## THE SPITZER SPACE TELESCOPE IS 15. BUT THE MYSTERIES OF SPACE REMAIN

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The fourth and final of NASA's Great Observatories programme — the Spitzer Space telescope — has just turned 15. Initially launched for a minimum two-and-a-half-year primary mission, this telescope has far exceeded the amount of time anyone expected it to last. It still appears to be going strong. The NASA Great Observatories programme comprises four large powerful astronomical telescopes — the Hubble Space Telescope, the Compton Gamma Ray Observatory (not operational anymore), the Chandra X-ray Observatory, and the Spitzer Space Telescope. These four telescopes have played an important role in shaping our current understanding of outer space, that great unknown, famously called the "final frontier" for humanity. The 15th anniversary of the youngest of these telescopes is an important milestone for human science, and should also be a sobering moment when we reflect on how far we've come, how little we still know about the universe.

When it was launched, the most optimistic expectation from the Spitzer was for it to last five years — the amount of time it took for the on board liquid helium supply (the cooling agent that maintained the very low temperatures needed for most of the instruments to be used) to be exhausted. The supply ran out in May 2009, marking the start of the Spitzer's "warm mission". In spite of the fact that most of the on-board instruments are no longer usable, two of the infrared array cameras are still functional and continue to send back usable data. The Spitzer has allowed scientists to peer into those spaces that optical telescopes could not see, such as centres of galaxies, extrasolar planets, giant molecular clouds, even organic molecules that, according to NASA, "may hold the secret to life on other planets". One of the unique things about the Spritzer is that it is heliocentric (orbits the sun) rather than geocentric (orbits the earth), which means that it is continuously trailing and drifting away from the earth.

Even as the Spritzer continues to cast light on some of the darker corners of the universe, scientific debate here on earth around theories that emerge from its observations rage on. As we discover more of the universe, the more evident it becomes that the existence of life is a unique. In the observation of the unknown universe, humanity can perhaps begin to grasp how precarious its perch is, how rare its existence.

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