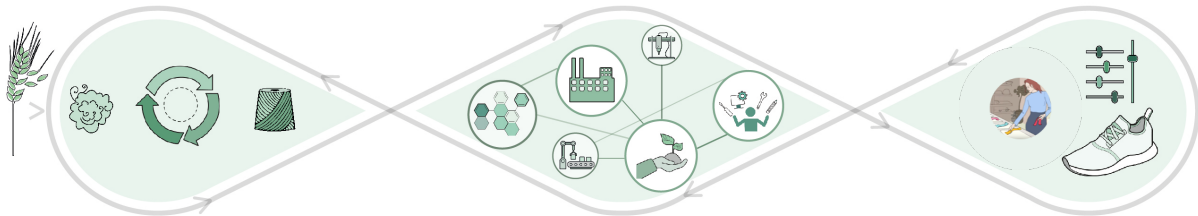


## UKRI Interdisciplinary Textiles Circularity Centre: Circular bioeconomy for textile materials

The Textiles Circularity Centre (TCC) will turn post-consumer textiles, crop residues and household waste into renewable materials for use in textiles, developing new supply chains, textile production, apparel design and consumer experience.



*Textiles Circularity Centre: creating a coupling between a textiles resource flow and human wellbeing*

Led by the RCA's Professor Sharon Baurley, with Professor Phil Purnell (University of Leeds) as co-director, and working in collaboration with Cranfield University, University of Cambridge, University College London, University of Manchester and University of York, the TCC supports better social, economic and environmental outcomes - working also with a wide range of partners from industry, the NGO and public sectors.

The Textiles Circularity Centre proposes materials security for the UK by circularising a *textiles* resource flow that will stimulate innovation and economic growth in the UK textile manufacturing and SME apparel, and creative technology sectors, whilst reducing reliance on imported and environmentally and ethically impactful materials, and diversifying supply chains.

We will effect a symbiosis between novel materials manufacturing and agentive consumer experiences through a supply chain design comprised of innovative business models and digital tools.

Using lab-proven biotechnology, we will transform *bio-based waste-derived feedstock* (post-consumer textiles, crop residues, municipal solid waste) into renewable polymers, fibres and flexible textile materials, as part of a CE transition strategy to replace imported cotton, wood pulp and synthetic polyester fibres and petrochemical finishes.

We will design a transparent supply chain for these textiles through industrial symbiosis between waste management, farming, bio-refinery, textile production, SME apparel brands, and consumer stakeholders.

We will develop an open 'Biomaterials Platform' for SMEs to access these materials, and data on their provenance, properties, circularity, and environmental impact. This platform, together with local flexible advanced manufacturing hubs, will enable on-site/on-demand manufacture on the high street, strengthening apparel brand profiles.

Working with SME apparel brands, we will develop the *Configurator* to engage consumers in digitally immersive experiences and services that amplify couplings between the resource flow, human well being and satisfaction. Consumers will become key *nodes* in the circular value chain, enabling responsible and personalised engagement.

As a human-centred design led centre, TCC is uniquely placed to generate these innovations that will catalyse significant business and skills growth in UK textile manufacturing, SME fashion-apparel, and creative technology sectors, and drastically reduce waste and carbon emissions, and environmental and ethical impacts for the textiles sector.

The TCC research programme has three interconnecting Research Strands: *Materials Circularity*, *Circular Supply Chain*, and *Consumer Experience*:

The **Materials Circularity Research Strand** will establish an integrated approach that transforms waste feedstocks into functional and regenerative textiles designed for circularity. Our pioneering biotechnology will convert waste into building blocks for new polymer and fibre production. Innovations in the fabrication and design of circular textiles will enable technology-driven processes that use local materials.

The *Materials Circularity* group includes:

Dr Miriam Ribul, Materials Science Research Centre, Royal College of Art [lead]

Professor Simon McQueen–Mason, Centre for Novel Agricultural Products, University of York [co-lead]

Dr Alexandra Lanot, Centre for Novel Agricultural Products, University of York

Professor Prasad Potluri, Department of Materials, University of Manchester

Professor Paulo Bartolo, School of Engineering, University of Manchester

Dr Sameer Rahatekar, Enhanced Composites & Structures Centre, Cranfield University

Professor Phil Purnell, School of Civil Engineering, University of Leeds

The **Circular Supply Chain Design Research Strand** will establish narrow, slow and closed resource flows through better tools for Circular Supply Chains. We will study which novel supply chain configurations and technologies are needed for bio-based textiles circular supply chains.

The *Circular Supply Chain Design* group includes:

Professor Steve Evans, Institute for Manufacturing, University of Cambridge [lead]

Dr Ali Asadipour, Computer Science Research Centre, Royal College of Art

The **Consumer Experience Research Strand** will establish a coupling between the resource flow and human wellbeing by building a *Product Cultures Lab* and a *Circular CX Framework* with which to design consumer experiences that engage people in interactive, meaningful, co-creative and sustainable cultures around products, transforming their *role* from 'consumers' to 'active co-creators' in a sustainable product cycle.

The *Consumer Experience* group includes:

Dr Bruna Petreca, Materials Science Research Centre, Royal College of Art [lead]

Professor Carey Jewitt, UCL Knowledge Lab, Institute of Education, University College London [co-lead]

Professor Nadia Bianchi-Berthouze, UCLIC, Division of Psychology & Language Sciences and Department of Computer Science, University College London

Dr Youngjun Cho, Department of Computer Science, University College London

Professor Aikaterini Fotopoulou, Department of Clinical, Educational & Health Psychology, University College London

Professor Marianna Obrist, UCLIC, Division of Psychology & Language Sciences and Department of Computer Science, University College London

Dr Danielle Barrios-O'Neill, School of Communication, Royal College of Art

**Link:** [UKRI Textiles Circularity Centre](#)

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