# *Science and Technology in São Paulo, Brazil*

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University of São Paulo - USP
Special Advisor – Engineering and Physical Sciences
The São Paulo Research Foundation, FAPESP

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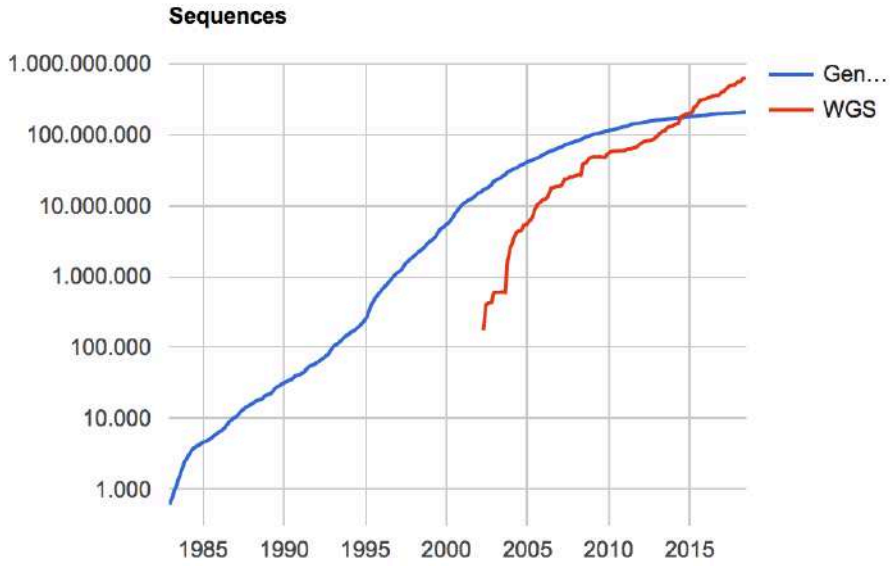
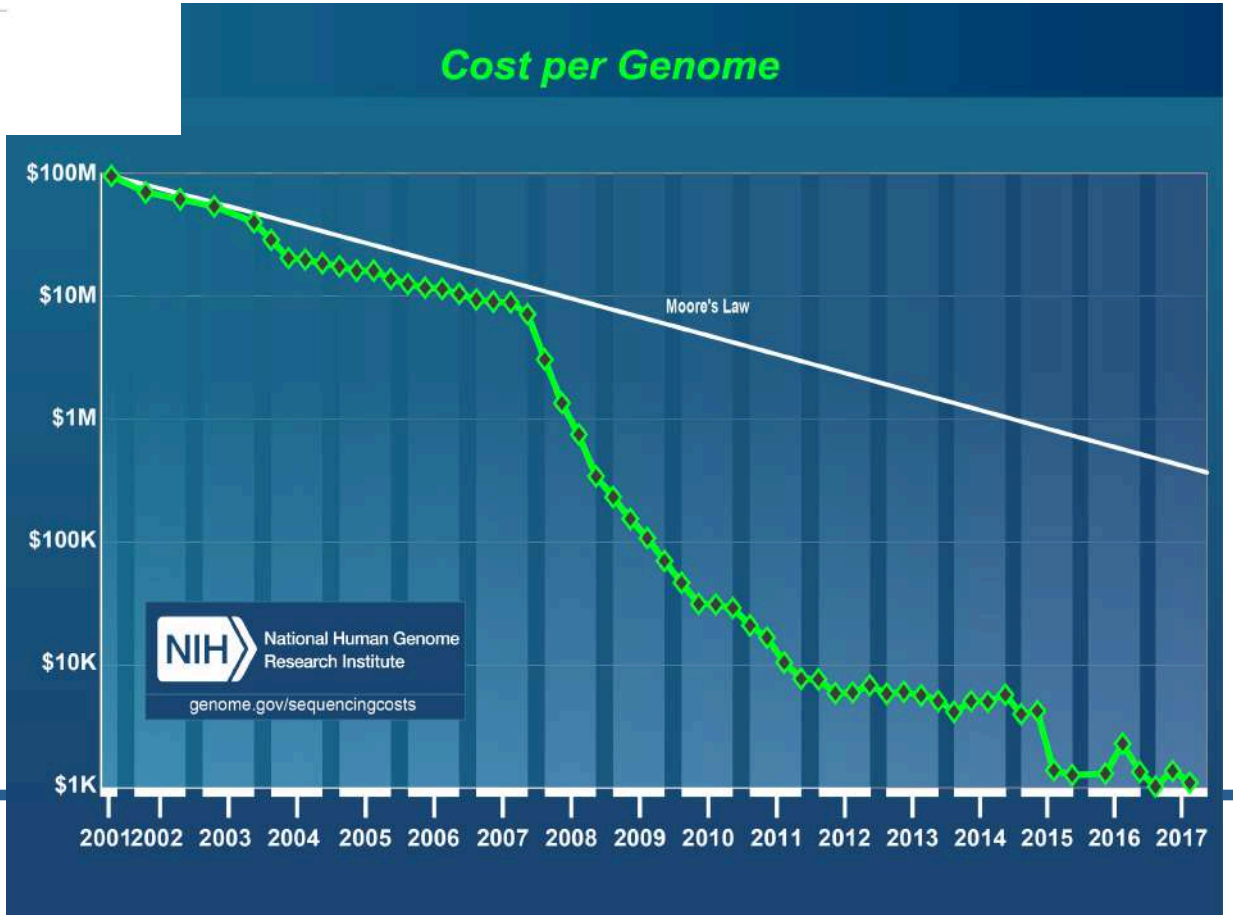



An example among many others of what is happening:
GenBank Growth



GENBANK AND WGS STATISTICS

| | | GenBank | | WGS | |
|---|---|---|---|---|---|
| **Release** | **Date** | **Bases** | **Sequences** | **Bases** | **Sequences** |
| 3 | Dec 1982 | 680338 | 606 | | |
| 14 | Nov 1983 | 2274029 | 2427 | | |
| 20 | May 1984 | 3002088 | 3665 | | |
| 24 | Sep 1984 | 3323270 | 4135 | | |
| 224 | Feb 2018 | 253630708098 | 207040555 | 2608532210351 | 564286852 |
| 225 | Apr 2018 | 260189141631 | 208452303 | 2784740996536 | 621379029 |
| 226 | Jun 2018 | 263957884539 | 209775348 | 2944617324086 | 639804105 |

**263.957.884.539**

**639.804.105**

FAPESP

# This new company wants to sequence your genome and let you share it on a blockchain

People will be able to earn cryptocurrency in exchange for letting pharma companies use their data.

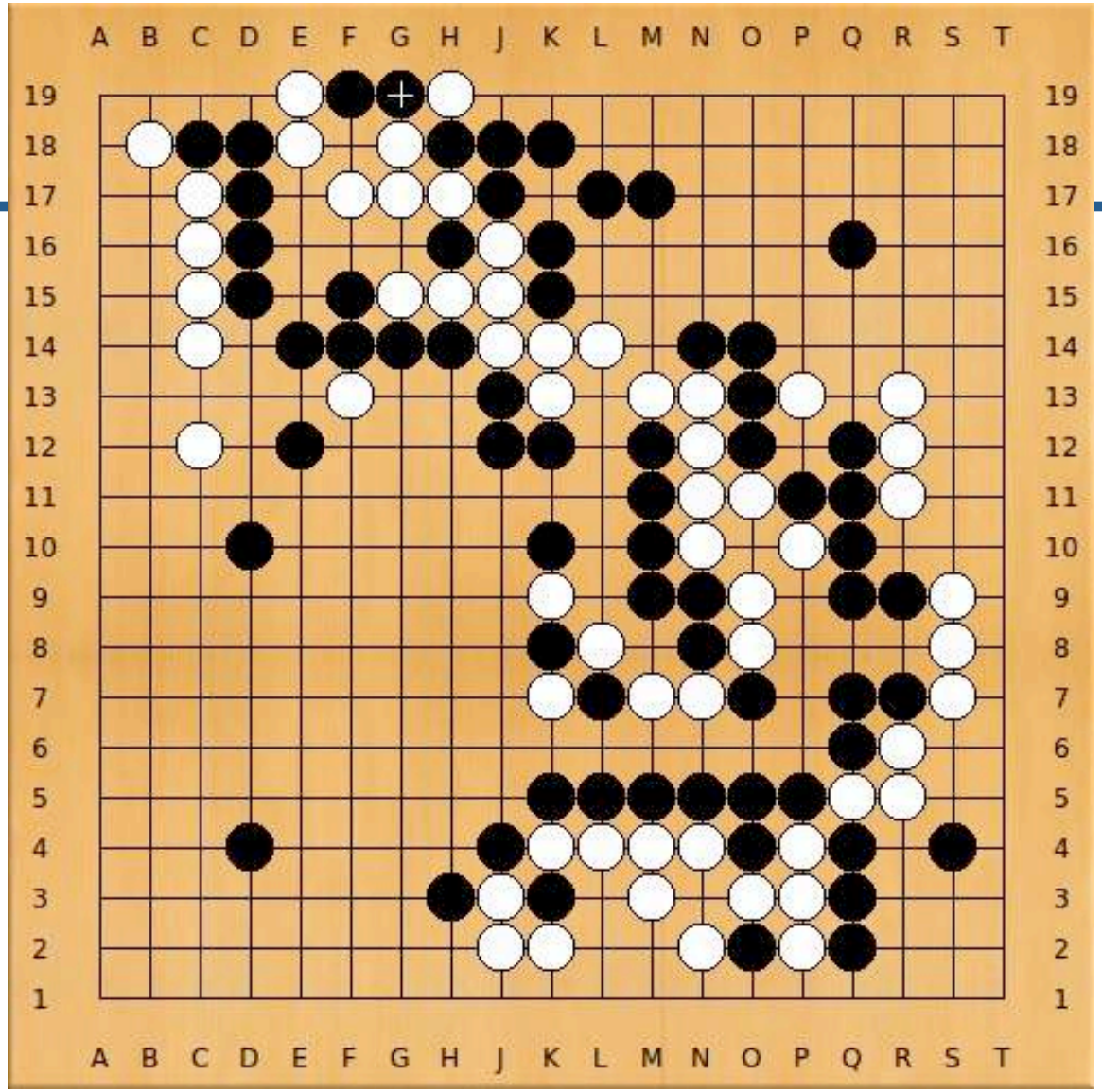
by Emily Mullin February 7, 2018

**Cryptocurrency in exchange for your genetic data! Sounds a bit like** a scam, but it's the premise behind a new company founded by a leading geneticist. Nebula Genomics says it plans to sequence your genome for under $1,000, give you insights about it, secure it using a blockchain, and allow you to do whatever you want with the data.

Nebula is the brainchild of geneticist George Church, PhD student Dennis Grishin, and graduate Kamal Obbad, all from Harvard. Mirza Cifric, CEO of Veritas Genetics, which offers a genome-sequencing service for $999, is a founding advisor.

# *Kasparov X Deep Blue - 1997*

KBA
Google DeepMind
Challenge Match
8 - 15 March 2016
AlphaGo
ALPHAGO
01:58:37
AlphaGo
Lee Sedol
Google DeepMind




Search space size: $10^{361}$

Number of atoms in the universe: $10^{81}$!



FAPESP

Announcement

## Open for submissions

Nature Machine Intelligence is now open for submissions! Like all Nature journals, we support the posting of... show more

Announcement

## Code reporting policy

Take a look at Nature's new policy on code reporting and availability.

NATURE | NEWS

# Self-taught AI is best yet at strategy game Go

**Artificial-intelligence program AlphaGo Zero trained in just days, without any human input.**

Elizabeth Gibney

18 October 2017

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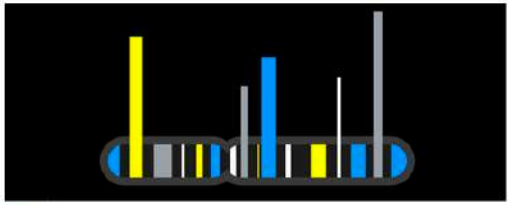
Gene count



The most popular genes in the human genome

A tour through the most studied genes in biology reveals some surprises.

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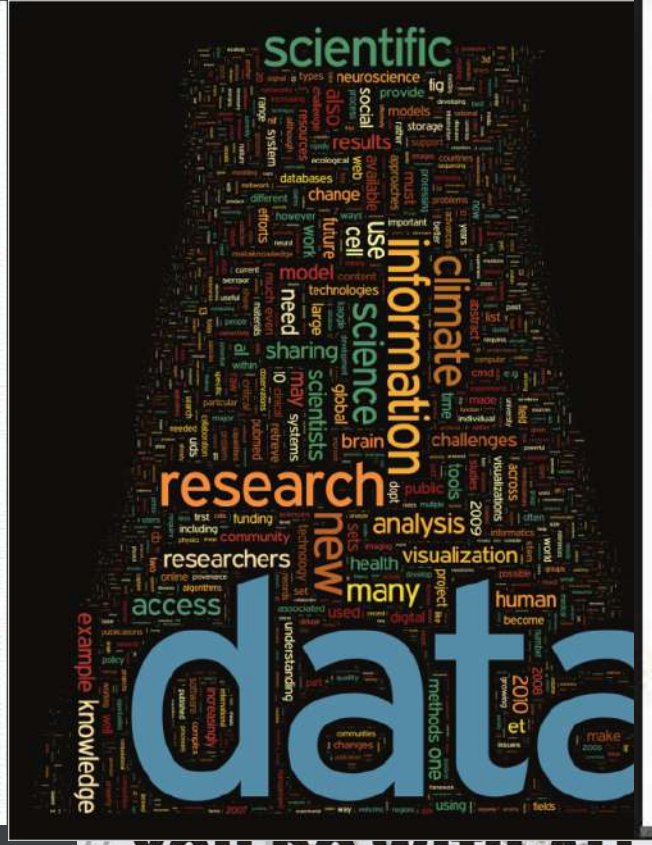
scientific
information
data
research
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climate
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visualization
researchers
access
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human

Harvard Business Review
GETTING CONTROL OF BIG DATA

THE WALL STREET JOURNAL.
U.S. EDITION
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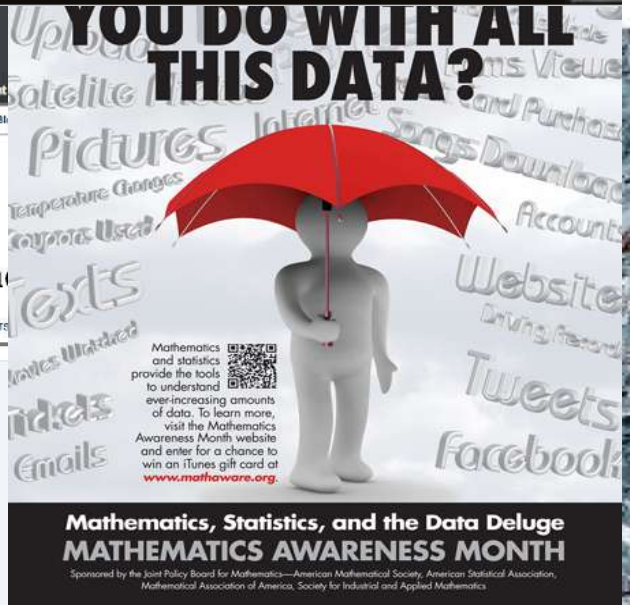
Setb & Wessel Politics & Policy Washington Wire Budget Battle Economy
JOURNAL REPORTS | Updated March 8, 2013, 4:22 p.m. ET
How Big Data Is Changing th
Article Stock Quotes Comments
By STEVEN ROSENBUSH AND MICHAEL TOTTY
There's a ton of information out there. And businesses are figuring
work.
Journal Report
Insights from The Experts
Read more at WSJ.com/LeadershipReport
More in Unleashing Innovation: Big Data
Big Data, Big Blunders
The New Shape of Big Data
The experts call this
data. The definition is
usually boils down to
have access to vastly
than they used to, it c
more different source
they can get it almost


Surfing the Rich Data Deluge
STEPS TOWARD DEVELOPING AN EFFECTIVE IT STRATEGY
Tessella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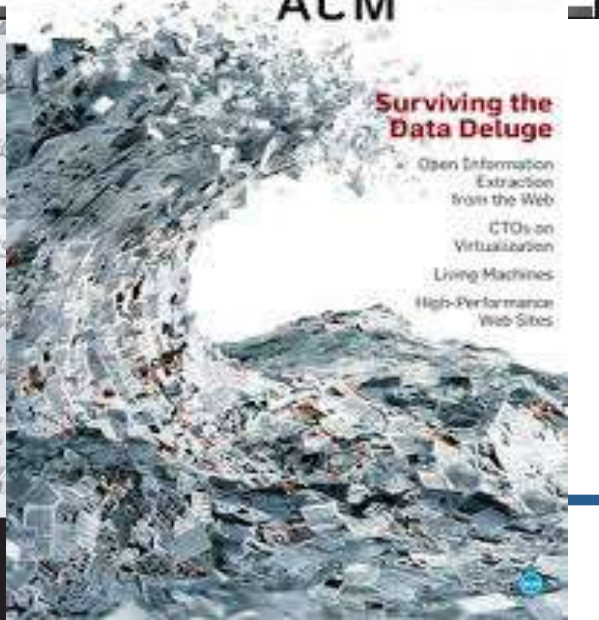
Mathematics and statistics provide the tools to understand ever-increasing amounts of data. To learn more, visit the Mathematics Awareness Month website and enter for a chance to win an iTunes gift card at www.mathaware.org.
Mathematics, Statistics, and the Data Deluge
MATHEMATICS AWARENESS MONTH


COMMUNICATIONS of the ACM
Surviving the Data Deluge
Open Information Extraction from the Web
CTOs on Virtualization
Living Machines
High-Performance Web Sites

# The São Paulo Research Foundation - FAPESP

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# *Fapesp: São Paulo Research Foundation*

- Mission: support research in all fields
- All proposals are peer reviewed (21,000 proposals in 2012)
- Funded (1962) by the State of São Paulo with 1% of all state revenues
- Annual budget: US$ 530 M in 2012


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# *Some of FAPESP's main programs*

- **12,000 Fellowships (SI, Training, MSc, Dr, PostDoc,)**
- **Research grants**
  - 17 Centers for Research, Innovation and Diffusion (CEPID) - 11 years funding
  - 312 Young Investigator Awards – 4 years funding
  - 419 Thematic Research Projects – 5 years funding
  - 3,983 Regular Research Grants – 2 years funding
- **Special Programs**
  - Biota: Virtual Institute for Biodiversity
  - PFGCC: Global Climate Change Research
  - IT and Advanced Internet
  - BIOEN: Bioenergy Research
  - Neurosciences: Epillepsy (using imaging)
  - Large, multiuser research instruments
- **Application oriented research**
  - Joint University – Industry (PITE)
  - Small bussiness research (PIPE)


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# *FAPESP: Basic Science Focus*

- In the World and in Brazil there is in an “utilitarian” view about Science
  - Science that makes business more competitive
  - Science that heals the sick
  - Science that makes the poor rich
- In addition, FAPESP also values a not so “utilitarian” item
  - Science that makes mankind wiser
    - In all fields there are fundamental questions
    - Philosophy, Archeology, Literature, High Energy Physics, Cosmic Rays, Astronomy, Evolution,..


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# Bertholletia excelsa

A Bertholletia excelsa, popularmente conhecida como castanha-do-pará, castanha-do-acre, castanha-do-brasil, tocari e tururi, Castaña de Pará, Noix de Brésil, Paranuss, Paranöt, جوز برازيلي, Para-Noot, Noce del Pará, бразильский орех, ブラジルナッツ, 巴西堅果, é ... Wikipédia


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# SP Environment Secretary bases Resolution on BIOTA research

SECRETARIA DE ESTADO DO MEIO AMBIENTE

GABINETE DO SECRETÁRIO

PUBLICADA EM 14/03/88 - SEÇÃO I - PÁG.36

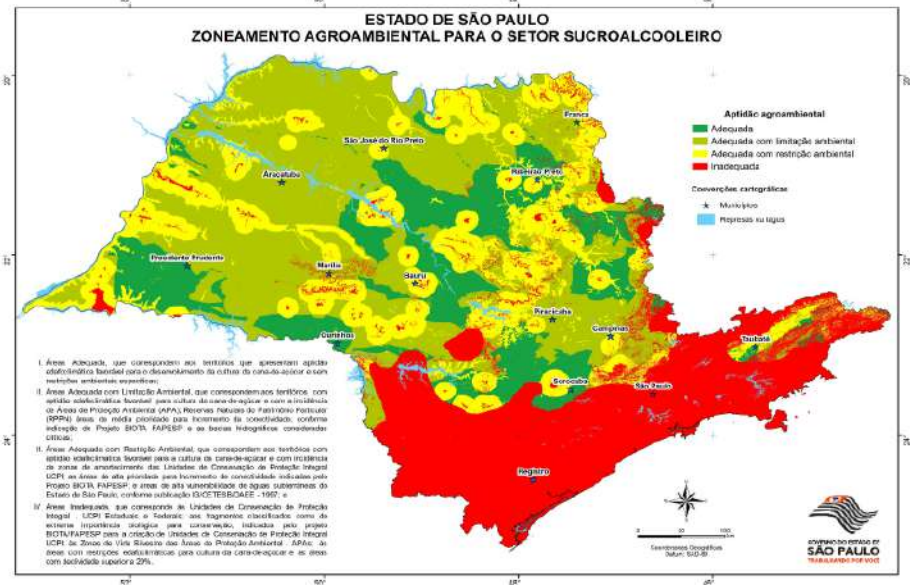
RESOLUÇÃO SMA-15 DE 13 DE MARÇO DE 2008.

Dispõe sobre os critérios e parâmetros para concessão de autorização para supressão de vegetação nativa considerando as áreas prioritárias para incremento da conectividade.

O **SECRETÁRIO DE ESTADO DO MEIO AMBIENTE**, em cumprimento ao disposto nos artigos 23, VII, e 225, § 1º, I, da Constituição Federal, nos artigos 191 e 193 da Constituição do Estado, nos artigos 2º e 4º da Lei federal nº 6.938, de 31 de agosto de 1981, e nos artigos 2º, 4º e 7º da Lei estadual nº 9.509, de 20 de março de 1997, e

Considerando os resultados obtidos pela equipe de pesquisadores do Projeto Biota FAPESP e as informações presentes no mapa de "Áreas prioritárias para incremento da conectividade" e "Areas prioritárias para criação de Unidades de Conservação" resultantes do Projeto Biota FAPESP;

- Several Governor Decrees and Resolutions
  - Decree 53.939, 06Jan09 – Legal Reserves
  - Decree 54.746, 04Sep09 – Conservation Units Cantareira



GIANT MAGELLAN TELESCOPE

GMT

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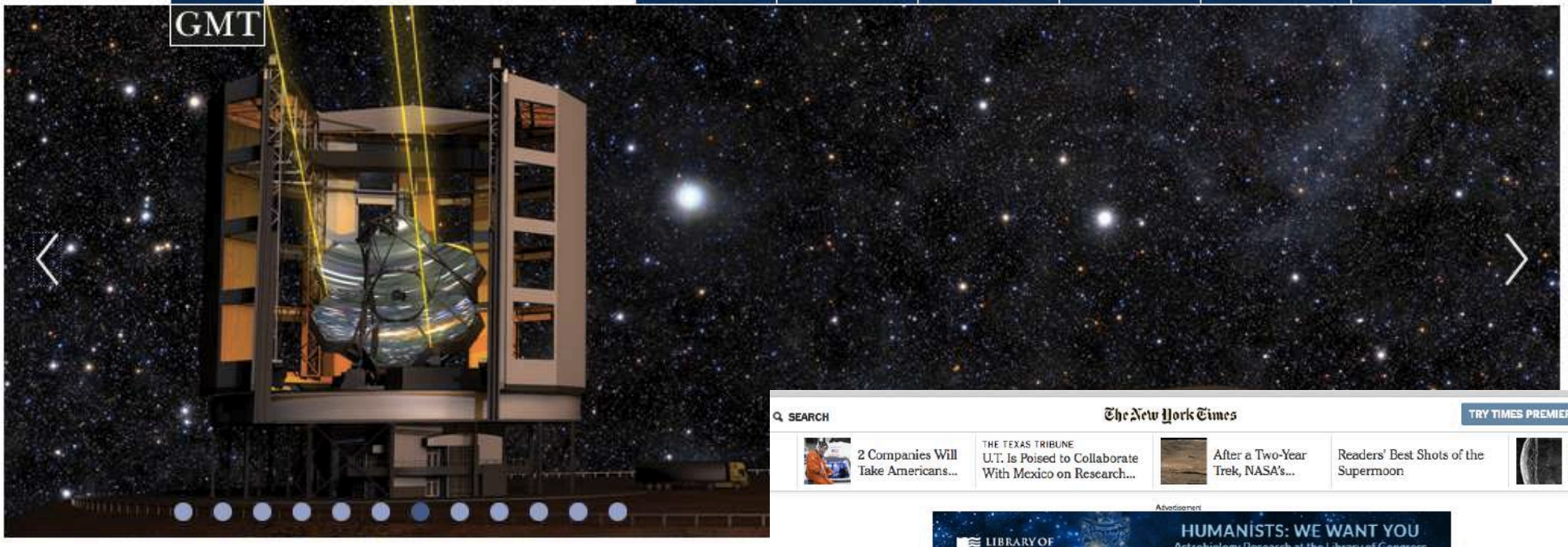

The GMT is being developed by a group of leading university and research centers from across the globe.

IMAGE BY MASON MEDIA INC. / © GMTO CORP.

NEWS

405th Anniver
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GMTO Project
discusses the
telescope and
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followed, leadi
Telescope. Mo

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## More Eyes on the Skies

By DENNIS OVERBYE JULY 21, 201

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The future,
to those wh
astronome
working th
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airports on
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to show for

More than
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money for

A rendering of the Giant Magellan Telescope that will be constructed atop a mountain in Chile.
Giant Magellan Telescope


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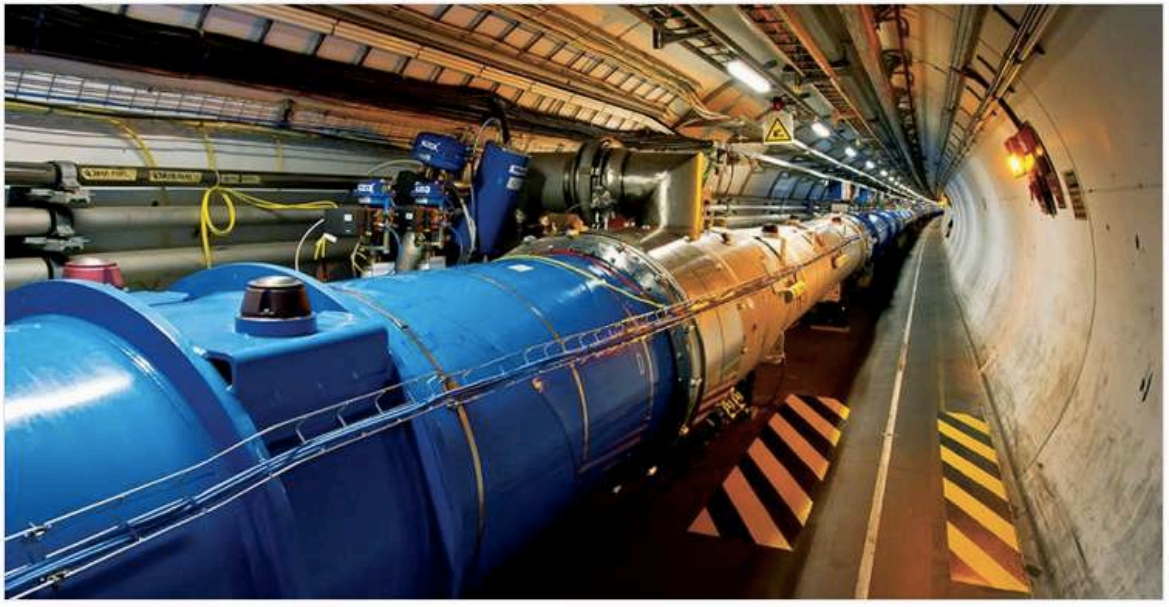
# Cientistas planejam detectar novas partículas elementares no LHC a partir de 2015

*22 de agosto de 2014*

**Por Elton Alisson**

**Agência FAPESP** – A operação do Grande Colisor de Hádrons (LHC, na sigla em inglês), da Organização Europeia para Pesquisa Nuclear (Cern), na Suíça, poderá contribuir, a partir de 2015, para a descoberta



The Large Hadron Collider is the world's largest and most powerful particle accelerator (Image: CERN)

peração com mais energia a partir de 2015 poderá contribuir para a escoberta de partículas não previstas pela Física atual, avaliam esquisadores (*foto: Cern*)

TP-SAIFR), e apoiado pela FAPESP, o encontro utros países da América do Sul.

realizados no LHC nos últimos anos, quando o es de elétrons-volt.

oderão ser feitas a partir de 2015, quando será

SAMPA
SAMPA
SAMPA
SAMPA

nature
Citrus pathogen sequenced
Cancer Research
Microbes and Infection
PCCP
nature
SINK OR SOURCE?
Journal of the American College of Cardiology
Zeitschrift für Kristallographie
NEW CRYSTAL STRUCTURES
NCS
Analyst
Physical Review Letters
Marine & Freshwater Research
Science
Analyst
JOC
The Journal of Organic Chemistry
NANOTECHNOLO
CrystEngCom
Acta Crystallographica Section E
Structure Reports Online
Cell
THE JOURNAL OF PHYSICAL CHEMISTRY C
Meteoritics & Planetary
nature REVIEWS NEUROSCIENCE
JOC
The Journal of Organic Chemistry
Physical Review Letters
7/2008

# *FAPESP RESEARCH CENTERS*

- 2 types of Research centers:
  - 17 Research, Innovation and Dissemination Centers (RIDCs)
  - 9 Engineering / Applied Research Centers (ERCs)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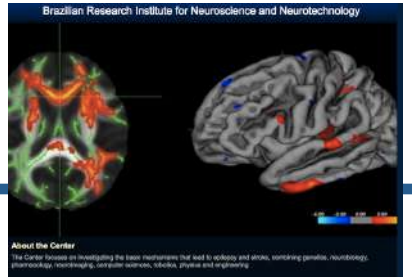
FAPESP

CEPID
Centros de Pesquisa, Inovação e Difusão

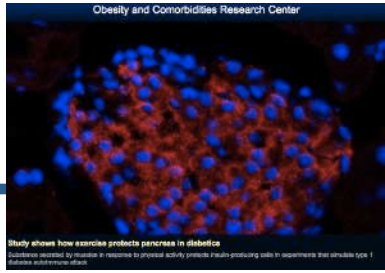
## BRAINN




## CTC

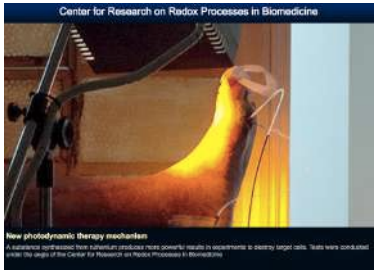
## CRID

## OCRC

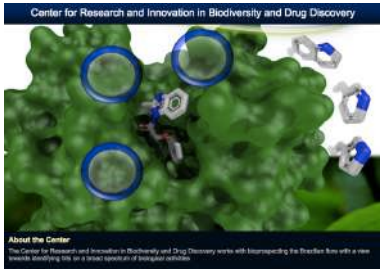



## HUG-CELL

## REDOXOMA




## CIBFar




## CETICS

## FORC

## CEPIV

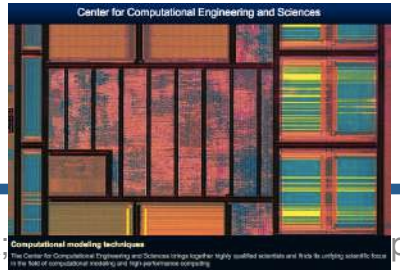
## CDMF

## CEPOF

## CEM

## NEV

## CCES




## CEMEAI

## NEUROMAT

# *Engineering Research Centers - ERCs*

- New instrument to support research in partnership with industry
  - Peugeot Citroën: Engineering Research Center for Biofuel Engines
  - BG: Research Centre for Gas Innovation
  - Natura: Center for Applied Research on Well-being and Human Behavior
  - GSK: Green Chemestry
  - GSK: Target Discovery
  - Shell: New Energies Research Center (4 Branches)
  - Statoil: Reservoir and Production Management
  - Grupo São Martinho – GSM
  - Koppert
- Co-funding
- Exploratory research on themes proposed by industry
- Long term (up to ten years)

# *FAPESP AND TICS*

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The referential information source for Research Supported by FAPESP

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# Research Grants and Scholarships supported by FAPESP

**Ongoing research grants (most recent)**

- Development of polymeric nanocomposites for different applications in energy, AP.R
- Optimal thermodynamic processes and applications, AV.EXT
- Visit of professor David held to Brazil, AV.EXT

**See more Ongoing research grants** (Only some records are available in English at this moment)

**Completed research grants (most recent)**

- International Workshop on advances of probiotics for food and veterinary applications, AO.R
- 18th annual International Conference on education, AR.EXT
- 43rd annual European calcified tissue society Congress, AR.EXT

**See more Completed research grants** (Only some records are available in English at this moment)

**Ongoing scholarships in Brazil (most recent)**

- Association between leptin and adponectin with antioxidant capacity of high density lipoprotein in individuals with diabetes mellitus, BP.IC
- Arrabidaea chica extract applied as a dentin pre-treatment or when incorporated into a conventional adhesive system: influence on long-term bond strength, BP.IC
- The reuse of spolia in ancient Sicily, BP.PD

**See more Ongoing scholarships in Brazil** (Only some records are available in English at this moment)

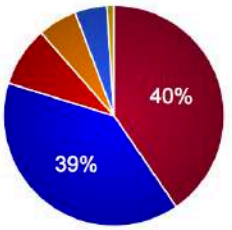
**Completed scholarships in Brazil (most recent)**

- Learning teaching and professional constitution situated on a practice (inter and trans) DISCIPLINAR: the case of the Matemáticas education program in teacher training of the Education Faculty of the UNICAMP, BP.DR
- Statistical models for genomic selection in Panicum maximum considering allelic dosage, BP.DR

**FAPESP support in numbers**

(Total / Available in English)

| | |
|---|---|
| 4,322 / 3,916 | Ongoing research grants |
| 83,542 / 32,736 | Completed research grants |
| 8,233 / 7,293 | Ongoing scholarships in Brazil |
| 106,501 / 33,673 | Completed scholarships in Brazil |
| 856 / 856 | Ongoing scholarships abroad |
| 7,734 / 4,769 | Completed scholarships abroad |
| 211,188 / 83,243 | All Research Grants and Scholarships |




*Updated in May 14, 2016

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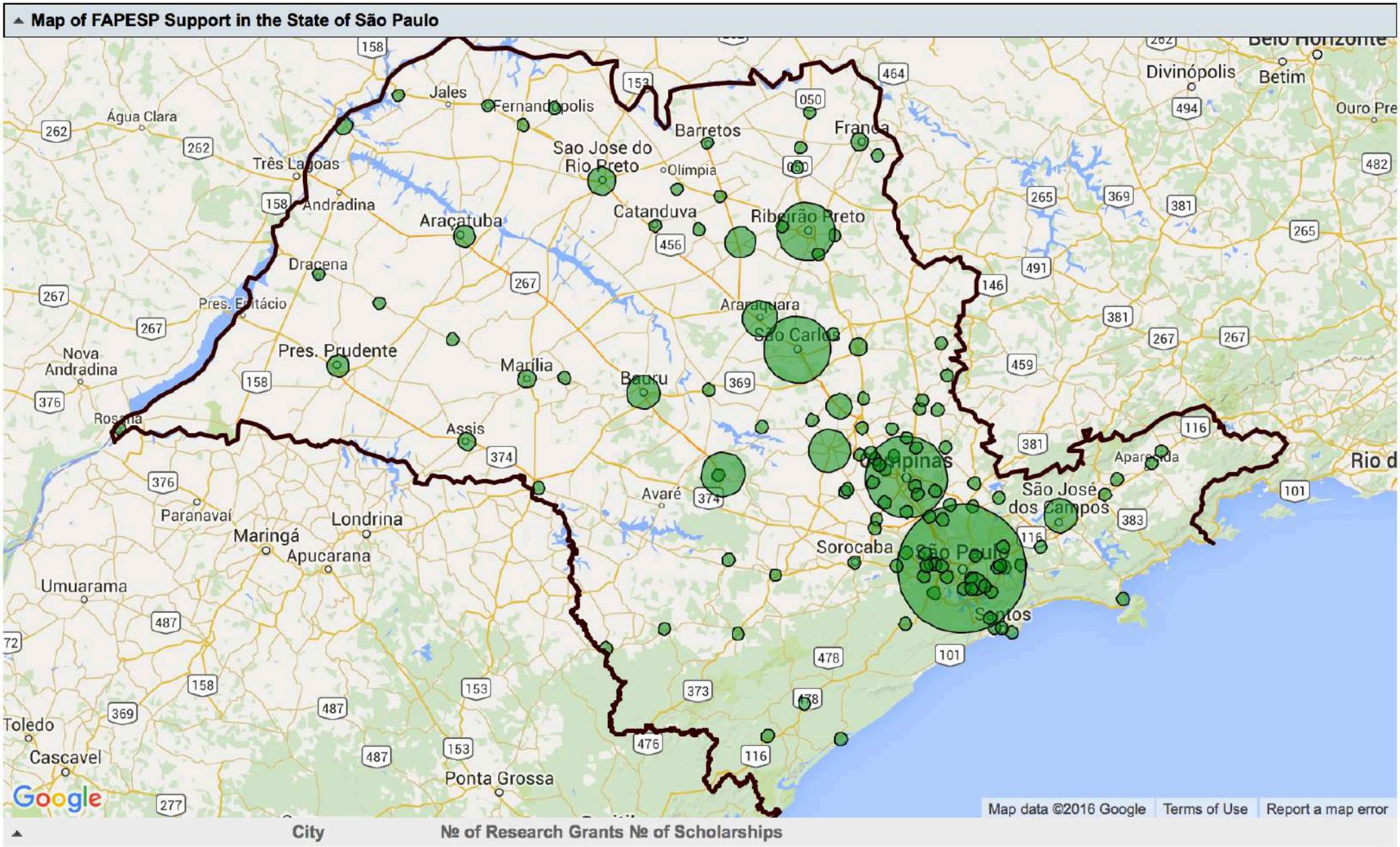
Map of FAPESP Support in the State of São Paulo
Jales
Fernandópolis
Barretos
Sao Jose do Rio Preto
Olímpia
Catanduva
Ribeirão Preto
Araçatuba
Andradina
Três Lagoas
Água Clara
Dracena
Pres. Prudente
Pres. Epitácio
Araraquara
São Carlos
Marília
Bauru
Assis
Avaré
Campinas
São José dos Campos
Sorocaba
São Paulo
Santos
Londrina
Maringá
Apucarana
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# FAPESP AND INTEL CALL FOR PROPOSALS (CFP)

**1. INTRODUCTION**

FAPESP and INTEL publish this Call for Proposals and invite interested researchers, working within public or private Higher Education or Research Institutions in the State of São Paulo, to submit projects under the cooperation agreement between FAPESP and INTEL, under the terms and conditions hereinafter set forth.

**2. SUBJECT**

Academic research on side-channel resistant security for system-on-a-chip (SoC) devices.

**3. OVERVIEW**

FAPESP and Intel's corporate University Research Office (URO) invite proposals from researchers in the State of São Paulo in Brazil on side-channel resistant security for lightweight Internet of Things (IoT) devices. IoT devices are expected to proliferate significantly in the coming years and pose unique challenges due to limited hardware resources, energy constraints, cost limitations, low bandwidth, and physical exposure to attackers. Unlimited access to IoT devices, in particular, creates opportunities for attackers to exploit side-channel information in order to obtain cryptographic keys, access-controlled data, or other types of protected information. Intel requests proposals for non-incremental research leading to compelling techniques and technologies that will make future lightweight IoT devices significantly more secure against side channel attacks than the current state-of-the-art.

**4. BACKGROUND**

System-on-a-Chip (SoC) based devices are expected to proliferate significantly in the coming years. One well-known source projects the total number of Internet connected devices globally to reach 25 billion by 2015 and 50 billion by 2020.[1] Dramatic increases in SoC-based device technologies will continue to be seen in such fields as

- Consumer electronics (digital cameras, media players, GPS devices, gaming)
- Mobile communications (smart phones, feature phones, cellular base stations)
- Health and medicine (diagnostic equipment, patient monitoring devices, medical imaging)
- Transportation (vehicle control systems, traffic monitoring and regulation)
- Energy (smart meters, climate sensors, energy management systems)

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Versão em português

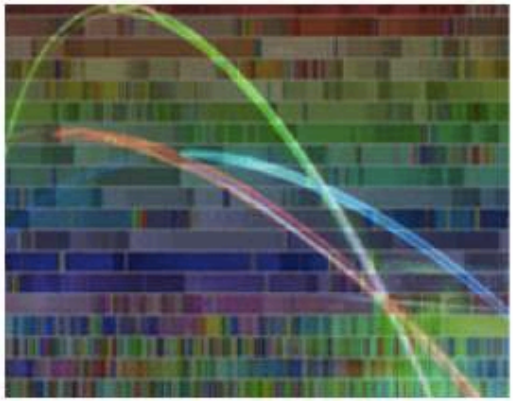
# FAPESP announces call for eScience program

FAPESP announce a call for research proposals for the new Research Program on eScience.

The call for research proposals is open to interested researchers associated to non-profit teaching and research institutions in the State of São Paulo. The main goal is to identify, select and broaden world-class, basic and applied research associated to the relevant topics described in the call.

Relevant topics for this call for research proposals are as follows. However, the call for proposals is not restricted to these topics and additional issues that fit in any eScience area are welcome.

- eScience algorithms and models
  - Mathematical models
  - Data-oriented approaches
  - Digital repositories and data management
  - Extreme scale approaches
- Cyberinfrastructure to support eScience
  - Novel hardware
  - Novel uses of cyberinfrastructure
  - Software, services, protocols, and research tools
- eScience target domains, including:
  - Agricultural Sciences



Proposals can be submitted electronically until April 28th, 2014

© Roberto.Cesar@vision.ime.usp.br

Rodrigo Garcia, Raupp, Lafer, Paulo Bernardo e Meirelles, durante a cerimônia de assinatura do convênio para apoiar projetos sobre aplicações-chave, engenharia e tecnologia e fundamentos científicos (*foto: Eduardo Cesar*)

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Especiais

# R$ 98 milhões para pesquisas sobre a internet

**19/12/2013**

**Agência FAPESP** – O Ministério das Comunicações, o Ministério da Ciência, Tecnologia e Inovação e a FAPESP firmaram um convênio de cooperação no valor de R$ 98 milhões para apoiar projetos de pesquisa científica e tecnológica que contribuam para o desenvolvimento da internet no Brasil.

A assinatura do convênio, ocorrida na quarta-feira (18/12) na sede da FAPESP, contou com a presença dos ministros Marco Antônio Raupp (Ciência, Tecnologia e Inovação) e Paulo Bernardo (Comunicações); de Rodrigo Garcia, secretário de Desenvolvimento, Ciência, Tecnologia e Inovação do Estado de São Paulo; João Carlos Meirelles, assessor especial de Assuntos Estratégicos do governo do Estado de São Paulo; Celso Lafer, presidente da FAPESP; Carlos Henrique de Brito Cruz, diretor científico da FAPESP; Virgílio Augusto Fernandes Almeida, secretário de

Buscar

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**Ciência de Alimentos na Unicamp oferece disciplina de pós**

Aulas serão ministradas pelos professores Frédéric Carlin, do Inra, e Anderson Sant'Ana, da Unicamp

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**Pós-doutorado em Espectroscopia Vibracional com Bolsa da FAPESP**

Bolsista atuará em projeto temático no Instituto de Química da USP

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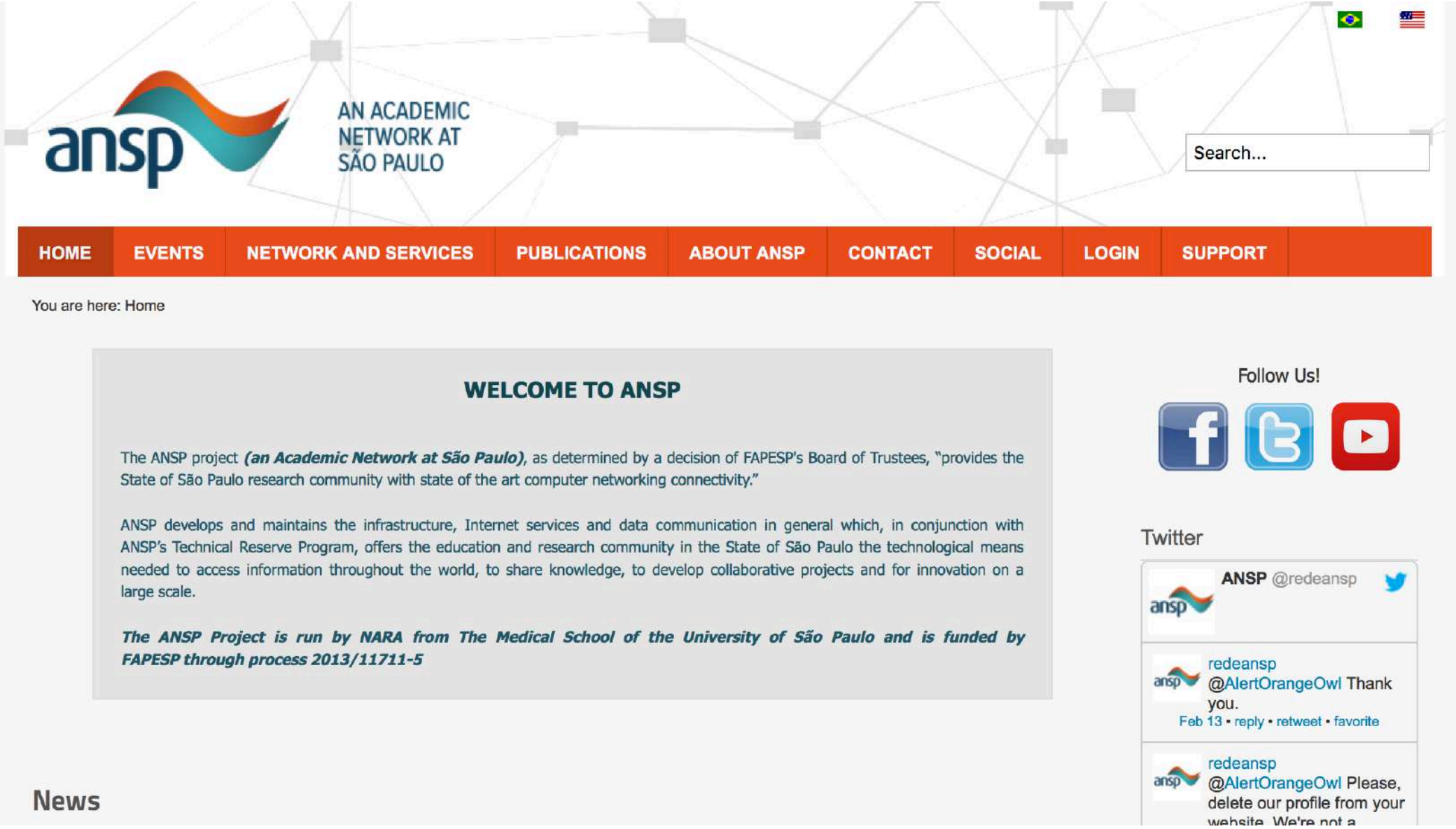
**Instituto de Pesquisa em**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The ANSP project (an Academic Network at São Paulo), as determined by a decision of FAPESP's Board of Trustees, "provides the State of São Paulo research community with state of the art computer networking connectivity."
ANSP develops and maintains the infrastructure, Internet services and data communication in general which, in conjunction with ANSP's Technical Reserve Program, offers the education and research community in the State of São Paulo the technological means needed to access information throughout the world, to share knowledge, to develop collaborative projects and for innovation on a large scale.
The ANSP Project is run by NARA from The Medical School of the University of São Paulo and is funded by FAPESP through process 2013/11711-5
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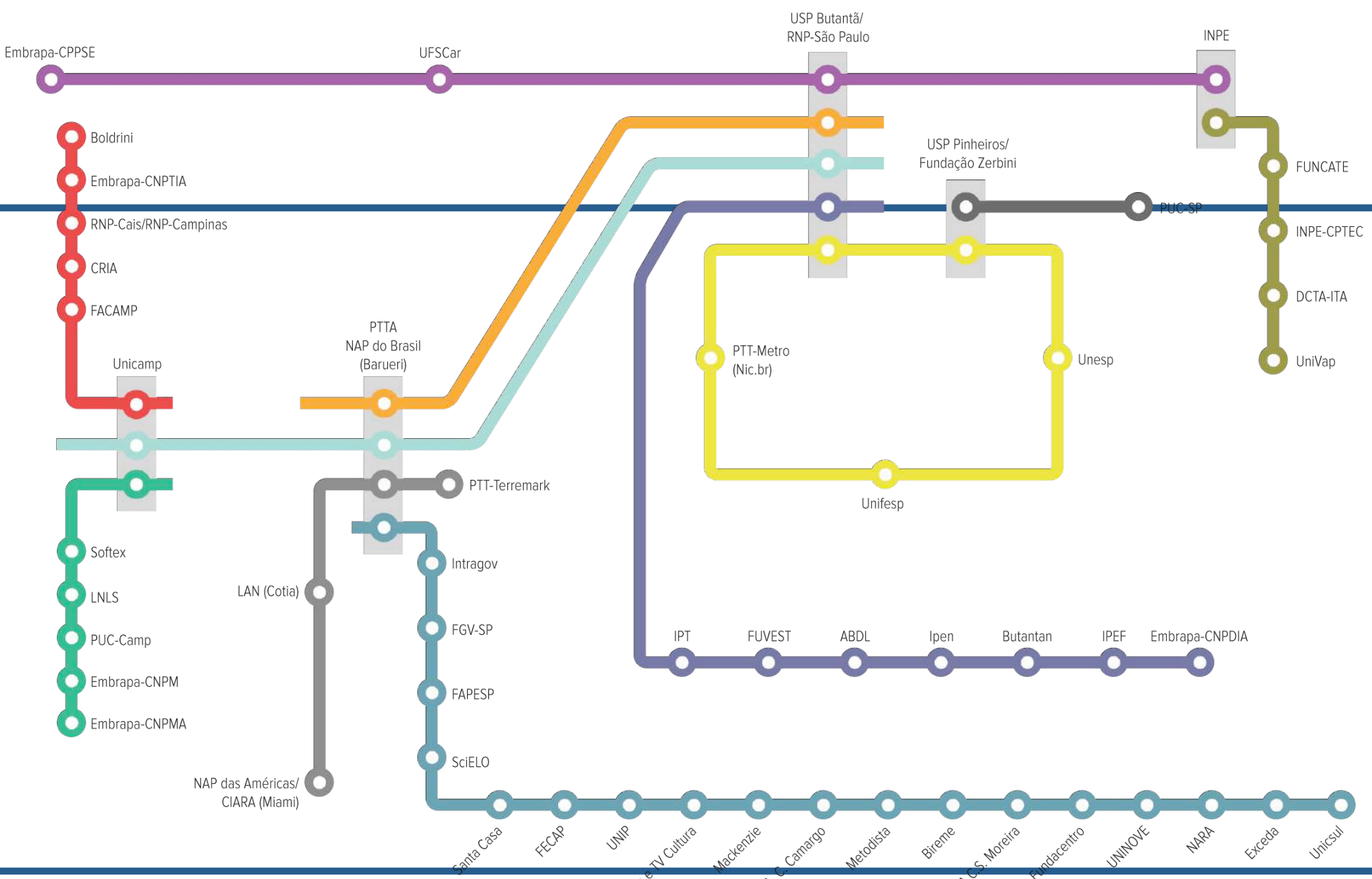
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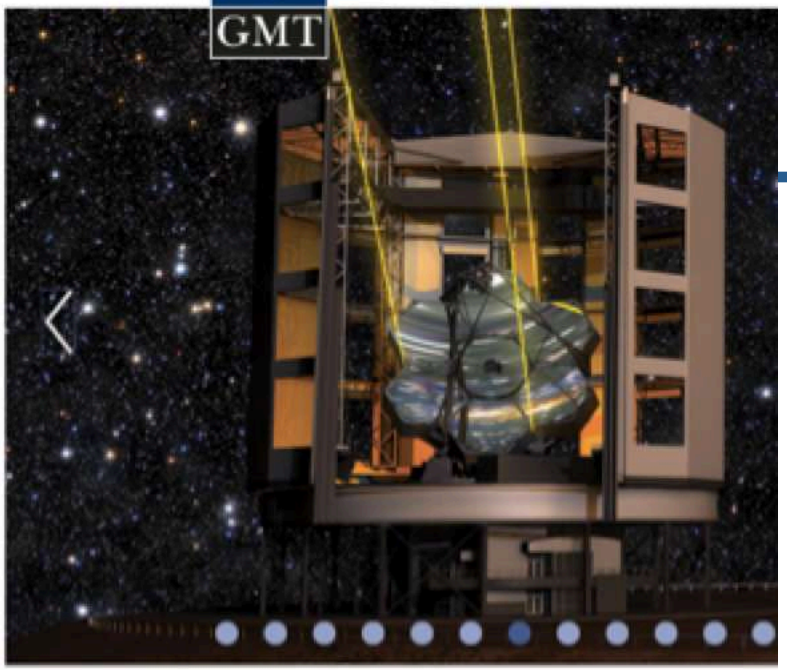
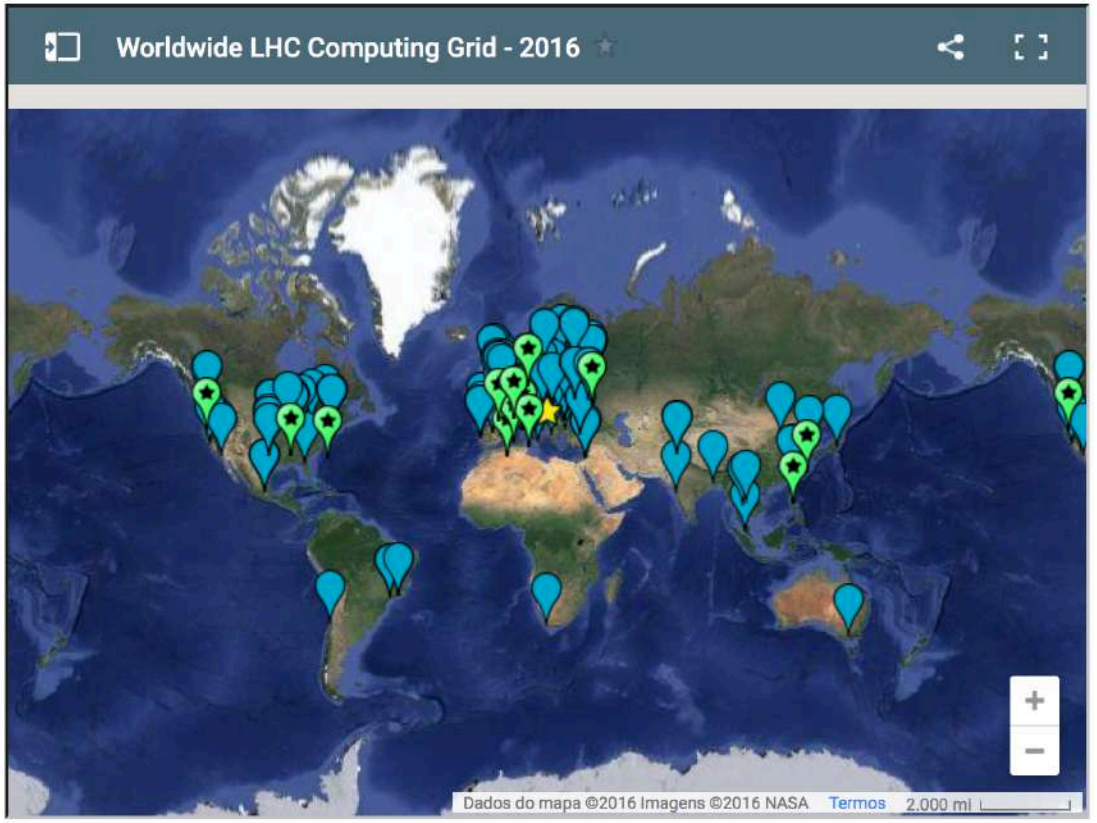


The GMT is being developed by a group of leading university and research centers from across the globe.

IMAGE BY MASON MEDIA INC. / © GMTO CORP.

## Connectivity for international projects



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FUNDAÇÃO DE AMPARO À PESQUISA DO ESTADO DE SÃO PAULO

Índice ▼ English

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# Plano de Gestão de Dados - FAPESP

## Gestão de Dados

A FAPESP reconhece a importância da gestão adequada dos dados de pesquisa como parte essencial das boas práticas de pesquisa. Para tanto, considera necessário que os dados resultantes de projetos financiados pela Fundação sejam gerenciados e compartilhados de forma a garantir o maior benefício possível para o avanço científico e tecnológico.

## Índice


Gestão de Dados

Conteúdo do Plano de Gestão de Dados - FAPESP

Ferramentas online para criação de Planos

Documentos e páginas de interesse - Planos de Gestão de Dados


**Contato para dúvidas:** plano-gestao-dados@fapesp.br

## Documentos e páginas de interesse - Planos de Gestão de Dados

Planos de Gestão de Dados vêm sendo exigidos há mais de uma década pelas principais agências governamentais ou privadas de fomento à pesquisa na América do Norte, Europa e Austrália. Esta página apresenta alguns endereços da rede onde podem ser consultados manuais, exemplos de planos e diretivas para redigi-los, para as

GESTÃO

# Uma estratégia para dados

Pesquisadores são estimulados a gerenciar e compartilhar as informações científicas que produzem

Bruno de Pierro

Edição 267
mai. 2018

Atualizado em
18 jul 2018

Educação
Engenharia

Gerenciar e armazenar grandes volumes de dados gerados em pesquisas são desafios enfrentados por cientistas em todos os campos do conhecimento. Na última década, algumas das principais agências de fomento, como a National Science Foundation (NSF) nos Estados Unidos e o Economic and Social Research Council do Reino Unido, passaram a exigir que os pesquisadores submetam, junto com as solicitações de financiamento, os chamados planos de gestão de dados, que descrevem como os dados produzidos serão gerenciados, preservados e divulgados em repositórios públicos. O objetivo é promover o compartilhamento de

# Organização de um plano em cinco etapas

**1.** Destaque os tipos de dados que serão produzidos durante a execução do projeto. Por exemplo: registros de coleta, resultados experimentais, gráficos, mapas, vídeos, planilhas, gravações de áudio ou imagens.

**2.** Comunique eventuais restrições éticas ou legais para o compartilhamento de dados, além de medidas para garantir a privacidade, confidencialidade, segurança e propriedade intelectual.

**3.** Descreva a política de preservação e compartilhamento. Por exemplo, se os dados serão disponibilizados imediatamente ou apenas após a publicação de um artigo.

**4.** Apresente os métodos que serão empregados para armazenar os registros e torná-los acessíveis. Inclua os metadados (dados que descrevem conjuntos de dados) para que usuários possam reutilizar arquivos depositados em repositórios.

**5.** Atualize o plano sempre que necessário, incluindo correções de rumo e adoção de novas metodologias.

FONTE CLAUDIA BALIZER MEDEIROS

a) Descrição dos dados e metadados produzidos pelo projeto - por exemplo, amostras, registros de coleta, formulários, modelos, resultados experimentais, software, gráficos, mapas, vídeos, planilhas, gravações de áudio, bancos de dados, material didático e outros.

b) Quando aplicável, restrições legais ou éticas para compartilhamento de tais dados, políticas para garantir a privacidade, confidencialidade, segurança, propriedade intelectual e outros.

c) Política de preservação e compartilhamento (por exemplo, compartilhamento imediato ou apenas após a aceitação da publicação associada). Período de carência (antes do compartilhamento) e período durante o qual os dados serão preservados e disponibilizados.

d) Descrição de mecanismos, formatos e padrões para armazenar tais itens de forma a torná-los acessíveis por terceiros. Esta descrição pode incluir o uso de repositórios e serviços de outras instituições.

**1. National Science Foundation, EUA**

Instruções de preparo e planos para cada área:

**https://www.nsf.gov/bfa/dias/policy/dmp.jsp**

Definições e respostas a perguntas frequentes

**https://www.nsf.gov/bfa/dias/policy/dmpfaqs.jsp**

**2. National Institutes of Health, EUA**

Guia Prático para Criação de um Plano e Compartilhamento de Dados. Descrição detalhada de como preparar um plano, seu conteúdo, e a importância do compartilhamento de dados para o avanço da ciência. Embora específico para a Saúde, o texto é aplicável a um grande leque de áreas do conhecimento:

**https://grants.nih.gov/grants/policy/data_sharing/data_sharing_guidance.htm**

**3. National Endowment for the Humanities, EUA**

Descrição de um plano e políticas adotadas nas Humanidades nos EUA - **https://www.neh.gov/files/grants/data_management_plans_2017.pdf**

Texto de todos os planos de todos os projetos aprovados pela agência desde 2014 - **https://www.neh.gov/divisions/odh/grant-news/data-management-plans-successful-grant-applications-2011-2014-now-available**

**4**. Documentos para ajuda a pesquisadores britânicos (todas as agências do RCUK e algumas agências privadas), com explicações, exemplos, e requisitos de cada agência. Estas páginas são mantidas pelo Data Curation Center, um órgão nacional de curadoria e preservação de dados de pesquisa

**http://www.dcc.ac.uk/resources/data-management-plans**

# *Further FAPESP Information*

- http://agencia.fapesp.br/en/
- http://www.bv.fapesp.br (all funded projects online)

- http://www.fapesp.br/gestaodedados/

- http://revistapesquisa.fapesp.br/2018/05/23/uma-estrategia-para-dados/


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