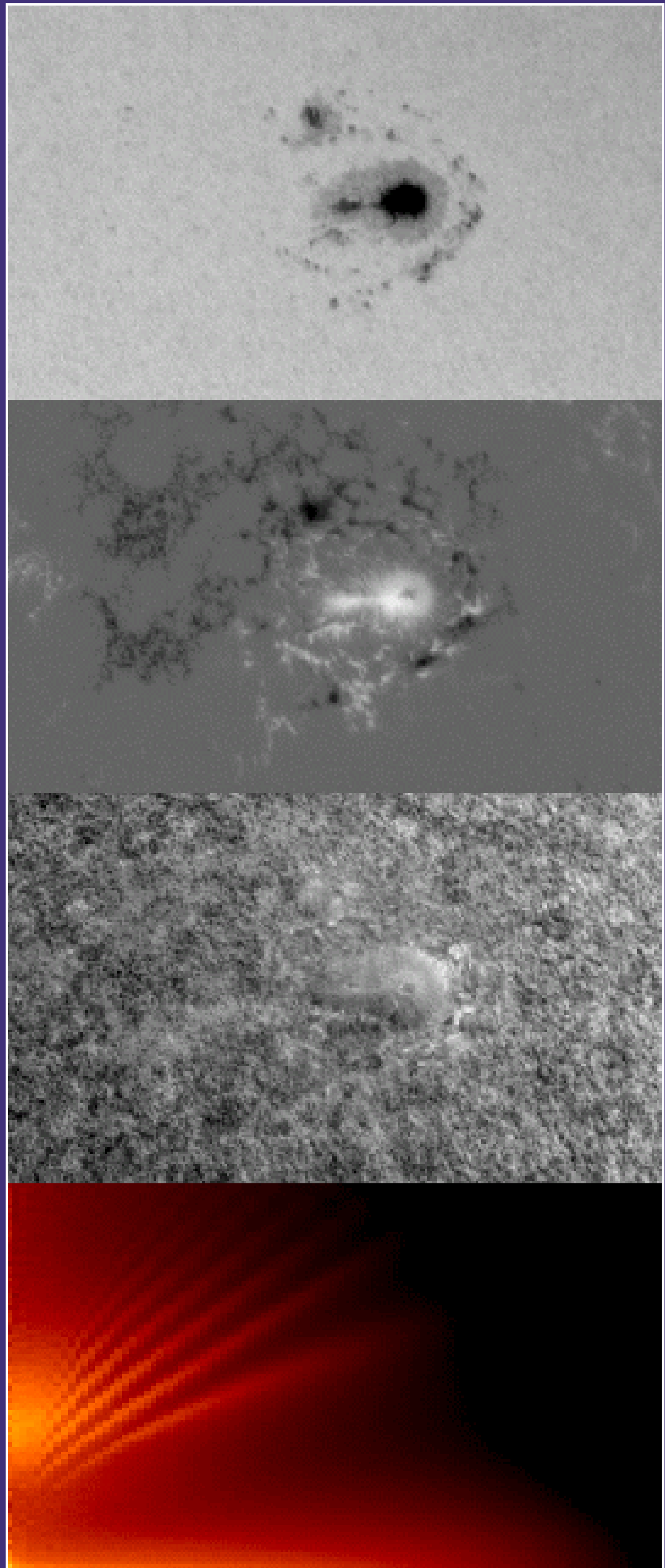
**An EIT 304Å image, an MDI full disk white light image, with a close-up, and a high-resolution magnetogram all view the same magnetic structures that we call sunspots.**

White light image

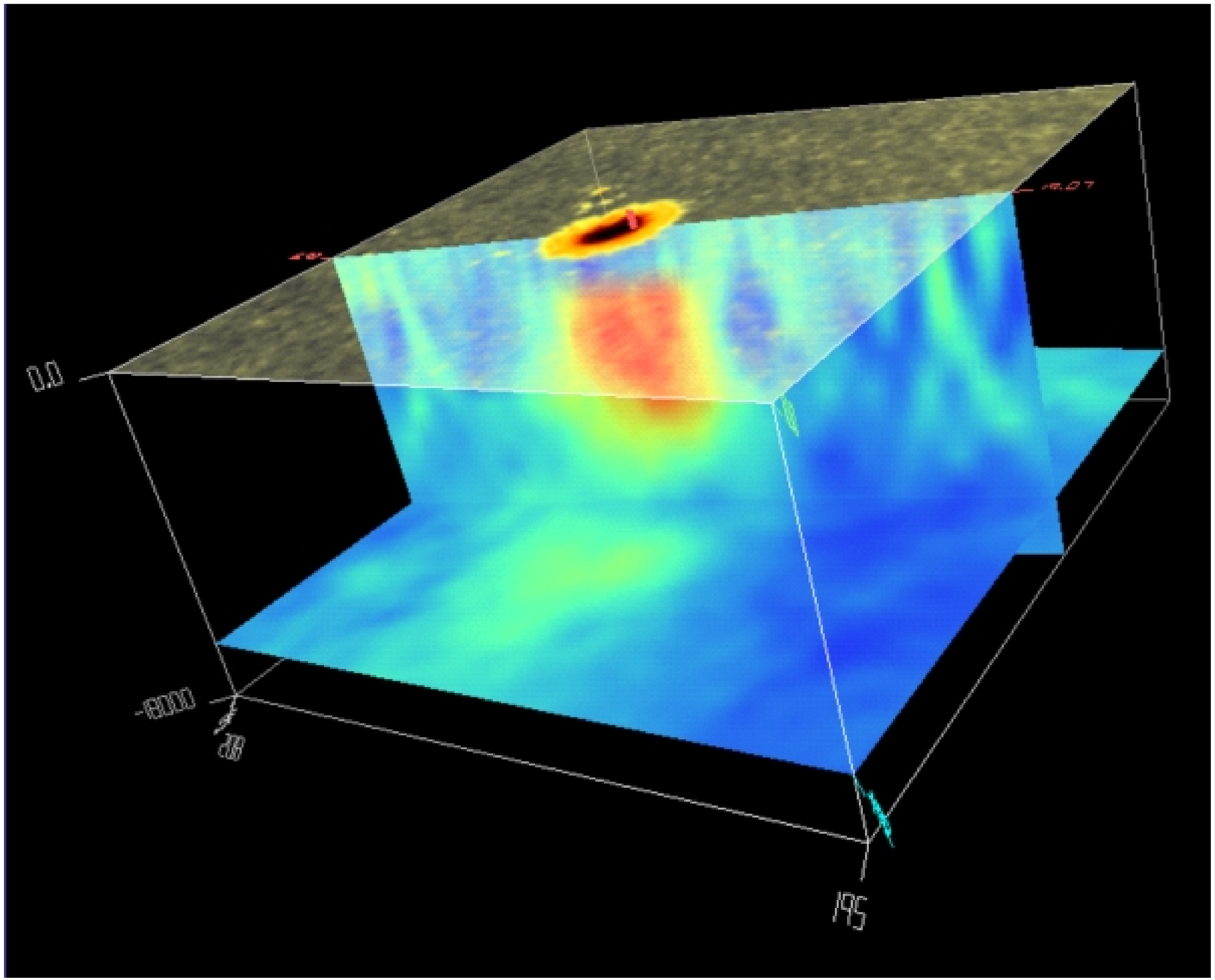
Magnetogram

Dopplergram

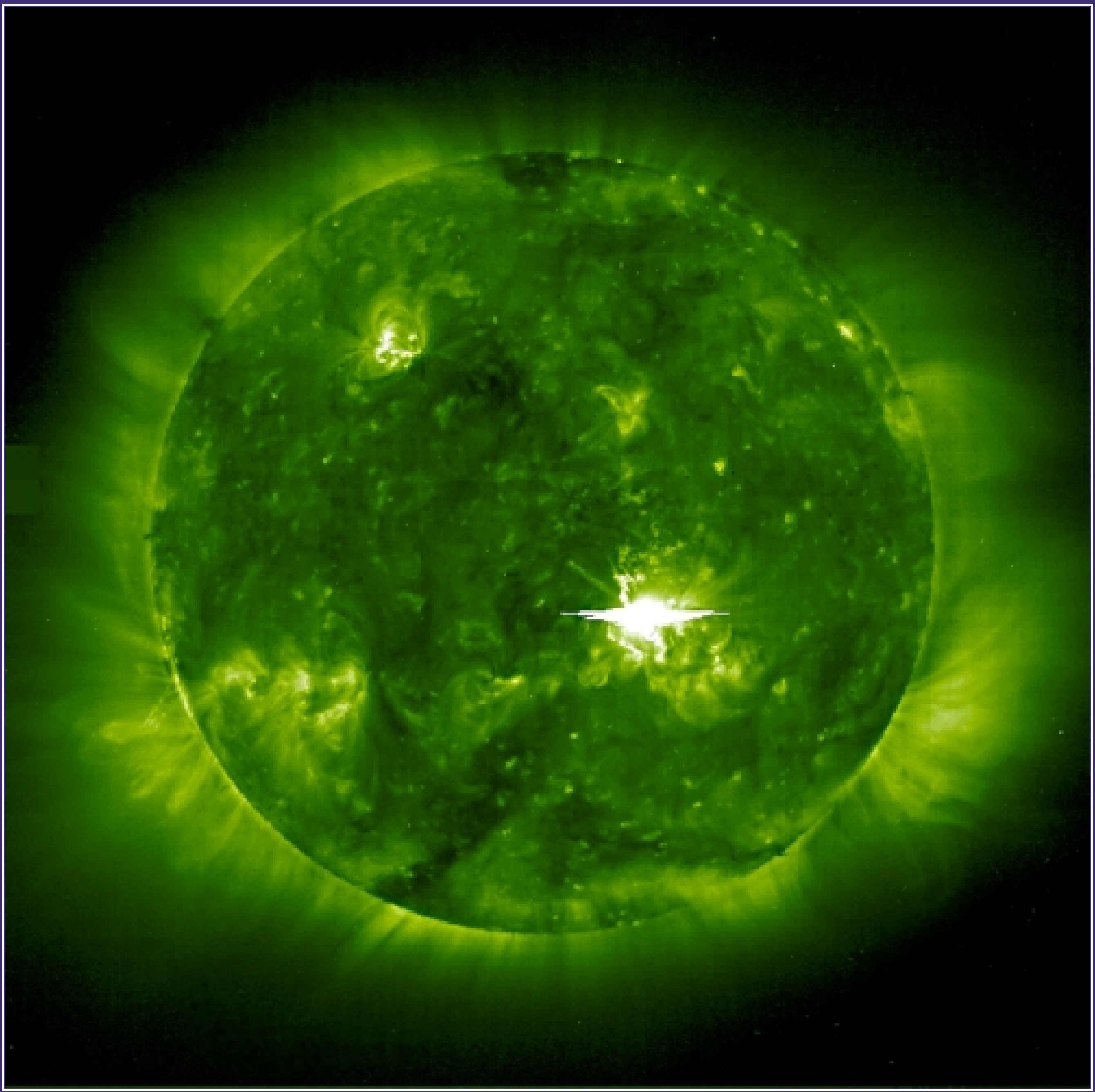
k-ω p mode spectrum



**SOHO/MDI high resolution images of an active region, taken on 5 November 1998 after successfully recomissioning of the instrument**

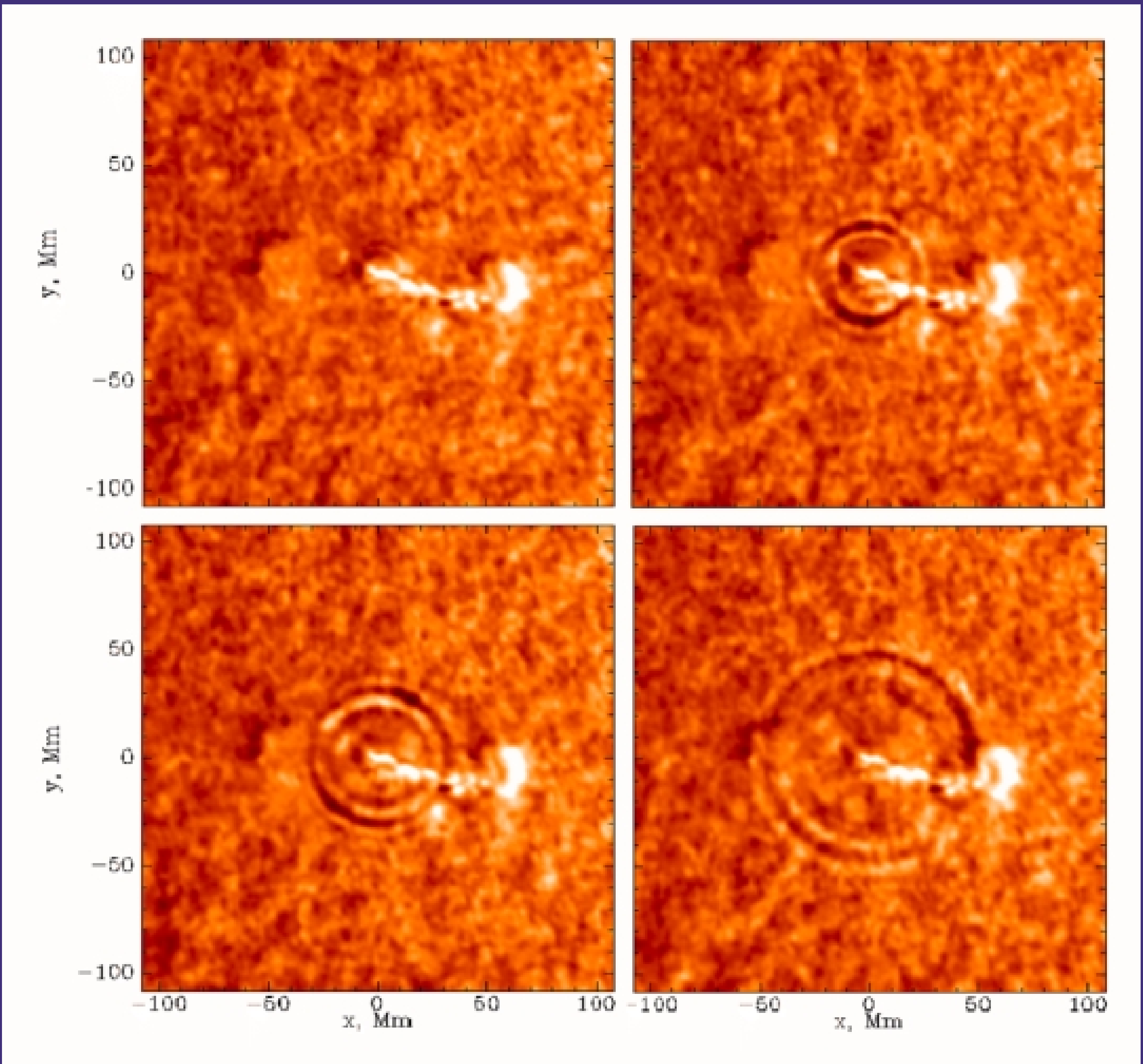



**The subsurface structure (sound speed) below a sunspot as derived from Doppler measurements by MDI**

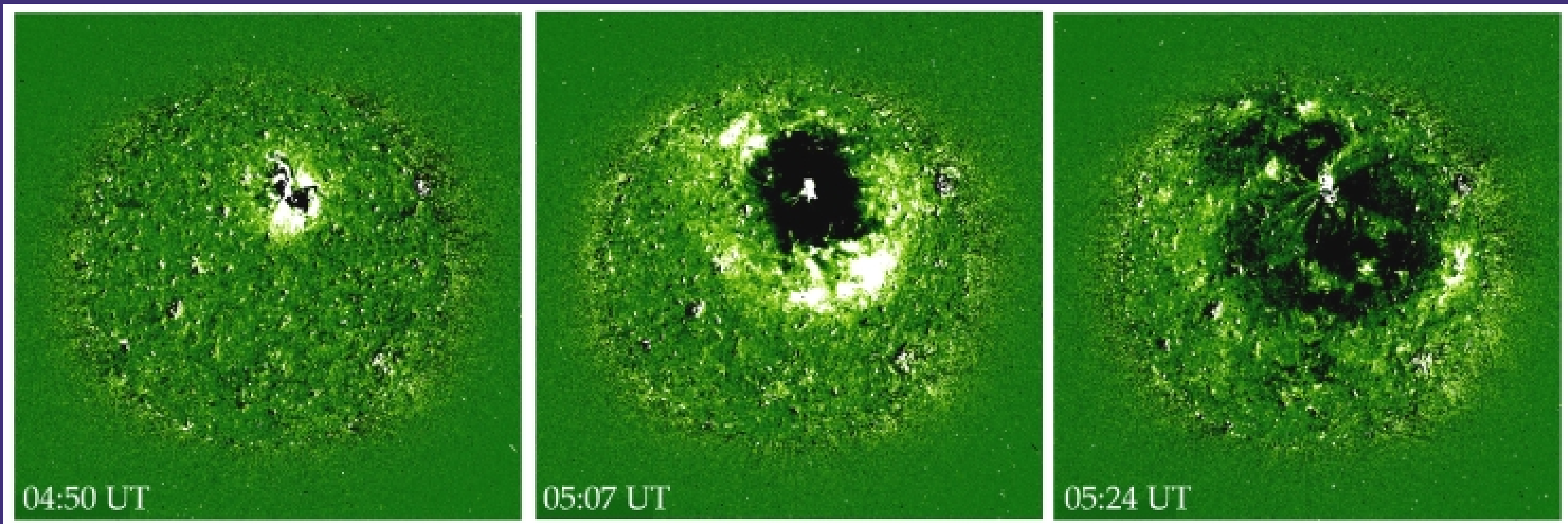


**A bright solar flare captured on 2 May 1998 in the 195Å line of Fe XII**

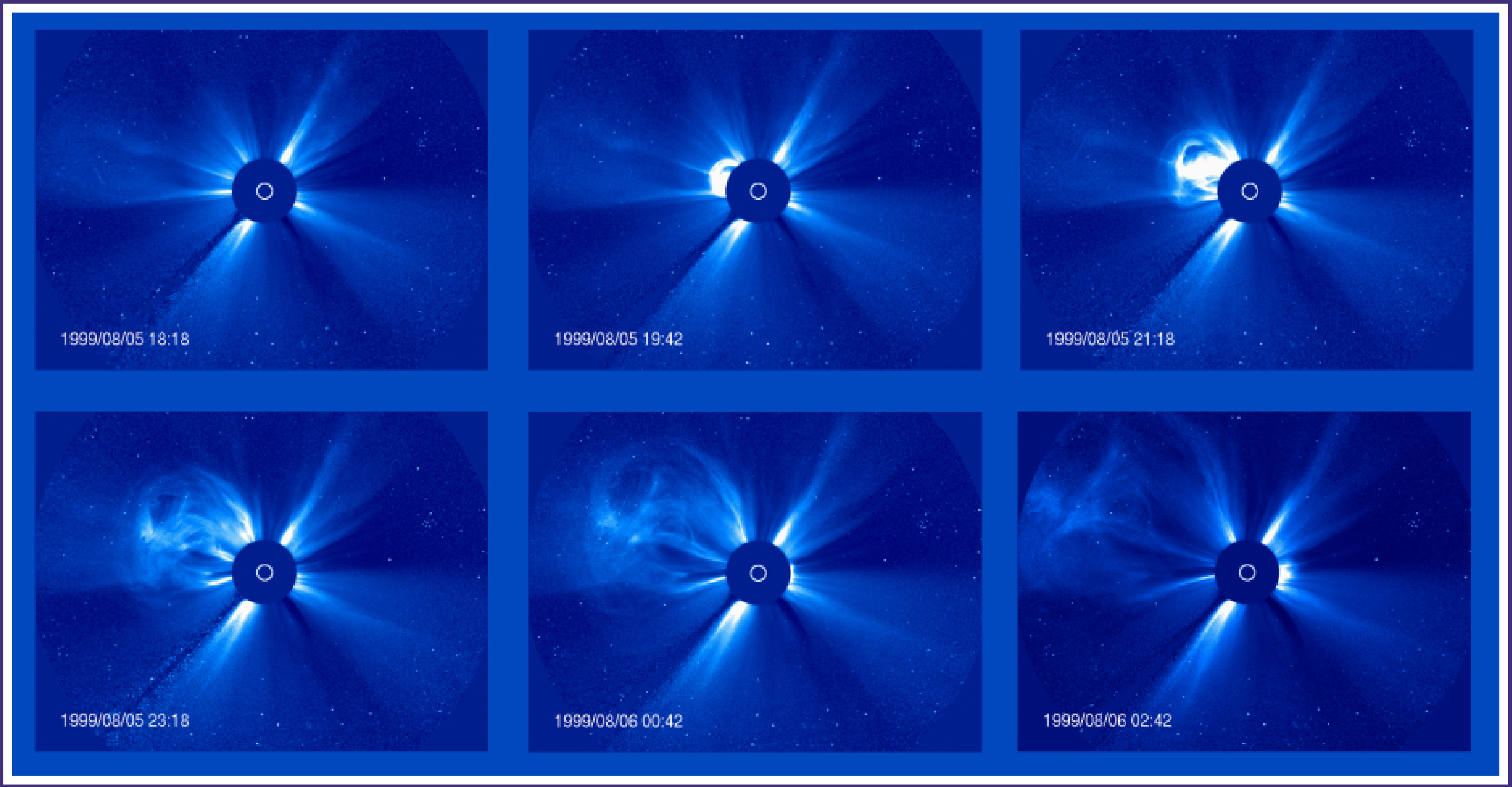
**(The horizontal white line on either side of the flare was caused by charge bleeding on the CCD detector.)**



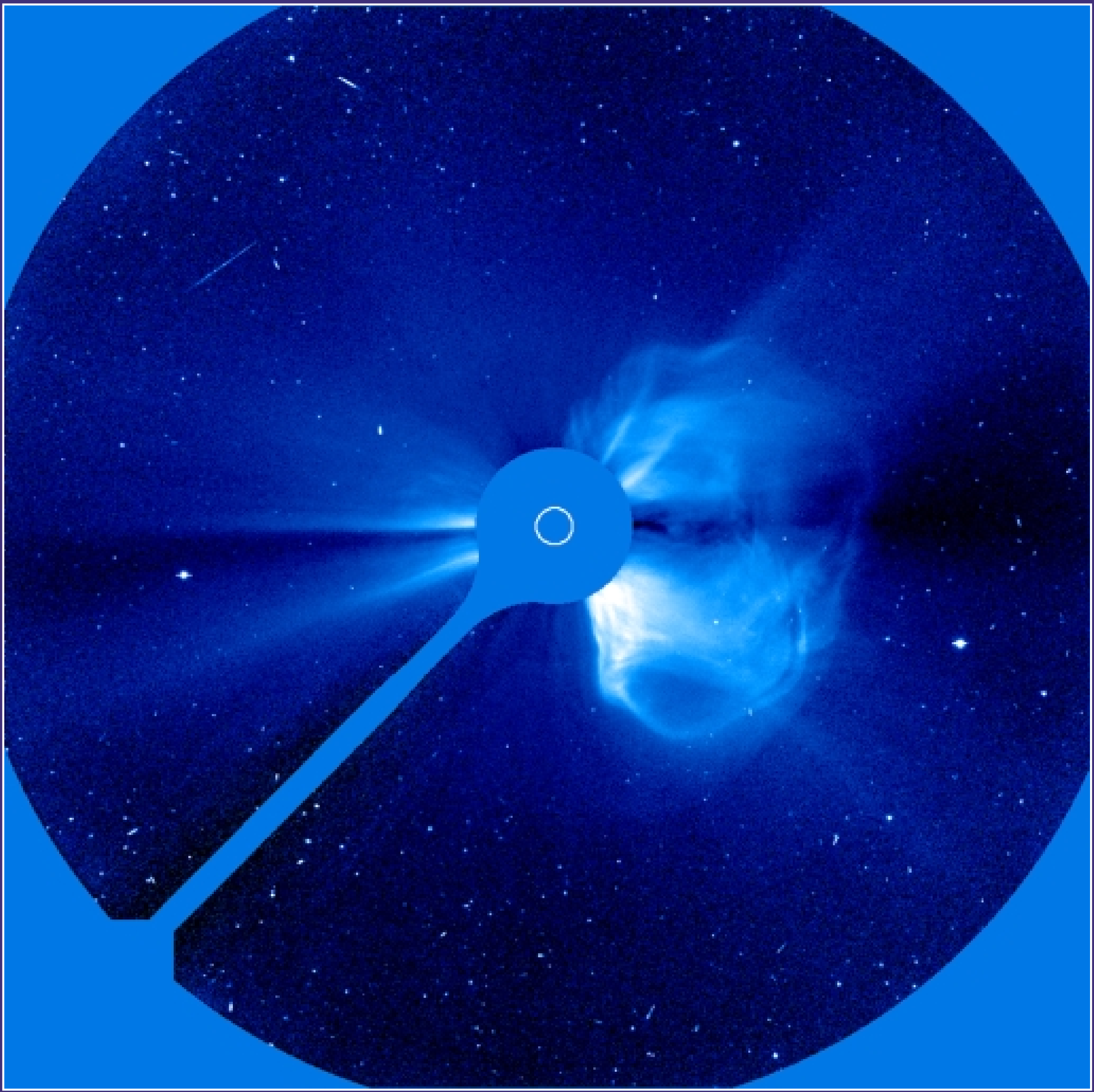

**A rapidly expanding "solar quake" on the Sun's surface based on data from the Michelson Doppler Imager (MDI). The wave was caused by a solar flare on 6 July 1996 and spread out more than 100,000 km at the solar surface.**



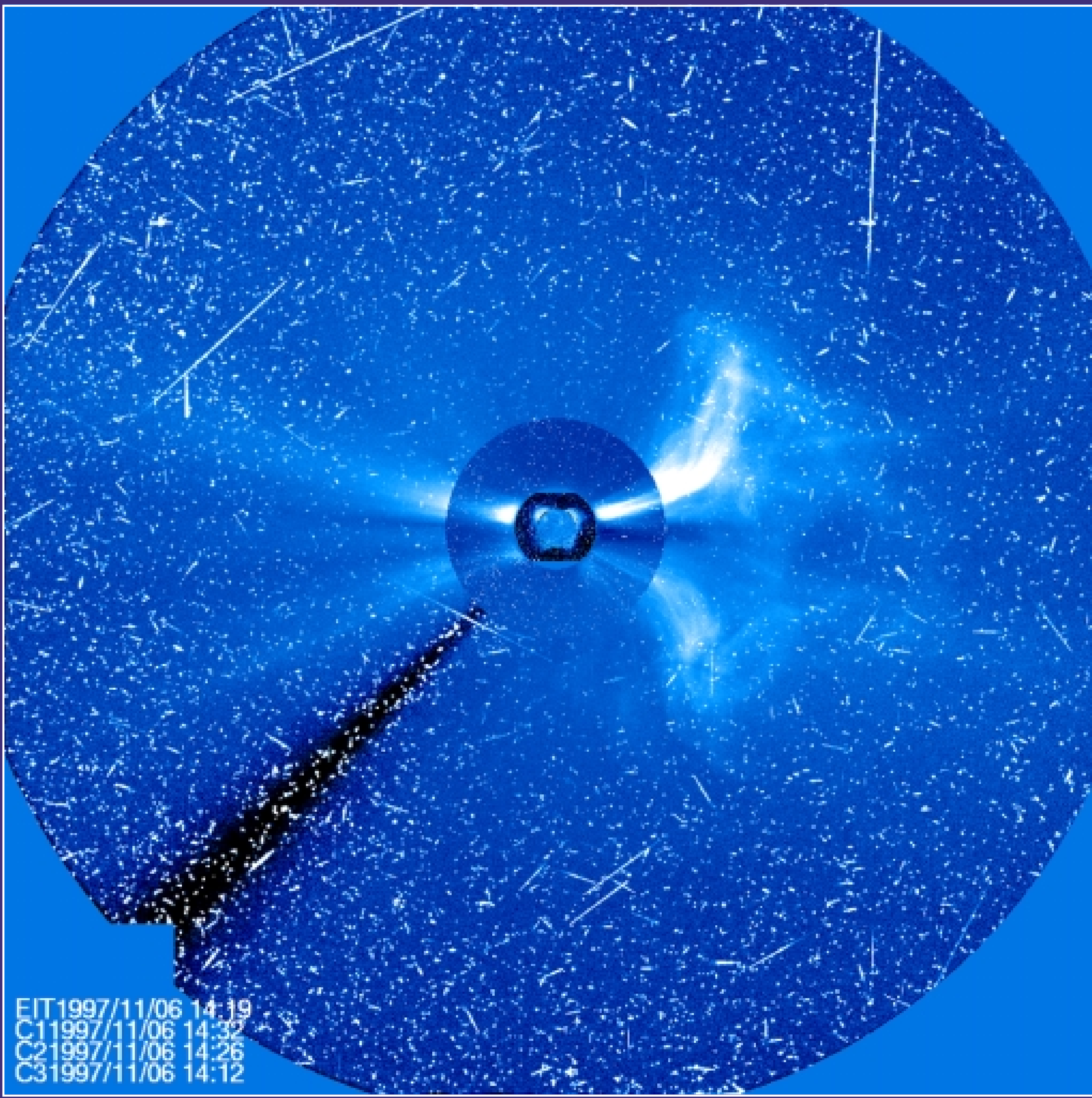

**EIT observation of a shock wave expanding across much of the Sun's surface from a coronal mass ejection (CME) initiation site on 12 May 1997. This "running difference" imaging technique emphasizes the chages between successive frames.**



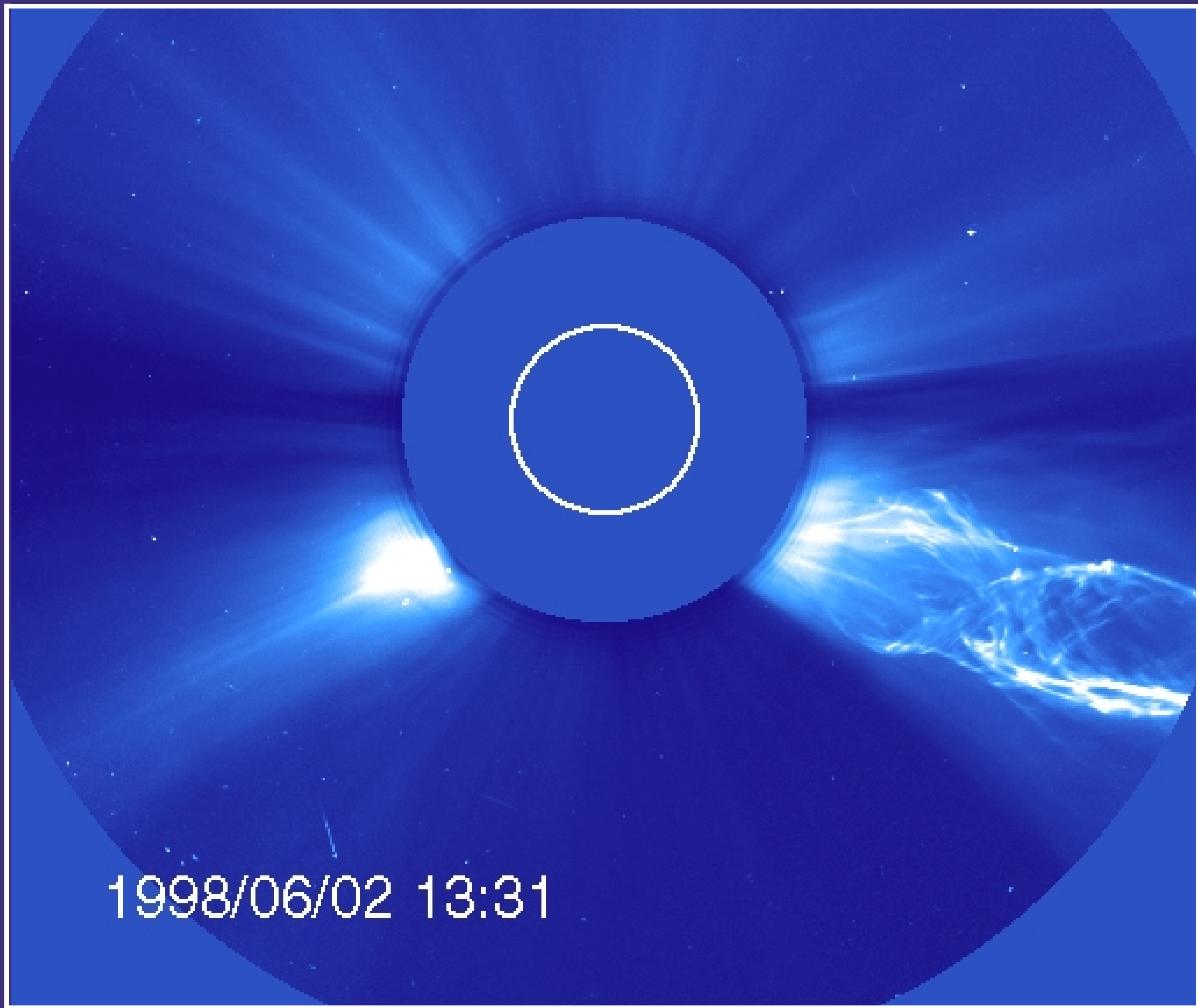

**An image sequence showing the progress over eight hours of a clearly defined coronal mass ejection on 5-6 August 1999 taken by LASCO C3.**



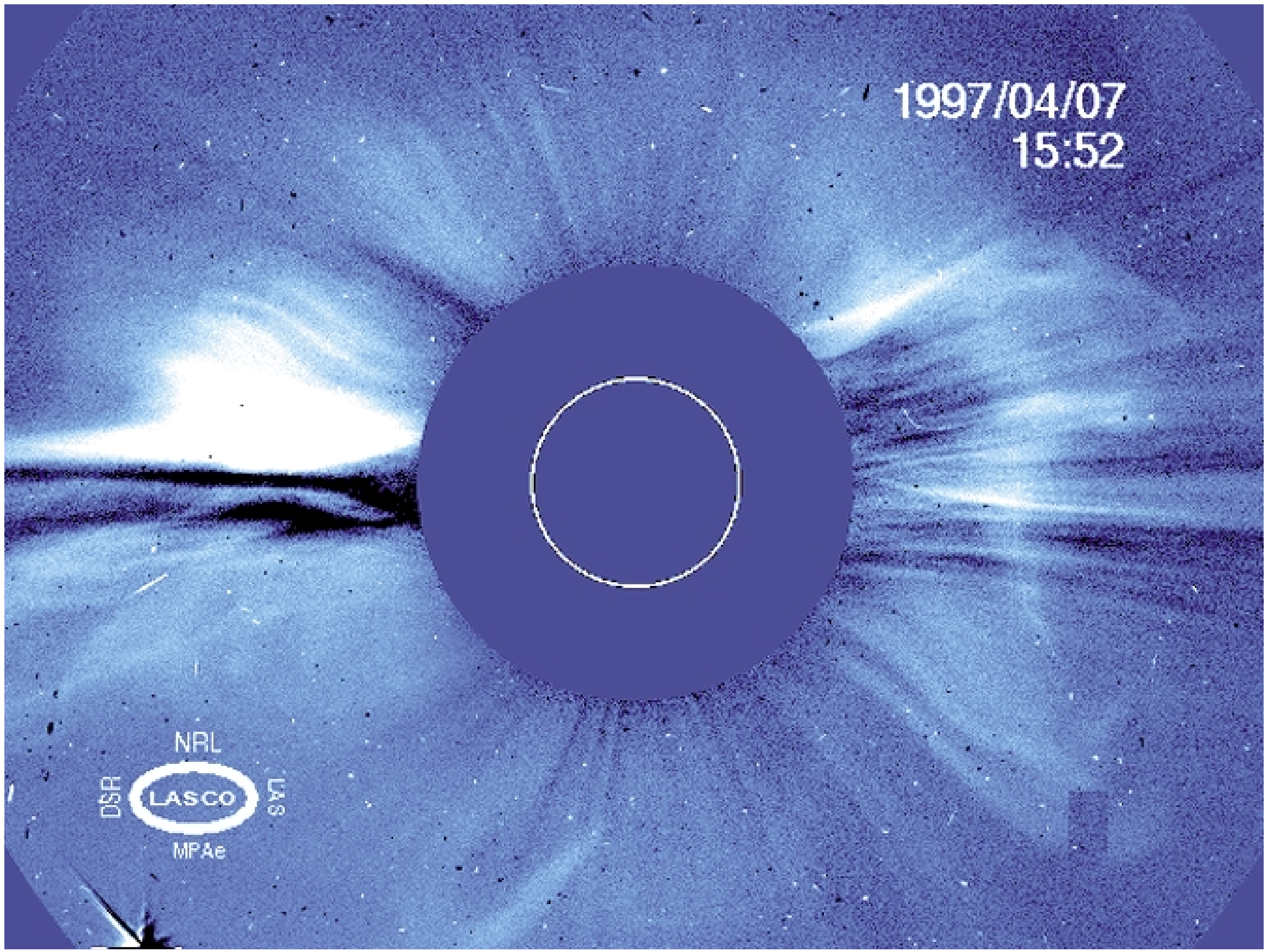
**LASCO C3 image of the large coronal mass ejection (CME) of 20 April 1998**



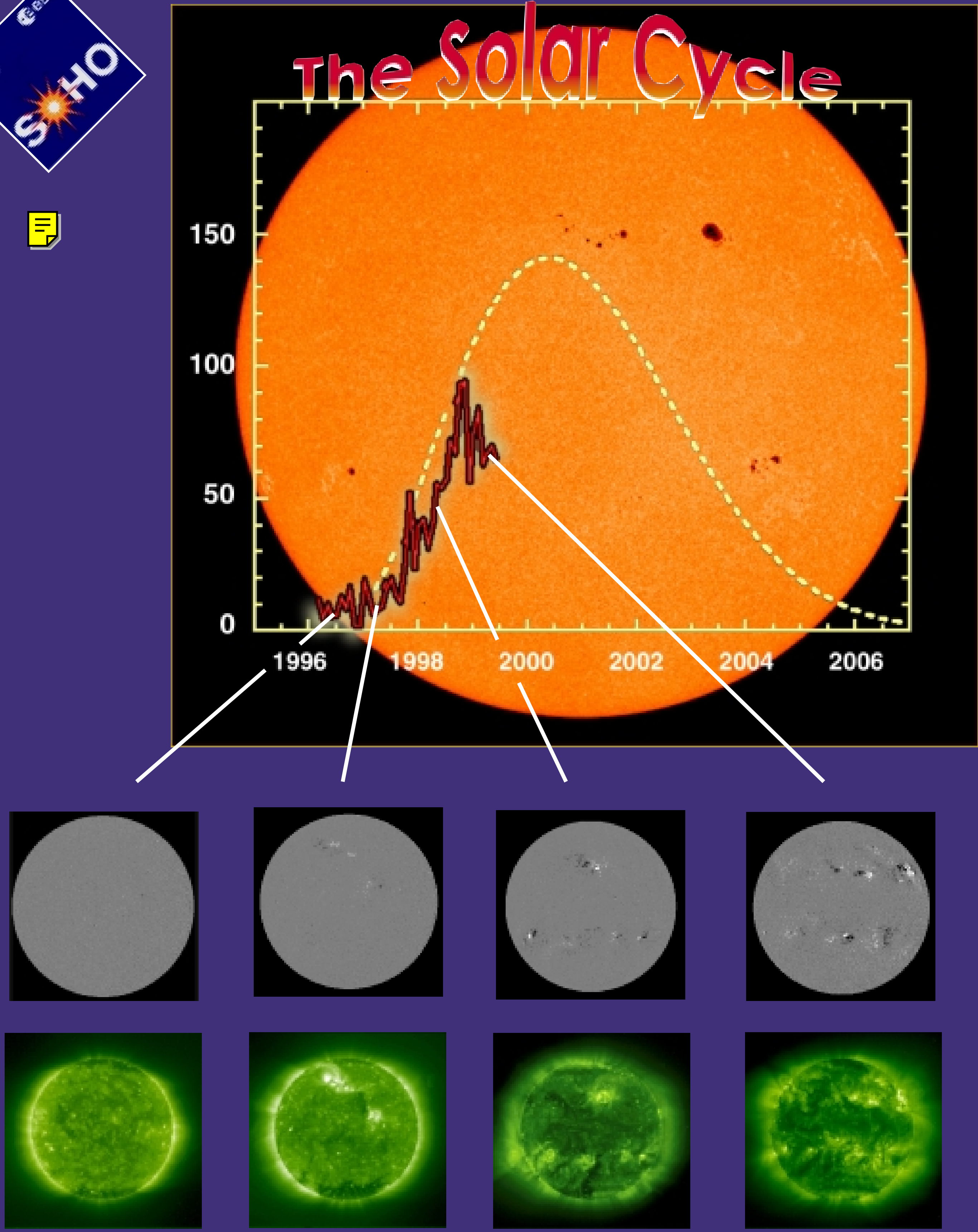

**A composite of four images of a large CME from 6 November 1997, which was associated with an X-9.4 flare**



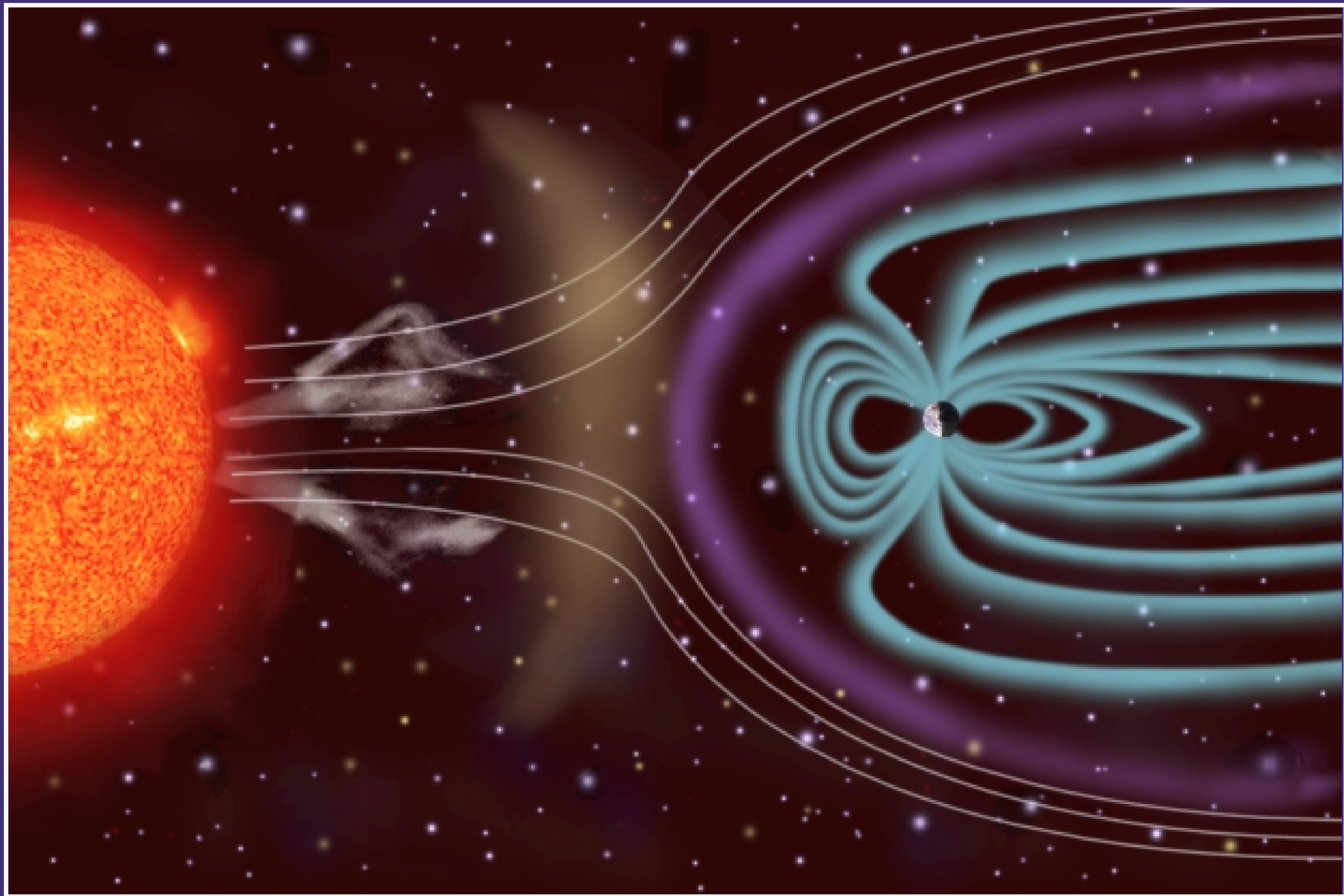

**LASCO C2 coronograph image in which a twisting, helical-shaped CME spins off from the Sun**




A LASCO C2 “running difference” image showing a “halo” CME blast beginning its journey towards Earth

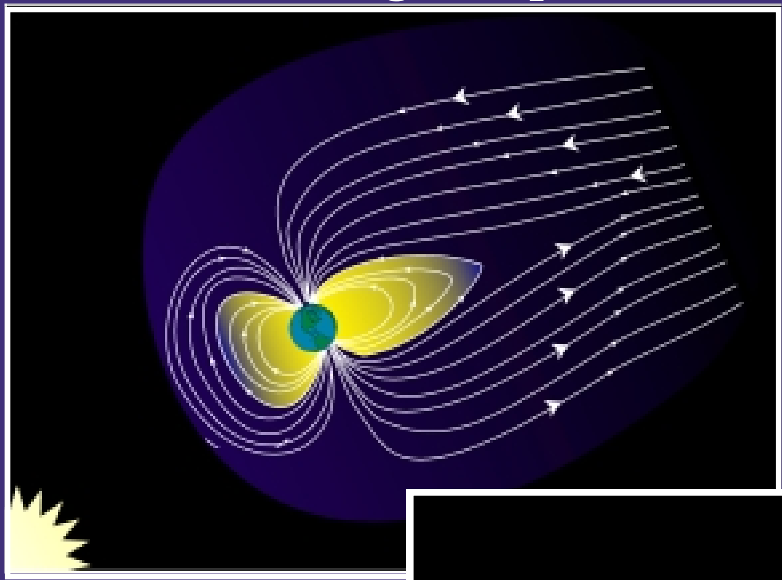



The rise of activity cycle 23 as reflected by the number of sunspots recorded to date and as projected (dotted line). Selected EIT 195Å images and MDI magnetograms are shown.

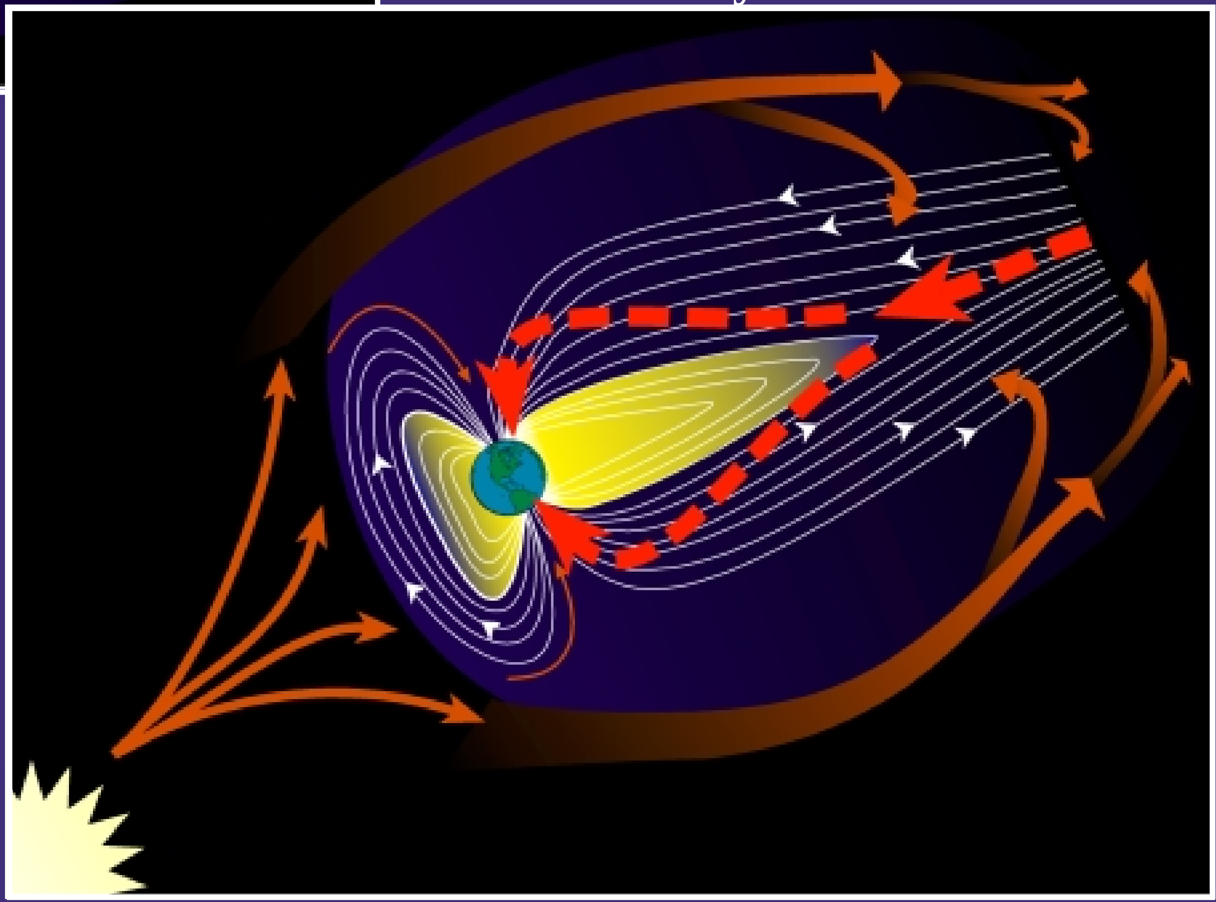


The Sun's magnetic field and plasma releases directly affect Earth and the rest of the solar system. This schematic view illustrates a magnetic storm approaching Earth and how the solar wind shapes the Earth's magnetosphere.

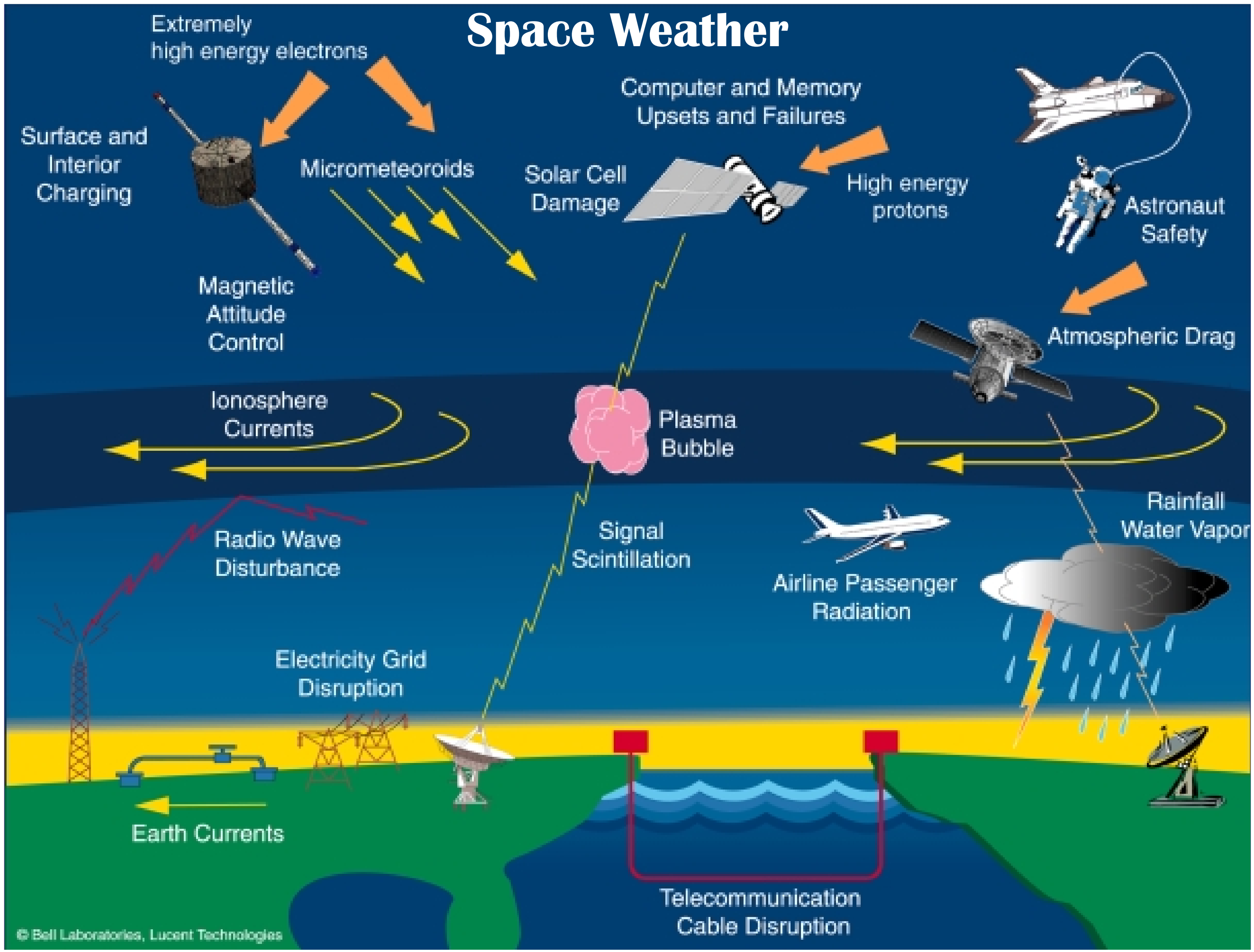
## Normal magnetosphere



## Magnetosphere being affected by a CME



**When the particles from a CME impact the Earth's magnetosphere , the sunward side flattens and the tail elongates. Note that most particles are drawn in on the far side.**




**The numerous effects of space weather**

Credit: Jan Curtis

An aurora, the most spectacular visual effect of magnetic storms seen on Earth