

GENESIS SAMPLE RETURN MISSION TO THE SUN



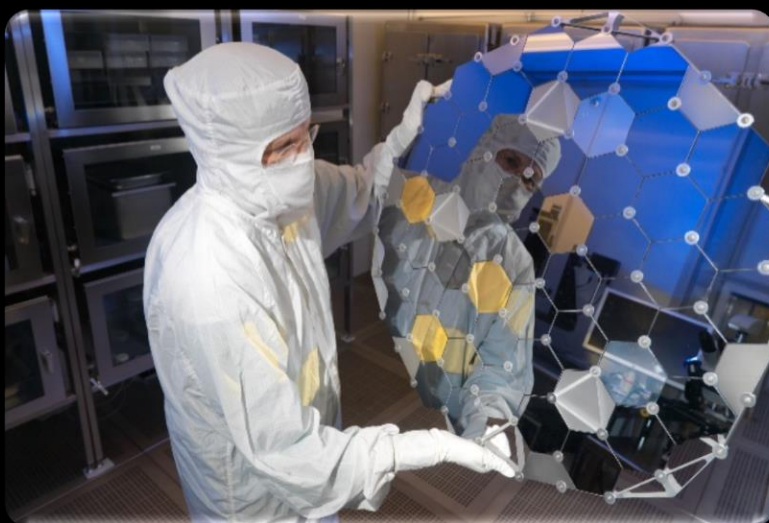
MISSION GOAL: Collect samples of the solar wind and return them to Earth.

FACTS ABOUT THE SUN

- The Sun is the star (yellow dwarf) at the center of our solar system. It is 93 million miles (1 Astronomical Unit) or 150 million kilometers from Earth.
- The gravity of the Sun holds the solar system together, keeping everything in its orbit.
- The mass of almost all (99.8%) the solar system is contained within the Sun.
- The Sun releases a constant stream of charged particles called the **solar wind**.

COLLECTING SOLAR WIND SAMPLES

- **WHY:** Samples reveal the chemical makeup of the solar nebula from which our Sun and planets were born.
- **WHAT:** Collected samples were ions (charged particles, atomic in size) that reveal elemental and isotopic composition of the Sun.

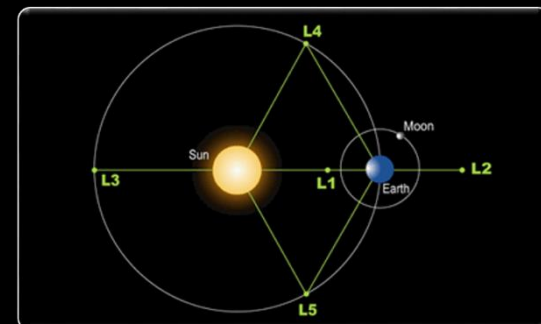


- **HOW:** Five collector arrays on the spacecraft carried 55 hexagonal (6 sided) wafers. There were 300 total wafers.
- As the collectors faced the Sun the ions in the solar wind crashed into them and were buried in the wafers.

GENESIS MISSION TIMELINE



- **Launch:** August 8, 2001
- **Sample Collection:** The spacecraft orbited Lagrange point (L1) between the Earth and the Sun for 884 days collecting solar wind.
- **Return to Earth:** September 8, 2004
- The sample return capsule had a hard landing when its parachute failed to deploy. Despite the hard landing, samples were recovered and are cleaned using ultrapure water.



CURATING RETURNED GENESIS MISSION SAMPLES



- Samples are curated in an ISO 4 Class lab at NASA's Johnson Space Center in Houston, TX.
- Samples are stored inside stainless steel cabinets under pure dry nitrogen.
- Ultrapure water (UPW) used for cleaning is highly purified water in which all minerals and impurities have been removed.

SCIENCE HIGHLIGHTS: By comparing Genesis data with spectroscopic measurements of the Sun, researchers are learning more about the processes that create the solar wind which allow them to determine the bulk composition of the solar nebula from which our solar system formed. Additionally, this is allowing scientists to better understand the unique history of each planetary body.

