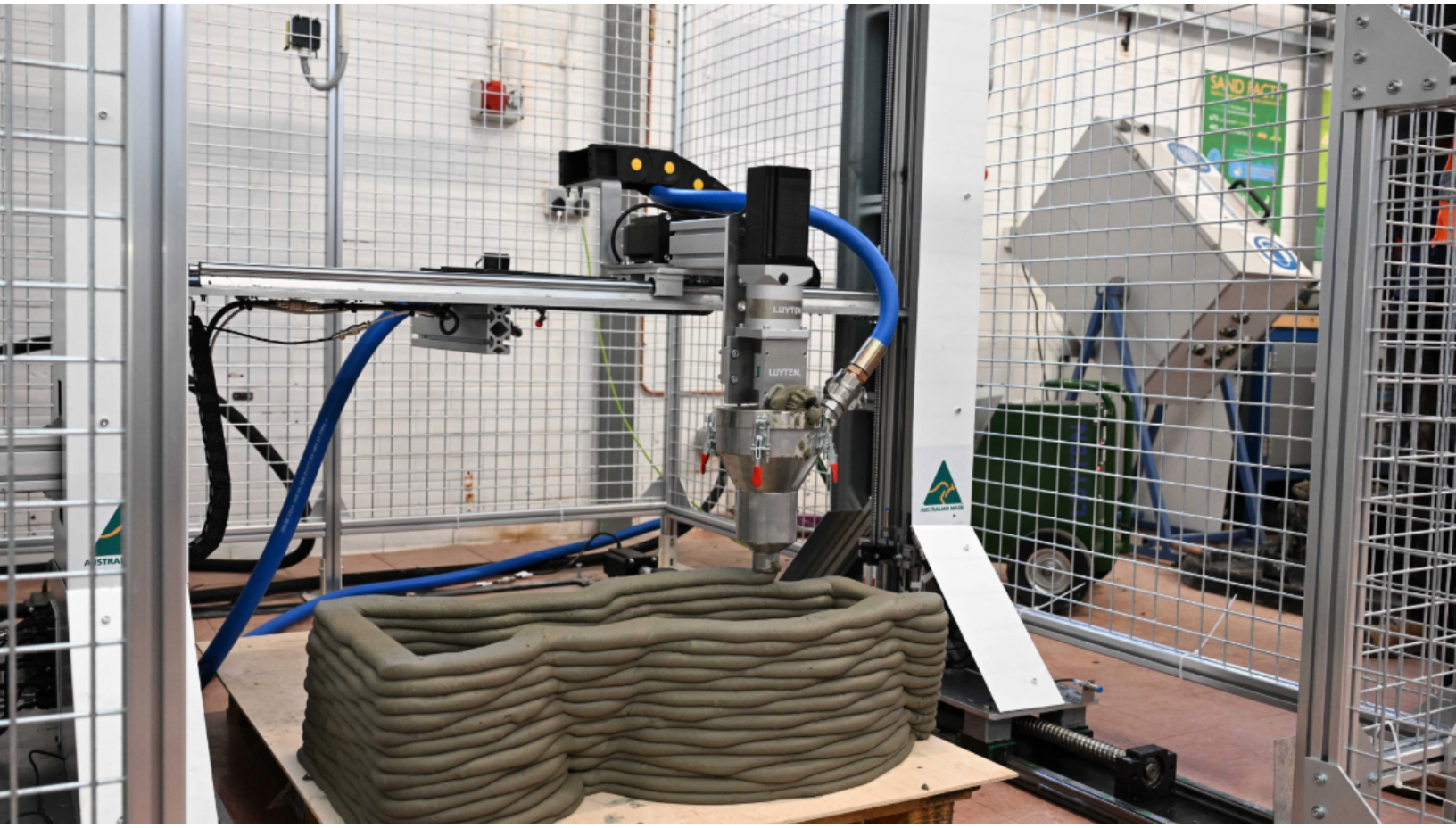
Northumbria University NEWCASTLE



3D construction printer in action in Northumbria University's Structures Laboratory.

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Northumbria awarded EU funding for sustainable 3D-printed construction research

Northumbria University has been awarded a prestigious Marie Skłodowska-Curie Actions (MSCA) Fellowship to lead innovative research into low-carbon, 3D-printed construction materials.

Funding of over a quarter of a million euros will enable postdoctoral

researcher Dr Jyotirmoy Mishra to join Northumbria University to undertake a fellowship exploring the potential of sustainable, waste-derived alternative activators in 3D-printed geopolymer mortars.

The MSCA Fellowships, part of the Horizon Europe programme, support postdoctoral researchers to expand their expertise through advanced training and cross-disciplinary, international collaboration.

Dr Jyotirmoy Mishra

The project will be led by Associate Professor Keerthan Poologanathan, Head of Structural Engineering at Northumbria, alongside Associate Professor in Civil Engineering Dr Vikki Edmondson, and Assistant Professor of Structural Engineering, Dr Mohammadali Rezazadeh. It aims to develop new geopolymer-based construction materials using agricultural and industrial waste – which could help to significantly reduce the environmental impact of the construction sector.

3D printing technologies are increasingly being seen as a game-changer for construction, offering faster, more efficient and environmentally conscious building solutions. A key focus of the project will be the development of 3D printable geopolymer mortars using alternative alkaline activators derived from waste, replacing the carbon-intensive Portland cement typically used in 3D-printed construction.

Dr Keerthan Poologanathan

The study will explore factors including setting time, workability, compressive strength, microstructure, and long-term durability, of the 3D printed materials, alongside a full Life Cycle Assessment to evaluate environmental performance.

Commenting on his MCSA Fellowship, Dr Jyotirmoy Mishra said: “I am truly honoured to receive the Marie Skłodowska-Curie Postdoctoral Fellowship and to join Northumbria’s world-class Associate Professor Keerthan Poologanathan and his research team. This project allows me to contribute to cutting-edge innovation in sustainable construction by integrating material science, structural engineering, and digital manufacturing.

“The opportunity to explore waste-based alternative activators in 3D-printed geopolymer mortars is both timely and essential for addressing global

climate challenges in the built environment. Being awarded the MSCA Postdoctoral Fellowship is a significant milestone that will greatly advance my research career and enable me to translate research into industry-relevant solutions."

This latest project builds on Northumbria's longstanding strengths in civil and structural engineering, international collaboration, and PhD-led innovation, and supports the University's broader commitment to addressing climate change and promoting a circular economy.

Speaking about the funding award, Dr Poologanathan said: "The MSCA Fellowship is a recognition of the Northumbria's research excellence and reinforces our position as a hub for advanced, interdisciplinary work in sustainable engineering.

"3D-printed concrete is the future of sustainable construction – this research will help to reduce carbon emissions, cut material costs, and minimise waste, while improving the strength and durability of modern infrastructure."

Last year the University announced the installation of new cutting-edge 3D construction printing technology, teaming up with world-leading 3D construction printer manufacturer, Luyten 3D, and UK-based, award winning sustainable technology company, ChangeMaker 3D, to establish the new capability within Northumbria's Structures Laboratory.

For more information about research at Northumbria, visit www.northumbria.ac.uk/research

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UNIVERSITY OF THE YEAR 2022 (Times Higher Education Awards)

Northumbria is a research-intensive university that unlocks potential for all, changing lives regionally, nationally and internationally.

Two thirds of Northumbria's undergraduate students come from the North East region and go into employment in the region when they graduate, demonstrating Northumbria's significant contribution to social mobility and levelling up in the North East of England.

Find out more about us at www.northumbria.ac.uk

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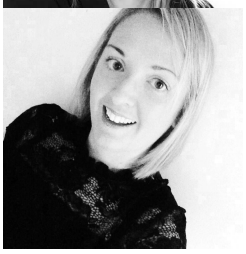

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