

Innovate UK

Results of Competition: Aerospace Technology Institute Batch 26

Competition Code: 1309_SPEC_TRA_ATI_batch26

Total available funding is £64,672,461 from BEIS

Note: These proposals have succeeded in the assessment stage of this competition. All are subject to grant offer and conditions being met.

Participant organisation names	Project title	Proposed project costs	Proposed project grant
ROLLS-ROYCE PLC	WESTUN (Whole Engine STructural UNderstanding)	£34,306,890	£17,153,445

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Project description - provided by applicants

WESTUN (Whole Engine STructural UNderstanding) project seeks to validate the novel UltraFan architecture through confirming the whole engine response to structural loads and vibrational excitation measured under dynamic operating conditions. This will be achieved through extracting extremely valuable and unique structural data from a heavily instrumented UltraFan demonstrator vehicle, to validate whole engine structural models and predicted behavioural responses.

Successful integration of a large composite fan driven by a geared power transmission and separable gas generator core, introduces extreme structural power transmission interface challenges.

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ROLLS-ROYCE PLC	LUSH (Lean UltraFan 2 Stage High Pressure Turbine)	£34,442,928	£17,221,464

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Project description - provided by applicants

The LUSH project overcomes the complex challenges associated with integrating the highly novel Advance3 core gas generator (HP Compressor, Combustor and HP Turbine) into the new UltraFan architecture.

The project, furthermore, provides cutting edge, innovative technology and gas generator component detailed design to ensure capable, safe and reliable solutions are realised while operating in the longer life, higher temperature environment.

The project also provides manufacture of parts and specialist engineering support and analysis during the engine test campaign which in turn will develop key understanding of the UltraFan architecture to be harnessed for the development of future UltraFan platforms.

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CFMS SERVICES LIMITED	Aero Flux	£703,313	£351,656
AIRCRAFT RESEARCH ASSOCIATION LIMITED		£145,961	£72,980
SHORT BROTHERS PLC		£224,943	£44,989
ZENOTECH LTD		£474,720	£303,821

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Aero Flux follows the successful Hyperflux++ (102366) project developing high order computational fluid dynamics (CFD) technology for aerospace. Original partners CFMS (Lead, CFD methods and advanced IT technology), Zenotech (solver technology and support for many-core computing), ARA (mesh generation and validation against wind tunnel data) and Bombardier (nacelle and thrust reverser design and development) will also address requirements for Airbus (surface effects for skin friction drag and undercarriage acoustics) by developing the capability for fluid-structure interaction, broadband acoustics, accelerated time-stepping, advanced high order mesh generation and multi-disciplinary coupling. The project supports international dissemination and export opportunities for UK aerospace technology.

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BOEING UNITED KINGDOM LIMITED	Future Nacelle - Very Short Composite Lipskin	£3,578,171	£0
CAV ICE PROTECTION LIMITED		£2,888,376	£1,733,026
DONCASTERS LIMITED		£697,607	£348,804
University of Sheffield		£2,613,964	£2,613,964

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Project description - provided by applicants

Integration of non-traditional nacelle anti-icing and erosion protection technology to enable the manufacture of a composite engine inlet assembly, while improving acoustic attenuation and not compromising material durability. The improved inlet assembly will benefit aircraft performance through reduced drag.

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Participant organisation names	Project title	Proposed project costs	Proposed project grant
QINETIQ GROUP PLC	Occupancy Productivity and Essential New (OPEN) Aerodynamic Simulation Capabilities	£559,080	£279,540
Boeing UK Limited		£7,296,551	£3,648,276

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Project description - provided by applicants

QinetiQ and Boeing have a vision to establish world class simulation capabilities in the UK to enhance the UK involvement in low-speed aerodynamics for commercial aircraft research, design and production offering cross-market exploitation in other sectors. The capabilities support the Aerospace Technology Strategy by enabling UK academia and industry to influence high value design for innovative aircraft architectures. The investment in 5m Wind Tunnel upgrades and provision of two physical reference models will provide an open access low-speed aerodynamic dataset which can be exploited by UK organisations to validate CFD models and provide a baseline reference to underpin future research.

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HYBRID AIR VEHICLES LIMITED	E-HAV1, Electric-Hybrid Air Vehicle Phase 1	£623,500	£261,870
GOODRICH CONTROL SYSTEMS		£898,164	£143,706
University of Nottingham		£714,890	£714,890

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E-HAV1 will develop electric flight propulsion system technologies at very high power density aligned to market needs for these high power motor and drive systems and will demonstrate them in a representative ground test environment with a suitably sized propeller to validate the performance of the resulting prototypes and the modelling tools developed during the programme.

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GOODRICH ACTUATION SYSTEMS LIMITED	Flexible & Adaptive Assembly Automation of Actuation Systems (FAAAAS)	£6,794,654	£3,397,327
BAUROMAT (UK) LTD		£831,000	£581,700
TWI LIMITED		£509,579	£254,790

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Project description - provided by applicants

UTC Aerospace Systems is a leader in advanced systems to the aerospace market and is delighted to have received this investment. The funding allows development of new technology for its "Future Factory" concept for high value systems, directly benefiting the UK. This project, Flexible & Adaptive Assembly Automation of Actuation Systems, is based around innovative factory technologies that will enable the following objectives to be realised: Adaptable to distributed architecture if required by air framers.

- * Development of Adaptive & Flexible Automation Manufacturing Cells
- * Real-time adaptive workflow monitoring and simulations of the value chain
- * Leverage of Product eDNA in assembly/test
- * Design for Automation

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L.P.W. TECHNOLOGY LIMITED	Additive Innovation of Recycling, Reuse and Revert (AIR 3d)	£5,163,798	£2,581,899
AEROMET INTERNATIONAL LIMITED		£353,304	£141,322
BAE SYSTEMS (OPERATIONS) LIMITED		£228,984	£91,594
Manufacturing Technology Centre		£626,537	£626,537
MATERIALS SOLUTIONS LIMITED		£2,343,046	£937,218
RENISHAW P L C		£1,122,468	£561,234
ROSS & CATHERALL LIMITED		£600,133	£240,053
University of Sheffield		£442,643	£442,643

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To create a UK powder supply chain optimised to facilitate increased adoption of AM for structural metal parts in the Aerospace sector. The project will allow for joint understanding and cooperation via the Aerospace Supply Chain alongside other market sector adopters. Developing, testing and recording powder in use to create control and quality standards not currently existing in the supply chain process critical to allow for the industrialisation of AM. The project will look to close gaps and market failures whilst exploiting the future demands of AM in Aerospace whilst enhancing competitiveness in the market.

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