

By Arch 2008 Gache, Science News Editor

SDO Build Milestone Complete

SDO mated with the propulsion module

The Solar Dynamics Observatory is expected to become the next space device to monitor solar flares, sunspots and coronal mass ejections in order to make accurate predictions on solar weather. Recently the Solar Dynamics Observatory, or SDO for short, was lowered and attached to the propulsion module that will help it move through space. "It's like lowering a telephone booth over a person. The mechanical people made the operation look easy. It's never easy. There are some mechanical things you can never model and predict," said SDO propulsion subsystem manager at NASA's Goddard Space Flight Center, Gary Davis. Bad solar weather, and space weather in general, is never good for astronomers nor for the spacecrafts in orbit around the Earth and even those on the surface of the planet, which can be disrupted by powerful magnetic storms. NASA hopes that the SDO will help better predict these events in the near future. The Goddard Space Center helped integrate the avionics and built the electronic instruments for the SDO. The propulsion modules and the instruments required to control and relay data back to Earth were also built at Goddard. "We built these modules up in parallel to allow us to get more done in a shorter amount of time," said Brent Robertson, SDO Observatory Manager at Goddard. Robertson reveals that this is the only bipropellant propulsion system built by Goddard engineers. A bipropellant propulsion system is made of two containers, one of fuel and one of oxidizer, which provide a combustible mix to the burner that ignites them into a flame, very similar to the engines used by the Lunar Lander Modules during the Apollo missions. The two containers are made out of titanium sheets, shaped into a balloon and are able to sustain a volume of fuel 27 times heavier than their own weight. Aside the two main engines, the SDO is also equipped with 8 smaller thrusters that will help maneuver the spacecraft and four additional thrusters which will act as attitude control backups. SDO is expected to have a mission lasting for 5 years only; however, the fuel it will carry will last for 10 years at least. "There was a lot of anxiety about mating these highly complex modules. We wanted to avoid any interference that might damage items such as the harness or thermal blankets. We had a well thought out and documented procedure for this operation. The whole design was smart from the beginning," said Davis.