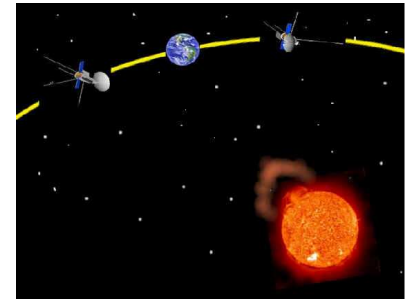


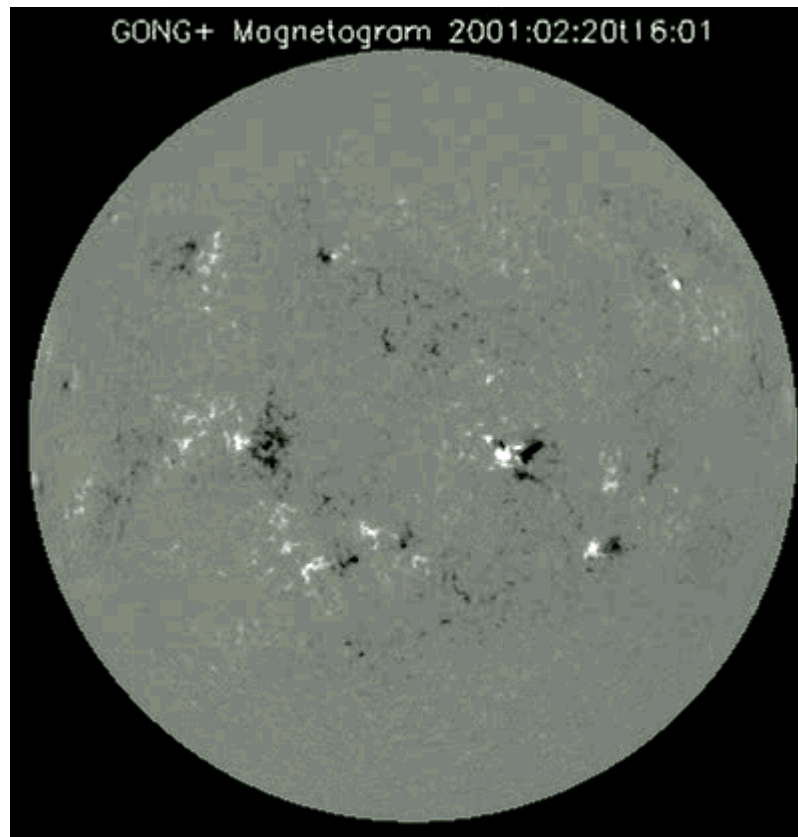


GONG & STEREO

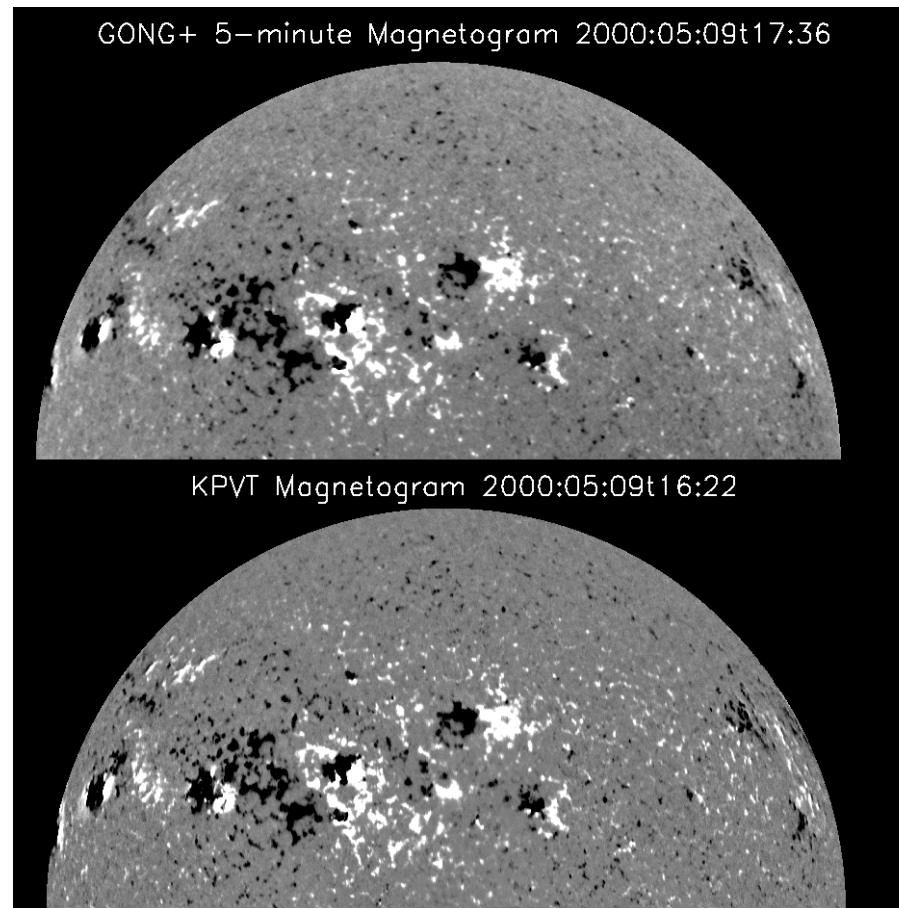


- **What is this helioseismologist doing here??**
 - “We all study phenomena that are driven or strongly influenced by magnetic activity.”
 - GONG produces continuous magnetograms
 - Sub-surface and farside solar structure
- **What is GONG?**
 - Six-station ground-based helioseismic network
 - NSO “Flagship”, along with Kitt Peak and Sac Peak
- **Sub-surface to heliosphere**

GONG Magnetogram



Kitt Peak Vacuum Telescope



GONG Magnetograms

Resolution

Pixel size = 2.5" [800² image]

Typical \approx 8"

Cadence

60-second sample rate [30 & 16 available]

\approx 90% duty cycle

Sensitivity

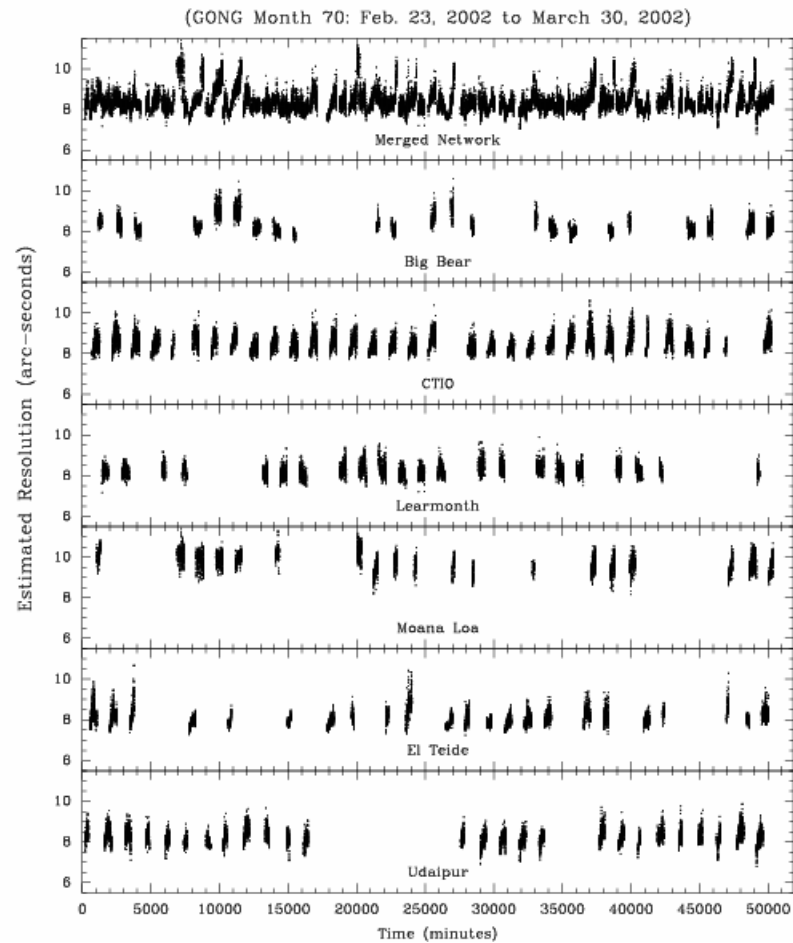
\approx 3 gauss in one minute

Precision

\approx 1 gauss

\approx .1 gauss after correction [goal]

Spatial Resolution

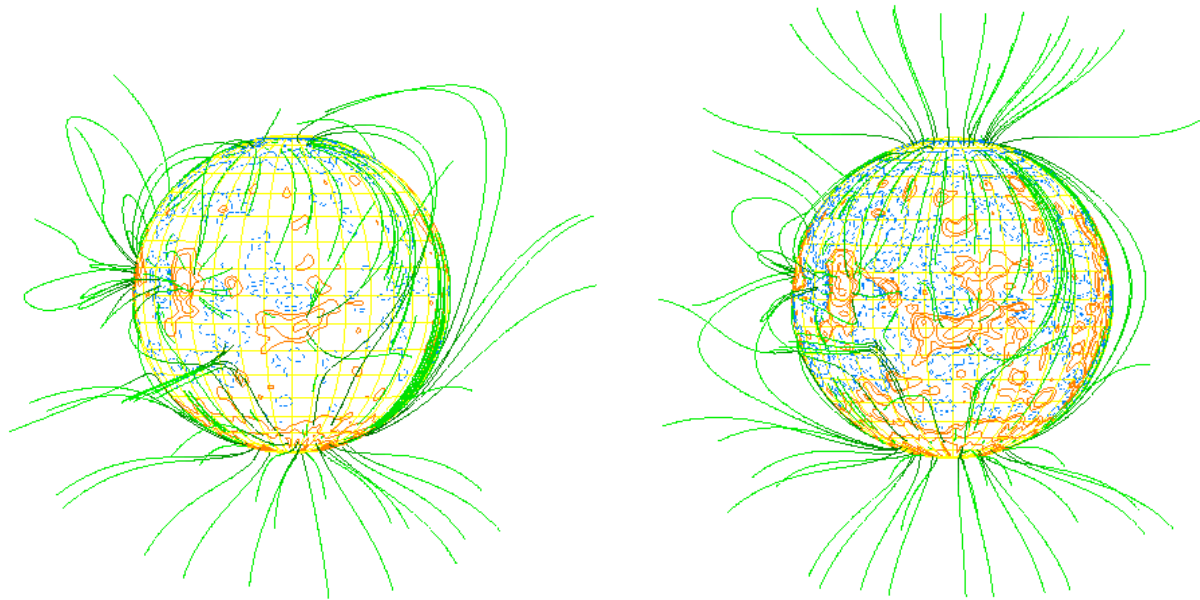


Courtesy Cliff Toner

<http://gong.nso.edu>

Rudi Komm

Magnetic Field Zero Point



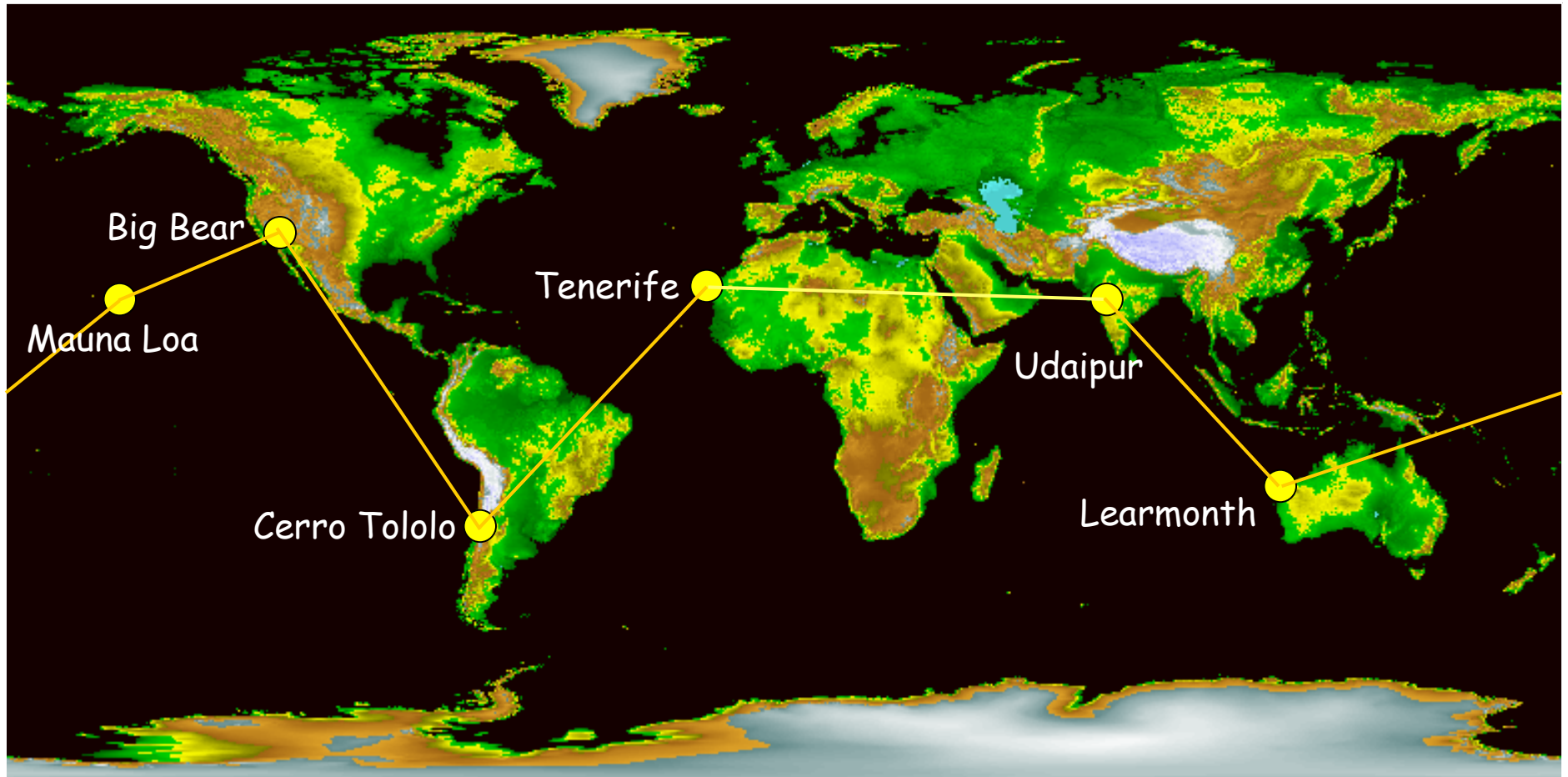
Differences in the potential magnetic field lines extrapolated above the solar surface with and without a 3 gauss zero error

Courtesy J. Harvey & T. Sakurai

<http://gong.nso.edu>

Rudi Komm

The Network



<http://gong.nso.edu>

Rudi Komm

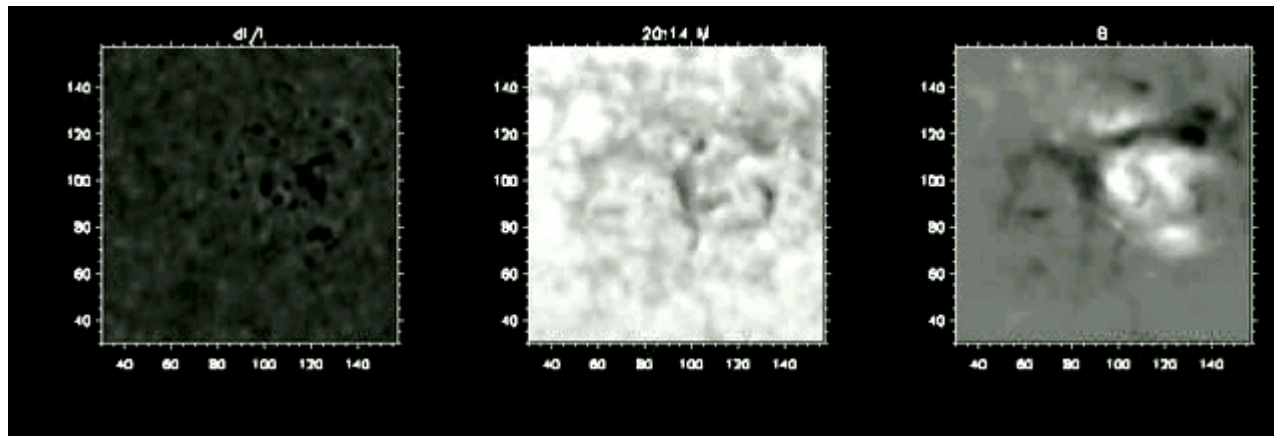
GONG at Learmonth, Western Australia



The GONG Instrument

- 6768 Å Ni I
- 10 cm objective
- Autonomous operations
- 100 Gb per week [DLT]
- Merged in Tucson \approx 2 Months
- Upgraded from 256^2 to 1024^2 in 2001

X10 flare in AR 10486

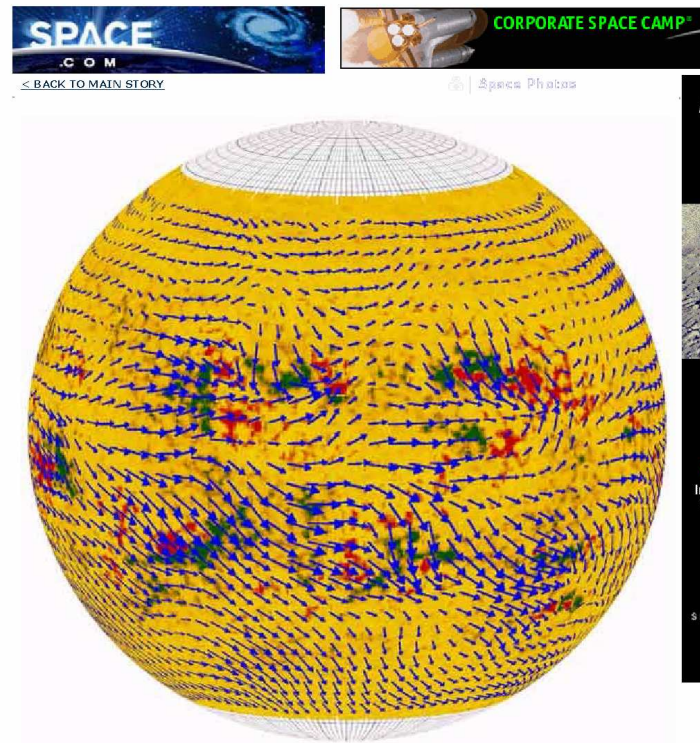


Courtesy Rachel Howe

<http://gong.nso.edu>

Rudi Komm

Solar Subsurface Weather



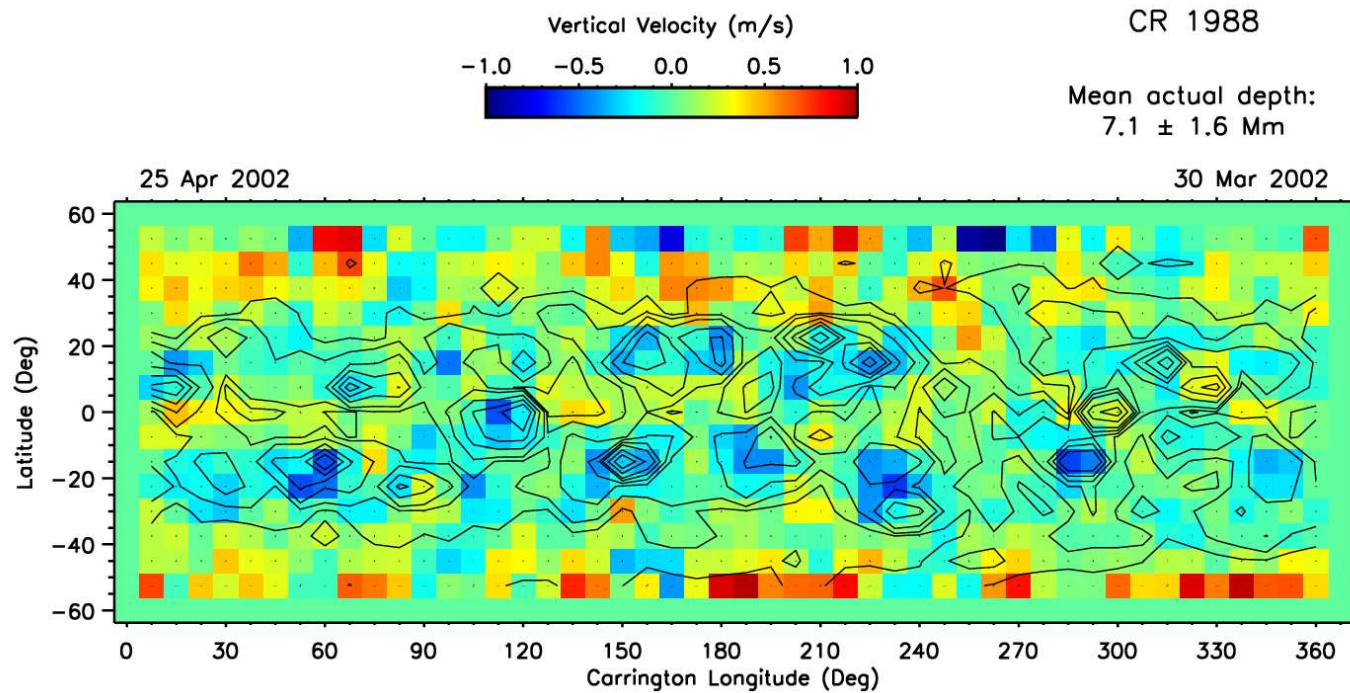
Global weather map showing magnetic patterns and wind flow on the Sun. This reconstructed global image of the Sun shows average wind flow just underneath the visible half of the solar surface. It was assembled by analysing average wind flow as the Sun rotated around over the course of 14 days, in April 2002. Large transient wind streams and hurricane-like winds are visible. The normal southern poleward flow is apparent in the lower part of the image.

Courtesy Deborah Haber, Brad Hindman, Rick Bogart, Juri Toomre

<http://gong.nso.edu>

Rudi Komm

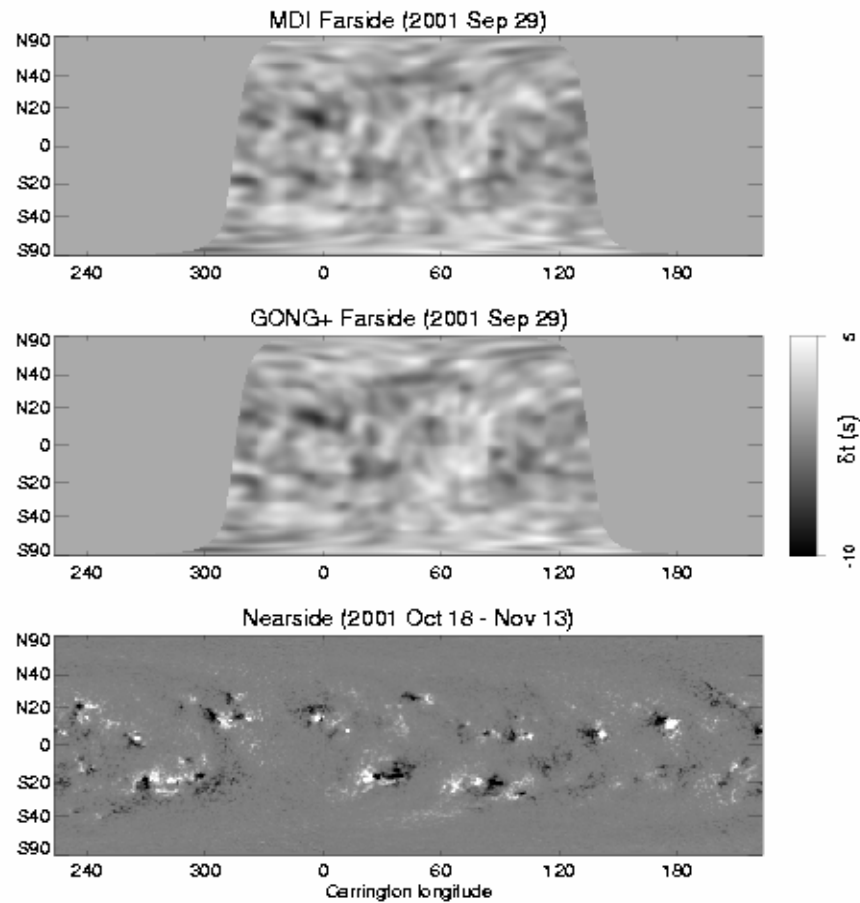
Vertical Velocity from GONG



Rudi Komm, Thierry Corbard, Bernard Durney, Irene Gonzalez Hernandez, Frank Hill, Rachel Howe, & Cliff Toner
<http://gong.nso.edu>

Rudi Komm

Farside Image Comparison

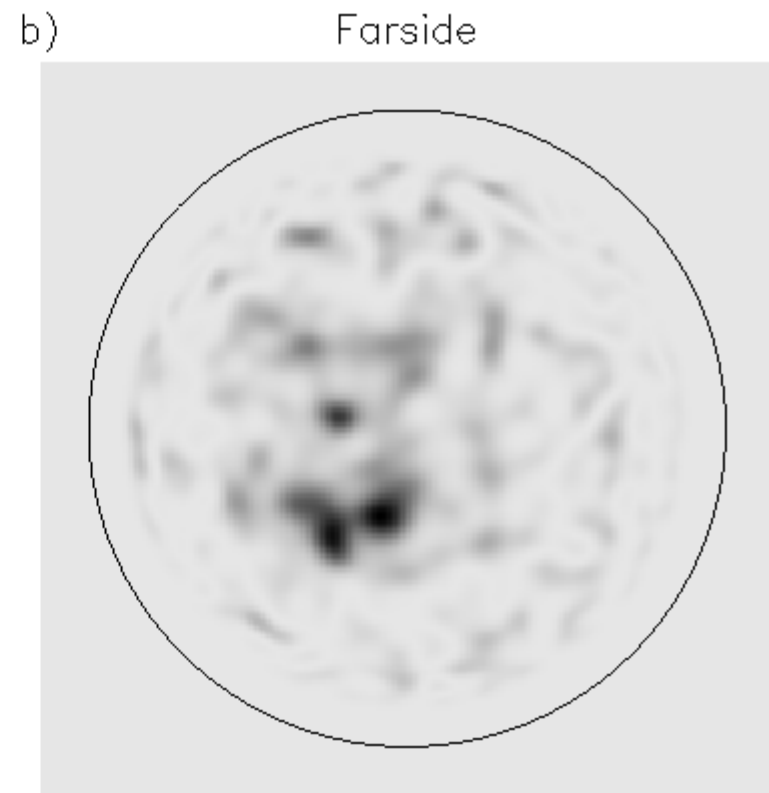
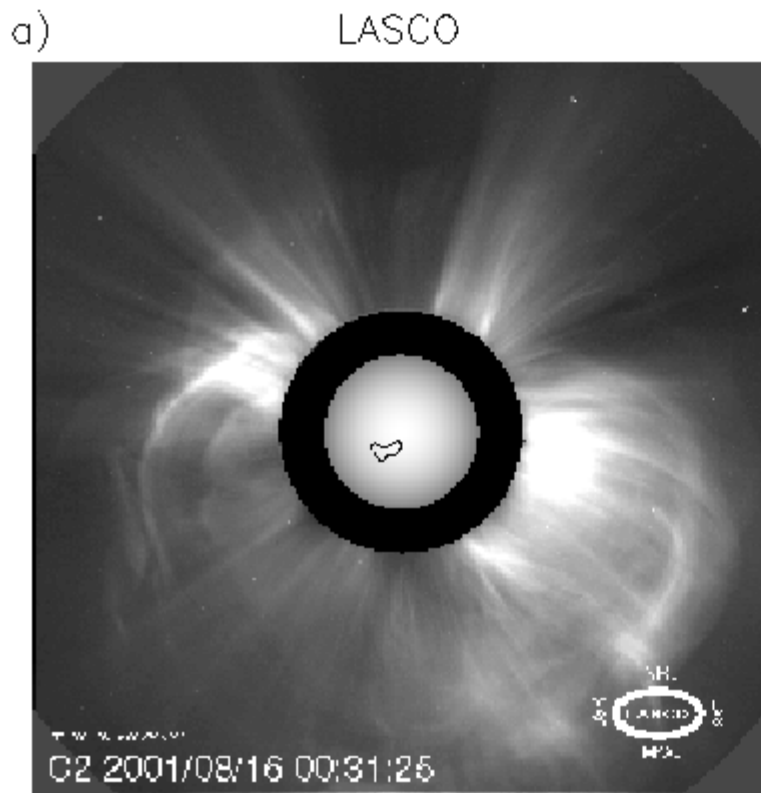


Courtesy of Doug Braun and Charlie Lindsey

<http://gong.nso.edu>

Rudi Komm

A Farside CME & its Source



Courtesy of Phil Scherrer, Doug Braun and Charlie Lindsey

<http://gong.nso.edu>

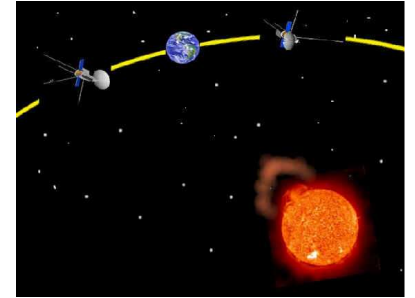
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SOLIS Core Data Products

Data Product	Frequency
Full-disk vector magnetogram in Fe I 630.15, 630.25 nm	3 per day
Full-disk line-of-sight magnetogram in Ca II 854.2 nm	3 per day
Full-disk intensity in He I 1083.0 nm	3 per day
Full-disk deep line-of-sight magnetogram at 630.2 nm	1 per day
H α core and wing intensity, velocity	1 per minute
Helium 1083 nm core intensity and velocity	1 per minute
Continuum (white light)	1 per 10 minute
Ca II K core and wing chromospheric intensities	1 per 3 hours
Oscillation-free photospheric velocity	1 per day
Various sun-as-a-star spectral lines	2 series per day

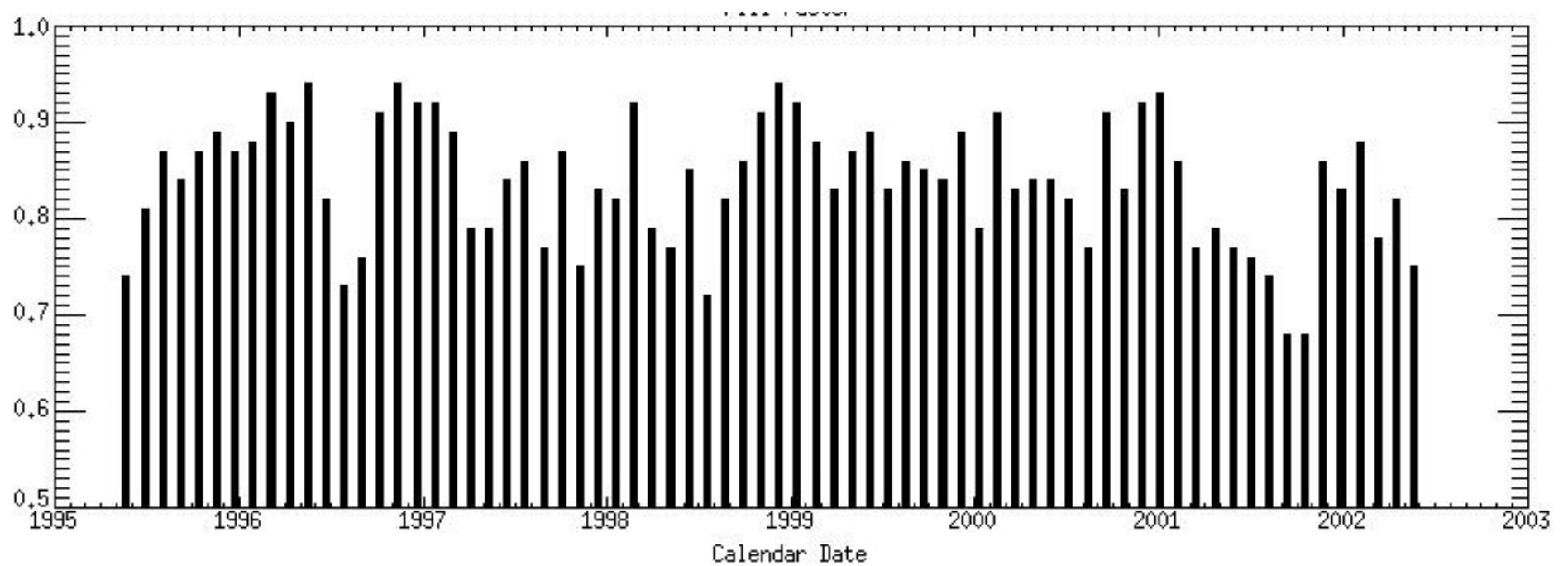


GONG & STEREO



- **Continuous Magnetograms**
 - To support your science
- **Sub-surface flows**
 - Sources of magnetic variability

Fill Factor



The GONG Network



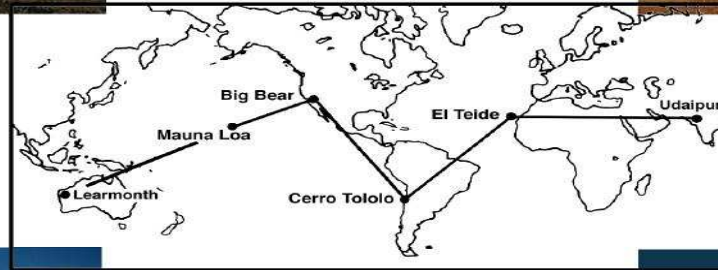
Mauna Loa



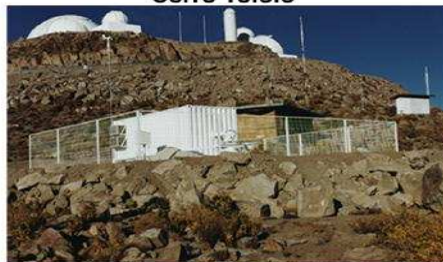
Big Bear



Udaipur



Learmonth



Cerro Tololo



El Teide

- Our noise is your signal
- Understand the causes and mechanisms triggering coronal mass ejections;
- •
- Characterize the propagation of coronal mass ejections through the heliosphere;
- •
- Discover the mechanisms and sites of energetic particle acceleration in the low corona and the interplanetary medium; and