Physics Recreations:
Distributed Computing
and Citizen Science

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The existence of the Internet has made it possible for ordinary citizens to make important contributions to scientific research in a way that was not possible just a few years ago. Two such types of project are *distributed computing* and *citizen science* projects.

- *Distributed computing projects.* These are projects that involve large amounts of computation—much more than is available at one facility. The organizers of the project divide the work up and parcel it out to the public. To participate in such a project, you download some software from the project's Web site to your computer; this software will then run its computations whenever your computer is sitting idle, and will periodically report results back to the project's Web site. This type of project generally works best with desktop computers that sit idle for long periods of time.

  Some well-known distributed computing projects are:

  - Great Internet Mersenne Prime Search, which searches for new prime numbers.
  - SETI@Home, a project to search for signals from extraterrestrial civilizations.
  - Einstein@Home, a project to search for gravity waves.

- *Citizen science.* These projects involve your active participation, rather than simply borrowing your unused computer time. A common situation here is that a project has massive amounts of data to be analyzed, and lots of volunteers are needed to analyze it. Humans are often better at pattern recognition than computers, so human eyes are often better than computers at tasks like this.

  Citizen science projects are available in mathematics, physics, astronomy, biology, chemistry, climatology, meteorology, archæology, and environmental science.

  Some well-known citizen science projects are:

  - Stardust@Home—Here you examine images from NASA's Stardust mission to search for particles of solid matter from outside the solar system.
  - Galaxy Zoo—This project involves classifying galaxies from Hubble Space Telescope images.
  - Planet Hunters—Search for extrasolar planets.