



SOLI INVICTO



# SOHO imaging the Sun



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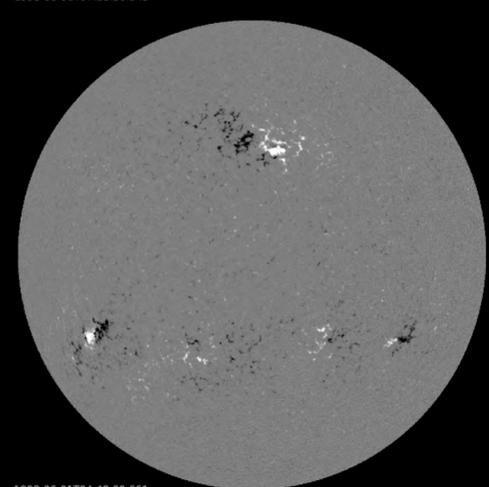
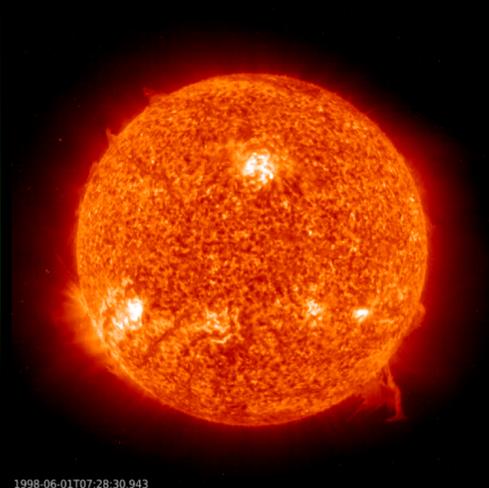
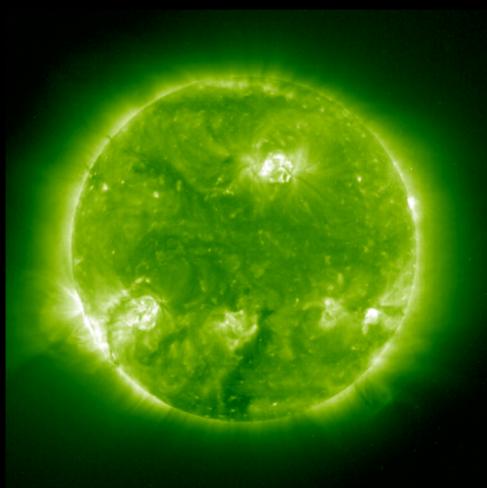
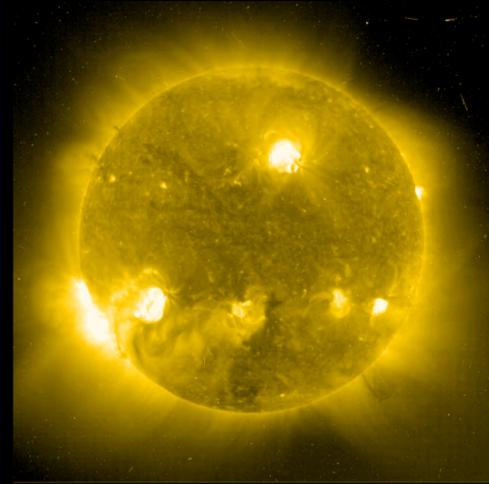
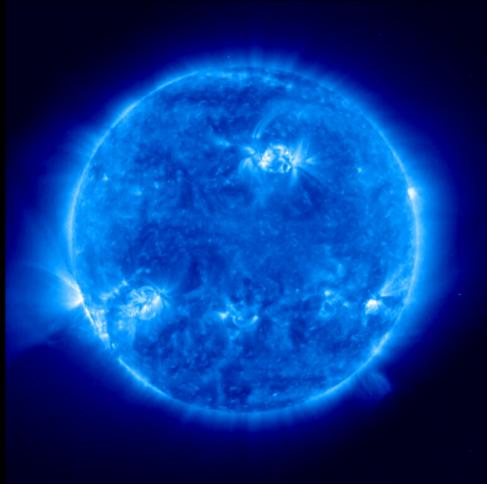




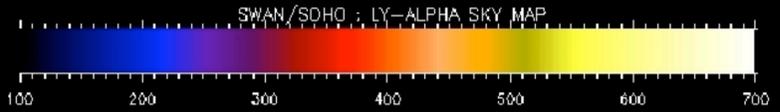
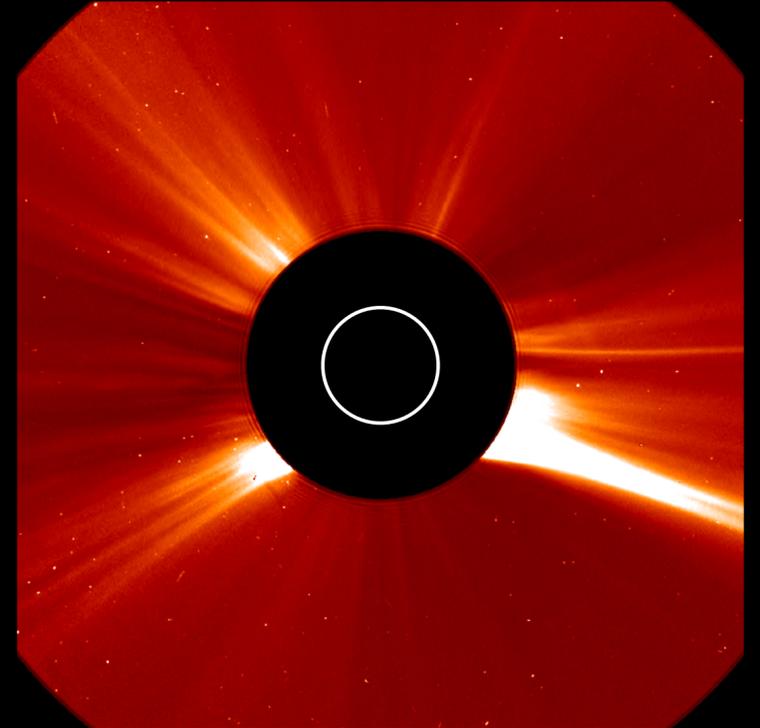
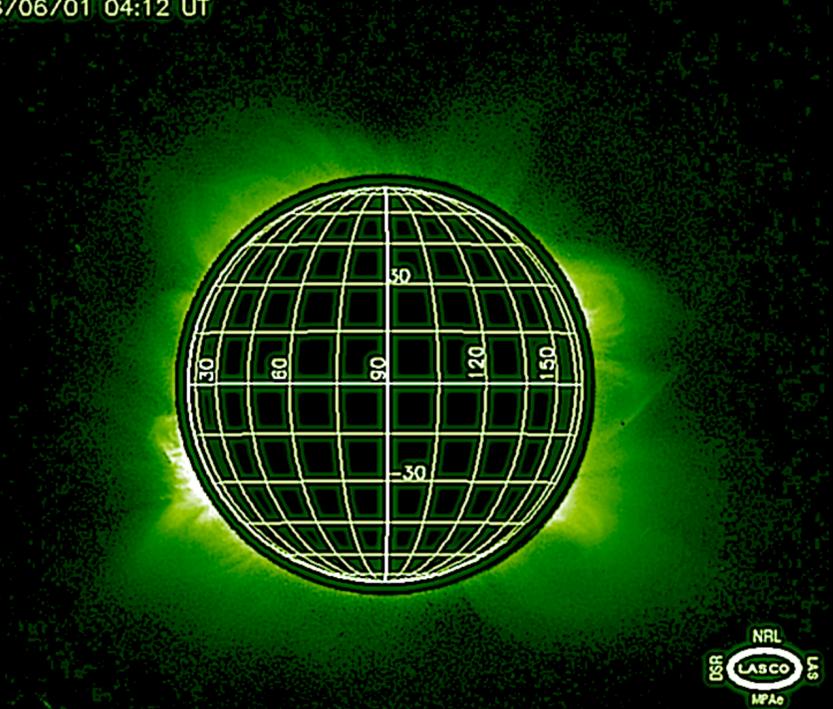
# Imaging the Sun and not only...



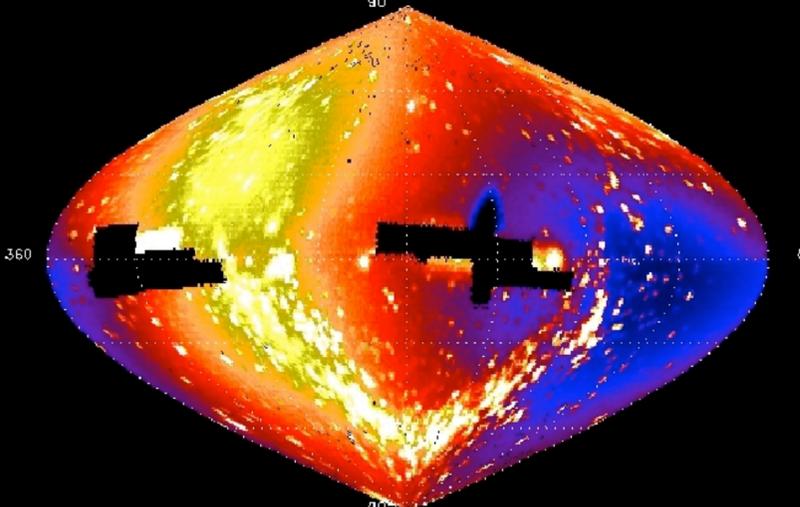
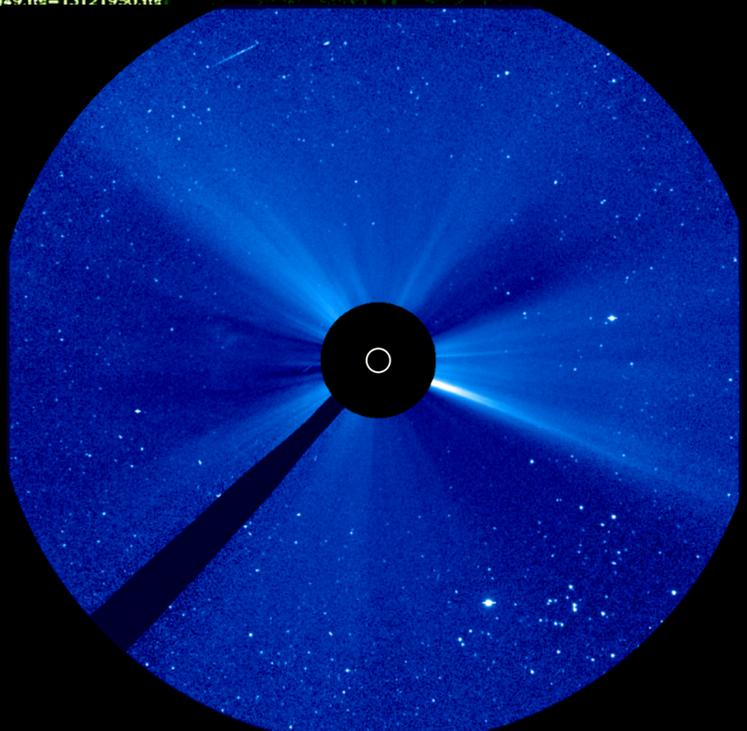
1998/06/01 04:12 UT



13121949.fts - 13121950.fts



ECLIPTIC COORDINATES: 02/02/1996



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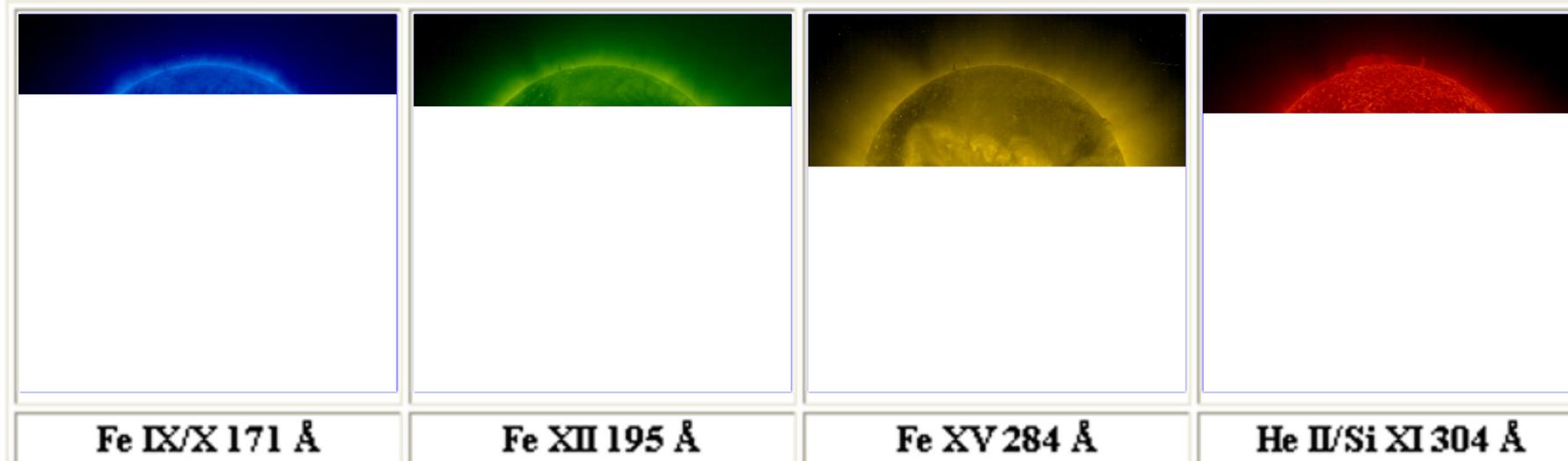


# My first SOHO images



## Latest EIT full-field images

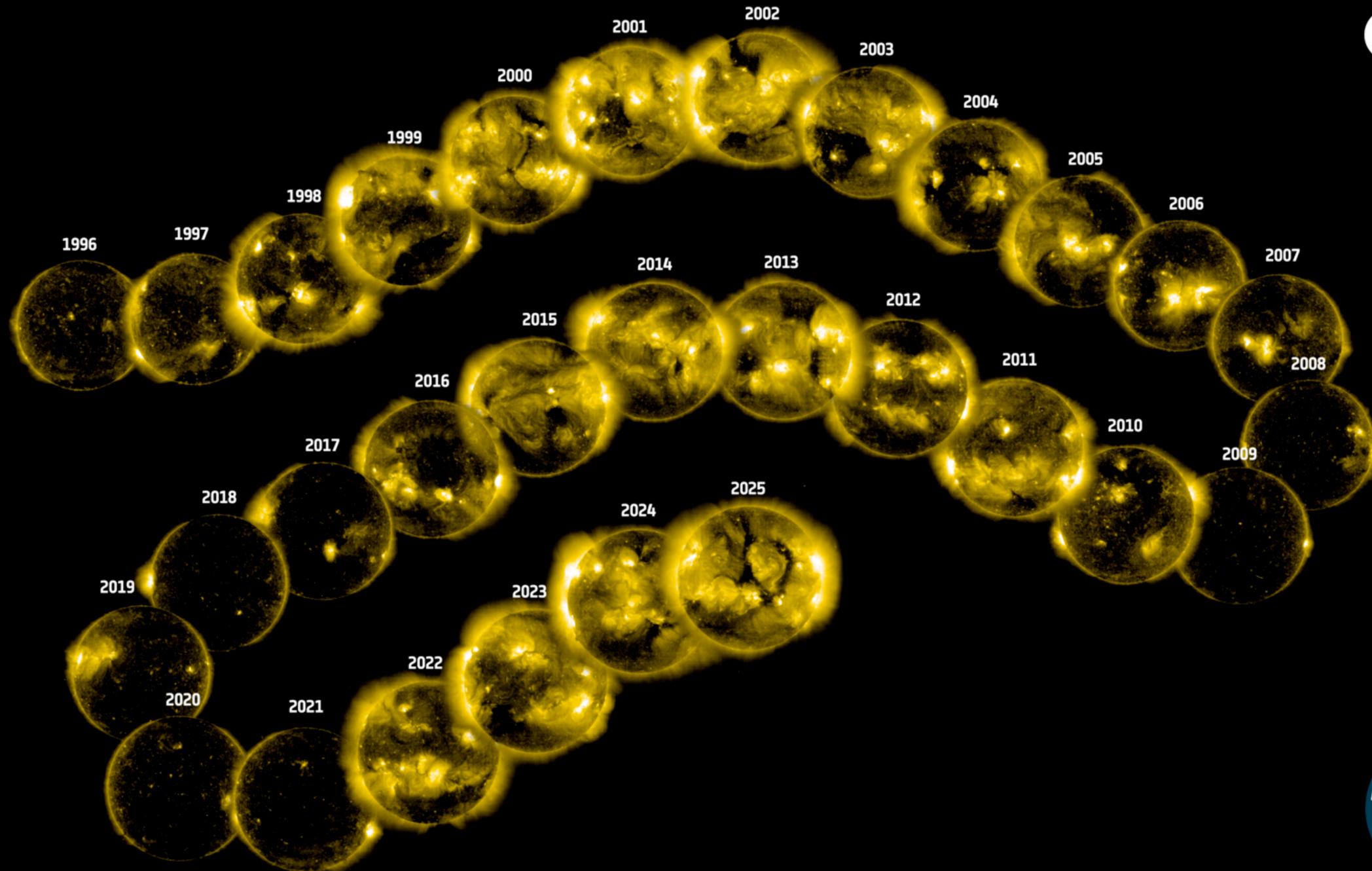
Each thumbnail image is a link to a 512 x 512 GIF image of the corresponding, latest EIT **synoptic** file. The "full res" link is to the full-sized image, whether 512 x 512 or 1024 x 1024. Only files with fewer than 15 missing pixel blocks are included.



- The SOHO mission started during the epoch of slow Internet!
- I may have been the first person in Russia to install the EIT SolarSoft branch.



# The third solar cycle of SOHO

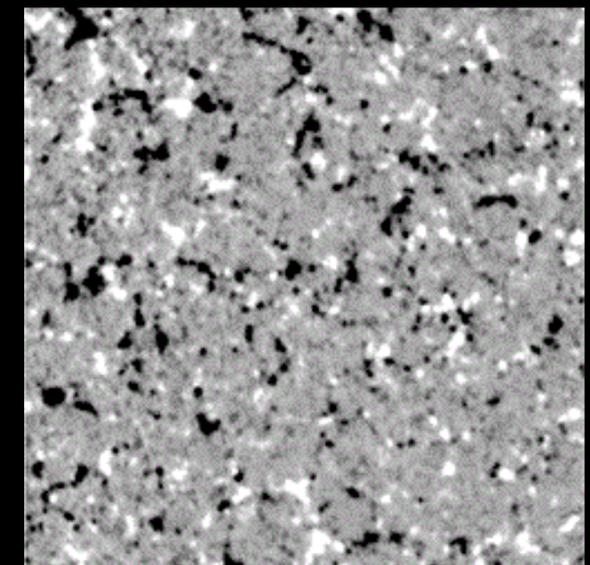
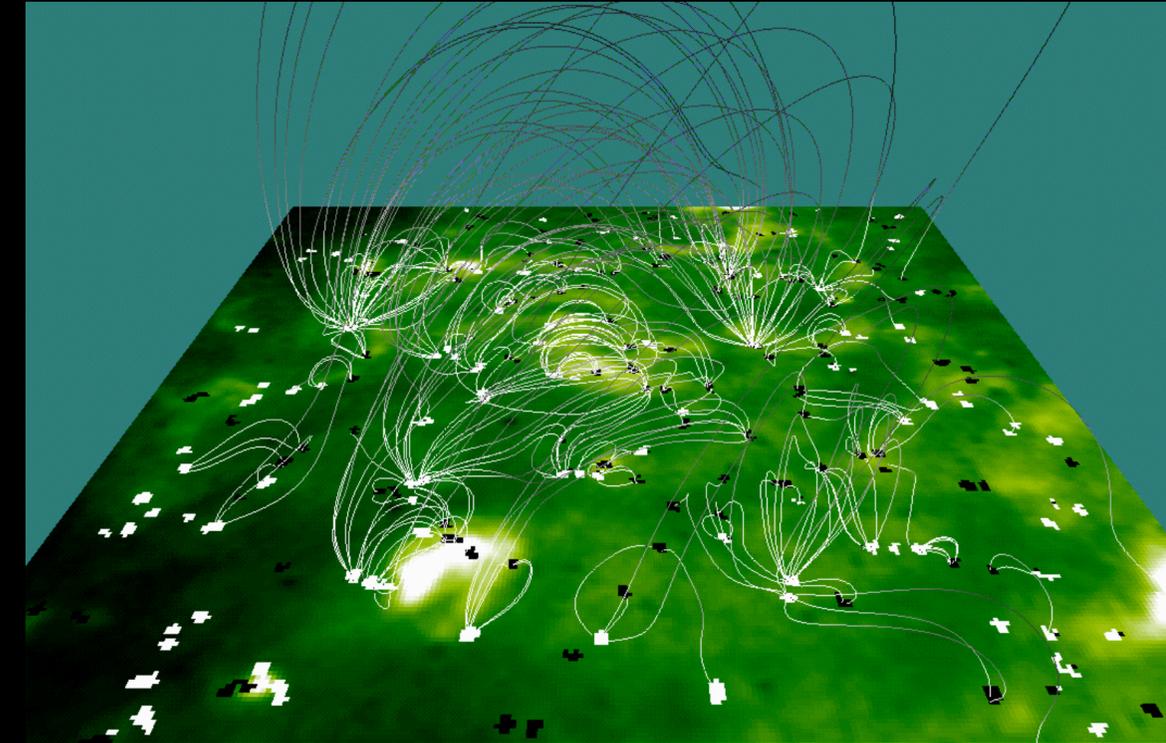
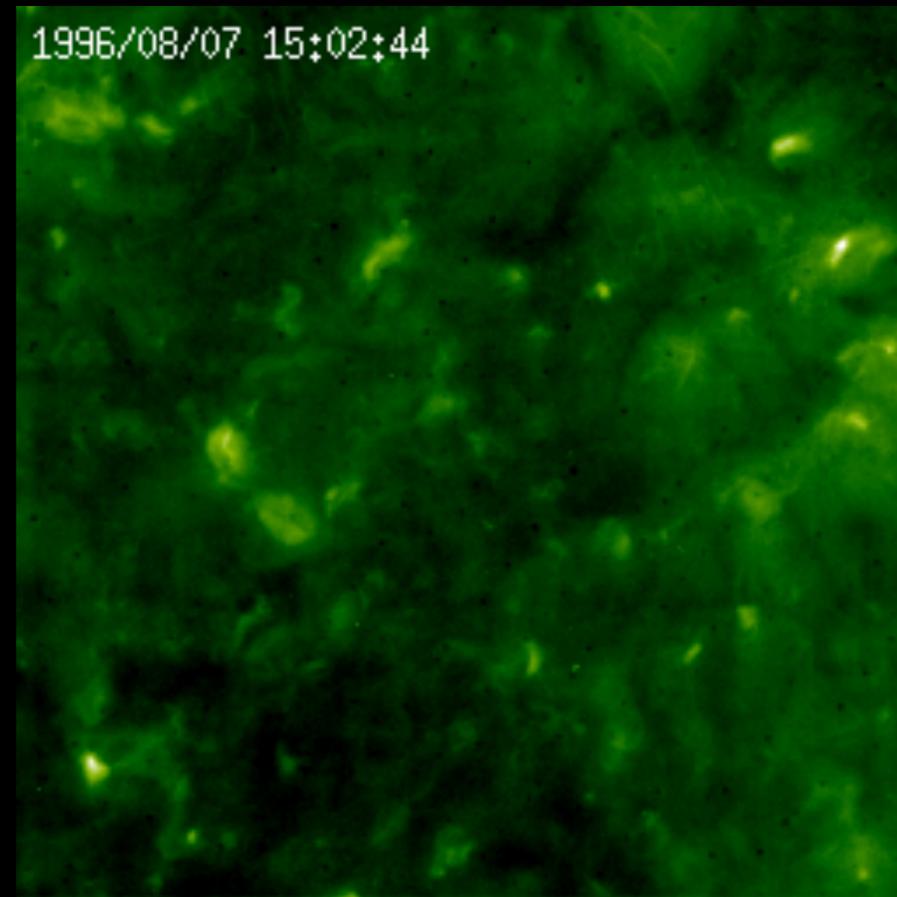




# The Sun is never quiet



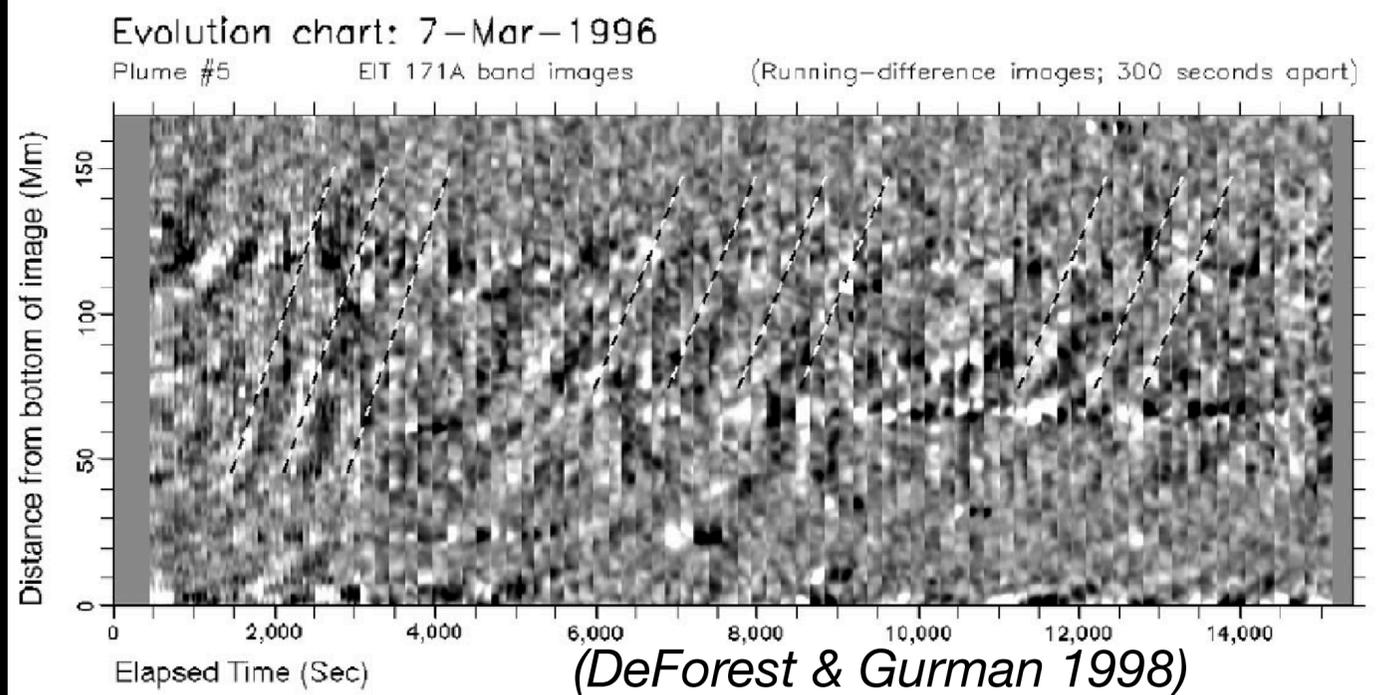
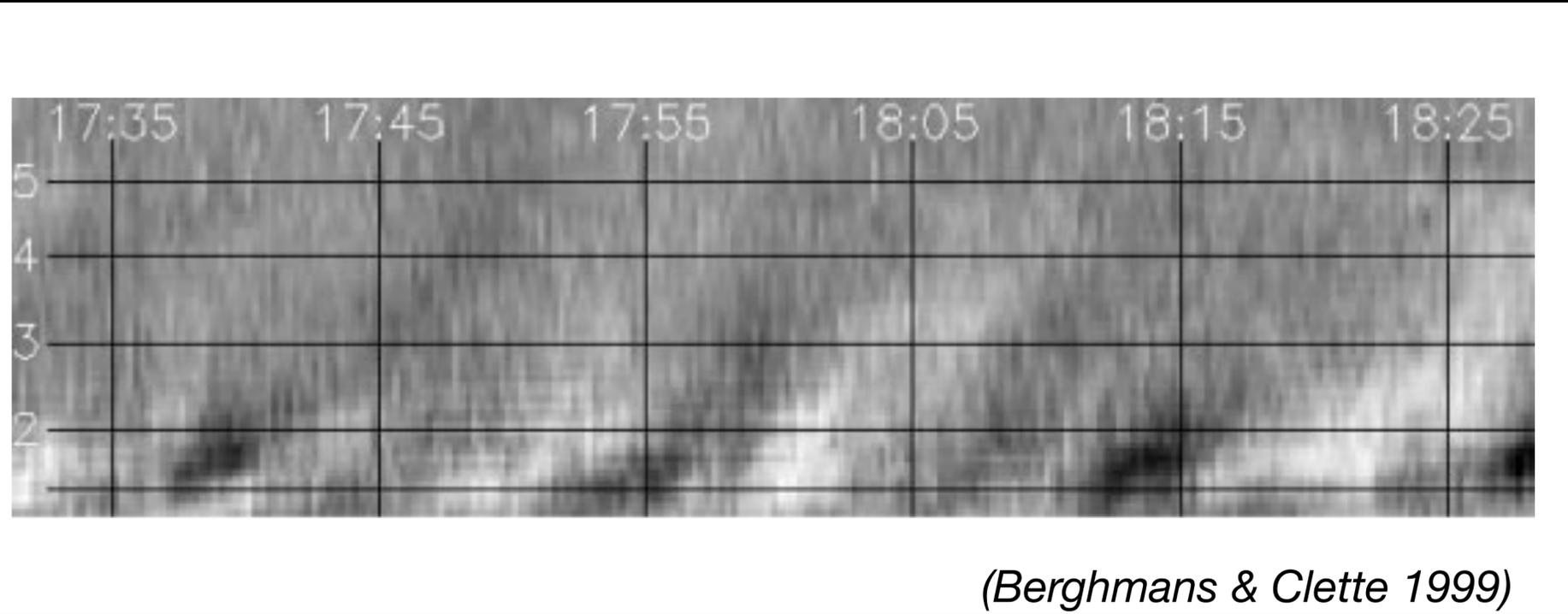
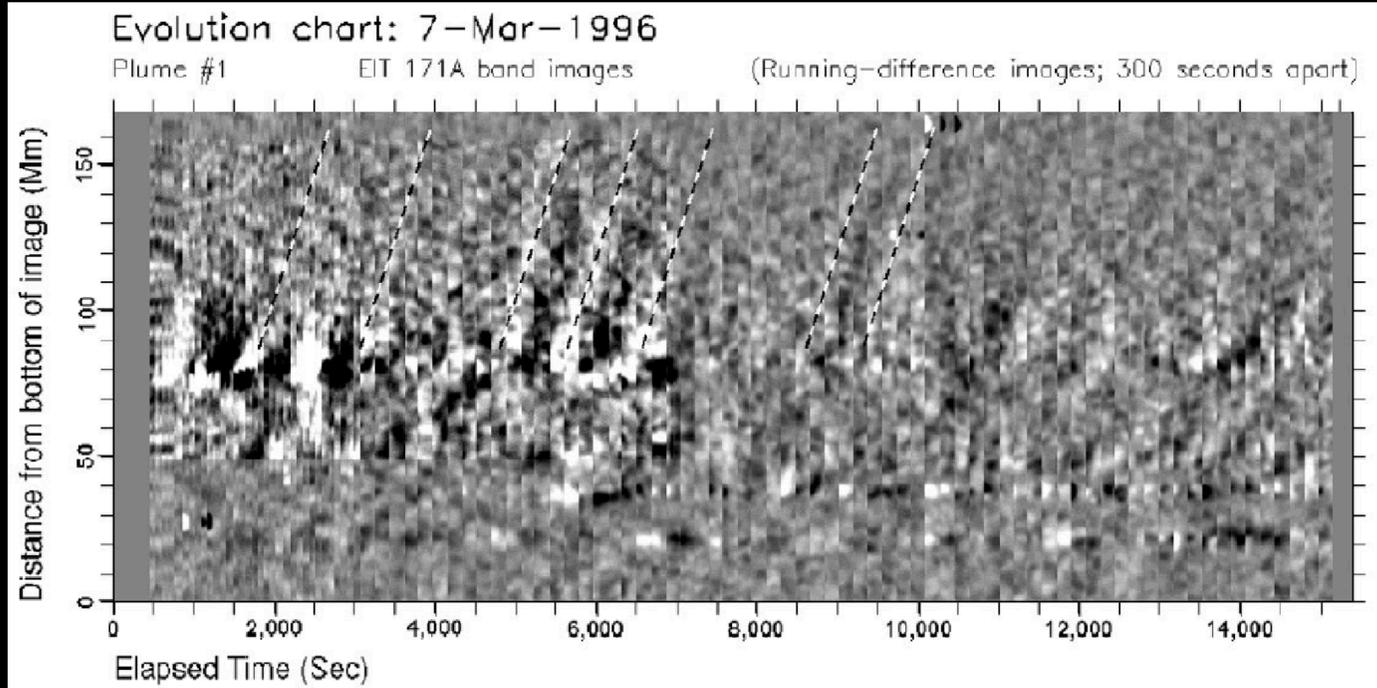
- SOHO/EIT observations showed persistent dynamic evolution everywhere in the solar corona (e.g. *Moses et al. 1997, Gurman et al. 1998*).
- The dynamics is linked to the so-called magnetic carpet on the photosphere observed by SOHO/MDI (*Parnell et al. 2002*).



(*Parnell et al. 2002*)

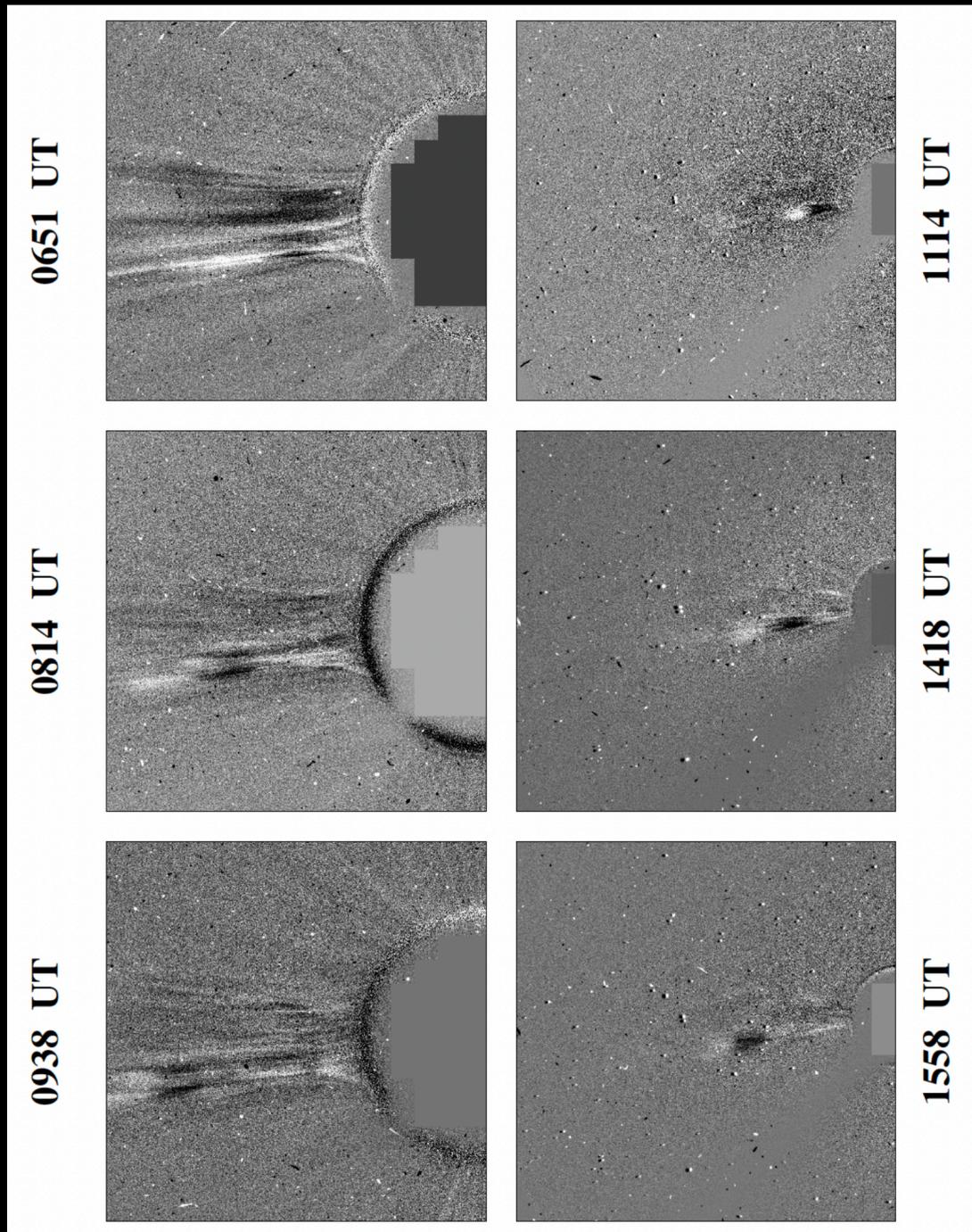


# Slow magnetosonic waves

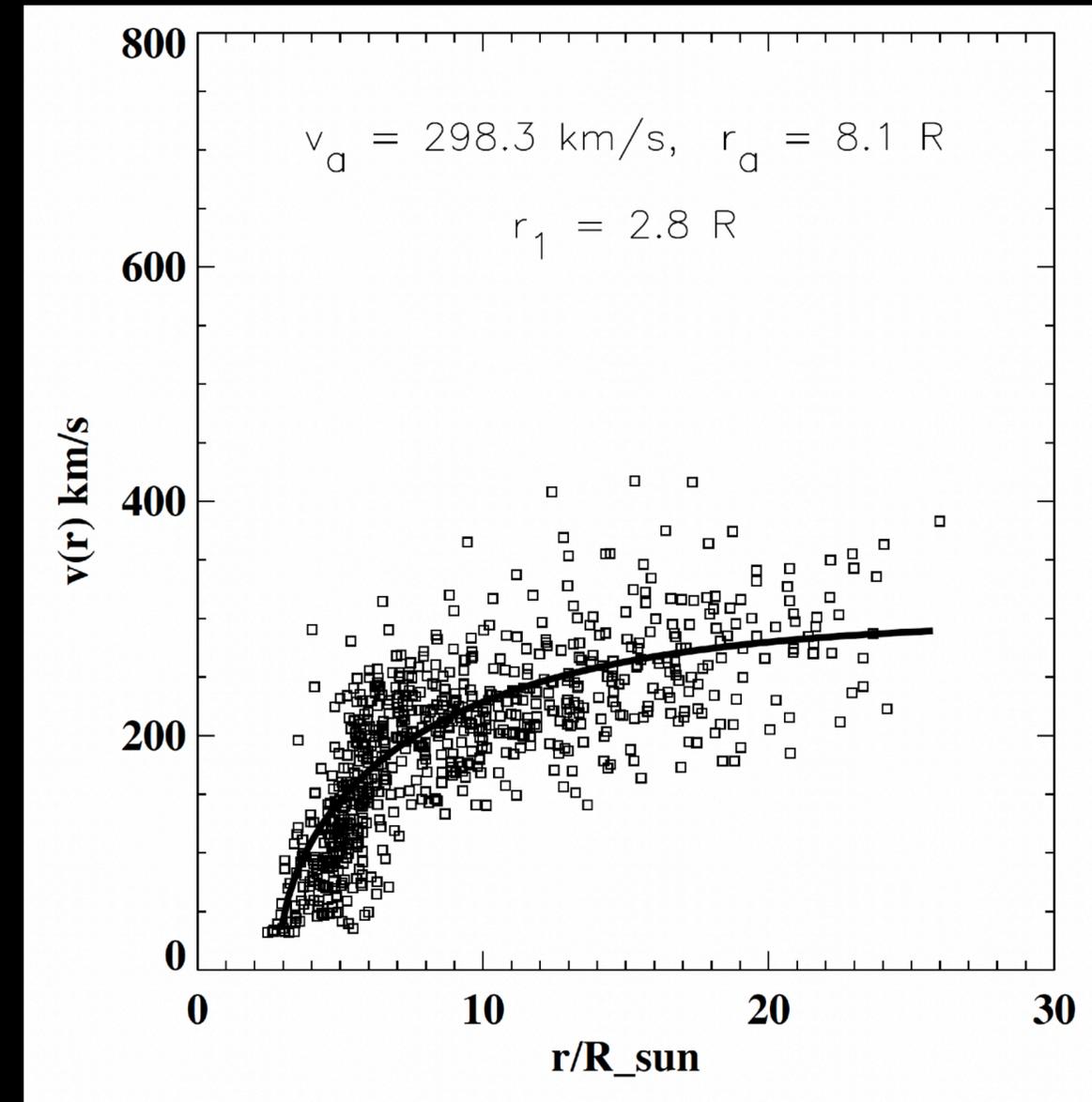


- Periodic propagating coronal disturbances were first observed by SOHO/EIT, both in coronal holes (DeForest & Gurman 1998) and in active regions (Berghmans & Clette 1999).
- The disturbances had the speed of around 150 km/s and were interpreted as slow magnetosonic waves.

# Slow solar wind



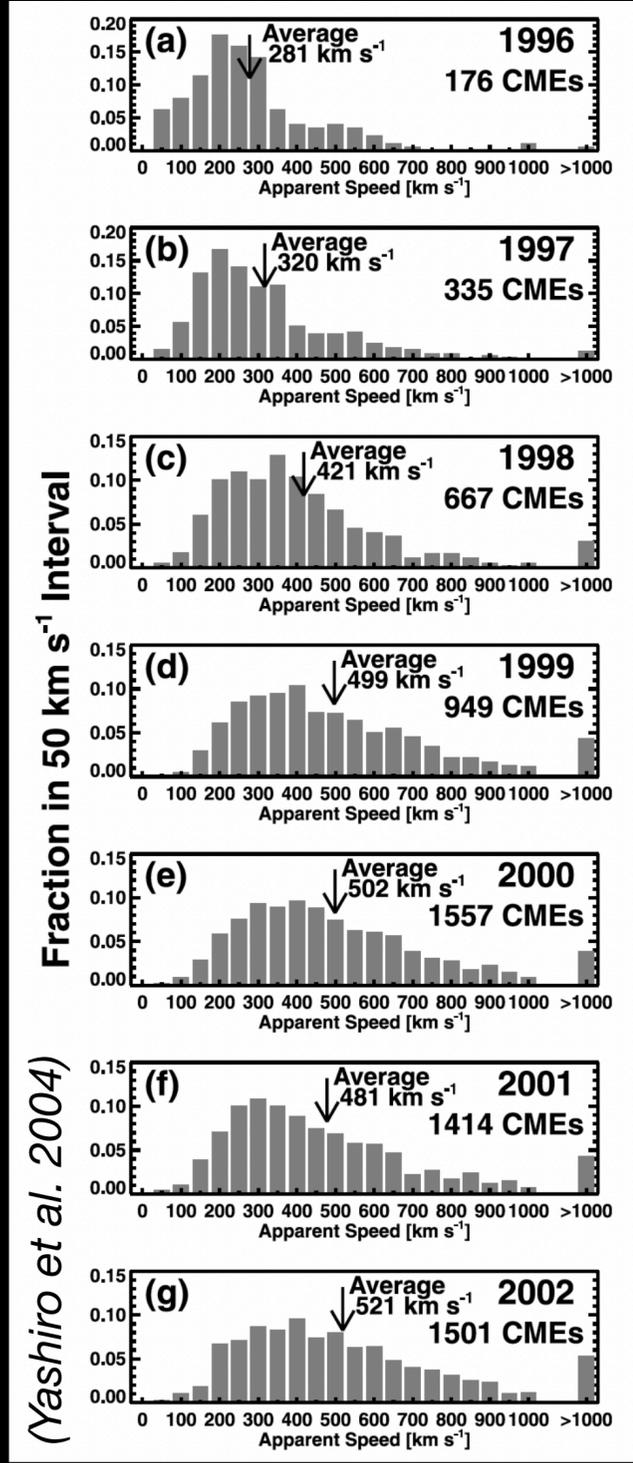
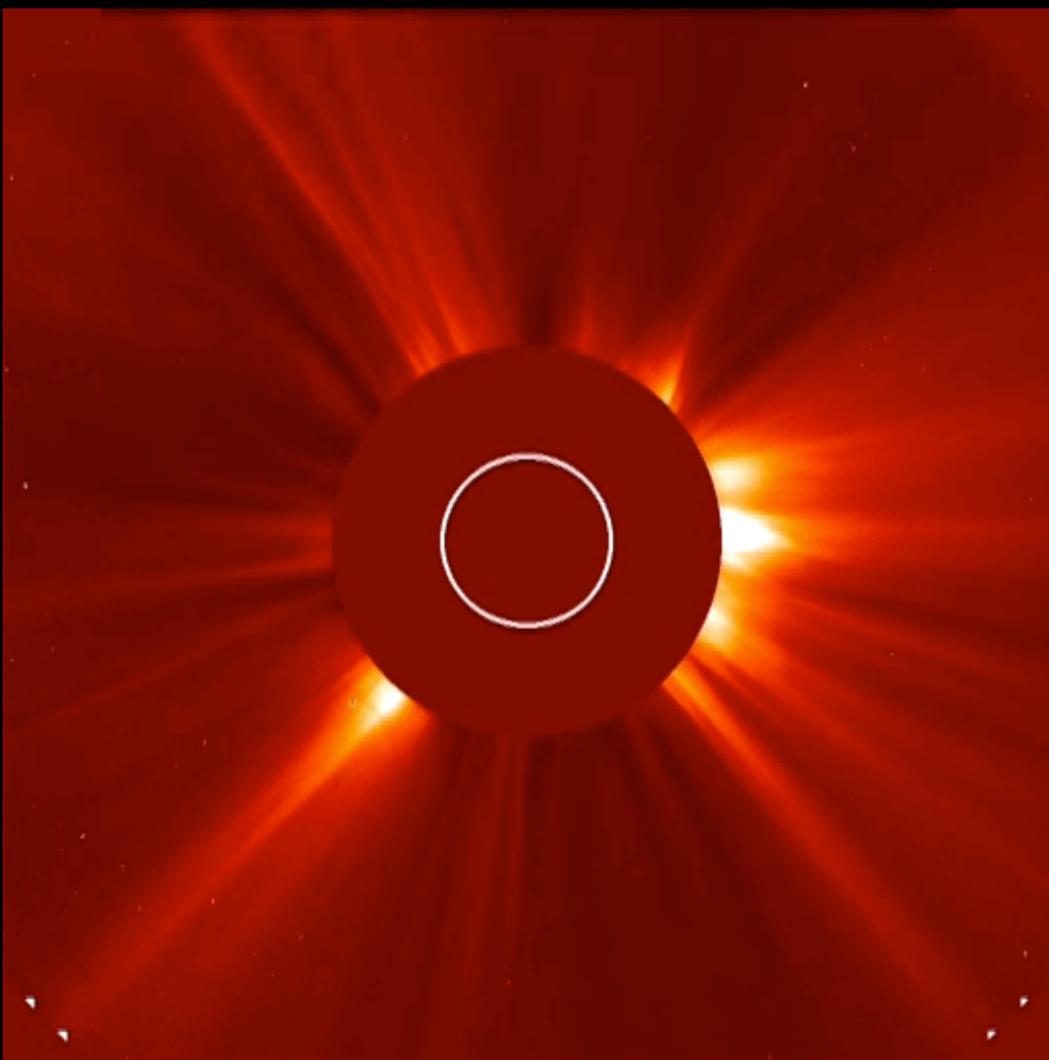
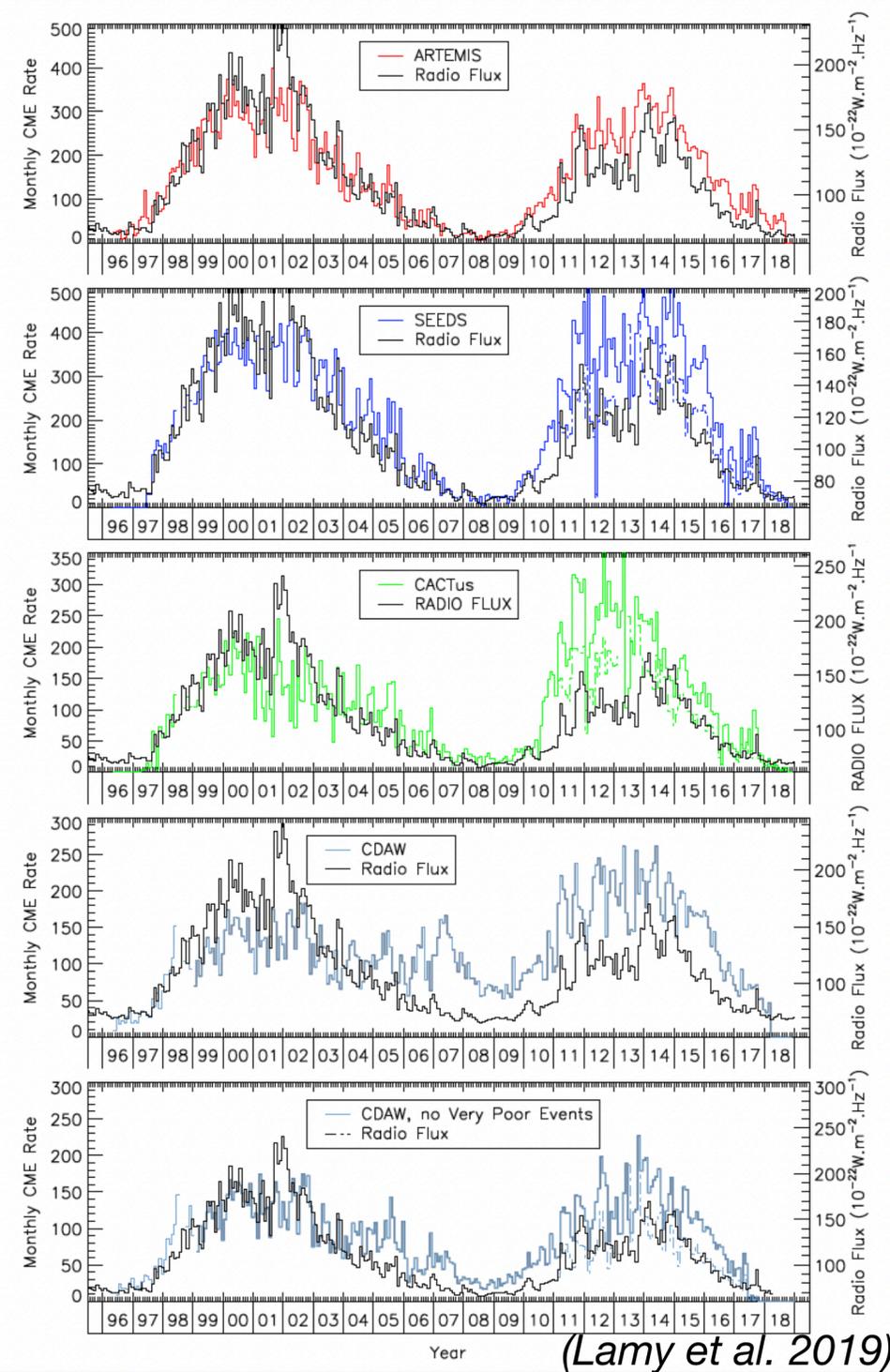
(Sheeley et al. 1997)



- Pioneering SOHO/LASCO measurements of propagating density perturbations (blobs) in streamers, tracking the slow solar wind flow (Sheeley et al. 1997).



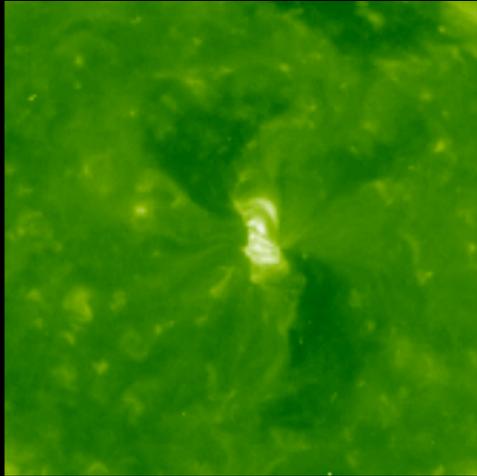
# Coronal Mass Ejections



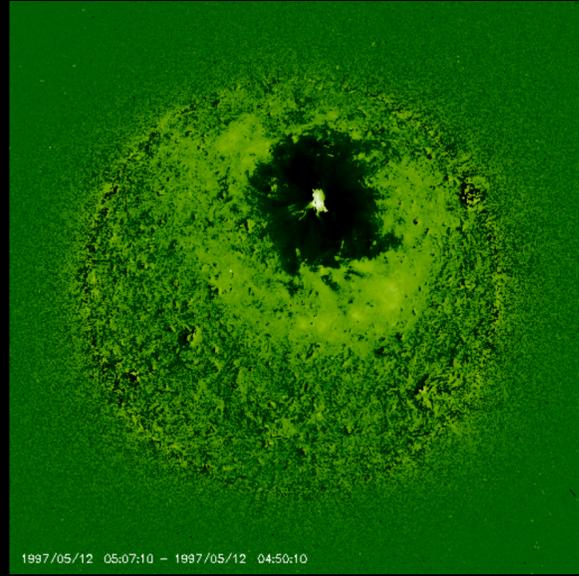
- Tens of thousands of coronal mass ejections (CMEs) were observed by SOHO/LASCO (e.g. Lamy et al. 2019).
- Their properties were measured and reported in catalogs, both manual (Yashiro et al. 2004) and automatic (Robbrecht & Berghmans 2004, Olmedo et al. 2005, Boursier et al. 2009, Byrne et al. 2009).



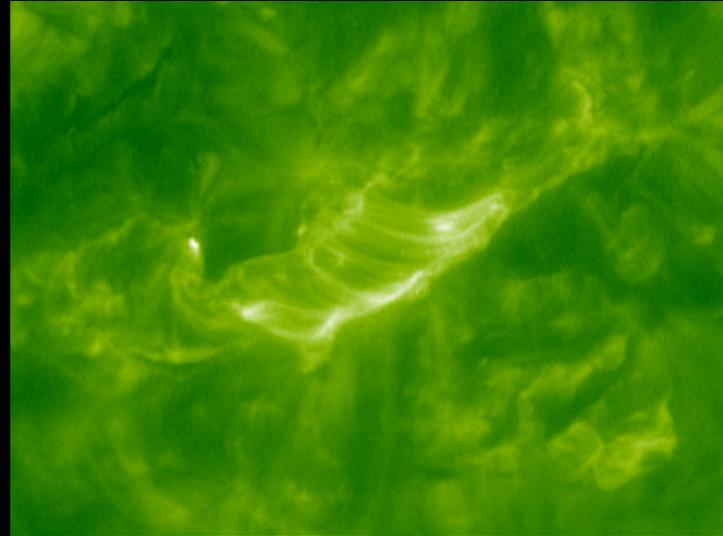
# CME signatures in EUV



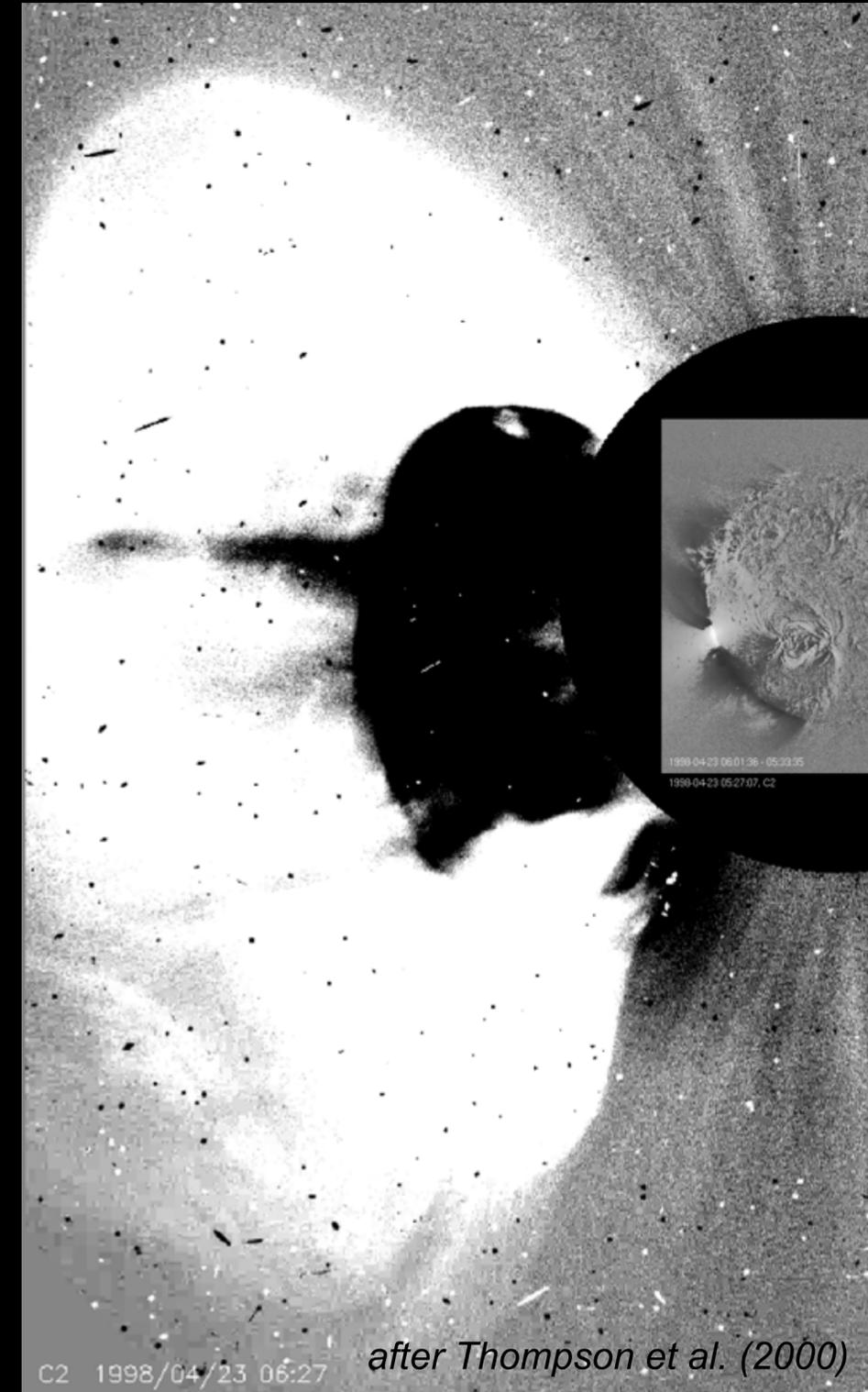
Dimmings (including TCHs)



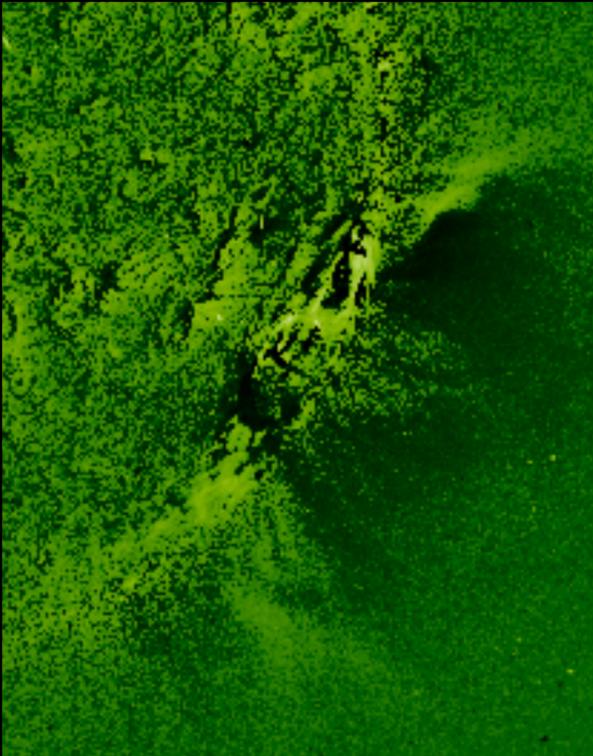
“EIT wave”



Post-eruption arcade

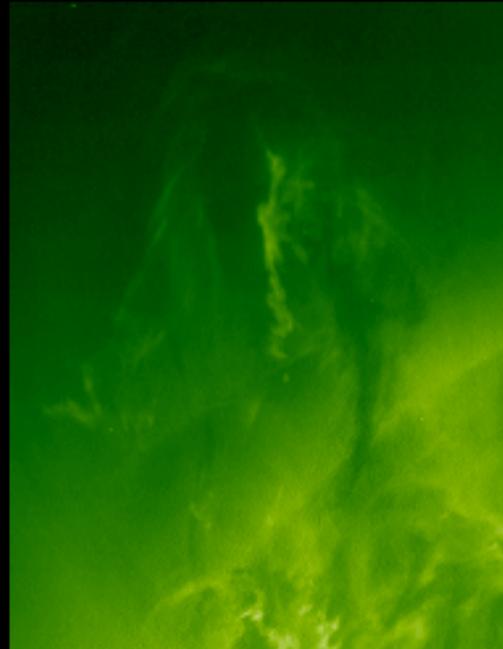


C2 1998/04/23 06:27 after Thompson et al. (2000)



Limb signatures: opening of loops, plasmoid lifting etc.

SOHO/EIT  
195 Å



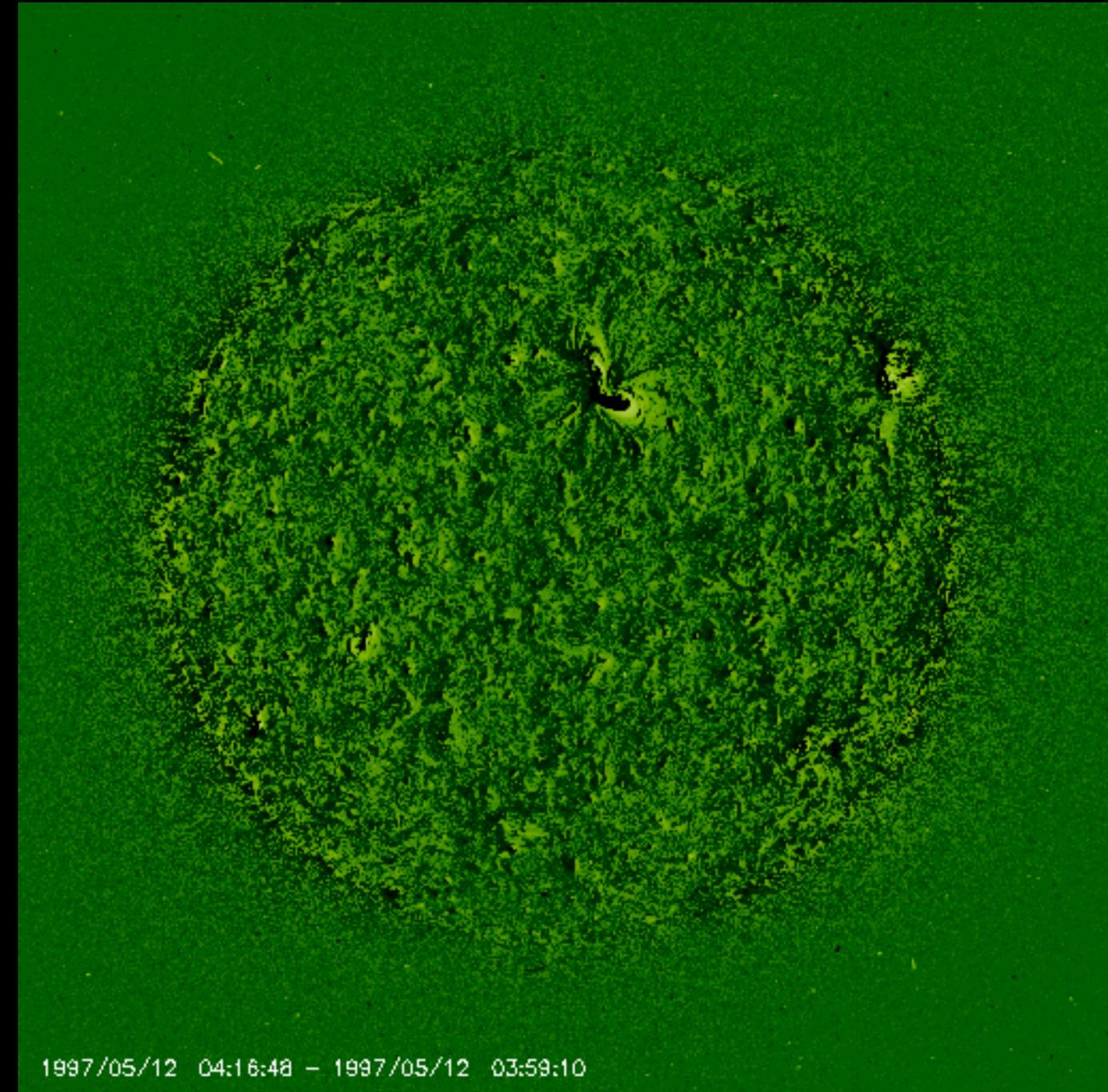
Erupting prominence (filament)

(Zhukov 2004, 2007)



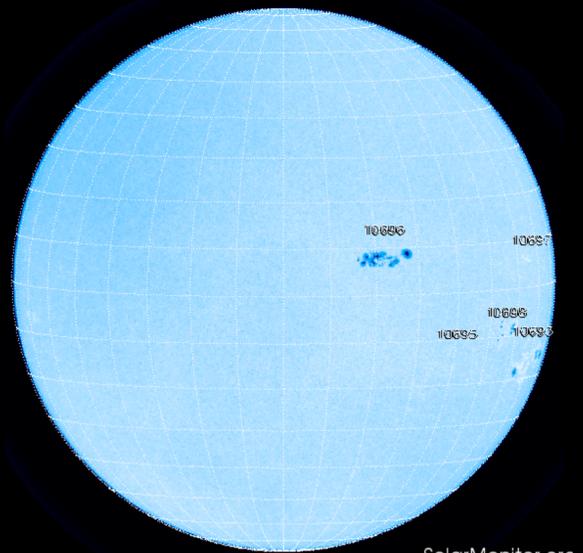
# “EIT waves”

- Discovery of “EIT waves” (a.k.a. “EUV waves”) – large-scale propagating bright fronts in the corona (*Thompson et al. 1998*).
- At least six review papers were written (*Wills\_Davey & Attrill 2009, Gallagher & Long 2010, Zhukov 2011, Liu & Ofman 2014, Warmuth 2015, Long et al. 2017*)!
- Bimodal, or hybrid, interpretation of “EIT waves” combines the CME-triggered fast-mode (shock) wave, and slow non-wave fronts produced by the CME expansion (*Chen et al. 2002, Zhukov & Auchère 2004, Liu & Ofman 2014*).

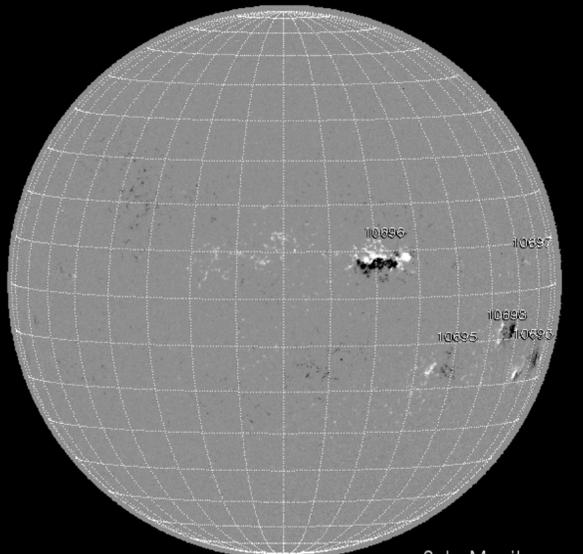




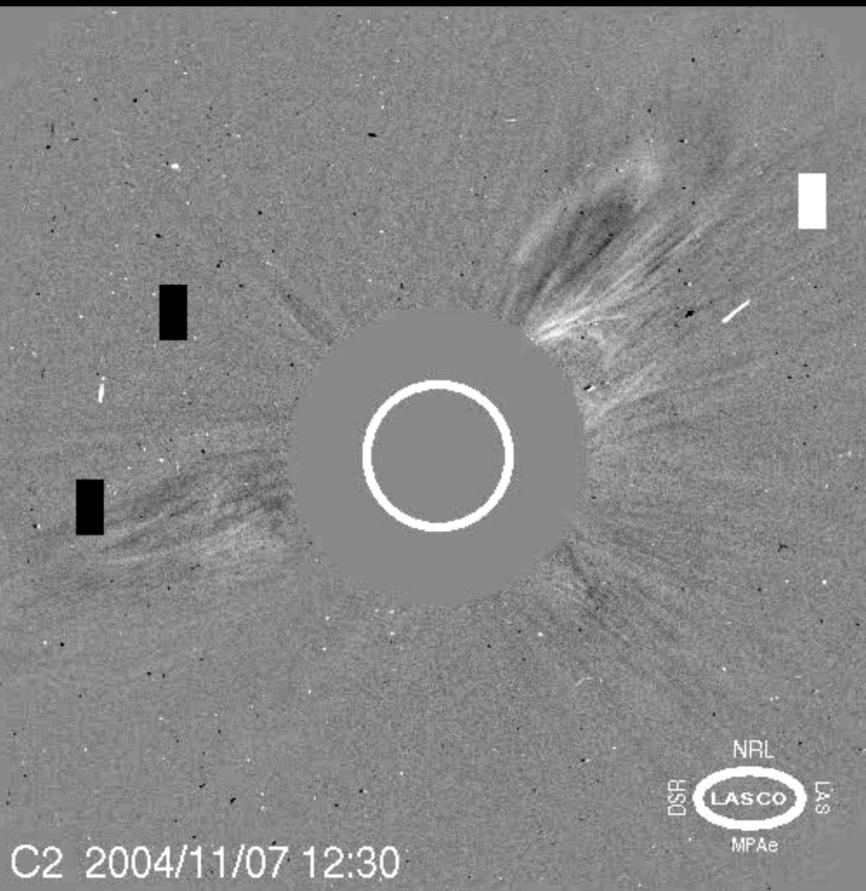
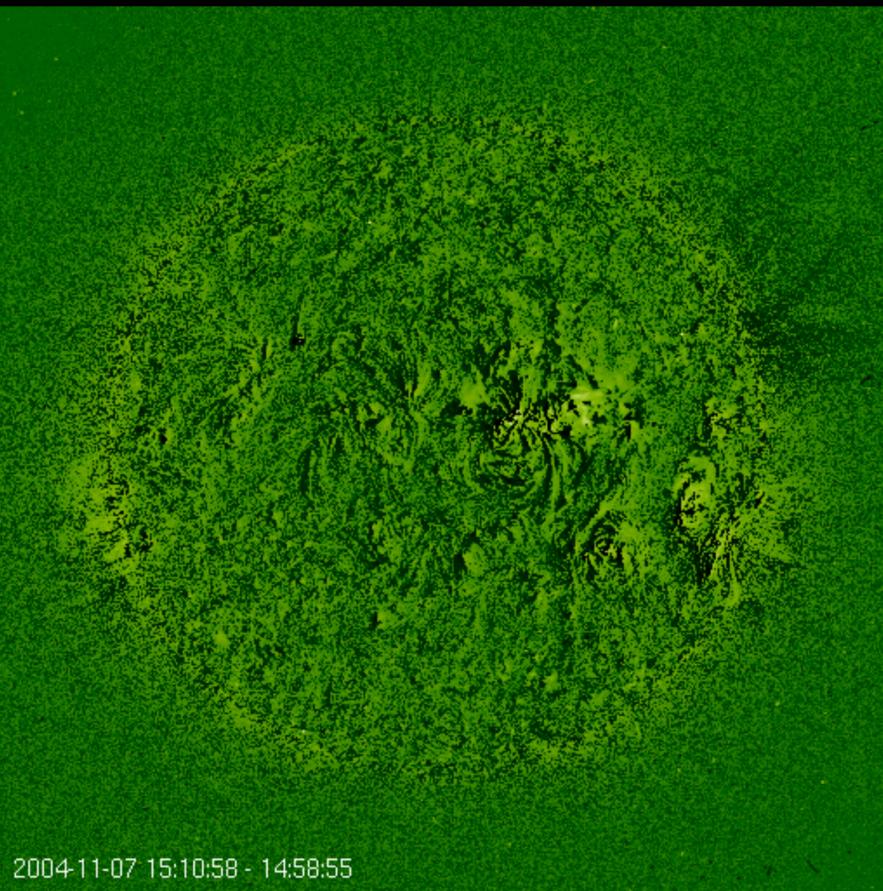
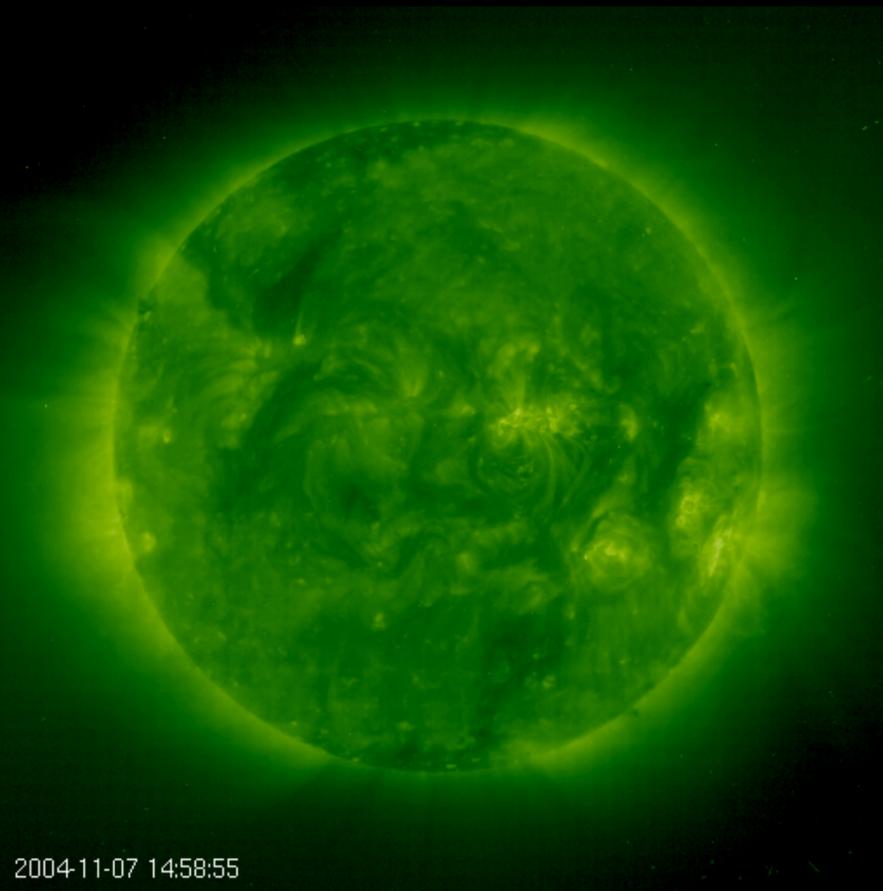
# Space weather monitoring and forecasting



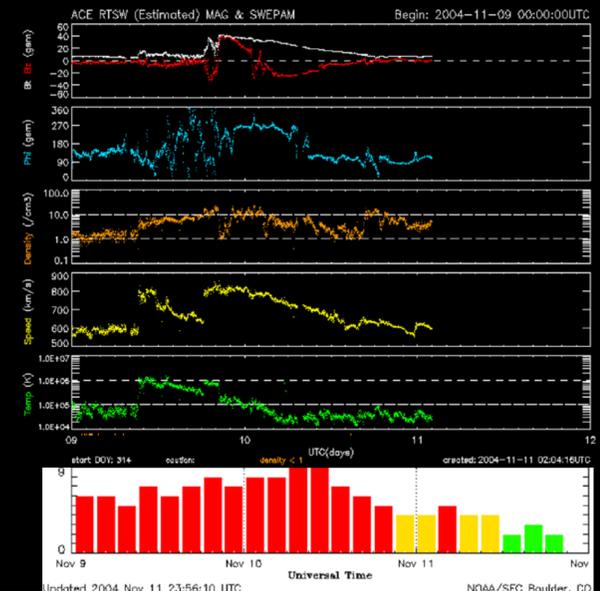
SolarMonitor.org



SolarMonitor.org

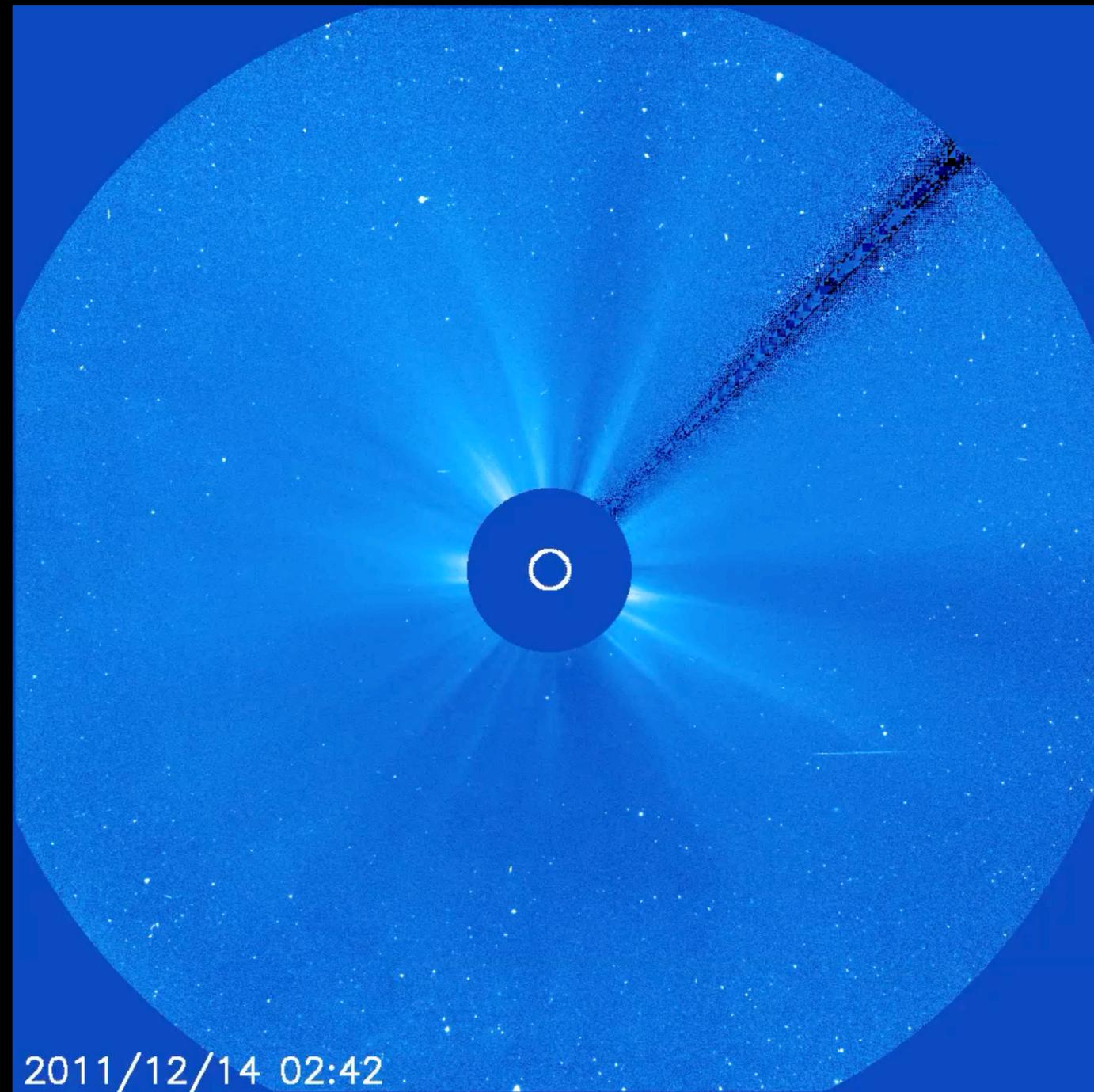


- Together, EIT and LASCO can identify the source regions of the most of the frontside CMEs (*Zhang et al. 2007*).
- Near real-time data from EIT (or SDO/AIA later on) and LASCO are widely used in geomagnetic storm forecasting (*Zhukov 2007*).

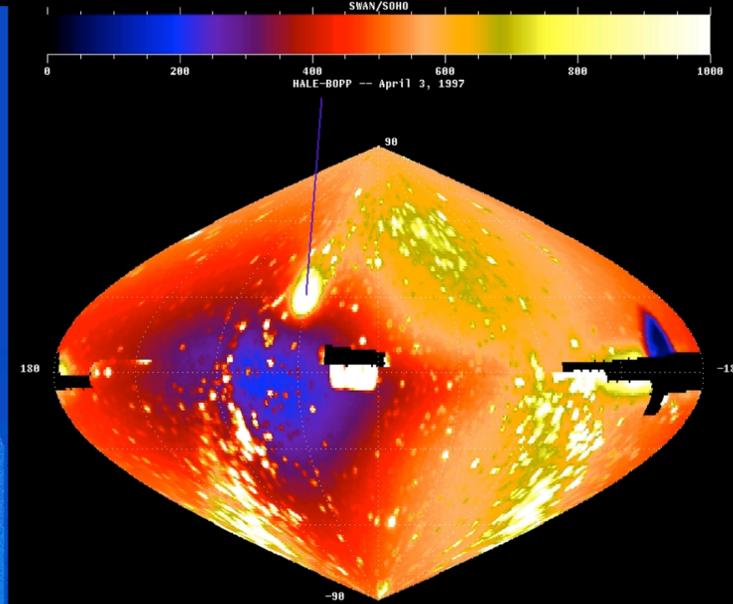




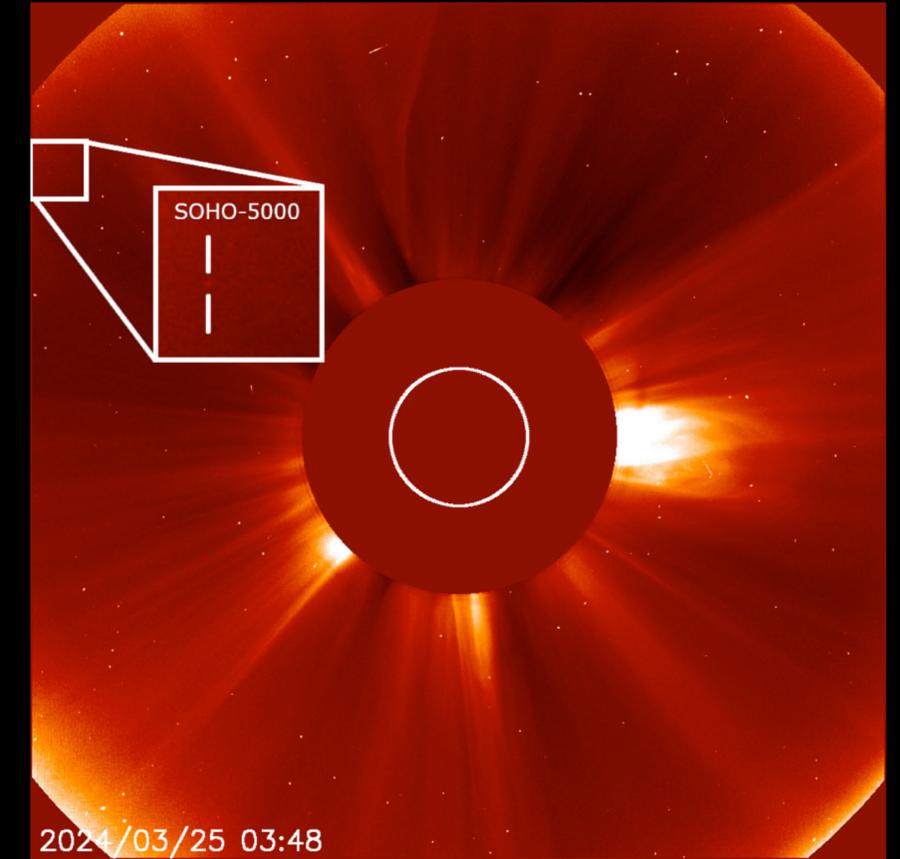
# 5176 comets discovered



comet C/2011 W3 (Lovejoy)



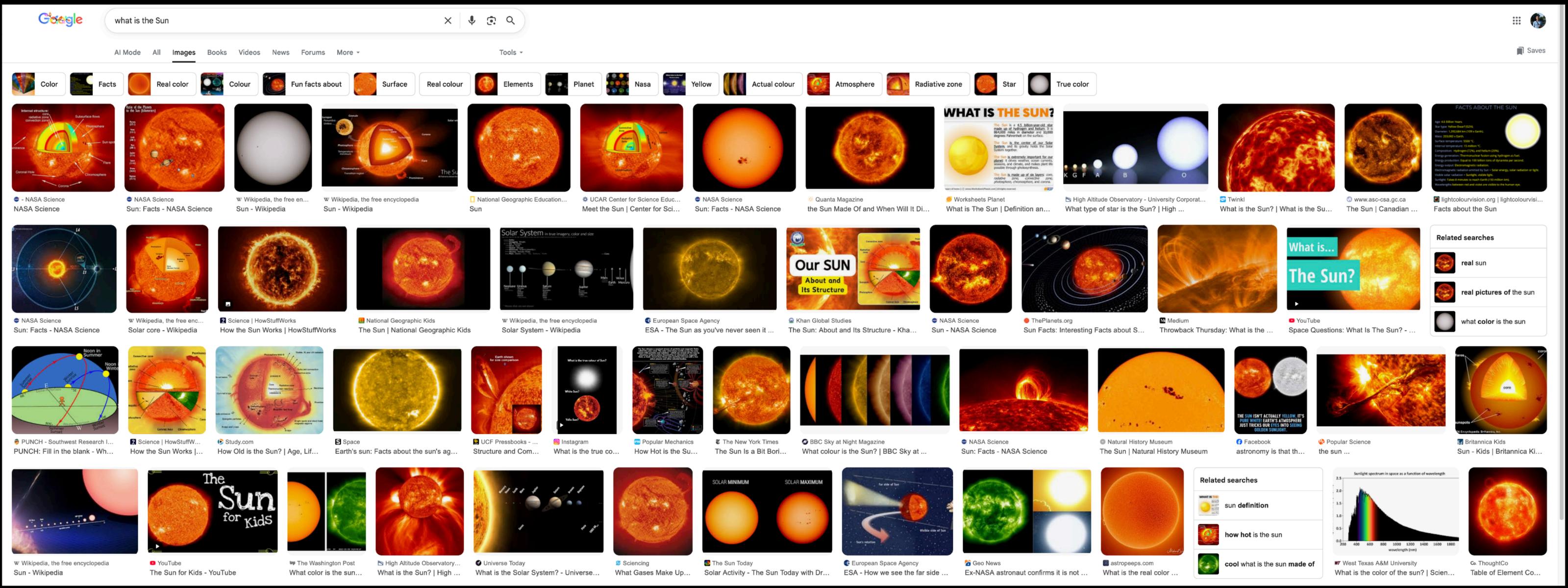
comet Hale-Bopp



- SOHO is the most prolific comet discoverer.
- A contribution of citizen scientists is very important in this effort.



# The Sun as imagined by public



- SOHO/EIT images (in particular those taken in 304 Å) became the reference image of the Sun in the eyes of the general public.

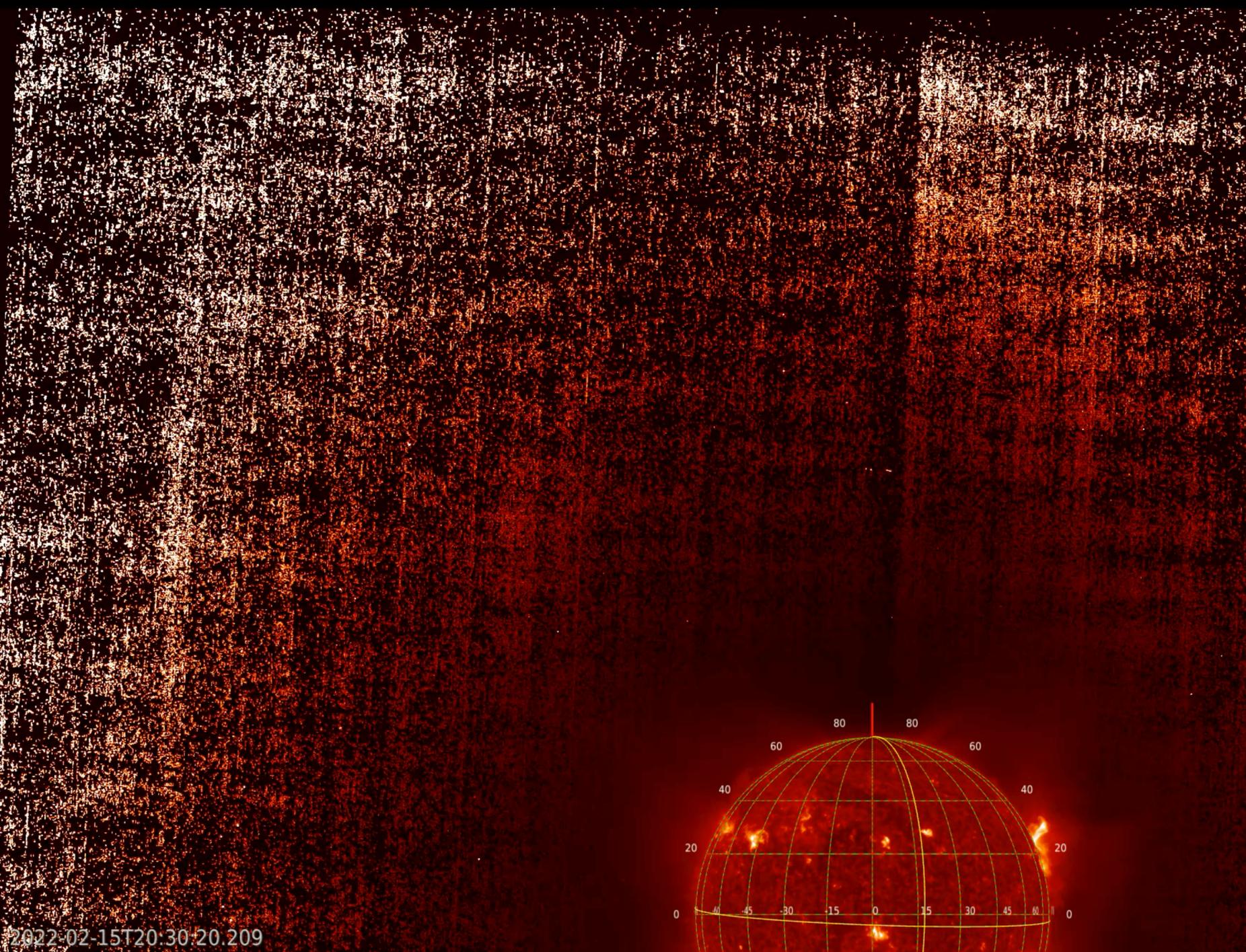


# The successors



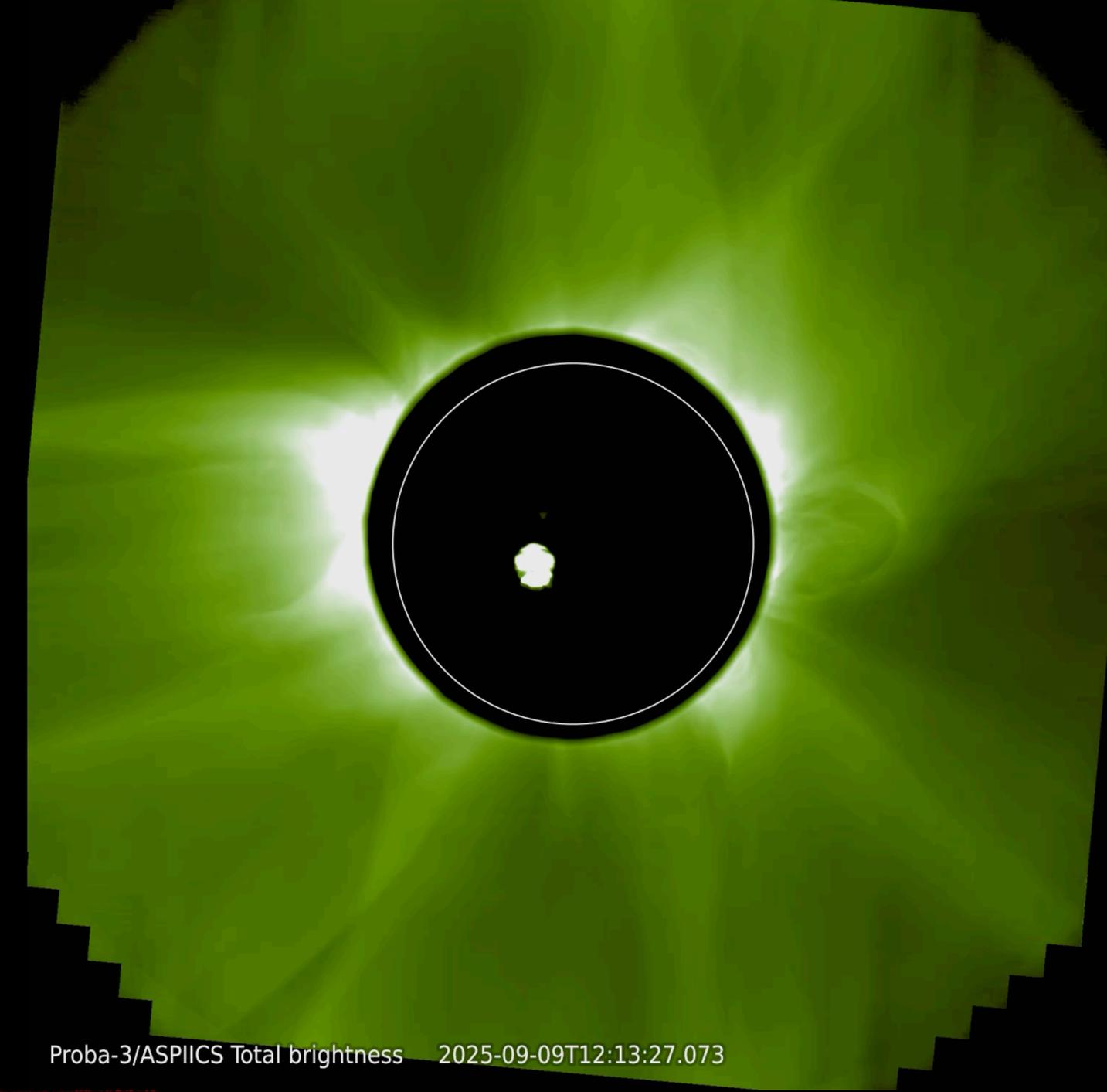
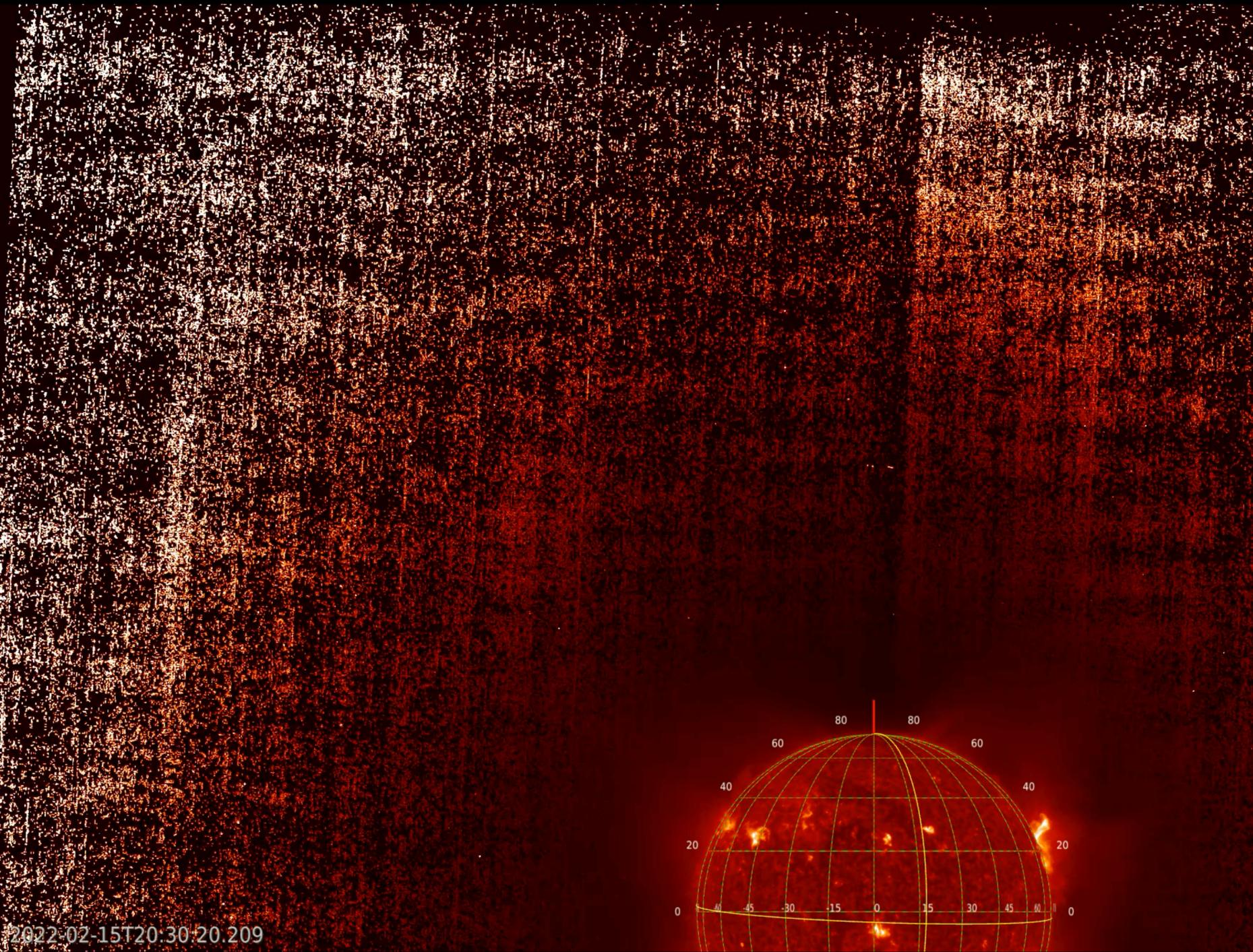


# The successors





# The successors



2022-02-15T20:30:20.209

Proba-3/ASPIICS Total brightness 2025-09-09T12:13:27.073

*Solar Orbiter/EUI/FSI*

*Proba-3/ASPIICS*



# The team





“The Sun shines  
on all of us.”

*Jean-Pierre Delaboudinière,  
a.k.a. Boudine,  
PI of SOHO/EIT*

