The University Of Sheffield.

Aerospace Engineering.

News Update Autumn 2007

HIGH FLYING SHEFFIELD AEROSPACE GRADUATE LANDS TOP AWARD

Ed Spalton receiving his award from Robin Brown of Airbus UK

A Sheffield Aerospace Engineering graduate has been named as Best Aeronautical Engineering Student 2007 at the national Science, Engineering and Technology (SET) awards, for a project which looked into the manufacturing quality of turbine blades and how this affects their aerodynamic performance. Ed Spalton, 22, who graduated with a first class MEng Aerospace Engineering degree in June 2007, was presented with the Airbus-sponsored award trophy by Robin Brown from Airbus UK. The judges assessed the technical quality and achievement of the applicants' projects, together with their personal qualities, overall knowledge of their discipline and ability to be an ambassador for the discipline. Ed's achievement was announced at a ceremony attended by more than 500 students, academics and business leaders at London's Alexandra Palace. Record numbers of entries were received from every major university in the United Kingdom and Ireland, and judges paid tribute to the exceptional quality of this year's work. In the final round Ed saw off challenges from two students from Cambridge University. Well done Ed.

HOW OUR STUDENTS SPEND THEIR SUMMERS

Whilst many of our students spend the summer travelling, relaxing and re-charging their batteries in readiness for their studies in the following academic year, others choose to do placements at engineering companies. Tom Snook, now in year 4 of our MEng course, spent last summer working at Thornton Precision Components in Sheffield. The company supplies precision forged components, primarily to the aerospace and orthopaedic industries. Tom says:

"The Aerospace Engineering staff at Sheffield put me in contact with the company. My job was related to new markets and in order to do it I needed to develop an understanding of the production process, the customer base and the market for the company's products. Although this wasn't a technical placement, it was surprisingly good experience. I gained first hand knowledge of how a company is run, saw how problems were rectified and made contacts within the aerospace sector. The advantage of working in a relatively small company was that I had the chance to meet people from all levels of the business. The whole experience was thoroughly enjoyable and rewarding and I even managed to make contact with a senior HR person at a large company in the aerospace sector who now has my CV!"

SHEFFIELD HOSTS MAJOR EUROPEAN STUDENT DESIGN WORKSHOP

During July and August, Aerospace Engineering at the University of Sheffield hosted a major student design workshop, Euroavia DeWo 2007, in conjunction with Rolls-Royce. Euroavia is the European Association of Aerospace Students. Twenty five students from 15 European aerospace universities participated in the workshop. Their task was to perform the preliminary design of an integrated electrical system for an unmanned aerial vehicle. The students were actively assisted by Sheffield's academic staff, as well as receiving lectures from supporting companies. The design activities were complemented by a full social programme, which included a trip to a local gliding club, a visit to an RAF base and ice skating. The culmination of the event was a final design review held at Rolls-Royce, Derby, followed by a dinner with senior staff from the company. Four Sheffield Aerospace Engineering students – Matt Raywood, Callum Ward, Helen Waddilove and Adam Slater - acted as student ambassadors, organising the social activities and providing support throughout the workshop. As a mark of thanks for their tremendous efforts, Euroavia hosted and funded a four day trip to The Netherlands for our ambassadors.

Euroavia glider flying exercise

TOP FEMALE STUDENT WINS NEW AWARD

Rebecca Adams, the top female student in year 4 of the MEng Aerospace Engineering in 2006-07, was the first recipient of the Zonta International Award for the University of Sheffield. This new award, which will be made available annually, has been provided through the generosity of Zonta International, a global organisation of executives and professionals working together to advance the status of women worldwide through service and advocacy. Our colleague, Dr Alma Hodzic from the Department of Mechanical Engineering helped in setting up this award.

STUDENTS QUALIFY AS PILOTS

Three of the first students to join our Private Pilot Instruction courses have now obtained their Private Pilot's Licences. Nick Allen, who graduated with a BEng in Aerospace Engineering with Private Pilot Instruction in July 2007, is now working as a flying instructor, while Richard Boynton and Andy Smith are currently completing the fourth and final year of the MEng course with Private Pilot Instruction. Congratulations to all three.

STUDENT PROJECT – UNMANNED AERIAL VEHICLE

Last session's year 3 MEng students worked on a group project where they formed competing groups, each of which designed, built and flew a mini-UAV (unmanned aerial vehicle).

Small unmanned aircraft can be used to penetrate and explore hazardous environments or to carry out routine or covert surveillance missions. The specification given to students was to build a UAV that was useful to the emergency services, robust, affordable (< £400) and easy to manufacture.

The project culminated in a flying competition where the UAVs were flown by a professional pilot. The winning team, shown below, was presented with a cash prize by a research company – Aurorra - that had been heavily involved in the project. As a next step one of the designs was presented at the MAV07 Competition held in Tolouse in September 2007.

The UAV group design project winning team being presented with cheques and certificates by Aerospace staff, May 2007

STUDENT GROUP DESIGN PROJECT WINS ROYAL ACADEMY OF ENGINEERING COMPETITION

One of the teams that took part in our Unmanned Aerial Vehicle Project won a Royal Academy of Engineering Student Engineering Design Project Competition for their work on 'The Design, Development and Production of a Semi-Autonomous Micro Aerial Vehicle'. The team was supervised by Dr Chris Bingham of the Department of Electronic and Electrical Engineering.

A YEAR ON THE OTHER SIDE OF THE POND

Two of our third year students recently completed a very rewarding year studying at Virginia Tech in the USA. One of them, Jason Forshaw, writes:

"Studying abroad is a unique and hugely fulfilling experience. Spending my third year at Virginia Tech provided me with the opportunity to live in another country and experience a foreign culture for a year. It also enabled me to travel widely and develop a large group of international friends. Academically, the experience augmented my theoretical knowledge by enabling me to study disparate specialist modules that aren't on offer in Sheffield, such as GPS theory and design, whilst still providing me with the equivalent broad range of modules that I would have taken at Sheffield. My capstone design project, entitled "Proposal for a Manned Mission to Mars: Mission Architecture and High Level Design", has prepared me well for the future by setting up opportunities in the astronautic systems industries and enabling connections to be established with the American professional institutions. On returning to Sheffield, I found that settling back in was not a problem. Studying abroad is truly an exceptional experience I would highly recommend."

MANNED MISSION TO MARS – PRIZE WINNING DESIGN

As part of their year at Virginia Tech, outlined previously, our students took part in a group design project. Jason Forshaw led a team of eight students that designed vehicles capable of transporting and sustaining a crew of four on the Martian surface for 18 months. The design won second place in the AIAA's (American Institute of Aeronautics and Astronautics) Space Transportation Design Competition that had participants from universities right across the USA.

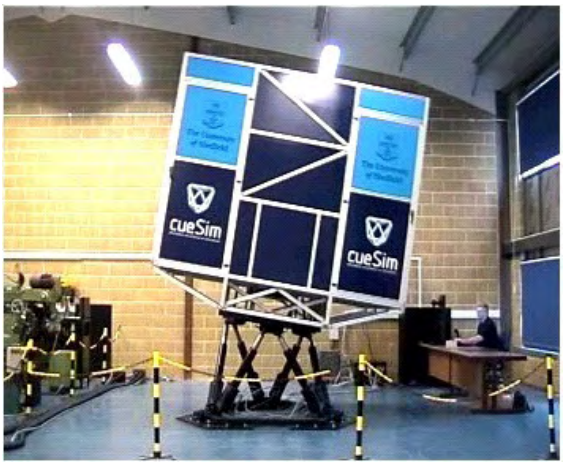
AEROSOC – THE SHEFFIELD AEROSPACE SOCIETY

The Sheffield Aerospace Society (AEROSOC), supported by the University's Union of Students, coordinates sports activities, socials and trips for our students. During the past year Society members organised two industrial visits. The trip to Airbus in Bristol saw our students visiting the assembly line of a normal A320 wing, the A380's landing gear testing site, the hangar where the first three A340M wings were being assembled, as well as the machinery used to drill holes into components. At Rolls-Royce in Derby, Aerospace Society members saw the New Engine Assembly and Test facilities and visited the Heritage Trust exhibition. Last year's Aerospace Society President, Inaki Azpiazu-Pelaez says:

……. "These trips were a huge success and the facilities we saw were very impressive. The visits really helped to put our academic studies into an industrial context."

FLIGHT SIMULATION HELPS STUDENT GET PUBLISHED

Flight simulation is an important tool for the aerospace design engineer. At Sheffield our two flight simulators help our students with flight training and provide them with the opportunity to use simulation in their final year projects. One of our students recently developed an algorithm for the flight controller of the F16 aircraft and the work was presented at the IEEE (Institute of Electrical and Electronics Engineers) International Conference on Fuzzy Systems in July 2007. The IEEE is a world leading professional association for the advancement of technology. The findings have also been published in the International Federation of Automatic Control's publication on Engineering Applications of Artificial Intelligence.



Six motion axis flight simulator which simulates the flight characteristics of the Lockheed Martin F16 fighter jet

SHEFFIELD MSc STUDENTS DESIGN METAMORPHIC UNMANNED AERIAL VEHICLE

The prototype of the unmanned aerial vehicle (UAV) that staff and MSc students presented at the Paris Air Show in 2005 was displayed again at the 47th Air Show in June 2007. The Aelius UAV is entirely built out of polymer composite materials and more specifically, carbon fibre/epoxy systems. The students have set up a company, AEROART, and raised 500K Euros to build and fly Aelius, a metamorphic UAV that can fly, become a boat and operate as a submarine. To see a video of the first flight of Aelius, follow the link **www.aeroart.eu.**