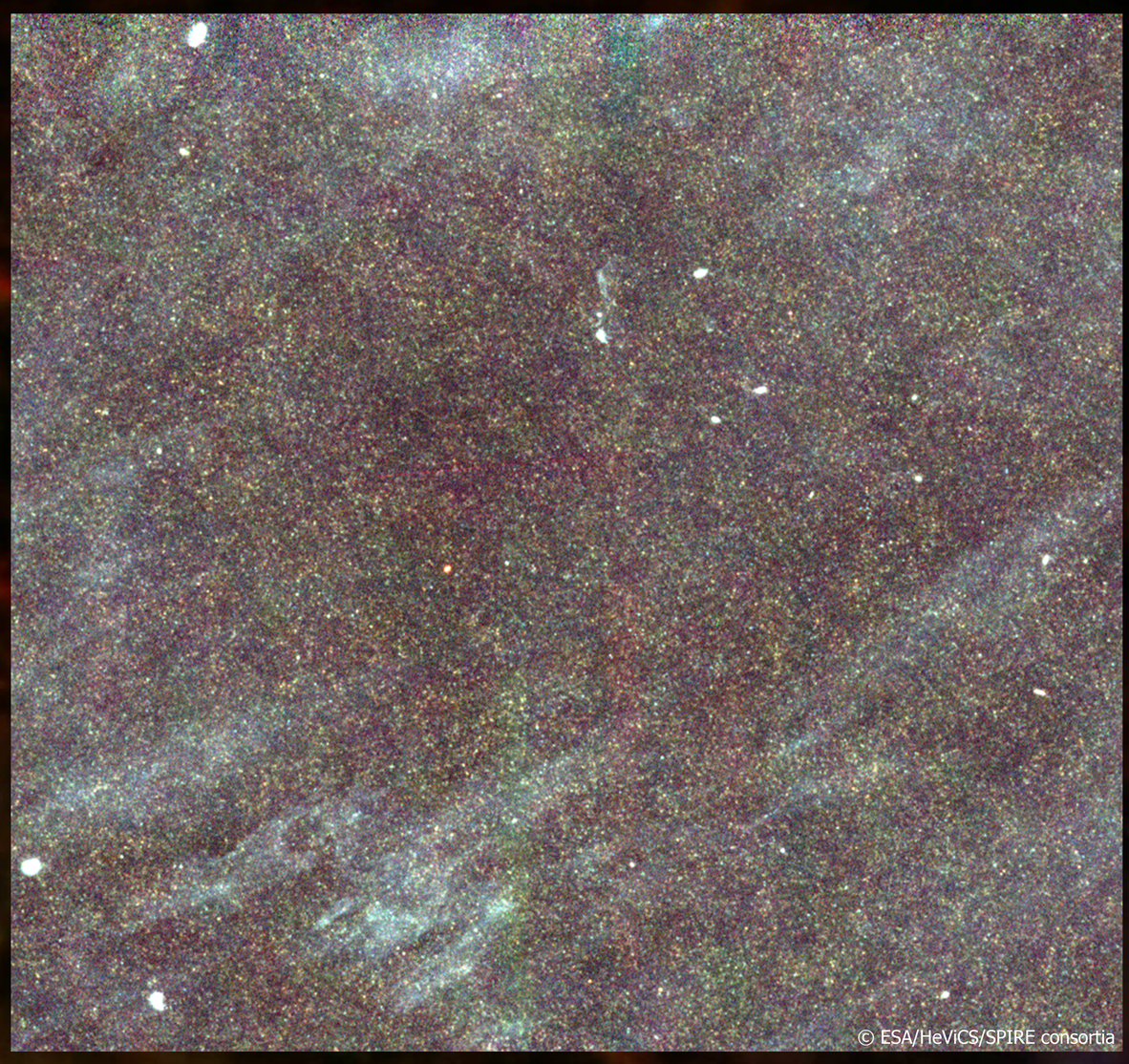
Herschel Space Observatory

Neighbourhood Watch

Our Galaxy, the Milky Way, is one of several main galaxies in the "Local Group". About 60 million light years away, in the constellation of Virgo, is the Virgo Cluster, containing over a thousand galaxies of different shapes and sizes.

While the Virgo Cluster provides the richest source of galaxies, nearby galaxies are scattered all over the sky. A number of Herschel projects are observing these galaxies in the far-infrared to examine their gas and dust. By looking at many nearby galaxies, details of the structure of our own Galaxy can be inferred. The findings can also be extended to much more distant galaxies, which were forming stars in the early Universe.



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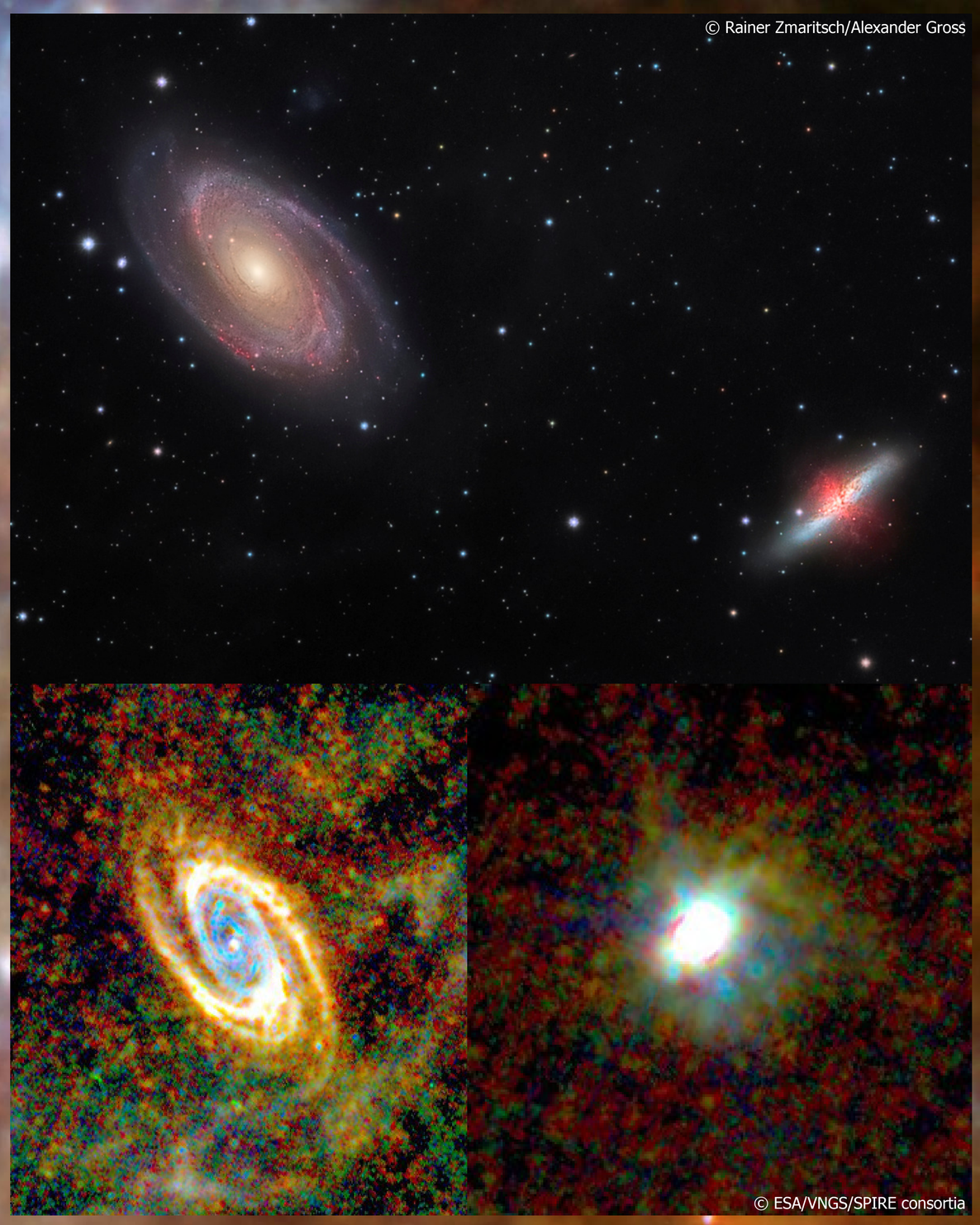
The image above is of a small region in the Virgo Cluster. The wispy structure is within our own Galaxy, while most of the small, faint, fuzzy blobs are much more distant galaxies in the early Universe. The brighter objects are Virgo Cluster galaxies.

Galaxies that are bright in optical light are not always bright in the far-infrared. The massive elliptical galaxy M86, bottom-right in the images below, contains many billions of stars but very little dust, making it much fainter when seen by Herschel. Conversely, the galaxy above it is much brighter in the far-infrared than the visible as it contains more dust.



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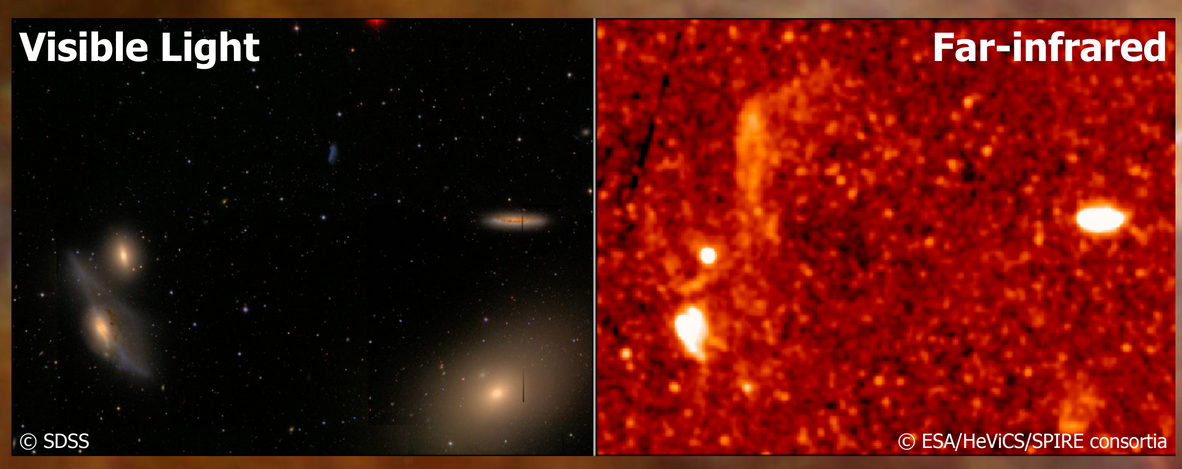
By looking at the space between galaxies, the effect of the gravitational interactions on the gas and dust can be studied.

The galaxies M81 (left) and M82 (right) passed close to each other millions of years ago. As a result, the spiral arms of M81 are forming more stars, and the smaller, elliptical M82 is spewing gas and dust into intergalactic space.



Meanwhile, the galaxies on the left of the image are pulling material from each other. Their disturbed shapes are apparent at both visible and far-infrared wavelengths, but the gas and dust which lies above both galaxies in this image is much more brighter in the far-infrared, making it easier for Herschel to study.