

There's more star-stuff out there but it's not dark matter

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A radio image of a small nearby galaxy, the Large Magellanic Cloud, made with CSIRO radio telescopes. The bright areas are where the most atomic hydrogen gas is found. Credit: S. Kim et al. / CSIRO

(Phys.org) -- More atomic hydrogen gas — the ultimate fuel for stars — is lurking in today's Universe than we thought, CSIRO astronomer Dr. Robert Braun has found.

This is the first accurate measurement of this gas in [galaxies](#) close to our own.

Just after the Big Bang the Universe's matter was almost entirely hydrogen atoms. Over time this gas of atoms came together and

generated galaxies, stars and planets — and the process is still going on. Astronomers want to understand where, when and how the atomic gas is transformed to better understand the Universe in which we live.

By taking a new look at some archival data, Dr. Braun, Chief Scientist at CSIRO Astronomy and Space Science in Sydney, Australia, has discovered that galaxies around us are hiding about a third more atomic [hydrogen gas](#) than previously calculated.

The study also shows that the gas is distributed very differently from how it was in the past, with much less in the galaxies' outer suburbs than billions of years ago.

"This means that it's much harder for galaxies to pull the [gas](#) in and form new stars," Dr. Braun said. "It's why [stars](#) are forming 20 times more slowly now than in the past."

The new finding doesn't help solve the problem of "Dark Matter" — lots of mass, detectable by its gravity, that we haven't yet identified.

"Even though there's more atomic hydrogen than we thought, it's not a big enough percentage to solve the [Dark Matter](#) problem. If what we are missing had the weight of a large kangaroo, what we have found would have the weight of a small echidna," Dr. Braun said.

Nevertheless, the work will continue to feed into our understanding of how galaxies evolve over time.

Dr. Braun based his work on observations made with radio telescopes: CSIRO's Parkes and Australia Telescope Compact Array telescopes in New South Wales (eastern Australia) and other radio telescopes in the USA and the Netherlands. His paper has been published in *The Astrophysical Journal*.

Provided by CSIRO

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