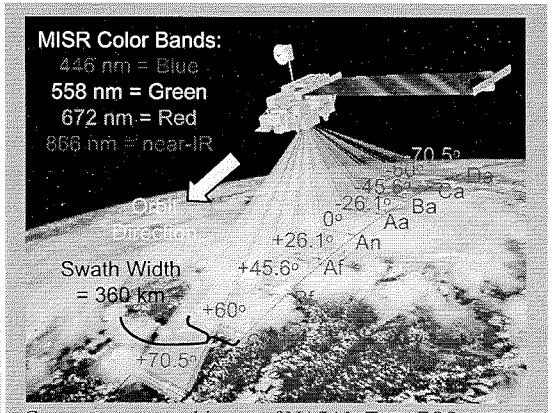
The MISR Instrument

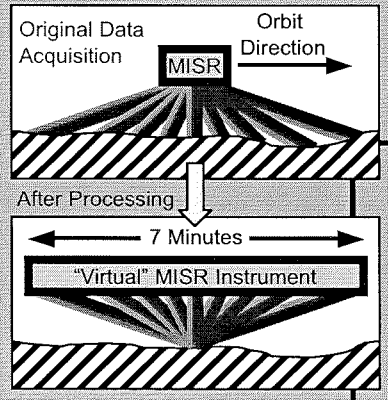
The Multi-angle Imaging SpectroRadiometer (MISR) was built and is managed by the Jet Propulsion Laboratory in Pasadena, CA. It is one of a suite of five instruments on NASA's Terra satellite, the flagship satellite of the Earth Observing System (EOS) program. Terra was launched into a sun-synchronous, polar orbit on December 18, 1999.

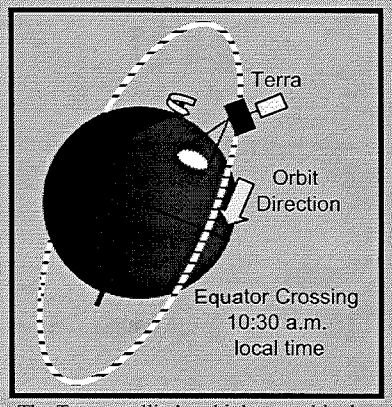


Computer generated image of NASA's Terra EOS satellite with the MISR instrument onboard. The pixel sampling is as high as 275 m. To reduce the data volume, most data is handled at a resolution of 1.1 km.
Image courtesy of Shigeru Suzuki and Eric M. De Jong, Solar System Visualization Project. JPL image P-49081

The five instruments onboard the Terra satellite are ASTER, CERES, MODIS, MOPITT, and MISR. MISR has nine CCD cameras which point in different directions to obtain angular information about the radiation reflected from the Earth. MISR obtains global, multi-angle coverage of the entire Earth in 9 days at the equator and 2 days at the poles.

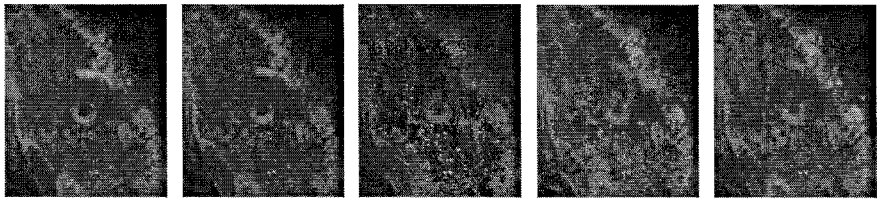
As MISR passes over the Earth, the most forward looking camera (Df) is imaging a point 2800 km away from the point imaged by the most aftward looking camera (Df). When the data is processed, the cameras are registered so that each point on the earth is effectively imaged from 9 different directions by a "virtual" MISR instrument. It takes 7 minutes for a point to be imaged by all 9 MISR cameras.





The Terra satellite's orbit has an altitude of 705 km and a period of 99 minutes. The satellite crosses the equator at 10:30 a.m. during the descending portion of its orbit. The repeat cycle is 16 days.

An Example of Multi-angle Viewing from MISR

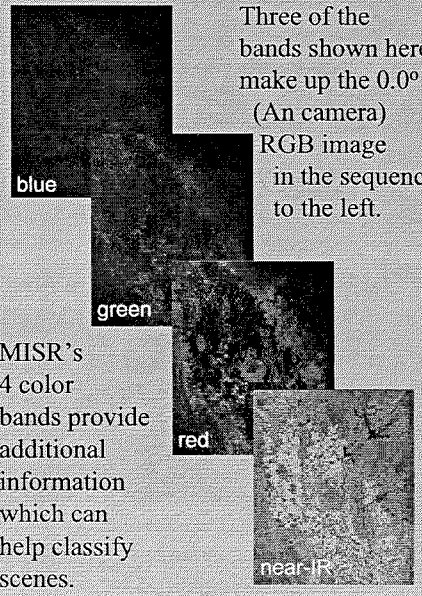


Df (+70.5°)	Cf (+45.6°)	An (0.0°)	Ca (-45.6°)	Da (-70.5°)
In most forward view, cloud in upper center of image is quite bright.	As the angle changes, cloud is less bright.	When looking straight down, cloud is nearly invisible.	Aftward looking cameras show cloud is still present.	In most aftward view, cloud is less visible than in forward view.

Additional Resources

For more information on Terra see the Terra homepage at http:/terra.nasa.gov

For more information on MISR see the MISR homepage at http://www-misr.jpl.nasa.gov/



Three of the bands shown here make up the 0.0° (An camera) RGB image in the sequence to the left.

MISR's 4 color bands provide additional information which can help classify scenes.