The Computation Moonshot

A competition designed to teach students about science and distributed computing by using their computers to contribute directly to scientific research

Computation Moonshot

Information Packet

We cordially invite you, your school, and your students to take place in the inaugural round of The Science Commons Initiative's Computation Moonshot!

The competition is free to all, requires no special knowledge or skills, and will help prepare your students for the future by teaching them about data and computational science!

Your participation in this first round will provide invaluable insights into how we can successfully connect students to science through distributed computing.

Also, there are some pretty sweet prizes!

Purpose

Active Education

Computation Moonshot is a competition for high schools which encourages students to learn about data science, computer science, distributed computing, and a wide array of fields in science by having them contribute to real, useful outcomes for researchers.

Pathways for Students

We utilize the Berkeley Open Infrastructure for Network Computing (BOINC) to connect students to dozens of groundbreaking scientific research projects where they can contribute the processing power of their computers and other electronic devices to research while becoming part of a lively scientific community

Get. Science. Done.

Our goal is to contribute 50,000 hours of computation to research while teaching students around the US about science!

What is BOINC?

BOINC was developed in 2002, though it truly began with the SETI@Home project in 1999. You may remember running the SETI@Home screensaver yourself!
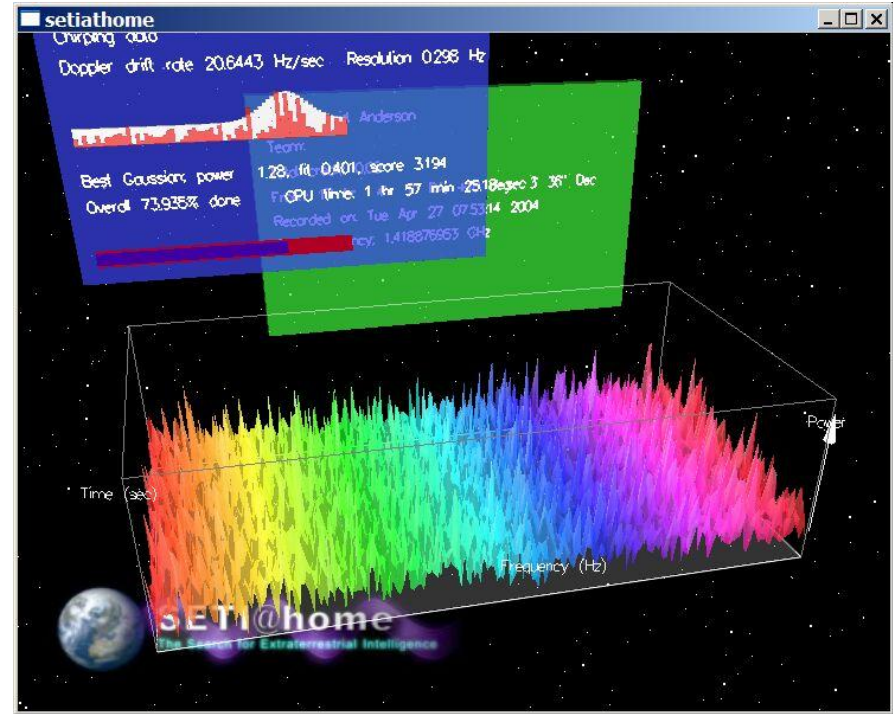
BOINC has hosted nearly 300 distributed computing projects over the decades.

It currently hosts over 20 projects including those from CERN, The University of Washington, Oxford, The Max Planck Institute, Arizona State University, and so many more.

BOINC

The great thing about BOINC, is that it's open source, permissionless, and anyone can make a distributed computing project, even your students! But that's a conversation for another day (let us know if you want to know more!).

BOINC
Open-source software for volunteer computing and grid computing.
73 followers · Berkeley, CA, USA · http://boinc.berkeley.edu/

Popular repositories

boinc Public
Open-source software for volunteer computing and grid computing.
● PHP ☆ 1.8k ⑂ 429

boinc-client-docker Public
The BOINC client in a Docker container
● Shell ☆ 100 ⑂ 35

boinc-site Public
Source code for the BOINC web site, https://boinc.berkeley.edu
● PHP ☆ 11 ⑂ 8

boinc-policy Public
☆ 7 ⑂ 11

boinc-apps Public
● C++ ☆ 7

boinc-combined-stats Public
● Java ☆ 4 ⑂ 3

People
Top languages
● PHP ● Shell ● C ● Ruby ● C++

Most used topics
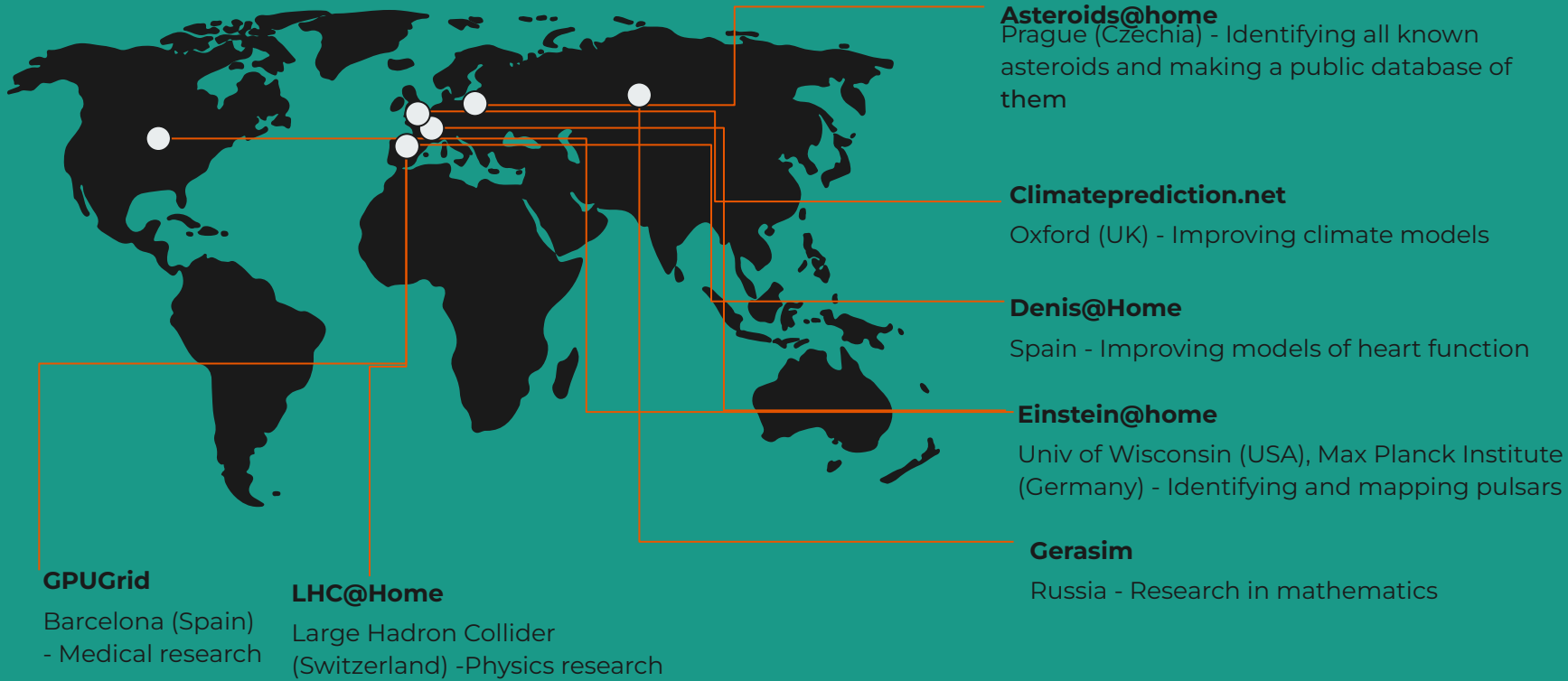boinc distributed-computing high-performance-computing science scientific-computing
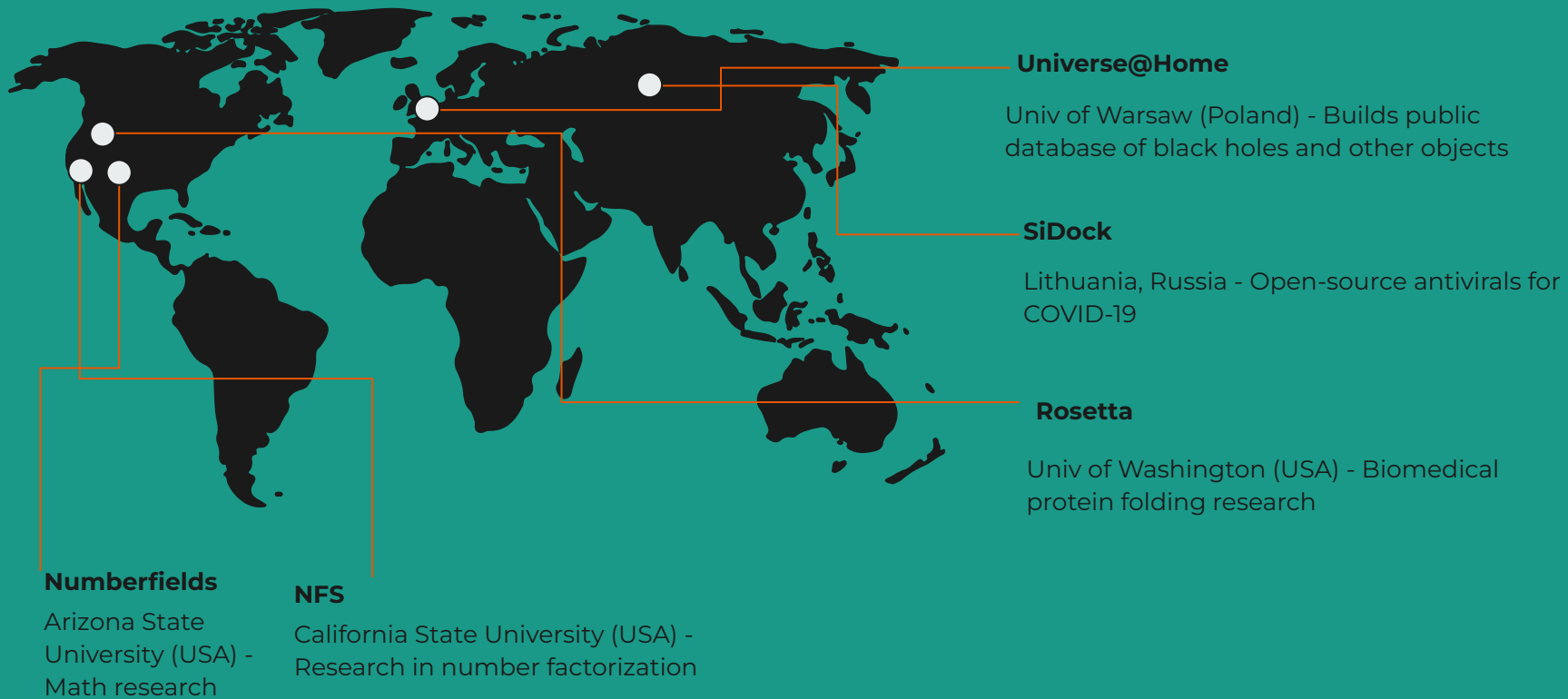
Report abuse

🖥 Repositories

Find a repository... | Type ▾ | Language ▾ | Sort ▾

boinc Public
Open-source software for volunteer computing and grid computing.
● PHP ☆ 1,811 ⚖ LGPL-3.0 ⑂ 429 ⊙ 509 ⑂ 25 Updated 2 days ago

boinc-site Public
Source code for the BOINC web site, https://boinc.berkeley.edu

Asteroids@home
Prague (Czechia) - Identifying all known asteroids and making a public database of them

Climateprediction.net
Oxford (UK) - Improving climate models

Denis@Home
Spain - Improving models of heart function

Einstein@home
Univ of Wisconsin (USA), Max Planck Institute (Germany) - Identifying and mapping pulsars

Gerasim
Russia - Research in mathematics

GPUGrid
Barcelona (Spain) - Medical research

LHC@Home
Large Hadron Collider (Switzerland) -Physics research

Over the years, BOINC projects have worked on astrophysics, biomedical research, mathematics, particle physics, climate research, materials science, and cryptography, along with the age old question of whether or not a room full of typewriters and monkeys can indeed produce Shakespeare, and so much more.

Universe@Home

Univ of Warsaw (Poland) - Builds public database of black holes and other objects

SiDock

Lithuania, Russia - Open-source antivirals for COVID-19

Rosetta

Univ of Washington (USA) - Biomedical protein folding research

Numberfields

Arizona State University (USA) - Math research

NFS

California State University (USA) - Research in number factorization

Some results include producing an accurate 3D model of SARS-CoV-2 faster than crystallization-based models (Rosetta@home), developing a manufactured and distributed COVID-19 vaccine (Rosetta@home), helping find new subatomic particles (LHC@Home), identifying pulsars (Einstein@Home), advancements in cancer marker and treatment research (World Community Grid), simulation of candidate molecules for next-generation solar panels (World Community Grid), advancements in climate research (ClimatePrediction.Net), and so much more.

The Crazy Thing

Is that all of these achievements have been completed by harnessing the spare computing power of volunteers from around the world.

4,000,000 Volunteers

100,000 Teams

13,000,000 GigaFLOPS of Computation Power

The Computation Moonshot

We're tapping in to the World Community Grid

This Computation Moonshot will take place on the BOINC project World Community Grid, which is run out of the Krembil Institute in Canada.

World Community Grid is one large project comprised of several smaller research projects from around the world.

World Community Grid supports research all over the world on a variety of subjects. Here are just a few of their projects.

Open Zika

Universidade Federal de Goiás, Brazil

Identifies drug candidates to treat the Zika virus in someone who has been infected

Open Pandemics

Scripps Research, California

Searches for treatments for COVID-19, and builds open-source tools to help address future pandemics quickly and early.

Mapping Childhood Cancer

Krembil Institute, Canada

Identifying genetic markers associated with cancer

The Clean Energy Project

Harvard, Cambridge MA

Develops efficient and inexpensive solar cells using organic molecules

Africa Rainfall

University of Technology in Delft, Netherlands

Developing better rainfall prediction models to fight off famine and improve crop yields

Competition Overview

Here's how to participate:

1. A teacher creates a BOINC account and registers their school's team
2. A teacher teaches students about distributed computing and the science that will be done with their computer (with our help!)
3. Students create BOINC accounts and join their school team
4. Students try to get as many people to join their school team as possible
5. School teams use their computers to contribute to as much science as possible
6. The competition continues for 60 days
7. Prizes are distributed to winners

What We'll Provide

Educational Resources

We will provide open educational resources to assist in teaching students about distributed computing, BOINC, and the science to which their computers are contributing. These resources will include slides, extra credit worksheets, and additional reading material.

Take Home Resources

We will also provide resources for your students to share with their families and friends to teach them about distributed computing, BOINC, and the science their computers are doing.

Prizes!

What's a competition without prizes?!

How to Win

We will distribute prizes for the top three winners in the following categories:

1. School team with the number of most active contributors
2. School team with the most CPU contributed
3. School team with the highest ratio of active contributors to students

If your school wins any prizes, whoever registered the team will be responsible for accepting delivery of the prizes.

Prizes

The winners will receive money that can be used to select supplies and goodies from our prize catalogues. Some examples of items that might be in the catalogue are:

- Microscopes
- Google Colab resources
- A pizza party
- Raspberry Pi Kits
- Scholarships for students
- School Lab supplies

Next Steps to Participate

So you want to sign your school up for the competition? Here's what to do next!

Follow the instructions on the Teacher's Setup Guide, which will walk you through how to:
1. Install and setup BOINC
2. Sign up for World Community Grid
3. Start contributing computation cycles to BOINC
4. Create a Team
5. Register your school for the competition
6. Set up basic BOINC settings

Teacher's Setup Guide

Rules and Registration

Please review the full competition rules and information at https://computationmoonshot.org.

To register your school, go to computationmoonshot.com and click the "sign up" link, registration process will take less than 10 minutes.

Reach out to contact@thesciencecommons.org with any questions

The Computation Moonshot is sponsored by The Science Commons Initiative, a 501(c)(3) non-profit public charity dedicated to rebuilding the bridge of trust and engagement between the public and science.