

CanSat France 2011

Proposed missions schedule

Version 1 - Septembre 2010

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ABOUT THIS DOCUMENT

This document provides complementary information related to the “CanSat France competition design guide”. This document is dedicated to 2011 CanSat France, a competition organised by CNES (Centre National d’Etudes Spatiales, the French space agency) and Planète Sciences; it includes:

The proposed schedule of scientific missions. At least one of these missions should be chosen by the team.

The detailed planning

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ED.	REV.	DATE	OBSERVATIONS
1	0	Sept 2010	Creation

GLOSSARY

CanSat: within CanSat France framework, a CanSat is a miniature space-probe, with a volume comprised between 330 mL and 1 liter; The probe contains equipments to perform missions.

Organization: members from CNES and Planète Sciences involved in the preparation of the competition.

Technical committee: composed of members from CNES and Planète Sciences (and possibly professionals from the industrial world). This group is responsible for the technical follow-up of the CanSat projects. More especially, the group collects the deliverables from the teams and attends to the project review meetings. This group is led by par Planète Sciences.

Jury: composed of members from CNES, professionals from the Space industry, the President of Planète and the leader of the Technical Committee. The Jury is gathering during the competition in order to evaluate the quality of the projects and to decide the awards.

PROPOSED MISSIONS

- Teams registered to CanSat France shall select at least one of the proposed missions listed below.
- The Jury will consider quality, originality, creativity of the projects to evaluate the projects.

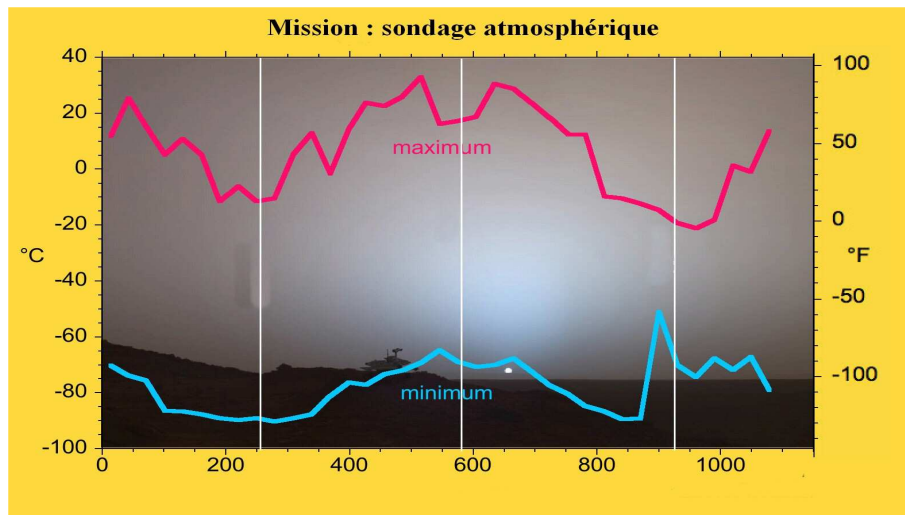
Proposed Mission #1: Atmospheric sounding

During the descent phase, the CanSat will measure and transfer to the ground station via telemetry 2 parameters. This mission simulates, as for example, a probe such as Huygens, in the Saturn's moon Titan's atmosphere.

Cf.: <http://saturn.jpl.nasa.gov/> and <http://www.esa.int/esaMI/Cassini-Huygens/>

During the descent phase, the CanSat shall:

- Acquire hygrometry at least every 5 seconds,
- Acquire altitude at least every 5 seconds,
- Send these data by telemetry to the ground station. These values could be sent during the flight or after landing.



Sample of data acquired during an atmospheric sounding mission

Proposed Mission #2: Deployment of a RF antenna after landing

After landing, the CanSat shall be able to deploy a RF antenna. This type of operation occurs when a probe or a rover is landing on the ground of a planet, Mars as for example.

Cf : http://marsrover.nasa.gov/mission/spacecraft_rover_antennas.html

Before the drop:

- Members of the organization will check that the antenna is contained within the volume of the CanSat.

After landing:

- The CanSat shall deploy the antenna out of its original volume

Teams are not required to transmit data from this antenna; although this will be strongly appreciated by the Jury.

The antenna shall not be composed of a simple flexible wire.

Proposed Mission #3: Photo/Video

During this mission the team shall demonstrate its capacity to send an image of the ground during the descent phase or after landing. This kind of mission was carried out of one of the first Mars Lander: Viking 1.

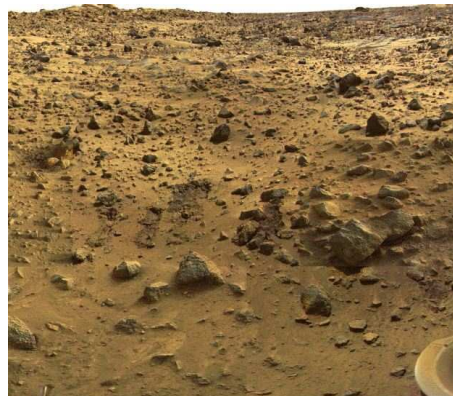
Cf.: <http://www.nasa.gov/viking>

And also at a greater distance from the Huygens probe on the Saturn's moon Titan's atmosphere.

Cf.: <http://www.esa.int/esaMI/Cassini-Huygens/>

The CanSat shall provide a photo from the surrounding area and transmit it by telemetry. The quality of the picture shall be good enough to identify items on the ground or items of the surroundings of the landing site.

The picture shall either be taken during the descent phase or after landing.



Pretty good picture of Mars by the probe Viking1

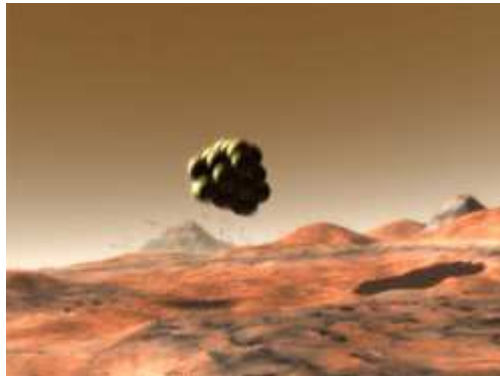
Proposed Mission #4: Airbag landing

Landing is one of the most critical phases for a planetary probe's mission. Airbag is one of the technologies used to ease landing: the cushions filled with air absorb the shocks of bounces on the surface of the planet. This prevents from using of retro-rocket at the time of ground contact.

Cf.: http://marsrover.nasa.gov/mission/spacecraft_edl_airbags.html

The mission consists in deploying one or several Airbags around the CanSat a few meters above the ground (less than 4 meters).

For this experiment, upon team's decision, the parachute can be dropped at the opening of Airbags.



Artist view of Airbags protecting Mars Explorer probe

Proposed Mission #5: Terraforming

In the context of human exploration of new planets, unmanned spacecrafts will be sent prior to the arrival of man.

The purpose of Terraforming, yet mostly a theoretical technique and a source of Sci-Fi inspiration, is to change the environment of the planet to make it compatible to the human needs.

Cf.: <http://en.wikipedia.org/wiki/Terraforming>

The mission consists in, once CanSat has landed, drilling a small hole in the ground and to lay down a crop seed. The choice of seed is free.

SCHEDULE : TECHNICAL MILESTONES

Deadline	Mile stone	Event	Deliverables	Remarks
<i>Before the event</i>				
31 Dec 2010	T0	Limit of registration	Registration form	Online form
18 Feb. 2011	T1	Design: intermediate report sent to the Organizers	Presentation (10 slides)	Projects selection
29 Apr. 2011	T2	Design: final report sent to the Organizers	Presentation (10 slides)	Softcopy For the technical committee: <ul style="list-style-type: none"> • Evaluates the project • Evaluates security issues
<i>During the event</i>				
J0	T3	Projects presentation	Presentation	
J0	T4	Controls/Checks	-	Template by Organization
J1 (J0+1)	T5	Drop	-	
J2 (J0+2)	T6	Post-flight debriefing	Presentation	

- The J0, J1, J2 deadlines will be provided by the Organizers
- CanSat France 2011 will take place at DGA-EM facilities in Biscarrosse (Landes) at the time of C'Space 2011, on the second half of August.

End of document