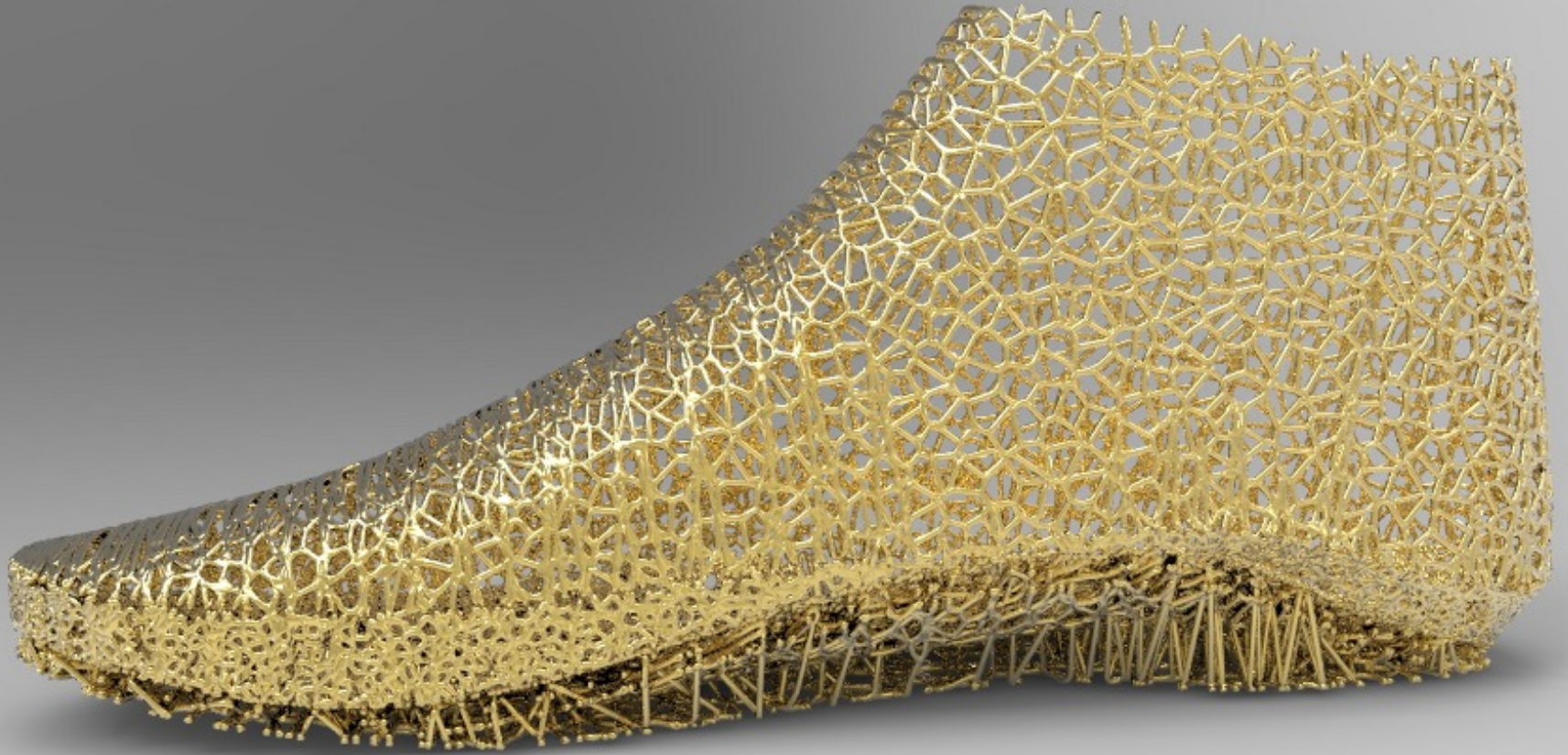




# Making the Future

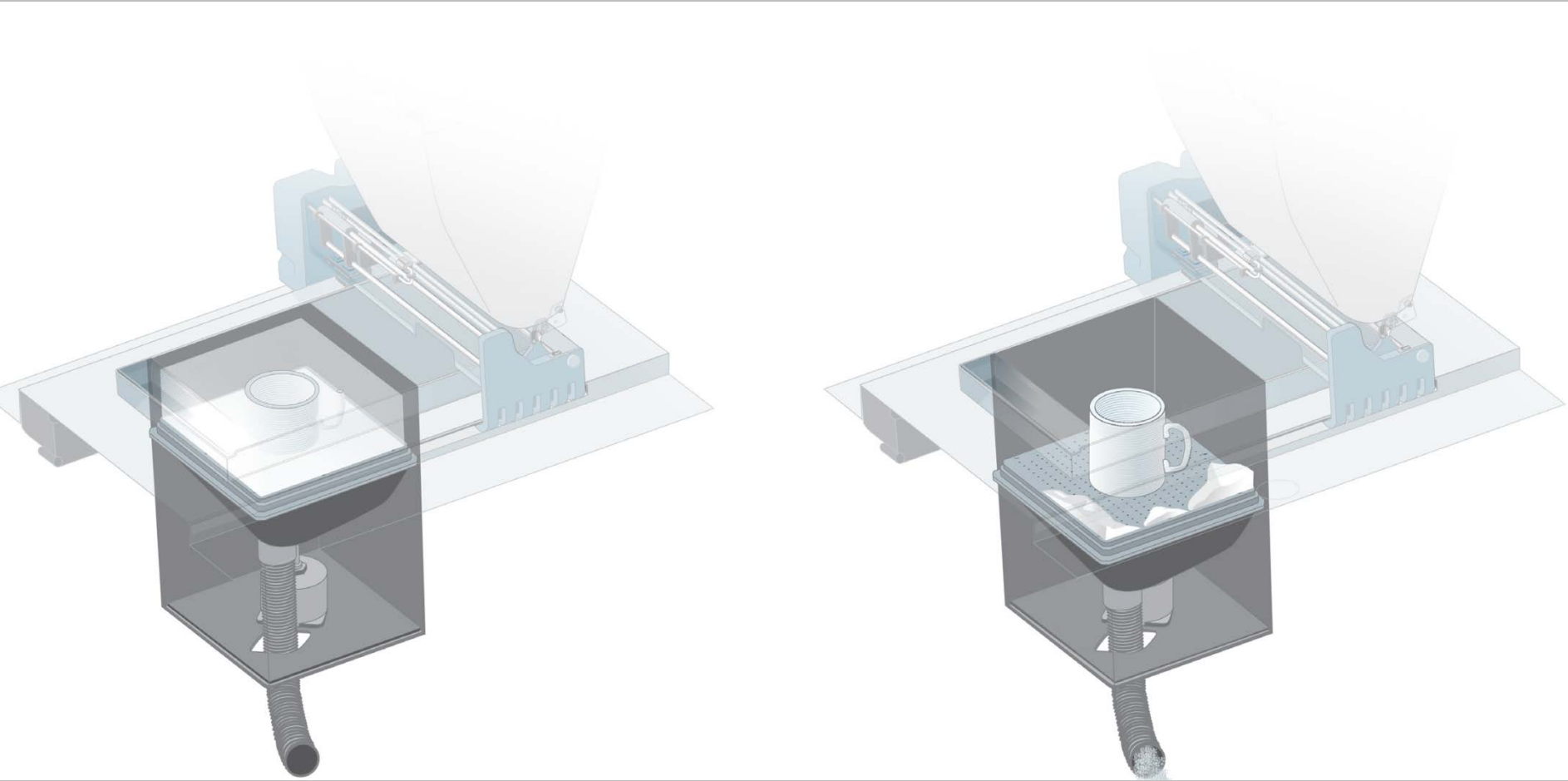


*Presented by,  
Drummond Masterton  
Head of Sustainable Product Design*

**Falmouth University**



# What is 3D Printing?



An additive layer manufacture process that creates 3D objects quickly and efficiently one layer at a time.



# What is it for?



Product Designers: As a communication tool, as new business opportunities, to save cost and time to reach market and to identify costly mistakes before mass manufacture.



# Manufactured Products




New Balance and Nike have both released mass market shoes which use 3D printed components.

# Manufactured Products



Home Shop Customise Latest News Dealers Gallery FAQ About Us

Home / Shop / Carbon Components / Carbon Garmin Mount For Giant Propel




**CARBON GARMIN MOUNT FOR GIANT PROPEL**

£39.99 inc vat

This is a 3D Printed Garmin mount suitable for the Edge 200, 500, 510, 800 and 810 models and designed to work with the Giant Contact SLR aero bars.

Available on backorder

 [Add to cart](#)

Categories: [Carbon Components](#), [Garmin Mounts](#).

Description Reviews (0)



Raceware offer a level of customisation and provide low volume solutions for bicycle components.





# Manufactured Products



Fabric collaborated with Airbus to create this onepiece 3D printed carbon fibre saddle.



# What is it for?



Designer Makers explore these technologies as a new method of creating unique objects, often one off or very low volume

# Designer/Maker Businesses

SEARCH



CATEGORIES

Type

bracelet  
brooch  
earrings  
necklace  
ring  
housewares  
gift card  
sale

Concept

algae  
ammonite  
cell cycle  
dendrite  
florescence  
hyphae  
kinematics  
radiolaria  
one of a kind  
xylem

Material

3d-printed  
brass  
nylon  
silicone rubber  
stainless steel

JEWELRY

LIGHTING

PUZZLES

HOUSEWARES

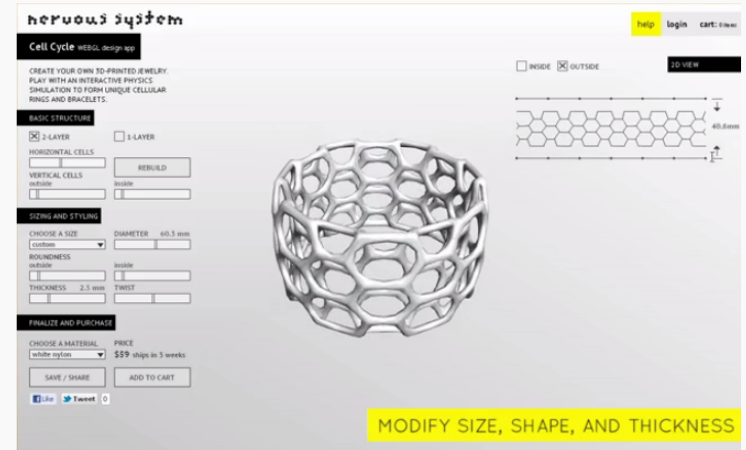
CREATE YOUR OWN

CONCEPTS

## Cell Cycle collection

A collection of 3-dimensional cellular jewelry inspired by the microscopic shells of radiolarians. The complex forms were created through simulations of the physical forces in a cellular network. Each piece is built up layer by layer using 3d-printing. You can use our interactive WebGL app to morph, twist, and subdivide; transforming a simple mesh to a complex patterned structure.

Designs are available in 3d-printed nylon, 3d-printed stainless steel, and sterling silver cast from 3d-printed wax. The intricate bi-layer forms would be impossible to create by traditional manufacturing methods.



INTERSTICE

\$60 - \$80



WAVE BRACELET

\$90.00



POROUS BRACELET

\$75.00



MORPH BRASS

\$450.00

Nervous Systems use web interfaces to enable customers to customise their products. Who is the designer in this relationship?



# Design Concepts



Digital Forming worked with Cooksons using their latest gold sintering processes developed with EOS to directly print this chainmail surface. Does the loss of craftsmanship matter?

# Design Concepts



The XYZ shoe by Earl Stewart used 3D scanning processes to ensure custom fit data and 3D printing in flexible materials to create a bespoke footwear solution



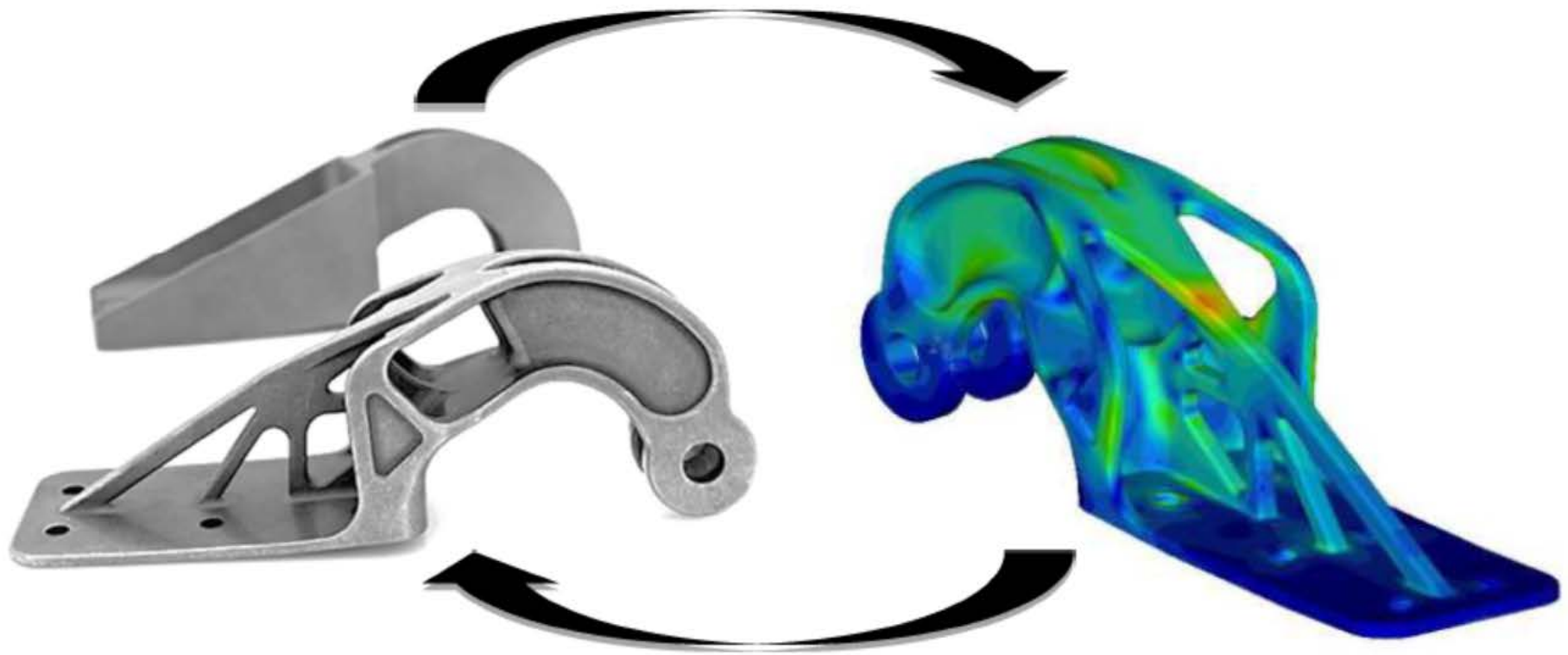
# What is it for?



Design Engineering: High Value sectors, currently focused at light weighting non-critical parts. Geometry is refined with algorithms, what role does the designer/engineer now offer?



# Aerospace



Airbus worked on optimised topology for titanium brackets.  
The AVLAM project was part funded by Innovate UK.  
Faster, Lighter, more reliable production, less waste (5% total)



# AM National Strategy

- Technology Awareness
  - Skills Gaps
  - Education
- Supply Chain

KTN: 'The Case for Additive Manufacturing' Positioning paper(2015).

# What's wrong with a name?



3D Printing: Generic term used to position these technologies in an understandable way for the public.





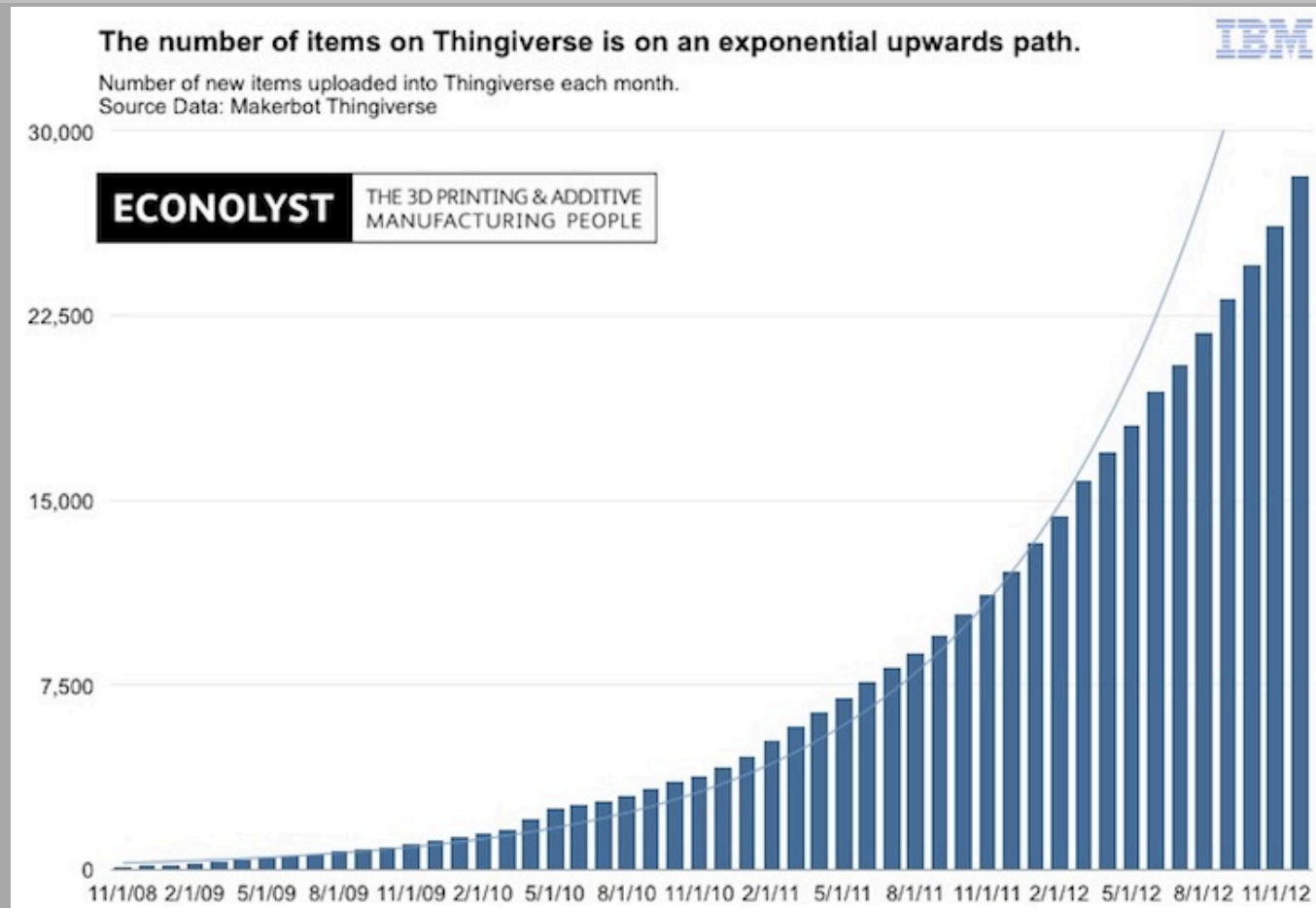
# Will Home printing ever take off?



Consumer Perception:

'I want to take a shower, not print a shower head!'

# Should we be worried if it does?



More people printing more stuff will ultimately generate more waste, while carbon savings are realised in the reduction of freight Printed parts present new problems for recycling .



# New Materials may reduce impacts



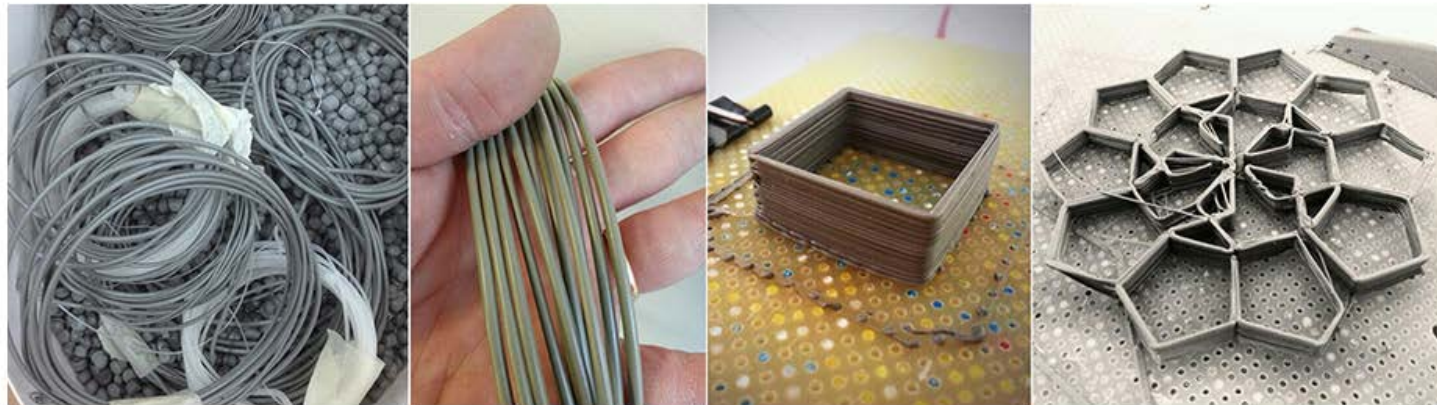
Better Future Factories (BFF) Perpetual Plastic Project (PPP) transforms plastic waste from disposable cups to create 3D printing filament



# Closed Loop systems



Image ©Co-product CIC 2015. PP Quality Street Packaging: shredding, filament extrusion and initial 3D print tests.



Co – oproduct won a green oscar award for its work on developing a closed loop system for 3D printed plastic waste. It is estimated that there are 10K RP machines in the UK. The PP used here has 20 MJ less energy and 50% less water per 1Kg than the current, most popular 3D printing solution(PLA).

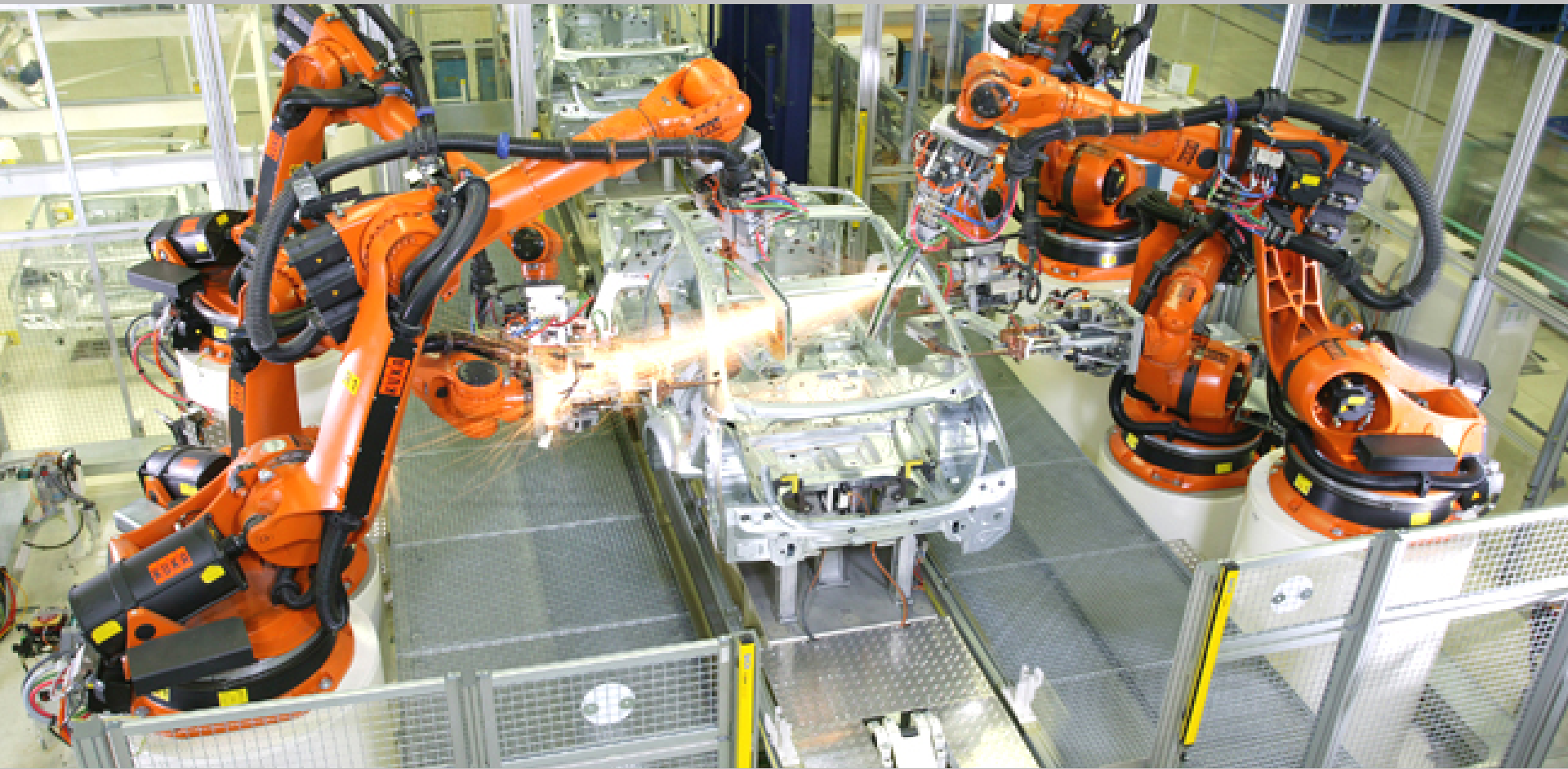


# Factories of the Future



Knyttan has designed a model similar to Nervous Systems that engages users through interfaces and enables new levels of customisation.

# Future Factories – Horizon 20/20



Robots and AI will play a significant role in the factories of the future.



# Future Factories – ALM



Ability to print in multiple materials and print electronics will become the standard for industry.





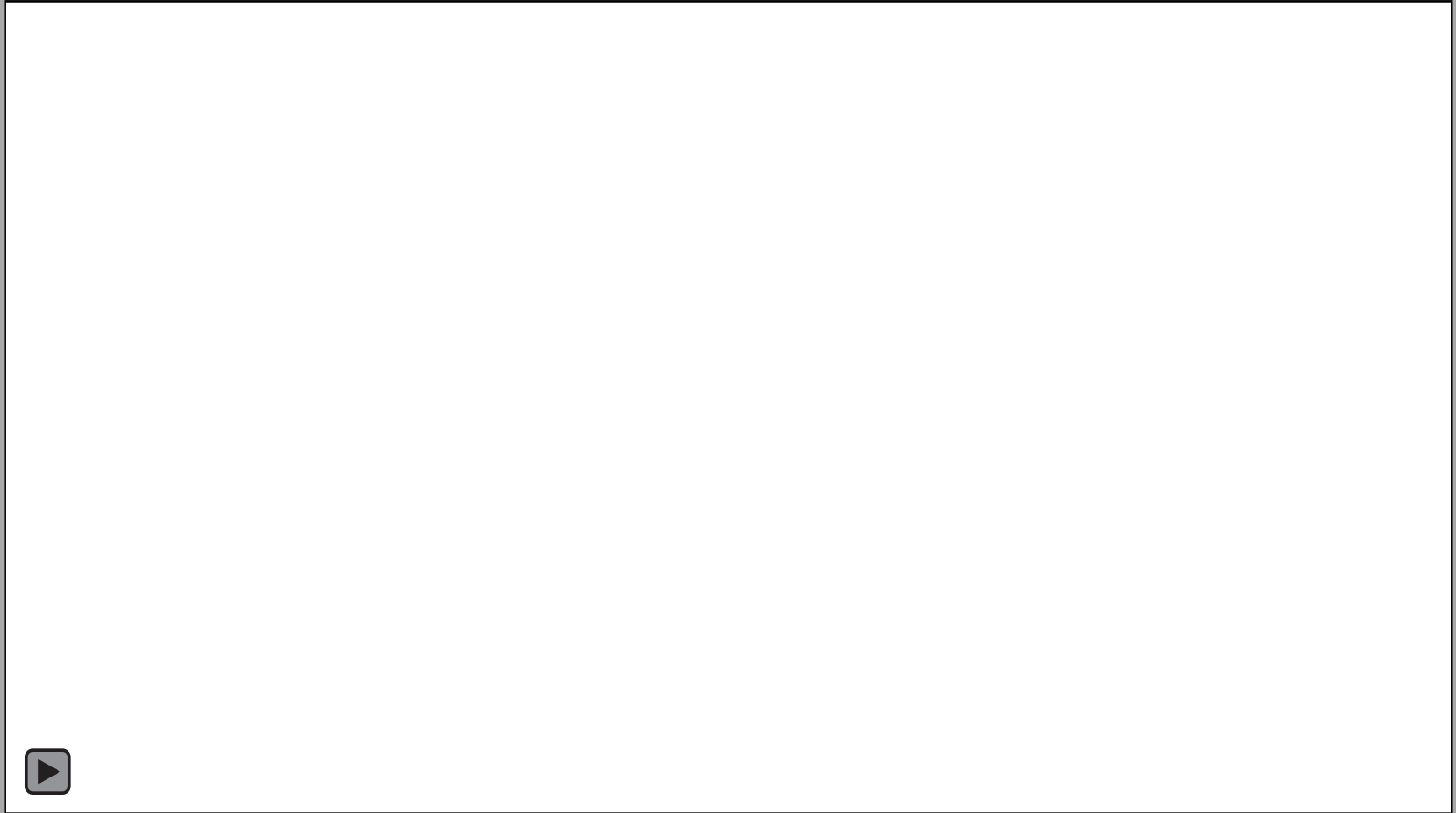
# AI workforce



Airbus is testing Smart robots in its Factory of the Future. On the fly programming through observation of trained operators.



# High end Additive Manufacture



Renishaw is at the forefront of AM technology in Metals

# Hybrid Manufacturing Centres



DMG MORI'S Lasertec machines utilise scanning, additive and subtractive processes



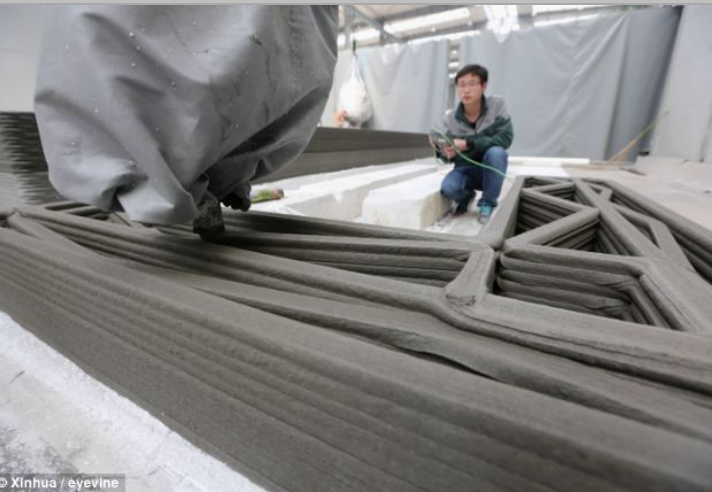
# New material developments



New material developments will enable the new market opportunities and innovation.



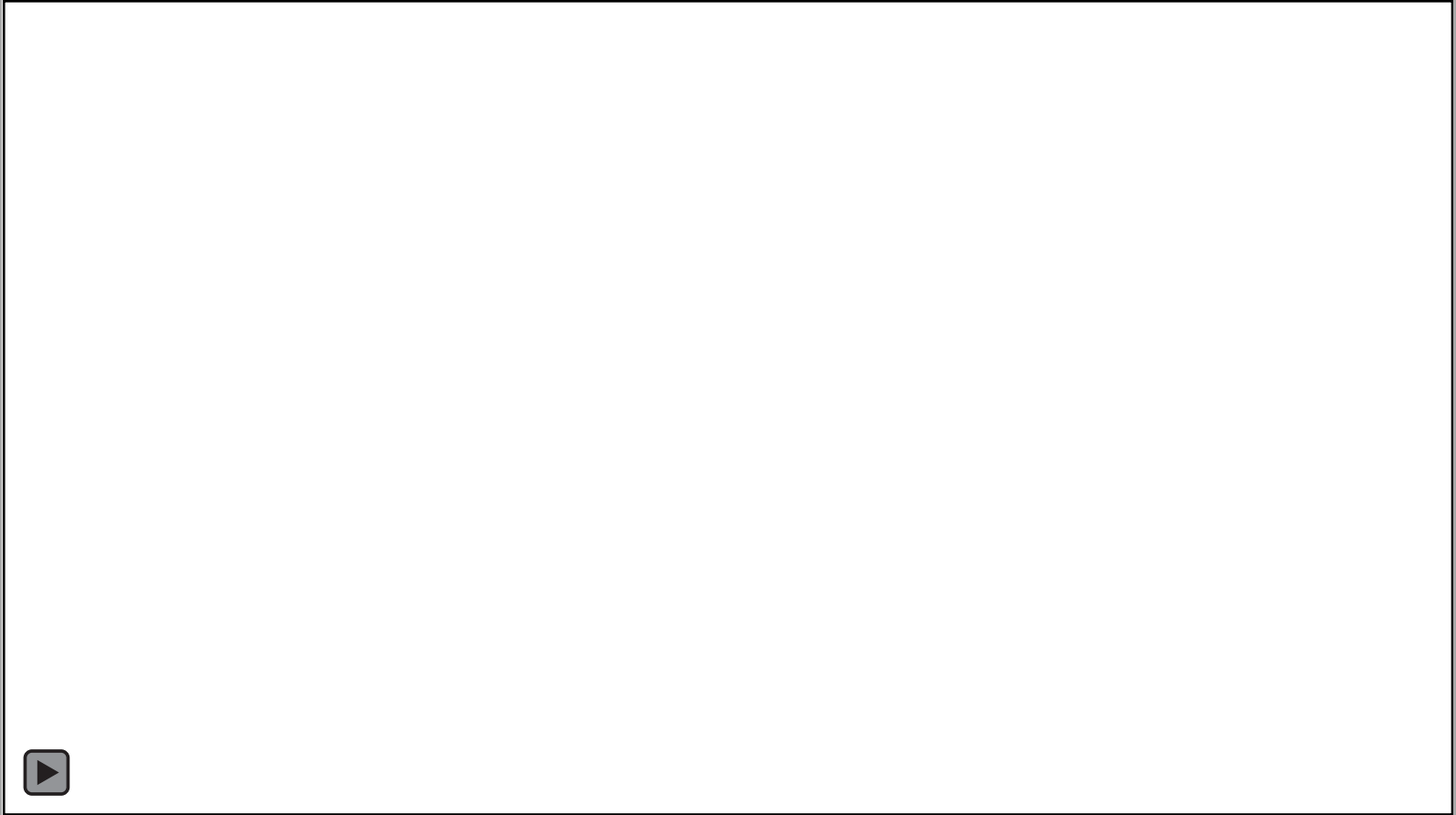
# The built environment



Upscaling and flexible robotic and gantry solutions will transform the building sector

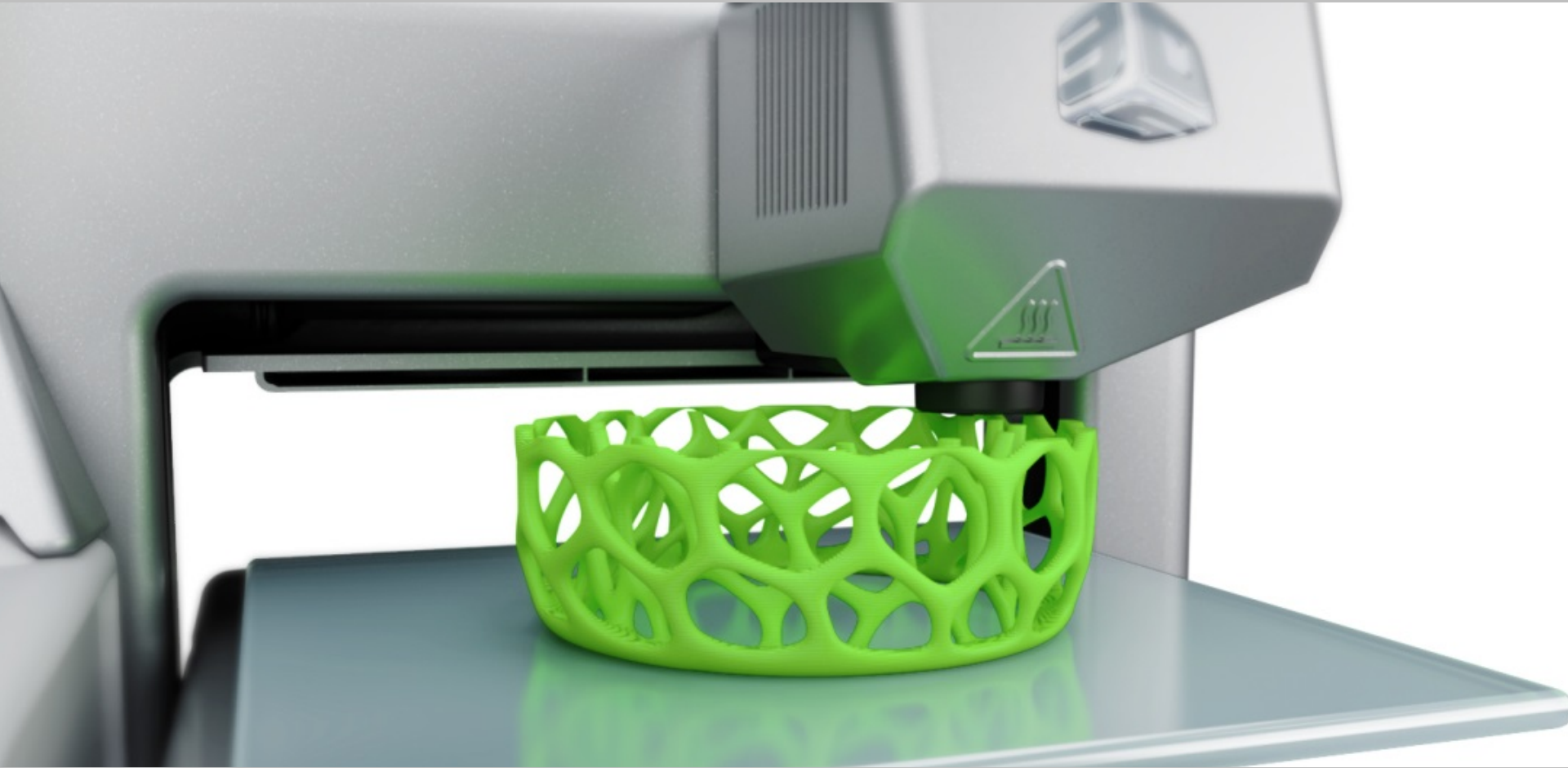


# Distributed Factories



Sustainability: Energy, raw materials, shipping (localised manufacturing). Digital Design rights? Rural economies, Local vernacular.

# 3D printing, Fashion Fad or Future?



*For 3D printing advice and project support  
Falmouth University  
[drummond@falmouth.ac.uk](mailto:drummond@falmouth.ac.uk)*