

Image: Feathery filaments in Mon R2

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Credit: ESA/Herschel/PACS/SPIRE/HOBYS Key Programme consortium

Fierce flashes of light ripple through delicate tendrils of gas in this new image, from ESA's Herschel space observatory, which shows the dramatic heart of a large and dense cosmic cloud known as Mon R2. This cloud lies some 2700 light-years away and is studded with hot, newly-formed stars.

Packed into the bright centre of this region are several hot 'bubbles' of ionised hydrogen, associated with newborn stars situated nearby. Here, [gas](#) heated to a temperature of 10 000 °C quickly expands outwards, inflating and enlarging over time. Herschel has explored the bubbles in Mon R2, finding them to have grown over the course of 100 000 to 350 000 years.

This process forms bubble-like cavities that lie within the larger Mon R2 cloud. These are known as HII regions and Mon R2 hosts four of them, clustered together in the central blue-white haze of bright light—one at the very centre, two stretching out like butterfly wings to the top left and bottom right, and another sitting just above the centre.

Each is associated with a different hot and luminous B-type star. These stars can be many times the mass of the Sun and usually appear with a blue hue due to their high temperature.

Astronomers have found that the hot bubbles in Mon R2 are enveloped by vast clouds of cold, dense gas, sitting within the filaments that stretch across the frame. In stark contrast to the gas in the hot bubbles, these clouds can be at temperatures as low as -260 °C, just above absolute zero.

This particular cluster of HII regions has been studied as part of the Herschel imaging survey of OB young stellar objects, or HOBYS,

programme. This image combines multiple Herschel observations obtained with the PACS and SPIRE cameras and has been processed to highlight the cloud's clumpy complex of filaments, visible here in great and dramatic detail.

Provided by European Space Agency

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