

# The Institute for Aerospace Technology (IAT)

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Director



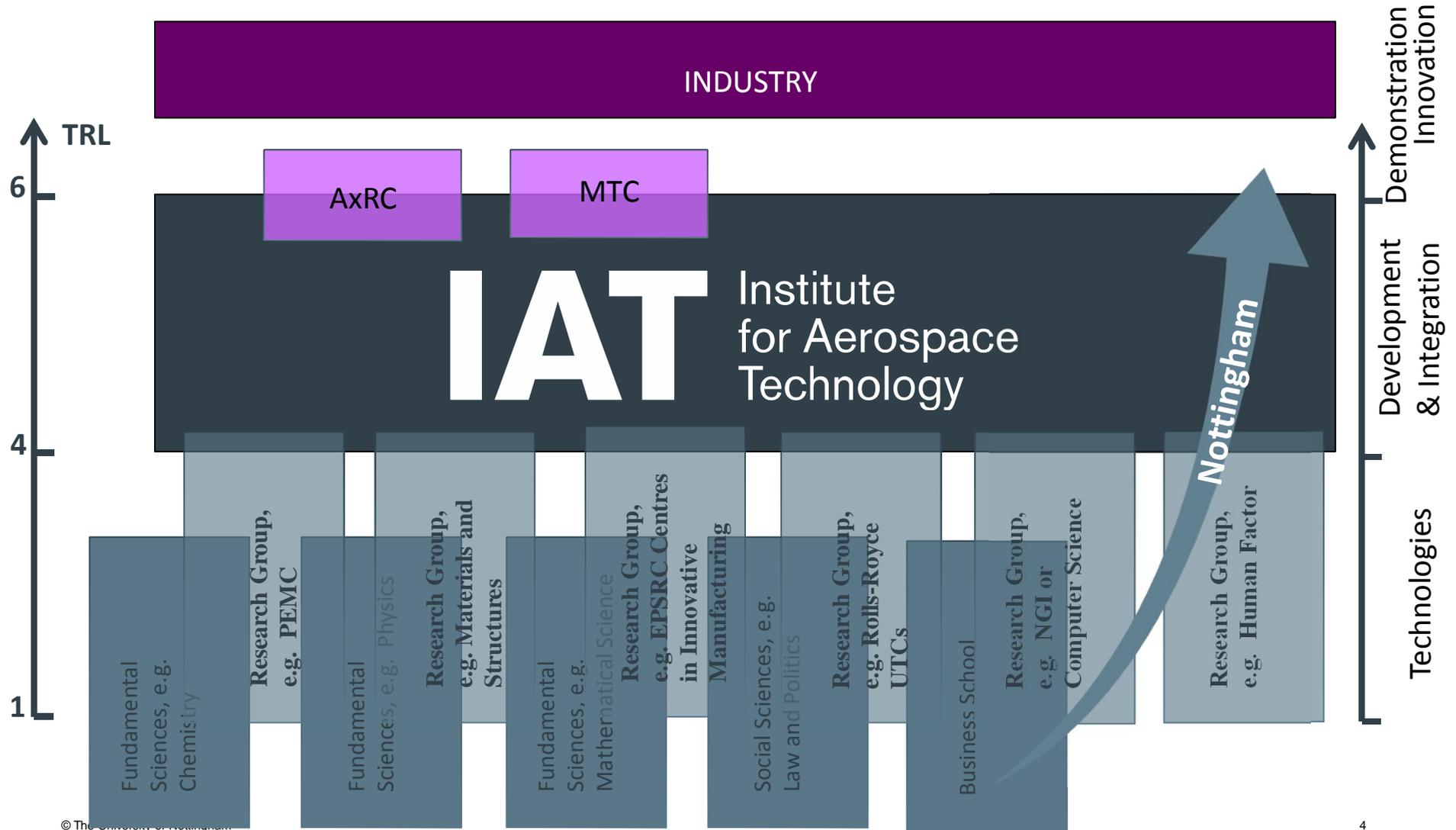
- A major centre for aerospace research and education
- Home to the **Institute for Aerospace Technology (IAT)**
- International and national engagements & reach
  - E.g. on/with Clean Sky 2
  - E.g. with the ATI
- Regional focal point in Aerospace
  - E.g. via/with the MAA or NATEP
- Partnerships with industry leaders including:-
  - **Airbus** Group
  - **BAE** Systems
  - **GE** Aviation
  - **Rolls-Royce**
  - The **Boeing** Company



*To integrate, develop and promote  
the University of Nottingham's  
aerospace research portfolio:  
delivering world leading aerospace  
research with translational impact  
with and for our partners*

# The Vision for the IAT

## – TRL 1 to 6 pathway



The IAT supports the University to develop its research excellence across five strategic areas:



Aero Engines and Propulsion



Aerospace Materials and Structures



Aerospace Manufacturing



Aerospace Operations



More Electric Aircraft

**The Institute for Advanced Manufacturing**, is a leading international research centre covering:

- Additive manufacturing (AM)
- Cloud manufacturing
- Conventional and unconventional machining
- Evolvable manufacturing systems
- Intelligent assembly, tooling & fixturing
- Process control and optimisation



**INNOVATE** (The **I**ntegration of **N**ovel **A**erospace **T**echnologies) is an EU-funded Marie Curie PhD training programme

13 researchers working in a multidisciplinary team on a range of technologies, including:-

- Propulsion systems
- Airframes and controls
- Operations
- Navigation
- Communication

INNOVATIVE, follow up project, due to start in March 2016 with 24 new researchers



# Working with Industry Corporate Partnerships



The IAT's portfolio of over 70 externally funded projects, valued at c.£75million, reflects the University's successful collaboration with the majority of relevant aerospace OEMs and Tier 1 companies over many years.

Highlights amongst our projects include:

- EU / Industry **Clean Sky JTI** – Systems for Green Operations – (2008–17)
- 2 **Rolls-Royce** University Technology Centres (UTCs): Gas Turbine Transmissions and Manufacturing (1997 – Present)
- **GE Aviation** strategic partnership in Advanced Electrical Power & Actuation Systems (2005 – Present)
- **Boeing** Strategic Collaboration in Composites Recycling (2006 – Present)
- **Airbus**-sponsored 'Centre for Aerospace Manufacturing' leads research in tooling and fixturing (2010 – Present)



The IAT works with a variety of SMEs, both regionally and nationally, that operate within the aerospace supply chain.

The opportunities for SMEs to engage with the IAT, and by extension our partners, are numerous. Popular routes for engagement include:

- Enabling SMEs to access UK and European aerospace funding
- Providing access to students
- Consultancy projects (including ERDF-funded projects)
- Continuing Professional Development (CPD)
- Knowledge Transfer Partnerships
- SME-specific seminars and events
- Advertising and marketing opportunities

# Working with Industry

## SME Case Study

### **Boeing** Strategic Collaboration in Composites Recycling (2006 – )

Carbon fibre reinforced composite materials are increasingly used to reduce weight in aircraft while retaining strength for performance and stability.

Concern about the impact of the growing use of carbon fibre composites by manufacturers in the aerospace industry – as well as the disposal of aircraft made from the material – prompted Boeing to commission the Polymer Composites Research Group at The University of Nottingham’s Institute for Aerospace Technology to develop a process for recycling carbon fibre composites.



# Working with Industry

## CSME ase Study



The University approached a number of SMEs with the process design and GAME Engineering, of Lincoln, was selected to assist with the manufacture of a scaled-down version of the plant for the recycling process.

Working closely with GAME Engineering gave our academics the experience of overcoming a technological challenge in scaling up a laboratory prototype. For GAME Engineering, the partnership with The University of Nottingham opened up a new area of technology and the prospect of experiencing a fresh market.

*“This project has been an amazing opportunity for us to work in an entirely fresh area and we have realised as a company that we can look to our universities as a source of fresh ideas and technological partnership. The academics from the Institute for Aerospace Technology worked closely with us to develop this technology and we see a bright future ahead in the carbon fibre composites recycling market”* – David Burkitt, GAME Engineering

- NATEP
  - The National Aerospace Technology Exploitation Programme (NATEP) is a £40m Technology Development Programme Derived From a Bid by the Aerospace Growth Partnership to the Government's Advanced Manufacturing Supply Chain Initiative.
  - Delivered by ADS and the Midlands Aerospace Alliance (MAA) in the Midlands.
  - <http://www.natep.org.uk/NATEP-in-2016>
- ATI
  - E.g. cross-sectorial expertise into aerospace
  - HEATSSIM project with Romax
- LEP & DCLG
  - 'Enabling Innovation' programme starting in April 2016
  - <http://www.ingenuitygateway.com>
- Membership of the MAA

- Challenges & questions:
  - How to ‘break the ice’ between SMEs, academe and OEMs?
    - Culture change
  - How to best support SMEs to allow them to ‘do innovation’?
    - Format & timelines
    - Commercialization, IP
  - How to exploit the potential greater agility of SMEs to best support the OEMs?
    - Viz. Airbus talks yesterday
  - How to ensure that SMEs can accompany the pace of change in the upper echelons of the supply chain?
    - Moving towards manufacturing models that are far more distributed

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