The search for ET just got easier

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Astronomers using the Science and Technology Facilities Council's (STFC) William Herschel Telescope (WHT) on La Palma have confirmed an effective way to search the atmospheres of planets for signs of life, vastly improving our chances of finding alien life outside our solar system.

The team from the Instituto de Astrofisica de Canarias (IAC) used the WHT and the Nordic Optical Telescope (NOT) to gather information about the chemical composition of the Earth's atmosphere from sunlight that has passed through it. The research is published today (11th June) in *Nature*.

When a planet passes in front of its parent star, part of the starlight passes through the planet's atmosphere and contains information about the constituents of the atmosphere, providing vital information about the planet itself. This is called a transmission spectrum and even though astronomers can't use exactly the same method to look at the Earth's atmosphere, they were able to gain a spectrum of our planet by observing light reflected from the Moon towards the Earth during a lunar eclipse. This is the first time the transmission spectrum of the Earth has been measured.

The spectrum not only contained signs of life but these signs were unmistakably strong. It also contained unexpected molecular bands and the signature of the earth ionosphere.

Enric Palle, lead author of the paper, from the Instituto de Astrofisica de

Canarias, said, "Now we know what the transmission spectrum of a inhabited planet looks like, we have a much better idea of how to find and recognize Earth like planets outside our solar system where life may be thriving. The information in this spectrum shows us that this is a very effective way to gather information about the biological processes that may be taking place on a planet."

Pilar Montañes-Rodriguez, from the Instituto de Astrofisica de Canarias, added, "Many discoveries of Earth-size planets are expected in the next decades and some will orbit in the habitable zone of their parent stars. Obtaining their atmospheric properties will be highly challenging; the greatest reward will happen when one of those planets shows a spectrum like that of our Earth."

The past two decades have witnessed the discovery of hundreds of exoplanets (planets beyond our solar system). Ambitious missions, ground and space based, are already being planned for the next decades, and the discovery of Earth-like planets is only a matter of time. Once these planets are found, techniques like transmission spectra will be invaluable to their further exploration.

Professor Keith Mason, Chief Executive of the Science and Technology Facilities Council (STFC), said, "This new transmission spectrum is good news for future upcoming ground and space based missions dedicated to the search for life in the Universe. The UK is committed to cutting edge science and UK owned facilities like the WHT are helping to make many groundbreaking discoveries and expand our knowledge of the Universe. Not only do these results improve our knowledge of our own planet but we now have an effective way to search for life on the increasing number of exoplanets being found by astronomers."

Source: Science and Technology Facilities Council (news : web)