



GMIT

INSTITIÚID TEICNEOLAÍOCHTA NA GAILLIMHE-MAIGH EO
GALWAY-MAYO INSTITUTE OF TECHNOLOGY



Could YOU build a satellite?

CanSat – a competition
for 2nd Level Students in
association with GMIT, and
sponsored by the European
Space Agency (ESA)



What is a CanSat?

A CanSat is a simulation of a real satellite, built inside an empty soft drinks can.

CanSat Competition

Teams of school students compete to design, build and test a 'mini-satellite', or CanSat.

The competition gives students a feel for the excitement of technological achievement by launching their own 'satellite', and gives them their first practical experience of a real space project.



Your mission, should you choose to accept it...

The challenge for students is to:

1. Fit all the major subsystems found in a satellite, such as power, sensors and a communication system, into a CanSat
2. Provide a parachute or other means to ensure the CanSat has a gentle landing
3. Carry out a scientific experiment and transmit data to earth based computer

Entry is open to teams of 6 to 10 second level students, 2 of whom must be aged 16 years or over.

What help will we get?

GMIT will support participating schools by providing access to state-of-the-art labs, technical support, and industry mentors for the competing teams.

Each team and their teacher will be provided with a kit, an introductory course, and on-going support from a dedicated technical mentor.

Teams can also avail of online support through GMIT's Learnonline (Moodle), the learning support system used by GMIT.



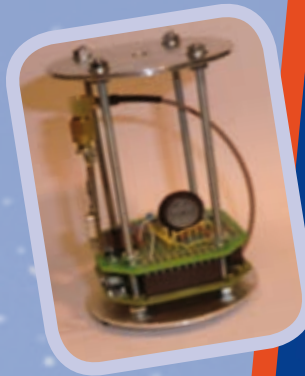
And now for the Science bit...

Each team develops a CanSat – arduino based electronic circuitry housed in a drinks can which takes measurements and transmits data back to a computer.

They are responsible for all aspects: designing the CanSat, selecting its mission, integrating the components, testing, preparing for launch and then analysing the data.

The teams are brought to a launch site and their CanSat is launched and released from a height.

The CanSat must then take measurements and transmit data on its journey back down.



Each team is given a kit containing;

- An arduino based processor board
- A proto board on which to build sensor circuitry and a frame, to fit inside a drinks can on which to mount the boards
- Transmitter & receiver kit
- Temperature & pressure sensors
- A manual

CanSat – Primary mission

After release and during descent, the CanSat shall measure the following parameters and transmit the data as telemetry once every second to the ground station:

- Air temperature
- Air pressure

It must be possible for the team to analyse the data obtained (for example, make a calculation of altitude) and display it in graphs (for example, altitude vs. time and temperature vs. altitude).

CanSat – Secondary mission

The students must develop a secondary mission of their choice. They can be inspired by other real missions of satellites.

Below are some examples of secondary missions; however teams are free to choose or invent another mission that is not covered here, as long as it has some technological, investigative or innovative value, for example:

Advanced Telemetry

After release and during descent, the CanSat measures and transmits additional telemetry to that required for the primary mission, for example: (i) Acceleration; (ii) GPS location; (iii) Radiation levels.

Telecommand

During descent, commands are sent from the ground to the CanSat to perform an action, such as switching a sensor on and off, changing the frequency of measurements, etc.

ComeBack

The CanSat navigates autonomously with a control mechanism such as a parafoil. The objective is for the CanSat to land as close as possible to a fixed target point on the ground after it has been released from the rocket. This mission is an advanced telemetry/telecommand mission – navigation data is exchanged between the CanSat and a ground station throughout the descent.

Landing System

For this mission, the team develops an alternative safe landing system for the CanSat, such as a bespoke parachute or airbag.

Planetary Probe

The CanSat simulates an exploration flight to a new planet, taking measurements on the ground after landing. Teams should define their exploration mission and identify the parameters necessary to accomplish it (e.g. pressure, temperature, samples of the terrain, humidity, etc.).



GMIT Galway Campus

Background

CanSat is an initiative to encourage school students to consider careers in science and engineering. In Europe it is sponsored by the European space agency, ESA.

The regional finals for the West of Ireland are held in GMIT Galway Campus in Spring. The regional finals are followed by a national final, and then a European final. Ireland has sent teams to the European final for the last number of years.



Contacts

Dr. Paul O'Dowd

Department of Mechanical and Industrial Engineering, GMIT

Email: paul.odowd@gmit.ie


Dr Carina Ginty


Schools Liaison Officer, GMIT

Email: carina.ginty@gmit.ie



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