

# Engineers build first-of-its-kind 3-dimensional infrared heat detector

January 30 2015, by Thomas Deane

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Engineers from Trinity College Dublin have developed a first-of-its-kind 3-dimensional infrared (IR) heat detector called 'The Herschel'. It will function by mapping the presence and distribution of IR energy – which has been dubbed 'invisible sunshine' – with unprecedented detail.

The Trinity team have just signed a licensing agreement with heating specialist Ceramicx Ltd, an Irish SME based in Co. Cork, that will see

'The Herschel' built for market to over 60 countries across the globe.

The Herschel, which resulted from an Enterprise Ireland Innovation Partnership between Trinity and Ceramicx, was named after Sir William Herschel, the 19th century discoverer of the Infrared spectrum. It will, for the first time, allow users and heat-work practitioners to create a full package of 3D data that makes the all-important science behind heating both visible and predictive.

This development should have major implications for industry and manufacturing because it will reduce waste, save on costs, and allow designers to better test how components are actually performing.

Although IR radiation is invisible to the human eye, it exists as light energy and can be reflected, absorbed and transmitted just like visible light. The problem when engineering complex IR energy systems is that we don't really know where the energy is going and how much is getting there. Not anymore.

With the Herschel we cannot only see the IR heat, but we also know its intensity and how it spreads into space around it. Whether IR heaters are used in a manufacturing process or in domestic heating applications, they are invariably heating a target – now we can know how the heat gets there and how efficient the process is.

Associate Professor in Mechanical and Manufacturing Engineering in the School of Engineering at Trinity, Dr Anthony Robinson, led the team that produced the first prototype.

He said: "I think this project really shows how university research can support Irish SMEs. Here we have created a scientific instrument, from scratch, that is immediately impacting Ceramicx' bottom line and is already creating profit and jobs and, in its own way, supporting the

regrowth of the Irish economy."

Frank Wilson, Ceramicx founder and Managing Director added: "Our new machine tool now provides a way to measure and map that previously invisible spectrum of energy. It can therefore enable users to precisely plan their manufacturing, save cost and waste, and also gain a greater understanding and measurement of how IR elements and target materials actually perform. The benefits will be immeasurable."

Technology Case Transfer Manager in Trinity's Office of Corporate Partnership & Knowledge Exchange, Dr Graham McMullin, said: "The level of engagement between Ceramicx and Trinity is an endorsement of EI's Innovation Partnership programme, and clearly shows how a University can benefit SME companies in transferring both technical expertise and personnel – Dr Gerard McGranaghan, one of the team members from Trinity's Fluids and Heat Transfer Research Group, is now the Senior Development Manager at Ceramicx."

Ceramicx Ltd has been perfecting and honing its IR heat work trade for the past 25 years and the new IR instruments will enjoy instant access to the Ceramicx global sales network. The company has distributors in all continents of the world and currently exports 98% of its IR heating production to over 62 countries.

Provided by Trinity College Dublin

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