NCAR Information Release

1981-14

For Release: May 25, 1981

SATELLITE TELESCOPE ILLUMINATES SOLAR SECRETS

BALTIMORE, MD--When a baby burps, only its mother knows. But when the sun belches, sending out violent eruptions called solar flares, the entire earth can be affected.

Reporting at the annual spring meeting of the American Geophysical Union here today, a scientist with the National Center for Atmospheric Research (NCAR) in Boulder, Colorado, revealed detailed photographs of solar events made with a special telescope flown aboard the Solar Maximum Mission (SMM) satellite.

The instrument, known as a coronagraph/polarimeter, was conceived and designed by a team from NCAR's High Altitude Observatory, led by Dr. Lewis L. House. From its vantage point aboard the satellite, it was able for the first time to photograph solar flares free of the obscuring screen of the earth's atmosphere. The Solar Maximum Mission was scheduled last year to take advantage of the peak in the sun's 11-year cycle of solar flare activity.

From the time the SMM was launched by the National Aeronautics and Space Administration in February of 1980 until the experiment shut down in September, the coronagraph captured more than 30,000 images of the sun's corona. Some showed mass and energy from the sun and their effects on the sun's outermost layer, the corona.

"So far we've detected more than 60 solar mass ejections or coronal transients," says Dr. Constance Sawyer, one of the NCAR/HAO investigators. "The images are particularly significant because they expose what's happening in the sun's halo more clearly and at a faster rate during a period of maximum solar activity than any previous experiment."

From measurements made with the sophisticated coronagraph, the NCAR scientists can detect very subtle changes in the coronal structure and, for the first time, measure the direction of magnetic fields in the corona. In practical terms, solar physicists can use the information to help predict when magnetic storms may disturb the earth's atmosphere and suddenly block out long-range communications or cause unexpected power surges in electrical transmission lines.

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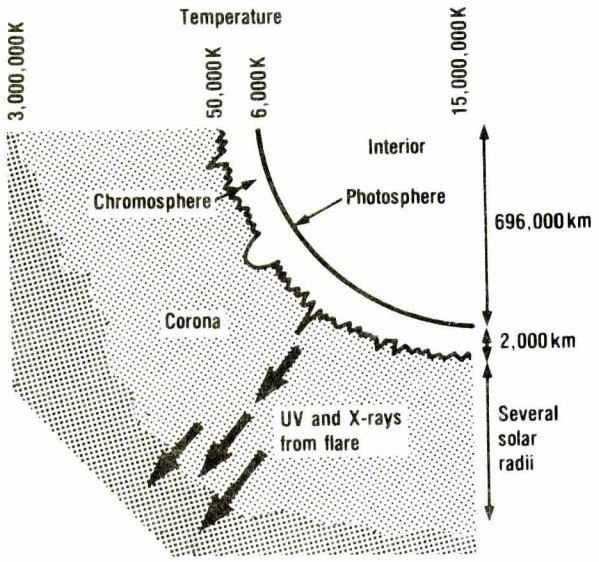
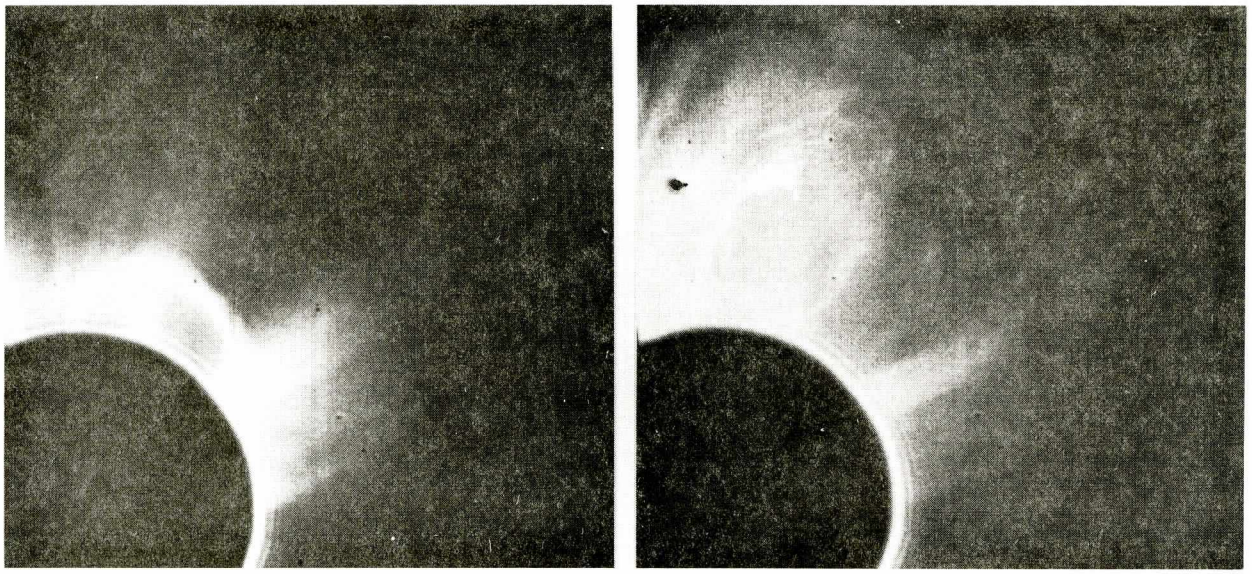
The National Center for Atmospheric Research is operated by the University Corporation for Atmospheric Research under sponsorship of the National Science Foundation



The sun's layers include the photosphere, or interior, which is the coolest portion of the sun; the chromosphere, a very hot layer where solar flares and other prominences occur; and the corona, the so-called solar wind, which extends far into space, reaching the earth and interfering with electronic communications.

This pair of solar images, separated by 49 minutes, shows coronal material moving outward. Mass ejections such as these often represent the major output of energy from an associated solar flare. Credit: NCAR/NASA Solar Maximum Mission.



NOTE TO EDITORS: Black and white glossies of the solar images can be obtained for publication by contacting the AGU Press Room or NCAR's Information Office below.

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