**NT takes the lead in 3D metal printing**

The Northern Territory took the lead today in advanced metal manufacturing with the production of a copper flywheel by the world’s first commercial LightSPEE3D metal printer, located at Charles Darwin University.

The flywheel took 11 minutes and 38 seconds to produce at a cost of $4.60, demonstrating the capability of the LightSPEE3D printer to generate low-cost metal parts at high speed, which is revolutionary in metal manufacturing.

The 3D printer is at the centre of a new industrial transformation research hub for advanced manufacturing in the Northern Territory, known as the Advanced Manufacturing Alliance (AMA).

The AMA is an open alliance founded by the Darwin-based start-up company that invented the printer, SPEE3D, and CDU. The Alliance aims to build a user base through local and global business members, and to collaborate with global research networks in advanced manufacturing.

Co-inventor of the technology, Steven Camilleri said that until now the metal manufacturing industry, worth hundreds of billions of dollars a year globally, had used mass production techniques that were slow, inflexible and expensive.

“Lead times from design to first prototype are long, often taking months, and prototyping is expensive because of the need for specialised tooling and design-specific moulds,” Mr Camilleri said.

He said that while traditional 3D metal printing had improved simplicity and immediacy to the manufacturing process, there had been little uptake in the casting industry because the technology could not deliver the required speed and uniformity in strength and shape.

“SPEE3D has produced and patented a truly innovative and transformative advanced manufacturing technology,” Mr Camilleri said.

“The LightSPEE3D machine demonstrates the strength, repeatability, and mass production capabilities of tried-and-tested metal casting together with the simplicity and immediacy of 3D printing.”

CDU’s Deputy Vice-Chancellor and Vice President Research and Research Training, Professor Lawrence Cram said the AMA would develop applications for the SPEE3D’s high speed metal printing processes that would contribute to Australia’s capacity in advanced manufacturing.

“The AMA hub will accelerate research to assist with commercialising the technology, and also will launch new training programs,” Professor Cram said.

“While the technology has global applications, we also expect to deliver wide-ranging impacts across the Territory including producing new tools, technologies, and skills, and generating professional, university-qualified jobs.”

Industries that could benefit immediately from the technology included defence and aerospace, automotive and healthcare.

“Our work at the AMA will place the Northern Territory at the forefront of advanced manufacturing in metal,” Professor Cram said.

ENDS

**BACKGROUND**

**Funding:**

* $400,000 Northern Territory Government
* $1,486,200 Australian Government, Department of Industry, Innovation and Science (CRC Project - Breaking the Mould: Making Australian Advanced Manufacturing Portable)
* $750,000 Australian Government, Department of Industry, Innovation and Science (Accelerating Commercialisation Programme)
* $200,000 Charles Darwin University

**The technology:**  The largest metal manufacturers are located in China, USA, India, Japan and Germany. More than 100 million metric tonnes of parts were cast in 2015 – with a value of almost US$200 billion.

However, state-of-the art metal manufacturing techniques use mass production technologies that are ancient, slow, inflexible and extremely expensive. Basic metal casting dates back nearly 6000 years - and a present-day foundry remains remarkably dangerous, dirty and relatively untouched by modern technologies. Lead times from design to first prototype are often measured in months and prototyping is expensive due to the need for specialised tooling and design-specific moulds. The expense of special equipment and tooling often inhibits innovation in the functional design of the prototype, even when there is a superior engineering solution.

**Additional benefits of SPEE3D**:

* Low cost – parts can be produced faster and cheaper than other forms of casting. There is no expensive specialised tooling or casting moulds. Metal powders and the SPEE3D production processes are not expensive
* Less waste material – near net shape parts with only ~1-5% of material lost on deposition
* More environmentally friendly – the environmental footprint is expected to be substantially smaller than current casting techniques. A LIGHTSPEED machine could run on a domestic electrical system, using neither high temperatures nor a specialised atmosphere
* Streamlined design flow – since the prototyping process is the same as the final mass manufacturing process, once a part is proven through prototyping, no additional steps are needed for final production.

## **Award**: This technology was awarded the top honour for innovation at the 2015 Bosch Venture Forum (Robert Bosch GmbH, Stuttgart, Germany).

**SPEE3D staff:** The SPEE3D principals and inventors of the technology Steven Camilleri (Chief Technology Officer) and Byron Kennedy (Chief Executive Officer), are graduates of Charles Darwin University students and former staff members.