Spitzer Reveals Pinwheel Galaxy's Hidden Wonders (Forwarded)

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Spitzer Reveals Pinwheel Galaxy's Hidden Wonders

Note: This release is being issued jointly with the University of Minnesota and the University of Arizona.

Denver, CO −− Like nosy neighbors, astronomers are spying on one of the nearest galaxies to our Milky Way. In studying the Pinwheel Galaxy, also known as Messier 33 (M33), they seek not malicious gossip but new knowledge as they search for clues to how galaxies like our own are born, live, and die. Today at the 204th meeting of the American Astronomical Society in Denver, Colorado, astronomers from the University of Minnesota, the Harvard−Smithsonian Center for Astrophysics (CfA), and the University of Arizona unveiled new infrared images of M33 taken by NASA's Spitzer Space Telescope. The photos reveal features of the galaxy never before visible.

About 50,000 light−years across, the spiral galaxy M33 is half the diameter of the Milky Way. It lies 3 million light−years from the Milky Way, which places it among the Local Group of galaxies. Its nearness and viewing angle give astronomers an excellent opportunity to study M33's physical and chemical processes.

"With the Andromeda Galaxy, it's one of the two nearest large spiral galaxies comparable to the Milky Way. Since it's so close, we can get a nice panoramic view. It's a great object for detailed study," said Smithsonian astronomer Steven Willner (CfA).

"M33 is a gigantic laboratory where you can watch dust being created in novae and supernovae, being distributed in the winds of giant stars, and being reborn in new stars," said University of Minnesota researcher and lead author Elisha Polomski. By studying M33, "you can see the Universe in a nutshell."

Because it operates at infrared wavelengths, the Spitzer Space Telescope detects details hidden to the human eye and to telescopes that operate in visible light. Spitzer collects light at wavelengths measured in microns− millionths of a meter. The new pictures were taken in light at wavelengths ranging from 3.5 to 24 microns.

"At 3.5 microns, we see stars," said University of Minnesota astronomy professor Robert Gehrz, a member of the M33 observation team. "At eight microns, we see warm dust that's about 130 degrees Fahrenheit. At 24 microns, we're picking up cool dust that's between minus 100 and minus 190 degrees Fahrenheit." Spitzer's cameras also operate at 70 and 160 microns.

Observations of M33's cool components are expected to reveal much about the "metabolism" of galaxies. A galaxy is akin to a living body, in which food substances are broken down to build the body, and the waste and decomposition products of a body are recycled to feed new life. For example, the iron in Earth's core was forged in the bellies of large, luminous stars, and the heavier elements−all the way to uranium, the heaviest naturally occurring element−were created in supernova explosions. The deaths of those stars sprayed interstellar space with dust and gas, some of which clumped together in a disk that coalesced to form the sun and its planets.

The Spitzer team will examine the Pinwheel Galaxy in detail for the next two and a half years, studying the processes that circulate energy and chemical elements through the galaxy to build up, destroy, and recycle the building blocks of stars and planets. The researchers expect to identify new star−forming regions, red giant stars, novae and supernovae, thereby mapping out the evolutionary process of stars in M33 and comparing it to the process in our own Galaxy.

The NASA Jet Propulsion Laboratory (JPL) manages the Spitzer Space Telescope mission for NASA's Office of Space Science, Washington.

Science operations are conducted at the Spitzer Science Center at the California Institute of Technology in Pasadena. JPL is a division of Caltech.

Headquartered in Cambridge, Mass., the Harvard−Smithsonian Center for Astrophysics (CfA) is a joint collaboration between the Smithsonian Astrophysical Observatory and the Harvard College Observatory. CfA scientists, organized into six research divisions, study the origin, evolution and ultimate fate of the universe.

Note to editors: A high−resolution image to accompany this release is available online at:
http://www.cfa.harvard.edu/press/pr0421image.html