

# Image: ESO telescope images a spectacular cosmic dance

August 16 2022

---



The galaxy NGC 7727 was born from the merger of two galaxies that started around a billion years ago. The cosmic dance of the two galaxies has resulted in the spectacular wispy shape of NGC 7727. At the heart of the galaxy, two supermassive black holes are spiraling closer to each other, expected to merge within 250 million years, the blink of an eye in astronomical time. This image of NGC 7727 was captured by the FOcal Reducer and low dispersion Spectrograph 2 (FOR2) instrument at ESO's Very Large Telescope (VLT). Credit: ESO

ESO's Very Large Telescope (VLT) has imaged the result of a spectacular cosmic collision—the galaxy NGC 7727. This giant was born from the merger of two galaxies, an event that started around a billion years ago. At its center lies the closest pair of supermassive black holes ever found, two objects that are destined to coalesce into an even more massive black hole.

Just as you may bump into someone on a busy street, galaxies too can bump into each other. But while galactic interactions are much more violent than a bump on a busy street, individual stars don't generally collide since, compared to their sizes, the distances between them are very large. Rather, the galaxies dance around each other, with gravity creating tidal forces that dramatically change the look of the two dance partners. "Tails" of stars, gas and dust are spun around the galaxies as they eventually form a new, merged galaxy, resulting in the disordered and beautifully asymmetrical shape that we see in NGC 7727.

The consequences of this cosmic bump are spectacularly evident in this image of the galaxy, taken with the FOcal Reducer and low dispersion Spectrograph 2 (FOR2) instrument at ESO's VLT. While the galaxy was previously captured by another ESO telescope, this new image shows more intricate details both within the main body of the galaxy and in the faint tails around it.

In this ESO VLT image we see the tangled trails created as the two galaxies merged, stripping stars and dust from each other to create the spectacular long arms embracing NGC 7727. Parts of these arms are dotted with stars, which appear as bright blue-purplish spots in this image.

Also visible in this image are two bright points at the center of the galaxy, another telltale sign of its dramatic past. The core of NGC 7727 still consists of the original two galactic cores, each hosting a [supermassive black hole](#). Located about 89 million light-years away from Earth, in the constellation of Aquarius, this is the closest pair of supermassive black holes to us.

The black holes in NGC 7727 are observed to be just 1600 light-years apart in the sky and are expected to merge within 250 million years, the blink of an eye in astronomical time. When the black holes merge they will create an even more [massive black hole](#).

The search for similarly hidden supermassive black hole pairs is expected to make a great leap forward with ESO's upcoming Extremely Large Telescope (ELT), set to start operating later this decade in Chile's Atacama Desert. With the ELT, we can expect many more of these discoveries at the centers of [galaxies](#).

Our home galaxy, which also sports a supermassive black hole at its center, is on a path to merge with our closest large neighbor, the Andromeda Galaxy, billions of years from now. Perhaps the resulting galaxy will look something similar to the cosmic dance we see in NGC 7727, so this image could be giving us a glimpse into the future.

Provided by ESO

Citation: Image: ESO telescope images a spectacular cosmic dance (2022, August 16) retrieved 14 August 2024 from <https://phys.org/news/2022-08-image-eso-telescope-images-spectacular.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.