Saturday Citations: Scientists study monkey faces and cat bellies; another intermediate black hole in the Milky Way

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This is not a rerun of last week's roundup; another group of astronomers found a second intermediate-mass black hole in the Milky Way and I

can't avoid highlighting it. They're cool! They may have formed in the primordial universe, they comprise the seeds of supermassive black holes, and may be formed by the accretion of multiple stars in a cluster rather than through stellar collapse.

If there's a third one next week, I'll be irresistibly compelled to tell you. If there's a fourth one after that, I promise to stick it in a footnote. Other than that, scientists looked at monkeys making faces at each other and a group of researchers studied cat poop, a plentiful resource, to draw conclusions about human metabolism.

Thing medium-sized, say scientists

We reported last week on the first discovery of an intermediate-sized black hole right here in the Milky Way galaxy, and this week, astronomers at the University of Cologne reported on a second one in the immediate vicinity of Sagittarius A*, the supermassive black hole at the center of the galaxy. The researchers were studying a cluster of stars called IRS 13.

Located 0.1 light-year from the galaxy core, (which is kind of another way of saying "in" the galaxy core) the cluster exhibits such a surprisingly orderly pattern of movement among its stars and such unexpected density that the researchers could only draw two conclusions: Either IRS 13 is interacting with Sagittarius A* in some way, or a gravitational object at the center of the cluster is influencing the motion of its stars and maintaining the cluster's compactness. Multi-wavelength observations of the cluster via the Very Large Telescope, ALMA and the Chandra X-ray telescope support the existence of an intermediate-class black hole in IRS 13.

Cats by the kilogram

House cats are a lot like people: They live in a climate-controlled, indoor environment, relax on furniture, and generally have ready access to prepared food. So scientists have come around to the idea that they're a great disease model for human maladies. In a new study, researchers at The Ohio State University analyzed feline gut microbes to study the origins of obesity.

Jenessa Winston, assistant professor of veterinary clinical sciences at The Ohio State University, says, "Animals share our beds. They share our ice cream. There are all these things that people do with their pets that highlight they are a naturally occurring disease model with similar environmental exposures as humans."

The researchers fed seven obese cats a four-phase diet: For the first two weeks, cats ate commercial cat food via open feeding; for one week, they were freely fed a weight-loss formulation; then they switched for 11 weeks to a calorie-restricted weight-loss diet; and finally, they returned to the original maintenance diet. By analyzing fecal samples, the researchers could track changes in the metabolites produced by the cats' gut bacteria, which are associated with metabolic factors throughout the body, including hormonal signals related to inflammation and insulin resistance.

An abundance of a short-chain fatty acid, propionic acid, increased during weight loss. "When the cats are on the special diet formulated for weight loss, propionic acid goes up and stays high, and then goes back down when they're put back on the maintenance diet. So it really is a dietary change," says Winston.

Expressive monkeys popular, study finds

Social animals tend to have a lot of facial musculature. For example, scientists theorize that the development of complex orbital muscles in

dogs during the process of domestication helped them to better communicate with humans (who have quite high facial muscle complexity, the Schwarzeneggers of facial muscle mass, symmetry and conditioning). Facial expressions convey information and context, and comprise an important conduit of communication.

Now, researchers at Nottingham Trent University studying rhesus macaquesreport that monkeys with high facial expressivity have strong social connections and are more socially successful. Their study included nine social groups of macaques with similar compositions: one adult male, multiple adult females and offspring. They developed a coding system for tracking 17 facial muscle movements, focusing on the dominant males of each group. They also quantified the social networks of all 66 monkeys in the study, including time spent between specific pairs and grooming interactions among members of the groups.

Males who displayed high facial expression diversity had stronger social bonds and were likely to be the central nodes in their social networks. "Facially expressive individuals may be better equipped to build and maintain strong social connections, potentially leading to the range of benefits associated with group cohesion, such as increased access to resources, mating opportunities, and protection from threats," says lead author Dr. Jamie Whitehouse.

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