Dr Laura Rhian Pickard

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NATIONAL COMPOSITES CENTRE
Bristol Composites Institute
University of BRISTOL

Industry linked teaching

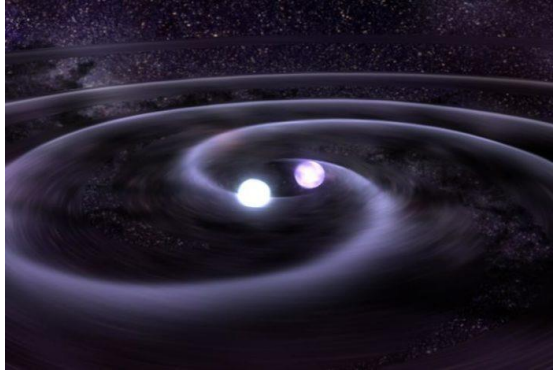


Illustration of Gravitational Waves, NASA

University of Bristol, Photo credit Elaine Pickard

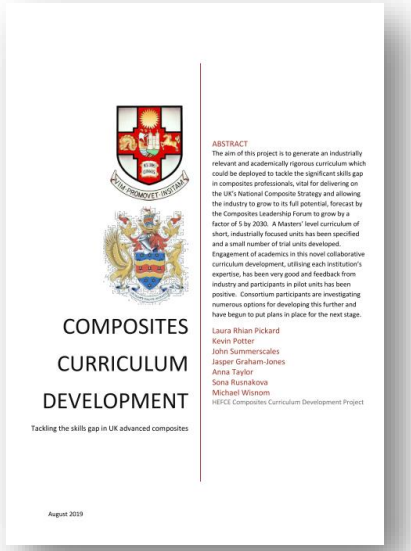
CIMComp
EPSRC
Future Composites
Manufacturing Research Hub

Next COMP
Next Generation
Fibre-Reinforced Composites

National Composites Centre

EPSRC Industrial Doctorate Centre in
COMPOSITES MANUFACTURE

UBC Vancouver



UKRI Engineering and Physical Sciences Research Council

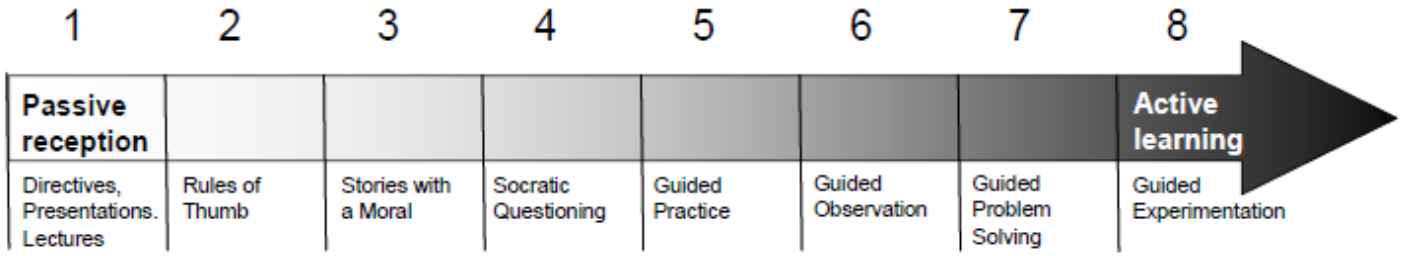
Industry <-> Teaching

Photo by Kenny Eliason on Unsplash

Teaching is Knowledge Transfer

What is this?
How was it made?
What went wrong?
How can we do better?

Viscosity of learning



Helms, R, Ignacio, R, Brinkkemper, S and Zonneveld,A.(2010) "Limitations of Network Analysis for Studying Efficiency and Effectiveness of Knowledge Sharing" *Electronic Journal of Knowledge Management Volume 8 Issue 1 (pp53 - 68), available online at www.ejkm com*

Real samples and case studies, hands-on, discussions, role-play

Must be engaging- especially for 3 hours on Friday pm!

Student choice- connect with the material

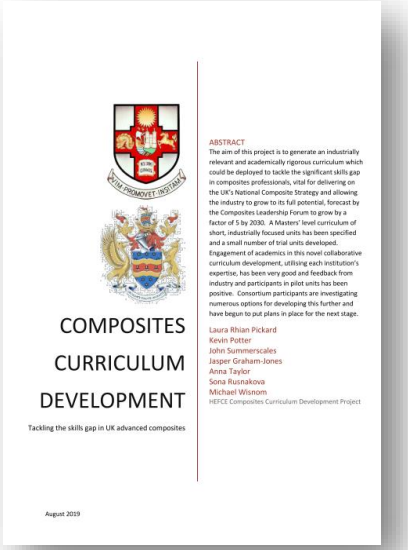
Research as part of the learning experience

What do students think?

"The practical section of laying up prepreg was very useful. This made it clear how difficult it is to avoid defects with some geometry"

"More group problem solving to discuss real life issues as these help the understanding of the presented material"

"Can do with more examples!!"


COMPOSITES CURRICULUM DEVELOPMENT

Tackling the skills gap in UK advanced composites

August 2019

ABSTRACT

The aim of this project is to generate an industrially relevant and academically rigorous curriculum which could be deployed to tackle the significant skills gap in composites professionals, vital for delivering on the UK's National Composite Strategy and allowing the industry to grow to its full potential, forecast by the Composites Leadership Forum to grow by a factor of 5 by 2030. A Masters' level curriculum of short, industrially focused units has been specified and a small number of trial units developed. Engagement of academics in this novel collaborative curriculum development, utilising each institution's expertise, has been very good and feedback from industry and participants in pilot units has been positive. Consortium participants are investigating numerous options for developing this further and have begun to put plans in place for the next stage.

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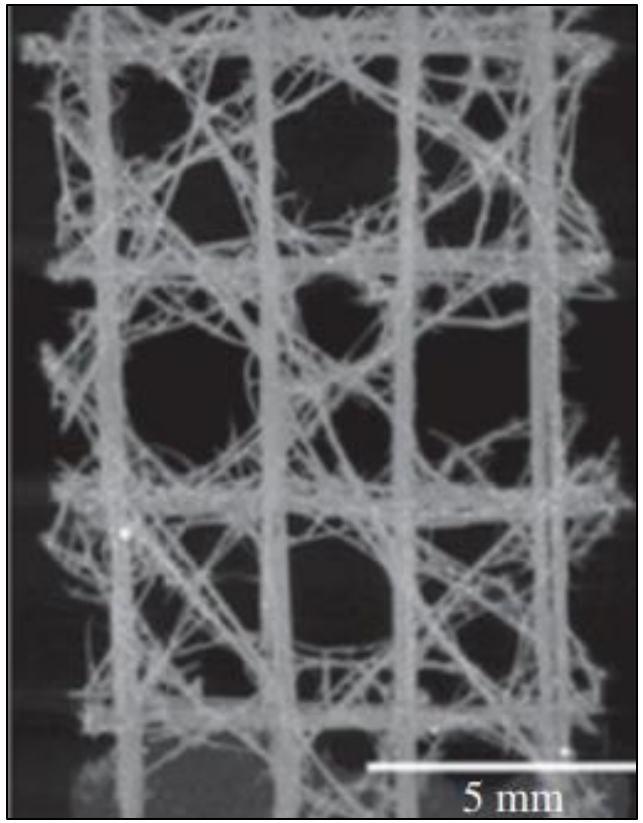
Kevin Potter
John Summerscales
Jasper Graham-Jones
Anna Taylor
Sona Rusnakova
Michael Wisnom
HEFCE Composites Curriculum Development Project

EPSRC Industrial Doctorate Centre in COMPOSITES MANUFACTURE

Most memorable aspect: laboratory workshops, robot, composite examples, costs module

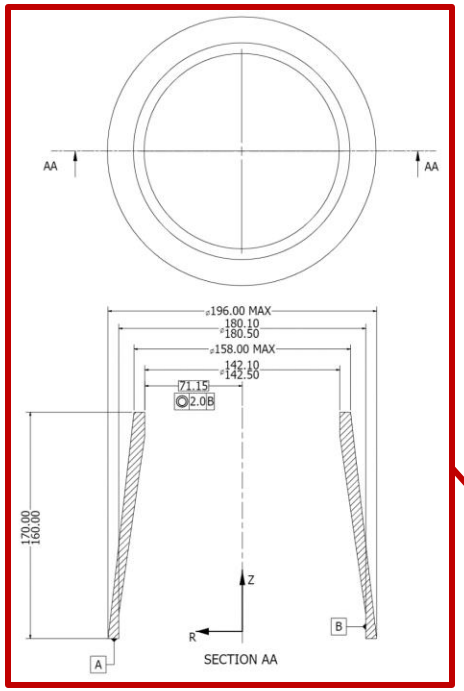
Favourite aspect: costing, different formats, real specimens, guest lecture, laboratory workshops, factory design

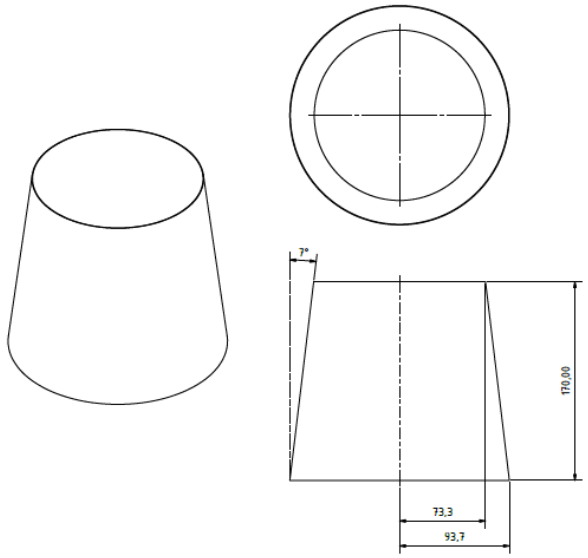
This year's CDT Design, Build and Test challenge

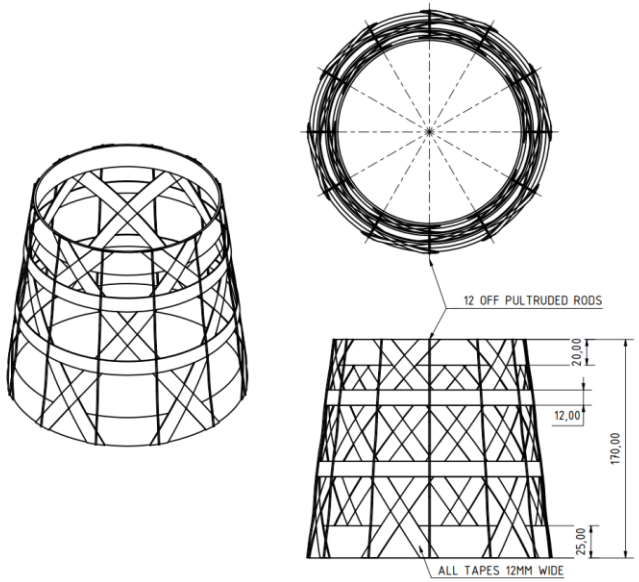


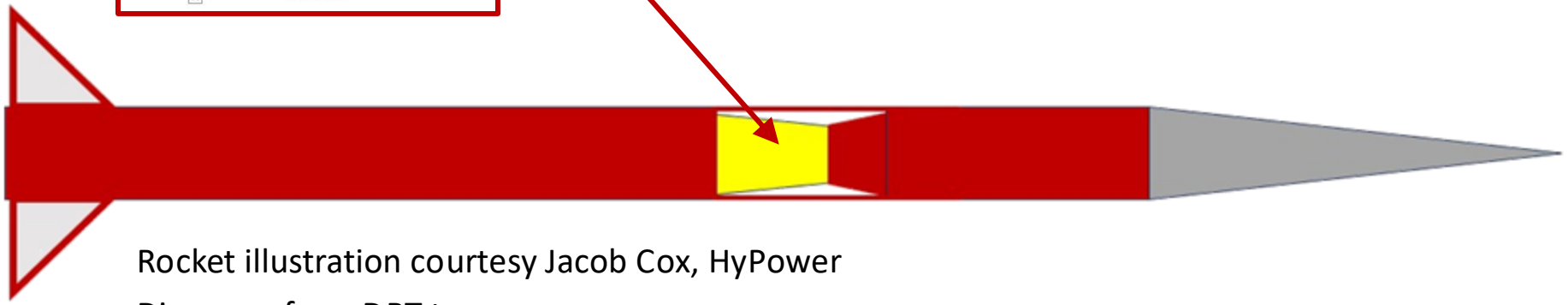
K. Robson Brown, D. Bacheva, and R. S. Trask 2019
DOI : 10.1098/rsif.2018.0965

- Sea sponge inspired lattice structure using fuzzy carbon overbraided rods and prepreg
- Compared to baseline thin shell of ±45° prepreg
- Tested in compression





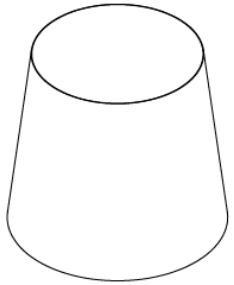


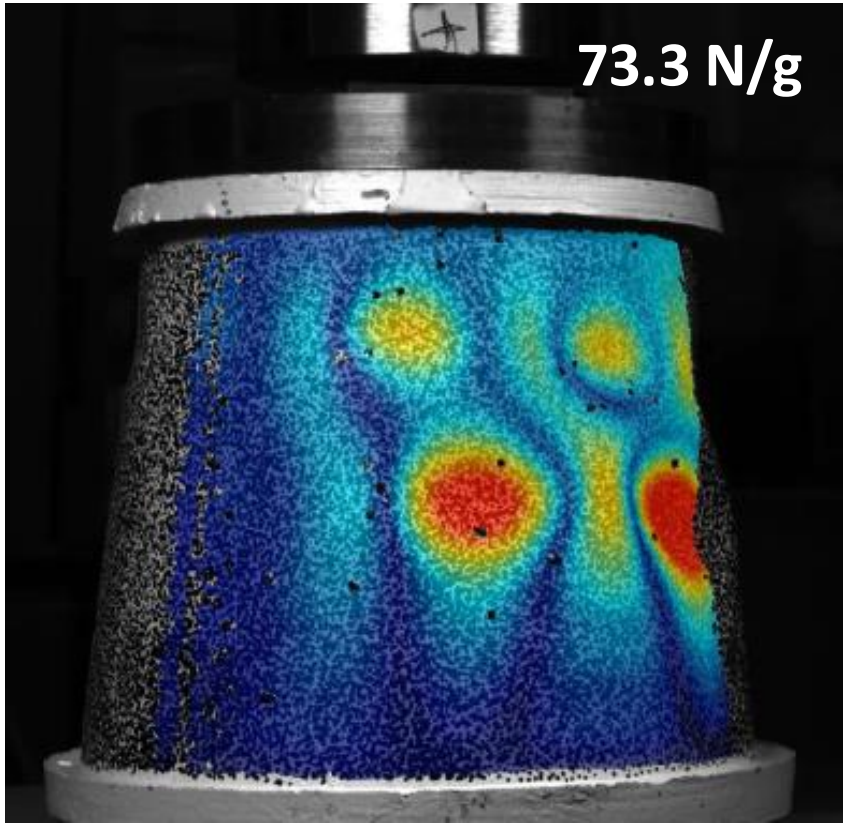


Rocket illustration courtesy Jacob Cox, HyPower

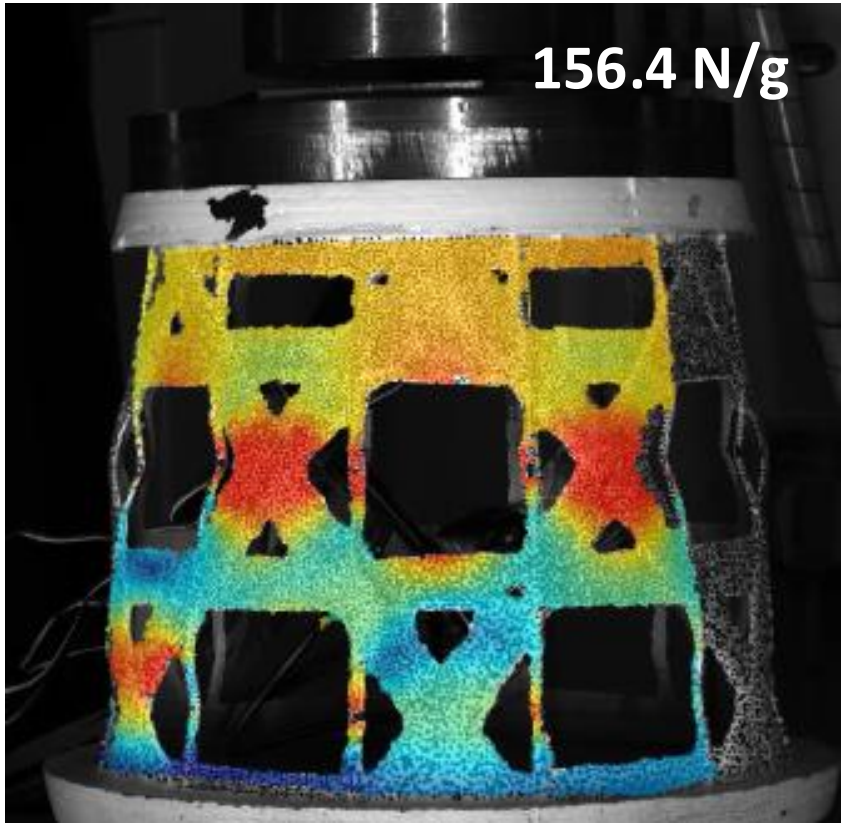
Diagrams from DBT team

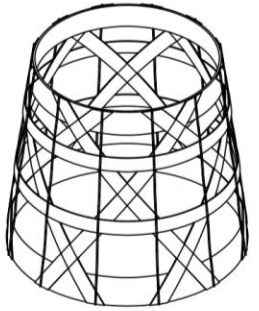
Baseline (closed cone)





Space sponge





Lattice structure also advantageous for internal coupling for instance can pass wires through holes

Summary

Students and employers benefit from industry linked teaching

Real world examples -> real world knowledge

Authentic learning

Transferable skills

Active learning promotes student engagement

Link to research in both industry and academia

Interesting challenges, chance to create something real

THANK YOU FOR YOUR ATTENTION

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