



National Aeronautics and  
Space Administration  
Goddard Space Flight Center

## Center of Galaxy M51: The Whirlpool Galaxy





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### A “WHIRL” OF A GALAXY

In 1845, Irish astronomer Lord Rosse pointed his 6-foot-wide telescope, the largest of its day, at a mysterious smudge of shimmering starlight. French astronomer Charles Messier, 72 years earlier, had named the glowing “blob” M51 while hunting for comets.

But Messier’s blob took on a more intricate form with Lord Rosse’s powerful telescope. To the Irish astronomer’s surprise, the glowing blob had a striking pinwheel shape that no one had ever seen before. Lord Rosse simply called M51 a “spiral nebula,” not realizing that the glowing spiral-shaped object was a faraway galaxy brimming with innumerable stars.

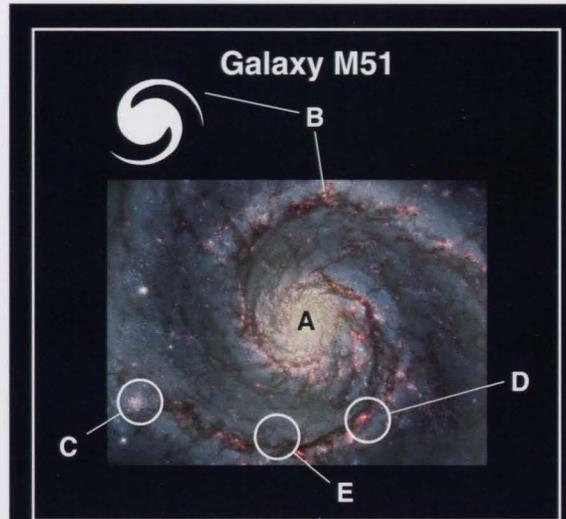
It wasn’t until the 20th century that astronomers determined that M51 and other objects like it are galaxies, vast cities of stars. Since then, M51 has become one of the galactic darlings of astronomy. Its beautiful face-on view and its closeness to Earth allow astronomers to study the structure and star-forming processes of spiral galaxies. The galaxy also is called the Whirlpool Galaxy — aptly named because it resembles a “whirlpool” of light.

Although M51 has been photographed many times, this exquisite view by NASA’s Hubble Space Telescope reveals more enticing details of this stunning spiral galaxy. The Hubble picture captures dense dust clouds and the majestic spiral arms, where a storm of star birth is taking place. The face-on portrait gives astronomers a unique bird’s-eye-view of the shimmering star-city. The view looks like the glowing lights of a metropolis as seen from an airplane window.

Astronomers suggest that the dramatic spiral structure may result from a close encounter with a nearby galaxy, called NGC 5195. The companion galaxy is shown in the inset picture.

The gravitational interaction with the companion also is compressing clouds of hydrogen gas, boosting the birthrate of massive stars. A train of bright colors traces the form of the spiral arms.

Blue depicts young stars; red represents glowing



M51 spiral galaxy. Central bulge (A); spiral arm (B); clusters of young, hot stars (C); glowing hydrogen gas (D); dust clouds (E).



Ground-based photo of the large spiral galaxy M51, also known as the Whirlpool Galaxy, and its smaller companion, NGC 5195 (lower right).

hydrogen gas in star-forming regions.

Hubble’s sharp view also reveals intricate structure in the gas clouds. Streams of dust can be seen branching off the spiral arms, like spokes in a wheel. M51 is the dominant member of a small group of galaxies.

### DEFINITIONS

**Spiral galaxy:** A large pinwheel-shaped system of stars, dust, and gas clouds.

**Messier Catalogue (M):** A catalogue of about a hundred of the brightest galaxies, star clusters, and nebulae, compiled in the late 1700s by French astronomer Charles Messier.

**Star cluster:** A group of stars held together by gravity that probably shares the same origin.

**Nebula:** A cloud of interstellar gas and dust.

**New General Catalogue (NGC):** A catalogue of star clusters, nebulae, and galaxies compiled in 1888.

### FAST FACTS

**Location:** In the spring constellation Canes Venatici (the Hunting Dogs).

**Distance from Earth:** 31 million light-years.

*Credits: NASA and the Hubble Heritage Team.  
Inset photo of M51 with companion dwarf galaxy:  
Travis Rector and Monica Ramirez, National Optical  
Astronomy Observatories.*

You can get images and other information about the Hubble Space Telescope on the World Wide Web. Visit <http://www.stsci.edu/outreach> and follow the links.

### EDUCATOR GUIDE

The Educator Guide can be found at:  
<http://oposite.stsci.edu/pubinfo/edugroup/>

