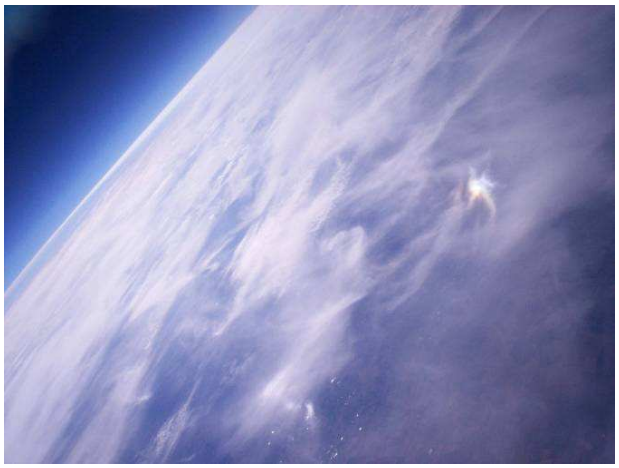
The UK Space Challenge 2009

Competition Outline

As part of the University of Cambridge's 800th Anniversary celebrations the Cambridge University Spaceflight team is delighted to announce the UK Space Challenge 2009. This national competition is aimed at teams of science students aged 14-18, or Science Clubs and Youth Clubs. The challenge is to build a scientific experiment that will be taken as a payload to the edge of space by a high-altitude helium balloon.

Teams will compete to design and build payloads containing everything required to conduct experiments on the edge of space. They could build sensor circuits, gather atmospheric data or take photographs (and videos) as their payloads begin to leave the Earth's atmosphere and are subjected to the cold and vacuum of space. Designing the experiments will be a fun and inexpensive way of expanding science education and inspiring the next generation of scientists and engineers. Could this be the next cover of your school magazine?



Right: The photograph that won the Owlstone Photography Prize 2007, entitled "Earth from 32km", that was taken on Cambridge University Spaceflight's first mission, Nova 1.

Prizes

The 5 winning payloads will be taken to roughly 25km altitude onboard a CU Spaceflight balloon, chosen on two five-page reports detailing the capabilities of the built payload. Further prizes can be won by any team that reaches the second round of the competition, and will be awarded based on the reports and flight performance in the following categories:

- Best overall payload
- Most innovative experiment
- Quality and analysis of results
- Independence award, for high calibre student work with minimum assistance.

Competition Rules in Brief

- Teams will design, build and test a payload to fit entirely in the given payload box (140x140x140mm internal size, 25mm wall thickness).
- Payloads must weigh no more than 0.4kg at launch (box weighs 90g).
- Payloads must contain no living animals, explosives or hazardous materials.
- Teams must submit 5-page reports which will decide their progress through the two rounds.

For a full list of competition rules and conditions, please see the CU Spaceflight website.

Timescale

- Please express your schools interest as soon as possible via our website to be updated on competition information. There is no obligation to enter at this stage.

- Fill in the entry form found online to formally enter the competition before 1st December 2008. You will receive your payload box and full information when you do this. The preliminary deadline for the first 5-page report will be January 15th, when 10 teams will be selected to continue. The second stage 5-page report will preliminarily be due on March 1st. At these stages payloads do not have to be 100% complete, but preference will be given to payloads based on their current capability and degree of completion.
- The preliminary launch window is in the Easter holidays (weather dependent).
- One month after the launch day will be the hand in submission date for each team's final post-flight 5-page report.
- For those who wish to attend, a finals day will be held after this date in Cambridge to award prizes and to display teams' research results.

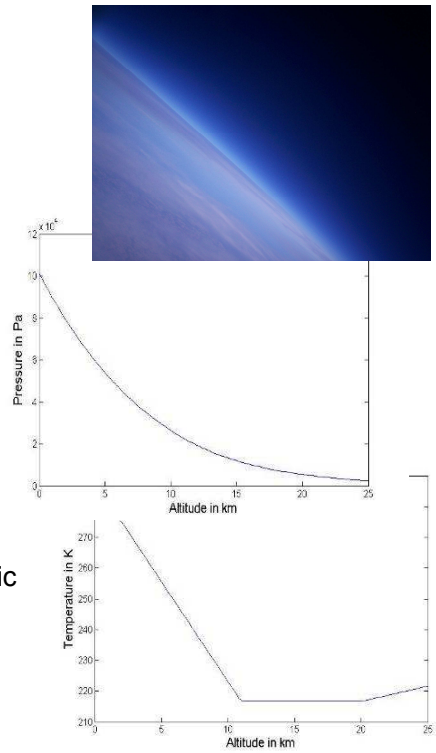
Support

Our website will have guidance on how to build a basic payload using microprocessor development boards, with suggested ways to attach sensors and cameras, useful links, example extra experiments and example source code. This should be enough to help all teams to create a standard payload which can then be further improved. However, teams are welcomed and encouraged to use different styles of hardware and software as they wish.

A forum will be also created on the CU Spaceflight website for competing teams to share ideas and help troubleshoot problems. The 10 teams entering the second stage of the competition will then receive increased mentoring if desired.

Experiments could include:

- Temperature and Pressure logging to investigate atmospheric behaviour with altitude.
- Sound attenuation in low pressure gases.
- Logging of accelerometer data to measure wind speeds.
- Automated photography depending on time or altitude.



Right: Photograph and example data as could be taken by the basic payload.

Cambridge University Spaceflight

Cambridge University Spaceflight is a student-run team dedicated to developing the technology needed to reduce the cost of sub-orbital access to space for scientific experiments. The team has already launched several payloads to the edge of space on high-altitude helium balloons and is in the process of designing a system to launch a rocket from a balloon platform. The CU Spaceflight team is also committed to fostering interest in science in the next generation of scientists and engineers. We believe that by demonstrating fun experiments and by building things with young people of all ages that we can help to inspire them to pursue science education to a higher level.

The team has developed the skills and equipment necessary to track and recover balloon payloads at minimum cost and are current holders of the UK Amateur Altitude Record with a balloon payload that reached 33.29km (109,200ft). Our work has been featured by journalists across the world including The BBC, C4, New Scientist, Nature, The Guardian, The Times and many internet sites.
For further information on the competition or the team please view our website www.cuspaceflight.co.uk or email enquiries to cuspaceflight-competition@srcf.ucam.org.