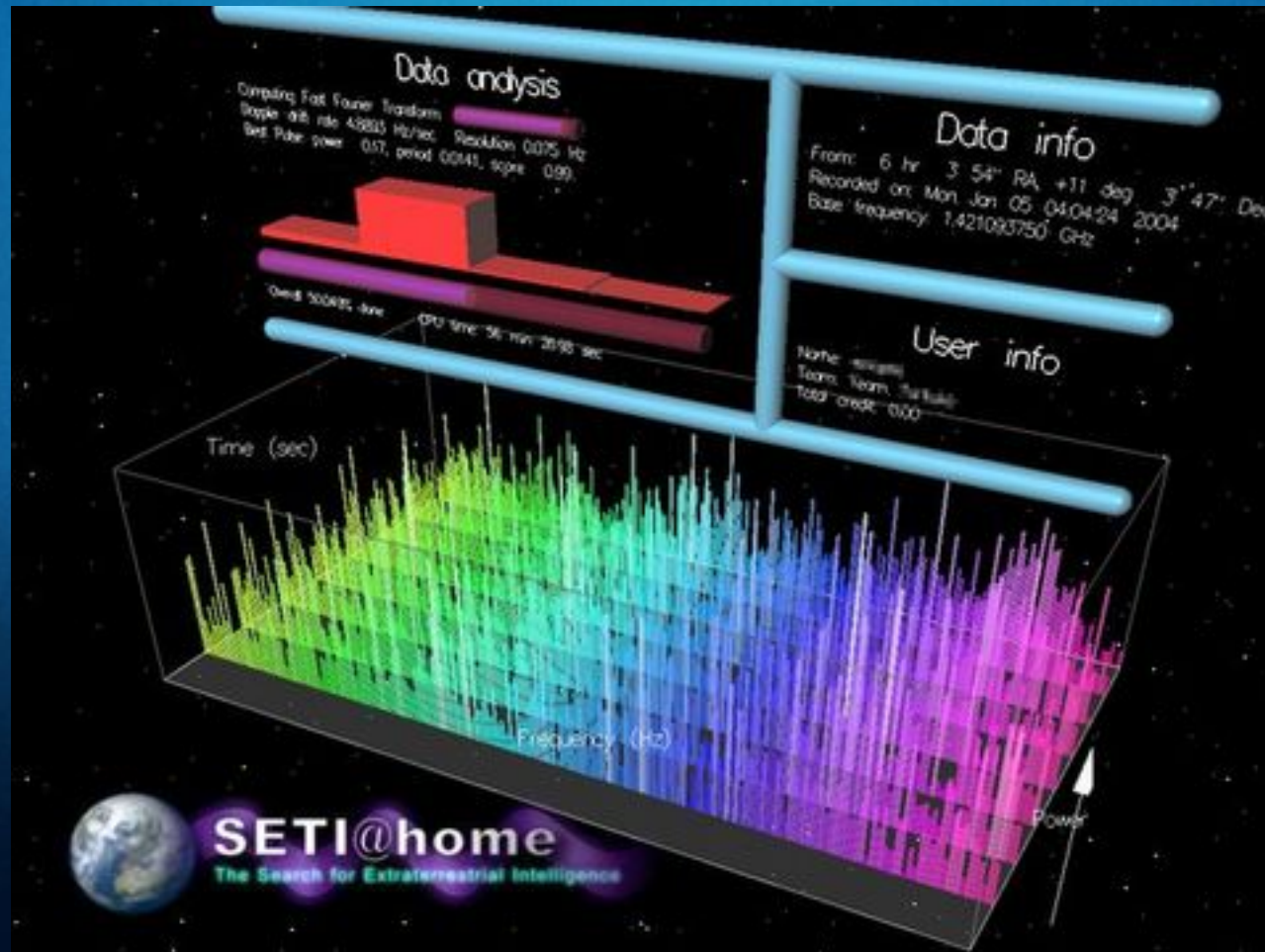


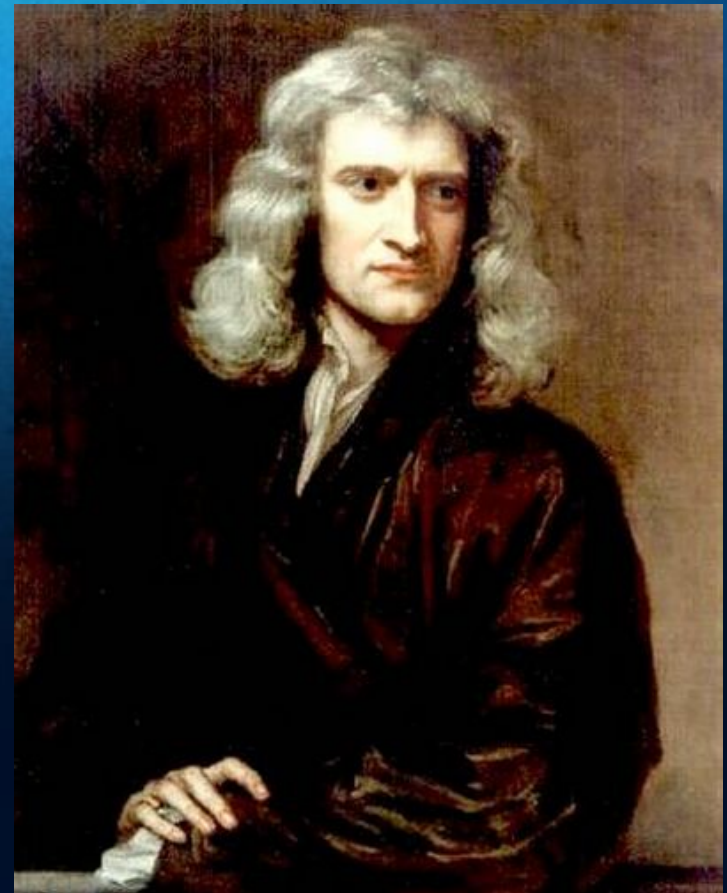
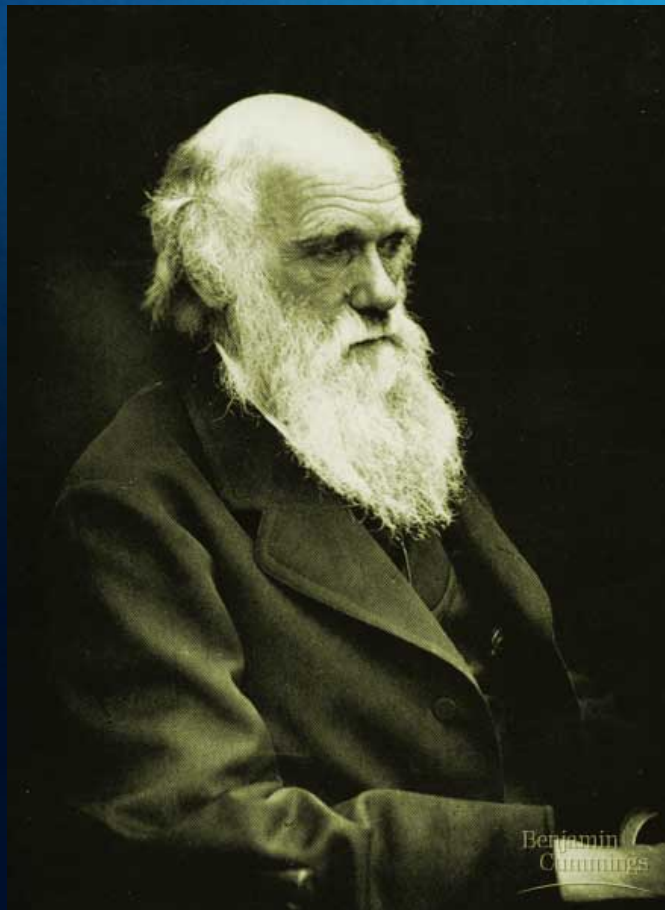
Citizen Science



What can you do with a million lab rats?

But I'm a citizen and a scientist...

- Reaction to what was seen as professionalization of science post-WWII.
- A return to science's roots?



What is this anyway?

- Another term would be 'amateur science'.



Ok, that's not nice.

Some degree of thought.

Think more 'distributed' rather than 'crowdsourced'.



A flash mob, it is not.

When can this work?

1. When the cost of analysis far outweighs the cost of data acquisition.
 1. SETI@home
 2. Galaxy Zoo
2. When the cost of data acquisition far outweighs the cost of analysis.
 1. EpiCollect/Spatial epidemiology
 2. SafeCast



Early enough to be the beginning.

The Audubon Society's Christmas Bird Count.

1. Running since 1900
2. Demonstrates a number of the common citizen science elements
 1. Standardized procedure
 2. Distributed data collection
 3. A central collection point
3. Also represented the great innovation of counting things in nature without killing them.



What kind of science can be citizenified?

1. Environmental science
 1. Phenology
 2. Radiation monitoring
 3. Atmospheric monitoring
2. Materials science
3. Astronomy
 1. Object classification
 2. SETI
 3. Cosmic ray studies
4. Public health
 1. Epidemiology
 2. Molecular biology

Phenology

Monitoring the temporal variations in the environment.

1. Project Budburst

1. Monitoring first bloom times as an indirect measure of climate
2. <http://www.neoninc.org/budburst/>

2. What's Invasive!

1. Monitoring invasive species' spread into local environments
2. <http://whatsinvasive.com/>
3. Yes, it is also available in mobile app form



THE FOUR SEASONS
TREVOR MORRIS PHOTOGRAPHICS



THE FOUR SEASONS
TREVOR MORRIS PHOTOGRAPHICS

Radiation monitoring

1. Project SafeCast

1. Project to upload geotagged geiger counter information in order to build a radiation map of Japan

2. <http://safecast.org/>

2. Pachube

1. Geotagged sensor map

2. <http://pachube.com/>



Atmospheric monitoring

1. USC's mobile sensing project on optical measurements of air quality from cellphone cameras.
2. NexLeaf Analytics and community air quality reports.



Materials science

Caltech runs a project across California high schools known as SHARK (Solar Hydrogen Activity Research Kit) in order to look for promising photocatalytic compounds.



Just set it, and forget it!

Object classification

The Zooniverse group of projects is the most notable. Using volunteers to find and classify:

1. Galaxies
2. Supernovae
3. Exoplanets
4. More....



SETI

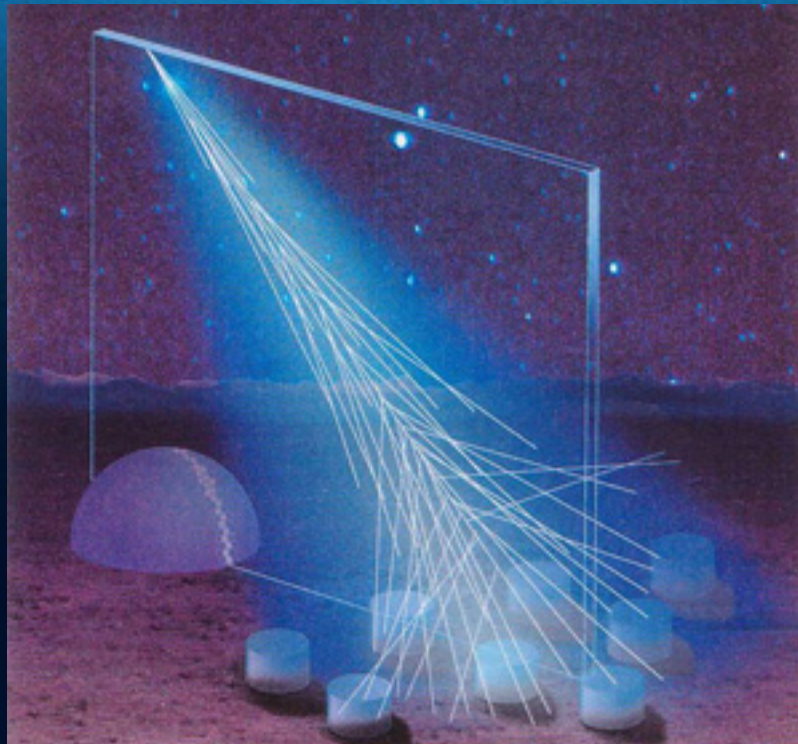
1. One of the more famous citizen science projects.
2. Popular use of distributed computing.

Cosmos > personals > missed connections



Cosmic ray detection

1. WALTA (WAshington Large area Time coincidence Array)
2. DECO (Distributed Electronic Cosmic-ray Observatory)



Epidemiology

As cell phones are the most plentiful computer platform in the poor world, why not use them to gather health data?

The Spatial Epidemiology project gathers disease data using the EpiCollect app to map and potentially spot outbreaks.



**ARE YOU
READY FOR A
ZOMBIE ATTACK**



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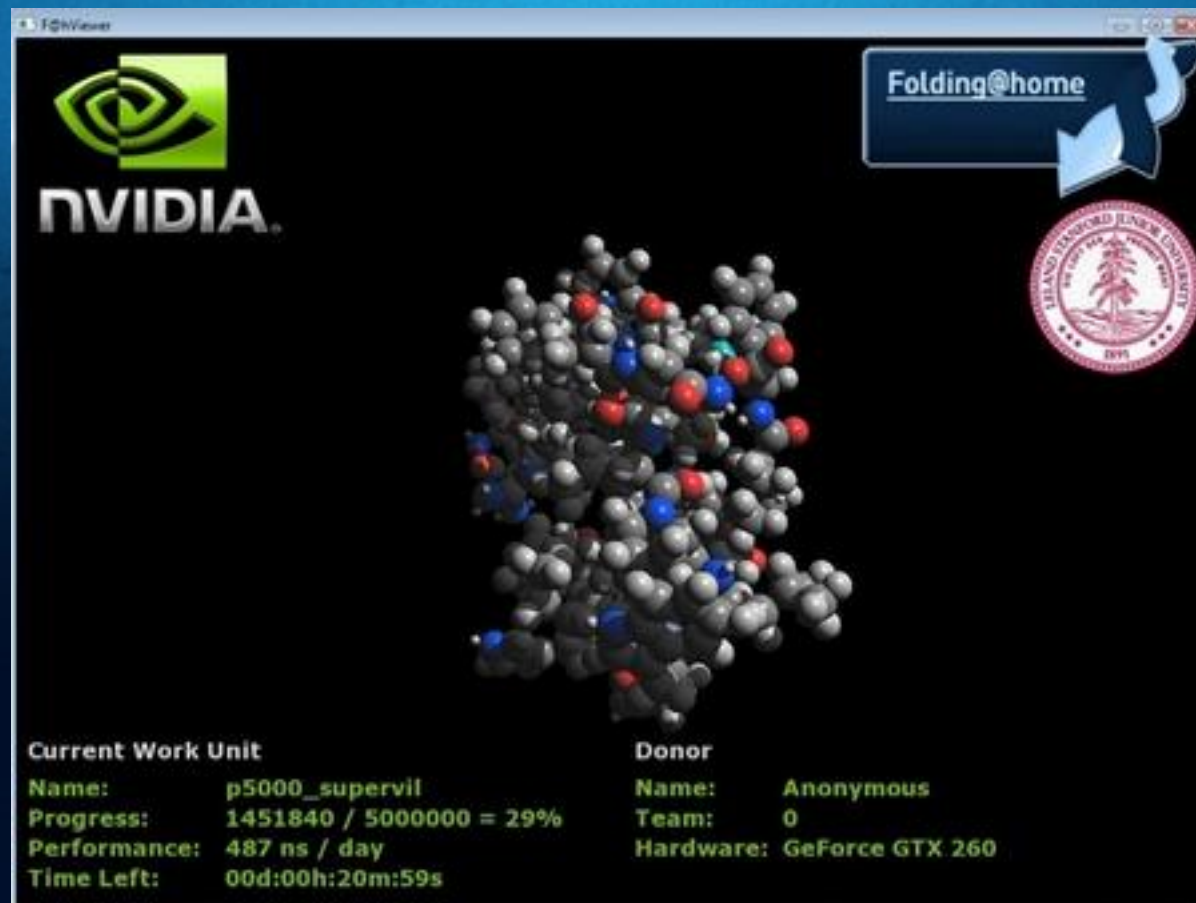


**ARE YOU
READY FOR A
ZOMBIE ATTACK**

Molecular biology

Folding@home

Distributed project to run protein folding simulations



The screenshot displays the Folding@home software interface. At the top left is the NVIDIA logo. In the center is a 3D ball-and-stick model of a protein structure. At the top right, there is a 'Folding@home' logo and a circular seal of the Massachusetts Institute of Technology. At the bottom, there are two columns of text providing details about the current work unit and the donor.

Current Work Unit		Donor	
Name:	p5000_supervil	Name:	Anonymous
Progress:	1451840 / 5000000 = 29%	Team:	0
Performance:	487 ns / day	Hardware:	GeForce GTX 260
Time Left:	00d:00h:20m:59s		

This has already happened.

Questions and comments?

Further reading:

<http://scienceland.wikispaces.com/DSRP>