National Aeronautics and Space Administration

Triangulum Galaxy (M33)

Hubble Maps a Nearby Spiral Galaxy

The Hubble Space Telescope has peered far across space and time to study a sample of the billions of galaxies in the universe. The farthest are seen as mere faint smudges of light that astronomers cannot analyze in detail.

To better understand the inner workings of galaxies and their stellar populations, researchers need to study our Milky Way's closest neighbors. These galaxies, collectively called the Local Group, are so close that Hubble's sharp vision can resolve not only the galaxies' structure and components, but also the individual stars within them.

Hubble has observed several of these nearby galaxies, including the Triangulum galaxy (M33), shown on the front. The image, a blend of visible and near-infrared light, displays the galaxy's central region, which is aglow with the light of at least 15 million individually resolved stars. The detailed portrait represents the largest high-resolution mosaic image of Triangulum ever assembled, spanning an area more than 14,500 light-years across.

M33 is oriented with its face mostly toward us, ideal for studying its distribution of stars and gas. The blue light from hot, young stars tracks the winding pattern of M33's spiral arms, and shows the numerous star-forming regions throughout the galaxy. Dark dust lanes appear like tentacles throughout the central region, obscuring part of the bright core.

Triangulum is the third largest galaxy in the Local Group, behind the Milky Way and Andromeda. Astronomers think it has been something of an introvert, isolated from the frequent interactions with nearby galaxies that can trigger star formation. However, M33 has a high star-formation rate, and the cause is unclear.

Hubble's detailed observations of the galaxy will help researchers determine the characteristics of M33's stars, including their ages, by studying their colors. Astronomers can then map the history of star formation, leading to a better understanding of how the stellar make-up of galaxies changes over time.

The Triangulum galaxy resides about 3 million light-years from Earth, in the northern constellation of Triangulum (the Triangle).

Credit: NASA, ESA, and M. Durbin, J. Dalcanton, and B.F. Williams (University of Washington)

The two close-up Hubble images above showcase the Hubble Space Telescope's exquisite resolution as well as the variety of stellar groupings in M33.

The image at left shows a glowing cloud of gas that cocoons bright, blue, young stars. The high density of star formation throughout the galaxy is one of Triangulum's most striking features, leading to many bright nebulas like this one.

Dense knots of many thousands of ancient stars gravitationally bound together, called globular star clusters, can also be seen in the galaxy (image at right). Globular clusters are composed mainly of older stars that generally were all born at the same time and in the same place.

Credit: NASA, ESA, and M. Durbin, J. Dalcanton, and B.F. Williams (University of Washington)

VOCABULARY

Galaxy: A collection of stars, gas, dust, and dark matter held together by gravity.

Local Group: A small cluster of more than 30 galaxies, including the Andromeda, Milky Way, and Triangulum galaxies, along with about three dozen small galaxies.

You can get images and news about the Hubble Space Telescope on our website, **hubblesite.org**. For images and information on the Hubble mission, go to **www.nasa.gov/hubble**. Follow the Hubble mission on social media: ***@NASAHubble***.

National Aeronautics and Space Administration

Goddard Space Flight Center
8800 Greenbelt Road
Greenbelt, Maryland 20771

www.nasa.gov

LG-2019-7-403-GSFC