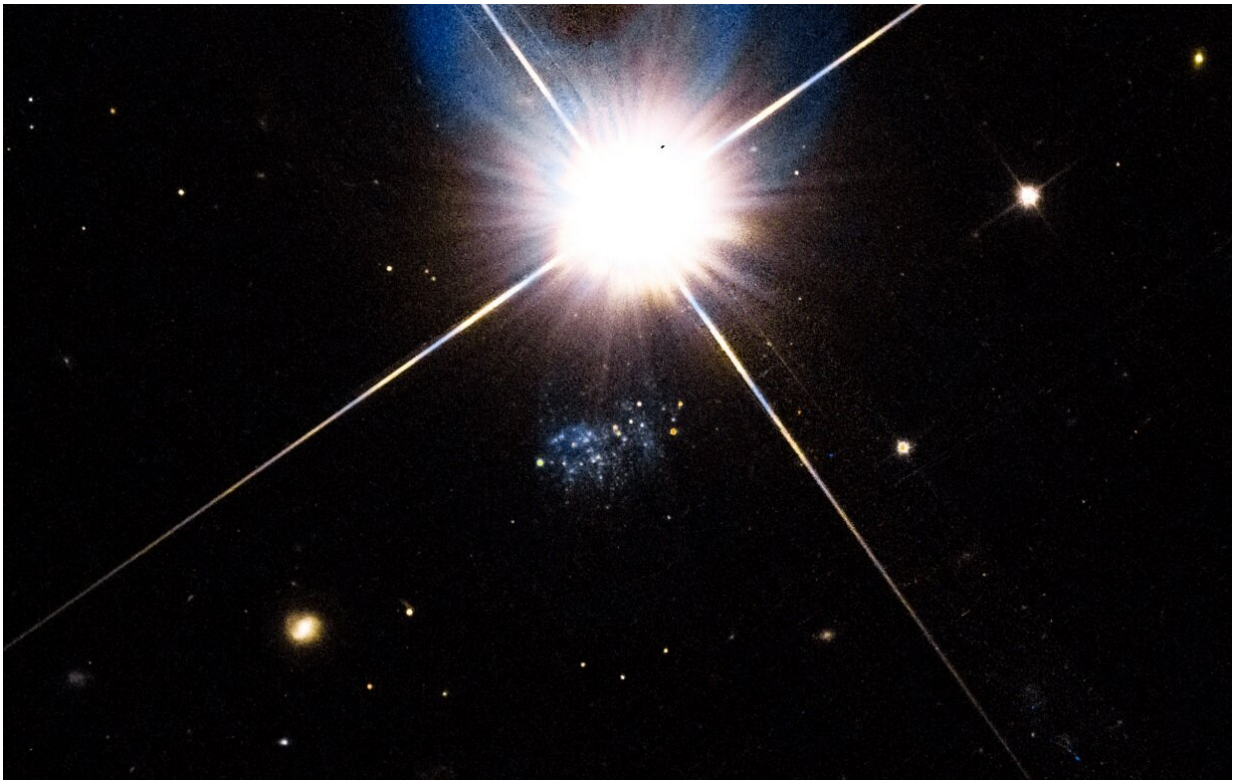


# 'Peekabo' dwarf galaxy is extremely metal-poor, study finds

December 15 2022, by Tomasz Nowakowski

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Two-color HST image of the dwarf galaxy HIPASS J1131-31, consisting of ACS F606W (blue) and F814W (red). The foreground star, TYC 7215-199-1 (10.4 mag), is located  $\sim 15$  arcsec to the North. Part of its diffraction pattern is included in the displayed image. Credit: Karachentsev et al., 2022.

Using the Southern African Large Telescope (SALT) and the Hubble

Space Telescope (HST), an international team of astronomers have observed the dwarf galaxy HIPASS J1131–31, dubbed the "Peekabo Galaxy." The observational campaign has found that Peekabo is one of the most extremely metal-poor galaxies known to date. The discovery was reported in a paper published in *Monthly Notices of the Royal Astronomical Society*.

Detected in 2001 as it emerged from behind a bright fast-moving star known as TYC 7215-199-1, Peekabo is a nearby dwarf irregular galaxy located some 21.8 million [light years](#) away. Previous observations of this galaxy, difficult to perform due to the glare of TYC 7215-199-1, have suggested that it is a relatively young system showcasing a low chemical enrichment level.

Recently, a group of astronomers led by Igor D. Karachentsev of the Special Astrophysical Observatory (SAO) in Russia has investigated Peekabo with SALT and HST, in order to collect more information about the properties and chemical composition of this galaxy. The study was completed by archival data from the Australia Telescope Compact Array (ATCA).

"The dwarf galaxy HIPASS J1131–31 was observed with the Hubble Space Telescope (HST) Advanced Camera for Surveys (ACS) on July 14, 2020, for 760 seconds in each of the  $u$ - and  $z$ -bands as a part of the 'Every Known Nearby Galaxy' survey. ... We carried out long-slit optical spectroscopic observations of the Peekaboo galaxy using the Robert Stobie Spectrograph (RSS) installed at the Southern African Large Telescope (SALT) on February 22, 2022," the researchers wrote in the paper.

The optical spectral observations found that Peekaboo is a gas-rich dwarf galaxy with a neutral atomic hydrogen (H I) mass of  $\log(\text{MHI}/\text{solar mass})$  at a level of 7.08. It turned out that Peekaboo is one

of the most extremely metal-poor galaxies known with the gas-phase oxygen abundance  $[12+\log(\text{O}/\text{H})]$  of approximately 6.99 dex.

According to the study, Peekaboo has an absolute magnitude of  $-11.27$  mag, a half-light radius of about 391 light years and its central surface brightness is at a level of  $22.0 \text{ mag/arcsec}^2$ . The distance to the galaxy was calculated to be approximately 22.2 million light years.

The astronomers assume that Peekaboo is a likely member of the scattered association of late-type dwarf [galaxies](#) around the galaxy NGC 3621. This group, with dimensions of between 3.2 and 5.9 million light years, is located in a very low density region between the Local Sheet and Dorado–Leo Spur–Antlia mini-wall.

The study also found that Peekaboo hosts a relatively low amount of red giant branch (RGB) stars. The finding suggests that the star formation process in this galaxy began in the last few billion years, so the system is devoid of ancient stellar populations.

**More information:** I D Karachentsev et al, Peekaboo: the extremely metal poor dwarf galaxy HIPASS J1131-31, *Monthly Notices of the Royal Astronomical Society* (2022). [DOI: 10.1093/mnras/stac3284](https://doi.org/10.1093/mnras/stac3284)

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Citation: 'Peekabo' dwarf galaxy is extremely metal-poor, study finds (2022, December 15) retrieved 6 May 2024 from <https://phys.org/news/2022-12-peekabo-dwarf-galaxy-extremely-metal-poor.html>

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