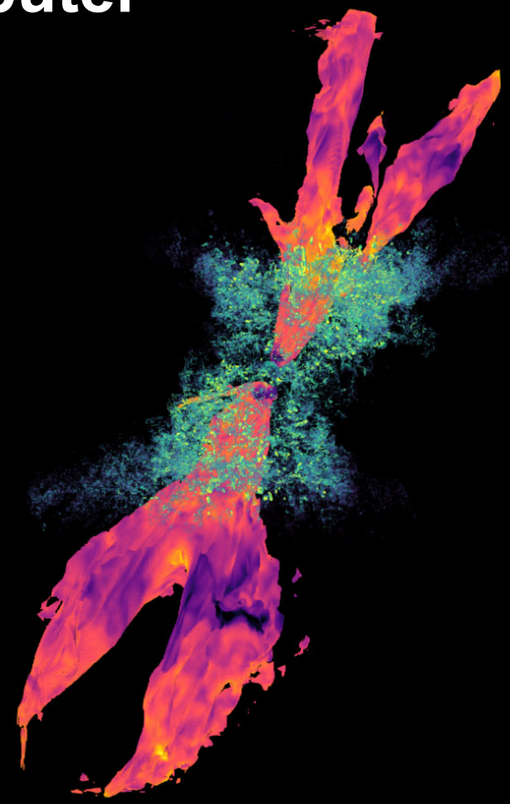
NASA Goddard Scientists Create Black Hole Jets with Discover Supercomputer

The Discover supercomputer is centerpiece of Goddard's NASA Center for Climate Simulation, capable of over 8 trillion operations per second. While primarily used for earth science, Discover has huge potential for other areas of study, including astrophysics.

Using the Discover, scientists ran 100 simulations exploring jets – narrow beams of energetic particles – that emerge at nearly light speed from supermassive black holes at the centers of active, star-forming galaxies.

The researchers focused on low-luminosity jets, which are difficult to study observationally, and discovered that these types of jets interact more with their host galaxies than high-luminosity ones. Low-luminosity jets also interact with the interstellar medium within the galaxy which affects their shape.

Press release: nasa.gov/news-events/nccs-highlights/black-hole-jets
Paper: https://iopscience.iop.org/article/10.3847/1538-3881/ac4d23



The jets appear in orange, pink, and purple, while the galaxy's stars and gas clouds are shown as green and yellow. As weak jets move through this environment, they can be deflected, split apart, or even suppressed. Credit: NASA's Goddard Space Flight Center/R. Tanner and K. Weaver