Science and Digital Briefs

By Shopper Editor Dave Bunting

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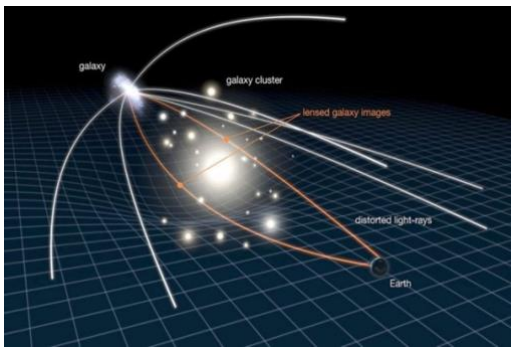

Gravitational lensing

Even farther dark matter found

Though it's tricky to measure "invisible" matter, the typical approach involves two galaxies, one in the foreground and one in the background. According to Einstein, the immense gravity of the foreground galaxy actually warps the fabric of space-time near it. Thus, as light from the background galaxy travels past the foreground galaxy, it gets bent, as if by an optical lens. This results in the background galaxy being both heavily distorted and magnified, a phenomenon called gravitational lensing.

Because the background galaxy (or "source galaxy") appears more heavily distorted when the foreground galaxy ("lens galaxy") has a lot of mass, astronomers can analyze the distortions to determine the distribution of matter — including dark matter — around the lens galaxy.

Aiming to overcome this obstacle, a team of astronomers recently altered the approach. Instead of using two galaxies, they opted to use a more distant light source in place of a source galaxy: the cosmic microwave background (CMB), emitted when the universe was just 300,000 years old.

Partly excerpted from Astronomy
Info: shpr.fyi/cbrlensing

Japan's new Sendai Nuclear Power Plant, the first approved since the Fukushima disaster

Japan is returning to nuclear power

Japan aims to bring seven reactors back into service, for a total of 17, and will invest in developing and installing next-generation reactors.

The economic costs of chronic energy shortages are starting to loom larger politically than the drawbacks of a nuclear restart.

Perhaps Japan's decision will get through to Germany, which also started phasing out nuclear after Fukushima and is now mired in a debate about keeping its three remaining reactors online. This should be an easy call as natural gas shortages loom this winter. Advanced economies need reliable base load power, and at least Tokyo understands this.

Partly excerpted from the Wall Street Journal
Info: shpr.fyi/japannuclear

The Importance of Elders

Societies are more successful whose individuals live longer lives because the knowledge of the elders increases the success including reproductive success of the young.

In a new paper, researchers challenge the longstanding view that the force of improvement in humans must decline to zero once reproduction is complete. They assert that a long post-reproductive lifespan is not just due to recent advancements in health and medicine. The secret to our success? Our grandparents!

Partly excerpted from Science Journal
Info: shpr.fyi/eldervalue

Robotic Cars Going Off-road

The future for autonomous driving cars may not be limited to just roadways. TartanDrive is a massive data set with nearly 200,000 off-road interactions that may help future programmers understand physics so that vehicles can interpret terrain more intuitively. There's a genuine use for that in a rapidly changing world where infrastructural disasters can happen very suddenly.

Recently, Carnegie Mellon University presented its report about TartanDrive to help change how autonomous vehicles interpret landscapes. At the moment, the way that a robot looks at off-road environments is to identify surfaces like "mud," "grass," "rocks," etc. But that's not actually very helpful in determining how to drive over them.

Anyone who's ever gone off-roading knows that there are many different types of mud. Identifying what type of surface is one thing, but it's much more important to be able to respond to how it treats the car.

For that, you need physics. For physics, you turn to scientists, so researchers took a Yamaha Viking all-terrain vehicle sliding and driving over every surface they could lay the wheels on. More than 200,000 data points were collected, which can be used to make vehicles that are smarter and more responsive in off-road contexts, interpreting the world physically rather than via mapped labeling.

Partly excerpted from Popular Mechanics
Info: shpr.fyi/robotoffroad

Colorado River's Lake Mead nearly empty

Arizona's Colorado River Water cut by 22%

The federal government announced new limits Tuesday Aug. 16 on how much water the Southwest can take from the shrinking Colorado River and top officials were clear about the stakes.

Starting Jan. 1, Arizona will reduce the amount of water it takes from the river by 592,000 acre-feet, or about 22% of the state's allocation. Nevada will lose 25,000 acre-feet and Mexico will give up 104,000 acre-feet.

California will not take any cuts as of now.

Partly excerpted from Arizona Republic
Info: shpr.fyi/coloradocuts

Read this week's Bible Readings on page 6 which includes David's tribute to God: **"You created my inmost being; you knit me together in my mother's womb."** *Psalms 139:13*

Dave Bunting, Aug. 29, 2022
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