

NOAA's Space Weather Observations to Provide Continuous Operational Capability

International Space Weather Initiative

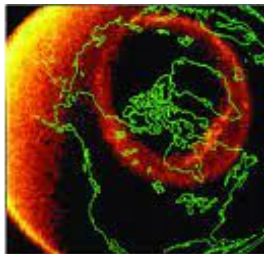
National Environmental Satellite,
Data, and Information Service

February 5, 2024

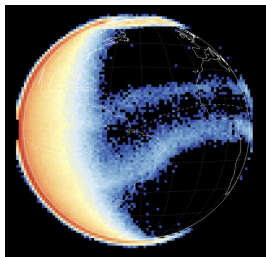
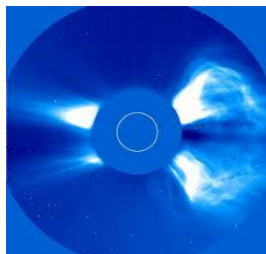
Dr. Elsayed Talaat
Director, Office of Space Weather Observations
NOAA NESDIS

NOAA provides decision makers and users with actionable Space Weather information and tools

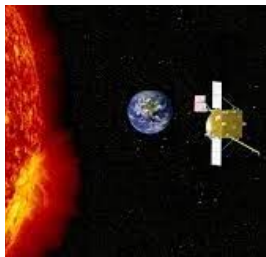
NASA Dynamic Exp-1



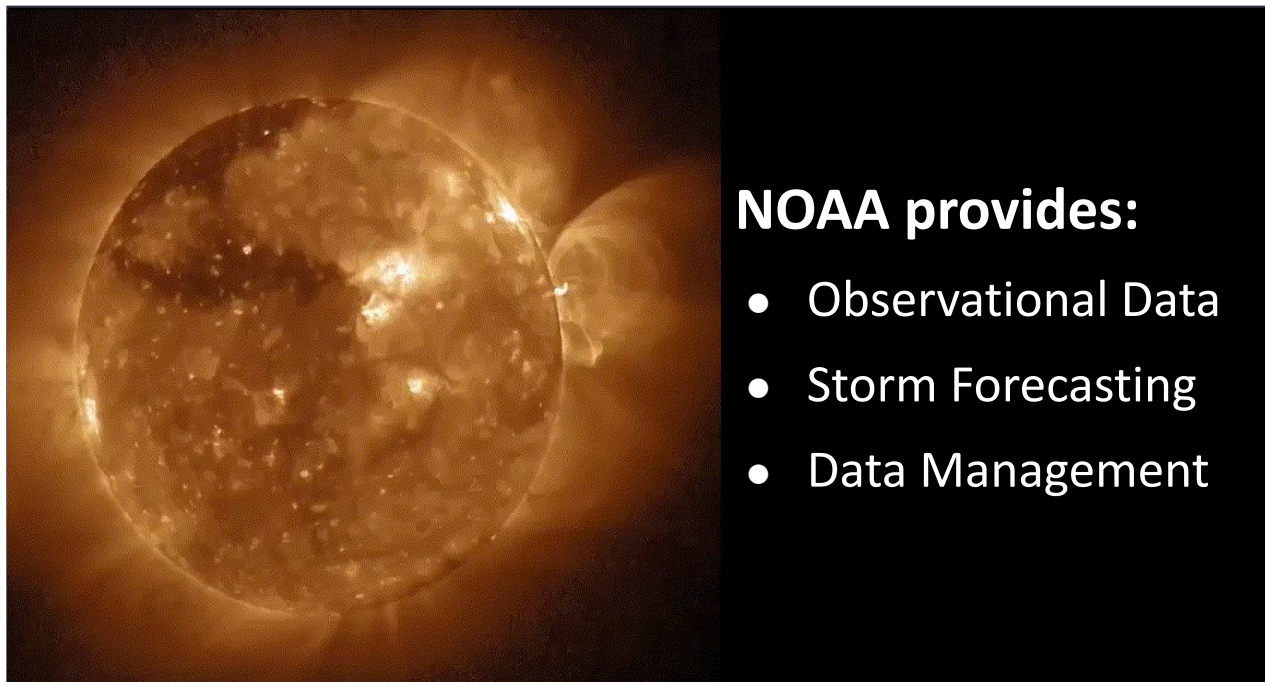
ESA/NASA SOHO/LASCO



NASA GOLD



ESA Vigil



GOES-16 SUVI

NOAA provides:

- Observational Data
- Storm Forecasting
- Data Management

Establishment of the Office of Space Weather Observations

National Environmental Satellite, Data, and Information Service

Office of
Space
Weather
Observations
(SWO)

Office of
Geostationary
Earth Orbit
Observations
(GEO)

Office of Low
Earth Orbit
Observations
(LEO)

Office of
Satellite and
Product
Operations
(OSPO)

Office of
Common
Services
(OCS)

Systems
Architecture &
Engineering
(SAE)

Center for
Satellite
Applications
and Research
(STAR)

National Centers
for
Environmental
Information
(NCEI)



Space Weather Follow On (SWFO) program

SWFO **sustains** NOAA's foundational set of space-based space weather observations and measurements to ensure continuity of critical data.

- **Development underway for:**
 - SWFO-L1 Observatory (Bus + Instruments)
 - Instruments (CCORs, MAG, SWiPS, STIS)
 - Ground Segment (Command & Control, SWFO Antenna Network, and Product Generation and Distribution)
- **Established agreements** with NASA, NRL, and European Space Agency (L1 & L5 cooperation)
- **Completed SWFO Program & Flight Project Critical Design Reviews** (May 2022)
- **On track for launches** in **April 2024 (CCOR-1 on GOES-U Mission)** and **2025 (SWFO-L1 Mission)**



CCOR-1 integration onto GOES-U
Image Credit: Lockheed Martin



Spacecraft assembly
Image credit: Ball Aerospace



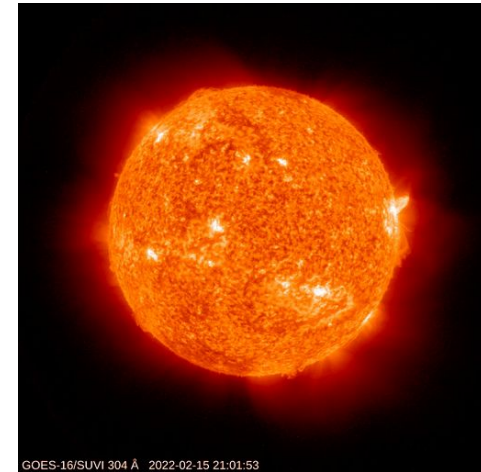
SWFO-L1 Spacecraft
Image Credit: Ball Aerospace



Space Weather Next (SW Next) program

SW Next will **maintain and extend** space weather observations from a range of different observing points, selected to most efficiently provide the comprehensive knowledge of the Sun and the near-Earth space environment.

- ✓ Planning for **continuity of observations** from:
 - L1 and L5 orbits
 - Geostationary orbit
 - Low Earth orbit
 - Space Weather ground support networks
- ✓ **Pre-formulation underway**
 - GEO Series requirement and concept definition work initiated
 - L5 Project preparing for System Requirement Review
- ✓ **Project formulation**
 - L1 Series preparing for Milestone 2
- ✓ **Development** of Ground Services underway
- ✓ **Engaging stakeholders** through user outreach, partnerships, and market research



NOAA-ESA L5 Collaboration Project

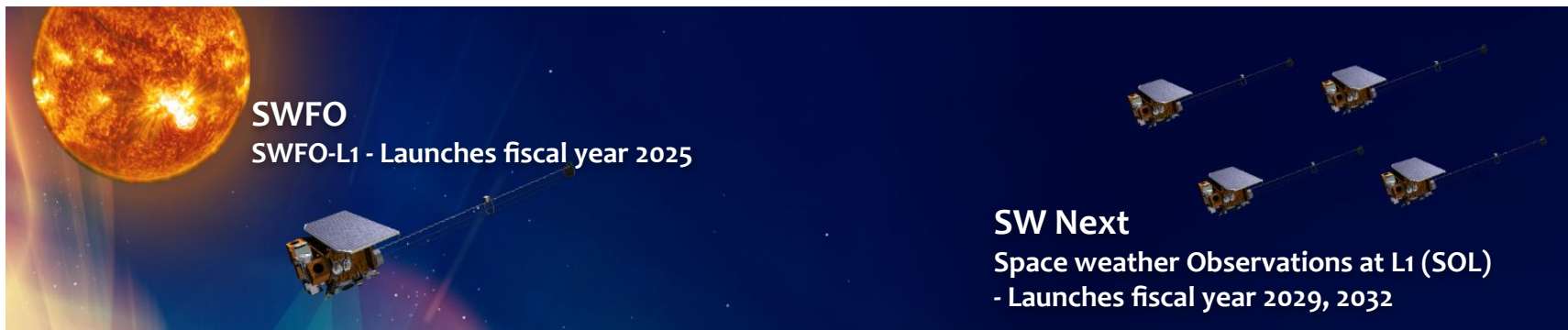
The L5 Project will manage the CCOR-3 development effort, the integration of the instrument into the ESA mission, and the development of data services.

Updates

- NOAA and ESA have a signed partnership agreement for space weather collaboration.
 - NESDIS provision of a **Compact Coronagraph to fly on Vigil mission to L5**
 - **Exchange of data** from all SWFO and Vigil instruments



What To Expect in 2035



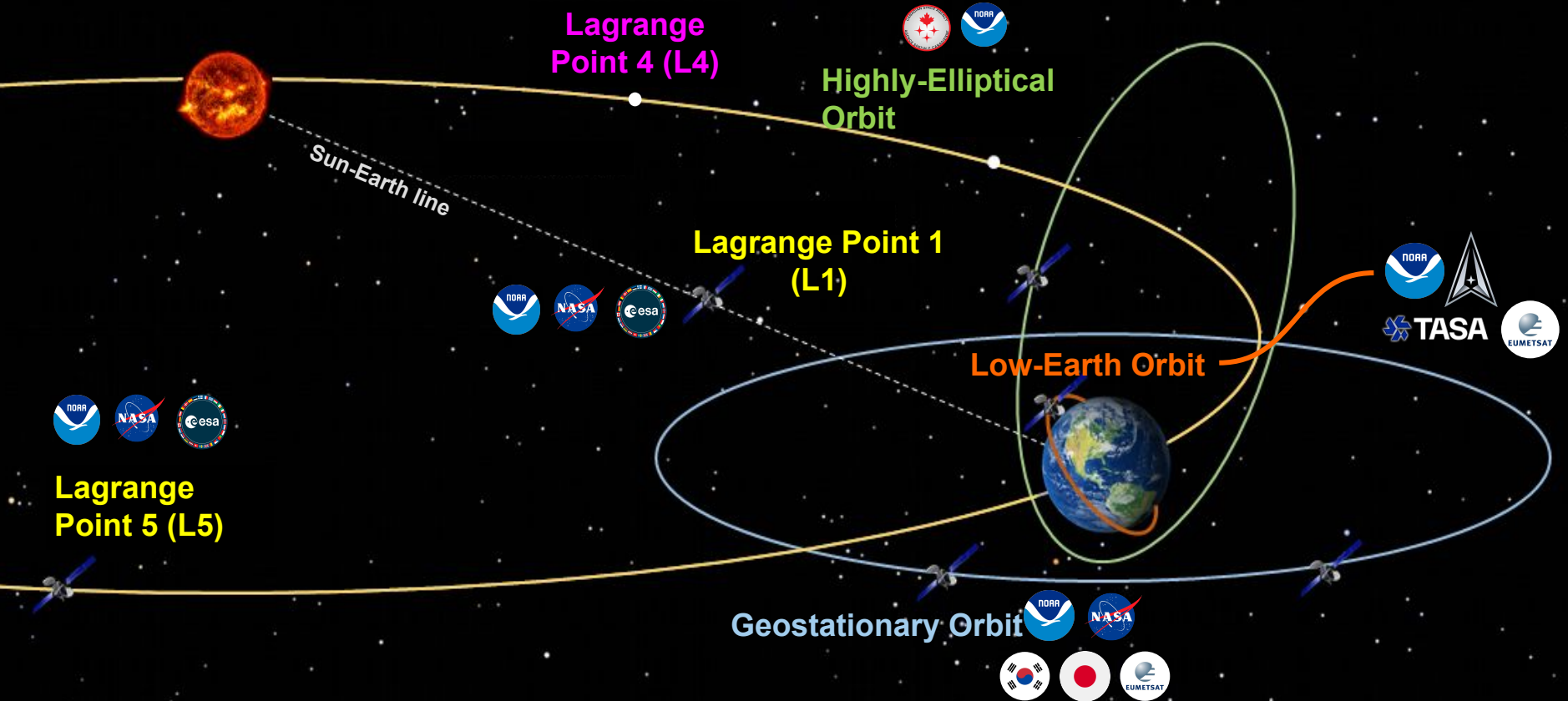
Satellites will have replaced aged spacecrafts such as SOHO and DSCOVR

- **SWFO-L1 satellite** with CCOR-2 and other space weather instruments: [2025 launch](#)
- **Space weather Observations at L1 (SOL)** -A and -B satellites: [2029, 2032 launches](#)

Observations will be operational at diverse vantage points

- **Nation's first coronagraph (CCOR-1)** on the GOES-U satellite: [2024 launch](#)
- **Observations at L5** via CCOR-3 through the ESA Vigil mission: [2029 launch](#)
- Possible **L4 mission** and **Geospace missions**

A Planetary System Observing Challenge, Met By ...

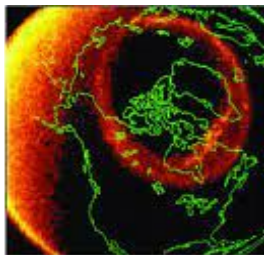




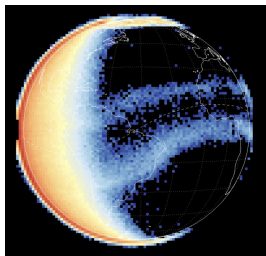
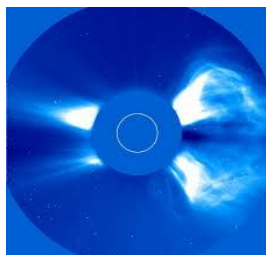
Back up

NOAA provides decision makers and users with actionable Space Weather information and tools

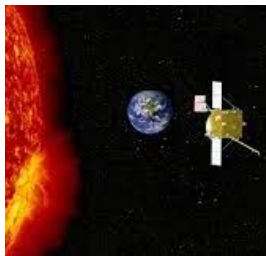
NASA Dynamic Exp-1



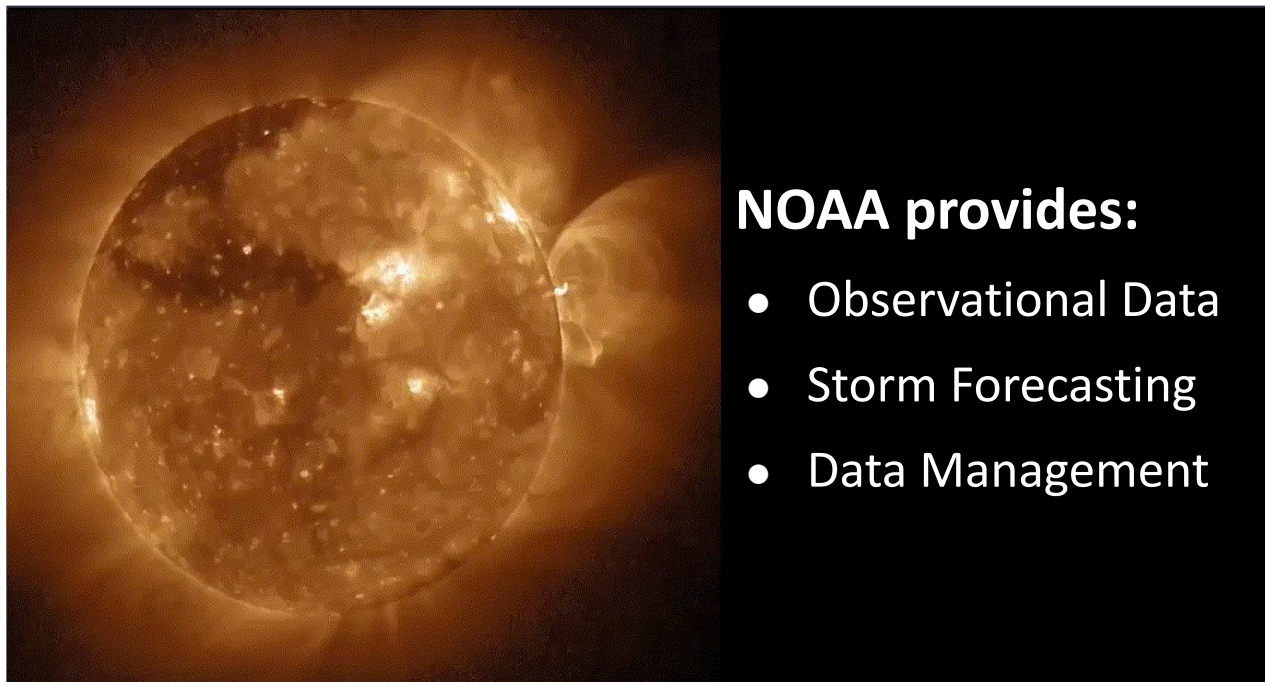
ESA/NASA SOHO/LASCO



NASA GOLD



ESA Vigil



NOAA provides:

- Observational Data
- Storm Forecasting
- Data Management

GOES-16 SUVI

Operational Space Weather Observing System

-  JAPAN
-  SOUTH KOREA
-  CANADA
-  SPAIN
-  USA
-  FRANCE
-  NOAA
-  EUMETSAT
-  EUROPEAN COMMISSION
-  TAIWAN SPACE AGENCY (TASA)
-  EUROPEAN SPACE AGENCY
-  NASA
-  DEPARTMENT OF DEFENSE
- COMMERCIAL DATA PURCHASE



- GEOSTATIONARY ORBIT
- LOW EARTH ORBIT
- DEEP SPACE

