

Herschel reveals a ribbon of future stars

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Credit: ESA/Herschel/SPIRE/M. Juvela (U. Helsinki, Finland)

Star formation is taking place all around us. The Milky Way is laced with clouds of dust and gas that could become the nursery of the next generation of stars. Thanks to ESA's [Herschel space observatory](#), we can now look inside these clouds and see what is truly going on.

It may seem ironic but when searching for sites of future [star formation](#), astronomers look for the coldest spots in the Milky Way. This is because

before the stars ignite the gas that will form their bulk must collapse together. To do that, it has to be cold and sluggish, so that it cannot resist gravity.

As well as gas, there is also [dust](#). This too is extremely cold, perhaps just 10–20 degrees above absolute zero. To optical telescopes it appears completely dark, but the dust reveals itself at far-infrared wavelengths.

One of the surprises is that the coldest parts of the cloud form filaments that stretch across the warmer parts of the cloud. This image shows a cold cloud [filament](#), known to astronomers as G82.65-2.00. The blue filament is the coldest part of the cloud and contains 800 times as much mass as the Sun. The dust in this filament has a temperature of -259°C . At this low temperature, if the filament contains enough mass it is likely that this section will collapse into stars.

This image is colour-coded so that the longest infrared wavelength, corresponding to the coldest region, is shown in blue, and the shortest wavelength, corresponding to slightly warmer dust, is shown in red.

The field of view on display here is a little more than two times the width of the full Moon. It is one of 116 regions of space observed by Herschel as part of the [Galactic Cold Cores project](#). Each field was chosen because ESA's cosmic microwave background mapper, [Planck](#), showed that these regions of the galaxy possessed extremely cold dust.

Provided by European Space Agency

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