

The Far Infrared Galaxy

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A Herschel false three-color image (blue=70 microns, green=160 microns, red=250 microns) of a region of the Milky Way galaxy with a giant stellar nursery in constellation of Vulpecula. Launched one year ago, Herschel's first results were announced last week, and the corresponding papers released to a forthcoming special issue of the journal *Astronomy and Astrophysics*. Credit: ESA, NASA, and the Herschel HiGal Team

(PhysOrg.com) -- Our Milky Way galaxy, like other spiral galaxies, has copious amounts of dust in its spiral arms. The dust absorbs starlight, thereby blocking our optical views, but at the same time it re-radiates the absorbed energy at far-infrared wavelengths.

One consequence is that, ironically, the many stellar birthplaces found in

molecular clouds throughout the galaxy have rarely been studied at the wavelengths where the dust emits at its brightest.

The Herschel [Space Observatory](#) is a 3.5-meter, cryogenically cooled orbiting telescope, launched last year, with cameras and spectrometers that cover the full far infrared electromagnetic band -- the four octaves of light from the short wavelength infrared just longward of the visible to the submillimeter. Several satellite observatories over the past few decades have successfully begun to probe this mysterious range, but all have lacked Herschel's large collecting area, complete wavelength coverage, and a full complement of instruments, leaving many questions unanswered.

Last week the journal [Astronomy and Astrophysics](#) accepted for publication an entire issue's worth of papers with the first results from Herschel, with papers co-authored by CfA astronomers Joe Hora, Tim van Kampen, Eric Keto, Gary Melnick, Phil Myers, Tom Robitaille, Howard Smith, Tony Stark, Volker Tolls, and Qizhou Zhang. We reported on extragalactic results [last week](#). Here we cite one set of papers about our own galaxy, the first results from a complete far-infrared map of the plane of the central third of the Milky Way. The images obtained so far from this study have revealed for the first time massive clouds of very cold dust and gas (only tens of degrees kelvin above absolute zero), apparently nurturing the very earliest embryos of future stars.

Provided by Harvard-Smithsonian Center for Astrophysics

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