

# Fireworks in the sky

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The Fireworks Galaxy.

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The Fireworks Galaxy is a very appropriate sky object for the month of July.

The Fireworks Galaxy, also known as NGC 6946, is a medium size spiral galaxy that we see face on. It is located 22 million light years away from earth on the border between the constellations Cepheus and Cygnus. It has a radius of 40,000 light years, contains more than 50 billion stars and was discovered on Sept. 9, 1798, by William Herschel.

What is unique to this galaxy is that it is the galaxy with the most recorded supernova explosions in the last century with a total of ten between 1917 and 2017. In contrast, our own Milky Way has had only one supernova in the last 100 years. It is the high rate of supernova explosions which has given this galaxy the nickname, Fireworks Galaxy.

It is also classified as a starburst galaxy, which means it has a very high rate of star formation. The bluish and magenta colors on the spiral arms is where the new young stars are formed and the more orange color is where the older stars are located. To the right of the core, at about four o'clock, we can see a small whitish/bluish area that looks like a star cluster. It was first described by Paul W. Hodge in 1967 as a supernova remnant, which eventually has turned out to be an interactive dwarf galaxy with stars that are 5 to 30 million years old.

A Supernova is the “final act” of a massive star at least five times the mass of our sun. There are two major forces at play in a massive star: gravity and the expanding forces created by the core nuclear fusion. These two forces are in balance keeping the star from collapsing. But when the star core runs out of fuel, gravity wins and the star collapses creating massive shock waves causing the outer layers of the star to explode. A black hole or a dense neutron star is left behind along with a hot cloud of gas known as a supernova remnant. We will have some examples of this type of nebula in the months to come.

The “kill zone” of a supernova explosion is about 160 light years meaning that any planet within the “kill zone” would likely be destroyed. Luckily for us the closest star to earth that will go supernova within the next 100,000 years is Betelgeuse which is located 550 light years from earth in the constellation Orion.

*– Dr. Carlos Rotellar is a Bowling Green nephrologist who has had an interest in astrophotography and has been taking images of the universe from his driveway for several years. Website: [Skyastrophotos.com](http://Skyastrophotos.com).*