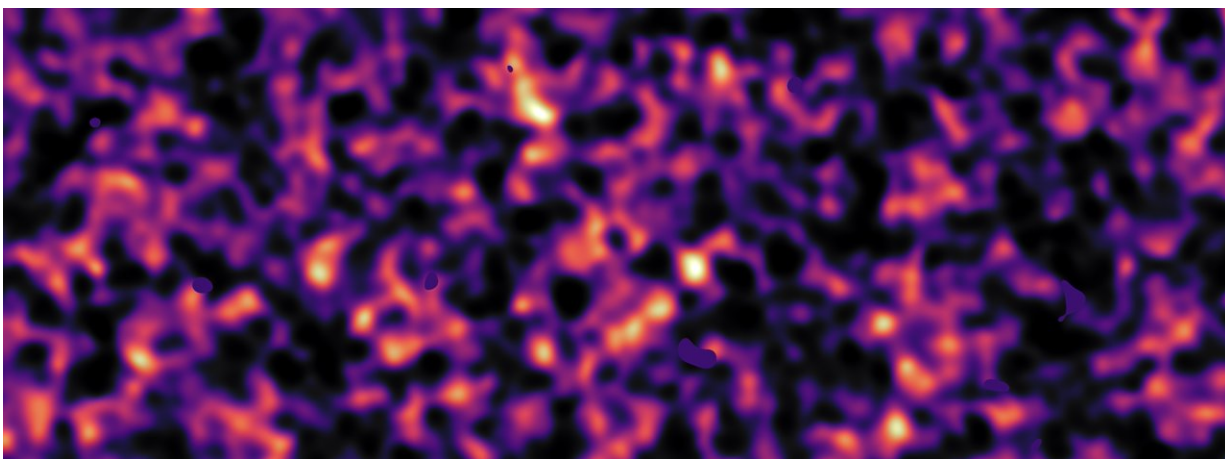


New theory suggests dark matter can create new dark matter from regular matter

November 9 2021, by Bob Yirka



Dark matter map of KiDS survey region (region G12). Credit: KiDS survey

An international team of physicists is proposing an addition to dark matter theory. In their paper published in the journal *Physical Review Letters*, the group is suggesting that dark matter came from regular matter and that dark matter is able to create more dark matter from regular matter.

The existence of a material described as [dark matter](#) has been proposed by physicists to explain certain behaviors observed by researchers—the way light bends as it makes its way from far away places to telescopes here on Earth, is just one example. But some parts of the [theory](#) have yet

to be worked out, such as how did the amount of dark [matter](#) believed to exist today come into being? The team on this new effort has come up with a theory to answer that question.

The theorists begin by citing prior research which suggests that some amount of dark matter was created as part of the 'thermal bath'—where primordial plasma made of regular matter begat dark matter particles—but not the amount that is believed to exist today. They suggest that at some point dark matter particles began making more dark matter particles out of regular particles. And the new dark matter particles were also able to create new dark matter particles out of regular particles.

The researchers note that under such a scenario, it would seem that eventually there would be nothing left in the universe but [dark matter particles](#). The reason this hasn't happened, they suggest, is because of the rapid expansion of the universe. In the early days, everything was close together making it easy for dark matter to come into contact with regular matter and convert it. But as time wore on, things moved farther and farther away as part of the expansion—and that made instances of dark matter coming across regular matter rarer. This expansion slowed the conversion of regular matter to dark matter, leaving us with the amount that is believed to exist today.

The team has built a model that shows that such a theory can explain the amounts of dark matter believed to currently exist—and they further claim that their theories can be tested. If their ideas are right, they contend, there should be an observable fingerprint left behind in the [cosmic background radiation](#)—all that needs to be done now, they note, is to find it.

More information: Torsten Bringmann et al, Dark Matter from Exponential Growth, *Physical Review Letters* (2021). [DOI:](#)

[10.1103/PhysRevLett.127.191802](https://arxiv.org/abs/10.1103/PhysRevLett.127.191802)

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