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Astronomers spot 15 new extremely dark galaxies

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Scientists using the ALMA telescope have discovered 15 previously unidentified, extremely dark galaxies buried deeply in cosmic dust.

Researchers observed a field named "Subaru/XMM-Newtown Deep Survey Field," located in the direction of the constellation Cetus.

As a result, they succeeded in finding 15 extremely dark galaxies that were unidentified until now.

"It is thanks to the high performance of The Atacama Large Millimeter/sub-millimetre Array (ALMA), which is proudly said to be the best in the world, that observations like this have been made possible," said Bunyo Hatsukade Post-doctoral fellow, Kyoto University.

The team successfully measured the number density of galaxies approximately 10 times darker than the millimetre wave research results up to now. The new results agree well with the prediction by the theories of galaxy formation.

That means, the galaxies detected in this research are the faint but dust-rich galaxies and they are most likely to be similar in type to normal galaxies not detected before.

"This is a big step towards getting the big picture of galaxy evolution as the objects connecting especially bright galaxies in millimetre/submillimetre waves and normal galaxies were detected with ALMA," said Professor Kouji Ota from Kyoto University.

Conventional research on distant galaxies have been carried out mainly with visible light and near infrared light.

However, it is possible that many galaxies in the universe have been overlooked as much of that radiation is largely absorbed by cosmic dust, researchers said.

That is why millimetre and submillimetre wave observations are important. Stellar light absorbed by dust is reradiated from the dust as millimetre/submillimetre waves.

Therefore galaxies, even those which it has not been possible to observe with optical telescopes, can be detected using these wavebands.

Furthermore, such waves are suitable for observation of distant galaxies. This is because the more distant the galaxy is, the more luminous part of light we can see due to the shift of wavelength of light by the expansion of the universe.

This effect is called "negative K correction" and it compensates the source dimming in the distant universe.