GPM MICROWAVE IMAGER

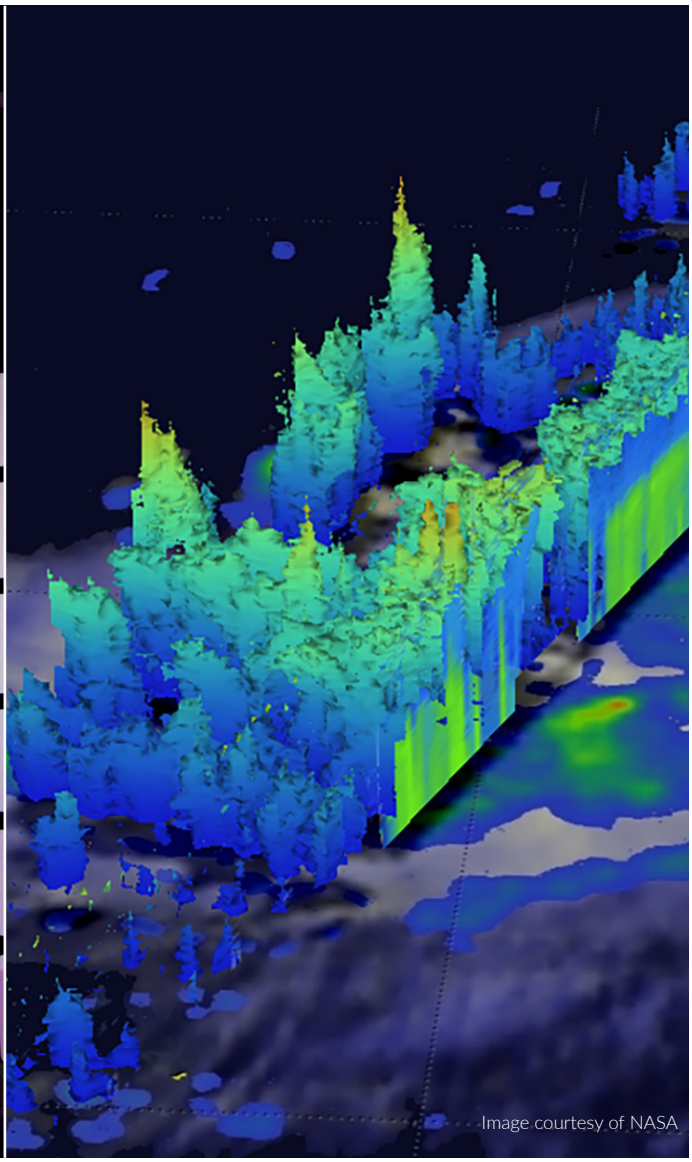


Image courtesy of NASA

GO BEYOND WITH BALL.®

We help scientists around the world study precipitation to gain insight into Earth's climate, weather and ecology. Our Microwave Imager aboard NASA's Global Precipitation Measurement (GPM) mission is improving understanding of precipitation patterns around the world.

OVERVIEW

Knowing how much rain and snow falls around the world is critical for improving weather forecasting and protecting lives and property.

The Global Precipitation Measurement (GPM) mission is a joint effort of a group of international partners led by NASA and the Japan Aerospace Exploration Agency (JAXA). The first satellite in the GPM constellation, the Core Observatory, launched from Japan's Tanegashima Space Center in February 2014.

The Core Observatory is carrying an advanced radar/radiometer system that measures precipitation from space. This system also serves as a reference standard for calibrating precipitation measurements from a constellation of other satellites. Through improved global precipitation measurements, the GPM mission will advance our understanding of Earth's water and energy cycles, improve forecasting of extreme events that cause natural hazards and disasters and extend our current capabilities for using accurate and timely precipitation information.

OUR ROLE

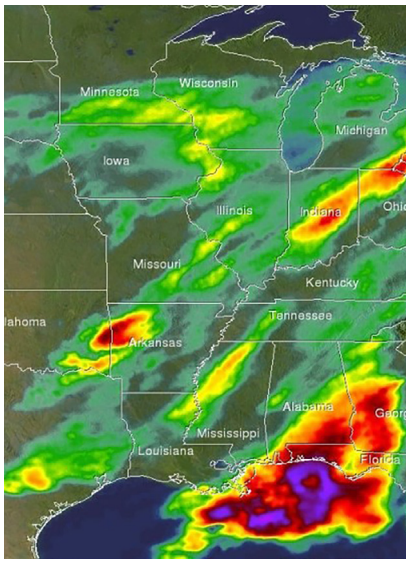
Ball Aerospace designed, built and tested the GPM Microwave Imager (GMI) and provided pre- and post-launch support for the instrument. GMI is a conical-scan microwave radiometer with a 1.2-meter (3.9 ft.) aperture with 13 channels operating from 10.65 to 183.3 gigahertz.

GMI's high-frequency channels measure small particles of ice, snow and rain, while the JAXA-built Dual-Frequency Precipitation Radar instrument gives a three-dimensional view of a column of precipitation. Together, these instruments provide comprehensive data to produce global rain maps and climate research data products. They also provide an accurate reference for calibrating other microwave radiometers in the GPM constellation.

GMI's design is based on successful microwave sensors built previously by Ball, including the Shuttle Radar Topography Mission (SRTM), Spaceborne Imaging Radar-C (SIR-C), GEOSAT Follow-On (GFO) and the Submillimeter Wave Astronomy Satellite (SWAS).

QUICK FACTS

- GMI is about 2.4 meters (8 ft.) tall
- GMI rotates at 32 revolutions per minute, using four very stable calibration points on each revolution to regulate scanned data
- GMI provides 4.4 to 32 km (2.7-19.9 miles) resolution at an altitude of 407 km (252.9 miles)
- GMI's accuracy set a new reference standard for the scientific community
- Using high-sensitivity frequencies, GMI is fine-tuned to discriminate between noise and signatures of small particles of precipitation
- GMI is fabricated with graphite composite structures instead of aluminum to reduce its mass by one third
- The instrument's innovative circuit design reduces power consumption by 20 percent as compared to previous radiometers
- GMI provides rain and snow observations worldwide every three hours, using refined algorithms to measure data at various frequencies and a flexible ground processing segment
- The GPM mission will fly multiple spacecraft
- The Core Observatory flies in low Earth orbit at a 65 degree inclination



GPM precipitation predictions for March 2016

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