SOHO Sees Through the Sun to Find Stormy Regions on the Other Side

A week’s advance warning of potential bad weather in space is now possible thanks to the Solar and Heliospheric Observatory (SOHO) spacecraft. With a technique that uses ripples on the Sun’s visible surface to probe its interior, SOHO scientists have, for the first time, imaged solar storm regions on the far side of the Sun, the side facing away from the Earth.

Like the unanticipated arrival of hurricanes before the advent of weather satellites, a group of previously hidden solar storm regions can rotate suddenly into view as the Sun turns, blazing away with explosive eruptions. The new technique, which uses the Michelsson Doppler Imager (MDI) instrument on SOHO, gives a warning by creating a window to the far side of the Sun.

Storm areas on the Sun are much larger than the Earth and consist of strong magnetic fields on the Sun’s surface. Active regions produce explosions, called flares, and eruptions of plasma (hot, electrically charged gas), called coronal mass ejections. The radiation and plasma from these events sweep past the Earth, sometimes affecting space craft, power systems and disrupting radio communications. Understanding and forecasting solar eruptions and their consequences is a relatively new science called space weather.

For more than 100 years, scientists have been aware that sunspots are often the scene of flares and other eruptions. Now they watch the Sun more closely because the Sun rotates, bringing the effects of hidden active regions to bear on Earth. With a far-side preview of sunspots, nasty surprises for the space weather experts may now be avoidable.

Ripples on the Sun’s surface used to image the interior are caused by sound waves reverb erating through the Sun. Analysis of solar sound waves is the science of helioseismology. It opened the Sun’s gaseous interior to investigation in much the same way as seismologists learned to explore the Earth’s rocky interior with earthquake waves.

The MDI instrument is the most elaborate of three helio seismic instruments on SOHO. It measures rhythmic motions at a million points across the Sun’s visible surface.

Computers can interpret the motions in terms of sound waves travelling through the Sun. The waves are affected by the various layers of gas and different motions they encounter. The MDI has already revealed many unknown features of the solar interior, including hidden jet streams circling the Sun’s poles.

The technique of helioseismic holography used examines a wide ring of sound waves that emanate from a small region on the far side and reach the near side by rebouncing internally from the solar surface. An active region reveals itself because it possesses very strong magnetic fields that speed up the sound waves. Waves that pass through an active region have a round-trip travel time about 12 seconds shorter than the average of six hours. The difference becomes evident when sound waves shuttling back and forth get out of step with one another.

Images and additional information are available at: http://pao.gsfc.nasa.gov/gsfc/spacesci/sunearth/sunearth.htm#soho

Wallops Shorts……………

Balloon Launch

A NASA scientific balloon was successfully launched from Kiruna, Sweden on March 3. The four million cubic foot balloon carried an upper atmosphere research experiment. Dr. William Brune of Penn State University was the principal investigator. Total float time was 3 hours, 52 minutes.

Goddard Honor Awards

Congratulations to the following employees who received a 1999 Goddard Space Flight Center Honor Award during a ceremony held at Greenbelt on Feb. 28. Felipe Arroyo — Excellence in Outreach, Wallops Saturday Youth Program — Group Award, Learjet Response Crash Team and NASA C-130 Aircrew/DynCorp — Emergency Response Award, Lisa Ward — Secretarial Excellence Award.

Safety Office Acting Chief

Craig L. Purdy, Suborbital and Special Orbital Projects, has been appointed Acting Chief of the Safety Office (Code 803). Purdy will serve in this position until a permanent placement is named.

Wallops on the Road

Greg Frostrom, GHG, spoke to Pocomoke Elementary School first grade students on March 8.

On March 9, Brian Hall, PRC-Arcata grade students on March 8.

Irish-American Heritage Month

by Proclamation dated March 1, 2000

William J. Clinton, President of the United States of America

More than two centuries ago, our founders envisioned a new Nation, a land free from tyranny and filled with opportunity, prosperity, and liberty for all. Many Irish people, faced with severe hardship in their homeland, embraced the dream of a more promising future and left behind Ireland’s shores, their families, and their friends for a new beginning in America. Each year during the month of March, we celebrate these courageous men and women of Ireland and remember with pride their many contributions to our Nation.

This month, as we celebrate Saint Patrick’s Day and our shared heritage with Ireland, we remember as well our common love of liberty, commitment to progress, and quest for lasting peace, and we look toward to a future as proud as our past.
Weather Summary
by Bob Steiner, Meteorologist

Some folks love snow, ice and cold, and the weather during January finally began to feel like winter. Along comes February and spoils it all with temperatures almost four degrees warmer than normal.

During February, on 18 days the recorded daytime as well as nighttime temperatures were above normal. At the same time, temperatures recorded on nine days and nights were cooler than normal.

There were only two days during February when daytime and nighttime temperatures matched the climatological norm. Nighttime temperatures were at or below 32 degrees on 18 nights. For 14 days, temperatures reached 50 degrees or above. On four of those days the temperature was 60 degrees or above and actually climbed into the 70’s. A new record high reading of 73 degrees was set on Feb. 25. The previous record high was 70 degrees set in 1985. The all time record high for February of 79 degrees was recorded Feb. 27, 1997.

Total measurable precipitation for February was only 1.8 inches, which is 1.25 inches below normal. Measurable snowfall was 2.3 inches below normal with only 1.1 inches recorded on Feb. 12.

Some folks love warm breezes and rain. For them April won’t be here soon enough. The month starts out with daytime highs in the upper 50’s with temperatures increasing to the mid-60’s by the end of the month. Don’t be surprised if the “snow babies” have to stay with us for a few more days. The air temperature was 60 degrees or above and actually climbed into the 70’s.

The all time record high for April is 93 degrees set on April 26, 1990. Evenings become more enjoyable with temperatures falling below 40 degrees usually only on two nights.

The “spring bunnies” might be mindful that temperatures have been known to drop below freezing during the early part of April. Perhaps they’d better keep the sweaters and gloves out for awhile. The all time low during April was a reading of 24 degrees on April 1, 1969. A late freeze is not uncommon even as late as the last week of April.

Typically, the Eastern Shore experiences the driest period in April, with only 10 days of measurable precipitation for an average totaling only 2.65 inches.

Now is the time to begin planning for spring garden planting and getting the summer toys and machinery ready. Just be aware that Jack Frost likes to have a last fling usually during April.

ISO Audit News
by Regina Haugh

Hank Ingber, the DNV ISO Auditor, has reported that Goddard Space Flight Center passed the first Surveillance Audit with the following results: seven minor non-conformances and nine observations. No major non-conformances were found. Ingber expressed satisfaction in the good progress the Center had made in maturing in the ISO disciplines and the good attitudes of the people.

Safety Message From the Administrator
The NASA Safety Reporting System

Lives can be, and have been, lost in our reach for the stars. In 1986, the world was horrified to watch the Space Shuttle Challenger disintegrate in a ball of flame shortly after takeoff. The NASA Safety Reporting System (NSRS) was established as one element of NASA’s response to that disaster.

The NSRS is NASA’s only Agency-level, voluntary, responsive and confidential safety reporting system. This reporting system provides a valuable option for timely notification of potential risks.

A Reporter should initially notify their supervisor of any potential safety problems and use the standard safety channels available at your work sites. If this has been done and the Reporter still has a concern with the safety of personnel, a mission, or an operation then the reporting of that potential or actual problem should become highest priority. The NSRS reporting process should be used as soon as possible.

NASA employees, contractor or crewmember may mail an NSRS reporting form to the NSRS Office. The Reporting Form is on the NSRS Web site, http://www.hq.nasa.gov/Nsrs or is displayed at the NASA Centers. Simply fill out the form, enclose it in an envelope, seal and mail.

For additional information on this safety topic, go to: <http://pao.gsfc.nasa.gov/gsfc/gnews/031000/031000.html/health>