

3rd Annual Conference of the CDT in Advanced Composites for Innovation and Science (ACCIS CDT)

Introduction and Update on ACCIS CDT Activities

*Professor Paul Weaver
(CDT Director)*

EPSRC Centre for Doctoral Training in Advanced Composites for Innovation and Science

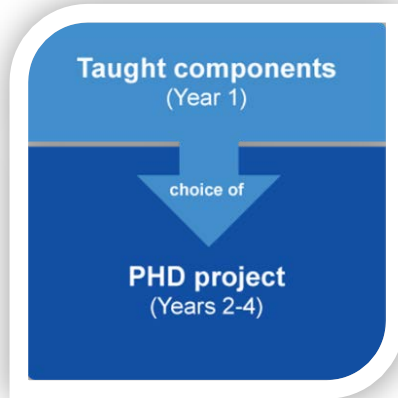
Vision: To develop the next generation of technical leaders in advanced composites by stimulating adventurous interdisciplinary research, which bridges the length scales, connects to and interfaces between the disciplines of engineering, chemistry, physics and life sciences, and bestows enhanced and added functionality to composite materials.

- Established in 2009 with £7.1 million award from the EPSRC
- Funding secured to continue training outstanding graduates until 2022
- Embedded within the Advanced Composites Centre for Innovation and Science
- Funded by EPSRC, University and industrial partners
- Significant industrial support
- National and international academic collaborations
- Memorandum of Understanding with the National Institute of Aerospace, USA



Discussing our research with Science Minister David Willetts at the EPSRC's CDT launch press conference at BT Tower on 22nd November '13

EPSRC Centre for Doctoral Training in Advanced Composites for Innovation and Science



- 4-Year PhD in Advanced Composites
- Cohort-driven training approach
- Transferable skills training
- At least 10 funded places per year (UK/EU and International)
- Integrated taught component
 - Small group teaching
 - Flagship group design, build and test (DBT) project
 - Individual 6-month exploratory research project
- Wide choice of cutting-edge PhD projects – blue skies and applied
- Graduate destinations
 - Blade Dynamics, Fraser-Nash Consultancy, Reaction Engines, Sahara Force India Formula One Team, Swansea University



DBT "Test Day" for the 2012 Cohort

www.bristol.ac.uk/composites/cdt/

 composites-cdt@bristol.ac.uk

CDT Staff and Management Committee



CDT Chair
Prof. Michael Wisnom



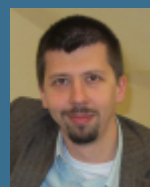
CDT Director
Prof. Paul Weaver



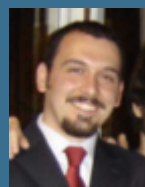
**Head of Department,
Aerospace Engineering**
Prof. Ian Bond



Teaching Co-ordinator
Dr Ian Farrow



CDT Lecturer
Dr Dmitry Ivanov



CDT Lecturer
Dr Alberto Pirrera



CDT Lecturer
Dr Sameer Rahatekar



Research Co-ordinator
Dr Richard Trask



**Project
Manager**
Dr Katharine
Blackwell



**CDT
Manager**
Ms Sarah
Hallworth



**PG Student
Administrator**
Ms Chris
Bennett

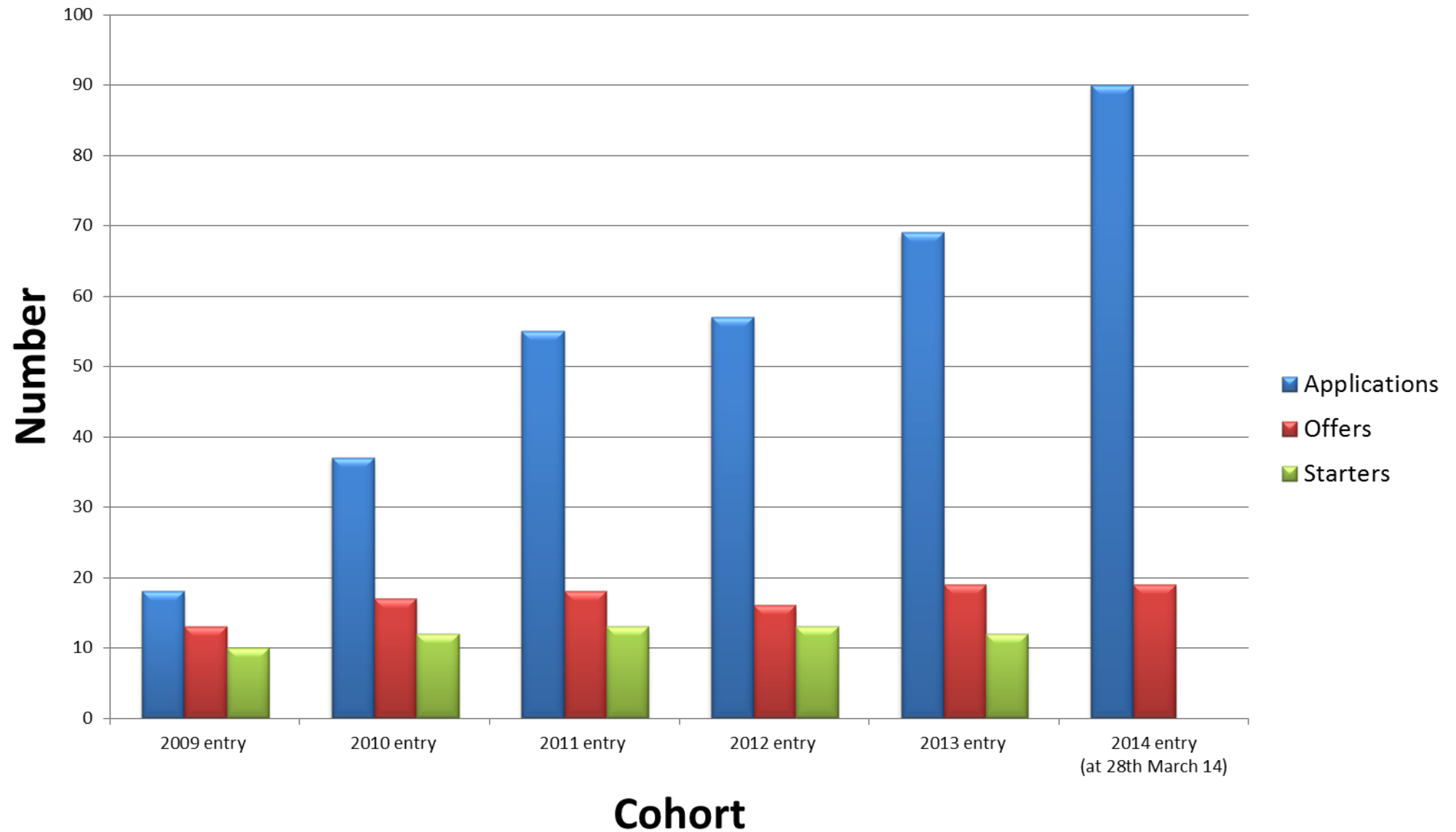
**DTC10
Reps**
B Coburn
J Trevarthen

**DTC11
Reps**
L Edwards
R Luterbacher
Mus

**DTC12
Reps**
A Baker
M Hazzard

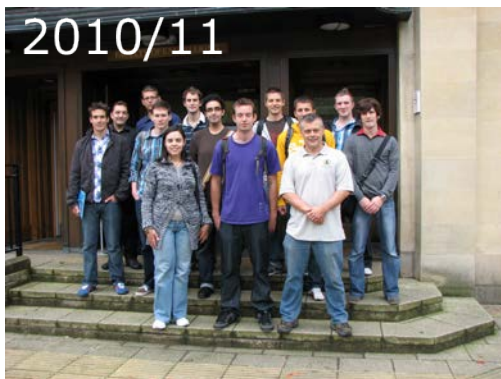
**DTC13
Reps**
B Cox
J Hartley

Applications to the CDT



Introducing our Students

- 5th cohort of 12 students started Sept 2013
- Academically gifted first/high 2:1 graduates
- Range of academic backgrounds
 - Engineering (aerospace, civil, mechanical, manufacturing, materials, textile), biochemistry, chemistry, physics and mathematics
- International!
 - Australia, Bulgaria, China, Egypt, France, Germany, Greece, Italy, India, Malaysia, Netherlands, Poland, Spain, Sri Lanka, UK, USA, Zimbabwe



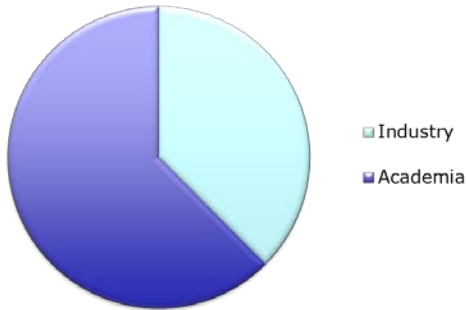
Introducing our Graduates



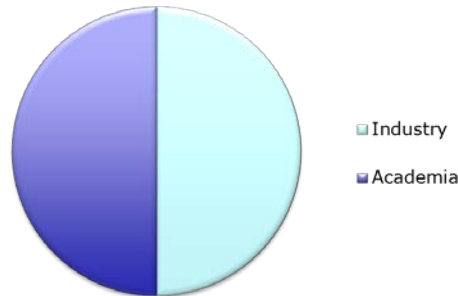
Graduation day, 30th January '14.
L-R: Alex Brinkmeyer, James Lightfoot,
Paul Weaver, John Williams, Joe Mills-
Brown

- 9/10 of the '09 entry cohort submitted
- All vivas passed with minor/no corrections
- Neil Buckney's thesis awarded prestigious Faculty of Engineering Commendation
- 4 students graduated in January – the others to follow in July

Graduate Destinations



Destination post-submission
by sector



Current known destination
by sector

- Blade Dynamics
- Frazer-Nash Consultancy Ltd
- Sahara Force India F1 Team
- Reaction Engines
- Swansea University
- University of Bristol

Collaboration with Industry & Academia

Extended Research Projects

- Undertaken in the first year
- Duration: 6 months (June to December)
- Co-supervised by ACCIS and collaborator(s)
- Significant piece of work/in-depth exploration of a subject
- Can develop in to PhD project
- Fully funded by the ACCIS CDT
- Previous project partners include:
 - AgustaWestland, Airbus, Crompton Technology Group, dstl, EMBRAER, EOARD, GKN Aerospace, Imperial College London, Rolls-Royce, RNLI, University of Cambridge, University of Exeter, University of Manchester, Vestas
- **Call for proposals open: Deadline Fri 25th April 2014**
- More info: www.bristol.ac.uk/composites/news/2014/103.html

Collaboration with Industry & Academia

PhD Projects

- Undertaken in years 2-4
- Co-supervised by ACCIS and collaborator(s)
- Academic Collaborations:
 - UoB Departments/Schools (Aerospace, Biological Sciences, Chemistry, Electrical & Electronic Engineering, Engineering Mathematics, Mathematics, Mechanical Engineering, Oral & Dental Sciences, Physics)
 - Cardiff University, Imperial College London, University of Manchester, University of Nottingham, University of Southampton
- Case Awards made by industry in support of projects:
 - 2010: AgustaWestland, Airbus, dstl (x2), Formula One Company, GE-Aviation, Haydale, Rolls-Royce, Vestas
 - 2011: Rolls-Royce (x2)
 - 2012: Rolls Royce(x2), dstl, Embraer, EOARD
 - 7 expected – contracts currently being signed
- **Next project call: Sept/Oct 2014**

International Placements

- International placement scheme available to all CDT students
- Opportunity to collaborate with leading international academic/industrial/research organisations
- 1 week to 3 months
- Completed Placements:

- ✓ Eindhoven University of Technology (TU/e), Netherlands
- ✓ National Institute of Aerospace, NASA Langley Research Center, USA
- ✓ Sandia National Laboratories, USA
- ✓ Space Structures Laboratory, Caltech, USA



Dan Everitt at
Amsterdam Airport
during his international
placement to TU/e

- Current Placement:

- ✓ Supported by the Sino-UK Higher Education Research Partnership for PhD Studies Robin Neville is currently visiting the Harbin Institute of Technology, China, to collaborate on a project relating to morphing technologies. Robin's main research focus is on shape memory polymers for Kirigami applications.

Outreach

- STEM Ambassador School Outreach Activities E.g.
 - Laura Edwards, Matthew Such and Beene M'Membe have been helping local 11-14 yr old school children to 'Beat the Bloodhound' – participants design an aerodynamic vehicle to race against the Bloodhound supersonic car
 - Anna Baker and Peter Duckworth have facilitated Bristol ChemLabS outreach
- Bristol Grammar School 2013
 - 8 CDT students supported BGS sixth-form students with their Extended Project AS level Qualifications and 10 CDT students helped to judge articles for a scientific writing competition
- Mangotsfield School, Bristol, 31st January 2014
 - Michael Elkington successfully bid for £700 of Faculty funding to undertake a rocket-building outreach event at this local school
- Pint of Science Festival, 19th-21st May 2014
 - Matthew Such is an event coordinator for this unique festival, which brings scientific experts to pubs to discuss their research with the general public
 - This year's highlight: composite materials at Channings, Clifton, by Prof. Weaver!

Achievements

- Publications

- 34 published journal articles (see delegate pack for a full list)
- 16 different journals
- Neil Buckney's paper 'Structural efficiency of a wind turbine Blade' was the third 'Hottest' article in 'Thin-Walled Structures' in April-June 2013

- Upcoming and Recent Conference Presentations

- 12th International Conference on Computational Structures Technology, Naples, Italy, 2-5 Sept 2014
- 16th European Conference on Composite Materials (ECCM16), Seville, Spain, 22-26 June 2014
- 8th International Conference on Digital Enterprise Technology (DET 2014), Stuttgart, Germany, 25-28 March 2014
- SAMPE Europe 35th International Technical Conference and Forum (SEICO 14), Paris, France, 10-11 March 2014
- 55th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference (SDM), Maryland, USA, 13-17 Jan 2014

Achievements

- Awards

- Matthew Such - Won best paper in the 'factory' track at DET 2014, Mar 2014
- Michael Dicker - 1st place in the University of Bristol's Festival of Postgraduate Research Poster Competition, Feb 2014
- Brodie Coburn – Won the Harry Hilton Student Paper Award in Structures at the 55th AIAA/ASME/ASCE/AHS/ASC SDM Conference, Jan 2014
- Desislava Bacheva - 1st Place in the Student Paper Competition at SEM 2013, June 2013
- Rainer Groh - Won the Ian Marshall's Award for Best Student Paper at ICCS17, June 2013
- Isabel Qamar - Awarded a €4000 travel award for young researches at ICSHM2013, June 2013
- Steven Rae – Won best presentation in the non-metallics category at the IOM3 YMC Research & Innovation Conference Dec 2013.

- Other

- Desislava Bacheva - selected to present at the Annual Airbus PhD day, Oct 13
- Helene Jones - Developed and delivered an interactive demonstration at the Institute of Making to explain the concept of bioglass scaffolds

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