Image: Hubble uncovers a burst of star formation

October 18 2021, by Lynn Jenner

Credit: ESA/Hubble & NASA, O. Graur; Acknowledgment: L. Shatz

NGC 4666 takes center stage in this image from the NASA/ESA Hubble Space Telescope. This majestic spiral galaxy lies about 80 million light-years away in the constellation Virgo and is undergoing a particularly intense episode of star formation. Astronomers refer to galaxies that

rapidly form stars as starburst galaxies. NGC 4666's starburst is likely due to gravitational interactions with its unruly neighbors—including the nearby galaxy NGC 4668 and a dwarf galaxy, which is a small galaxy made up of a few billion stars.

NGC 4666's burst of star formation is driving an unusual form of extreme galactic weather known as a superwind—a gigantic transfer of gas from the bright central heart of the galaxy out into space. This superwind is the result of driving winds from short-lived massive stars formed during NGC 4666's starburst as well as spectacularly energetic supernova explosions. Two supernovae occurred in NGC 4666 within the last decade—one in 2014 and the other in 2019. The star that led to the 2019 supernova was 19 times as massive as our Sun!

Though the torrent of superheated gas emanating from NGC 4666 is truly vast in scale—extending for tens of thousands of light-years—it is invisible in this image. The superwind's extremely high temperature makes it stand out as a luminous plume in X-ray or radio observations, but it doesn't show up at the visible wavelengths imaged by Hubble's Wide Field Camera 3.

Provided by NASA's Goddard Space Flight Center