Visible (left) and submillimeter (right) images of the spiral galaxy NGC 7331. At submillimeter wavelengths we see warm molecular gas. In the central region gas is wrapped into a ring shape, but we do not see gas at its very center. By observing the velocity of gas, we can study how the ring moves.

NGC 7331
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Distance from the Sun: 49,000,000 light years

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NGC 7331 was once thought to be a twin of the Milky Way Galaxy. The mass and spiral structure are both very similar. The recent observations with the Spitzer Space Telescope show that our Milky Way probably has only two spiral arms, and astronomers started doubting the similarity between the Milky Way and NGC 7331.
M 100 (NGC 4321) is a nearly face-on, grand design spiral galaxy, and it is a member of the rich Virgo cluster of galaxies. The submillimeter data are shown here as contours, which indicate warm molecular gas. It is overlaid on a visible image. The warm gas traces the spiral arms.
A "family" of galaxies called Stephan's Quintet which are moving through space together. The top galaxy, just to the right of center, has bright star-forming regions (pink in this image), and is closer to us, not part of the "family" moving through space together.
The Ultra-Deep Survey of the UKIRT Infrared Deep Sky Survey (UKIDSS) will provide the most sensitive large-scale map of the distant Universe. This image, projected on the ‘Imiloa Planetarium dome, shows thousands of distant galaxies. This data set will give us clues about how and when the first galaxies were formed.