Battery research and development dublin

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Pioneering research focusing on creating a new type of extremely long lasting battery - one that can come in any shape or size and can be camouflaged within any type of material - is being led byProfessor Valeria Nicolosi in AMBER, the Science Foundation Ireland-funded materials science centre, hosted in Trinity, and Trinity"s School of Chemistry.

Professor Nicolosi secured EUR2.5 million to create an innovative new type of energy storage device under the European Research Council"s (ERC) Consolidator Grants earlier this year. This grant is one of the most sought-after competitive research grants in Europe and will provide Professor Nicolosi funding over five years for her project "3D2DPrint".

Professor Nicolosi is Ireland"s only five-time ERC awardee, and has secured over EUR11 million in funding for her research in the past five years at Trinity. She has previously received an ERC Starting and two Proof of Concepts grants worth EUR4.3 million in total. Her most recent ERC award was at the beginning of July - another Proof of Concept grant which will act as top-up funding to explore commercial or innovation potential of the results of her ERC-funded research.

Imagine a family of batteries that recharge in a few minutes, that can come in any shape or size and can be disguised within any type of material - whether a piece of clothing or the hard plastic shell of a mobile device. These are revolutionary batteries that could be customised just for you and could even be implanted within your body to power a device that monitors your health - they could be hidden and integrated to the extent that you might not really know they were even there.

From there, consider that these batteries won"t die after a year"s worth of repeated recharging - they could last 50 times longer than the normal battery life as they are "smart" batteries - they harvest energy from their surroundings and are actually charging themselves. These are a new type of battery that Professor Nicolosi and her team are working to create.

Professor Nicolosi"s research will develop fully customisable batteries - they will be custom made and formulated for whatever specific application needed. They will be able to be used for general fitness (e.g. within a 3D Printed smart fitness watch), as well as being manufactured and fully integrated within a 3D printed Implanted Cardiac Device. These batteries will also, compared to the current Li-battery technology, be fully non-harmful and non-flammable.

The aim of this project is to develop a new energy storage technology using a unique combination of Professor Nicolosi"s novel 2-Dimensional nanomaterials and 3D printing processes. It is hoped that this innovative approach will produce a range of energy storage devices by exploiting 3D printing to develop complex material shapes, which may offer further performance enhancement at low cost.

Professor Nicolosi commented: "Since 2011, the first year of my ERC Starting Grant, my group has grown from three to 25 people. The ERC Grants I have been awarded were not only important in helping fund our research and grow our team, but to also help leverage more funding and realise partnerships with large multinationals. What is key is that these grants allow us to take the next step with our research - whether it is the licensing of technology or starting up a new company."

Professor Michael Morris, Director of AMBER, said: "The work Professor Nicolosi and her team are doing is at the forefront of their fields, and the ERC grants will help them take the next step in combining the team"s expertise of advanced materials methods to integrate nanomaterials into 3D printed energy storage devices. She is an exceptional asset to the AMBER team and this funding also reaffirms how competitive Ireland is as a place for research."

Ireland inaugurated the country’s ‘largest’ grid-scale battery energy storage facility, located in Poolbeg Energy Hub. The 75 MW/150 MWh BESS is aimed at enhancing grid stability and facilitating greater integration of renewable energy into Ireland's power network. The project, with an investment value of USD 321 million, is a collaboration between Ireland's Electricity Supply Board and BESS manufacturer Fluence.

The BESS operates by storing excess energy generated from renewable sources like wind and solar during periods of low demand. This stored energy can then be released back into the grid when demand peaks, ensuring a reliable and stable electricity supply. This flexibility is crucial for integrating more renewables, which are inherently intermittent, into the grid without compromising its stability.

The Dublin Energy Hub, housing the largest battery, serves as a testbed for the future of clean energy in Ireland. It is envisioned as a hub for integrating various green technologies, including offshore wind, hydrogen, and carbon capture and storage, all working together to power a sustainable future for the Emerald Isle. For further information about renewable energy projects in the region, explore our Ireland renewable energy projects database.

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