



New Data Adds to Understanding of ‘Black Holes’

Discussion > Advanced 9



Exercise 1 – Vocabulary

disperse	To move apart and go away in different directions; to make somebody/something do this.
[verb]	<i>Ex: After the army was defeated, people fled and dispersed throughout the area.</i>

titanic	Very large, important, strong or difficult.
[adjective]	<i>Ex: They are facing a titanic task to keep the company in the black.</i>

singularity	A point or region of infinite mass density at which space and time are infinitely distorted by gravitational forces and which is held to be the final state of matter falling into a black hole.
[noun]	<i>Ex: Black holes are the main examples of singularities in the known universe.</i>

out of commission	Not in service; not in working order.
[phrase]	<i>Ex: Yesterday's blackout put all the electronics in my house out of commission.</i>

cluster	A group of things of the same type that grow or appear close together.
[noun]	<i>Ex: There is a cluster of kids around the ball.</i>



Exercise 2 – Reading

Read the text aloud with your tutor and discuss the key points.

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Scientists continue to learn more about black holes in space, places where the pull of gravity is so strong that not even light can escape. Black holes occur after supergiant stars explode into brilliant but short-lived supernovas. All the matter dispersed by that titanic explosion collapses in a few weeks or months, and gravity crushes it all into a tiny space. Now, data from a Japanese satellite is helping decipher the secrets of these invisible singularities.

Black holes are invisible to the human eye. But telescopes with special tools can help find them by revealing how they affect nearby stars.

In February, Japan’s space agency rocketed its Astro-H satellite into orbit to examine large-scale structures in the cosmos, like supermassive black holes that exist at the center of most galaxies.



Unfortunately, after only about a month in space, the satellite fell apart. But before it went out of commission, it was able to gather vital data about the Perseus cluster, consisting of hundreds of galaxies 240 million light years from earth.

“And that gives us a very precise measurement of how much energy is being pumped into this gas by supermassive black holes, and so it allows us to form a more complete picture of how galaxies evolve, how the stars and the gas that will eventually cool out like rain to form the stars, evolves over cosmic time,” explained Brian McNamara, an astrophysicist at the University of Waterloo in Canada.

Supermassive black holes may manipulate how galaxies form and evolve.

“The energy released by these giant black holes is very tightly coupled to these atmospheres, which is the stuff out of which future stars will form,” said McNamara.

And this means the invisible giant at their heart influences the rate at which a galaxy grows.



Exercise 3 – Discussion

Discuss the following questions with your tutor.

1. What do you know about black holes?
2. Do you think that our universe is not the only one in existence? Why or why not?
3. To your knowledge, is time travel possible? Why or why not?
4. Do you think that space exploration is beneficial for us? Why or why not?
5. Do you think that humans will ever set foot on Mars? Why or why not?
6. How far into space do you think that humans have the audacity to delve? Why?
7. Have you ever used a telescope? If so, please share your experience.
8. “We are an impossibility in an impossible universe.” Do you agree with this statement? Why or why not?