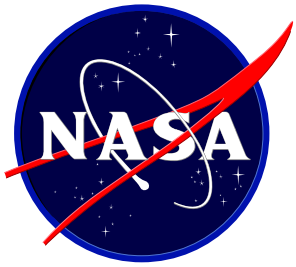
National Aeronautics and Space Administration
Press Kit



HESSI Mission

Points of Contact

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Contents **Page No.**

For Release:
January 29, 2002

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NEW LAUNCH DATE SET FOR HESSI SPACECRAFT

NASA's High Energy Solar Spectroscopic Imager (HESSI) remains on track for a Feb. 5 launch. HESSI will study solar flares - gigantic explosions in the atmosphere of the Sun- with a unique kind of X-ray vision, producing the very first high-fidelity color movies of them in their highest energy emissions.

HESSI will be carried aloft inside a Pegasus XL rocket under the belly of Orbital Science Corporation's Stargazer L-1011 aircraft. The L-1011 is scheduled to lift off from Cape Canaveral Air Force Station, Fla. at 3:21 p.m. EST. After the aircraft is about 40,000 feet over the Atlantic Ocean, it will drop the Pegasus rocket. Following a free fall and a series of short rocket motor burns, the rocket will deliver HESSI to its 373-mile (600-kilometer) circular orbit above the Earth, inclined at 38 degrees to the equator.

In order to understand what triggers a solar flare and how it explosively releases energy, scientists need to identify the kinds of particles being accelerated, locate the regions where the acceleration occurs, and determine when the particles get accelerated. The most direct tracer of these accelerated particles is the X-ray and gamma ray radiation they produce as they travel through the solar atmosphere.

The spacecraft's sole instrument, an imaging spectrometer, will construct flare images from patterns of light and shadows, that are produced by high-energy radiation as it passes through the instrument's grids while the spacecraft rotates.

-More-

Inside solar flare explosions, magnetic fields twist, snap and recombine, blasting particles to almost the speed of light and firing solar gas to tens of millions of degrees. This intense action causes the solar atmosphere to sizzle with high-energy X-rays and gamma rays and drives proton and electron particles into the solar system. Radiation and particles from solar flares can sometimes affect orbiting spacecraft.

HESSI was originally scheduled for launch in July 2000, but was postponed after the satellite suffered damage during vibration testing. Since then, flight delays due to launch vehicle failures have affected the launch date. However, officials have cleared the way for next Tuesday's scheduled launch.

In order for scientists to understand the physical processes and conditions within flares, they will use the spectrometer aboard HESSI to create images of the gamma rays and highest energy X-rays emitted by each flare. These images will be the first to simultaneously measure the location and energy content of radiation from the flare material and should improve predictability of flare occurrences at the Sun and the subsequent consequences we experience here on Earth.

Working together with several other solar spacecraft such as the Solar and Heliospheric Observatory (SOHO), Geostationary Operational Environmental Satellites (GOES), and Transition Region and Coronal Explorer (TRACE) for flare radiation, as well as Wind, Advanced Composition Explorer (ACE), Ulysses, and Voyager for particle detection, HESSI will provide scientists with vital insight into the impulsive energy release and particle acceleration processes at the Sun.

The HESSI mission cost about $85 million, which includes the spacecraft, launch vehicle, mission operations and data analysis. The Explorers Program Office at NASA Goddard Space Flight Center, Greenbelt, Md. will provide mission management and technical oversight under the auspices of NASA's Office of Space Science in Washington.

For detailed information about HESSI and its science mission, go to:

http://hesperia.gsfc.nasa.gov/hessi

http://hessi.ssl.berkeley.edu/

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Media Services Information

NASA Launch Coverage and Commentary

NASA TV will provide live coverage and commentary of the HESSI launch on February 5 beginning at about 2 p.m. EST. The L-1011 Stargazer aircraft is scheduled to lift off at 3:21 p.m. EST from Cape Canaveral Air Force Station, Fla. The Pegasus rocket drop is scheduled to occur at 3:26 p.m. EST.

For a live Webcast of the Stargazer take off and Pegasus drop, go to: http://www.ksc.nasa.gov/

Pre-Launch Press Briefings

A pre-launch press conference will be held at KSC on February 4 (L-1) beginning at 2 p.m. to discuss details of the launch vehicle, spacecraft readiness and timeline after spacecraft separation through start of science, and weather forecast for launch day.

An L-1 science briefing will immediately follow the pre-launch press conference to address the science payload and science objectives for the mission. Both briefings will be carried live on NASA TV.

News Center/Status Reports

NASA Public Affairs will staff the News Center at KSC beginning on L-2 and continuing through launch and receipt of the initial signal from the spacecraft. Recorded status reports will be available beginning on L-2 by dialing either **321-867-2525** or **301-286-NEWS**.

Media Credentials

Media seeking launch accreditation should fax requests **at least five days** prior to the launch to:

George Diller, KSC/PAO
NASA Kennedy Space Center
Kennedy Space Center, FL
FAX: 321-867-2977

******Requests must be submitted on the letterhead of the news organization and specify the editor making the assignment to cover the launch******

HESSI Quick Facts

Spacecraft Payload

HESSI's sole instrument – an **imaging spectrometer** – will construct flare images from patterns of light and shadows that are produced by high-energy radiation as it passes through the telescope's grids while the spacecraft rotates. The spectrometer will separate the light electronically into its component "colors," which correspond to different wavelengths and energy levels. X-ray and gamma ray detectors onboard the spacecraft will count the number of photons passing through the grids and precisely measure their energy.

When combined with the imaging information, scientists can reconstruct high-resolution "color" pictures of solar flares using computers back on the ground. This advanced approach will significantly enhance our current understanding of the solar flare phenomenon.

Spacecraft Dimensions

HESSI measures 85 inches (2.16 meters) high by 227 inches (5.76 meters) wide after solar panel deployment. During launch, the spacecraft's solar panels are folded to 43.3 inches (1.1 meters) in width to fit securely inside the Pegasus rocket fairing.

Spacecraft Weight – 645 lbs. (293 kg)
Science Payload – X-ray and gamma-ray imaging spectrometer
Onboard Memory – 4.0 gigabytes
Spacecraft Telemetry – Up to 2 gigabytes/day
Mission Lifetime – Two to three years

Orbit – 373-mile (600-kilometer) circular orbit, inclined at 38 degrees to the equator.

Launch Site – Cape Canaveral Air Force Station, Fla.

Stargazer L-1011 Lift off: February 5, 2002 at 3:21 p.m. EST.

Pegasus drop and separation: 3:26 p.m. EST with spacecraft separation from the Pegasus about 10 minutes later at 3:36 p.m. EST.

Launch Vehicle – Orbital Sciences Corporation Pegasus XL rocket. Additional information about the launch vehicle can be obtained from their web site at:
http://www.orbital.com/LaunchVehicles/Pegasus/pegasus.htm

First Signal Acquisition – Should occur about 5 p.m. (93 minutes after the L-1011 aircraft is airborne). The lead Goddard PAO will issue the initial post-launch status to media at this time.

Mission Costs – Total mission costs are approximately $85 million for the spacecraft, instrument payload, launch vehicle, data analysis, ground operations and mission operations.

Mission Oversight –HESSI is the sixth Small Explorer (SMEX) mission. The Explorers Program Office at Goddard provides management and technical oversight for the mission in accordance with NASA Headquarters Office of Space Science in Washington, D.C.

Spacecraft and Instrument Design/Operation – The University of California, Berkeley (UC Berkeley), as principal investigator institution for this mission, is responsible for most aspects of the mission including the spacecraft and science payload, integration and environmental testing of the spacecraft, and operations and data analysis after launch.

Development of the instrument was a joint effort by UC Berkeley, the Lawrence Berkeley National Laboratory, NASA's Goddard Space Flight Center, and the Paul Scherrer Institut in Switzerland. Spectrum Astro, Inc. of Athens, Ohio, built the spacecraft.

Launch Operations – Kennedy Space Center is responsible for all launch operations at Cape Canaveral Air Force Station, Fla.

Payload Operations Centers – The mission and science operations centers for HESSI are located at the UC Berkeley Space Science Laboratory.

HESSI Science Objectives

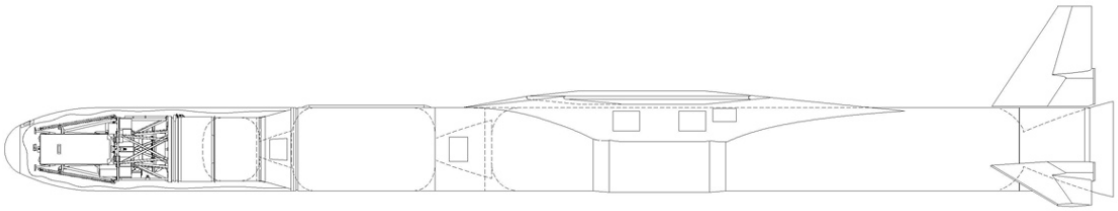
Solar flares, which occur in the atmosphere of the Sun, are the most powerful eruptions in our solar system. During a flare, large numbers of electrically charged particles are rapidly accelerated to high energies and gas is quickly heated to tens of millions of degrees.

Studying solar flares is important as they are often accompanied by coronal mass ejections, the eruption of gas and energetic particles from the Sun. The energetic particles are particularly dangerous to spacecraft that leave the protection of the Earth's magnetic field.

X-rays from flares also can alter the structure of the Earth's electrically charged upper atmosphere, or ionosphere, and adversely affect radio communications, which rely on reflection by the ionosphere for transmissions to distant receivers.

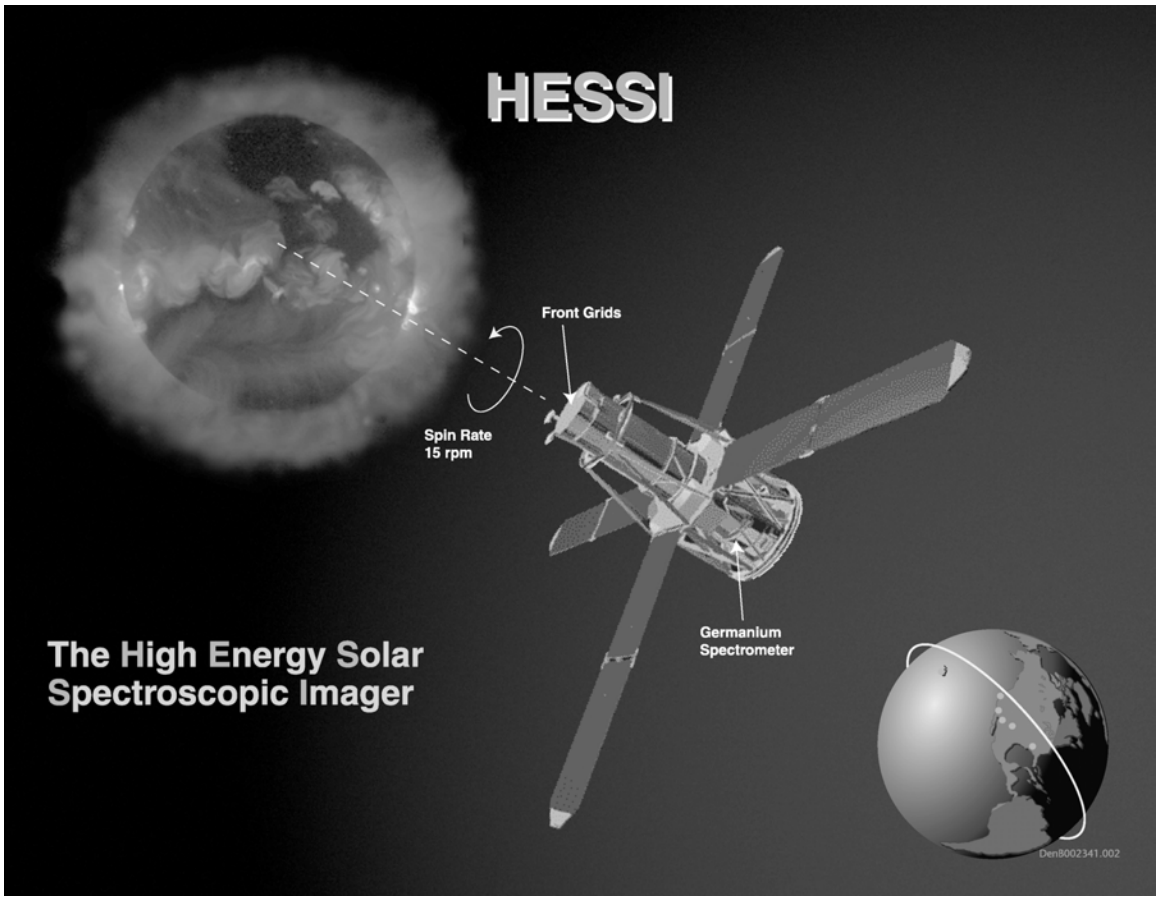
This mission will tell scientists where in the solar atmosphere these particles are accelerated, when in the flare explosion the particle acceleration occurs, and what energies are achieved by the accelerated particles. Data provided by HESSI will vastly advance our current understanding of the fundamental high-energy processes that produce solar flares.

Pegasus XL Rocket



(Line drawing courtesy of Orbital Sciences Corporation)

Artist Concept of the HESSI Spacecraft



Program/Project Management

NASA Management:

Office of Space Science:
Sun-Earth Connection Program Director **George Withbroe**
HESSI Program Scientist **William Wagner**
HESSI Program Manager **George Albright**

Goddard Space Flight Center:
HESSI Project Manager **Frank Snow**, Explorers Program Office
HESSI Mission Scientist **Brian Dennis**, Laboratory for Astronomy and Solar Physics
HESSI Mission Manager (after spacecraft checkout) **Patrick Crouse**, Space Science Operations Project Office

UC Berkeley Project Management:

HESSI Principal Investigator **Robert Lin**, Space Sciences Laboratory
HESSI Project Manager **Peter Harvey**, Space Sciences Laboratory