The Royal Aeronautical Society’s 5th Aircraft Structural Design Conference, undertaken with the support of the Aerospace Research Institute, University of Manchester, will address the challenges facing the designers of the next generation aircraft. These arise because the new designs will need to meet strict environmental constraints and will be subject to ever increasing pressures for reductions in manufacturing and life-cycle costs and continual improvements in overall performance/efficiency factors. The resulting aircraft will be complex, requiring multi-disciplinary design approaches and solutions in a distributed design environment.

The conference seeks contributions covering current research focused on the design and manufacture of future civil and military air-vehicle structures both manned and uninhabited. The scope of the conferences covers both airframe and engines. This includes consideration of innovative forms and design scenarios together with the challenges resulting from considering the complete aircraft life-cycle from initial concept to final disposal. The design and analysis of structures constructed from CFRP and novel materials is a major topic area for the conference.

These challenges need complex and innovative design solutions that often require the use of interdisciplinary and dynamically interactive design methods that may be supported by knowledge based engineering tools. In addition, today’s design teams are multinational, distributed across continents or the globe, and the computational methods employed must be able to support a distributed work environment. The control of such complexity in the designs and the design process is a major issue that the conference wishes to address.
**PROGRAMME - TUESDAY 4 OCTOBER 2016**

08.00  **Registration & Refreshments**

08.30  **CHAIRMAN’S WELCOME**
Dr Malcolm Nash FRAeS, Chairman, Structures & Materials Group, The Royal Aeronautical Society

08.45  **KEYNOTE SPEAKER: TECHNOLOGY DEVELOPMENT: A RIGOROUS GATED APPROACH**
Torben Syberg, Technical Fellow, Boeing Commercial Airplanes, USA

**ROOM 1**

**SESSION A – CFRP (PART 1)**

09.30  **(A.1) On the Fatigue Life Analysis of Monolithic Laminated CFRP Designs of Large Aircraft Spoilers**
Nitesh Kumar Karna, Researcher, Johannes Kepler University Linz, Austria

10.00  **(A.2) The Effect of Geometric Parameters on the Stress Concentration of Rectangular Laminated Composite Plates with Central Rectangular Hole Under Transverse Loading**
Asad S. Albostami, PhD Student, School of Mechanical, Aerospace and Civil Engineering, UK

11.00  **(A.3) Commercialised Use Of 3D Woven Composites In The Aerospace Industry**
Andrew Main, Senior Technical Consultant, MSC Software, UK

11.00  **Networking Refreshment Break**

11.30  **SESSION C – CFRP (PART 2)**

**ROOM 2**

**SESSION B – MDO & OPTIMIZATION (PART 1)**

09.30  **(B.1) Large-Scale Numerical Optimisation for Preliminary Sizing of Aircraft Structures**
Dr Vincent Malmedy, Innovation Lead, Sogeti UK Ltd.

10.00  **(B.2) Efficient Gradient Based Optimization Approach of Composite Stiffened Panels in Multidisciplinary Environment**
Sascha Dähne, Research Engineer, German Aerospace Centre, Germany

10.30  **(B.3) The Application of True Multi-Scale Modeling in a Designed for Performance Environment**
Michael Doyle, Scientist, BIOVIA, UK

11.00  **Networking Refreshment Break**

11.30  **SESSION D – MDO & OPTIMIZATION (PART 2)**

12.30  **(C.2) Experimental and Computational Study of Ballistic Impact on Fibre Reinforced Composite Materials**
Syed Idrus Bin Syed Abdullah, PhD Researcher, Imperial College London

12.30  **(C.3) A Multi-Level Set Gradient Based Algorithm for Global Buckling Optimization of Blended Composite Structures**
F. Farzan Nasab, PhD Candidate, University of Twente, Netherlands

13.00  **Networking Lunch**

14.15  **KEYNOTE SPEAKER: A FUTURE VISION FOR AEROSPACE STRUCTURAL DESIGN**
Royston Jones, Exec VP European Operations & Global CTO, Altair Engineering Ltd

**SESSION E – CFRP (PART 3)**

15.00  **(E.1) The Effect of Panel Boundary Conditions on Laminate Damage Tolerant Strength**
Miss Cara Harley, PhD Researcher, Queen’s University Belfast, UK

15.30  **(E.2) On Understanding the Applicability of Mohr-Coulomb Failure Criterion for Composite Materials**
Nimal Kumar Balasubramani, Student, The University of Nottingham, UK

16.00  **Networking Refreshment Break**
PROGRAMME - TUESDAY 4 OCTOBER 2016 (continued)

ROOM 1
SESSION F - CFRP (PART 4)
16.30 (F.1) Crushing Analysis of Foam and Honeycomb Filled Metallic Tubes for Crashworthy Aircraft Structures
   Luis Romera, Mechanical Engineer, University of Coruna, Spain

17.00 (F.2) Inkjet Printed Reconfigurable Toughened Composites for Aerospace Structures
   Prof Alma Hodzic, Professor in Advanced Materials Technologies, The University of Manchester, UK

17.30 Drinks Reception
   Location tbc

End of Day One

PROGRAMME - WEDNESDAY 5 OCTOBER 2016

08.00 Registration & Refreshments

08.30 CHAIRMAN’S WELCOME

08.45 KEYNOTE: EXPLOITING AEROELASTIC DEFLECTIONS TO ENABLE GREENER AIRCRAFT DESIGNS
   Prof. Jonathan Cooper, FRAeS, Airbus Sir George White Chair of Aerospace Engineering, University of Bristol, UK

ROOM 1
SESSION H – MANUFACTURING (PART 1)
09.30 (H.1) Generative Design for Additive Manufacturing Applications
   Mr Georgi Bonev, Solution Consultant SIMULIA, Dassault Systèmes Bulgaria EOOD

10.00 (H.2) Closing the Gap Between AS-Designed and AS-Manufactured Parts Using Multi-Scale Multi-Physics Simulation for Additive Manufacturing Processes
   Mr Georgi Bonev, Solution Consultant SIMULIA, Dassault Systèmes Bulgaria EOOD

10.30 Networking Refreshment Break

SESSION J – STRUCTURES (PART1)
11.15 (J.1) Alternative Technologies and Design For Metallic Parts In Aviation: The use of Titanium Investment Casting for Aircraft Structural Components
   Dr Emanuele Basile, Stress Engineer, GE Aviation

11.45 (J.2) Efficient Multifidelity Design of Aerospace Structures
   Daniel Francis, University of Bristol, UK

12.15 (J.3) Simulated Impact Response of Metallic Projectile on Foam Filled Metallic and Laminated Sandwich Panels
   Muhammad Kamran, Student, Northwestern Polytechnical University, China

12.45 (J.4) Finite Element Analysis of Notch Sensitivity in Unconventional Aerospace Laminates with Novel Ply Angles and Stacking Sequences.
   Edward McCarthy, Student, University of Manchester, UK

13.15 Networking Lunch

14.15 KEYNOTE SPEAKER: TBC
   Dr Robert Harwood, Global Industry Director, Aerospace and Defence, Ansys

ROOM 2
SESSION G - MANUFACTURING (PART 1)
10.00 (G.1) Current Sandwich Designs and Future Monolithic Designs of Large Aircraft Spoilers: A Review Regarding Structural Analysis and Manufacturing Processes
   Martin Meindlhumer, Researcher, Johannes Kepler University Linz, Institute of Constructional Lightweight Design, FACC Operations GmbH, Austria

10.30 (G.2) Fibre Steered Skin Design of Composite Thermoplastic Horizontal Stabilizer Torsion Box
   Wouter van den Brink, Senior Scientist, Netherlands Aerospace Centre (NLR)

ROOM 2
SESSION I – AEROELASTICITY (PART 1)
10.30 Networking Refreshment Break

SESSION K– AEROELASTICITY (PART 2)
11.15 (K.1) Aeroelastic Tailoring for Enhanced Aerodynamic Wing Performance
   Eduardo Pedro Krupa, PhD Student, University of Bristol

11.45 (K.2) Flutter / LCO Behaviour of Highly Flexible Wings
   Andrew Eaton, PhD Researcher, University of Bristol

   Dr Rafic Ajaj, Lecturer, University of Southampton

12.45 (K.4) Robust Aeroelastic Tailoring For Composite Aircraft Wings
   Muhammad F. Othman, PhD Student, University of Bristol, UK

Networking Lunch

KEYNOTE SPEAKER: TBC
   Dr Robert Harwood, Global Industry Director, Aerospace and Defence, Ansys
PROGRAMME - WEDNESDAY 5 OCTOBER 2016 (continued)

15.00  SESSION L – STRUCTURES (PART 2)
(L.1) Shape Adaptive Technology for Aircraft Engine Nacelle Inlets
Ulrich Kling, Bauhaus Luftfahrt e.V, Taufkirchen
(L.2) Assessment of Structure Weight Resulted from Heating
Ms Xiao Yuan, Graduate Student, Nanjing University of Aeronautics and Astronautics, China

15.30  Networking Refreshment Break

16.00  SESSION N - TBC
(N.1) Strut-braced Wing Sizing with a Geometrically Nonlinear Reduced Order Beam Model
Christopher Szczyglowski, Student, University of Bristol
(N.2) Study of an Influence of Reynolds Number on a Model Deformation in a Wind Tunnel Flow
Dr Svetlana Kuzmina, Leading Researcher, TsAGI – Central Aerohydrodynamic Institute, Russia

16.30  End of day 2

17.00  CONFERENCE BANQUET
University of Manchester: Christie's Bistro

18.00  Drinks Reception Begins
19.30  Dinner
22.00  After Dinner Talk: Speaker TBC
23.00  Departure

PROGRAMME - THURSDAY 6 OCTOBER 2016

08.00  Registration & Refreshments
08.30  CHAIRMAN’S WELCOME
08.45  KEYNOTE SPEAKER:
Frank Kirkland, Rolls-Royce Senior Fellow – Mechanical Integrity

09.30  SESSION P - POLARBEAR (PART 1)
(P.1) EU-POLARBEAR – Project Overview
Prof Christian Hühne, Head of Department, German Aerospace Centre

10.00  Networking Refreshment Break

10.30  (P.2) Enhancement of Weight Efficiency for Lattice Section on the Basis of New Approach to the Scenario of Designing of Lattice Structures of Composite Fuselage
Dr Victor Fomin, Leading Research Scientist, TsAGI – Central Aerohydrodynamic Institute, Russia

11.00  SESSION Q – STRUCTURES (PART 4)
(Q.1) Rotordynamic Analysis with Flexible Rotors and Non-Symmetric Components
Mike Coleman, Senior Technical Consultant, MSC Software

11.30  SESSION R - POLARBEAR (PART 2)
(R.1) Testing and Analysis of Post-Buckling Behaviour of Anisgrid Prepreg Panel Under Compression
Steffen Niemann, Scientist, German Aerospace Centre

12.00  (R.2) Anisogrid - Stiffened Shell Analysis with High Order Kirchhoff – Love Elements
Thomas Ludwig, Senior Engineer, SMR S.A, Switzerland

12.30  CLOSING COMMENTS
TECHNICAL TOURS

All tours are open to all conference delegates. Each the NCCEF tour and the National Graphene Institute tour are a short 8 minute walk from the Manchester Conference Centre. BAE Systems will also be conducting a technical tour on their Samlesbury site. Coaches will be provided you to the site of the visit and back to Manchester Conference Centre. Places are limited and will be given on a first come first serve basis, so make sure you book your place when registering for the conference. Please note that booking is essential and delegates can only attend one technical tour.

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<td>12.30 Coaches to depart from conference venue to BAE Systems site</td>
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<td>13.45 Tours to begin</td>
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<td>15.45 Coaches to depart from BAE Systems site for Manchester Conference Centre</td>
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CONFERENCE NETWORKING EVENTS

MONDAY 3 OCTOBER 2016
Pre-Registration Networking Evening - Location TBC
18.00 - Meet in pub

Join us for a drink on the eve of the conference. This will be a fantastic opportunity to meet other delegates, speakers and members of the Conference Organising Committee, whilst experiencing traditional Manchester Culture. This event is open to all and free to attend, although drinks are to be bought at delegates expense. Pre-registration is appreciated but not essential.

TUESDAY 4 OCTOBER 2016
Evening Drinks Reception -
18.00 - Drinks Reception Begins

The first evening of the conference will feature a drinks reception to be held in Manchester (location tbc). Further details will follow shortly.

WEDNESDAY 5 OCTOBER 2016
Conference Banquet - University of Manchester
18.00 - Drinks Reception Begins
19.30 - Dinner
22.00 - Evening closes

All conference attendees are invited to a conference banquet which will take place in
The evening will begin with a drinks reception and you will have the opportunity to explore the university. A three course meal will be served, followed by an after dinner talk.

This event is open to all and free to attend, but registration is essential. The venue is a short walk from the conference venue.

To find out more about the University of Manchester please visit www.manchester.ac.uk

THURSDAY 6 OCTOBER 2016
Technical Tours to NCCEF and the National Graphene Institute
13.00 Tours to begin
14.00 Tours to finish

Technical Tours to BAE Systems Samlesbury
12.30 Coaches to depart from conference venue to BAE Systems site
13.45 Tours to begin
15.45 Coaches to depart from BAE Systems site for Manchester Conference Centre
16.50 Arrive back at Conference Centre

These tours have kindly been arranged by local businesses and will include a visit to BAE Systems Samlesbury, the National Composites Certification and Evaluation Facility (NCCEF) or the National Graphene Institute. Places are limited for each tour so booking is essential.

To find out more about the tours please visit the following websites:
http://www.baesystems.com
www.graphene.manchester.ac.uk
www.nccef.manchester.ac.uk

To find out more information on any of these networking events and register, please visit our website or contact RAeS Conference and Events Department on +44 (0) 20 7670 4345 or conference@aerosociety.com

FOR MORE INFORMATION AND TO REGISTER www.aerosociety.com/5ASD
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Prof Alan Morris, Royal Aeronautical Society, UK

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Prof Zheng Zhong, Tongji University, Shanghai, China
REGISTRATION FORM

Reference: #788

REGISTRATION FORM:

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REGISTRATION FEES: (includes refreshments, lunch and access to the conference proceedings)

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RAeS Student Affiliate Members may attend free of charge subject to availability.

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All payments should be made in Sterling (UK£).

Online: Registration and secure payment can be made online at www.aerosociety.com/conference

Cheque: Should be made payable to the RAeS and enclosed with this registration form. Please add £15 if your cheque is not drawn on a UK bank to cover bank charges/currency exchange rates.

Bank Transfer: Payments can be made by bank transfer into Account No. 01564641, Sort Code 40 05 22, HSBC Bank plc, Mayfair Branch, 18a Curzon Street, London W1J 7LA, UK. Please indicate on the registration form if you have paid your fees direct.

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