

# Scholarly literature and the press: scientific impact and social perception of physics computing

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<sup>4</sup>IEEE, Piscataway, NJ, USA



**CHEP 2013**  
**Amsterdam**

**IEEE NSS 2013**  
**Seoul, Korea**



# God's particle

'God particle': New particle found, could be the Higgs boson, CERN scientists say

04 Jul 2012, 13:05

CERN scientists have discovered a new subatomic particle that could be elusive Higgs boson, which is believed to be crucial in formation of universe.

SOCIEDAD | TRABAJOS EN EL GRAN COLISIONADOR DE HADRONES

## Anuncian el descubrimiento de lo que podría ser la "partícula de Dios"

04/07/12 | La Organización Europea para la Investigación Nuclear (CERN) anunció este miércoles el descubrimiento de una nueva partícula que podría ser el bosón de Higgs, aunque todavía es demasiado pronto para saber si se trata de la "partícula de Dios" que...

4/7/2012

## Scientists discover 'god-like' particle

After a quest spanning nearly half a century, physicists on Wednesday said they had found a new sub-atomic particle consistent with the Higgs Boson which is believed to confer mass....



Tækni & vísindi | mbl | 4.7.2012 | 10:10

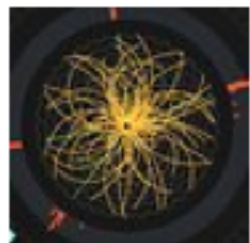
### Guðseindin fundin? 📺

Vísindamenn við CERN eru nú á blaðamannafundi þar sem fram kom að þeir telji sig hafa fundið sterkar vísbendingar um svokallaða Higgs-bóseind, en hún er stundum nefnd Guðseindin. Vísindamennirnir taka fram að frekari vísbendinga sé þörf til að staðfesta

## Descoberta nova partícula coerente com a 'partícula de Deus'

Amazônia

04 Jul 2012 . 07:40 h



## Physicists Find Particle That Could Be the Higgs Boson -

## The New York Times

Researchers said they had discovered what looked for all the world like the Higgs boson, a long-sought particle that could lead to a new ...

July 4, 2012 - By DENNIS OVERBYE - Science - Article - Print Headline: "Physicists Find Elusive Particle Seen as Key to Universe"



THE TIMES OF INDIA

## Clarín

El gran diario argentino

Argentina

## DAILY NATION

Kenya

## Morgunblaðið

Iceland

## Diário do Amazonas

# Foreword

This scientometric investigation does not have the character of a rigorous, quantitative statistical analysis due to the difficulty of retrieving data from mainstream media sources

Nevertheless, the results provide some  
**food for thought...**

The few landmark cases we selected are intended to be  
**representative of the field**

Selections and omissions are not a judgement of merit!

# Data sources

- **Thomson-Reuters: ISI Web of Knowledge**

- CERN subscription: since 1970, conference database not included

- **CERN, Fermilab and SLAC press releases**

- Limited time coverage
- Limited search facilities

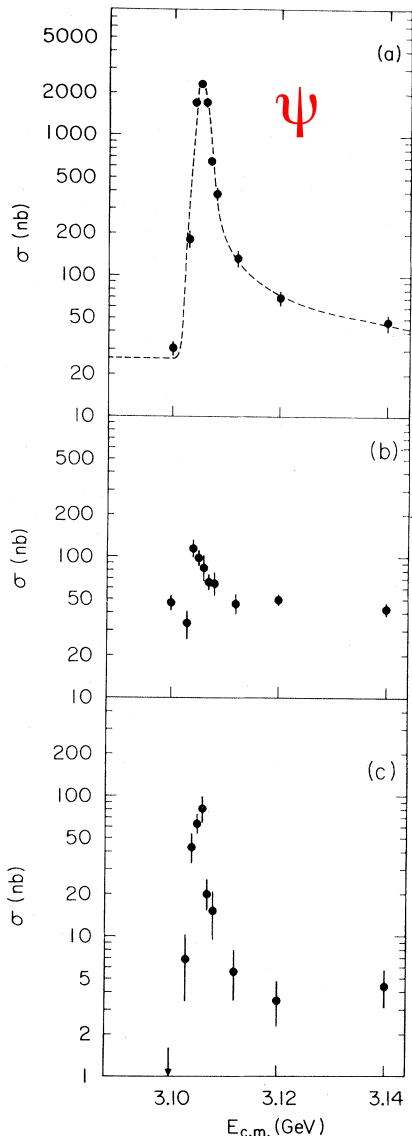
- **Newspaper web sites**

- Some have a search engine
- Search facilities are paying (e.g. FAZ) or with limited free access (e.g. NYT)
- Search engines are usually primitive

- *Warning: 2013 statistics covers only a portion of the year*

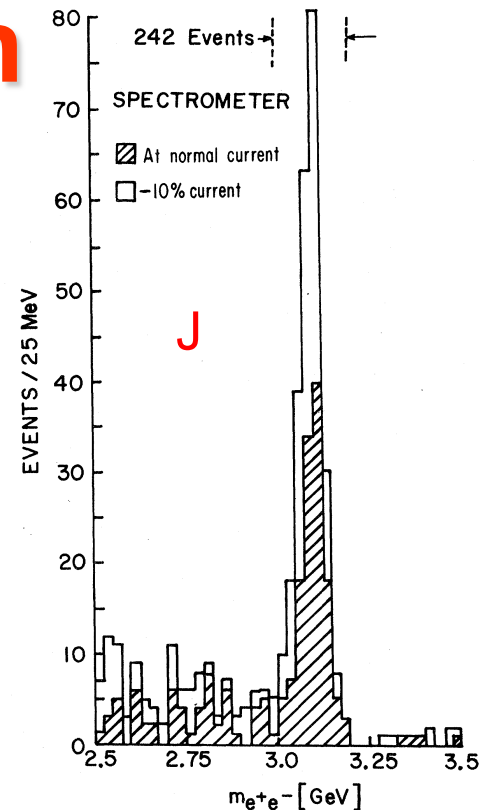


# The November revolution



The Nobel Prize in Physics 1976  
Burton Richter, Samuel C.C. Ting

## The Nobel Prize in Physics 1976



- J. J. Aubert et al.,  
**Experimental observation of a heavy particle- $J$ ,**  
*Phys. Rev. Lett.*, vol. 33, no. 23, pp. 1404-1406, 1974  
– Times Cited: 1059 (14 authors)
- J. E. Augustin et al.,  
**Discovery of a narrow resonance in  $e^+e^-$  annihilation,**  
*Phys. Rev. Lett.*, vol. 33, no. 23, pp. 1406-1408, 1974  
– Times Cited: 963 (35 authors)

# MINUIT

F. James and M. Roos,

## **MINUIT - System for function minimization and analysis of parameter errors and correlations**

*Comp. Phys. Comm.*, vol. 10, no. 6, pp. 343-367, 1975

Times Cited: **1330** (on 8 September 2013)

Computer Physics Communications 10 (1975) 343–367

© North-Holland Publishing Company

### **MINUIT – A SYSTEM FOR FUNCTION MINIMIZATION AND ANALYSIS OF THE PARAMETER ERRORS AND CORRELATIONS**

**F. JAMES**

*Data Handling Division, European Organization for Nuclear Research,  
CH-1211 Geneva 23, Switzerland*

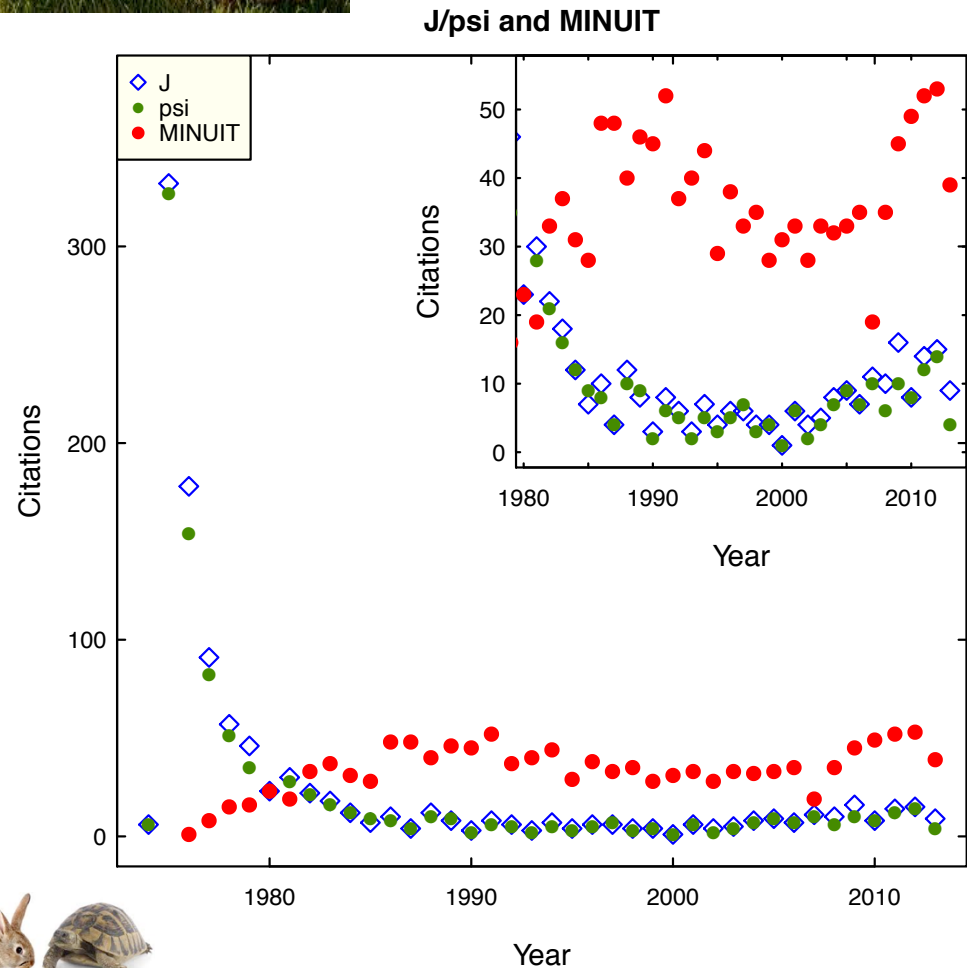
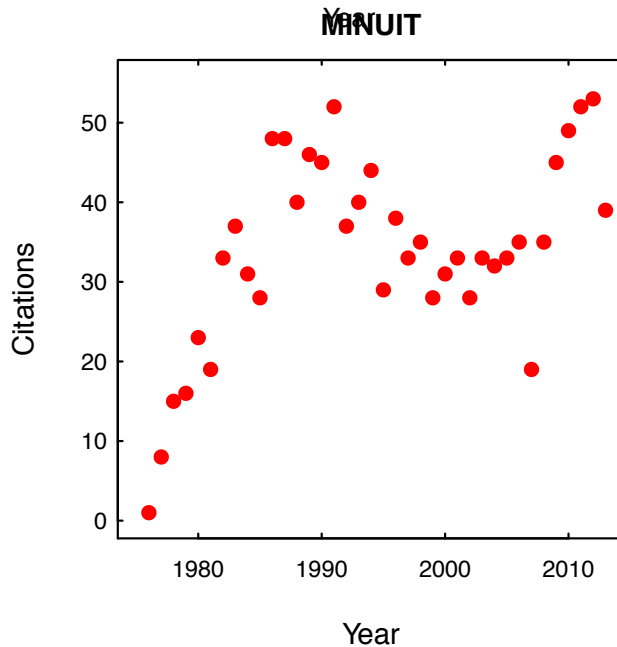
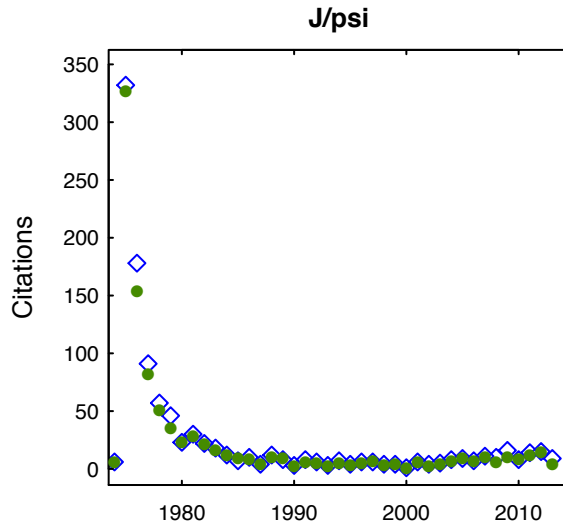
and

**M. ROOS**

*Department of Nuclear Physics, University of Helsinki,  
Sf-00170 Helsinki, Finland*

# The hare and the tortoise

	Citations
J	1059
$\psi$	963
MINUIT	1330



# Landmark experimental HEP papers

## ● **J/ $\psi$ discovery** (citations: 1059, 963)

J. J. Aubert et al., Experimental observation of a heavy particle-J, *Phys. Rev. Lett.* 33, no. 23, pp. 1404-1406, 1974

J. E. Augustin et al., Discovery of a narrow resonance in e<sup>+</sup>e<sup>-</sup> annihilation, *Phys. Rev. Lett.* 33, no. 23, pp. 1406-1408, 1974

## ● **$\tau$ discovery** (citations: 574)

M. L. Perl, Evidence for anomalous lepton production in e<sup>+</sup>e<sup>-</sup> annihilation, *Phys. Rev. Lett.* 35, no. 22, pp. 1489-1492, 1975

## ● **W and Z<sub>0</sub> observation** (citations: 590, 550)

G. Arnison et al., Experimental-observation of isolated large transverse energy electrons with associated missing energy at  $\sqrt{s}=540$  GeV, *Phys. Lett. B* 122, no. 1, pp. 103-116, 1983

G. Arnison et al., Experimental-observation of lepton pairs of invariant mass around 95 GeV/c<sup>2</sup> at the CERN SPS collider, *Phys. Lett. B* 126, no. 5, pp. 398-410, 1983

## ● **t quark observation: CDF, D0** (citations: 1005, 888)

F. Abe et al., Observation of top-quark production in p $\bar{p}$ -p collisions with the Collider Detector at Fermilab, *Phys. Rev. Lett.* 74, no. 14, pp. 2626-2631, 1995

S. Abachi et al., Observation of the Top Quark, *Phys. Rev. Lett.* 74, no. 14, pp. 2632-2637, 1995

## ● **Neutrino oscillations** (citations: 2906)

Y. Fukuda et al., Evidence for oscillation of atmospheric neutrinos, *Phys. Rev. Lett.* 81, no. 8, pp. 1562-1567, 1988

## ● **CP violation observation: E832, Belle, BaBar** (citations: 346, 361, 335)

A. Alavi-Harati et al., Observation of direct CP violation in K-S, K-L  $\rightarrow$   $\pi\pi$  decays, *Phys. Rev. Lett.* 83, no. 1, pp. 22-27, 1999  
K. Abe et al., Observation of large CP violation in the neutral B meson system, *Phys. Rev. Lett.* 87, no. 9, p. 091802, 2001

B. Aubert et al. BaBar, Observation of CP violation in the B<sub>0</sub> meson system, *Phys. Rev. Lett.* 87, no. 9, p. 091801, 2001

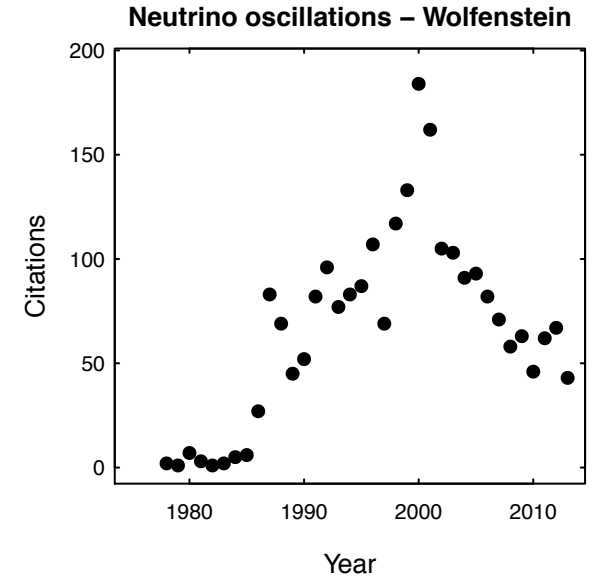
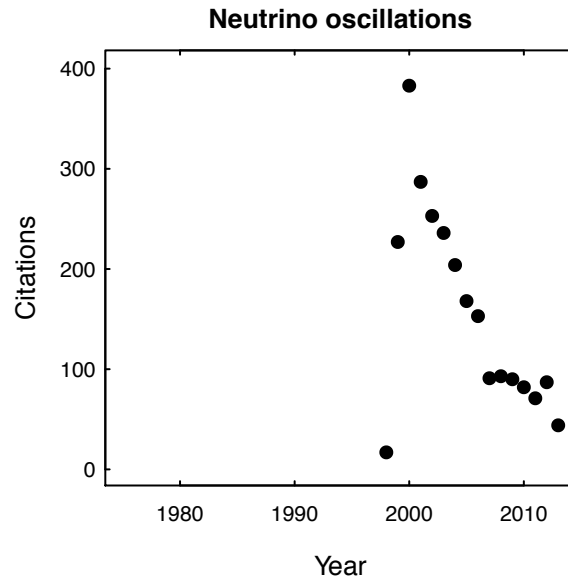
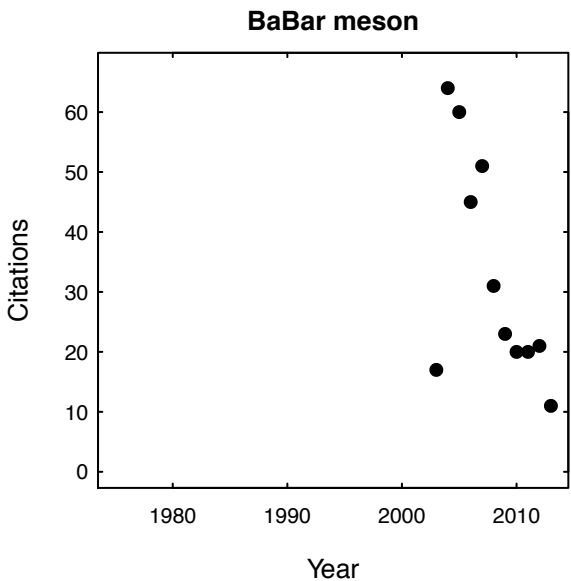
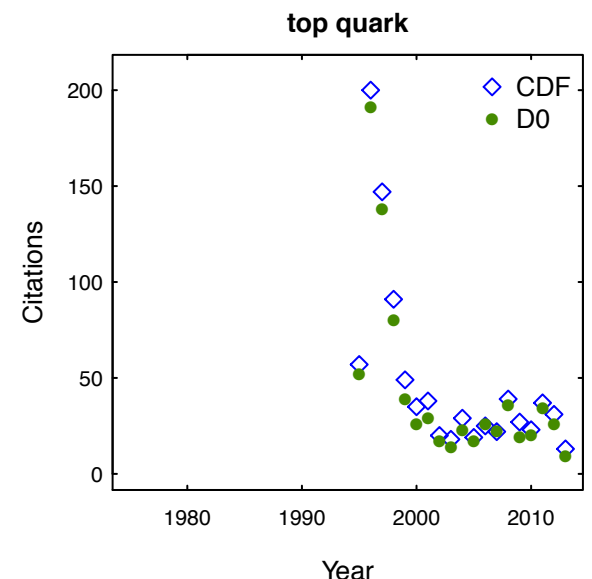
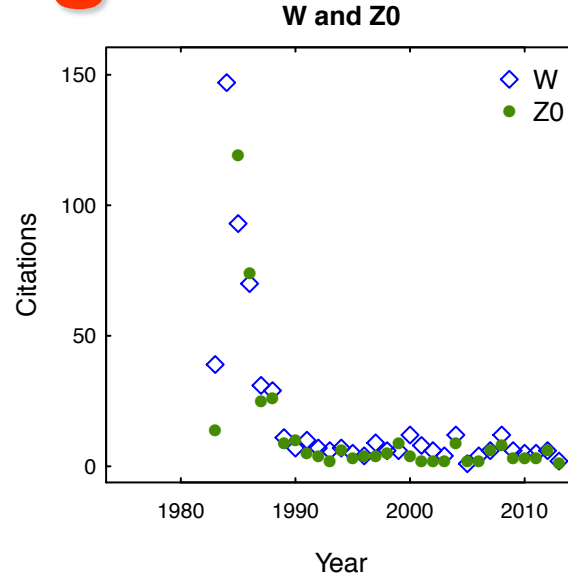
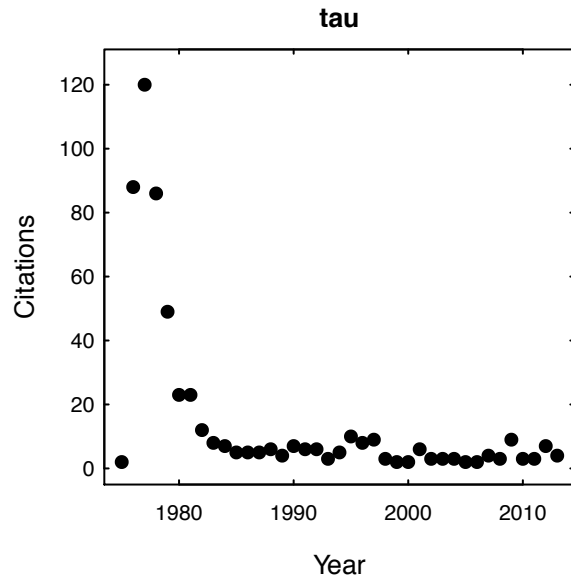
## ● **Higgs boson observation** (citations: 681, 644)

G. Aad et al., Observation of a new particle in the search for the Standard Model Higgs boson with the ATLAS detector at the LHC, *Phys. Lett. B* 716, no. 1, pp. 1-29, 2012

S. Chatrchyan, Observation of a new boson at a mass of 125 GeV with the CMS experiment at the LHC, *Phys. Lett. B* 716, no. 1, pp. 30-61, 2012



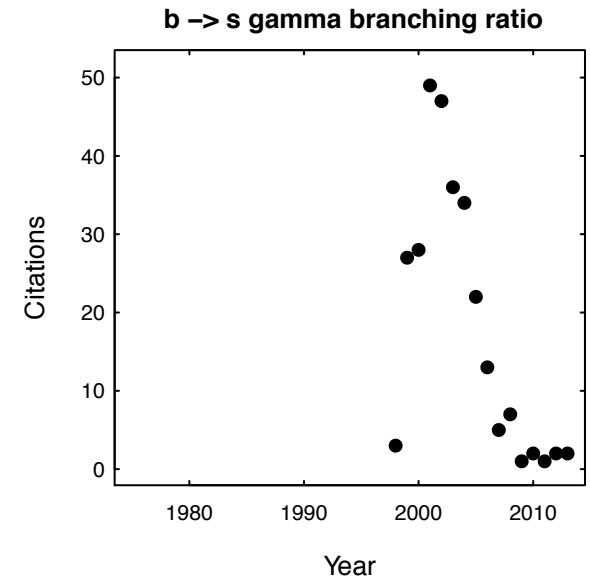
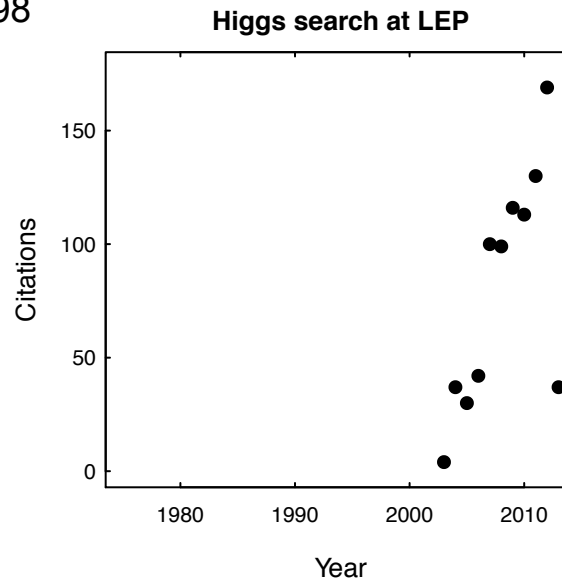
# Sic transit gloria mundi



# LEP

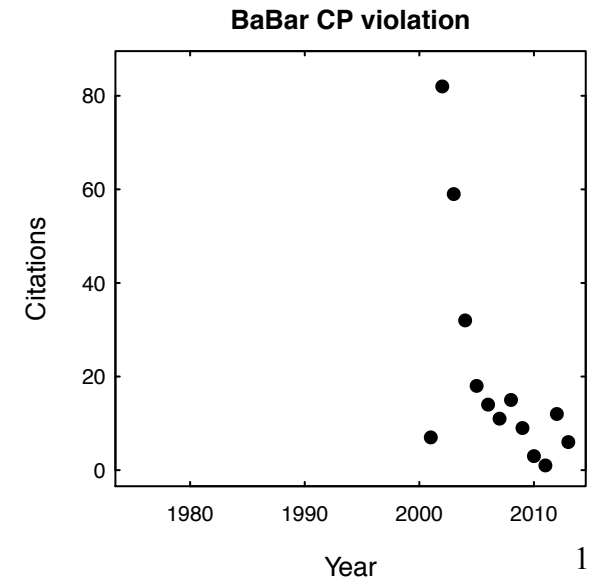
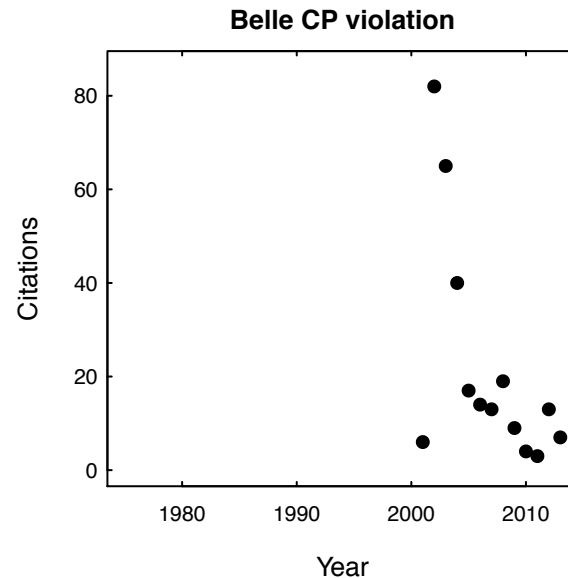
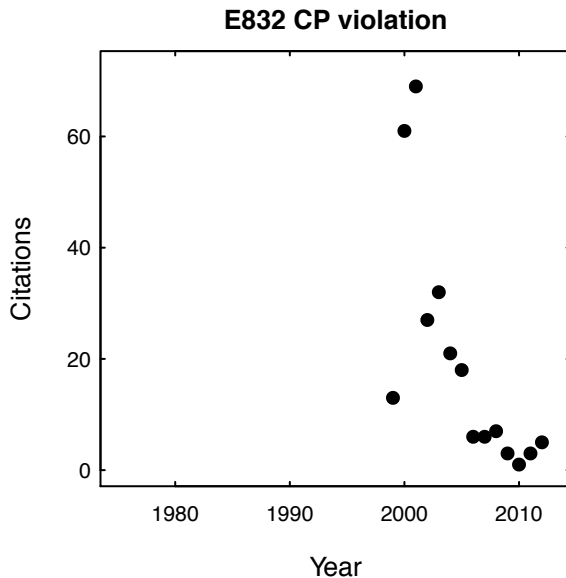
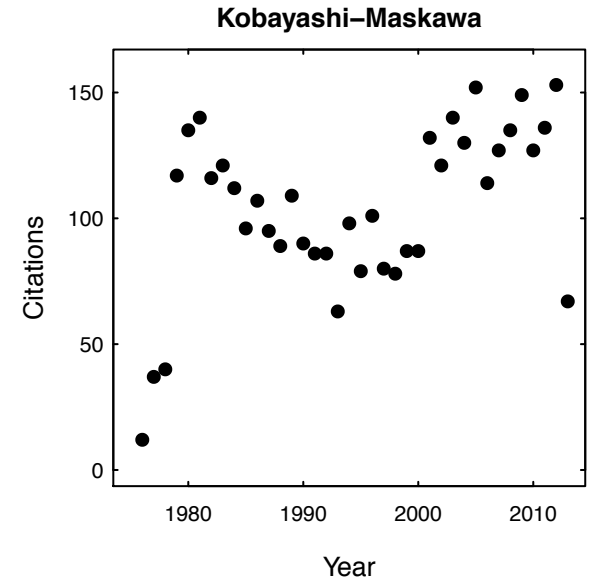
1. ALEPH, DELPHI, L3, OPAL, **Search for the standard model Higgs boson at LEP**, Phys. Lett. B, vol. 565, no. 1-4, pp. 61-75, 2003.  
– Times Cited: **978**
2. B. Adeva et al., The construction of the L3 experiment, NIM A 289, no. 1-2 , pp. 35-102, 1990  
– Times Cited: **512**
3. ALEPH, DELPHI, L3, OPAL, Search for neutral MSSM Higgs bosons at LEP, EPJC 47, no. 3 , pp. 547-587, 2006  
– Times Cited: **390**
4. D. Decamp et al., ALEPH - A detector for electron-positron annihilations at LEP, NIM A 294, no. 1-2 , pp. 121-178, 1990  
– Times Cited: **342**
5. J. Allison et al., The detector simulation program for the OPAL experiment at LEP, NIM A 317, no. 1-2, pp. 47-74, 1992  
– Times Cited: **341**
6. R. Barate et al. ALEPH Collaboration, **A measurement of the inclusive  $b \rightarrow s$  gamma branching ratio**, Phys. Lett. B. 429, no. 1-2 , pp. 169-187, 1998  
– Times Cited: **314**

What makes a paper  
of lasting value?



# CP violation

- M. Kobayashi, T. Maskawa, CP-violation in renormalizable theory of weak interaction, *Progr. Theor. Phys.* 49, no. 2, pp. 652-657, 1973 – 4272 citations
- A. Alavi-Harati et al. **E832**, Observation of direct CP violation in K-S, K-L  $\rightarrow$   $\pi\pi$  decays, *Phys. Rev. Lett.* 83, no. 1, pp. 22-27, 1999 – 346 citations
- K. Abe et al. **Belle**, Observation of large CP violation in the neutral B meson system, *Phys. Rev. Lett.* 87, no. 9, p. 091802, 2001 – 361 citations
- B. Aubert et al. **BaBar**, Observation of CP violation in the  $B^0$  meson system, *Phys. Rev. Lett.* 87, no. 9, p. 091801, 2001 – 335 citations



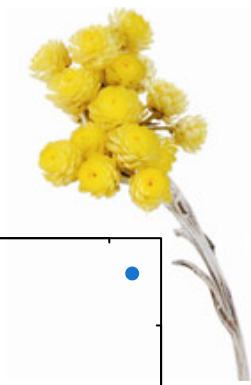
# Higgs boson

- ATLAS Collaboration, Observation of a new particle in the search for the Standard Model Higgs boson with the ATLAS detector at the LHC, *Phys. Lett. B* 716, pp.1-29, 2012
  - Times Cited: 730
- CMS Collaboration, Observation of a new boson at a mass of 125 GeV with the CMS experiment at the LHC, *Phys. Lett. B* 716, pp. 30-61, 2012
  - Times Cited: 695

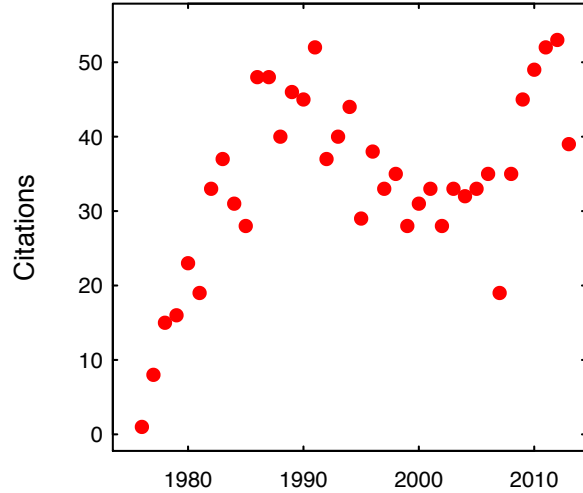
**How long is glory going to last?**

- *Canc. Genome Atlas Res. Network, Comprehensive genomic characterization defines human glioblastoma genes and core pathways, Nature* 455, pp. 1061-1068, 2008
  - Times Cited: 1379

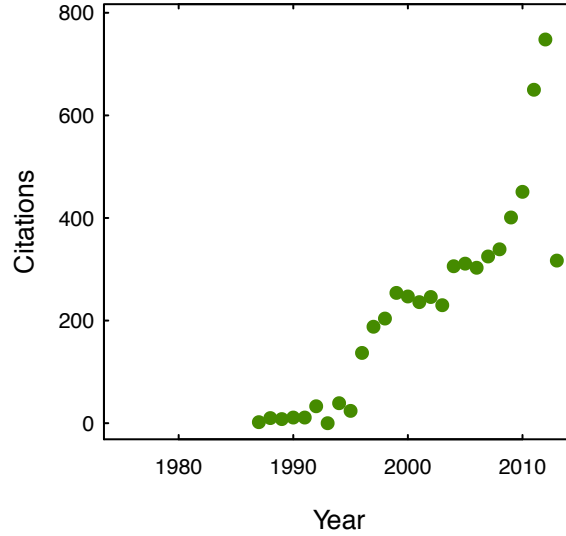
# Evergreen



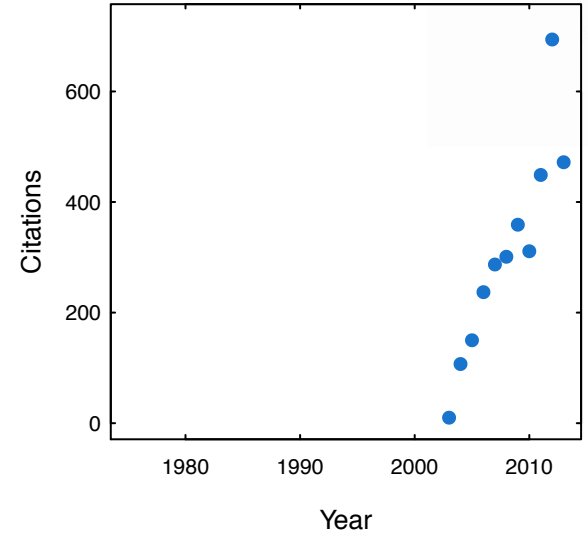
**MINUIT**



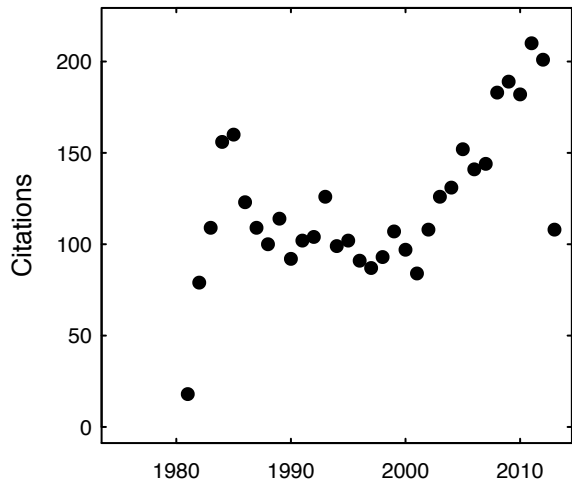
**Pythia**



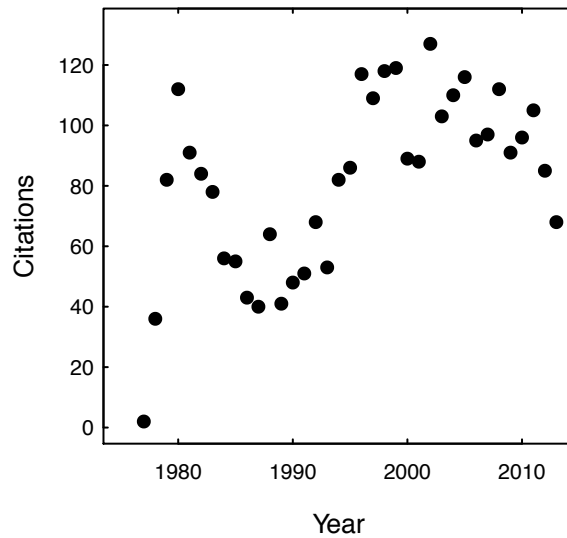
**Geant4**



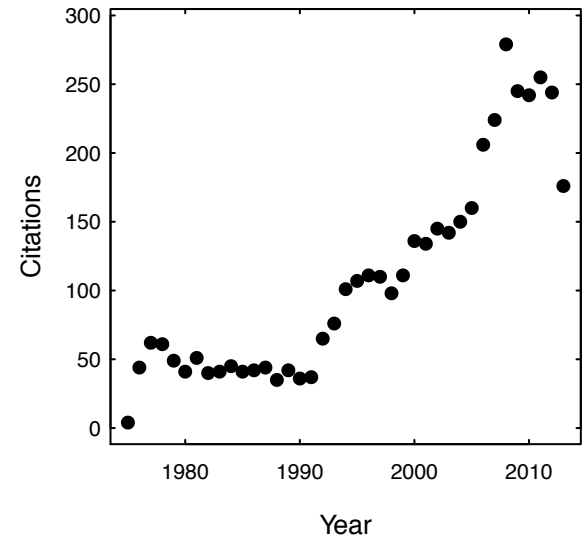
**A.H. Guth, Inflationary universe**



**Altarelli-Parisi**

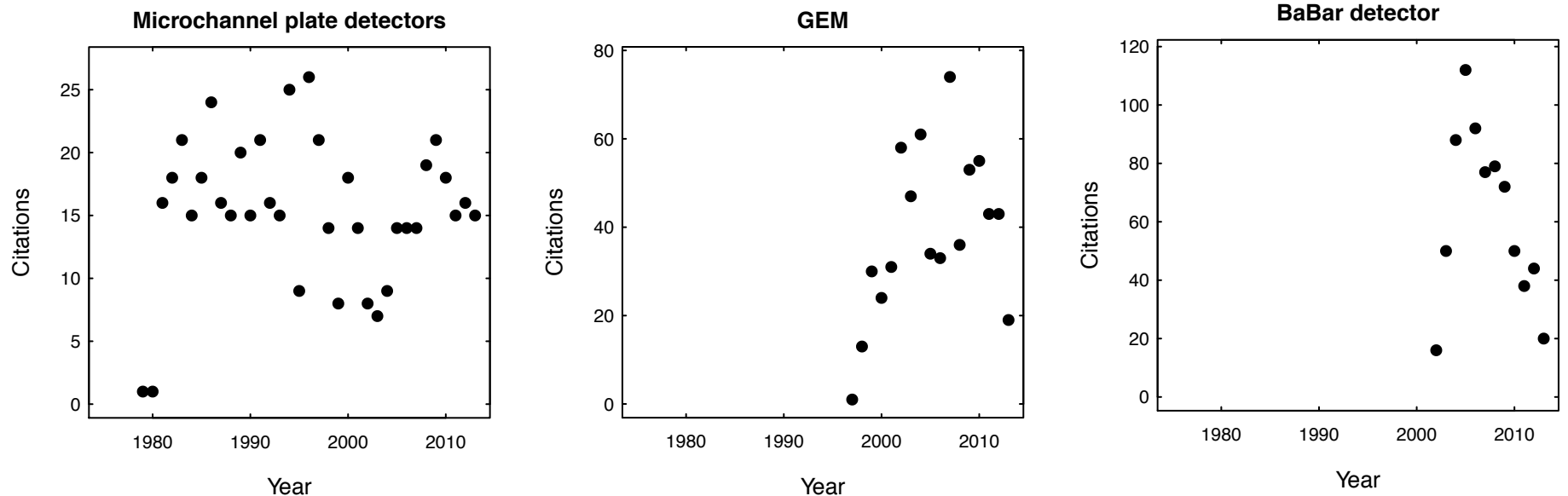


**Hawking, black holes**





# Hardware



- B. Aubert et al., The BABAR detector, NIM A 479, no. 1, pp. 1-116, 2002
  - Times Cited: 952
- F. Sauli, GEM: A new concept for electron amplification in gas detectors, NIM A 386, no. 2-3, pp. 531-534, 1997
  - Times Cited: 904
- J. L. Wiza, Microchannel plate detectors, NIM 162, no. 1-3, pp. 587-601, 1979
  - Times Cited: 586

# Inspired news

James Gillies, head of communication for CERN, admitted that the institute "very shamelessly" uses the collider to build a platform to promote particle physics and said they were always keen to make the most of Hollywood's interest. However he added that the organisation is careful to show how the Higgs story was part of a broader push for scientific discovery.

By Ben Riley-Smith  
11:55AM BST 07 Jun 2013

**The Telegraph**

"You have to shout to be heard when it comes to getting science into the media and people to listen," said Professor Lythgoe.

Hannah Devlin Science Editor  
Published at 12:01AM, June 7 2013

**THE TIMES**  
**THE AUSTRALIAN** 

<http://www.telegraph.co.uk/science/10105715/God-particle-overhyped-says-man-behind-discovery.html>

<http://www.thetimes.co.uk/tto/science/article3784820.ece>

<http://www.theaustralian.com.au/news/world/god-particle-no-big-deal-says-scientist-who-predicted-it-peter-higgs/story-fnb64oi6-1226659215259#>

# 24 April 2013

## LHCb experiment observes new matter-antimatter difference

24 Apr 2013



Press Office

Geneva, 24 April 2013. The LHCb collaboration at CERN<sup>1</sup> today submitted a paper to *Physical Review Letters* on the first observation of matter-antimatter asymmetry in the decays of the particle known as the  $B^0_s$ . It is only the fourth subatomic particle known to exhibit such behaviour.

## Materia e antimateria, un indizio per risolvere il grande mistero dell'universo

**CORRIERE DELLA SERA**

...fatti noi e le stelle mentre l'antimateria, che pur doveva esserci, non ha lasciato traccia, scomparendo del tutto? Ora al **cern** di Ginevra con l'esperimento LHCb, uno dei quattro innestati nel grande acceleratore Large Hadron Collider, hanno ottenuto...

Categoria: primopiano > Scienze e Tecnologie | Pubblicato il 24 April 2013

Scientists working on the LHCb detector at the Large Hadron Collider have now announced that they have spotted a slight difference in the way antimatter decays that may go some way to explaining this.



By **Richard Gray**, Science Correspondent

6:48PM BST 24 Apr 2013



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**The Telegraph**

Maria Grazia Pia, *INFN Genova*

# ATHENA's antihydrogen

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## Thousands of cold anti-atoms produced at CERN

18 Sep 2002

The New York Times

U.S.

WORLD

U.S.

N.Y. / REGION

BUSINESS

TECHNOLOGY

SCIENCE

HEALTH

POLITICS EDUCATION TEXAS

## Physicists' Antimatter Recipe Is More Sci- Than Fi

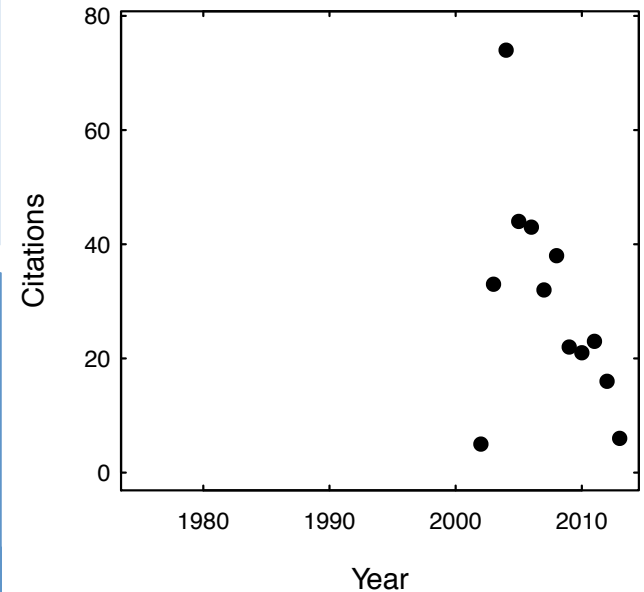
By DENNIS OVERBYE

Published: September 19, 2002

Correction Appended

Physicists working in Europe announced yesterday that they had passed through nature's looking glass and had created atoms made of antimatter, or antiatoms, opening up the possibility of experiments in a realm once reserved for science fiction writers. Such experiments, theorists say, could test some of the basic tenets of modern physics and light the way to a deeper understanding of nature.

## Antihydrogen atoms



M. Amoretti et al., Production and detection of cold antihydrogen atoms, *Nature*, vol. 419, no. 6906, pp. 456-459, 2002

Times Cited: 463



DIE WELT Digital testen und iPad mini gewinnen!<sup>3</sup>

> Mehr er

19.09.02

## Forscherteam produziert Treibstoff für die Enterprise

Präzisionsmessungen an Anti-Wasserstoff sollen jetzt Theorien der Physik auf den Prüfstand stellen *Von Thomas Bührke*

ARTIKEL EMPF

# la Repubblica

# Le Monde

### A Ginevra nasce l' antimateria da freezer

...ROMA - L' antimateria è tornata ad esistere, prodotta in quantità significativa dai fisici del Cern, il laboratorio di fisica delle particelle di Ginevra. Quello che sembrava un paradosso della...

la Repubblica | 19 settembre 2002 | pag. 30 | sez. CRONACA

### Les physiciens ont fabriqué une multitude d'antimondes

ABONNÉS

LE MONDE | 20 septembre 2002 | JEAN-FRANCOIS AUGEREAU. | 849 mots

Seule solution pour le savoir, regarder si les grandes lois de la physique restent « invariantes » dans une expérience qui met en jeu et associe simultanément les trois symétries de la physique : la symétrie C qui remplace la matière par de l'antimatière ; la symétrie P qui met en scène...

Natur und Wissenschaft

### Antiwasserstoff in Hülle und Fülle

Langsame Positronen und Antiprotonen behutsam vereinigt

Der Antimaterie ist in der Welt der normalen Materie keine große Zukunft beschieden. Wenn nämlich ein Teilchen mit seinem Antiteilchen zusammentrifft, ...

# Frankfurter Allgemeine

ZEITUNG FÜR DEUTSCHLAND



# CERN press office

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## New State of Matter created at CERN

10 Feb 2000

### Il vero volto dell' Universo

...Ginevra L' annuncio ufficiale verrà dato questa mattina a Ginevra: per la prima volta nella storia dell' Universo conosciuto, gli scienziati del Cern (Centro europeo di ricerche nucleari) sono...

di FRANCO PRATTICO

la Repubblica | 10 febbraio 2000 | pag. 35 | sez. CULTURA

# la Repubblica

### L'après-big bang recréé en laboratoire

Le Figaro -  Article, infographie - 

Fabrice NODE-LANGLOIS | Créé le 10 février 2000

Une équipe de physiciens d'une vingtaine de pays présente aujourd'hui au **Cern** (1) à Genève le fruit de six années d'un travail fondamental[...]Les équipes du **Cern**[...]les atomes de plomb dans une « boule de feu », pour reprendre l'image des physiciens du **Cern**[...]Moins d'un milliardième de milliardième de seconde, estime Claude ...

# LE FIGARO



**FERMILAB**

A Department of Energy National Laboratory

**NEWS RELEASE**

**top  
quark**

**News Release - March 2, 1995**

**NEWS MEDIA CONTACTS:**

Judy Jackson, 708/840-4112 (Fermilab)

Gary Pitchford, 708/252-2013 (Department of Energy)

Jeff Sherwood, 202/586-5806 (Department of Energy)

Office of Public Affairs

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Batavia, IL 60510

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Fax 630-840-8780

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**PHYSICISTS DISCOVER TOP QUARK**

**Elusive Atomic Particle Found by Physicists**

By MALCOLM W. BROWNE  
Published: March 03, 1995

**The New York Times**

Culminating nearly a decade of intense effort, two rival groups of physicists announced today that they had found the elusive top quark -- an ephemeral building block of matter that probably holds clues to some of the ultimate riddles of existence.

**Top-Quark zweifelsfrei nachgewiesen**

Standardmodell der Elementarteilchen bestätigt / Von Christoph Ettl

FRANKFURT, 2. März. Die Existenz des sogenannten Top-Quarks ist jetzt experimentell gesichert. Dies gaben am Donnerstag Forscher vom Fermi National ...

März 1995 | Politik | 472 Wörter

**Frankfurter Allgemeine**

ZEITUNG FÜR DEUTSCHLAND

**ECCO IL TOP QUARK L' ULTIMO MISTERO DELLA MATERIA**

...ROMA - E' ufficiale: l' ultimo mistero della materia è stato definitivamente svelato. Il top quark, la sesta e ultima particella dello "zoo" subnucleare, della cui esistenza un anno fa si erano...

**la Repubblica**

**Des physiciens ont déchiffré l'alphabet des particules**

2 mars 1995 | . JEAN-FRANCOIS AUGEREAU. . | 431 mots

**Le Monde**

Depuis bien longtemps déjà, les chercheurs ont montré qu'il leur suffisait de disposer d'un alphabet de douze particules pour construire les mots et les phrases permettant de décrire la matière qui nous entoure : six leptons (parmi lesquels on trouve, par exemple, l'électron, composant de base de...

# CMS magnet



## Giant magnet goes underground at CERN

28 Feb 2007

Geneva, 28 February 2007. At 6:00 am this morning the heaviest piece of the Compact Muon Solenoid (CMS) particle detector began a momentous journey into the experiment's cavern, 100 metres underground at CERN<sup>1</sup>. Using a huge gantry crane, custom-built by the Vorspann System Losinger Group, the pre-assembled central piece, containing the magnet and weighing as much as five Jumbo jets (1920 tonnes) is being gently lowered into place.

DIE  WELT

02.03.2007 00:00 | Die Welt

## Größter Magnet der Welt wiegt soviel wie vier Jumbo-Jets

Genf - Ein gigantischer Magnet mit dem Gewicht von vier Jumbo-Jets ist jetzt am europäischen Teilchenforschungszentrum Cern bei Genf montiert worden. Der "CMS-Detektor" ist eins von vier haushohen, ...

# Network

CERN and Caltech join forces to smash Internet speed record

15 Oct 2003



CERN<sup>1</sup> and California Institute of Technology (Caltech<sup>2</sup>) will tomorrow receive an award for transferring over a Terabyte of data across 7,000 km of network at 5.44 gigabits per second (Gbps), smashing the old record of 2.38 Gbps achieved in February between CERN in Geneva and Sunnyvale in California by a Caltech, CERN, Los Alamos National Laboratory and Stanford Linear Accelerator Center team.

## la Repubblica

16 October 2003

## The New York Times

10 November 2003

Dal Cern una connessione 20 mila volte più rapida dell'Adsl  
Permette di scaricare un cd musicale o un dvd in pochi istanti

### Un download da record nasce l'Internet superveloce

I ricercatori: "Nel futuro, collegamenti da 10 gigabit al secondo"

di ALESSIO BALBI

IMMAGINATE di poter scaricare da Internet l'ultimo cd del vostro artista preferito in un secondo. Fantascienza? Assolutamente no. È il futuro di Internet. Domani, due scienziati del Cern e del California Institute of Technology (CalTech) saranno premiati per aver realizzato, con i rispettivi team, il più impressionante record di velocità della storia della Rete: la trasmissione di un terabyte di dati a 7 mila chilometri di distanza con una velocità media di 5,44 gigabit per secondo.

But the Europeans are racing ahead in developing faster optical networks. A CERN-Caltech team set an Internet 2 Land Speed Record recently by transferring 1.1 trillion bytes of data in less than 30 minutes.

Such transfer speeds were "not even thinkable a year ago," said Flavia Donno, the computer scientist in charge of physics experiments on the grid for CERN.



# Computing?



Press Office

Global Grid **service** for LHC computing succeeds in gigabyte-per-second challenge  
12 Feb 2006

LHC Computing Grid Goes Online  
29 Sep 2003

LHC Computing Centres Join  
Forces for Global Grid Challenge  
25 Apr 2005

CERN awards the Italian Institute for Nuclear Physics  
for its role in Grid development  
01 Dec 2004

CERN recognizes UK's outstanding  
contribution to Grid computing  
02 Jun 2004

Let the number-crunching begin: the Worldwide LHC Computing Grid celebrates  
first data  
03 Oct 2008

World's Largest Computing Grid Surpasses 100 Sites  
15 Mar 2005

CERN launches Europe-wide tests of Grid technology  
16 Sep 2002

The Grid gets real  
13 Nov 2002

World's largest scientific Grid sustains a million jobs per month  
25 Sep 2006

CERN Grid leadership recognized by business world  
15 Sep 2006



# LHC Computing Grid, October 2008

Let the number-crunching begin: the Worldwide LHC Computing Grid celebrates first data



Press Office

03 Oct 2008

Geneva, 3 October 2008. Today, three weeks after the first particle beams were injected into the Large Hadron Collider—the world's largest particle accelerator—the Worldwide LHC Computing Grid celebrates the start of its crucial data challenge: the analysis and management of more than 15 million Gigabytes of data every year, to be produced from the hundreds of millions of subatomic collisions expected inside the LHC every second. This data-handling feat marks an essential stage in the process of enabling researchers to discover new physics.

## Party-Stimmung beim Cern

Am Freitag wurde mit einer Feier beim Forschungszentrum Cern in Genf das "Worldwide LHC Computing Grid" offiziell in Betrieb genommen. Dieses Computernetzwerk soll jährlich 15 Millionen Gigabyte an Messdaten speichern und verarbeiten. *DW*

DIE  WELT

la Repubblica

## Il Cern vara la rete globale dei computer Google Earth esplora gli abissi marini

...Al nastro di partenza la rete globale da 100.000 computer che potrebbe diventare l' Internet del futuro. Si chiama **Grid** (calcolo a griglia) ed è stata inaugurata con una cerimonia nel **Cern** di...

la Repubblica | 13 ottobre 2008 | pag. 31 | sez. AFFARI FINANZA

# HEP software

At most this is the result of searching for the words “CERN” and “software”...

Suchergebnis für "*cern software*"

---

31.07.2011 04:00 | Welt am Sonntag

## Web-Urknall in der Schweiz

Nur mit Hilfe des WWW können auch Laien das Internet nutzen Das Web Die meisten Labors des Kernforschungszentrums CERN lagen in den 80er-Jahren in der Schweiz, andere in Frankreich. Sie waren über ... [mehr](#)

DIE  WELT

# Scientific software in press releases

# Geant 4

S. Agostinelli et al.

## **Geant4: a simulation toolkit**

NIM A, vol. 506, no. 3, pp. 250-303, 2003

**4295 citations)**

*Most cited NIM paper*

Most cited publication in

- Nuclear Science and Technology (618147 papers)
- Instruments and Instrumentation (618147 papers)
- **Particle and Fields Physics** (264075 papers)

Most cited CERN publication in WoS

J. Allison et al.

## **Geant4 Developments and Applications**

IEEE Trans. Nucl. Sci., vol. 53, no. 1, pp. 270-278, 2006

**969 citations**

*Most cited TNS paper*

*Many papers cite the NIM paper, but they omit citing the TNS one, even though both are indicated in <http://cern.ch/geant4>*

*Many papers that use Geant4 do not cite either reference*

# CERN press office

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## Search

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# Simulation in press releases

## Putting your computer to work to fight against malaria in Africa

13 Jul 2006

Geneva, 13 July 2006. While you are sending an email or surfing the web, your computer could be helping to tackle one of Africa's major humanitarian challenges, malaria. [Africa@home](#) , a project conceived and coordinated by CERN <sup>1</sup>, was launched publicly this week. It is recruiting volunteer computers in homes and offices to run a computer-intensive simulation program called MalariaControl.net <sup>2</sup>, developed by researchers at the Swiss Tropical Institute (STI) <sup>3</sup>.

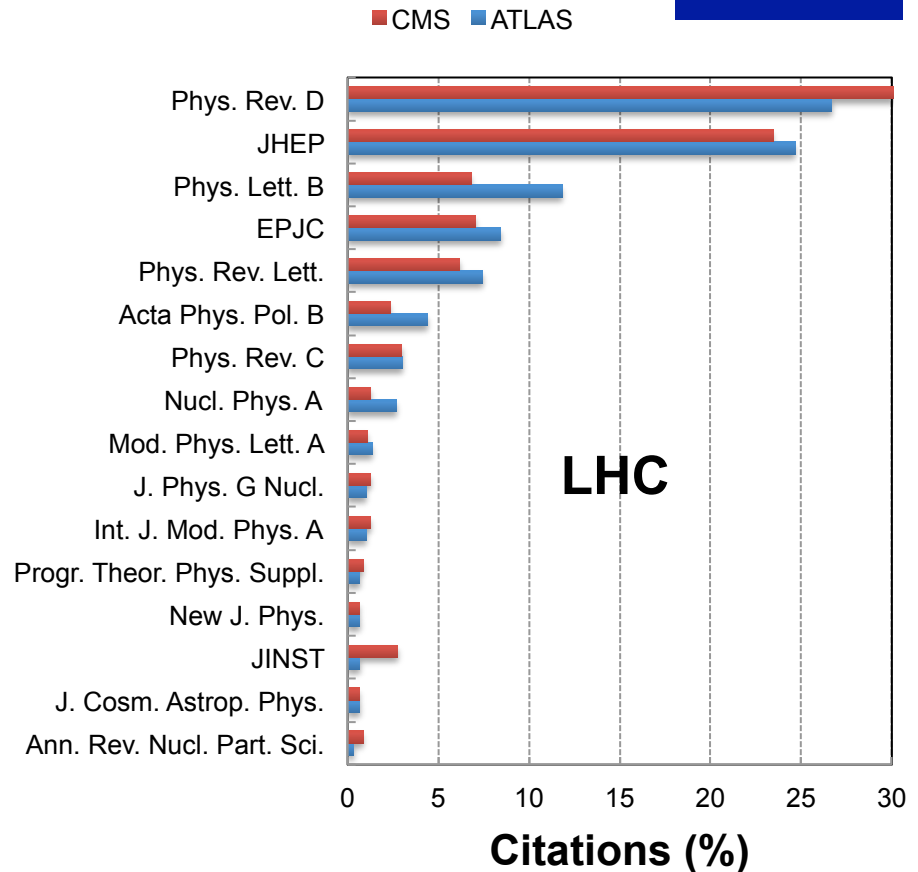
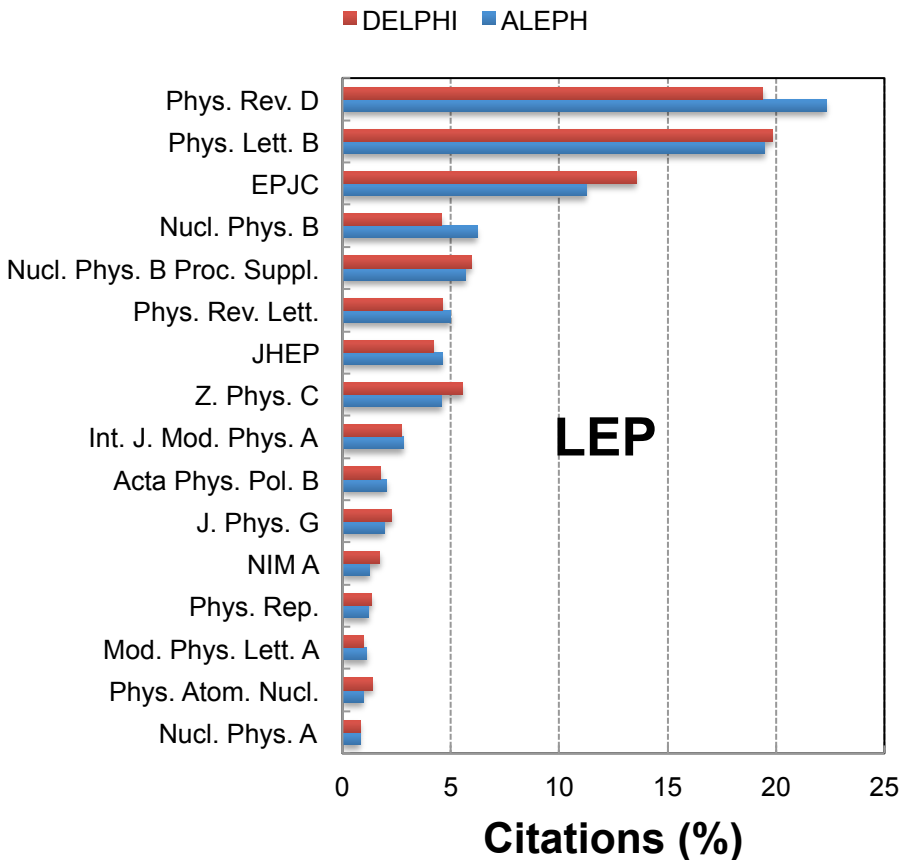
To install MalariaControl.net, volunteers just need to download the necessary software from the [Africa@home website](#) , which will do the scientific calculations in the background, while they are doing something else. The results are regularly returned to a server at the University of Geneva <sup>4</sup>, so that the researchers can evaluate them.



# Preaching to the converts?

Samples in plots account for >90% of citations

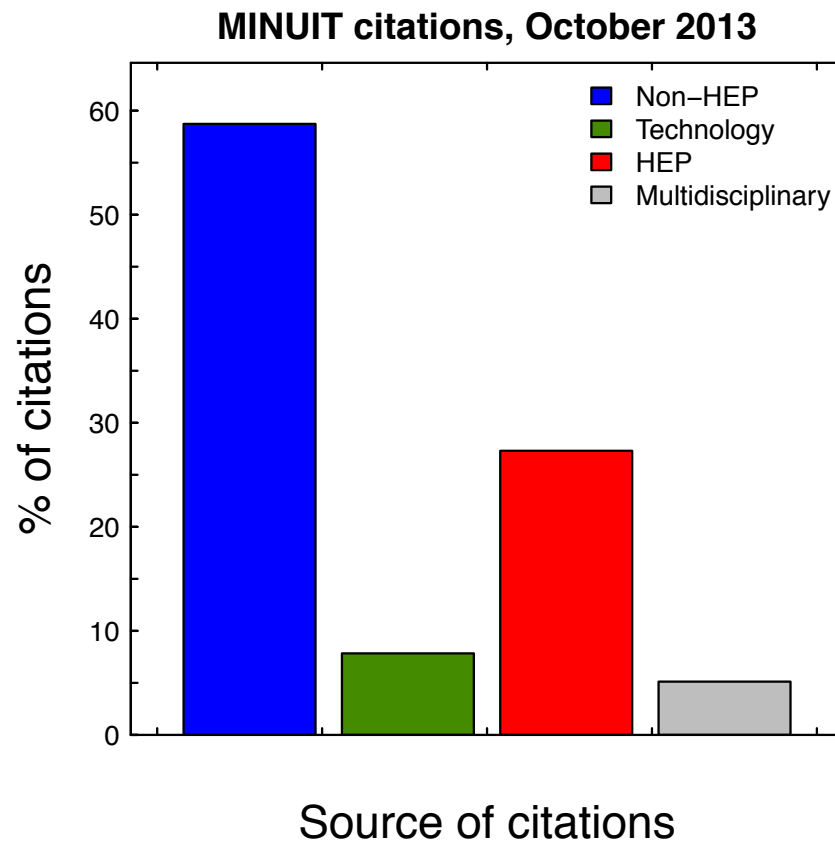
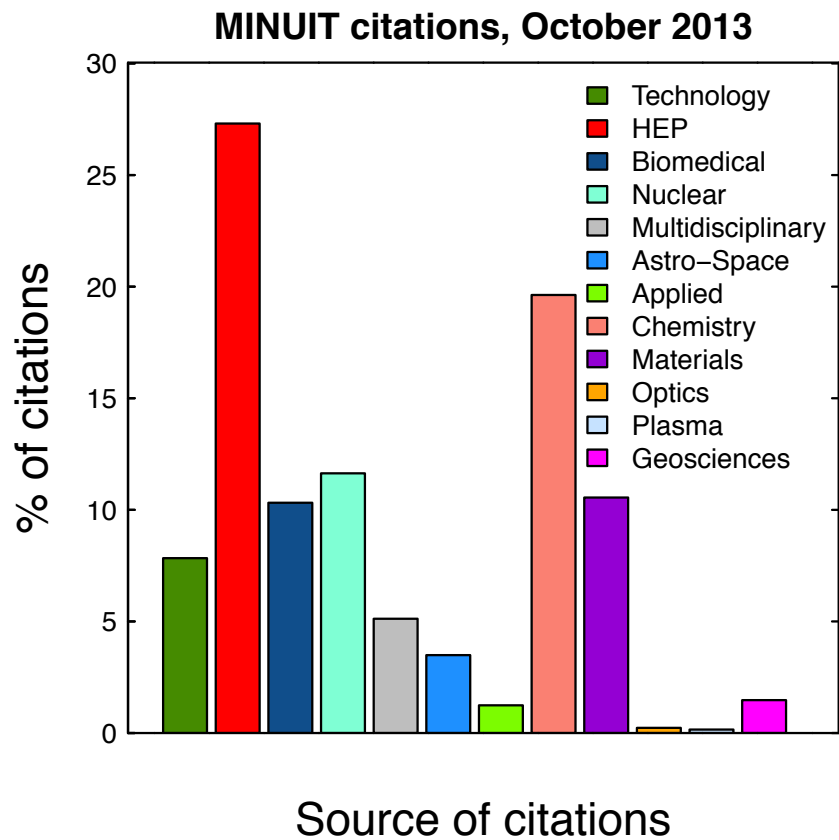
2012  
statistics



Citations of HEP physics papers mostly come from journals specialized in HEP and a few related fields (astroparticle and nuclear physics)

1. A. K. F. Haque et al., Electron impact ionization cross-section of K-shell and H- to Be-isoelectronic series: An empirical model, **RADIATION PHYSICS AND CHEMISTRY**, vol. 91, pp. 50-59, OCT 2013
2. A. de Gouvea, A. C. Kobach, The lightest massive invisible particles at the LHC, **NUCLEAR PHYSICS B**, vol. 874, no. 2, pp. 399-412, SEP 2013
3. F. Acero et al., Constraints on the galactic population of TeV pulsar wind nebulae using Fermi large area telescope observations, **ASTROPHYSICAL JOURNAL**, vol. 773, no. 1, p. 77, AUG 2013
4. B. Aharmim et al. (SNO Collaboration), Combined analysis of all three phases of solar neutrino data from the Sudbury Neutrino Observatory, **PHYSICAL REVIEW C**, vol. 88, no. 2, p. 025501, AUG 2013
5. M. Ganeshalingam et al., Constraints on dark energy with the LOSS SN Ia sample, **MONTHLY NOTICES OF THE ROYAL ASTRONOMICAL SOCIETY**, vol. 433, no. 3, pp. 2240-2258, AUG 2013
6. I. Pogrebnya et al., Mean proton and alpha-particle reduced widths of the Porter-Thomas distribution and astrophysical applications, **PHYSICAL REVIEW C**, vol. 88, no. 1, p. 015808 JUL 2013
7. J. E. Camargo-Molina et al., Stability of R parity in supersymmetric models extended by U(1)(B-L), **PHYSICAL REVIEW D**, vol. 88, no. 1, p. 01503, JUL 2013
8. A. M. Iyer et al., Warped alternatives to Froggatt-Nielsen models, **PHYSICAL REVIEW D**, vol. 88, no. 1, p. 016005, JUL 2013
9. C. T. Parsons et al., The impact of oscillating redox conditions: Arsenic immobilisation in contaminated calcareous floodplain soils, **ENVIRONMENTAL POLLUTION**, vol. 178, pp. 254-263, JUL 2013
10. J.-P. Costes et al., A Strictly Dinuclear MnIII-GdIII Complex: Synthesis and Magnetic Properties, **EUROPEAN JOURNAL OF INORGANIC CHEMISTRY**, no. 19, pp. 3307-3311, JUL 2013

# Who uses MINUIT?

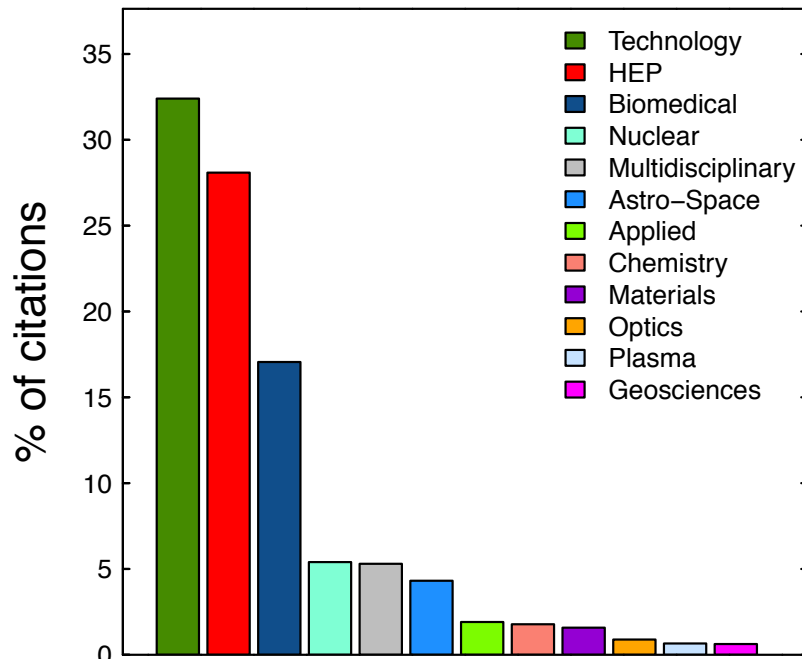


# Geant 4

October  
2013  
statistics

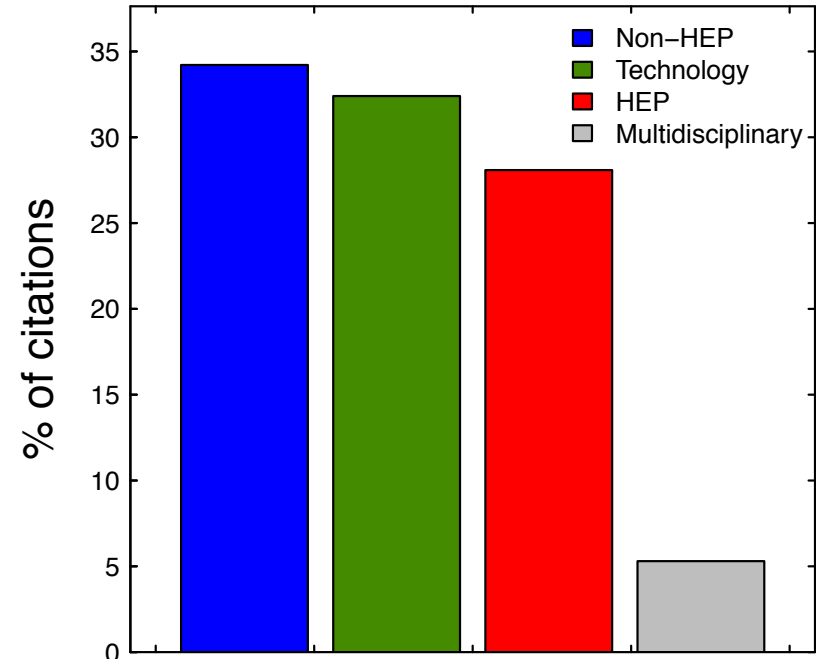
Born from LHC experimental requirements  
**Multidisciplinary** sources of citations

Geant4 citations, October 2013



Source of citations

Geant4 citations, October 2013



Source of citations

*Based on Thomson-Reuters' Web of Science data*

# Conclusions

"You have to shout to be heard when it comes to getting science into the media and people to listen," said Professor Lythgoe.

Hannah Devlin Science Editor  
Published at 12:01AM, June 7 2013


THE  TIMES

**How loud to get  
HEP software into the media  
and HEP management  
to listen?**



Among the citations of Higgs boson observation:

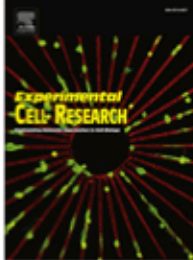
EXPERIMENTAL CELL RESEARCH 319 (2013) 1240–1246



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journal homepage: [www.elsevier.com/locate/yexcr](http://www.elsevier.com/locate/yexcr)



**Review Article**

## **Predicting the future: Towards symbiotic computational and experimental angiogenesis research**

*Katie Bentley<sup>a,b,\*</sup>, Martin Jones<sup>a</sup>, Bert Cruys<sup>c,d</sup>*

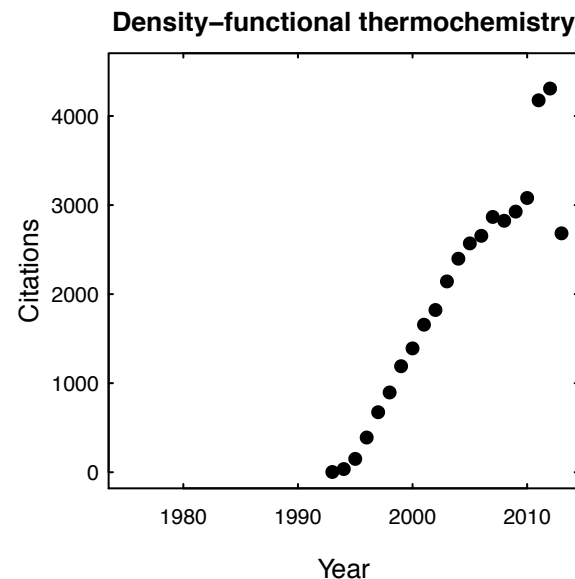
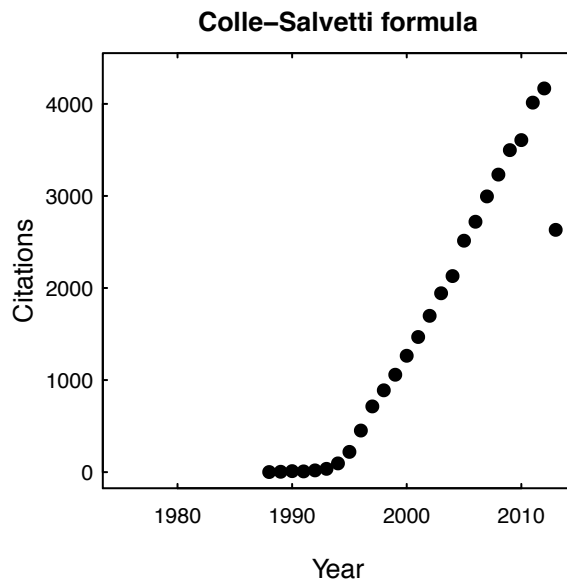
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<sup>b</sup>*Computational Biology Laboratory, CVBR, Beth Israel deaconess Medical Center, Harvard Medical School, Boston MA 02215 USA*



# Most cited physics papers

- C.T. Lee, W.T Yang, R.G. Parr, Development of the Colle-Salvetti correlation-energy formula into a functional of the electron-density, *Phys. Rev. B* 37, no. 2, pp. 785-789, 1988
  - Times Cited: 41831 (Physics, Condensed Matter)
- A.D. Becke, Density-functional thermochemistry .3. The role of exact exchange, *J. Chem. Phys.* 98, no. 7, pp. 5648-5652, 1993
  - Times Cited: 41315 (Physics, Atomic, Molecular & Chemical)



# Web of Science champions

- U.K. Laemmli, Cleavage of structural proteins during assembly of head of bacteriophage-T4, *Nature* 227, no. 5259, p. 680, 1970
  - Times Cited: 209978
- M.M. Bradford, Rapid and sensitive method for quantitation of microgram quantities of protein utilizing principle of protein-dye binding, *Anal. Biochem.* 72, no. 1-2, pp. 248-254, 1976
  - Times Cited: 148770

