

Distributed Computing

Astronomy & Astrophysics - Arts

Biology & Medicine - Chemistry - Climate study

Cognitive science - Computer science - Cryptography

Earth & Environmental Science - History - Language & Literature - Social science

Mathematics (Integer factorization, Number theory, Prime numbers)

Physics (Large Hadron Collider) - Software testing (Chess engines) - Statistics - Others

Astronomy

Cosmology@Home - Find the most accurate models that best describe the universe

Milkyway@Home - Create a highly accurate three-dimensional model of the Milky Way galaxy using data collected from the Sloan Digital Sky Survey

Stardust@home - Scans/analyzes the collection grid from the NASA Stardust mission to capture particles from the coma of comet Wild 2

Universe@Home - Universe@Home aims to create the first database of the simulated stellar content of the Universe, from the earliest stars to the most exotic black hole binaries

Astrophysics

> Astronomy / Physics / Chemistry

Asteroids@home - To significantly enlarge our knowledge of the physical properties of asteroids

Einstein@Home - Search for pulsars using radio signals and gravitational wave data

Galaxy Zoo - Classifies galaxy types from the Sloan Digital Sky Survey

AstroQuest - Complete quests to help Australian scientists understand how galaxies grow and evolve.

Astronomy & Astrophysics

> Zooniverse - 20 space projects:

PLANET FOUR	LOFAR	STAR NOTES
MAPPING HISTORIC SKIES	CLUMP SCOUT	GALAXY ZOO MOBILE
HUBBLE ASTEROID HUNTER	ZWICKY'S QUIRKY TRANSIENTS	PLANET HUNTERS TESS
SUPERWASP VARIABLE STARS	VARIABLE STAR ZOO	GALAXY ZOO
SOLAR STORMWATCH II	EXOPLANET EXPLORERS	ASTRONOMY REWIND
PLANET 9	GRAVITY SPY	RADIO METEOR ZOO
SUPERNOVA HUNTERS	TERRAINS	

Arts

BURP - Rendering of 3D animations

Electric Sheep - Screen Saver for desktop and laptop computers

> Zooniverse - 7 arts projects:

FISHING IN THE PAST	VINTAGE CUBAN RADIO
MAPPING HISTORIC SKIES	HERITAGE QUEST
CRIMINAL CHARACTERS	AFRICAN AMERICAN CIVIL WAR SOLDIERS
SCRIBES OF THE CAIRO GENIZA	

Biology - Molecular biology

Folding@home - Understand protein folding, misfolding, and related diseases, with a minor emphasis in protein structure prediction; computing power also harnessed the power of PlayStation 3s

RNA World - Uses bioinformatics software to study RNA structure

Rosetta@home - Protein structure prediction for disease research

GPUGRID - Many graphics cards (GPUs) joined together to deliver high-performance all-atom biomolecular simulations

> Zooniverse - 61 biology projects:“

JUNGLE WEATHER THE KOSTER SEAFLOOR OBSERVATORY NOTES FROM NATURE - FLORA OF TEXAS AND OKLAHOMA HUMMINGBIRDS FISHING IN THE PAST SEAL WATCH NOTES FROM NATURE - MI-BUG WILD MONT-BLANC NOTES FROM NATURE - TERRESTRIAL PARASITE TRACKER ROBINS UNIVERSITY OF WYOMING RACCOON PROJECT SNAPSHOT BLOUBERG OFFAL WILDLIFE WATCHING ETCH A CELL - POWERHOUSE HUNT EYE FOR DIABETES NOTES FROM NATURE - HERBARIUM NOTES FROM NATURE - NYBG AÑO NUEVO ISLAND - ANIMAL COUNT NOTES FROM NATURE - SOUTHEASTERN U.S. BIODIVERSITY NOTES FROM NATURE - CAPTURING CALIFORNIA'S FLOWERS

CHIMP&SEE SECRET LIVES OF MICE SKINK SPOTTER NZ NOTES FROM NATURE - BUTTERFLIES SNAPSHOT KGALAGADI NOTES FROM NATURE - PLANTS OF ARKANSAS WILDWATCH BURROWING OWL NOTES FROM NATURE - CALBUG NOTES FROM NATURE - WEDIGFLPLANTS PLANT LETTERS TARANAKI MOUNGA VIRUS FACTORY SNAPSHOT MOUNTAIN ZEBRA SNAPSHOT KAROO EYES ON THE WILD MONKEY HEALTH EXPLORER BELUGA BITS SOUTH SUDAN DIVERSITYCAM LONDON BIRD RECORDS PENGUIN WATCH

EMAMMAL INVADER ID MANATEE CHAT GROUSE GROOVES READING NATURE'S LIBRARY CALGARY CAPTURED SCIENCE SCRIBBLER SNAPSHOT GRUMETI SNAPSHOT SERENGETI SNAPSHOT RUAHA PROJECT PLUMAGE FLOATING FORESTS PARASITE SAFARI SEABIRDWATCH WILDWATCH KENYA WEDDELL SEAL COUNT FOSSIL ATMOSPHERES WESTERN MONTANA WILDLIFE BASH THE BUG CHICAGO WILDLIFE WATCH

MAPPING CHANGE SNAPSHOT WISCONSIN WILDCAM GORONGOSA

Medicine

DENIS@Home - Research in Cardiac Electrophysiology

DreamLab - Breast, ovarian, prostate and pancreatic cancer [1)]

> Zooniverse - 7 medicine projects:

ETCH A CELL - POWERHOUSE HUNT	EYE FOR DIABETES	SECRET LIVES OF MICE
VIRUS FACTORY	MONKEY HEALTH EXPLORER	SCIENCE SCRIBBLER
BASH THE BUG		

Climate study

Climateprediction.net - Investigates the approximations that have to be made in state-of-the-art climate models [2)]

> Zooniverse - 12 climate projects:

JUNGLE WEATHER	WEATHER 100 - ESKDALEMUIR	WILD MONT-BLANC
NOTES FROM NATURE - NYBG	SKINK SPOTTER NZ	CASTAWAY
PENGUIN WATCH	INVADER ID	FLOATING FORESTS
PARASITE SAFARI	FOSSIL ATMOSPHERES	MAPPING CHANGE

Chemistry

Cleanmobility.now - Find safer and greener materials for e-vehicle batteries

Quantum Medicinal Chemistry at Home - Do quantum-mechanical computations on medically relevant biomolecular systems, to help with developing quantum-mechanics-based approaches for computational drug design

Cognitive science

MindModeling@Home - Builds cognitive models of the human mind

Computer science

iThena - Generally computer networks

Cryptography

Distributed.net - Crack the RC5-72 cipher, find optimal Golomb rulers of length 28

Enigma@Home - Decode 3 unbroken Enigma messages from World War II

Moo! Wrapper - Combines BOINC with distributed.net to try to break the RC5 cipher

Earth & Environmental Science

Quake Catcher Network - Seismic Monitoring - An accelerometer is needed to run this project, for others an USB attachment is necessary

> Zooniverse - 64 nature projects:

WEATHER 100 - ESKDALEMUIR	THE KOSTER SEAFLOOR OBSERVATORY	NOTES FROM NATURE - FLORA OF TEXAS AND OKLAHOMA
HUMMINGBIRDS	FISHING IN THE PAST	SEAL WATCH
NOTES FROM NATURE - MI-BUG	WILD MONT-BLANC	NOTES FROM NATURE - TERRESTRIAL PARASITE TRACKER
ROBINS	UNIVERSITY OF WYOMING RACCOON PROJECT	SNAPSHOT BLOUBERG

OFFAL WILDLIFE WATCHING	ETCH A CELL - POWERHOUSE HUNT	EYE FOR DIABETES
NOTES FROM NATURE - HERBARIUM	HERITAGE QUEST	NOTES FROM NATURE - NYBG
AÑO NUEVO ISLAND - ANIMAL COUNT	NOTES FROM NATURE - SOUTHEASTERN U.S. BIODIVERSITY	

Earth & Environmental Science (2)

NOTES FROM NATURE - CAPTURING CALIFORNIA'S FLOWERS	CHIMP&SEE	SKINK SPOTTER NZ
NOTES FROM NATURE - BUTTERFLIES	SNAPSHOT KGALAGADI	NOTES FROM NATURE - PLANTS OF ARKANSAS
WILDWATCH BURROWING OWL	NOTES FROM NATURE - CALBUG	NOTES FROM NATURE - WEDIGFLPLANTS
CASTAWAY	PLANT LETTERS	TARANAKI MOUNGA
SNAPSHOT MOUNTAIN ZEBRA	SNAPSHOT KAROO	EYES ON THE WILD
EARTHQUAKE DETECTIVE	MONKEY HEALTH EXPLORER	THE WILDS' WILDLIFE WATCH
BELUGA BITS	SOUTH SUDAN DIVERSITYCAM	

Earth & Environmental Science (3)

SNAPSHOT HOGE VELUWE	LONDON BIRD RECORDS	PENGUIN WATCH
EMAMMAL	INVADER ID	MANATEE CHAT
GROUSE GROOVES	READING NATURE'S LIBRARY	CALGARY CAPTURED
SNAPSHOT GRUMETI	SNAPSHOT SERENGETI	SNAPSHOT RUAHA
PROJECT PLUMAGE	FLOATING FORESTS	PARASITE SAFARI
SEABIRDWATCH	WILDWATCH KENYA	WEDDELL SEAL COUNT
FOSSIL ATMOSPHERES	WESTERN MONTANA WILDLIFE	

BASH THE BUG	CHICAGO WILDLIFE WATCH	MAPPING CHANGE
SNAPSHOT WISCONSIN	WILDCAM GORONGOSA	

History

> Zooniverse - 26 history projects:

JUNGLE WEATHER	NOTES FROM NATURE - FLORA OF TEXAS AND OKLAHOMA

NOTES FROM NATURE - MI-BUG	NOTES FROM NATURE - TERRESTRIAL PARASITE TRACKER
STAR NOTES	MAPPING HISTORIC SKIES
MEASURING THE ANZACS	NOTES FROM NATURE - HERBARIUM
HERITAGE QUEST	NOTES FROM NATURE - NYBG
NOTES FROM NATURE - SOUTHEASTERN U.S. BIODIVERSITY	NOTES FROM NATURE - CAPTURING CALIFORNIA'S FLOWERS
NOTES FROM NATURE - BUTTERFLIES	NOTES FROM NATURE - PLANTS OF ARKANSAS

History (2)

MACDONALD DICTIONARY	NOTES FROM NATURE - CALBUG
NOTES FROM NATURE - WEDIGFLPLANTS	CRIMINAL CHARACTERS
CASTAWAY	PLANT LETTERS
THE AMERICAN SOLDIER	AFRICAN AMERICAN CIVIL WAR SOLDIERS
BEHIND THE SCENES AT SUPREME COURT CONFERENCE	ANTI-SLAVERY MANUSCRIPTS
SCRIBES OF THE CAIRO GENIZA	ASTRONOMY REWIND

Language & Literature

> Zooniverse - 4 language projects [3]:

VINTAGE CUBAN RADIO	BEHIND THE SCENES AT SUPREME COURT CONFERENCE
ANTI-SLAVERY MANUSCRIPTS	SCRIBES OF THE CAIRO GENIZA

Social science

> Zooniverse - 12 social science projects:

VINTAGE CUBAN RADIO	POWER TO THE PEOPLE
STAR NOTES	MEASURING THE ANZACS
HERITAGE QUEST	CHIMP&SEE
CRIMINAL CHARACTERS	THE AMERICAN SOLDIER
AFRICAN AMERICAN CIVIL WAR SOLDIERS	BEHIND THE SCENES AT SUPREME COURT CONFERENCE

ANTI-SLAVERY MANUSCRIPTS	SCRIBES OF THE CAIRO GENIZA

Mathematics

Collatz Conjecture - Study the Collatz conjecture, an unsolved conjecture in mathematics

Gerasim@Home - Researched in discrete mathematics and logic control systems

SRBase - Solving Mathematical problems of Sierpinski/Riesel Base

Van Der Waerden Numbers - Mathematical solutions relating to Van Der Waerden Theorem

Mathematics - Integer factorization

NFS@Home - Performs parts of the Number Field Sieve in the factorization of large integers

Mathematics - Number theory

NumberFields@Home - Search for number fields with special properties to assist with the formulation of mathematical conjectures

Mathematics - Prime numbers

Great Internet Mersenne Prime Search (GIMPS) - Searches for Mersenne primes of world record size

Primaboinca - Search for counterexamples to Agrawal's conjecture and Popovych's conjecture, which relate to the identification of prime numbers

Twin Prime Search - Searches for large twin primes

WEP-M+2 Project - Investigates the factorization of Mersenneplustwo prime numbers

PrimeGrid - Searching for large twin primes of the form k*2^n+1 and k*2^n-1

Physics

Radioactive@home - Real-time radioactivity monitoring, detected by gamma sensors connected to volunteer computers

> Zooniverse - 13 physics projects:

LOFAR	STAR NOTES	CLUMP SCOUT
GALAXY ZOO MOBILE	PLANET HUNTERS TESS	EARTHQUAKE DETECTIVE
SUPERWASP VARIABLE STARS	GALAXY ZOO	STEELPAN VIBRATIONS
EXOPLANET EXPLORERS	GRAVITY SPY	RADIO METEOR ZOO
SUPERNOVA HUNTERS		

Physics - Large Hadron Collider

LHC@home - Improve the design of the Large Hadron Collider and its detectors

- Sixtrack - Create better beams!
- ATLAS@home - Discover particles!
- CMS@Home - Open a window to theories beyond the Standard Model.
- Beauty - Where is the antimatter?

Software testing

Albert@home - Testing project for Einstein@Home

RALPH@home - Test project for Rosetta@home

SETI@home Beta - Test project of SETI@home

YAFU - Test BOINC server software, integer factorization

Pirates@Home - Always under development, so please don't expect it to work all the time; in fact, right now we have very little work, just occasional tests

Software testing - Chess engines

Fishtest - Validates patches to the Stockfish chess engine by playing thousands of chess games at fast time controls between different versions of the engine

Leela Chess Zero - Trains chess neural-networks with deep reinforcement learning, experiments with training parameters and net architectures

Statistics

WUProp@Home - Collect various statistics about other BOINC projects

Others

1. CAS@home - A Multi-Application project in Biochemistry, Physics etc. [4)]
2. Citizen Science Grid - The project is dedicated to supporting a wide range of research and educational projects
3. SETI@home - SETI@home project, Search for Extraterrestrial Intelligence
4. TN-Grid - Research in various scientific projects
5. World Community Grid - Research includes HIV/AIDS, cancer, muscular dystrophy, dengue fever, and many more [5)]
6. Yoyo@home - Brings existing distributed computing projects to the Boinc world using the Boinc Wrapper technology [6)]

Projects

EDGeS@Home
SZTAKI Desktop Grid
The Lattice Project
World Community Grid
DIMES
Majestic-12
NESSI-GRID
OMII-UK
Storage@home
StrataGenie
Surveill@Home

Infrastructure (1)

BREIN uses the Semantic Web and multi-agent systems to build simple and reliable grid systems for business, with a focus on engineering and logistics management

A-Ware is developing a stable, supported, commercially exploitable, high quality technology to give easy access to grid resources

AssessGrid addresses obstacles to wide adoption of grid technologies by bringing risk management and assessment to this field, enabling use of grid computing in business and society

Cohesion Platform is a Java-based modular peer-to-peer multi-application desktop grid computing platform for irregularly structured problems developed at the University of Tübingen (Germany)

Infrastructure (2)

The European Grid Infrastructure (EGI) is a series of projects funded by the European Commission which links over 70 institutions in 27 European

countries to form a multi-science computing grid infrastructure for the European Research Area, letting researchers share computer resources

GridCOMP provides an advanced component platform for an effective invisible grid

GridECON takes a user-oriented perspective and creates solutions to grid challenges to promote widespread use of grids

neuGRID develops a new user-friendly grid-based research e-infrastructure enabling the European neuroscience community to perform research needed for the pressing study of degenerative brain diseases, for example, Alzheimer's disease

Infrastructure (3)

OMII-Europe is an EU-funded project established to source key software components that can interoperate across several heterogeneous grid middleware platforms

OurGrid aims to deliver grid technology that can be used today by current users to solve present problems. To achieve this goal, it uses a different trade-off compared to most grid projects: it forfeits supporting arbitrary applications in favor of supporting only bag-of-tasks applications

Infrastructure (4)

ScottNet NCG is a distributed neural computing grid. A private commercial effort in continuous operation since 1995. This system performs a series of functions including data synchronization amongst databases, mainframe systems, and other data repositories. E-commerce transaction processing, automated research and data retrieval, content analysis, web site monitoring, scripted and dynamic user emulation, shipping and fulfillment API integration and management, RSS and NNTP monitoring and analysis, real time security enforcement, and backup/restore functions.

Infrastructure (5)

BEinGRID - Business Experiments in Grid

Legion is a grid computing platform developed at the University of Virginia

Berkeley NOW Project

Debian Cluster Components

DiaGrid is a grid computing network centered at Purdue University

Open Science Grid

SARA Computing and Networking Services in Netherlands

The Extreme Science and Engineering Discovery Environment (XSEDE) - formerly Teragrid

References

1. https://en.m.wikipedia.org/wiki/List_of_distributed_computing_projects
2. https://boinc.berkeley.edu/wiki/Category:Projects / https://boinc.berkeley.edu/wiki/Project_list / https://boinc.berkeley.edu/projects.php
3. https://en.wikipedia.org/wiki/List_of_citizen_science_projects
4. https://boinc.berkeley.edu/wiki/Publications_by_BOINC_projects
5. https://www.boincitaly.org/progetti/pubblicazioni-scientifiche.html#en

1)

Cancer research

2)

Analyse ways to improve climate prediction models - Climate Study

3)

Zooniverse - 3 literature projects

4)

Encourage Chinese scientists to use volunteer computing for their research

5)

To further critical non-profit research on some of humanity's most pressing problems by creating the world's largest volunteer computing grid

6)

Data structure analysis to help prove a conjecture, elliptic curve factorization, pion creation in a particle accelerator, evolution research, find the shortest optimal Golomb ruler of length 28

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Last update: **2021/10/30 11:39**