Aeronautical Engineering
Group Design Project Presentations

Joint event with the Loughborough Branch of the Royal Aeronautical Society

Tuesday 13 June, 7–9 pm

Edward Herbert Building Lecture Theatre J104

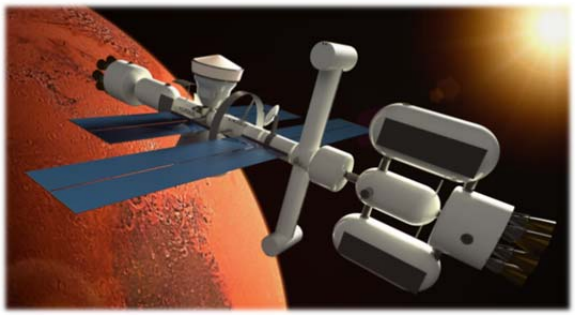
Posters and models will be on display in the foyer from 6:30 pm
Drinks reception to follow the presentations from 9 pm

“Nemesis” Autonomous Fighter Aircraft

Nemesis is an autonomous next generation fighter aircraft which has been designed for entry into service by 2060. Since the introduction of aircraft into the theatre of war, controlling airspace in combat zones has been a major priority for all parties. Nemesis is able to achieve this while also reducing the risk to human life through its autonomy. It is an advanced combat system that combines extreme manoeuvrability with a tail-sitting VTOL capability.

“Casius” Mission to Mars

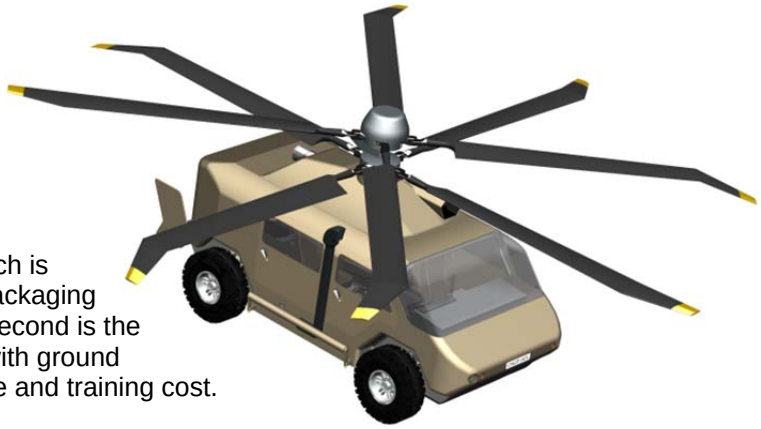
Casius is a concept for a manned mission to Mars. Many space agencies are planning manned missions in the 2030s, as Mars could be the key stepping stone to further human exploration of the solar system and beyond. The Casius mission will send three astronauts to Mars and return them by 2038, with a total mission time of 912 days, including a 524 day surface mission. Commercial launch vehicles will deliver the total mission mass of 1,054 tonnes to low Earth orbit for assembly. The transit vehicles will depart in 2035 on their 197 day journey to Mars. Descent vehicles will carry the crew and equipment to the Martian surface, where the crew will use a rover to gather surface samples. The crew will launch from the surface to return to their transit vehicle in mid-2037, returning to Earth 174 days later.



“Skeiron” Supersonic Trans-Pacific Airliner

Skeiron is a supersonic civil air transport aircraft capable of carrying 60 passengers across the Pacific. Current civil airliners can fly from Los Angeles to Hong Kong in 16 hours—Skeiron can do it in just 5 hours. Cruising at Mach 2.5 for up to 6,000 nmi makes this aircraft the longest range supersonic aircraft ever. New and existing technology is used all across the aircraft, including bespoke variable cycle engines, over 50% composite structure and an augmented reality system to aid pilot vision. Skeiron is bringing supersonic travel back to the public.

“Pegasus” Military Flying Car



Pegasus aims to save lives on ground-based forward patrol missions. In current operations, improvised explosive devices (IEDs) or other unforeseen obstacles can cause patrols to halt making all crew vulnerable to attack. Pegasus can use flight to quickly overcome this. The vehicle has two very unique features: The first is a co-axial rotor system used to provide lift which is retracted behind the vehicle to reduce the packaging dimensions during ground operations. The second is the cockpit controls which are designed in line with ground vehicles which reduces both the training time and training cost.

“Atlas” Unmanned Aircraft System

(Poster and aircraft only)

Project “Atlas” is Loughborough University’s entry to the IMechE UAS Challenge 2017. The system has been developed to complete a representative humanitarian aid mission, and will be assessed on Payload Delivery, Reconnaissance and Endurance. The aircraft operates with complete autonomy, performing take-off, target identification and landing without any operator input. Key features of the design include its topologically optimised fuselage, T-tail configuration for maximum aerodynamic efficiency, use of the latest generation of the Pixhawk flight controller and high-speed ground-based optical character recognition (OCR). With an MTOM of 6.9 kg, the aircraft can deploy two 1 kg bags of flour to any target within a 10 km range. Flight testing has begun and the aircraft has already successfully completed an autonomous mission in preparation for the competition in mid-June. An extensive test programme has been developed to ensure the system performs to the maximum of its ability during the competition.

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