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The Super Awesome, Supermassive Black Hole

An Interview with Professor Sarah Gallagher
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What are black holes and why do they matter?

In the centre of every massive galaxy, there's a supermassive black hole. And when I mean supermassive, that's what we actually call them. I mean, it's a million to a billion times the mass of our sun, and there seems to be one in the centre of every big galaxy. And when these black holes are growing, they grow because gas is funnelling around, sort of in a whirlpool, and falling into the black hole. The light that is generated in the gas falling into the black hole is so amazingly bright that it can outshine the trillions of stars in the host galaxy by a thousand times. So that incredible power that comes out in light is actually so strong that it can blow gas out into the galaxy at speeds of up to thousands of kilometres per second.

What's new in astronomy?

Astronomy has really exploded in these past couple of decades. We have access to these amazing facilities, so everyone knows about the Hubbell Space Telescope. There's a Hubble Space Telescope in every wavelength of light, so there's also the Spitzer Space Telescope, the Chandra X-Ray Observatory, and so we are able to look at the entire sky in all different kinds of light. The other thing that astronomy does better than I think than any science is that the community is very sharing and so any time the Hubble Space Telescope takes data, takes images from space, that data is put into an archive, and after a year, anyone in the world can look at that data.

What are the practical applications of astronomy?

Every human is sort of interested in what the world is about and what the universe is like. And so there's this innate curiosity about what the world is like, and especially the extreme things. I have yet to meet a third grader who didn't think that black holes were awesome. There's also the practical applications of astronomy,

research that is really unexpected, and that we're pushing the envelope in certain types of science. For example, the first x-ray detectors were launched in rockets to go above the atmosphere to look at x-rays from the sun. That same technology is what's being used in x-ray scanners today. We're also pushing the boundaries in computer science because the data sets that you get from astronomy are absolutely enormous, and they just break all the codes that are out there. But those aren't what motivate people. People want to know what the universe is like. They want to understand what's going on. That's why they're doing it and it turns out that in solving those problems, you develop tools that are really powerful and useful in other completely unanticipated fields.