BOINC:FAST 2017

PETROZAVODSK
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USE OF BOINC TO SOLVE APPLIED SCIENTIFIC PROBLEMS

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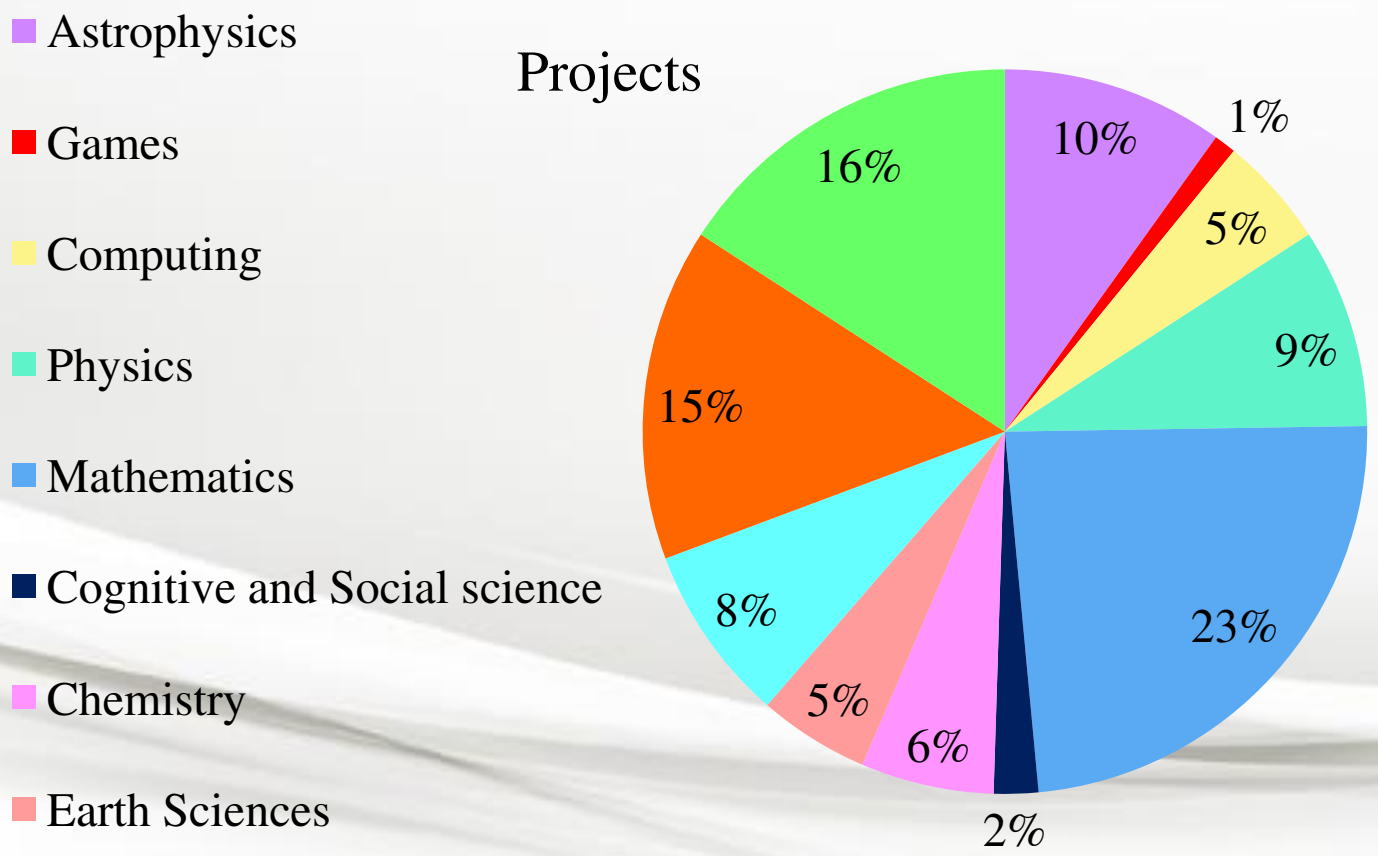
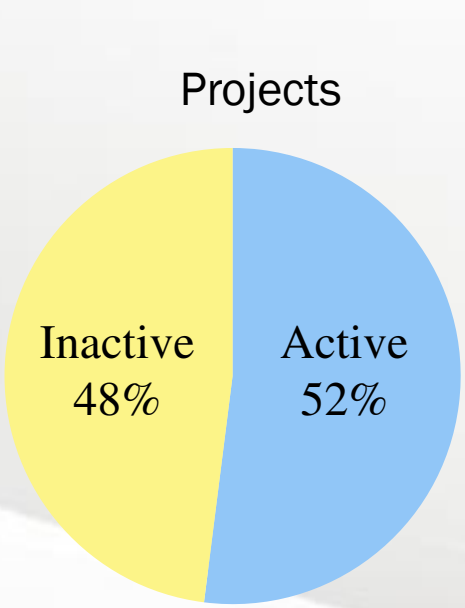
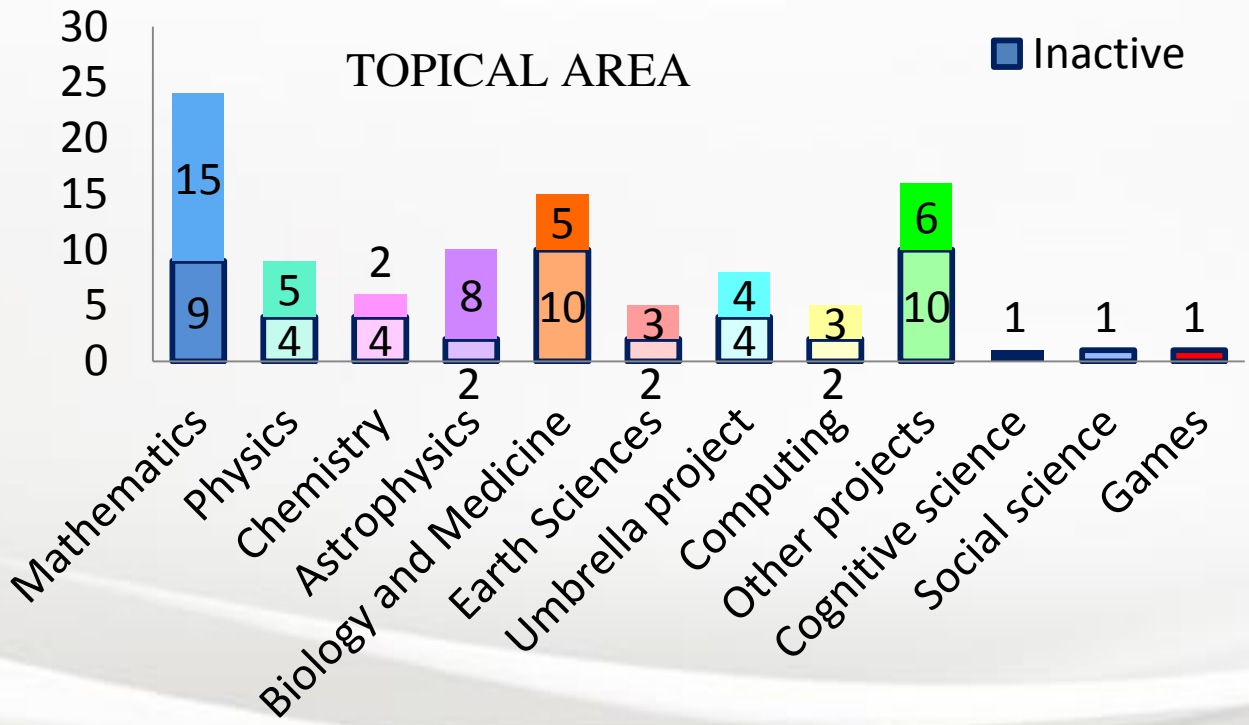
TOPICAL AREA OF BOINC PROJECTS



- According to information from the website https://boincstats.com the total number of BOINC-projects is 101.
- Almost one fourth of BOINC-projects out of 101 are in the area of Mathematics. BOINC has Games project.

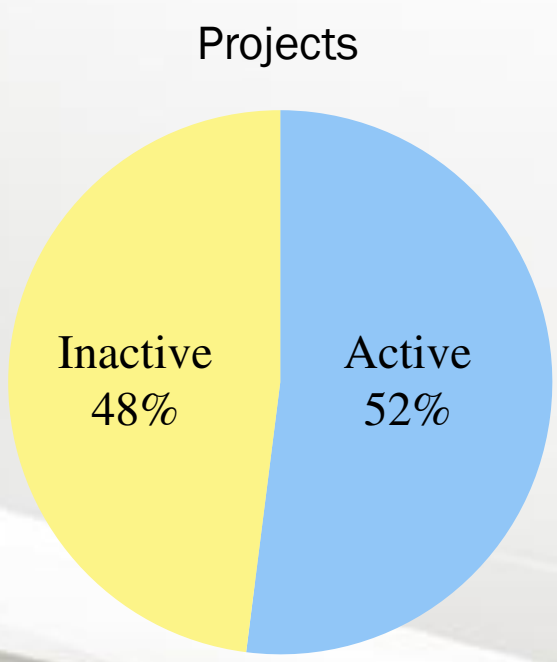
INACTIVE PROJECTS AND TOPICAL AREAS

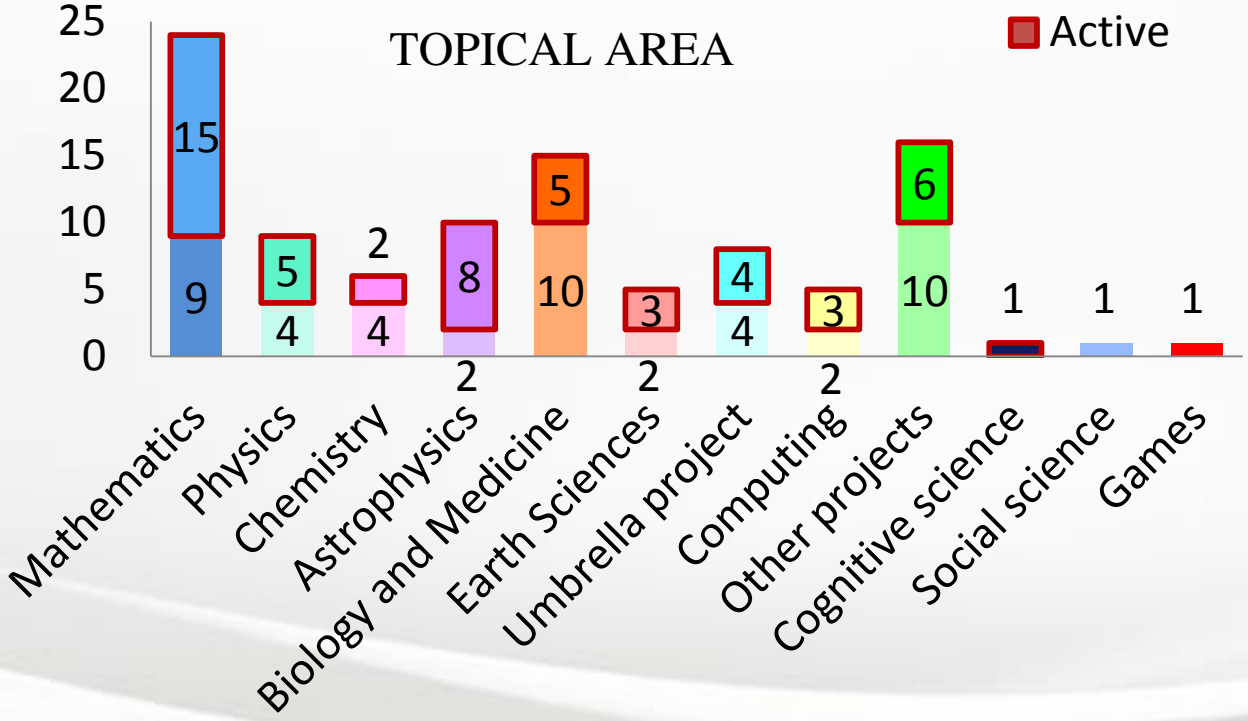




- A large number of inactive projects in the areas of Mathematics and Biology and Medicine.

ACTIVE PROJECTS AND TOPICAL AREAS





- Active projects in the area of Mathematics show themselves as a leading choice.

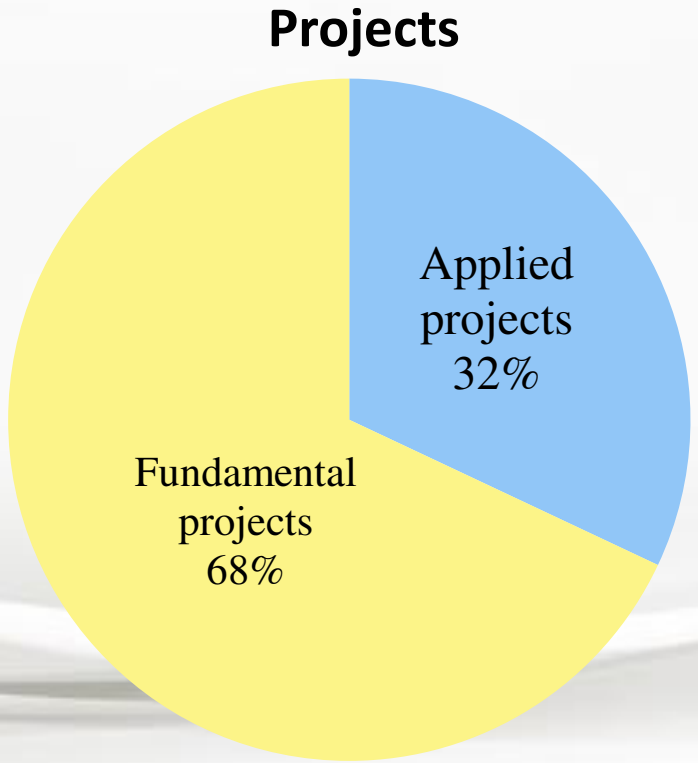
PECULIARITIES OF FUNDAMENTAL AND APPLIED SCIENCES

Fundamental science	**Applied science**
Tasks and results are understandable only for experts	Tasks and results are understandable for everybody
It is difficult to connect results with real life	It is easy to trace results with real life
Fundamental projects are not very interesting for people	Easy actualization

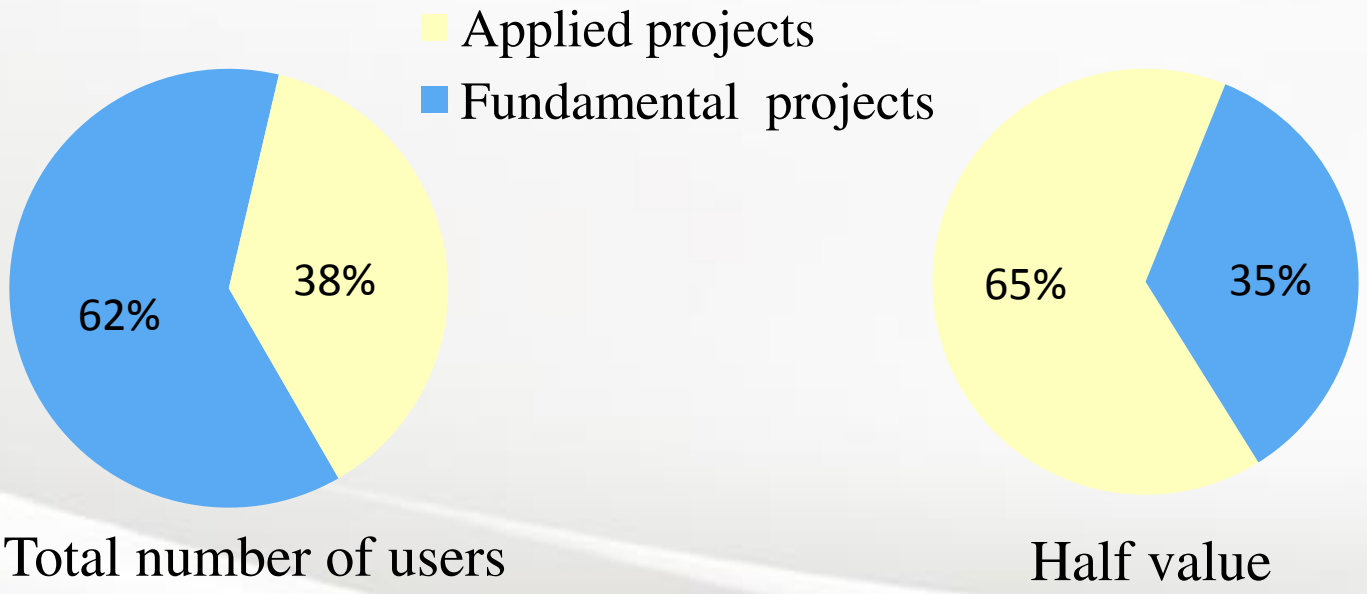
BOINC PROJECTS

- The aim of fundamental projects is to research of laws of nature and society, targeting discovery of new and deepening of existing knowledge about studied objects, revealing some common rules peculiar to reality.

- An applied project is a project aimed at practical solutions of technical and social problems. The purpose of applied projects is to apply fundamental science to solve not only cognitive but also social and practical problems.



Number of users of active fundamental and applied projects



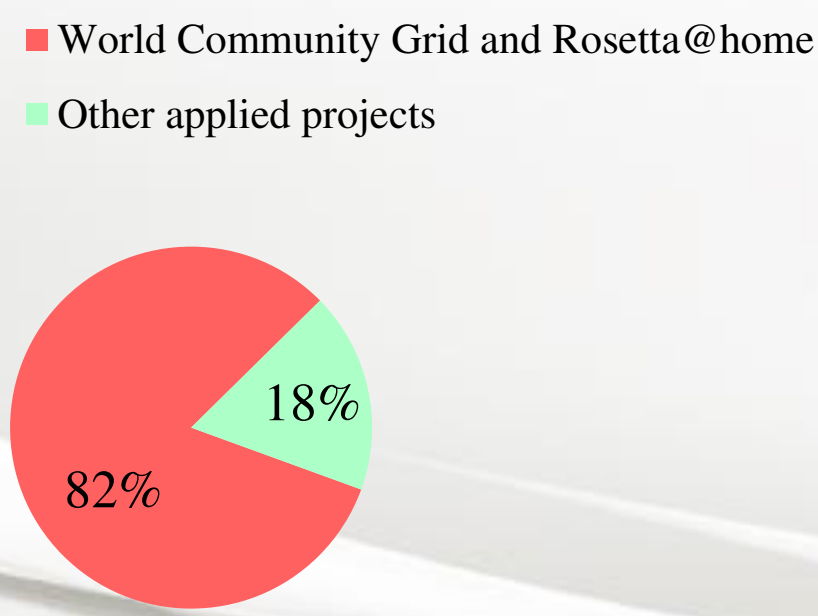
Total number of users

Half value

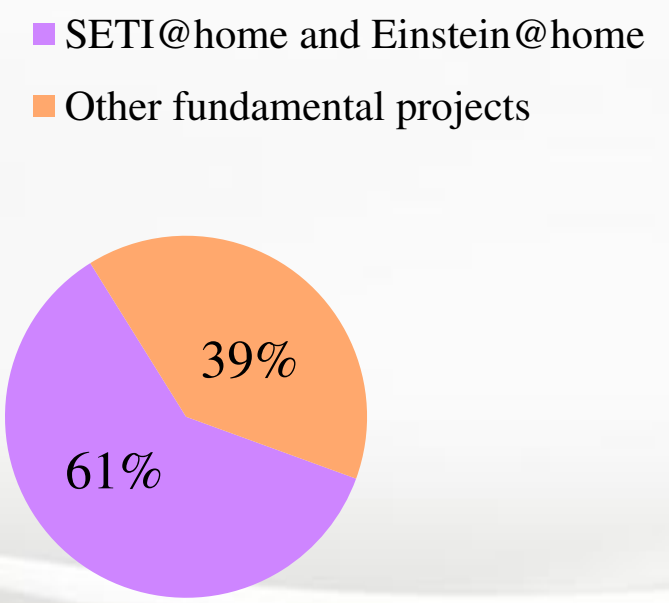
- Fundamental projects have a leading position in total number of participants.
- In average, there are more participants in an applied project than in a fundamental project.

Number of users

Active applied projects



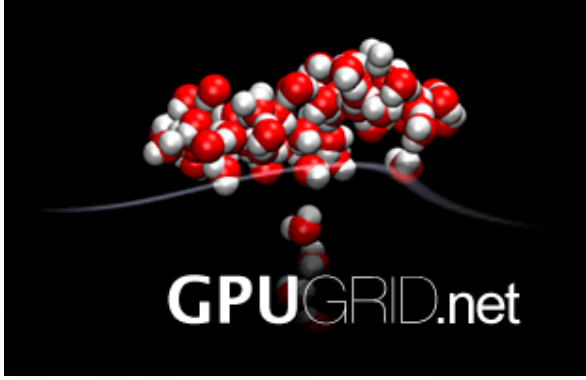
Active fundamental projects



- The density of participants in projects is not uniform due to the fact that two projects: ***World Community Grid*** and ***Rosetta@home*** have almost 82% of participants in active applied projects.
- We can see pretty the same situation in the area of fundamental projects: nearly 60,5% of participants are involved in only two projects ***SETI@home*** and ***Einstein@home***.

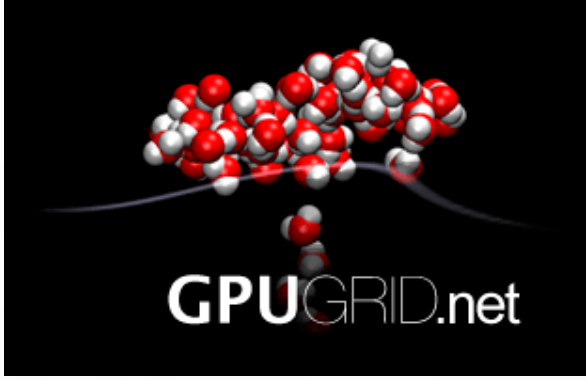
I considered the applied projects and their final results in more detail.

GPUGRID



It has been shown that regular chemical modification of the IDP protein leads to the protein's change. It is established that it has important consequences for proteins interactions, which affects on how hereditary information from the gen is converted to RNA or protein and how signals are transferred inside the cell.

GPUGRID



The understanding of changes in the enzyme, which plays an important role in a life cycle of the virus HIV, is highly important in development of a new class of antiretroviral drugs. The project opened access to those alternative molecules, and it created the basis for an expanded medical treatment of HIV/AIDS.

CLIMATE PREDICTION

climateprediction.net

Results suggest that global warming of 3 degrees Celsius by 2050 is as likely as a rise of 1.4 degrees (relative to the average number in 1961-1990). Simulations that matched observed temperature changes over the last 50 years were used to produce the figures.

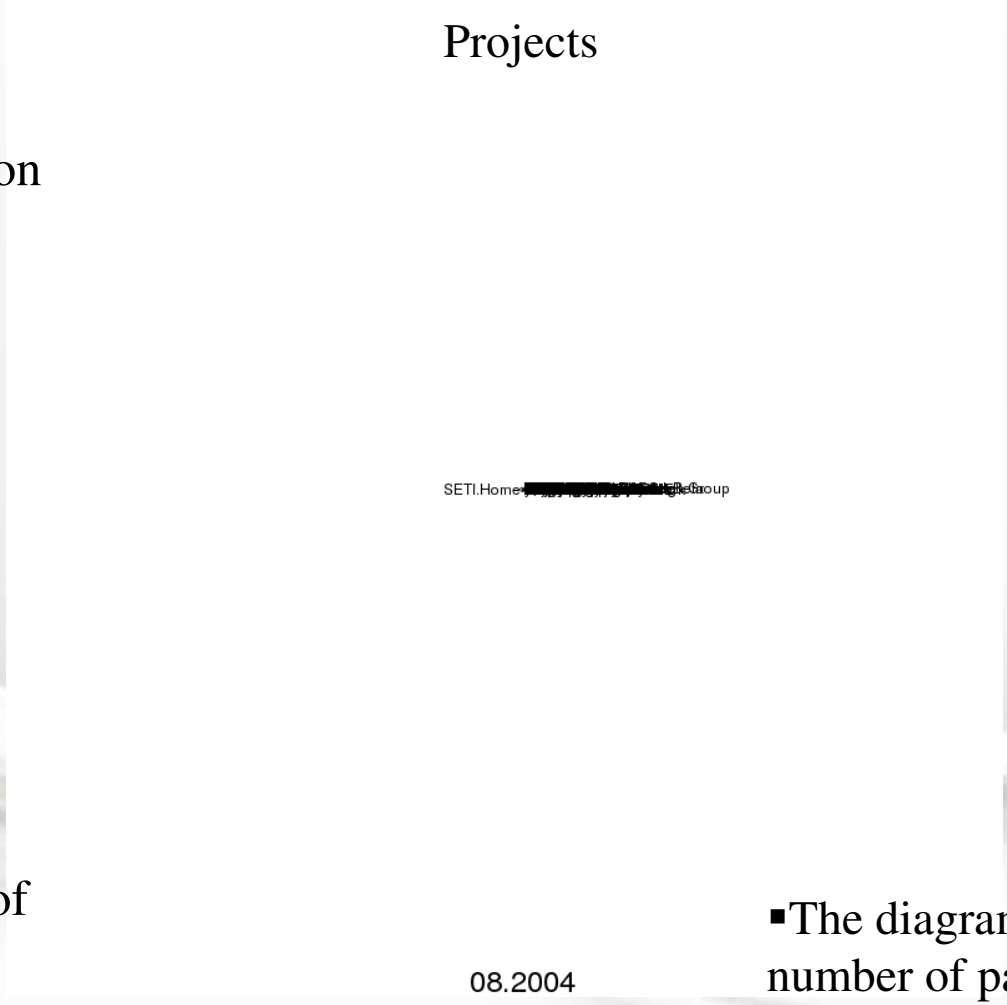
If greenhouse gas emissions continue to rise at the current rate, results suggest that the world is very likely to cross the '2 degrees barrier' at some point this century, and that those planning for the impacts of climate change need to consider the possibility of warming of up to 3 degrees (above the average in 1961-1990) by 2050, even on a mid-range emission scenario. This is a faster rate of warming than most other models predict.

WORLD COMMUNITY GRID

The result of subproject Help Conquer Cancer from the project World Community Grid is the feature of stem cells helps to predict the level of leukemia. The study of head and neck tumors allows changing significantly the process of the patient's recovery.

DEVELOPMENT DYNAMICS

- In programming language R, the animation was made to represent dynamics of BOINC projects development.
- The diagram grows during the process of appearance of new BOINC projects and increase of the number of users.



- The diagram shows the number of participants in all projects.
- Share of project is the number of participants in this project.

FINAL RESULTS

- The list of applied and fundamental projects was created.
- The topical area and the number of active/inactive projects were analyzed.
- It is planned develop recommendations for new applied projects, how to attract participants, and to understand if the connection to existing project is profitable or is it better to start a separate project.
- Statistics were taken from the website: https://boincstats.com .
- Considered characteristics: the number of participants, topical area of projects.