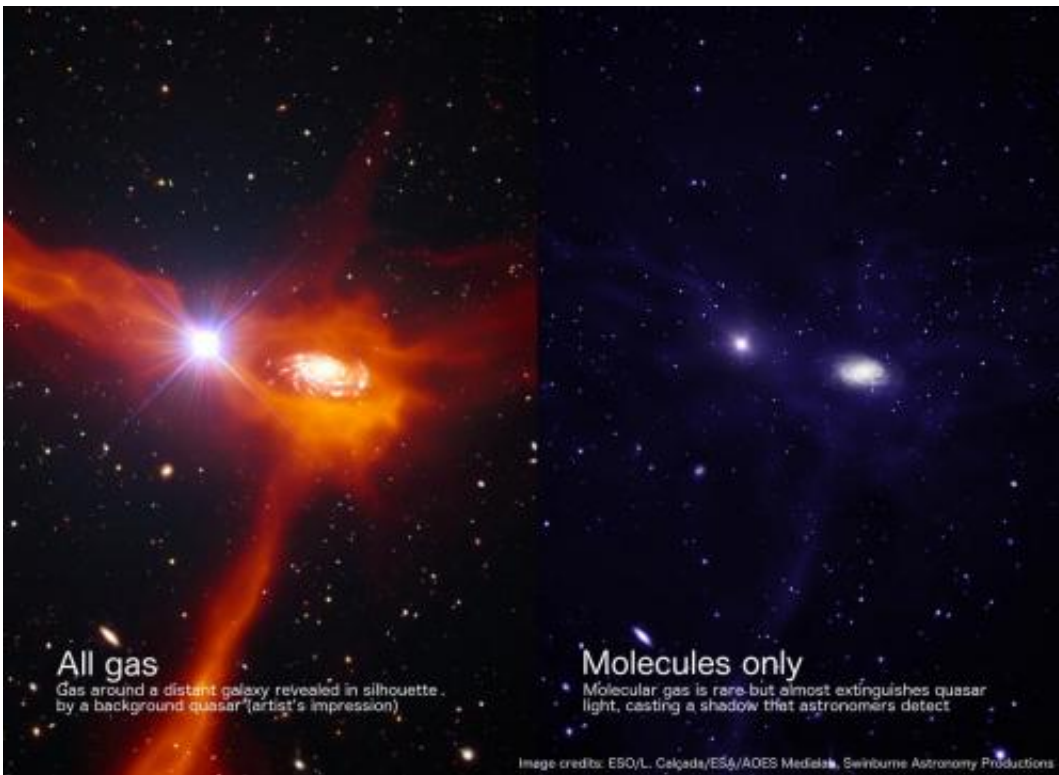


Silhouettes of early galaxies reveal few seeds for new stars

July 14 2014



Artist's impression of the gas surrounding a young galaxy in the distant universe. The gas, shown as red streams on the left, is actually invisible, and the starlight from the galaxy is too faint for astronomers to see directly. Instead, the gas is seen in silhouette against a bright, background quasar. Molecules in the gas imprint a shadow, or absorption line, onto the quasar light at a very specific colour, as seen on the right, and astronomers can detect this shadow. Credit: Swinburne University of Technology

(Phys.org) —An international team of astronomers has discovered that gas around young galaxies is almost barren, devoid of the seeds from which new stars are thought to form – molecules of hydrogen.

Without starlight to see them directly, the team – including Associate Professor Michael Murphy from Swinburne University of Technology – observed the young galaxies' outskirts in silhouette.

They searched for telltale signs of [hydrogen molecules](#) absorbing the light from background objects called quasars – [supermassive black holes](#) sucking in surrounding material – that glow very brightly.

"Previous experiments led us to expect molecules in about 10 of the 90 young galaxies we observed, but we found just one case," Associate Professor Murphy said.

Astronomers believe that [stars](#) begin to form in cold gas that is rich in molecules. The team observed galaxies at a time when the Universe was most actively forming stars, about 12 billion years ago.

"This is a little mystery. This is when most stars are born, and we think this gas forms stars eventually, but it lacks the key ingredient – [molecules](#) – to do so," Association Professor Murphy said.

The team believes that location and time are the key.

"The gas we observe in silhouette probably lies too far from the galaxies to form stars," co-leader of the study, the University of Hawaii at Manoa's Dr Regina Jorgenson said.

"It's got lots of potential, but it hasn't had time to fall into the richer, denser parts of the galaxies which might be better stellar nurseries."

The researchers made new observations of more than 50 quasars for this study using the 6.5 metre diameter Magellan telescopes in Chile.

The study will be published in the *Monthly Notices of the Royal Astronomical Society* and is available online at arxiv.org/abs/1407.1111.

It was conducted by researchers from the University of Hawaii, Swinburne University of Technology, The University of Cambridge and the University of Arizona.

Provided by Swinburne University of Technology

Citation: Silhouettes of early galaxies reveal few seeds for new stars (2014, July 14) retrieved 25 April 2024 from <https://phys.org/news/2014-07-silhouettes-early-galaxies-reveal-seeds.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.