



CITIZEN SCIENCE

DISCOVERY

You're probably already a citizen scientist, whether you realize it or not. Sometimes called *crowdsourcing* (because of the vast number of people required), citizen science involves the analysis of large data sets created, organized, and categorized by ordinary people. Thousands or even millions of citizen scientists assemble data that, when analyzed for patterns and trends, can lead to important breakthroughs. Citizen science is used in a wide variety of experiments, from monitoring bat populations to developing new technologies and even identifying new galaxies.

INNOVATION

Citizen science has been used, in one form or another, for more than a century. Crowdsourced data has provided valuable insights in weather reporting and prediction ([Old Weather](#)), insect identification ([BugGuide](#)), translation of ancient texts ([Ancient Lives](#)), measuring solar flares ([Solar Stormwatch](#)), and perhaps the biggest crowdsourced archive in history, [Wikipedia](#). Thanks to the Internet, crowdsourced information has never been easier to obtain, or more useful. Millions of people have now participated in major citizen science projects, with more emerging every day. Some notable recent projects include:

- GALAXY ZOO** In one of the [first online crowdsourced projects](#), volunteers classified galaxies in Hubble Space Telescope images according to their type. This allows scientists to better understand how galaxies form.
- planethunters** Volunteers [examine data](#) from the Kepler Space Mission to help find planets in other solar systems based on the drop in brightness of a star when a planet transits across it. Sometimes the human eye is better at spotting this than a computer.
- SPACEWARPS** Using data from the Canada-France-Hawaii telescope, viewers can [examine pictures](#) that contain massive galaxies that warp the fabric of spacetime.
- SETI LIVE** Using planets found by the Kepler Space Telescope, the Allen Telescope Array directs itself at them and measures radio-frequency signals. The goal of [SETILIVE](#) is to find any pattern or abnormalities in the data – perhaps evidence of alien civilizations!

IMAGINATION

The possibilities of citizen science are limitless, especially in tandem with *gamification* (the use of game elements to motivate and reward participants). The University of Washington created a game that asked users to manipulate virtual proteins into more efficient structures. Thousands of participants matched the efficiency and even outperformed computers in this task. Imagine playing a game that could result in important scientific breakthroughs! Can you imagine a game that could result in important scientific breakthroughs? What big scientific problem would you like to see tackled through the use of citizen science?

