

Supermassive Black Holes and Stars Grow Together

Almost all large galaxies contain a supermassive black hole, but how did the black holes get there?

Many low surface brightness (LSB) galaxies are inefficient at turning gas into stars, compared to normal galaxies like the Milky Way. *Chandra* X-ray images of 32 LSB galaxies saw the expected number of “active” systems if black holes grow with the stars, but too few if they grow with total mass.

Black hole masses are related to the sizes of their host galaxies. Since normal galaxies are mostly stars, we can't tell whether the stellar or total mass is more important. Using LSB galaxies, we learned that it is the stars that matter. We also show that LSB galaxies are excellent targets for future X-ray missions, such as *Lynx*.

The tremendous energy released by growing black holes can shape — or starve — their host galaxies. By learning how monster black holes grow, we learn why galaxies look the way they do.

