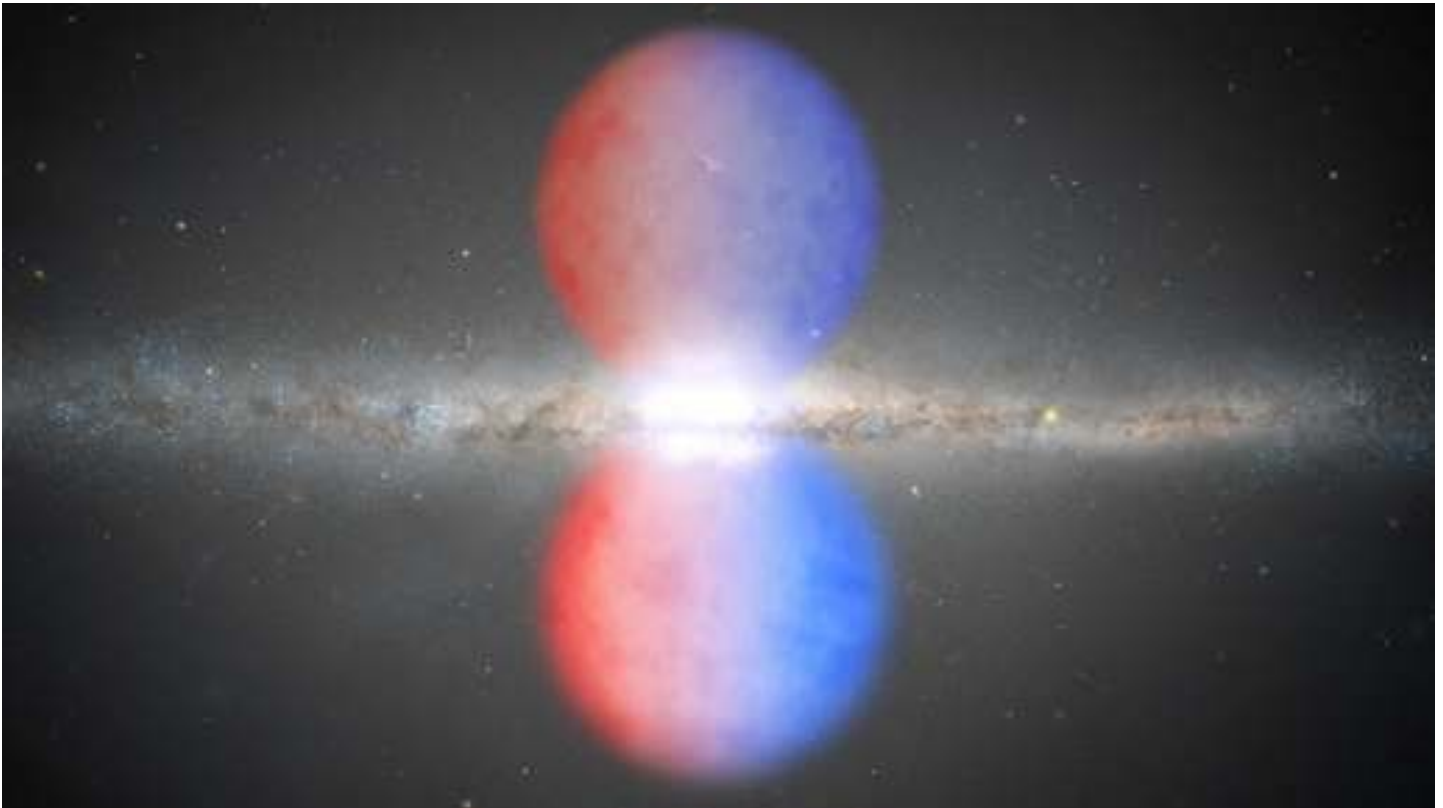


NEWS SPACE

## The Milky Way's giant gas bubbles were seen in visible light for the first time

The new technique could map the velocity of gas in the towering structures called Fermi bubbles



Giant bubbles of expanding gas that surround the Milky [Way](#) have been seen in visible light for the first time. The gas's motion shifts the light's wavelength, as depicted in this illustration. Emission from gas moving toward the solar system (bright spot at middle right) appears slightly bluer, while gas moving away appears redder.

HST/NASA, AND A. FIELD/STSCI

By [Emily Conover](#)

18 HOURS AGO

Mysterious cosmic bubbles are being seen in a new light.

For the first time, scientists have observed visible light from the Fermi bubbles, enormous blobs of gas that sandwich the plane of the Milky [Way](#) galaxy. The newly spotted glow was emitted by hydrogen gas that was electrically charged, or ionized, within the bubbles. [Astronomer Dhanesh Krishnarao](#) of the University of Wisconsin–Madison and colleagues [described the finding](#) June 3

in a news conference at the American Astronomical Society virtual meeting and [in a paper](#) posted at arXiv.org on May 29.

Originally observed in 2010, the bubbles spew high-energy light known as gamma rays. The towering structures, each 25,000 light-years tall, are thought to be [relics of an ancient outburst of gas](#) from the galaxy's center (*SN: 11/9/10*). But scientists don't know the source. The outflow could have been the result of the black hole at the center of the galaxy messily gobbling up matter, or emissions caused by bursts of stars forming.

Within the bubbles, gas is expanding outward, its motion altering the apparent wavelength of its light. Material closer to the solar system is traveling toward it, appearing bluer, and more distant gas is moving away, appearing redder. The wavelength shift allowed the researchers to pinpoint the gas's velocity at one location within the bubbles. Using the Wisconsin H-Alpha Mapper telescope, or WHAM, the researchers determined that the gas flowed outward at about 220 kilometers per second. The estimate agreed with an earlier measurement made using ultraviolet light.

By taking measurements in other locations, the researchers hope to more fully map out the velocity of the gas. "What that can tell us is how, over time, the energy output from the Fermi bubbles has changed. That'll really be able to nail down more about the origin," Krishnarao said.

#### CITATIONS

D. Krishnarao. [First optical measurements of the Fermi bubbles probe their origin](#). 236th meeting of the American Astronomical Society, June 3, 2020.

D. Krishnarao, R.A. Benjamin and L.M. Haffner. [Discovery of high-velocity H-alpha above galactic center: Testing models of the Fermi bubble](#). arXiv:2006.00010. Posted May 29, 2020.