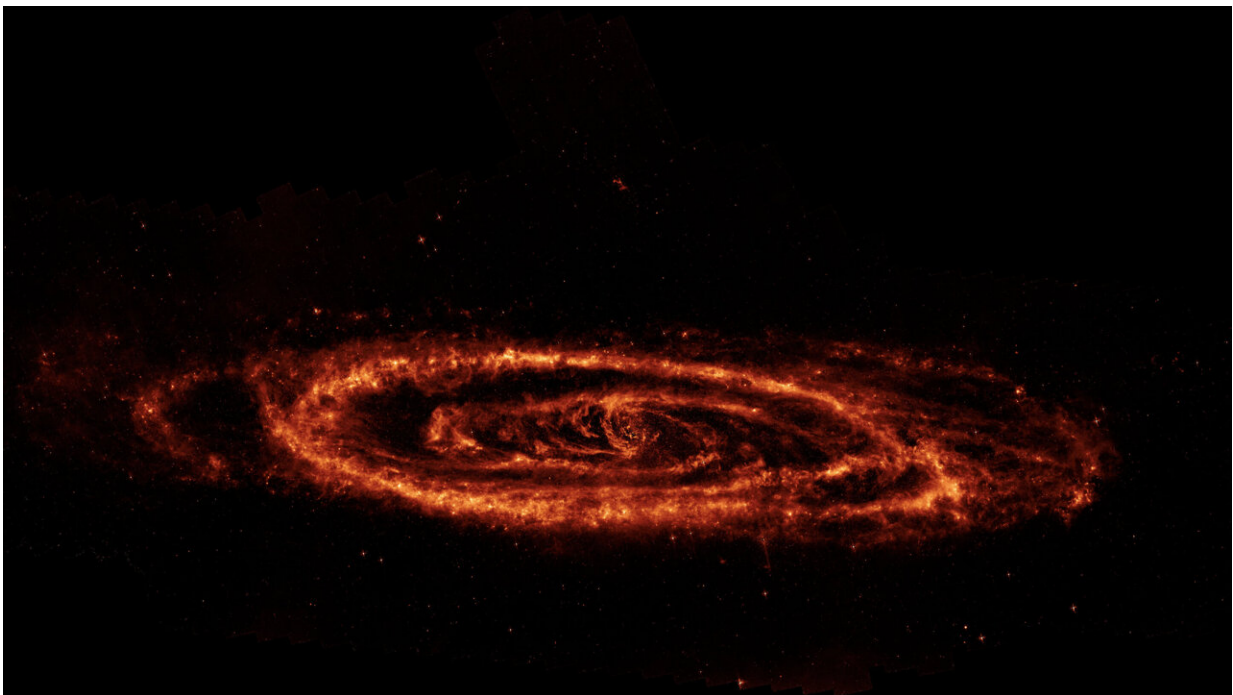


Saturday Citations: Dietary habits of humans; dietary habits of supermassive black holes; saving endangered bilbies

May 11 2024, by Chris Packham



In this image of the Andromeda galaxy, made with data from NASA's retired Spitzer Space Telescope, only dust is visible, making it easier to see the galaxy's underlying structure. Researchers used Spitzer images to identify sources feeding the galaxy's supermassive black hole. Credit: NASA/JPL-Caltech

The onset of solar maximum has resulted in severe geomagnetic storms,

with the possibility of aurora borealis events this weekend as far south as the northern United States. Do not be alarmed if you see awesome displays of light over your neighborhood, it is just a solar wind disturbance passing through the magnetosphere. This week, we reported on a cute but endangered marsupial, the table manners of supermassive black holes and what ultra-processed Tostitos Scoops may be doing to your heart.

Cute, picky, endangered

Bilbies are threatened marsupials native to Australia, if the fact that they're called "bilbies" isn't a dead regional giveaway.

Alternate, very Australian name: rabbit-bandicoots. They once thrived in temperate regions of the continent, but are now listed as a [vulnerable species](#), jeopardized by predation and declines in range caused by the spread of invasive rabbits.

Scientists from UNSW Sydney and Taronga Conservation Society Australia [recently conducted a study](#) at a large sanctuary in Taronga Western Plains Zoo in Dubbo, which is located within an Australian temperate zone, in order to learn about bilby habitat requirements for the future rewilding of bilbies.

The habits and movements of bilbies at night are understudied, so the researchers used GPS tags to record the locations of 20 bilbies once per hour to provide information about nocturnal habits.

Andrew Elphinstone of Taronga Conservation Society Australia says, "Bilbies turn over and aerate the earth which improves [soil health](#). Understanding the habitat preferences and needs of bilbies is critical to restoring the species to a wider area so that they can have a positive impact over as wide an area as possible."

Among other findings, the scientists report that females caring for

offspring are pickier about soil types, having to make a tradeoff between burrowing in soft, sandy soil versus burrowing in silty soil where food is more abundant. The females were also more sensitive than males to location and seasonal availability of resources.

Per- and polyfluoroalkyl substance watch

It's been a long time since there was any good news about PFAS chemicals, probably going all the way back to the first press release about Teflon-coated cookware. Now we're older, wiser and way more contaminated with endocrine-disrupting industrial chemicals, all because we've spent the last five decades suppressing fires with chemical foam. But actually, this week, there was some good news—[a joint research project](#) by scientists at the University of California, Riverside, and Clarkson University has resulted in a new strategy for cleaning PFAS pollutants from water.

Extending previous findings about UV-based approaches, the researchers treated water with UV light, sulfite and electrochemical oxidation. They report that the method achieved near-complete destruction of PFAS in water samples contaminated with fire-suppression foam. Notably, the method overcomes previous limitations, including the difficulty of breaking up the non-PFAS organics that also comprise fire-suppression foam; they report that the electrochemical oxidation process also breaks up those products. It's potentially cheap and the reaction happens at room temperature.

Galactic misophonia

Weirdly, the [supermassive black holes](#) at the center of both the Milky Way and Andromeda galaxies are among the quietest in a universe

packed with noisy eaters. As supermassive black holes consume surrounding gas and dust, they heat the materials just before they fall into the event horizon, producing light. Clumpy matter in differing densities results in fluctuations in light intensity, which astronomers observe basically everywhere in the universe except right here in the Milky Way, where Sagittarius A* emits only imperceptible but non-zero amounts of light that do not vary in intensity.

Astronomers theorize that supermassive black holes like ours feed on a steady trickle of spiraling gas; now, in a [new study](#), scientists have built a model of the Andromeda galaxy to simulate gas and dust dynamics near its supermassive black hole. They demonstrated that a small disk of gas could form around the black hole and steadily feed it. They compared their findings to data from the retired Spitzer Space Telescope and found clouds of dust that fit the constraints suggested by the model, concluding that these spirals of matter are feeding Andromeda's black hole.

Mozzarella sticks draw concern

Researchers have linked higher consumption of the ultra-processed foods that basically comprise the Western diet to a slightly higher risk of death in a 30-year study published in the *British Medical Journal*.

Ultra-processed foods have been previously linked with specific medical conditions including diabetes and cancer, but this is the first to examine the links to all-cause mortality and cause-specific deaths such as cancer. The [meta-study](#) tracked the [long-term health](#) of nearly 75,000 female registered nurses and almost 40,000 male health professionals from two large datasets compiled in two previous long-term studies.

Every two years, the participants provided information on health and lifestyle habits and completed food questionnaires. The researchers found a 4% higher risk of death due to cancer, cardiovascular diseases, [respiratory diseases](#) and neurogenerative diseases in subjects with the highest consumption of ultra-processed foods. However, they also note that the association was less pronounced after accounting for overall dietary quality, concluding that a high-quality diet exerts a stronger influence on longevity than ultra-processed food consumption.

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