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Sun observer nasa

HMI Dopplergram AR Maps Advanced Maps EUVI / AIA 195 Å Stonyhurst Heliographic AIA 0193 AIA 0171 AIA 0304 AIA 0211 AIA 0131 AIA 0335 AIA 094 AIA 1600 AIA 1700 AIA 211, 193, 171 AIA 304, 211, 171 AIA 094, 335, 193 AIA 171 & HMIB HMI Magnetogram HMI IntensityGram HMI Dopplergram Happy Birthday SOHO! We celebrate 25 years since the launch of SOHO ... more » Two and a half decades of scientific discovery is an important milestone for any space mission. But when the spaceship at the heart of the celebration was designed to last only for two years,.. more » JHeliviewer is new imaging software that allows everyone, anywhere to explore the Sun... read the story » In-depth overview of the numbers Explore Galleries Overview in depth of the numbers Explore Galleries Overview in depth from the numbers Explore Galleries Important announcement on disabling the STEREO ftp server Important announcement on the STEREO redirects Important announcement on STEREO Back STEREO currently consists of a space observatory, STEREO-A, orbiting the Sun just through 1 AU - slowly catching on to Earth as it revolves around the Sun. This view away from the Earth-Sun line allows scientists to see the structure and evolution of solar storms as they blast out of the Sun and move through space. This film shows a spherical map of the Sun, as shown today, formed by a combination of the latest STEREO-A lighthouse images combined with an SDO/AIA. The film begins with the view of the Sun, as seen from Earth, with the meridian line 0 degree in the middle. The map then rotates through 360 degrees to show the part of the Sun is not visible from Earth. For more news on STEREO Visit STEREO at NASA Portal. Last Revised: Friday, 20-Nov-2020 19:12:15 EST Responsible NASA Official: Privacy Policy and Important Notices Webmaster: Kevin Addison Solar Dynamics ObservatoryMission typeSolar research[1]OperatorNASA GSFC[2]COSPAR ID2010-005ASATCAT no.36395Website durationPlanned: 5–10 years Elapsed: 10 years, 10 months, 9 days Spacecraft propertiesLaunch mass3,100 kilograms (6,800 lb)Dry mass1,700 kilograms (3,700 lb)Payload mass290 kilograms (640 lb) Start of missionLaunch dateFebruary 11, 2010, 15:23:00 (February 11, 2010, 15:23:00) UTCRocketAtlas V 401Launch siteCape Canaveral SLC-41ContractorULA Orbital parametersReference systemGeocentricRegimeGeosynchronousLongitude102° westSemi-major axis42,164.71 kilometers (26,199.94 mi)[3]Eccentricity0.0002484[3]Perigee altitude35,783 kilometers (22,235 mi)[3]Apogee altitude35,804 kilometers (22,248 mi)[3]Inclination28.05 degrees[3]Period1436.14 minutes[3]EpochJanuary 24, 2015, 10:48:18 UTC[3] Play media The detailed Recorded by SDO in 2011–12 have helped scientists uncover new secrets about the Sun. The Solar Dynamics Observatory (SDO) is a NASA mission that has been monitoring the Sun since 2010. [4] Started on 11, 2010, the observatory is part of the Living With a Star (LWS) program. [5] The objective of the LWS programme is to develop the scientific understanding needed to effectively address these aspects of the connected Sun-Earth system that directly affect life and society. The goal of SDO is to understand the effect of the Sun on Earth and near Earth space by studying the solar atmosphere at small scales of space and time and at many wavelengths at once. SDO has investigated how the Sun's magnetic field is produced and structured, how this stored magnetic energy is converted and released into the heliosphere and geospace in the form of solar wind, energy particles, and variations in solar radiation. [6] General game media This visualization covers the same 17-hour period over the full wavelength range of the SDO. The SDO spacecraft was developed at NASA's Goddard Space Flight Center in Greenbelt, Maryland, and launched on February 11, 2010, from Cape Canaveral Air Force Station. The main mission lasted five years and three months, with consumables expected to last at least ten years. [7] Some consider SDO to be a continuing mission to the Solar and Heliospheric Observatory (SOHO). [8] The SDO is a stabilized 3-axis spacecraft, with two solar arrays, and two high-gain antennas, in a tilted geosynchronous orbit around the Earth. The spacecraft comprises three instruments: the Extreme Ultraviolet Variability Experiment (EVE) built in collaboration with the University of Colorado at Boulder's Laboratory of Atmospheric and Space Physics (LASP), Heliosismic and Magnetic Imager (HMI) manufactured in collaboration with Stanford University, and The Atmosphere Imaging Assembly (AIA) built in collaboration with Lockheed Martin Solar & Astrophysics Laboratory. The data collected by the vessel shall be made available as soon as possible after receipt. [9] From February 2020, SDO is expected to remain in operation until 2030. [10] Instruments Of Heliosism and Magnetic Illustrator (HMI) The Helioseismic and Magnetic Imager (HMI), led by Stanford University in Stanford, California, studies solar variability and characterizes the interior of the Sun and the various components of magnetic activity. HMI will take high-resolution measurements of the longitudinal and vector magnetic field throughout the visible solar disk [how?] thus expanding the capabilities of SOHO's MDI instrument. [11] HMI produces data to determine the internal sources and mechanisms of solar variability and how physical processes within the sun are associated with magnetic field and surface activity. It also produces data that allow coronal magnetic field estimates for variability in the extended solar atmosphere. HMI observations will allow the relationship between internal dynamics and magnetic activity to be defined in order to understand solar variability and its effects. [12] Extreme Ultraviolet Variability Experiment (EVE) Extreme Ultraviolet The Experiment (EVE) measures the Sun's extreme ultraviolet radiation with improved spectral resolution, time rate, accuracy and accuracy compared to previous measurements made by TIMED SEE, SOHO and SORCE XPS. The instrument incorporates physics-based models in order to further scientific understanding of the relationship between EUV solar variants and magnetic variation changes in the sun. [13] The sun's production of energy extreme ultraviolet photons is primarily what heats the earth's upper atmosphere and creates the ionosphere. Euv solar radiation production undergoes continuous changes, both at any moment and during the Sun's 11-year solar cycle, and these changes are important to understand because they have a significant impact on atmospheric heating, satellite attraction and the degradation of the communications system, including disruption to the Global Positioning System. [14] The EVE instrument pack was built by the University of Colorado in Boulder's laboratory for atmospheric and space physics, with Dr. Tom Woods as principal investigator,[7] and delivered to the Goddard Space Flight Center on September 7, 2007. [15] The instrument provides improvements of up to 70 percent in spectral analysis measurements at wavelengths below 30 nm, and a 30 percent improvement in the pace of time by taking measurements every 10 seconds in a 100 percent operating cycle. [14] Atmospheric Imaging Assembly (AIA) Atmospheric Imaging Assembly (AIA), led by Lockheed Martin Solar and Astrophysics Laboratory (LMSAL), provides continuous complete disk observations of the solar chromosphere and corona in seven extreme ultraviolet (EUV) channels, covering a temperature range from about 20,000 Kelvin to over 20 million Kelvin. The 12-second rate of image flow with 4096 by 4096 pixels at 0.6 arcsec/pixel provides unprecedented views of the various phenomena occurring within the evolving solar outer atmosphere. The scientific research of the AIA is guided by LMSAL, which also manages the institution and – together with Stanford University – manages the Joint Centre for Scientific Enterprises from which all data is served to the global scientific community as well as to the general public. LMSAL designed the overall instruments and led its development and integration. The four telescopes providing individual light feeds for the instrument were designed and built at the Smithsonian Astrophysical Observatory (SAO). [16] Since the start of its operational phase on 1 May 2010, the AIA has operated successfully with unprecedented EUV image quality. AIA Wavelength Channel Source[17] Area of solar atmosphere Characteristic temperature White light (450 nm) continuous Photosphere 5000 K 170 nm continuous Temperature minimum, 5000 K 160 nm C IV + continuum Transition region & upper photosphere 105 & 5000 K 33.5 nm Fe XVI Ενεργή περιοχή corona 2.5×106 K 30.4 nm He II Chromasphere & transition region 50.000 K 21.1 nm Fe XIV Ενεργή περιοχή corona 2×106 2×106 19.3 nm Fe XII, XXIV Corona & hot flare plasma 1.2×106 & 2x107 K 17.1 nm Fe IX Quiet corona, upper transition area 6.3×105 K 13.1 nm Fe VIII, XX, XXIII Flaking Areas 4×105, 107 & 1.6×107 K 9.4 nm Fe XVIII Flaking Areas 6.3×106 K Photos of the Sun in these various areas of the spectrum can be seen on NASA's SDO Data website. [18] Images and films of the Sun seen on any day of the mission, including within the last half hour, can be found on The Sun Today. Comparison of HMI Continuum images immediately after the eclipse, and then after the sensor has reheated. Communications SDO down-links scientific data (K band) from the two high-profit antennas on board, and telemetry (S-band) from its two onboard pan-directional antennas. The ground station consists of two exclusive (unnecessary) 18-meter radio signals in the White Sands missile range, New Mexico, made specifically for SDO. Mission controllers operate the spacecraft remotely from the Mission Operations Center at NASA's Goddard Space Flight Center. The combined data rate is approximately 130 Mbit/s (150 Mbit/s overhead, or 300 Msymbols/s at a speed of 1/2 encoding) and the craft produces about 1.5 terabytes of data per day (equivalent to receiving about 500,000 songs). [7] Start Effort Scheduled Result Turnaround Reason Weather Decision Point Gone (%) Notes 1 10 Feb 2010, 3:26:00 pm Scrubbed - Weather (strong winds) [19] 10 Feb 2010, 4:26 p.m. (T-3:59, just after t-4:00 hold) 40%[20] window 10:26 to 11:26a EST, attempts made at 10:26, 10:56 and 11:26 2 11 Feb 2010, 3:23:00 pm Success 0 days, 23 hours, 57 minutes 60%[20] Window: 10:23 to 11:23a EST Starting Thursday,1 1 February 2010 15:23:00 UTC (10:23 am .m. EST) See also: NASA's Launch Window Services Program at Kennedy Space Center manages payload integration and launch. [21] The SDO was launched from the Cape Canaveral Air Force Station Space Launch Complex 41, using an Atlas V-401 rocket with a powered Common Core Booster RD-180, which has been developed to meet the requirements of the Evolved Expandable Launch Vehicle (ELV) program. [22] Orbit movement of the solar dynamics observatory from 11 February 2010 to 11 April 2010 Solar Dynamics Observatory ; Earth After launch, the spacecraft entered orbit around Earth with an initial perigee of about 2,500 kilometers (1,600 miles). The SDO then underwent a series of orbital lift manoeuvres, which adjusted its orbit until the spacecraft reached its planned circular, geosynchronous orbit at an altitude of 35,789 kilometers (22,238 miles), at a length of 102° D, with a gradient of 28.5°. [23] This trajectory was selected to 24 hours a day, 7 days a week communications to/from the fixed ground station, and to minimize solar eclipses to about an hour a day for only a few weeks a year. Sun Dog Phenomenon Moments after launch, the SDO's Atlas V rocket flew over a sun dog hanging suspended in florida's blue sky and when the rocket penetrated the cirrus cloud, shock waves rippled through it and destroyed the alignment of the sun dog's crystals by making a visible ripple effect on the sky. [24] Mission Mascot - Camilla Camilla Corona is a rubber chicken (similar to a children's toy), and is the mission mascot for SDO. It is part of the education and public outreach team and helps with various functions to help educate the public, especially children, about the SDO mission, events on the Sun and space weather. [25] Camilla also helps cross-reference the public about other NASA missions and space projects. Camilla Corona SDO uses social media to interact with fans. Image gallery Play media SDO:Year 5 Camilla Corona SDO. SDO 3D schematic. SDO instruments. SDO ready to be mounted on the Atlas rocket for launch. Media playback An animation showing the deployment of SDO. First light image from the SDO showing a protrusion explosion. An image of the 2012 transit of Venus taken by SDO. Media playback This movie opens with a full disk view of the Sun at visible wavelengths. The filters are then applied to small slices in the shape of a sun's pie. Play media SDO has now captured nearly seven years worth of ultra-high resolution solar shots. This time period shows that the full operation of two of the instruments of SDO. See also SpaceFlights Portal Heliophysics Radiation Zone Storm Probes (Van Allen Probes) Richard R. Fisher Solar and Solar Observatory STEREO (Solar TErrestrial RElations Observatory), launched in 2006, 1 of 2 spacecraft are still operating. WIND (spaceship), launched in 1994, is still operating. List of missions of heliophysics References ^ SDO our eye on the sun (. PDF). Nasa. Retrieved February 13, 2010. ^ Dean Pesnell; Kevin Addison (February 5, 2010). SDO - Solar Dynamics Observatory: SDO Specifications. Nasa. 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SDO; June 24, 2020) Instruments Extreme Ultraviolet Volatility Experiment (EVE), The Colorado Atmospheric Research Association (AIA), Lockheed Martin Heliosismic and Magnetic Imager (HMI), Stanford Joint Science Operations Center – Science Data Processing HMI – AIA Recovered from

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