

# Research breakthrough will lead to more accurate weather forecasts

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Queen's University Belfast engineers Raymond Dickie (L) and Professor Robert Cahill (R) pictured with their new filter, that for the first time, will give scientists access to a completely new range of data, leading to improved accuracy in weather forecasting. Credit: Queen's University Media Services

More accurate global weather forecasts and a better understanding of climate change are in prospect thanks to a breakthrough by engineers at Queen's University Belfast's Institute of Electronics, Communications and Information Technology (ECIT).

The ECIT team has developed a high performance electronic device -

known as a dual polarized Frequency Selective Surface filter - that is to be used in future European Space Agency (ESA) missions.

The filters will be installed in instruments being developed by ESA for meteorological satellites it plans to launch between 2018 and 2020. The ESA instruments are used to detect thermal emissions in the Earth's atmosphere. The data measures temperature, humidity profiles, and gas composition, which are in turn entered into operational systems and used to forecast weather and pollution.

Lead ECIT engineer Raymond Dickie said: "Measuring just 30mm in diameter and 1/100mm thick, the devices will help to provide a much more comprehensive analysis of conditions in the Earth's atmosphere than has been possible previously.

"Up to now, spaceborne remote sensing instruments have only been capable of separating either the vertically or horizontally polarized components of naturally occurring thermal emissions from gases in the Earth's [atmosphere](#) - but not both together at the same time. The invention of the new filter resolves this problem and will enable complex imaging of clouds to be undertaken for the first time at very short wavelengths."

Global patent applications have already been filed for the filters which are constructed by ECIT engineers and research staff at Queen's University's Northern Ireland Semiconductor Research Centre in Belfast. The filters have been developed as a result of a £1.2 million investment in Queen's by EPSRC, EADS Astrium and ESA to develop the technology, and have taken over 10 years to develop.

Robert Cahill, a member of the project team added: "As a result of the new filter, scientists will gain access to completely new data on a range of phenomenon including ozone depletion and the size of water particles

in cirrus clouds. This in turn will enable more accurate global weather forecasts to be compiled and will provide important new insights into [climate change](#)."

Source: Queen's University Belfast

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