

Astronomy without a telescope - Green peas

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A Green Pea galaxy - which may be an analogue of the universe's first galaxies.
Credit: Galaxy Zoo/SDSS.

The ground-breaking discovery of a new class of galaxies, Green Peas, in 2009 by a group of [Galaxy Zoo](#) volunteers – have recently been followed up by further observations in the radio spectrum.

The [Green Peas](#) were first identified from Sloane Digital Sky Survey

data – and then in Hubble Space Telescope archive images. Now radio observations of Green Pea galaxies (from GMRT and VLA) have led to some new speculation on the role of magnetic fields in early galaxy formation.

Green Pea galaxies were so named from their appearance as small green blobs in Galaxy Zoo images. They are low mass galaxies, with low metallicity and high [star formation](#) rates – but, surprisingly, are not all that far away. This is surprising given that their low metallicity means they are young – and being not very far away means they formed fairly recently (in universal timeframe terms).

Most nearby galaxies reflect the 13.7 billion year old age of the universe and have high metallicity resulting from generations of stars building elements heavier than hydrogen and helium through fusion reactions.

But Green Peas do seem to have formed from largely unsullied clouds of hydrogen and helium that have somehow remained unsullied for much of the universe’s lifetime. And so, Green Peas may represent a close analogue of what the universe’s first galaxies were like.

Their green color comes from strong OIII (ionized oxygen) emission lines (a common consequence of lots of new star formation) within a redshift (z) range around 0.2. A redshift of 0.2 means we see these galaxies as they were when the universe was about 2.4 billion years younger ([according to Ned Wright’s cosmology calculator](#)). Equivalent early universe galaxies are most luminous in ultraviolet at a redshift (z) between 2 and 5 – when the universe was between 10 and 12 billion years younger than today.

Anyhow, studying Green Peas in radio has yielded some interesting new features of these galaxies.

More information: Chakraborti, et al., [Radio Detection of Green Peas: Implications for Magnetic Fields in Young Galaxies](#)

Cardamone, et al., [Galaxy Zoo Green Peas: Discovery of A Class of Compact Extremely Star-Forming Galaxies.](#)

Source: [Universe Today](#)

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