Saturday Citations: Citizen scientists observe fast thing; controlling rat populations; clearing nanoplastic from water

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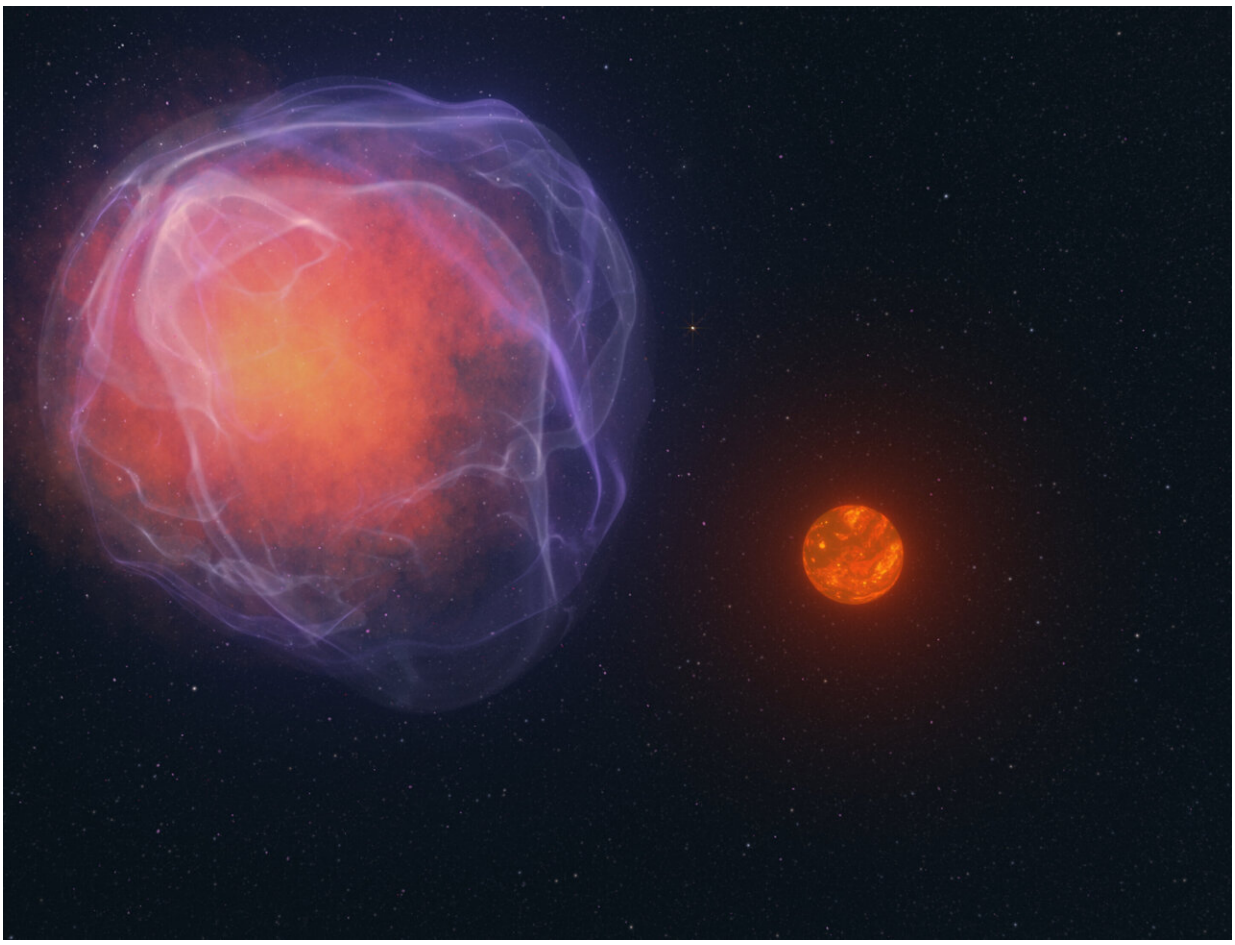

Artist's illustration of a hypothetical J1249+36-white dwarf binary pair that ends with the white dwarf exploding into a supernova (left), which sends its companion L subdwarf star flying out across the Milky Way. Credit: W. M. Keck Observatory/Adam Makarenko

Good morning! Here are a few of this week's most interesting science stories to read while you're settling into the couch with your cup of General Foods International French Vanilla Cafe.

Object hasty

In the citizen science project Backyard Worlds: Planet 9, volunteers look for patterns in the vast ocean of data accumulated over the 14 years of NASA's Wide-field Infrared Survey Explorer mission. They tag moving objects in the data files and when many volunteers flag the same object, astronomers investigate the finding.

Anyway, this collective of volunteers recently flagged a faint red star tearing through the Milky Way at about 1.3 million miles per hour, or 600 kilometers per second, representing the discovery of the first low-mass, hypervelocity star and the nearest hypervelocity object to the sun.

This raises the obvious question: Why is this thing so speedy? The researchers speculate that the object, called CWISE J124909+362116.0, could have been a subdwarf of a white dwarf binary system that was blasted into its current trajectory when the white dwarf exploded into a supernova. There's also a cooler theory involving a tightly bound pair of black holes hurling J1249+36 out of a globular cluster.

Moving at 0.1% the speed of light, J1249+36 is moving fast enough that it will, in all likelihood, eventually escape the Milky Way.

Pests profligate

New York City is famous for bright lights, high-kicking precision dance

lines and chewy pizza crust. Where else in the world can you eat falafel on the street while an accordion player dressed like Boba Fett serenades passing junk bond brokers? Hey, I'm walkin' here! New York is also famous for rats, a distinction it has definitely earned and wears like a badge of not so much honor as depressed resignation.

For decades, the city has controlled the rat population with poison bait programs, which has a major impact on other urban wildlife, including poor Flaco the owl, an escapee from the Central Park Zoo who thrilled New Yorkers for a stretch of months before colliding fatally into a building; a subsequent necropsy revealed high levels of rat poison in his system. The Mayor's Office announced this year that the city will conduct a trial of a contraceptive baiting program to assess its effectiveness versus poison campaigns.

However, researchers say that birth control programs may not be an efficient means of controlling rat populations. They cite several reasons, including the likelihood that many rats won't eat the bait and will give birth to offspring who similarly avoid it. However, they do suggest that contraceptive baiting could contribute to a constellation of approaches to control the problem.

Water plasticky

There's a Rhode Island-sized shoal of Jon Snow Funko Pops that's been migrating with the tides around the Sargasso Sea since season three of "Game of Thrones." Look, I made that up, but there is a true story about 30,000 plastic ducks that began washing up on the Alaskan coast in 1992. And the ocean is truly saturated with plastic waste and nanoplastics, as are fresh waterways, ecosystems and the bodies of organisms, including humans.

If it seems like nanoplastics are a new, exploding problem compounding

many others, including climate change, you're not wrong—consider that large-scale production of plastic only began in 1950 and fully half of all plastic ever produced has been made since 2000. Nanoplastic contamination is truly a new, freaky problem, and as it becomes a threat to human health, researchers are seeking ways to eliminate nanoplastics from water.

Scientists at the University of Missouri now report a method using a small amount of a water-repelling solvent that clears 98% of nanoplastics from large amounts of water. The solvent, made from natural products, is introduced to the surface of the water, floating like oil. When the water is mixed, the solvent separates and then floats back to the surface carrying nanoplastics within its molecular structure.

In the lab, the scientists removed the plastic from the water's surface using a pipette, but in future experiments, they plan to scale up the process with an eye toward removing nanoplastics from large bodies of water.

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