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Supermassive black hole struggles to swallow Milky Way

Jan 8, 2010 [4 comments](#)

Heart of darkness Sagittarius A* feeds on massive young stars

Scientists were already aware that the huge black hole at the centre of our galaxy does not consume large amounts of matter, but it could be an even pickier eater than previously thought. That is according to new research done in the US that suggests that the black hole – called Sagittarius A* – has a tendency to blow away 99.99% of the matter available for its consumption.

Supermassive black holes are awesome phenomena that are believed to exist at the centre of most, if not all, galaxies. They are hundreds of thousands to billions of solar masses and expand by feeding on dust that is blown off massive young stars just outside the black hole's event horizon – the zone beyond which not even light can escape.

In the Milky Way, these neighbouring stars are located a relatively large distance away from the black hole mass. For this reason, scientists had calculated that Sagittarius A* should consume only about 1% of the available dust. But now a team of astronomers, including [Roman Shcherbakov](#) of Harvard University, claims that it is consuming much less than that.

Gaseous lobes

The team studied an image constructed from a series of observations captured by NASA's [Chandra X-ray Observatory](#), over almost two weeks. This long exposure time, enabled the researchers to get a clear view of the gas surrounding the event horizon, which revealed a series of gaseous lobes stretched in various directions.

To explain this observation, Shcherbakov and his colleagues employ a model that considers the flow of energy between two regions around the black hole: an inner region that is close to the event horizon, and an outer region that includes the black hole's fuel source – the young stars – extending up to a million times farther out than the event horizon. They conclude that collisions between particles in

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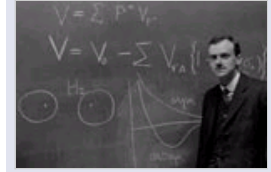
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the hot inner region transfer energy to particles in the cooler outer region via conduction, which adds an additional outward pressure so that all but 0.01% of the incoming star dust is blown away.

Jul 27, 2009

These findings were presented at the [215th annual meeting of the American Astronomical Society \(AAS\)](#), which is taking place this week in Washington, DC.

About the author

[James Dacey](#) is a reporter for [physicsworld.com](#)

4 comments

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1

Ragtime

Jan 9, 2010 6:51 PM
Prague, Czech Republic

This finding serves as another evidence of model, in which large galaxies were formed by evaporation of matter from primordial white holes (quasars or dark matter stars). The black holes sitting at the center of galaxies are cold remnants of the former white holes, which are in equilibrium with surrounding matter.

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2

badamit

Jan 10, 2010 5:20 PM
pinon hills, United States

So we should consider ourselves lucky?

This article makes me feel very lucky. There is an entity out there which has the ability to swallow our entire galaxy but because of the laws of physics, doesn't. I welcome any clarification of my reasoning.

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John Duffield

Jan 10, 2010 9:15 PM
United Kingdom

I am reminded of the article a month back entitled "Are quasars star-making machines?" see [physicsworld.com...41166](#). There does seem to be some rather odd similarity between a quasar and a jet engine, see for example [nedwww.ipac.caltech....eilek.html](#). Ragtime, I think it's a real stretch to call a quasar a white hole. This thing is pulling in gas and dust but somehow blowing out most of it front and back, so concentrating it in some fashion. It makes me wonder if it actually could be a galaxy-making machine. Interesting stuff, lots to read up on. Badamit: for all I know, maybe it even made it.

Edited by John Duffield on Jan 10, 2010 9:16 PM.

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4

Ragtime

Jan 11, 2010 6:20 AM
Prague, Czech Republic

Quote:

*Originally posted by **John Duffield**
but somehow blowing out most of it front and back*

It's antigravity, i.e. the pressure of radiation. In its latest stage of evolution, quasar is behaving like fountain, which forms a flat shape of galaxies. I described this model in my previous post, but it was deleted because of (indirect) link to my blog.

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