



Citizen Cyber-science in China

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Founder of EQUN.com

The Largest Volunteer Computing Community

In China Since 2001



Outline of the Talk

- Basics about volunteer computing
- Our efforts in promoting volunteer computing in China
- Obstacles and unique challenges
- Results and some statistics
- Furthering your research



Basics about Volunteer Computing

Scientists

- Expertise in one field
- Lack of funding
- Lack of computing power
- High cost of super computers

Middleware

- Open Source
- BOINC
- Simplify project creation
- Standardize participation process
- Facilitate cross-project coordination

Volunteers

- Have idle PC power
- Volunteering spirit
- Advancing science
- Credits and rankings
- Personal reasons

Examples of Volunteer Computing

SETI@home

Analyze radio signals to get potential ET intelligence evidences

Einstein@home

Search for gravitational signals from observatory data

Rosetta@home

Predict protein-protein docking and design new proteins

Climate Prediction

Study global quantitative climate modeling

PrimeGrid

Compute largest primes which helps cryptography

C4CW

Computing for clean water filtering nano-mechanics



BOINC Screenshot

The screenshot shows the BOINC Manager application window. The title bar reads "BOINC Manager". The menu bar includes "File", "View", "Tools", "Activity", "Advanced", and "Help". The toolbar contains icons for "Notices", "Projects", "Tasks", "Transfers", "Statistics", and "Disk". The "Tasks" tab is selected, displaying a table of project tasks. On the left, a "Commands" panel includes buttons for "Show active tasks", "Show graphics", "Suspend", "Abort", and "Properties". The bottom status bar indicates "Connected to (7.0.25)".

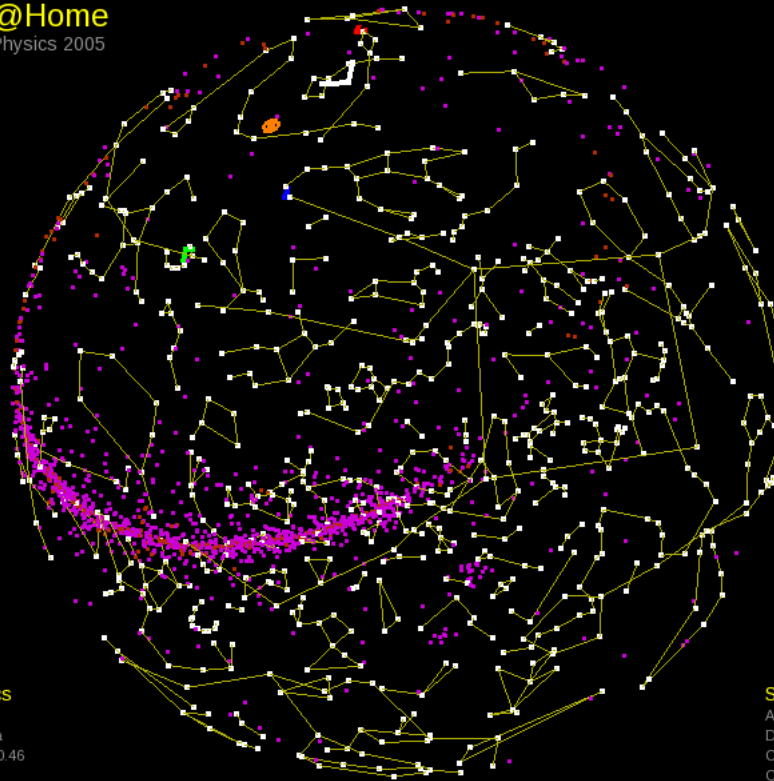
Project	Progress	Status	Elapsed	Remaining (esti...)	Deadline	Application
Einstein@Home	82.500%	Running	08:14:02	01:44:53	9/22/2012 12:17:29 PM	Gamma-ray pulsar search #1 0.30
Einstein@Home	100.000%	Ready to report	06:50:36	---	9/22/2012 12:17:25 PM	Gravitational Wave S6 LineVeto search 1.13 (SSE2)
Einstein@Home	94.780%	Running	06:26:54	00:21:18	9/22/2012 12:17:27 PM	Gravitational Wave S6 LineVeto search 1.13 (SSE2)
Einstein@Home	50.412%	Running	03:26:50	03:23:27	9/22/2012 12:17:25 PM	Gravitational Wave S6 LineVeto search 1.13 (SSE2)
Einstein@Home	4.945%	Running	00:21:12	06:31:43	9/22/2012 7:31:44 PM	Gravitational Wave S6 LineVeto search 1.13 (SSE2)
Einstein@Home	0.000%	Ready to start	---	06:50:19	9/22/2012 7:31:44 PM	Gravitational Wave S6 LineVeto search 1.13 (SSE2)
Einstein@Home	0.000%	Ready to start	---	06:50:19	9/22/2012 7:31:44 PM	Gravitational Wave S6 LineVeto search 1.13 (SSE2)
Einstein@Home	0.000%	Ready to start	---	06:50:19	9/22/2012 10:56:43 PM	Gravitational Wave S6 LineVeto search 1.13 (SSE2)
Einstein@Home	0.000%	Ready to start	---	06:50:19	9/22/2012 10:56:46 PM	Gravitational Wave S6 LineVeto search 1.13 (SSE2)
Einstein@Home	0.000%	Ready to start	---	06:50:19	9/22/2012 10:56:46 PM	Gravitational Wave S6 LineVeto search 1.13 (SSE2)
Einstein@Home	0.000%	Ready to start	---	06:50:19	9/23/2012 4:10:31 AM	Gravitational Wave S6 LineVeto search 1.13 (SSE2)
Einstein@Home	0.000%	Ready to start	---	06:50:19	9/23/2012 4:10:27 AM	Gravitational Wave S6 LineVeto search 1.13 (SSE2)
Einstein@Home	0.000%	Ready to start	---	06:50:19	9/23/2012 4:10:29 AM	Gravitational Wave S6 LineVeto search 1.13 (SSE2)
Einstein@Home	0.000%	Ready to start	---	06:50:19	9/23/2012 9:13:33 AM	Gravitational Wave S6 LineVeto search 1.13 (SSE2)
Einstein@Home	0.000%	Ready to start	---	06:50:19	9/23/2012 9:13:33 AM	Gravitational Wave S6 LineVeto search 1.13 (SSE2)
Einstein@Home	0.000%	Ready to start	---	06:50:19	9/23/2012 9:13:33 AM	Gravitational Wave S6 LineVeto search 1.13 (SSE2)
Einstein@Home	0.000%	Ready to start	---	06:50:19	9/23/2012 3:32:13 PM	Gravitational Wave S6 LineVeto search 1.13 (SSE2)
Einstein@Home	0.000%	Ready to start	---	06:50:19	9/23/2012 3:32:13 PM	Gravitational Wave S6 LineVeto search 1.13 (SSE2)
Einstein@Home	0.000%	Ready to start	---	06:50:19	9/23/2012 3:32:13 PM	Gravitational Wave S6 LineVeto search 1.13 (SSE2)

BOINC Screen Savers

Einstein@Home

World Year of Physics 2005

22:48:30



BOINC Statistics

User: ledled
Team: Team China
Project Credit: 6440.46
Project RAC: 8.01

Search Information

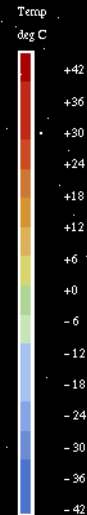
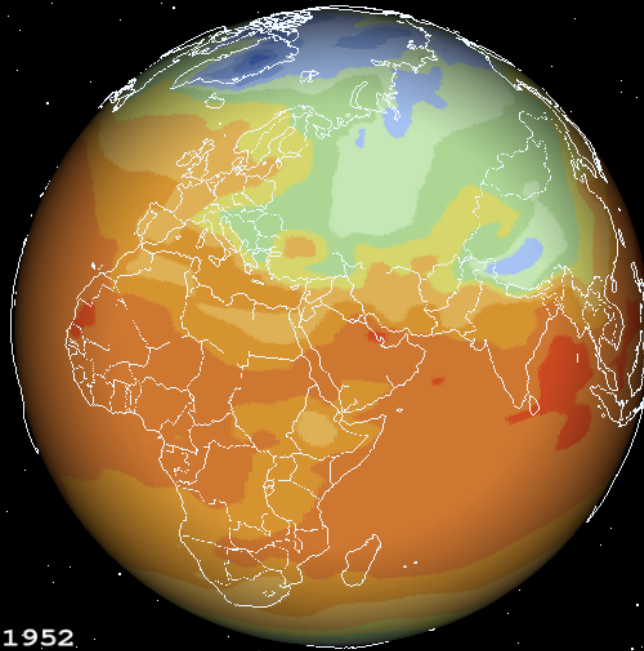
Ascension: 229.41 deg
Declination: 63.03 deg
Completed: 65.80 %
CPU Time: 05:03:57

BOINC Screen Savers



This globe shows your climate model running

Model date and time: 19/10/1952 00:30

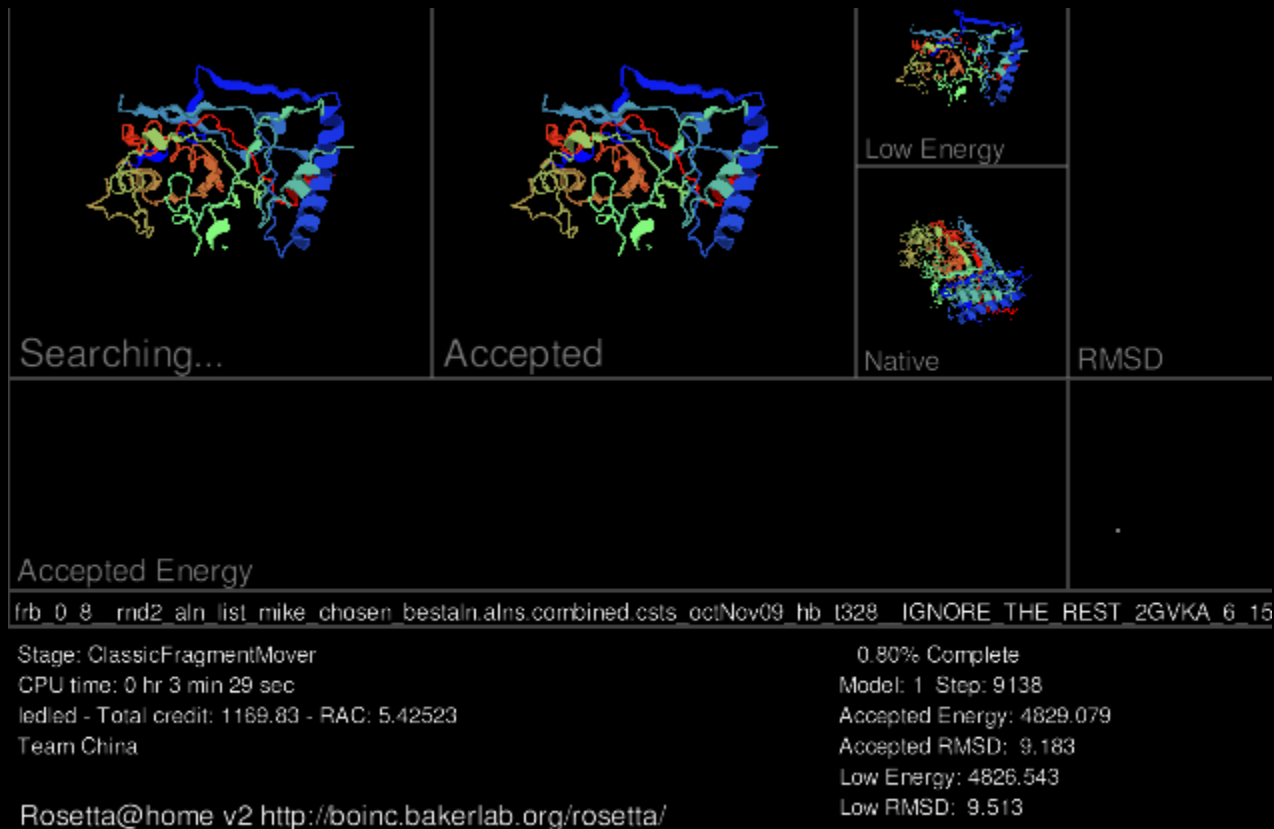


Atmos Model Time - 00:30
Atmos Model Date - 19/10/1952
Hours Elapsed - 0685:15:50 (2.99 s/TS)
Timestep - 826417 of 4147560
Progress - 19.93 %

bbc.co.uk/climatechange

created by
climateprediction.net

BOINC Screen Savers



A decorative border runs along the top and bottom of the slide. It features a variety of icons in a dark gray color, including a satellite dish, a cactus, a spiral, a DNA double helix, a globe, a leaf, a flower, a star, and a magnifying glass. The icons are arranged in a flowing, organic pattern.

Our Efforts.....


Word-by-Word Project Website Translations


Started on 2002

Around 22 project official sites
translated into Chinese.

Retired in 2008. Moved to Wiki.


Seventeen Or Bust
A Distributed Attack on the Sierpinski Problem

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 英语论坛

 项目百科

VOXROX
WE'RE DEDICATED
1-866-VOXROX-1

Support our host!

Seventeen Or Bust
A Distributed Attack on the Sierpinski Problem

您能够一夜成名！

也许您不能成为CNN的头条，但是如果您足够幸运，利用您的计算机排除一个谢尔宾斯基数的候选数，您将会在数学界留下姓名，而且还能因为发现大素数而在数学史上留名！七位幸运的参与者已经发现了七个当时最大的素数，您，也许会是一个！

这个项目做什么？

Seventeen or Bust 是通过分布式计算找寻最小的谢尔宾斯基数 (Sierpinski numbers)。我们的系统利用世界各地空闲的计算能力，组成一张巨大的计算网络来解决这个数学问题。所有的人都能参与进来：我们提供一个软件，一旦安装在您的计算机上，它会自动利用您空闲的计算能力来为这个项目出力！您甚至不会察觉到项目在运行，因为它只利用闲置的计算能力，而不会影响您正在使用中的程序。

谢尔宾斯基数问题是处理符合如下形式的数字： $N = k * 2^n + 1$ (对于奇数 k 和 $n \geq 1$) 具有这样形式的数字被称为普罗斯数 (Proth numbers)。对于一个特定的值 k ，取任意的 n 都可以使 N 成为一个合数 (Composite numbers) 那么这个 k 就可以称为是一个谢尔宾斯基数 (Sierpinski number)。谢尔宾斯基问题本身是：“什么是最小的谢尔宾斯基数？”。想要深入了解谢尔宾斯基数，请参考 prothsearch.net's Sierpinski Problem page。

约翰·塞尔弗里奇 (John Selfridge) 40年前曾经证明 $k=78557$ 是一个谢尔宾斯基数。大多数数学家相信它就是最小的，但这一点还未得到证明。为了证明它，我们所需要的就是证明每个更小的 k 都不是谢尔宾斯基数——也就是说，要对每一个 $k < 78557$ 找到一个 n ，使得 $N = k * (2^n) + 1$ 是素数。

当这个项目开始的时候只有 17 个 k 还没有找到素数，所以项目叫 Seventeen Or Bust。经过 20 个月的计算之后，我们已经算完了 7 个乘数，还有 10 个。

关于我们

这个项目在 2002 年 4 月开始，是由 美国密歇根大学 的 Louis Helm 和 美国伊利诺伊大学 的 David Norris 合作创立。不计其数的个人也为本项目贡献了许多。George Woltman (GIMPS 寻找最大质数的项目的创立者) 提供了 blindingly-fast 源代码。Michael Garrison 维护这项目的核心服务器。我们感谢对于这些项目作出贡献的人。

如果您想要了解本页面的中文翻译者的信息，请访问我们的关于我们页面。

发帖

欢迎回来 equn, 你上次访问时间是在 昨天 22:18, 我的帖子, 查看新帖, 标记已读

今日: 83, 昨日: 162, 会员: 23193

综合板块

- **分布式计算项目新闻发布区**
主题: 199, 帖数: 3607
最后发表: 2012-8-21 16:01
- **分布式计算综合讨论区**
主题: 828, 帖数: 8877
最后发表: 4 天前 00:42
- **项目竞赛活动区**
主题: 302, 帖数: 8733
最后发表: 昨天 21:57

中国分布式计算平台与项目区

- **CAS@home 中科院志愿计算** (今日: 4)
主题: 180, 帖数: 2600
最后发表: 1 小时前
- **Computing for Clean Water 清水计算**
主题: 73, 帖数: 907
最后发表: 2012-8-18 23:36
- **分布式计算之开发与测试**
主题: 272, 帖数: 3520
最后发表: 前天 14:45

BOINC 平台及该平台上的主流项目

- **BOINC 平台综合讨论区** (今日: 4)
主题: 3717, 帖数: 42730
最后发表: 1 小时前
- **SETI@home 寻找外星文明**
主题: 2008, 帖数: 20569
最后发表: 4 天前 18:36
- **Einstein@Home 寻找引力波证据**
主题: 479, 帖数: 6734
最后发表: 前天 10:02
- **World Community Grid 世界公共网格** (今日: 12)
主题: 868, 帖数: 10262
最后发表: 半小时前
- **Climateprediction.net 预测地球气候**
主题: 439, 帖数: 4566
最后发表: 2012-8-25 23:52
- **Rosetta@home 蛋白质结构预测**
主题: 155, 帖数: 1401
最后发表: 2012-7-7 23:34
- **LHC@home 开发和利用粒子对撞机**
主题: 343, 帖数: 2159
最后发表: 5 天前 09:31
- **MilkyWay@home 构建银河系三维模型**
主题: 111, 帖数: 1141
最后发表: 5 天前 14:29

非 BOINC 平台的主流项目

- **Folding@Home 模拟蛋白质折叠** (今日: 14)
主题: 4088, 帖数: 66358
最后发表: 5 分钟前
- **GIMPS (Prime95) 寻找梅森素数**
主题: 289, 帖数: 1913
最后发表: 昨天 23:41
- **Stardust@home 及其它人工协作类项目**
主题: 96, 帖数: 1084
最后发表: 昨天 21:58

其他分类讨论板块

- **数学、密码、游戏类项目**
主题: 434, 帖数: 3473
最后发表: 2012-8-29 11:51
- **天文、物理、化学类项目**
主题: 225, 帖数: 2010
最后发表: 2012-7-7 19:37
- **地球科学类项目**
主题: 106, 帖数: 840
最后发表: 2012-8-8 13:42
- **生命科学类项目**
主题: 306, 帖数: 1882
最后发表: 2012-8-22 02:28
- **网络类项目**
主题: 69, 帖数: 498
最后发表: 2012-8-18 23:39

EQUUN.com
Distributed Computing
Forum

Started on Nov. 2003
Forum Members: 23,189
Number of Topics: 29,088
Number of Posts: 373,819

Free discussions of volunteer
computing and others.



EQUUN.com

Distributed Computing Wiki

Started on Feb. 2008

Number of Entries: 1,277

Number of Edits: 6,213

Covering guidance and background information of all major volunteer computing projects.

推荐项目



本站致力于向中文世界推广公益性**分布式计算**|**志愿计算**项目，由一个百科系统和一个论坛组成。

新手指南

- ▶ 概述
 - ▶ 什么是分布式计算
 - ▶ 如何参加分布式计算
 - ▶ 分布式计算常见问题
 - ▶ 如何寻求帮助
- ▶ BOINC
 - ▶ BOINC 新手指南
 - ▶ BOINC 使用教程
 - ▶ BOINC 常见问题
 - ▶ BOINC 每日之星

推荐文章

- ▶ SETI 的历史
- ▶ 搜寻外星人的新途径
- ▶ 大众的天文学
- ▶ 蛋白质游戏：绞尽脑汁的一天
- ▶ 星际尘埃：寻找构建宇宙的砖块
- ▶ 他们眼中的星辰
- ▶ 由一群热心人组成的星系

最新动态

- ▶ 2011+ 新浪微博/Weibo

最新的分布式计算/志愿计算动态请关注我们在新浪网的官方微博账号 [\(点击进入注册连接\)](#)。

- ▶ 2011/5/14

中国科学院高能物理研究所在北京将举办关于 [CAS@home](#) 的科普活动、讲座和讨论，重点介绍 [CAS@home](#) 在火狐浏览器的扩展。您也可以免费参加！[\(详细\)](#)

- ▶ 2011/4/23

[清水计算](#)项目的首项科研成果发表在在了国际物理学界一流期刊《物理学评论E》(Physical Review E)上！[\(详细\)](#)

- ▶ 2011/3/5

[BOINC](#) 创始人 David Anderson 等人将到访北京参加分布式科普活动。您也可以免费参加！[\(详细\)](#)

- ▶ 2011/3/1

[Einstein@Home](#) 又发现了一颗新的脉冲星 J1952+2630！[\(详细\)](#)

- ▶ 2010/10/20

[CAS@home](#) 项目中关于蛋白质结构预测的 [SCThread](#) 子项目正式发布！[\(详细\)](#)

- ▶ 2010/8/24

由清华大学微纳力学和多学科交叉创新研究中心 [发起的清水计算项目](#) 登录 [World Community Grid](#) 平台！

>>> [点击查看所有的分布式计算新闻动态](#)

其他信息

- ▶ 版权信息 项目官方授权 曾经的项目子站 WAP
- ▶ 沙盒 待译条目 最近更新 随机页面 所有页面





Folding@home 是一个研究蛋白质折叠、误折、聚合及由此引起的相关疾病的分布式计算工程。由斯坦福大学化学系的潘德小组(Pande Group)主持,于2000年10月1日正式启动。Folding@home 目前是世界上最大的分布式计算项目,于2007年为吉尼斯世界记录所承认。

2004年3月8日,研究基因结构的 **Genome@home** 计划终止,并入 Folding@home。

目录 [\[隐藏\]](#)

- 1 项目意义和研究成果
- 2 什么是蛋白质?它们是怎么折叠的呢?
- 3 您可以为我们做什么?
- 4 Folding@home是如何工作的呢?
- 5 注意事项
- 6 与类似的分布式计算项目的比较
- 7 相关链接

项目意义和研究成果

Folding@home 致力于精确地模拟蛋白质折叠和错误折叠的过程,以便能更好地了解多种疾病的起因和发展,包括阿兹海默症、牛海绵状脑病(疯牛症)、多种癌症和癌症相关综合症、囊胞性纤维症。到目前为止, **Folding@home** 可成功模拟长达5秒时段的折叠过程,超出先前估计可模拟的时段数百万倍。

[目前取得的研究成果](#)

什么是蛋白质?它们是怎么折叠的呢?

蛋白质是一个生物体系的网络基础,它们是一个个纳米级计算机。在蛋白质实现它的生物功能之前,它们会把自己装配起来,或者说折叠;虽然蛋白质折叠对所有的生物来说是最基本的和最明确的事实,但它的折叠过程对人类而言仍然是个未解之谜。此外,当蛋白质没有正确的折叠(误折)无疑会产生严重的后果,包括许多知名的疾病,比方阿兹海默症(Alzheimer's),疯牛病(Mad Cow, BSE),可传播性海绵状脑病(CJD),肌萎缩性脊髓侧索硬化症(ALS),还有帕金森氏症(Parkinson's),多种癌症和其相关综合症(many Cancers and cancer-related syndromes)。

您可以为我们做什么?

您可以下载并运行我们的客户端程序。我们的规则是这样的,加入本项目的计算机越多,本项目计算的速度就越快。

Folding@home 是一个分布式计算的项目—从世界各地来的人下载运行我们的客户端程序,彼此组合在一起构成了世界上最大的超

Folding@home



Folding@home logo



在 PS3 游戏机运行中的图形界面。
模拟蛋白质分子的折叠过程。

开发者	斯坦福大学 / Pande Group
版本历史	2000年10月1日
运算平台	    
项目平台	独立平台
程序情况	查看计算程序情况
任务情况	查看计算任务情况
项目状态	运行中/开放注册
项目类别	生命科学类
优化程序	无
官方网址	Folding@home
 RSS	通过 RSS 获取项目新闻

Other than our website...

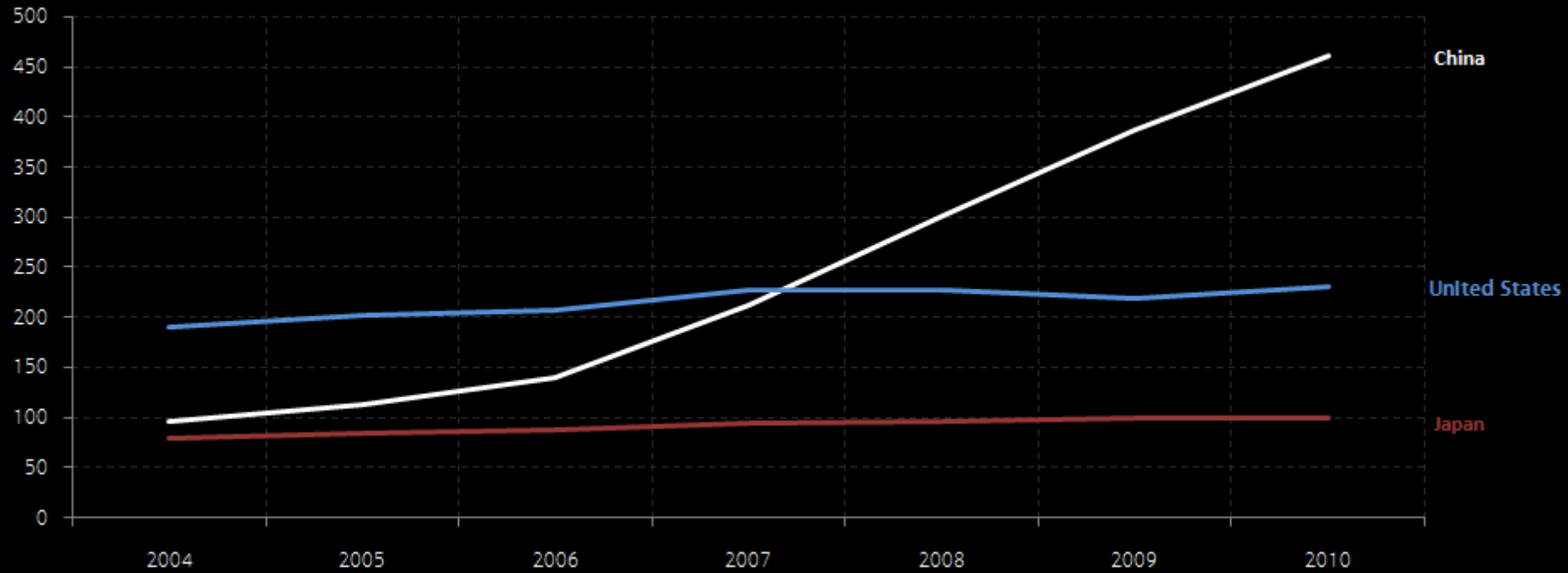
- Science/tech websites
- Social networks
- Science/tech magazines
- Traditional media
- On-campus campaigns
- Computer manufacturers
- Common software ad/bundling



A decorative border at the top of the slide features a series of faint, stylized icons. From left to right, these include a gear, a satellite dish, a virus-like structure, a spiral, a molecular structure, a magnifying glass over a document, a flower-like shape, and a small building or structure.

Despite all the efforts.....

of Internet Users



BOINC Total Credits



Volunteer Demographics

EQUN.com Forum Member

23,189

As of Aug 2012

Total BOINC Users in China

59,495

No. 8 in world as of Aug 2012

Total Internet Users in China

512,000,000

No. 1 in world as of 2011

Total Population of China

1.35 Billion



**Average Age of Volunteers
from China**

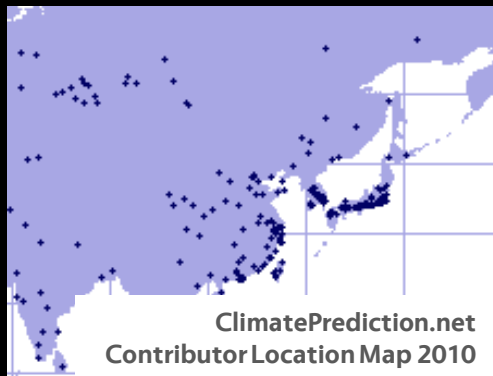
27.09

EQUN.com Forum Survey
Sample Size: 581

Professions of Volunteers

- Students
- IT Professionals
- Mid-income Workers

Gender
90%+ Male



Volunteer Concerns

Barriers

- Language barrier (software & website interface)
- Complication of registration and participation
- Lack of consciousness of science and contribution

Security

- Low level of trust on internet
- Privacy
- Public computer limits

Energy

- High electricity bills
- Electricity in China relies on coal, worthwhile?
- Extra air conditioning cost in hot seasons

China

- When will China has its our own projects?
- Yes! Now China got *CAS@home* on BOINC and *Computing for Clean Water* on WCG! (2010)

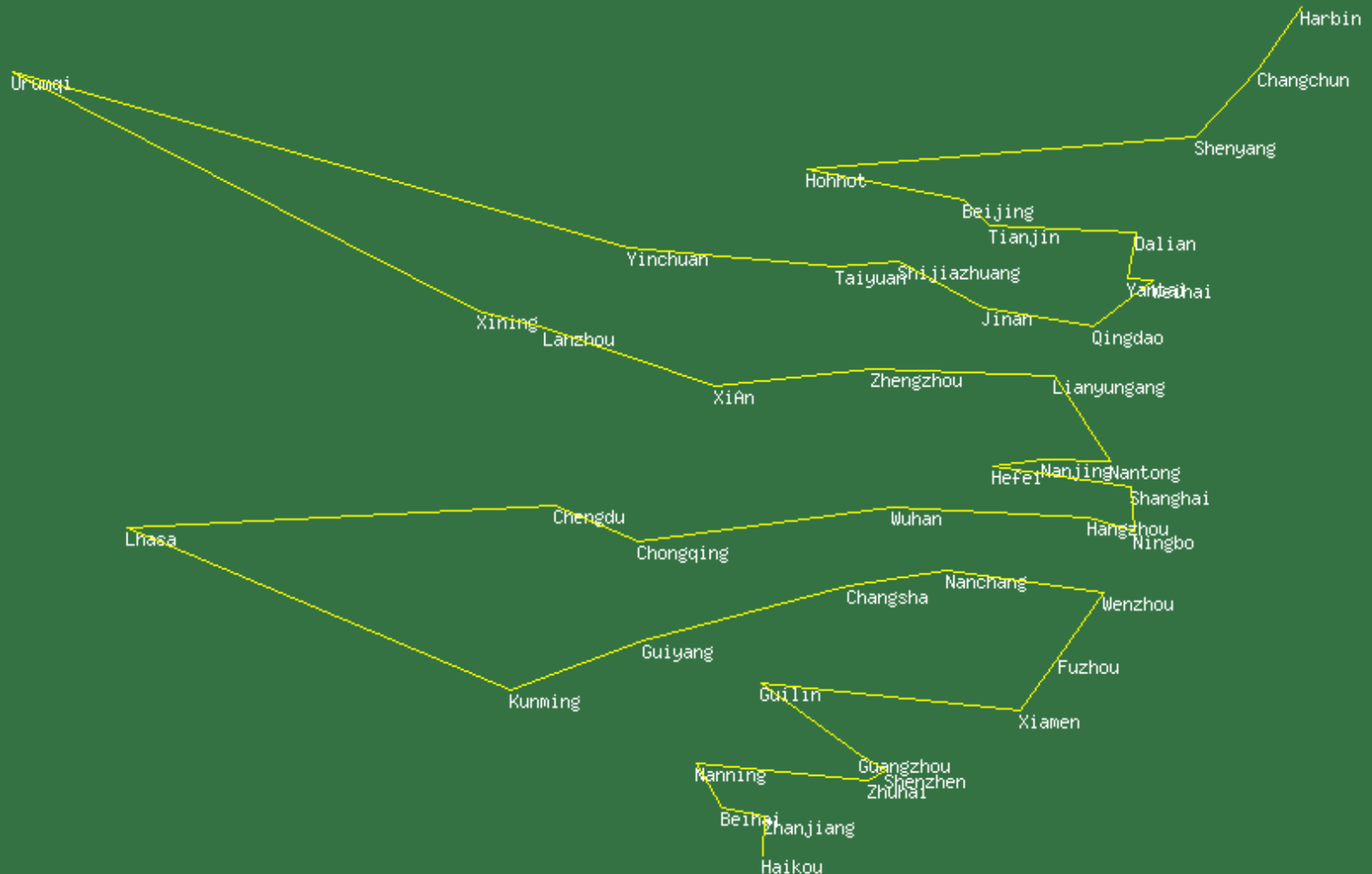
A decorative border at the top of the slide features various scientific icons in a light gray color. These include a microscope, a satellite dish, a DNA double helix, a chemical structure, a cell, a magnifying glass over a document, and a globe. The background is a solid dark gray.

We can be scientists too!!!

Efforts of "Made in China" Volunteer Computing Projects

TSPChina@home, "Youngfan", (2004), Travelling Salesman Problem, Browser-based, Java VM required

Total distance(km):18988



Graceful Tree Verification Project



[中文版](#)

This project (aka GTV) aims to verify the graceful conjecture by distributed volunteer computing. The graceful tree conjecture is an important open problem in graph theory. Via this project, we can verify this conjecture on trees with size restriction, try to find a possible counter-example, and get statistics about graceful trees. For more detail, please visit [Mathematical Background](#).

This project is temporary in pause. A paper resuming results and algorithms of this project is available on arXiv: [A Computational Approach to the Graceful Tree Conjecture](#). Here is the most current computation code: [gtvb.cpp \(2010/10/23\)](#)

If you want to know what we have done, please have a look at [Current Status](#).

If you want to have a look at results produced so far, please go to [Project Result](#).

If you are interested by this project and want to participate, please visit [Guide for Participants](#).

You can also benchmark your machine following a guide in [CPU Benchmark](#).

If you have any doubt, you may find an answer on [Project FAQ](#).

If you want to know more about who am I and why I build this project, you can have a look at [Personal Introduction](#).

For any question or problem, please contact me via projectgtv@gmail.com. You can also find me at [Distributed Computing Forum in Chinese \(English Section\)](#).

Pages will now only be updated occasionally, due to severe procrastination of the author.

News

An archive is on [Project News Archive](#).

2008/11/22 GTV Project is on Beta.

2008/11/22 This website is set up, thanks to phchenjie!

2008/11/27 Participant BiscuiT has returned the first valid result.

Efforts of “Made in China” Volunteer Computing Projects

Graceful Tree Verification Project

Wenjie Fang

(2008-2010)

C++/VB

Executable program

Efforts of “Made in China” Volunteer Computing Projects

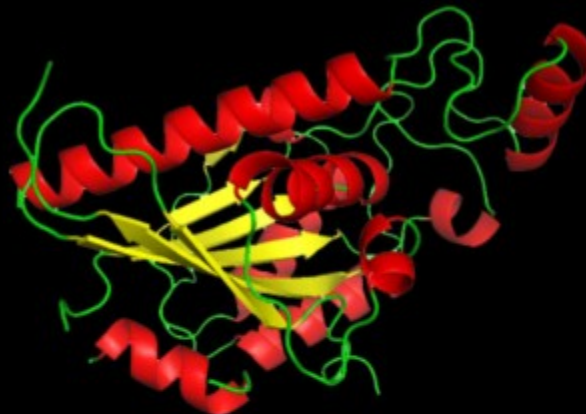
CAS@home

Institute of High Energy Physics

Chinese Academy of Science

(2010-Now)

BOINC



CPU time: 17.140625

Team: Team China

User: zglloo

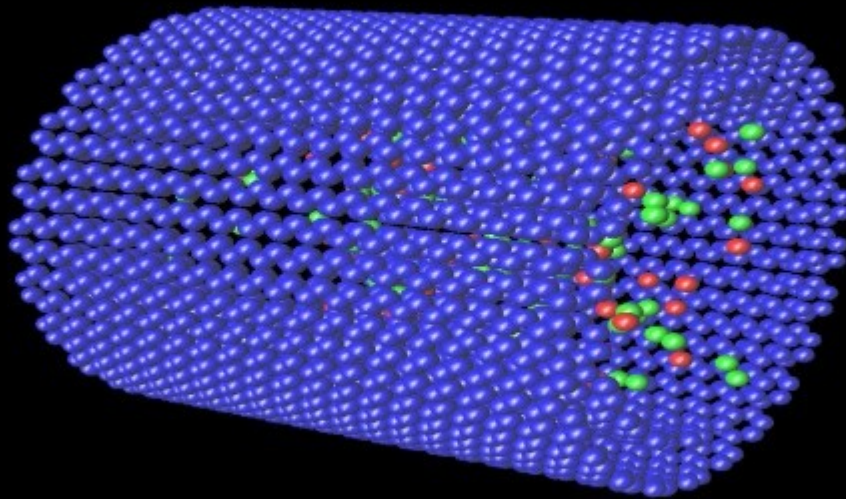
Done: 1.66%



Efforts of “Made in China” Volunteer Computing Projects

Computing for Clean Water
Center for Nano and Micro Mechanics (CNMM)
Tsinghua University
(2010-Now)
World Community Grid / BOINC

Computing for Clean Water



Prog:
0.9%



world community grid.
technology solving problems



Powered by
IBM. CNMM

Jinpeng's Comment on CAS@home:

"I have been waiting for a thousand years.
Finally we have a Chinese project today!"

Fanren's Comment on Rankings:

"One spot up! China is now No. 23 on BOINC!"

Namidayin's Comment on Security:

"If I join these projects, will my computer be
more vulnerable to hackers?"

Diyizhousi's Comment:

"Will the results of our calculations open for
everyone? Will developed nations be further
advanced and we be lagged behind even more?"

Celei's Comment on Meaningfulness:

"No project is more meaningful than another. It
all depends on your personal preference".

Youth's Comment on Hardware Life:

"I have changed my computer fans three times
for my DELL D620. Luckily, it is in warranty."

A decorative border at the top of the slide features various scientific icons in a light gray color. These include a microscope, a cell, a satellite dish, a DNA helix, a chemical structure, a magnifying glass over a cell, and a computer monitor. The background is a solid dark gray.

Carrying out your own research...

Further Research Proposals

- Volunteer-side
 - Participant behavior (length, project preference)
 - Country rankings / “development economics”
 - Motivation studies
 - Global communities
- Project-side
 - Research institution versus citizen scientists
 - Project participation evolution



Questions?

