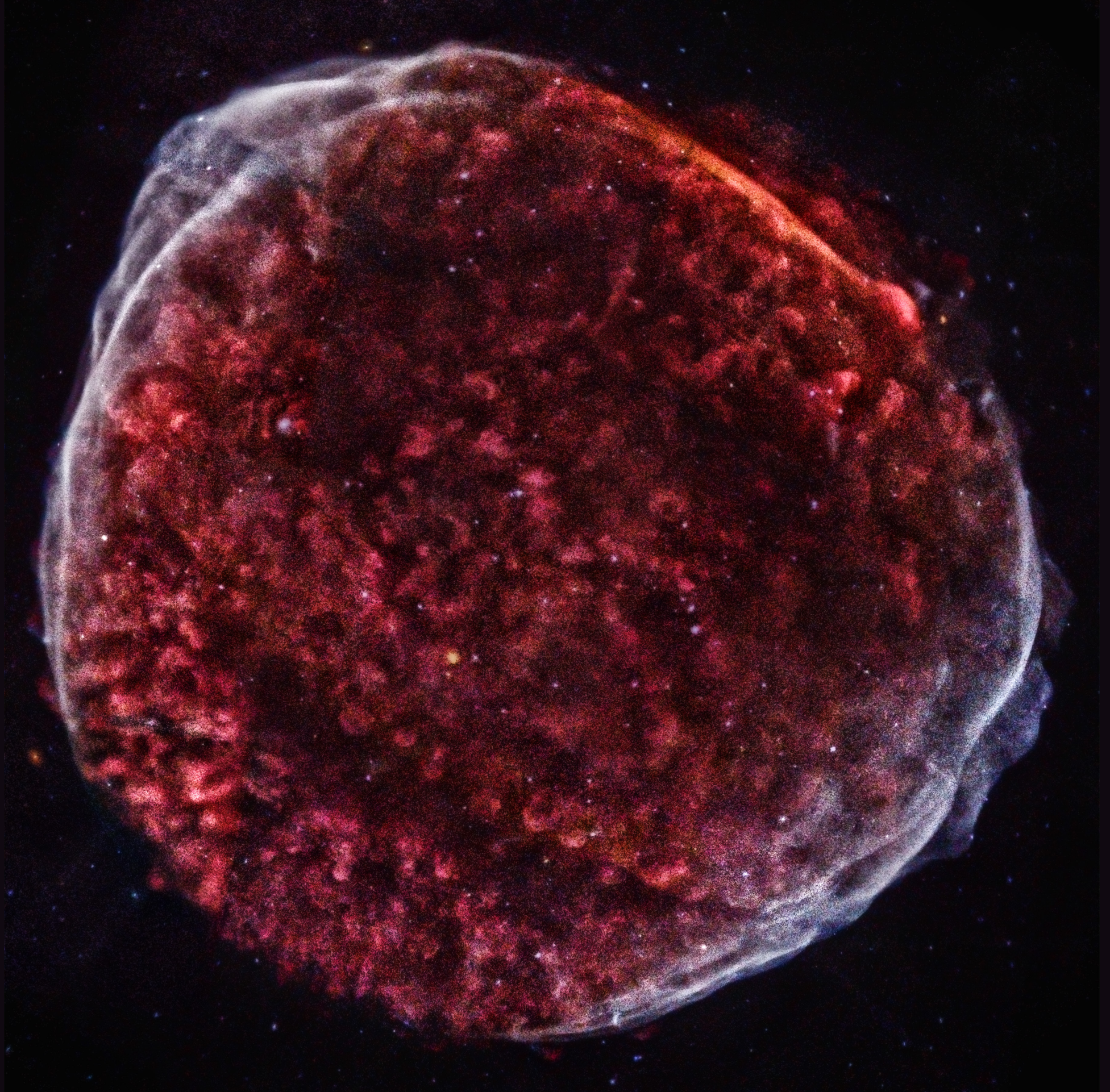


JANUARY 2014

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CASSIOPEIA A

This new version of Chandra's image of the Cassiopeia A supernova remnant has been specially processed to show with better clarity the appearance of Cas A in different bands of X-rays. This will aid astronomers in their efforts to reconstruct details of the supernova process such as the size of the star, its chemical makeup, and the explosion mechanism. The color scheme used in this image is the following: low-energy X-rays are red, medium-energy ones are green, and the highest-energy X-rays detected by Chandra are colored blue.

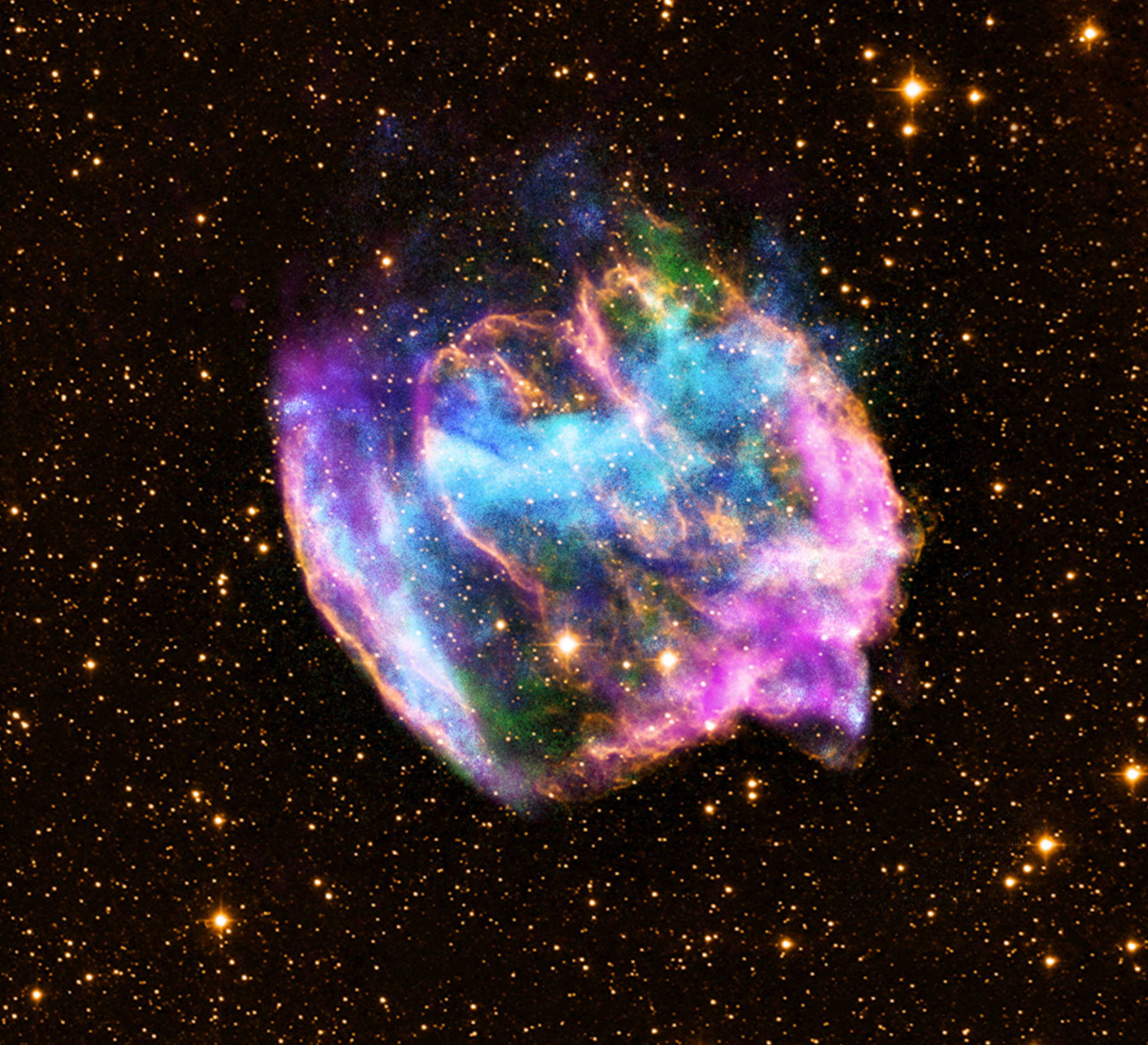


FEBRUARY 2014

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SN 1006

A long Chandra observation reveals SN 1006 supernova remnant in exquisite detail. By overlapping ten different pointings of Chandra's field-of-view, astronomers have stitched together a cosmic tapestry of the debris field that was created when a white dwarf star exploded, sending its material hurtling into space as seen from Earth over a millennium ago. In this new Chandra image, low, medium, and higher-energy X-rays are colored red, green, and blue respectively. Since SN 1006 belongs to the class of supernovas used to measure the expansion of the Universe, the new Chandra data provide insight into these important objects.



MARCH 2014

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W49B

This highly distorted supernova remnant may contain the most recent black hole formed in the Milky Way galaxy. The composite image combines X-rays from Chandra (blue and green), radio data from the Very Large Array (pink), and infrared data from the Palomar Observatory (yellow). Most supernova explosions that destroy massive stars are generally symmetrical. In the W49B supernova, however, it appears that the material near its poles was ejected at much higher speeds than that at its equator. There is also evidence that the explosion that produced W49B left behind a black hole and not a neutron star like most other supernovas.



APRIL 2014

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4C+29.30

The intense gravity of a supermassive black hole can be tapped to produce immense power in the form of jets moving at millions of miles per hour. A composite image shows this happening in the galaxy known as 4C+29.30 where X-rays from Chandra (blue) have been combined with optical (gold) and radio (pink) data. The X-rays trace the location of superheated gas around the black hole, which is estimated to weigh 100 million times the mass of our Sun. Some of this material may eventually be consumed by the black hole, and the magnetized, whirlpool of gas near the black hole could in turn, trigger more output to the radio jet. The optical light image shows the stars in this galaxy.



MAY 2014

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NGC 2392

When a star like our Sun uses up all of the hydrogen in its core, it becomes what is called a “planetary nebula.” During this stage, the star begins to cool and expand, increasing its radius by tens to hundreds of times its original size. Eventually, the outer layers of the star are swept away by a slow and thick wind, leaving behind a hot core. The radiation from the hot star and the interaction of its fast wind with the slower wind creates the complex and filamentary shell of a planetary nebula. This composite image of NGC 2392 contains X-ray data from Chandra in pink showing the location of million-degree gas near the center of the planetary nebula. Data from the Hubble Space Telescope—colored red, green, and blue—show the intricate pattern of the outer layers of the star that have been ejected.



JUNE 2014

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M60-UCD1

The densest galaxy in the nearby Universe may have been found. The galaxy, known as M60-UCD1, is located near a massive elliptical galaxy NGC 4649, also called M60. This composite image of M60 and the region around it presents X-rays from Chandra (pink) and optical data from Hubble (red, green, and blue). The Chandra image shows hot gas and double stars containing black holes and neutron stars, and the HST image reveals stars in M60 and neighboring galaxies including M60-UCD1. The density of stars in M60-UCD1 is about 15,000 times greater than found in Earth’s neighborhood in the Milky Way, meaning that the stars are about 25 times closer.



JULY 2014

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COMA CLUSTER

Enormous arms of hot gas have been revealed in the Coma galaxy cluster in data from NASA's Chandra X-ray Observatory and ESA's XMM-Newton. A specially processed Chandra image (pink) has been combined with optical data from the Sloan Digital Sky Survey (white and blue) to highlight these spectacular arms. Researchers think that these arms—which span at least a half million light years—were most likely formed when smaller galaxy clusters had their gas stripped away by the head wind created by the motion of the clusters through the hot gas.



AUGUST 2014

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NGC 6240

Scientists have used Chandra to make a detailed study of an enormous cloud of hot gas enveloping two large, colliding galaxies in the system known as NGC 6240. This unusually large reservoir of gas contains as much mass as 10 billion Suns, spans about 300,000 light years, radiates at a temperature of more than 7 million degrees, and glows in X-rays (purple). The Chandra data have been combined with optical data from the Hubble, which show long tidal tails from the merging galaxies, extending to the right and bottom of the image.

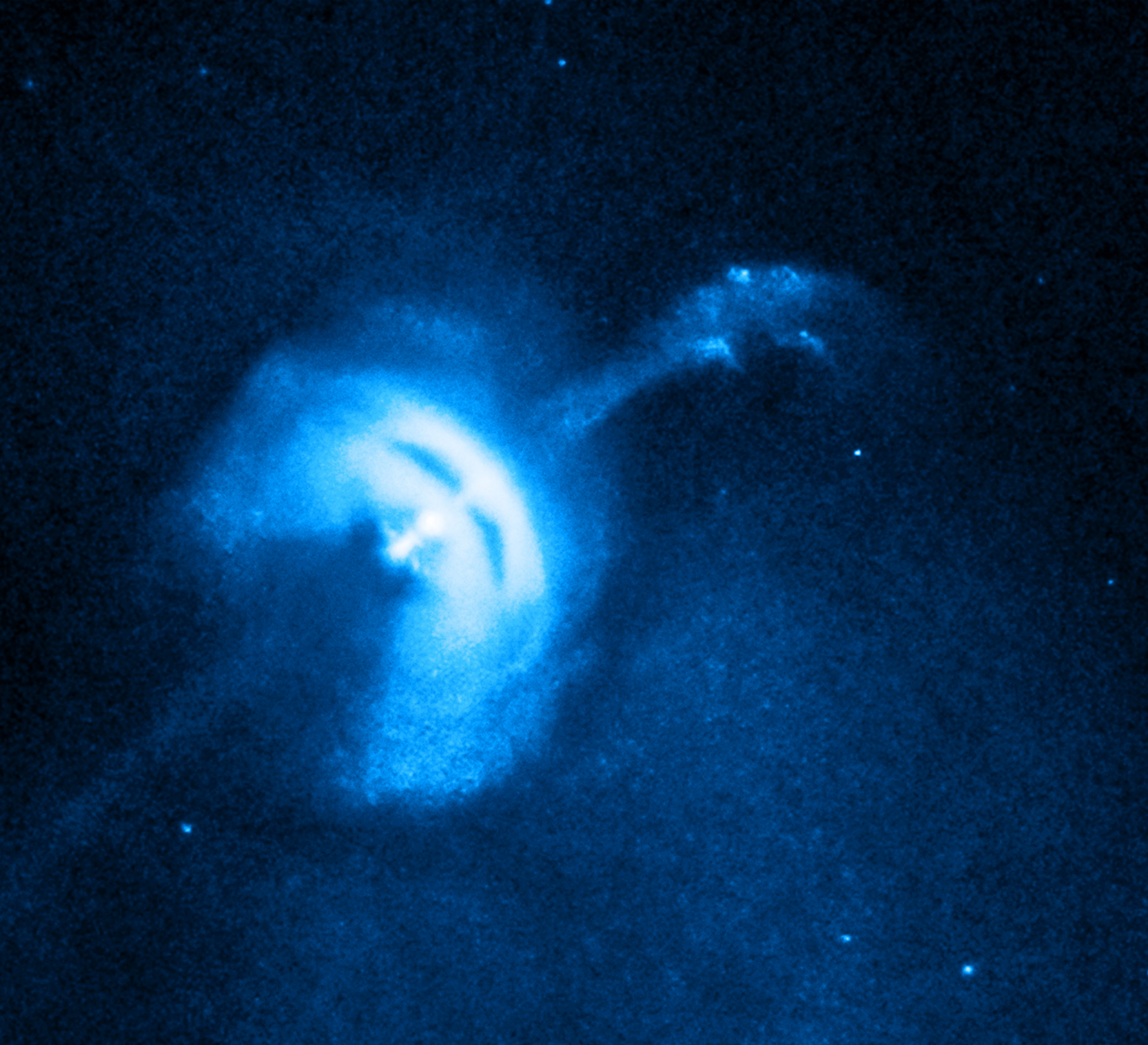


SEPTEMBER 2014

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DEM L50

DEM L50 (a.k.a. N186) is what astronomers call a superbubble. These objects are found in regions where massive stars have formed, raced through their evolution, and exploded as supernovas. The winds and shock waves from the supernovas carve out huge cavities in the gas and dust around them, creating superbubbles. This composite contains X-rays from Chandra (pink) and optical data from ground-based telescopes (red, green, and blue). The superbubble in DEM L50 is giving off about 20 times more X-rays than expected by standard models. Researchers think supernova shock waves striking the walls of the cavities and hot material evaporating from the cavity walls may be responsible for this additional X-ray emission.



OCTOBER 2014

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VELA PULSAR

This deep image from NASA's Chandra X-ray Observatory shows the Vela pulsar, a neutron star that was formed when a massive star collapsed. In the upper right is a fast moving jet of particles produced by the pulsar. The pulsar is about 1,000 light years from Earth, and makes over 11 complete rotations every second. As the pulsar spins, it spews out a jet of charged particles that race out along the pulsar's rotation axis at about 70% of the speed of light. A movie shows dramatic changes in the jet, suggesting that the pulsar may be slowly wobbling, or precessing, as it spins. If this evidence is confirmed, it would be the first time that a neutron star has been found to be precessing.



NOVEMBER 2014

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NGC 1232

A massive multimillion-degree cloud of gas has been revealed in X-ray data from Chandra (purple) that have been combined with optical data from the Very Large Telescope (blue and white) in this new composite image. The hot gas cloud is likely caused by a collision between a dwarf galaxy and a much larger galaxy called NGC 1232. If confirmed, this discovery would mark the first time such a collision has been detected only in X-rays, and could have implications for understanding how galaxies grow through similar collisions.



DECEMBER 2014

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NGC 6946

NGC 6946 is a medium-sized, face-on spiral galaxy about 22 million light years away from Earth. In the past century, eight supernovas have been observed to explode in the arms of this galaxy. Chandra observations (purple) have, in fact, revealed three of the oldest supernovas ever de-tected in X-rays, giving more credence to its nick-name of the “Fireworks Galaxy.” This composite image also includes optical data from the Gemini Observatory in red, yellow, and cyan.