The JCMT celebrates 25 years on top of the world

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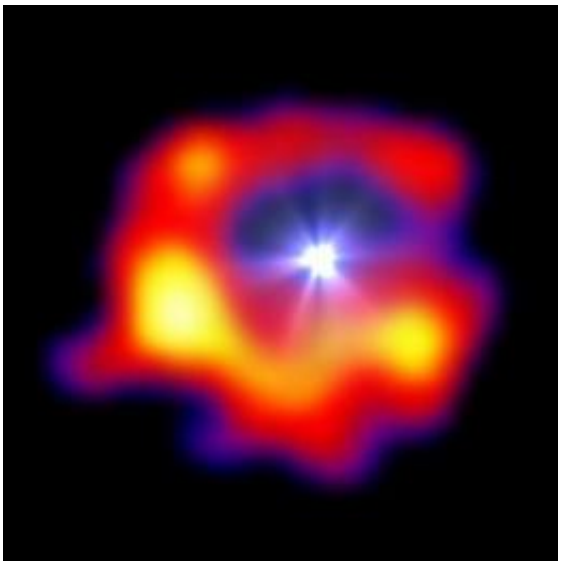
The James Clerk Maxwell Telescope sits at 14,000 ft atop Mauna Kea in Hawaii. Credit: JAC.

The James Clerk Maxwell Telescope (JCMT) on Mauna Kea in Hawaii, is celebrating its 25th birthday this week. It first turned its dish to the heavens this week in 1987, and now, a quarter of a century later, the JCMT continues to lead the world in submillimetre astronomy.

With a diameter of 15m, the JCMT is the largest dish in the world dedicated to observing at submillimetre (sub-mm) wavelengths. Submillimetre light comes from the coldest and most distant material in the universe and has a wavelength 1000 times longer than visible light. Sub-mm emission traces everything from cold dust in the Milky Way, just a few degrees above absolute zero, to distant galaxies whose light has been stretched by the expansion of the universe.



A ring of dust particles around a nearby star, Epsilon Eridani. This star is similar to the Sun with the dust eventually going on to form a planetary system. Credit: Greaves et al.

The JCMT was one of the first sub-mm telescopes to be built and it has blazed the trail in this field. One of the reasons for this success is the series of increasingly sensitive instruments, built using state-of-the-art technology, which have been responsible for some key discoveries in astronomy. An early instrument called UKT14 revealed young stars at the very earliest stages of their formation, objects known as Class 0 protostars. This discovery was vital for understanding how stars form

from clouds of gas and dust. The world's first sub-mm imaging camera, SCUBA, operated on the JCMT for 8 years and enabled the discovery of a previously unknown population of dusty galaxies, that became known as 'SCUBA galaxies', that fundamentally changed our understanding of galaxy evolution in the early universe. SCUBA also produced the first ever images of cold debris discs around nearby stars, which may indicate the presence of planetary systems. All of these diverse discoveries have led to major scientific advances.

The JCMT's journey of astronomical discovery is continuing. Just a few months ago the observatory unveiled SCUBA-2, a revolutionary successor to SCUBA that has already produced exciting scientific results. To celebrate its 25th birthday, the JCMT is releasing the first SCUBA-2 data from W51, a massive star forming region in the Milky Way. The image shows 850 micron emission from SCUBA-2 which traces dust, and reveals a detailed morphology, from dense clumps to wispy filaments. This data is part of the JCMT Galactic Plane Survey that aims to map the large regions of the Milky Way at sub-mm wavelengths.

"The JCMT has been an outstanding success over the past quarter century" says Professor Gary Davis, its Director. "It has provided its user communities in the United Kingdom, Canada and the Netherlands with scientific capabilities that are unrivalled anywhere in the world. With the recent release of SCUBA-2, this success will continue into the future and I look forward to seeing the observatory continue to thrive."

The JCMT is operated by the Joint Astronomy Centre (JAC) on behalf of the UK Science and Technology Facilities Council, the National Research Council of Canada, and the Netherlands Organisation for Scientific Research. The JAC operates two telescopes on Mauna Kea; the second is the United Kingdom Infrared Telescope (UKIRT), that celebrated its 30th birthday in 2009.

Provided by Joint Astronomy Centre