ESCAPE
European Science Cluster of Astronomy & Particle physics ESFRI research Infrastructures

Galaxy Zoo: Cosmic Dawn

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Galaxy Zoo Team

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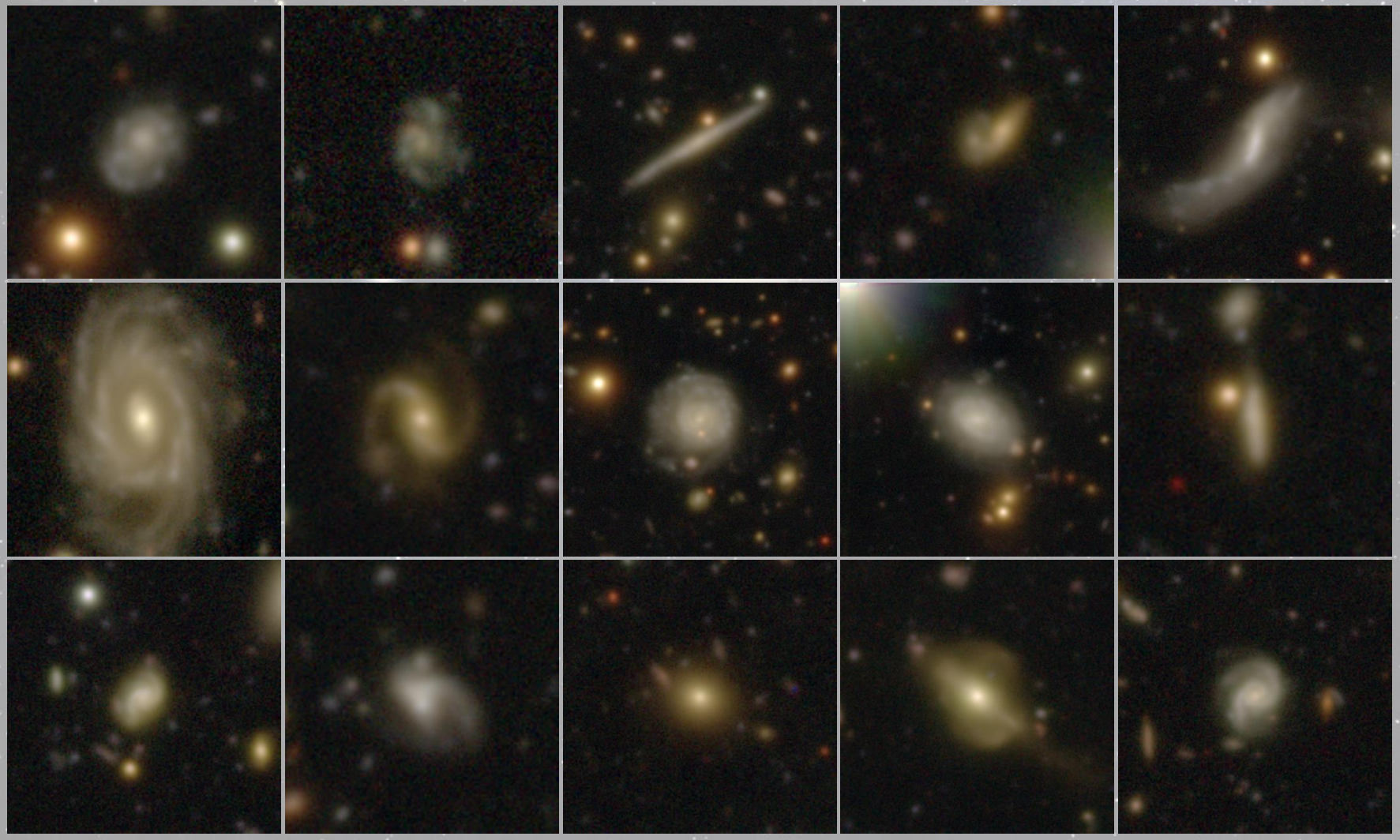
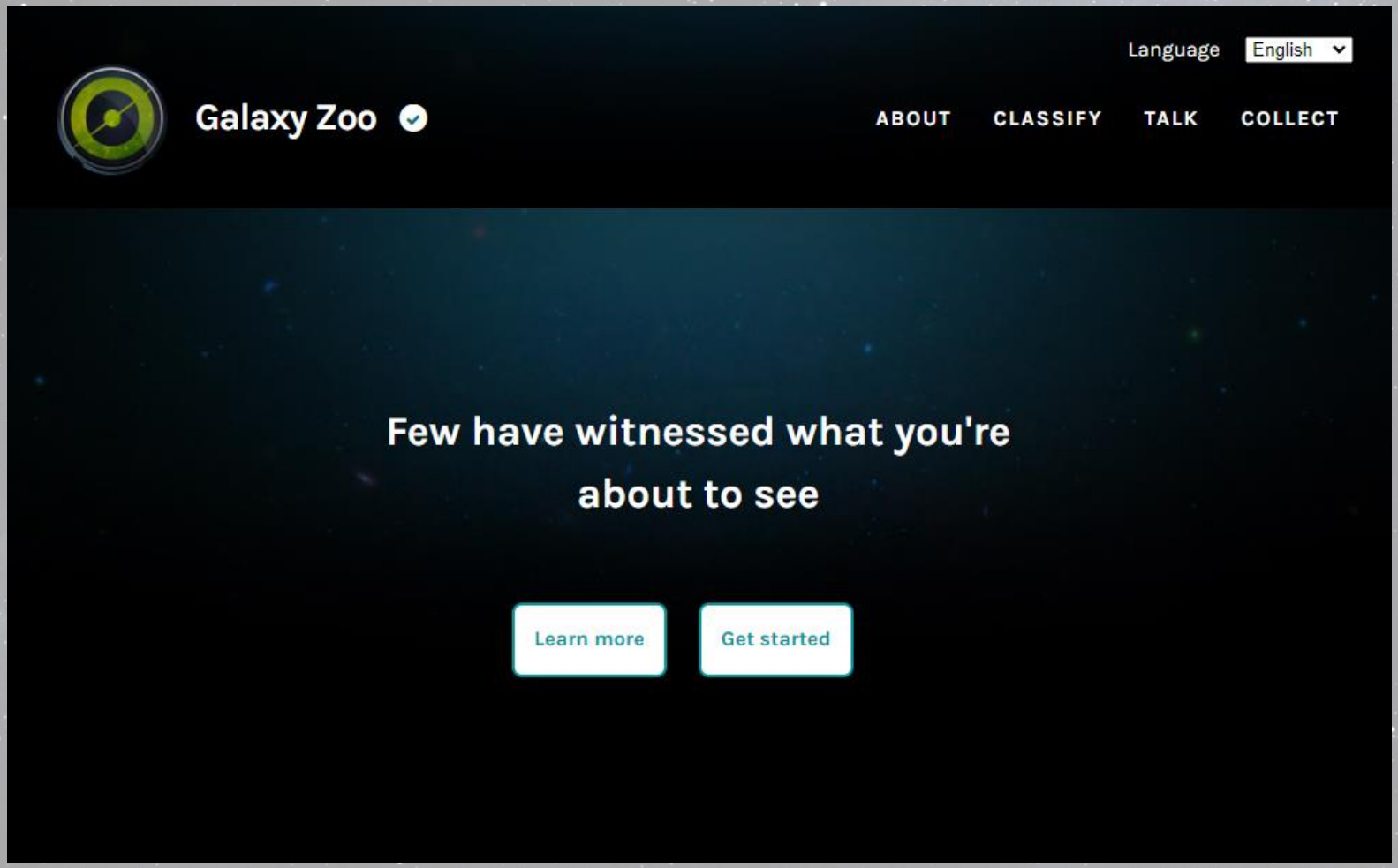
Galaxy Zoo

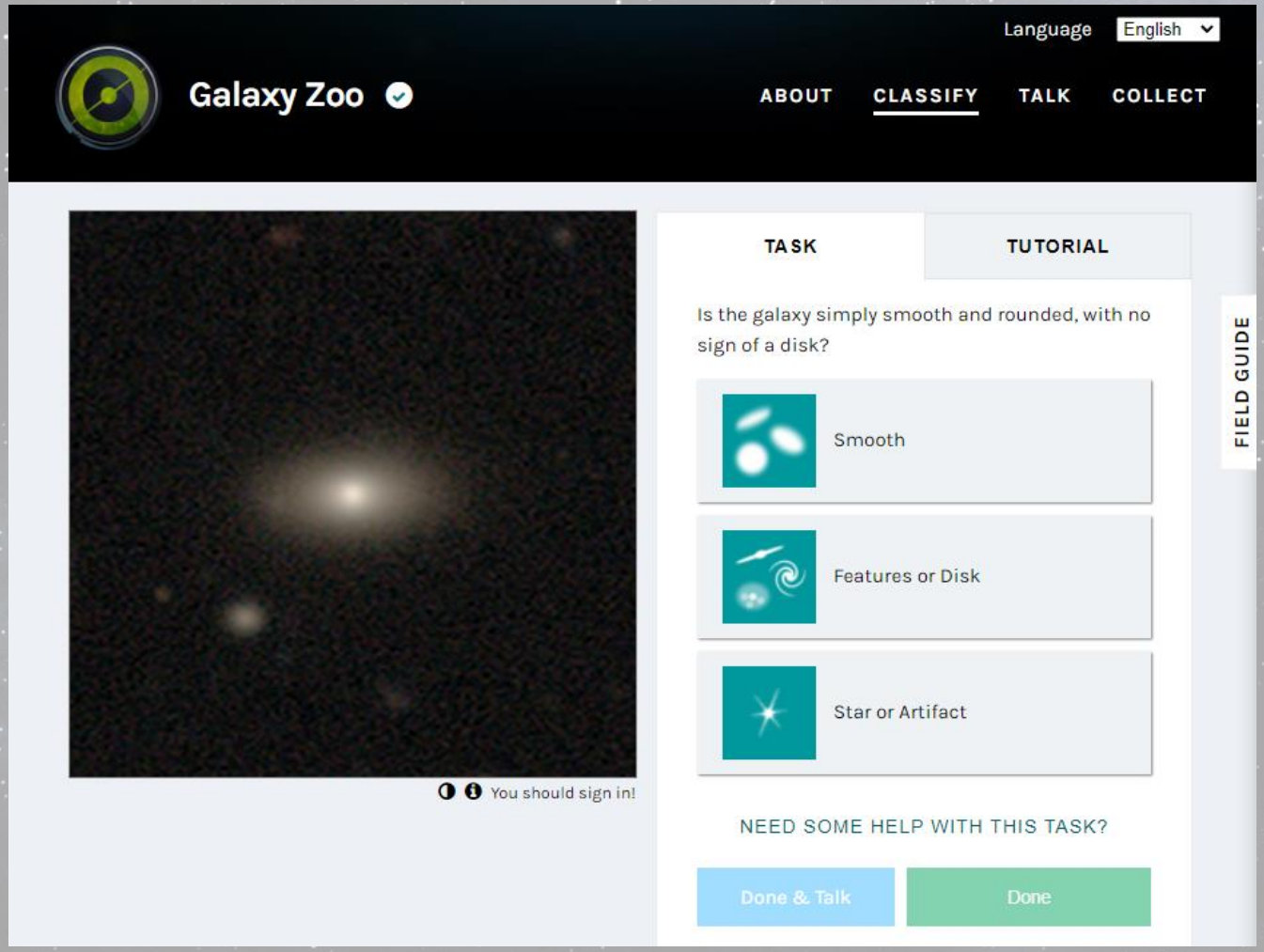


Galaxy Zoo



https://www.zooniverse.org/projects/zookeeper/galaxy-zoo

Galaxy Zoo



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Galaxy Zoo: Cosmic Dawn

Citizen science galaxy classification using Subaru **Hyper Suprime-Cam (HSC)** imaging in the Euclid Deep Field North (EDF-N), with data from the **Hawaii Two-0 (H20) Cosmic Dawn survey.**

Cosmic Dawn

- A 50 sq deg multi-wavelength survey of the Euclid Deep and Calibration fields – some of the darkest and most observable fields on the sky.
- Aims to understand the co-evolution of galaxies, black holes, and the dark matter haloes that host them from reionization to the present.

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HAWAII TWO-0 COSMIC DAWN SURVEY

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Galaxy Zoo: Cosmic Dawn

H20

- Covers 20 sq. deg. of the two primary Euclid deep calibration fields (Euclid Deep Field North and Chandra Deep Field South).
- Studying galaxy evolution out to z = 7 (<800 million years since the Big Bang).
- Includes ultra-deep Subaru HSC imaging, containing about a million galaxies per square degree.

Galaxy Zoo project

- Focusing on deep multiband imaging of the 10 sq. deg. of the EDF-N.
- Implemented as hundreds of thousands of colour postage stamp cutouts.

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HAWAII TWO-O

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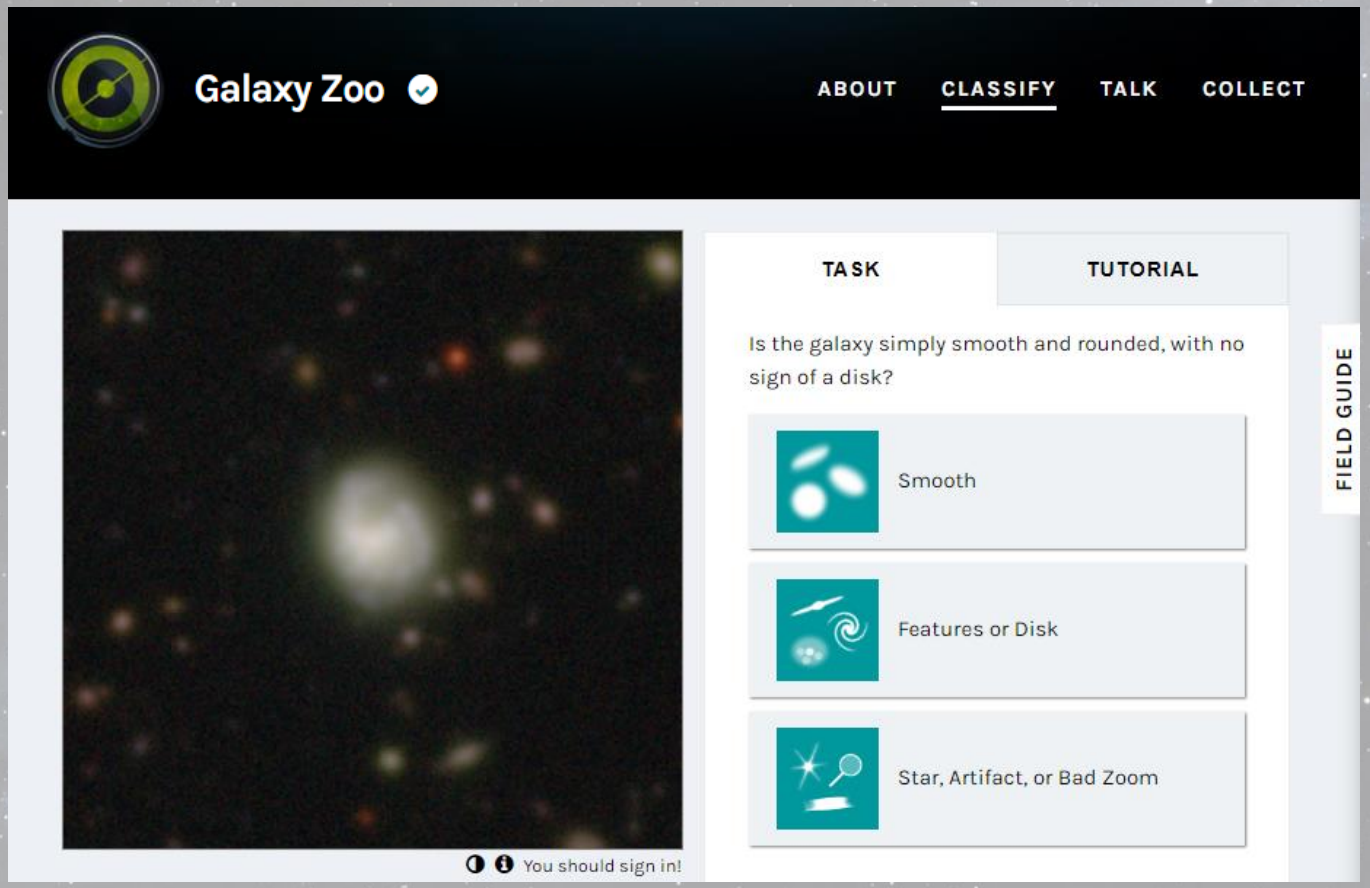

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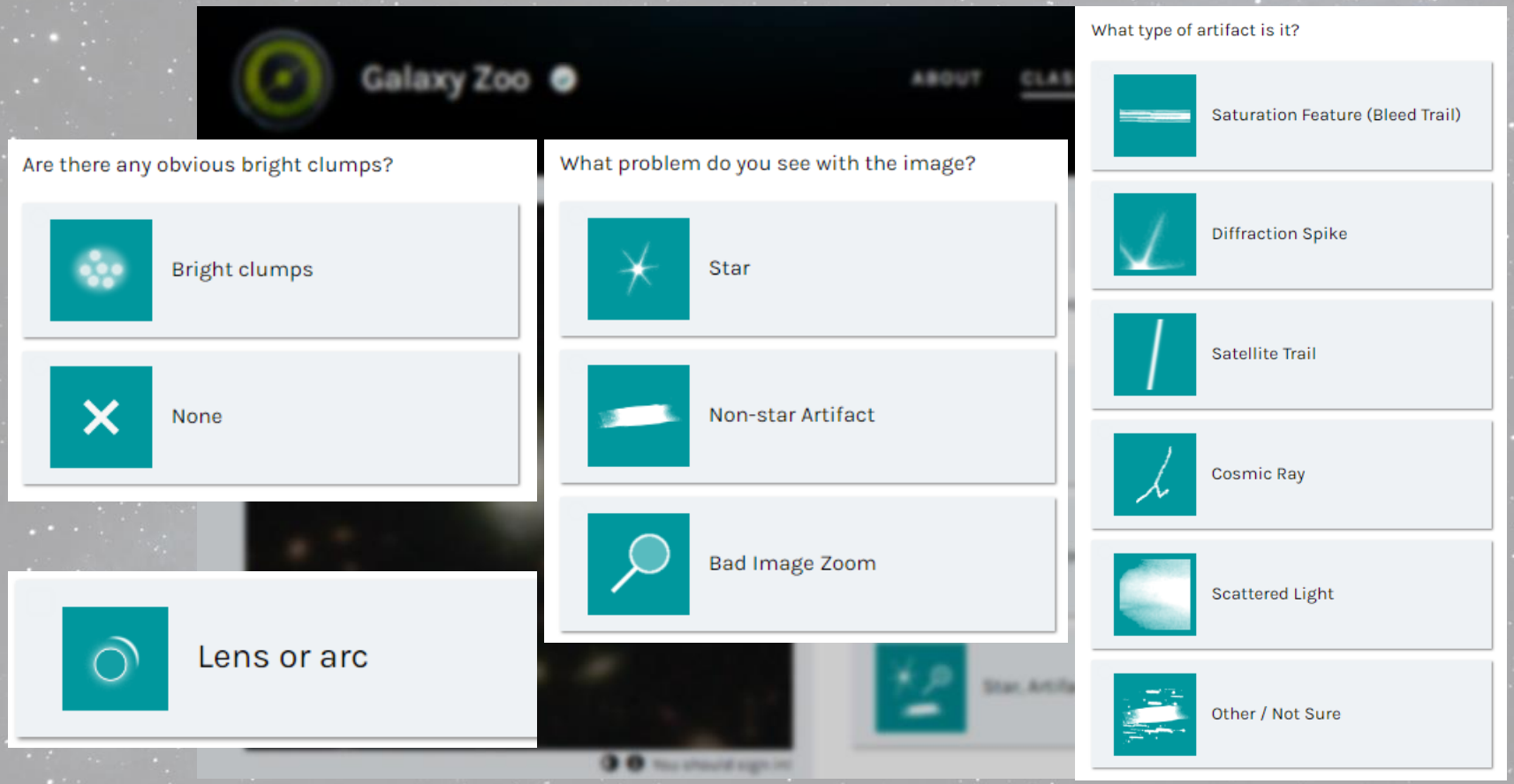
Galaxy Zoo: Cosmic Dawn



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Galaxy Zoo: Cosmic Dawn

Potential Publications

- General data release paper
- Strong gravitational lens discoveries
- Clumpy galaxy statistics
- Low surface brightness features
- Barred galaxy discoveries and statistics
- Interesting cases of utilising machine learning (Zoobot)
- Galaxy mergers identified by GZ, and their correlation with AKARI/Spitzer data
- Correlations between Galaxy Zoo morphology and IR luminosity

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Galaxy Zoo: Cosmic Dawn

Benefits

- Euclid precursor (and others): mapping the EDF-N provides **initial classifications for rapid follow-up** of the most interesting objects.
- LSST Rubin precursor: mapping provides **multiband ground truth sets** for use in training deep learning models.
- Higher-end resolution and deep multiband imaging for statistically studying both **higher redshift sources** and **low surface brightness features.**
- Expands the lists of interesting objects, including those from **serendipitous discovery**.

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Galaxy Zoo: Cosmic Dawn

Summary

- Galaxy Zoo is the longest running Zooniverse citizen science project, classifying galaxies based on their visual morphologies.
- Galaxy Zoo: Cosmic Dawn forms its next iteration, using deep multi-band Subaru HSC imaging of the 10 sq. deg. EDF-N, with data from the H20 Cosmic Dawn survey.
- Partly supported by the ESCAPE project, it is in the final stages prior to public launch, awaiting the initial 6 sq. deg. subject set.
- Benefits include studying higher-z sources and those with LSB features, as well as expanding the list of interesting objects (e.g. through serendipitous discovery).
- Mapping the EDF-N also acts as a precursor for Euclid and Rubin LSST, providing initial classifications for rapid follow-up, and multiband ground truth sets for training deep learning models.