# MARS ORBITERS



### **MARS RECONNAISSANCE ORBITER**

The Mars Reconnaissance Orbiter was launched in August of 2005 by NASA. The mission objective was much of what the Global Surveyor was set to accomplish; to study the Martian climate, search for signs of water and map the surface of mars. Since the MRO is expected to stay in orbit for a long time, it also has various mission support objectives; this is mostly relaying information from Mars ground operations back to earth, but it also searches for hazards and safe areas around Mars Rovers.

### MARS GLOBAL SURVEYOR

The Mars Global Surveyor launched in November of 1996 by NASA. The MGS had many goals; to map the surface of Mars, determine the composition of Martian soil, determine the nature of the Martian gravitational field, and monitor the climate of Mars. Unfortunately, in 2006 the orbiter suffered an error while attempting to reorient its solar panels and contact was lost.

## LUNAR ORBITERS (

LUNAR RECONNAISSANCE ORBITER



## **TYPES OF SENSORS ACTIVE AND PASSIVE**

There are two types of sensors that are employed by these satellites, active sensors, and passive sensors. Passive sensors can detect light from the sun, and then record the reflected data. Active sensors work differently; they can produce their own energy and record the data that is reflected, because of this, most active sensors can be used day or night. There are many kinds of active sensors. Some sensors use LiDAR, which stands for Light Detection And Ranging, which uses lasers to record information. The main problem of LiDAR is that it can't penetrate

cloud cover. This is the advantage that SAR has over LiDAR. SAR uses lower frequency radiation, MAGELLAN like microwaves, which can penetrate cloud cover.





Magellan was launched in 1989 by NASA. The probe was developed by Lockheed Martin, using spare parts from various spacecraft including Voyager, Galileo, Mariner, and Ulysses. Its main mission was to map the surface of Venus, a task never before done. Using SAR, the spacecraft was able to look past the thick Venusian atmosphere to see the actual surface of the planet. The craft lasted long past its original mission, and its last act was to study the CO2 in the Venusian atmosphere by going through it. This experiment was called "Windmill".

Lunar Reconnaissance Orbiter was launched in 2009 by NASA. Originally planned for only one year of service, its mission has been extended many times. Its primary goal is to continue to map the lunar surface and study the lunar polar regions for the possibility of ice water.

### SELENE/KAGUYA

The SELENE Spacecraft was launched by JAXA (Japan Aerospace Exploration Agency) in 2007. The primary mission of SELENE was to study the origins of the moon, and how it formed, as well as to map the lunar surface in the process. The spacecraft was nicknamed Kaguya after a lunar princess from an ancient Japanese folktale.

## **VENUSIAN ORBITERS**

### **AKATSUKI**

Akatsuki was launched in 2010 by JAXA. The probe was originally supposed to start its mission sometime in December of that year, however while attempting to orbit around Venus, communications were blocked by the planet causing it to fire its boosters for too long. The probe was able to orbit around the sun for 5 years, when it finally was able to orbit around Venus and begin its mission. Once there, it would use its imaging instruments to study the Venusian atmosphere, rather than attempting to study the surface. These instruments are similar to the instruments used by typical imaging satellites to study a planets surface, using infrared and ultraviolet imagers.



Carpe Atmospherum means "To Pluck the Sky" in Latin

of the Magellan Misson

A poster made for the end



## NASA

