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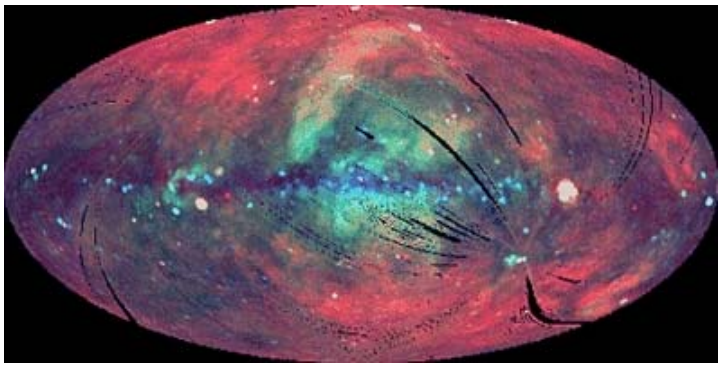
Chandra Telescope Helps Solve X-Ray Mystery

"Since it was first observed thirty-seven years ago, understanding the source of the X-ray background has been the Holy Grail of X-ray astronomy. Now, it is within reach."

- Dr. Alan Bunner, Director
NASA's Structure and Evolution of the Universe



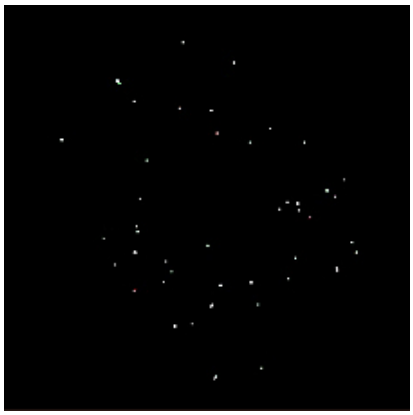
X-Ray Image: A view of our galaxy from the all-sky image by the German-led ROSAT x-ray observatory research "oriented so that the plane of our Milky Way Galaxy runs horizontally through the center. Both x-ray brightness and relative energy are represented with red, green and blue colors from lowest energy to highest. Over large areas of the sky a general diffuse background of x-rays dominates." Provided by NASA's Marshall Space Flight Center, Huntsville, Alabama.

January 17, 2000 Huntsville, Alabama - NASA's Chandra X-Ray Observatory was launched only five months ago, but it continues to astonish astronomers with its discoveries. One of the most perplexing cosmic mysteries has been the source of x-ray radiation that seems to pervade the universe.

Now a German-led team using Chandra has "resolved much of the lower-energy X-ray background showing that it arose in very faraway galaxies with extremely bright cores, called quasars or Active Galactic Nuclei (AGN)." In one sampled region of the sky, the Chandra team resolved about 80% of the more energetic X-ray background into discrete sources. "Nearly one-third of the sources are galaxies whose cores are very bright in x-rays, yet emit virtually no optical light

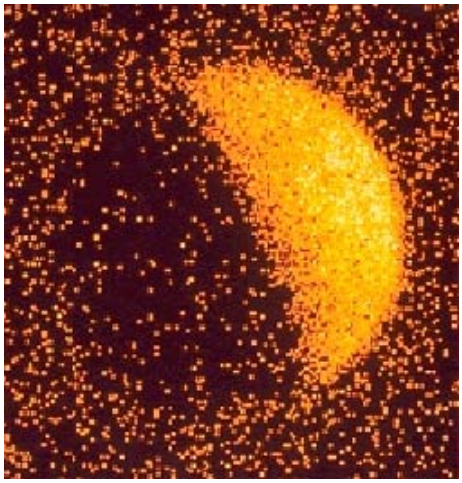
from the core. The observation suggests that these 'veiled galactic nuclei' galaxies may number in the tens of millions over the whole sky. They almost certainly harbor a massive black hole at their core that produces X-rays as the gas is pulled toward it at nearly the speed of light."

During this research, the scientists discovered another new class of objects that have a red shift of 6 or higher, meaning they are well over 14 billion light years away and could be the most distant objects ever identified.



X-Ray Image: New class of galaxies that have a red shift of 6 or higher, meaning they arewell over 14 billion light years away and could be the mostdistant objects ever identified. Provided by NASA's Marshall Space Flight Center, Huntsville, Alabama.

The diffusion of X-rays in our galaxy and universe shows up clearly in this X-ray image of the Moon made by the orbiting Roentgen Observatory Satellite (ROSAT) in 1990. It shows three regions: a bright yellow half of the Moon, the darker half of the Moon and the brightly speckled sky filled with diffuse cosmic X-rays.



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More Information:

In other astronomy news, scientists have calculated that in three billion years, our Milky Way Galaxy will collide with our neighbor galaxy, Andromeda, in a headlong collision at 300,000 mph. This arm of the Milky Way Galaxy could either end up shoved into the new galactic center where super novae and other bombardments would be rough on life. Or our solar system might be flung out of the Milky Way galaxy altogether ending up in a dark sky far from other stars.

Black Hole Not Far from Earth - On September 14, 1999, a black hole only 1600 light years from our solar system erupted with four bursts of strong X-rays. Astronomers focused X-ray detectors on the eruption near a star called V4641 Sgr. in the constellation Sagittari. The flares were the brightest source of X-rays in the sky except for our own sun.

According to astronomers at the National Radio Astronomy Observatory, radio telescopes detected two jets of matter firing at nearly the speed of light in the region identified as a black hole. Black holes are being discovered throughout the universe from the center of galaxies to the very edges of the theoretical Big Bang. Why there are so many is not understood?

It is theorized that black holes are produced when stars or even galaxies collapse on themselves distorting the gravity fields around them so that nothing can escape, including photons of light. Normally, black holes give off steady x-rays and gamma rays. But the star V4641 Sgr released four brief bursts of rapid and intense X-rays. Astrophysicist Ronald Remmillard of MIT said, "Either the matter can flow into the black hole without forming an accretion disk or the black hole is significantly different in its mass, spin or charge."

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Websites:

http://chandra.harvard.edu

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