

INSPIRE

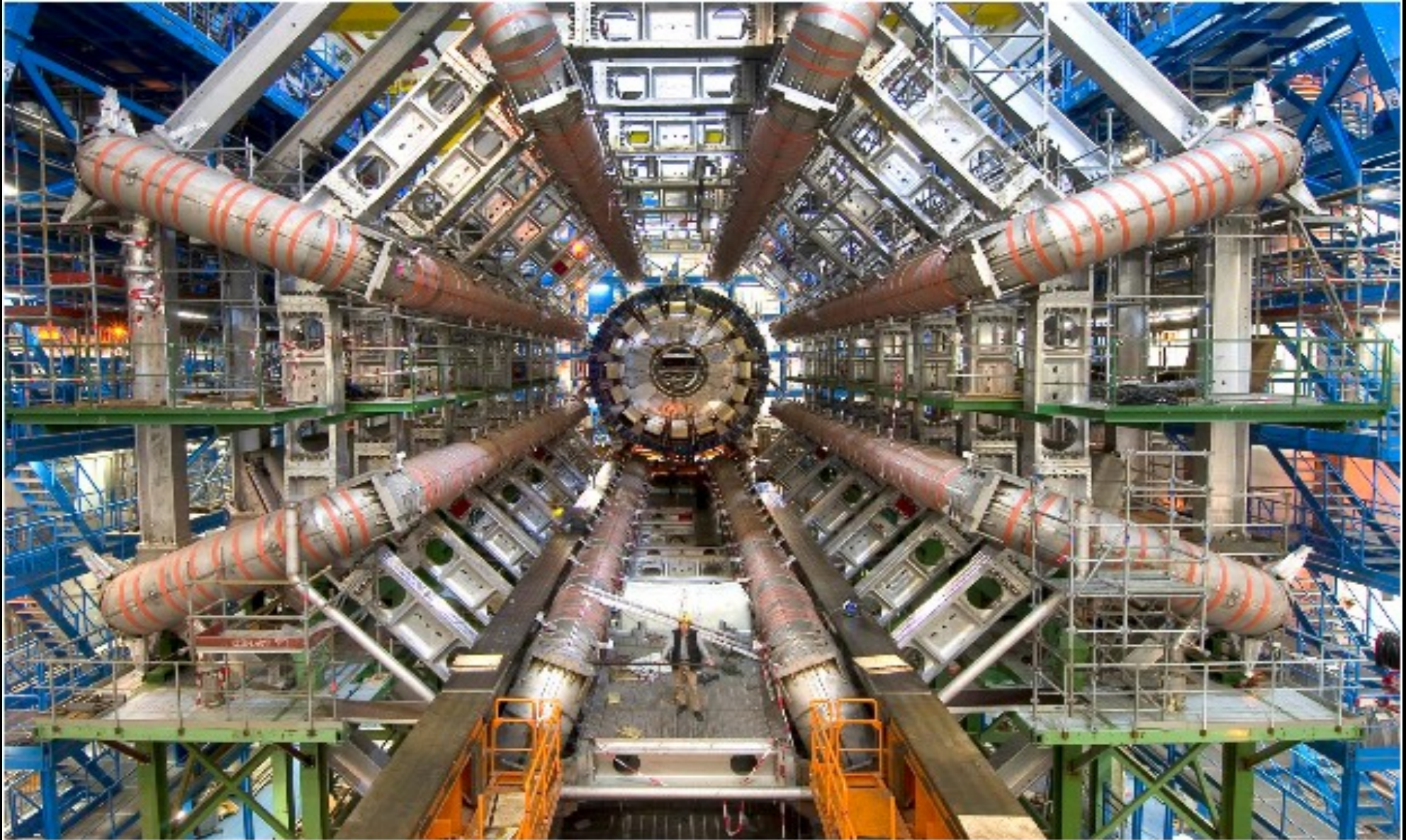
A new information system for
High-Energy Physics.
Lessons learnt.

Salvatore Mele, CERN

On behalf of the INSPIRE collaboration

OR2010 | Madrid | July 6th 2010

~15'000 High Energy Physics (HEP) scientists smash stuff at the speed of light to produce new stuff

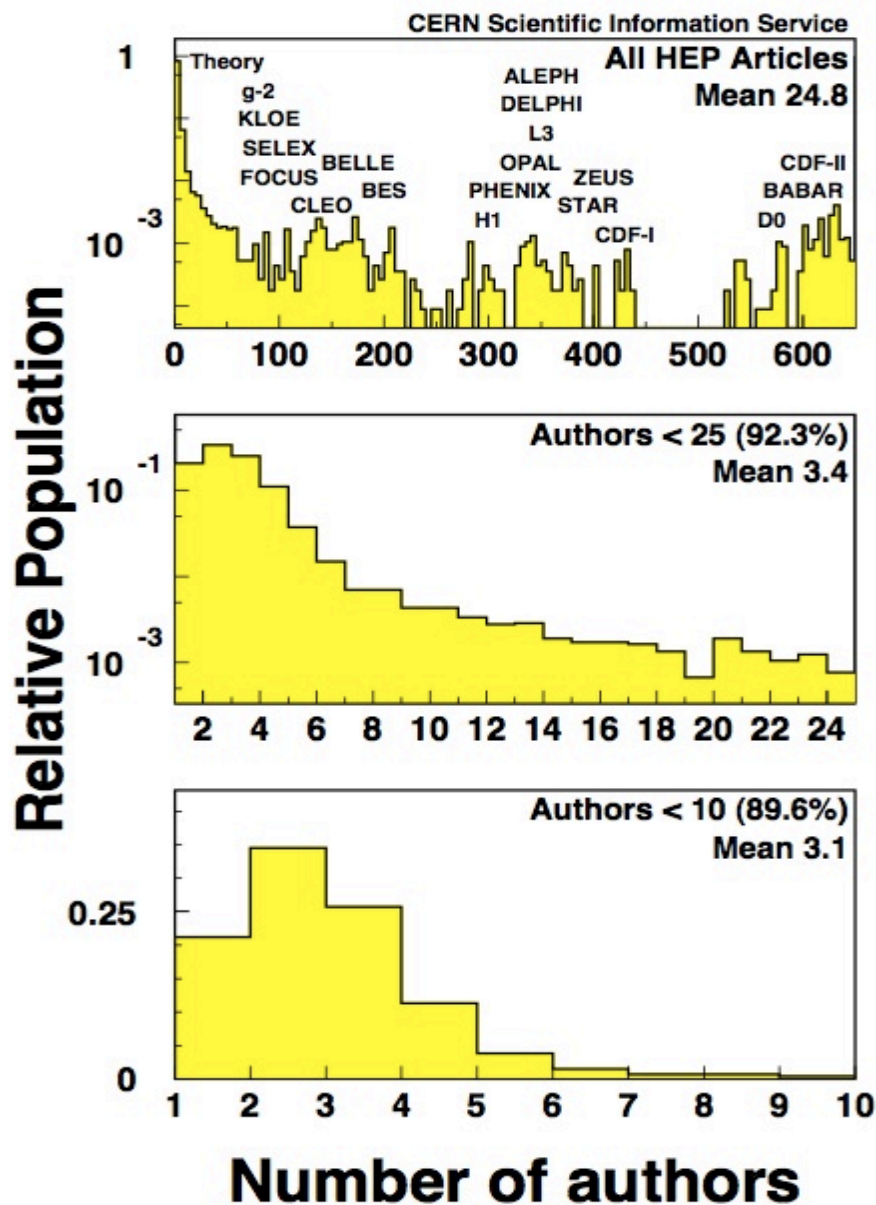




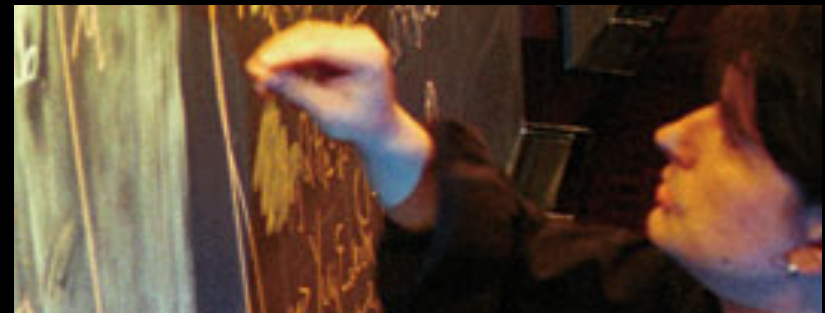
~15'000 HEP theorists scratch their heads to make sense of all that stuff and then some more



...and they write 10k papers/year 'bout it



90% of papers...
...on theory
... 3 authors



The “preprint culture”

L.Goldschmidt-Clermont, 1965, http://eprints.rclis.org/archive/00000445/02/communication_patterns.pdf

- Scientific journals of ‘60s too slow for HEP
- Mass-mail preprints to institutes worldwide
- *Ante litteram* (institute-pays) Open Access
- Leading libraries catalogue & serve preprints
- From the ‘70s SPIRES: e-Catalogue

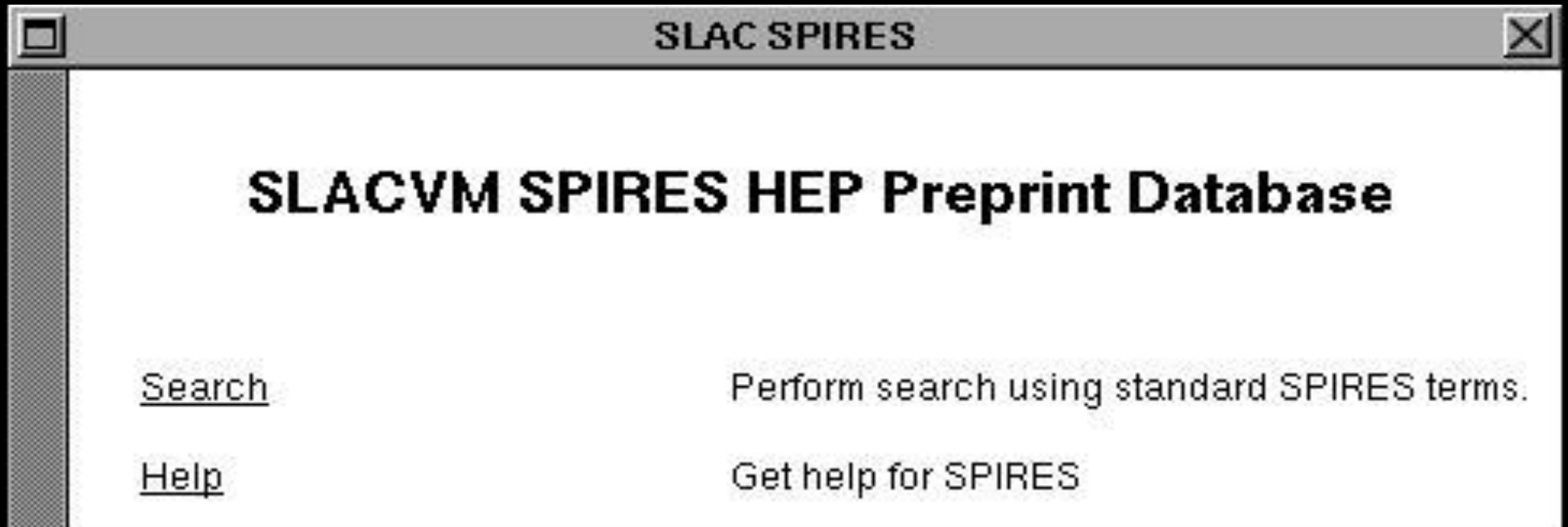


Something “vague but exciting” @CERN



(T. Berners-Lee at CERN, early '90s)

1st Web Site in the U.S.



Why we do not need mandates?
Why we do not need advocacy?

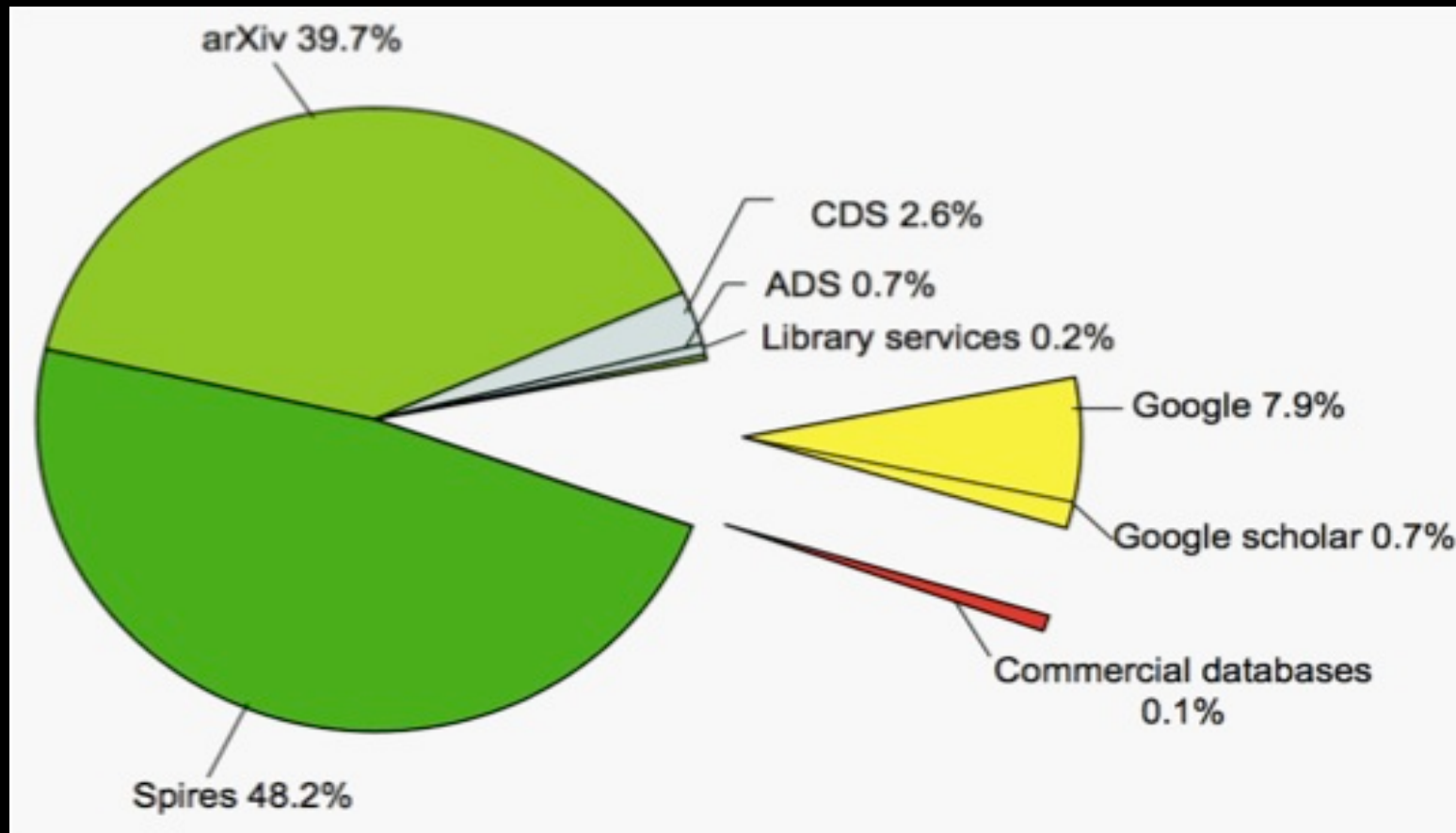
What do scientists want ?

Visibility
Acceleration
Impact

Visibility

Where do HEP scientists look for info?

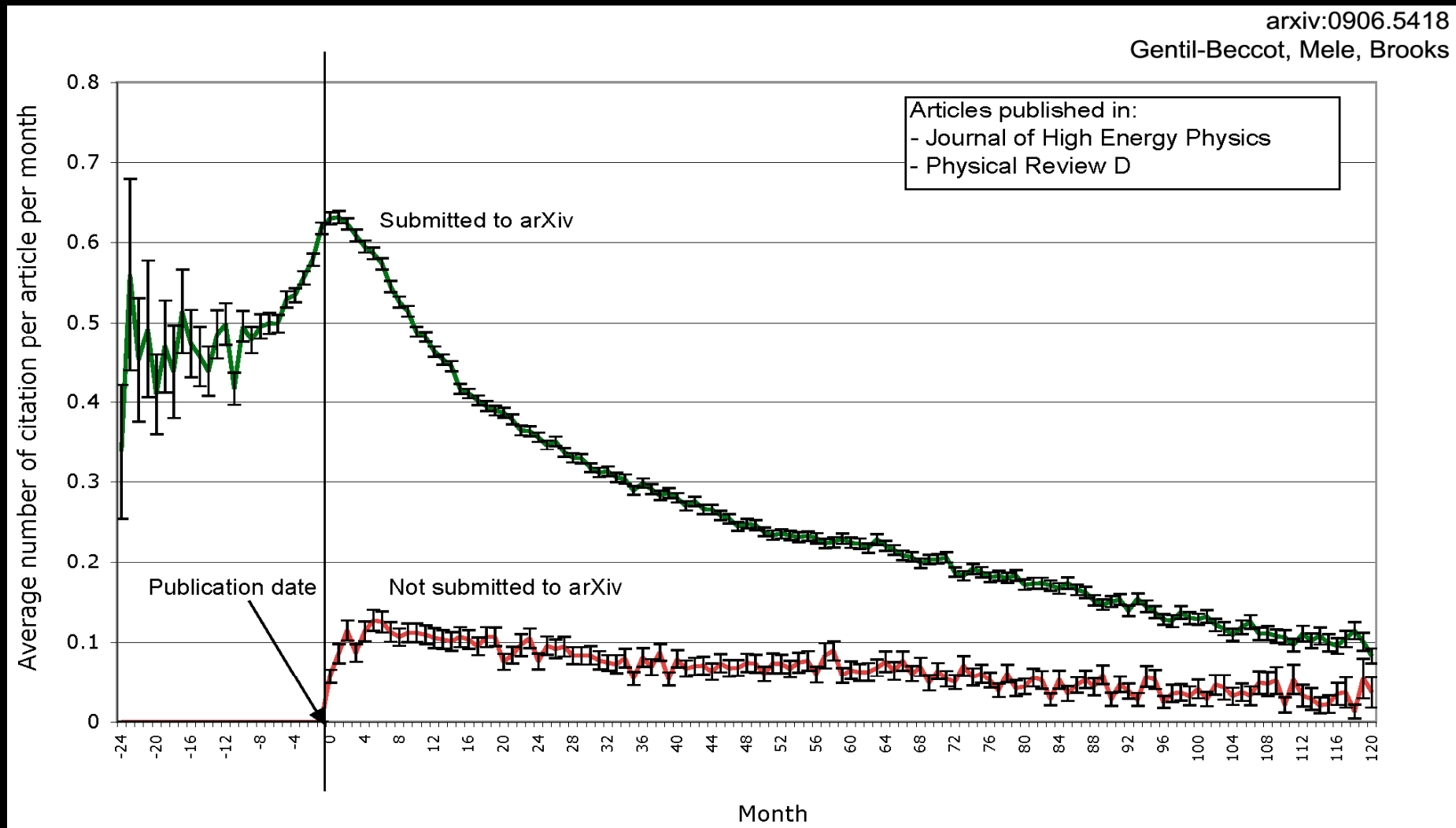
Gentil-Beccot *et al.* arxiv:0804.2701



- Survey of 2'000+ scientists (10% of community)
- OA tools answer scientists' information needs
- Google as proxy of arXiv, SPIRES, publishers

Acceleration

Ten years in the life of a HEP article

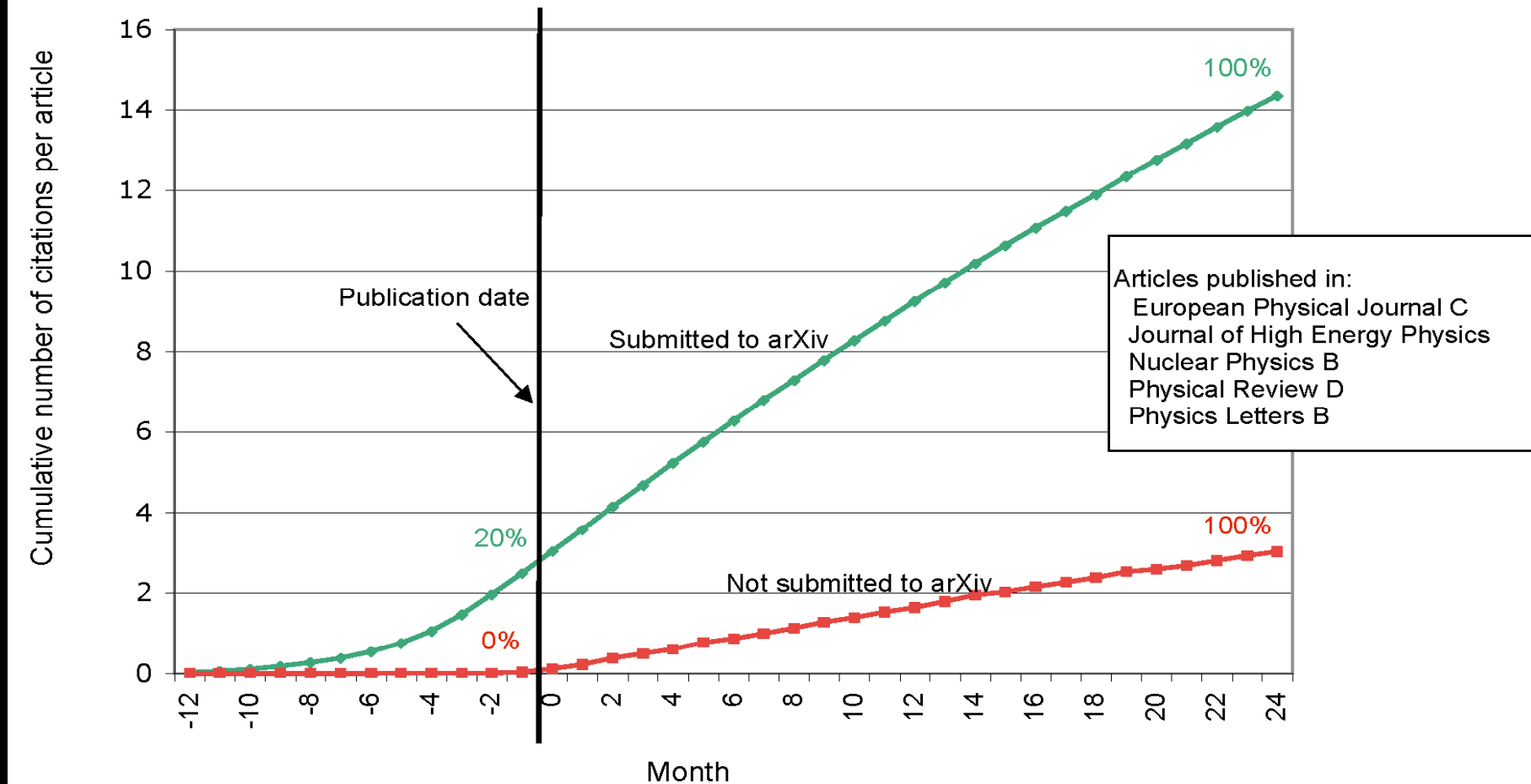


- SPIRES counts: citations to/from preprints/articles
- Citation peaks at publications
- Scientific discourse proceeds on discipline repository

Impact

Citation augmentation

arxiv:0906.5418
Gentil-Beccot, Mele, Brooks



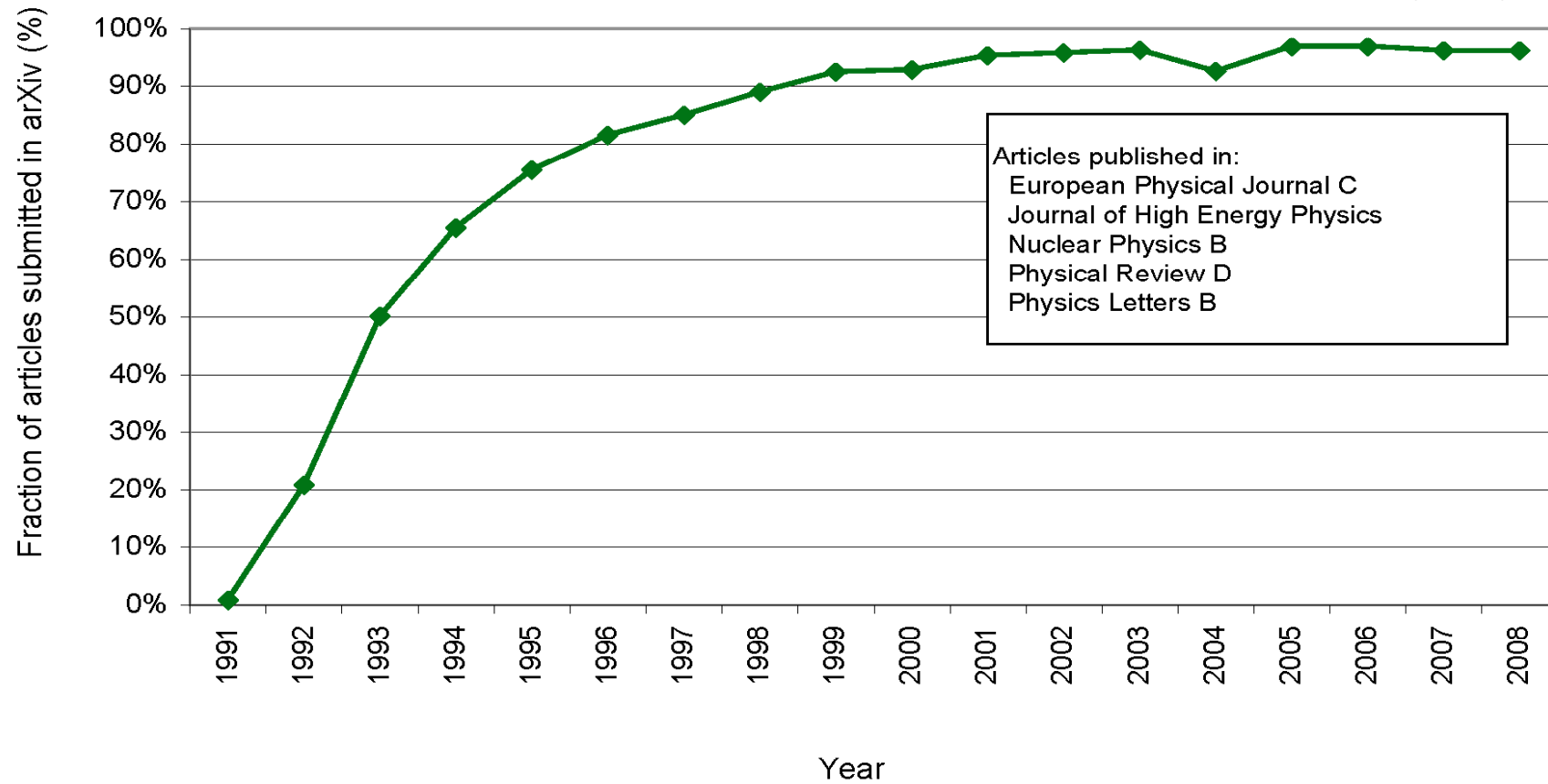
- Discipline repository yields immense advantage
 - Five times more citations for articles in arXiv
 - 20% of 2-year citations occur before publication

By the way, do they read journals?

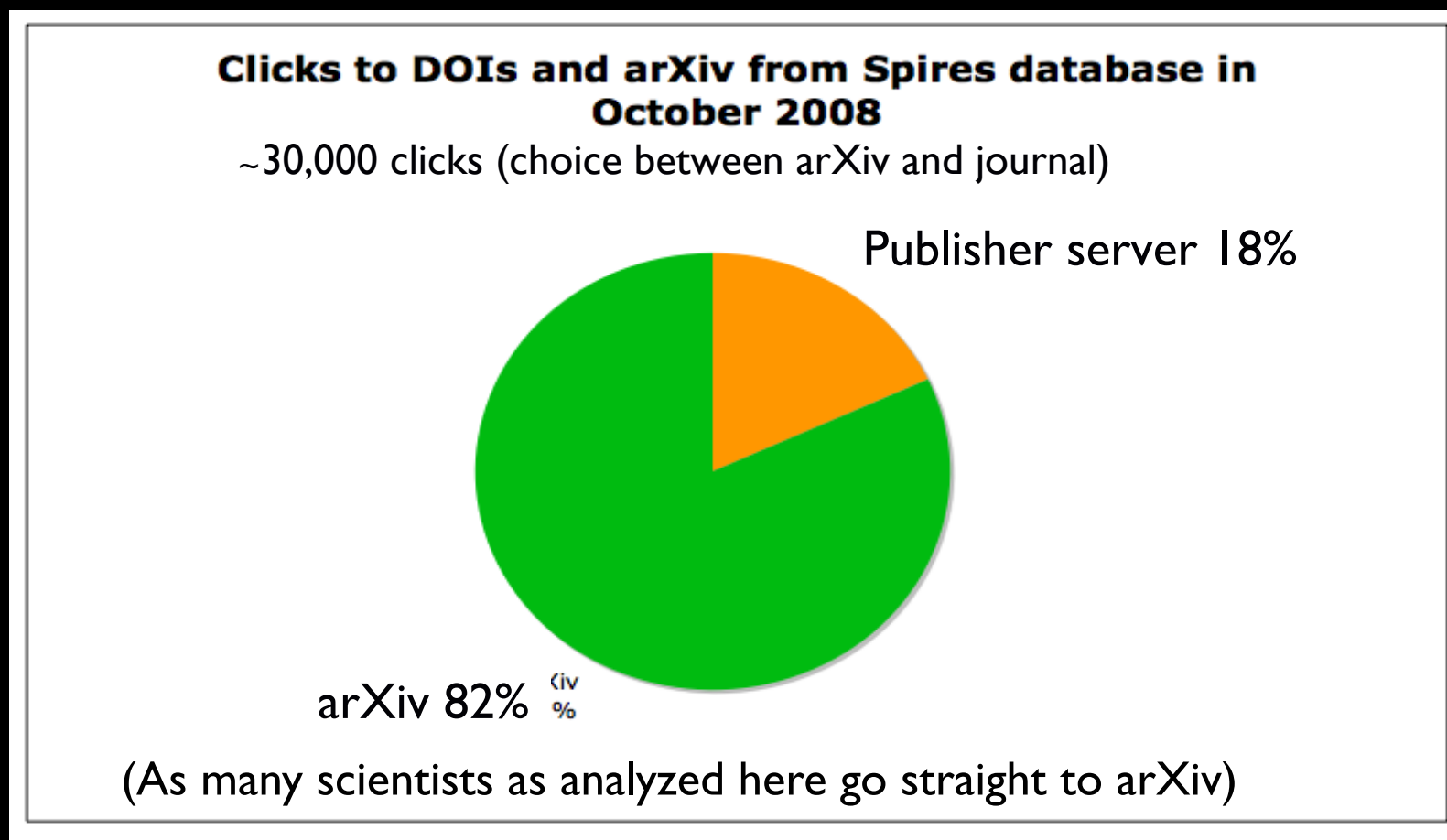
97% of HEP journals' content is in arXiv

arxiv:0906.5418

Gentil-Beccot, Mele, Brooks



Given a choice, only one in five (maybe ten) scientists goes to the published version of an article.



(Still, peer-review and journals are indispensable
SCOAP3.org will solve this conundrum)

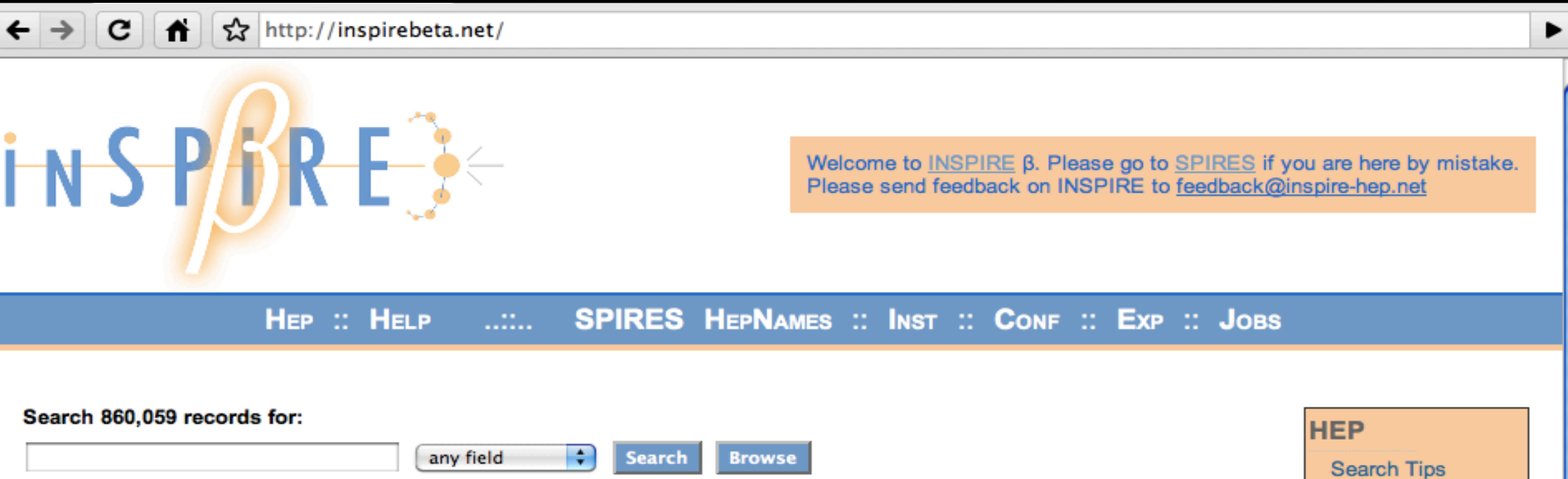
Enter INSPIRE

What is it?

What does it do?

What will it do?

Why shall I care?



The screenshot shows a web browser window with the address bar containing `http://inspirebeta.net/`. The main content area features the INSPIRE logo on the left, which includes the word "INSPIRE" in blue and a stylized orange "beta" symbol. To the right of the logo is a navigation menu with links: "HEP :: HELP", ".....", "SPIRES", "HEPNAMES", "INST", "CONF", "EXP", and "JOBS". Below the menu is a search bar with the text "Search 860,059 records for:" and a dropdown menu set to "any field". There are "Search" and "Browse" buttons. In the bottom right corner, there is a box labeled "HEP" with a link to "Search Tips". A warning message in an orange box reads: "Welcome to INSPIRE β . Please go to SPIRES if you are here by mistake. Please send feedback on INSPIRE to feedback@inspire-hep.net".

INSPIRE in a nutshell

- Joint Project of CERN, DESY, Fermilab and SLAC
- Inspired by survey HEP scientists (2000+ respondents) expecting the future from ageing SPIRES infrastructure
- Unify DESY/Fermilab/SLAC SPIRES content with CERN Invenio Open Source Digital Library Platform
- 860'000 Records/500'000 Fulltext/All that matters HEP
- 40 years of manual curation; arXiv and publishers feeds



- Invenio – CERN Open Source Digital Library solution
- <http://invenio-software.org>
- Designed for scientific libraries with 0.2-10M records
- Now also powering OpenAIRE “Orphan” repository
- (Listen to S. Kaplun’s talk today @1500 Room 2)



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Search:

mele search standard higgs lep 2003 any field Search Browse

[Search Tips](#) :: [Advanced Search](#)

Sort by:

latest first desc. times cited

Display results:

25 results single list

Output format:

HTML brief

HEP 4 records found Search took 0.05 seconds.

1. **Search for the standard model Higgs boson at LEP.**
(993) [LEP Working Group for Higgs boson searches](#) and [ALEPH](#) and [DELPHI](#) and [L3](#) and [OPAL](#) Collaborations (R. Barate *et al.*).
CERN-EP-2003-011. Mar 2003. 23 pp.
Published in **Phys.Lett. B565 (2003) 61-75**
e-Print: [hep-ex/0306033](#)

- [References](#) | [BibTeX](#) | [LaTeX\(US\)](#) | [LaTeX\(EU\)](#) | [EndNote](#)
- [Abstract](#) and [Postscript](#) and [PDF](#) from arXiv.org (mirrors: [au](#) [br](#) [cn](#) [de](#) [es](#) [fr](#) [il](#) [in](#) [it](#) [jp](#) [kr](#) [ru](#) [tw](#) [uk](#) [za](#) [aps](#) [lanl](#))
- [Journal Server](#)
- [CERN Server](#)
- [pdgLive \(measurements quoted by PDG\)](#)
- [Science Direct](#)

[Information](#)[References \(34\)](#)[Citations \(993\)](#)

Search for the standard model Higgs boson at LEP.

LEP Working Group for Higgs boson searches and ALEPH and DELPHI and L3 and OPAL Collaborations (R. Barate *et al.*) [Show all 1314 authors.](#)
Mar 2003

Phys.Lett. B565 (2003) 61-75
e-Print: [hep-ex/0306033](#)

Abstract: The four LEP collaborations, ALEPH, DELPHI, L3 and OPAL, have collected a total of 2461 pb⁻¹ of e⁺e⁻ collision data at centre-of-mass energies between 189 and 209 GeV. The data are used to search for the Standard Model Higgs boson. The search results of the four collaborations are combined and examined in a likelihood test for their consistency with two hypotheses: the background hypothesis and the signal plus background hypothesis. The corresponding confidences have been computed as functions of the hypothetical Higgs boson mass. A lower bound of 114.4 GeV/c² is established, at the 95% confidence level, on the mass of the Standard Model Higgs boson. The LEP data are also used to set upper bounds on the HZZ coupling for various assumptions concerning the decay of the Higgs boson.

Keyword(s): INSPIRE: [review: experimental results](#) | [electron positron: colliding beams](#) | [electron positron: annihilation](#) | [Higgs particle: search for](#) | [Higgs particle: neutral particle](#) | [Higgs particle: electroproduction](#) | [Z0: associated production](#) | [coupling: \(Higgs particle Z0\)](#) | [Higgs particle: decay modes](#) | [background](#) | [Higgs particle: mass](#) | [lower limit](#) | [experimental results](#) | [CERN LEP Stor](#) | [electron positron --> Higgs particle Z0](#) | [Higgs particle --> 2beauty](#) | [Higgs particle --> tau+ tau-](#) | [189-209 GeV-cms](#)

Record created 2003-05-21, last modified 2010-07-02

[Similar records](#)

[Abstract](#) and [Postscript](#) and [PDF](#) from arXiv.org

[Journal Server](#)

[CERN Server](#)

[pdgLive \(measurements quoted by PDG\)](#)

[Science Direct](#)

→ **Export**

[BibTeX](#), [EndNote](#), [LaTeX\(US\)](#), [LaTeX\(EU\)](#), [NLM](#), [DC](#)



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HEP :: HELP SPIRES HEPNAMES :: INST :: CONF :: EXP :: JOBS

Home > Search for the standard model Higgs boson at LEP > References

Information

References (34)

Citations (993)

Search for the standard model Higgs boson at LEP - Barate, R. et al hep-ex/0306033 CERN-EP-2003-011

- [Broken symmetries, massless particles and gauge fields](#) - [Higgs, Peter W.](#)
- [Broken Symmetries and the Masses of Gauge Bosons](#) - [Higgs, Peter W.](#)
- [Spontaneous Symmetry Breakdown without Massless Bosons](#) - [Higgs, Peter W.](#)
- [Broken Symmetry and the Mass of Gauge Vector Mesons](#) - [Englert, F. et al](#)
- [Global Conservation Laws and Massless Particles](#) - [Guralnik, G.S. et al](#)
- [A Model of Leptons](#) - [Weinberg, Steven](#)
- [A Combination of preliminary electroweak measurements and constraints on the standard model](#) hep-ex/0212036 SLAC-R-643, CERN-EP-2002-091, LEPEWWG-2002-02, ALEPH-2002-042-PHYSIC-2002-018, DELPHI-2002-098-PHYS-927, CERN-L3-NOTE-2788, OPAL-PR-370
- [Observation of an excess in the search for the standard model Higgs boson at ALEPH](#) - [Barate, R. et al](#) hep-ex/0011045 CERN-EP-2000-138
- [Higgs candidates in \$e^+ e^-\$ interactions at \$s^{1/2} = 206.6\text{-GeV}\$](#) - [Acciarri, M. et al](#) hep-ex/0011043 CERN-EP-2000-140
- [Search for the standard model Higgs boson in \$e^+ e^-\$ collisions at \$s^{1/2}\$ approximately = 192-GeV - 209-GeV](#) - [Abbiendi, G. et al](#) hep-ex/0101014 CERN-EP-2000-156
- [Search for the standard model Higgs boson at LEP in the year 2000](#) - [Abreu, P. et al](#) hep-ex/0102036 CERN-EP-2001-004
- [Final results of the searches for neutral Higgs bosons in \$e^+ e^-\$ collisions at \$s^{1/2}\$ up to 209-GeV](#) - [Heister, A. et al](#) hep-ex/0201014 CERN-EP-2001-095
- [Final results from DELPHI on the searches for SM and MSSM neutral Higgs bosons](#) - [Abdallah, J. et al](#) hep-ex/0303013 CERN-EP-2003-008

Information | **References (34)** | Citations (993)



Search for the standard model Higgs boson at LEP - Barate, R. et al hep-ex/0306033 CERN-EP-2003-011

Cited by: 993 records

- (391) [Precision electroweak measurements on the Z resonance](#) hep-ex/0509008 SLAC-R-774
- (332) [Physics interplay of the LHC and the ILC](#) - Weiglein, G. et al hep-ph/0410364 SLAC-PUB-10764, ANL-HEP-PR-04-108, CERN-PH-TH-2004-214, DCPT-04-134, DESY-04-206, IFIC-04-59, IISC-CHEP-13-04, IPPP-04-67, UB-ECM-PF-04-31, UCD-04-28, UCI-TR-2004-37
- (320) [Split supersymmetry](#) - Giudice, G.F. et al hep-ph/0406088 CERN-PH-TH-2004-100
- (301) [Expected Performance of the ATLAS Experiment - Detector, Trigger and Physics](#) - Aad, G. et al arXiv:0901.0512 [hep-ex]
- (297) [Search for neutral MSSM Higgs bosons at LEP](#) - Schael, S. et al hep-ex/0602042 CERN-PH-EP-2006-001

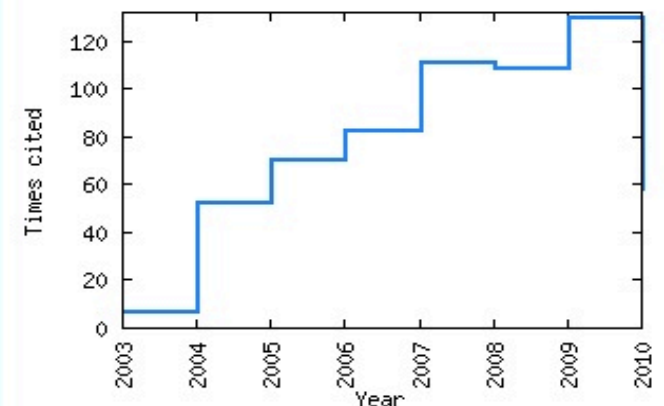
[more](#)

Co-cited with: 21049 records

- (168) [Supersymmetry, Supergravity and Particle Physics](#) - Nilles, Hans Peter UGVA-DPT-1983-12-412
- (161) [Review of Particle Physics](#) - Yao, W.-M. et al
- (158) [A Model of Leptons](#) - Weinberg, Steven
- (158) [Review of particle physics. Particle Data Group](#) - Eidelman, S. et al
- (151) [Search for neutral MSSM Higgs bosons at LEP](#) - Schael, S. et al hep-ex/0602042 CERN-PH-EP-2006-001

[more](#)

Citation history:



Information References (16) Citations (7135)

A Model of Leptons - Weinberg, Steven

Cited by: 7135 records

- (6018) [CP Violation in the Renormalizable Theory of Weak Interaction](#) - Kobayashi, Makoto *et al* KUNS-242
- (3600) [Supersymmetry, Supergravity and Particle Physics](#) - Nilles, Hans Peter UGVA-DPT-1983-12-412
- (3491) [The Search for Supersymmetry: Probing Physics Beyond the Standard Model](#) - Haber, Howard E. *et al* UM-HE-TH-83-17, SCIPP-85-47
- (3225) [Unity of All Elementary Particle Forces](#) - Georgi, H. *et al*
- (3178) [Review of particle physics. Particle Data Group](#) - Barnett, R.Michael *et al*

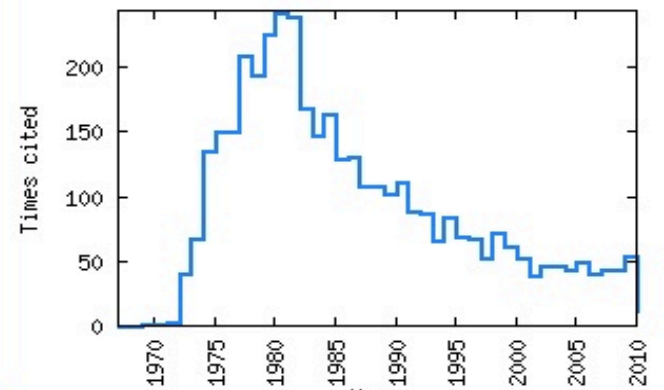
[more](#)

Co-cited with: 60553 records

- (3668) [Partial Symmetries of Weak Interactions](#) - Glashow, S.L.
- (2079) [Weak Interactions with Lepton-Hadron Symmetry](#) - Glashow, S.L. *et al*
- (1429) [CP Violation in the Renormalizable Theory of Weak Interaction](#) - Kobayashi, Makoto *et al* KUNS-242
- (1039) [Broken symmetries, massless particles and gauge fields](#) - Higgs, Peter W.
- (867) [Unity of All Elementary Particle Forces](#) - Georgi, H. *et al*

[more](#)

Citation history:



Weinberg, Steven

Papers:

[All papers \(220\)](#)
[Published \(156\)](#)
[Review \(23\)](#)
[Conference \(20\)](#)
[Introductory \(16\)](#)
[Book \(11\)](#)
[Lectures \(8\)](#)

Affiliations:

[Texas U. \(100\)](#)
[Harvard U. \(51\)](#)
[MIT, LNS \(26\)](#)
[UC, Berkeley \(20\)](#)
[unknown \(12\)](#)
[Harvard-Smithsonian Ctr. Astrophys. \(8\)](#)
[Columbia U. \(4\)](#)
[Stanford U., Phys. Dept. \(3\)](#)
[Princeton U. \(2\)](#)
[Imperial Coll., London \(2\)](#)
[LLNL, Livermore \(1\)](#)
[Stanford U., ITP \(1\)](#)
[MIT \(1\)](#)

Frequent keywords:

[spontaneous symmetry breaking \(31\)](#)
[gravitation \(21\)](#)
[renormalization \(21\)](#)
[unified field theory \(20\)](#)
[quantum chromodynamics \(17\)](#)
[S-matrix \(16\)](#)
[FIELD THEORY: HIGHER-DIMENSIONAL \(15\)](#)
[strong interaction \(15\)](#)
[electroweak interaction \(14\)](#)
[field theory: scalar \(14\)](#)

Frequent co-authors:

[Glashow, S.L. \(3\)](#)
[Schnitzer, Howard J. \(3\)](#)
[Bjorken, J.D. \(2\)](#)
[Flauger, Raphael \(2\)](#)
[Gerstein, I.S. \(2\)](#)
[Hall, Lawrence J. \(2\)](#)
[Jackiw, R. \(2\)](#)
[Lane, Kenneth D. \(2\)](#)
[Lee, Benjamin W. \(2\)](#)

Citations:

Citation summary results

	All papers	Published only
Total number of citable papers analyzed:	170	156
Total number of citations:	47,121	46,594
Average citations per paper:	277.2	298.7

Breakdown of papers by citations:

Renowned papers (500+)	25	25
Famous papers (250-499)	20	20
Very well-known papers (100-249)	45	43
Well-known papers (50-99)	18	17
Known papers (10-49)	32	28
Less known papers (1-9)	20	16
Unknown papers (0)	10	7

Who do we know?

80K names (20K affiliation histories, 25k e-mails)

860K papers with authors and affiliations

22M 'signatures' on papers

Automatic Disambiguation

Henning Weiler – PhD@CERN

“Who was where when and wrote on what with whom ?”

E.g. Scan 5.4 M signatures. Attribute 5.3M to 250 authors !

E.g. 963 papers by "Chen, G", 98% attributed to 21 authors

Author Details (#109)

NAME HISTORY

- Ellis, Stephen D. (57 Papers)
- Ellis, S.D. (54 Papers)
- Ellis, S. (3 Papers)
- Ellis, Stephen (1 Paper)

AFFILIATION HISTORY (10 DISTINCT)

- 2009-12 - Unknown (as Ellis, Stephen D.)
- 2009-05 - Washington U., Seattle (as Ellis, Stephen D.)
- 2007-12 - Washington U., Seattle (as Ellis, S.D.)
- 2005-09 - Washington U., Seattle (as Ellis, S.D.)
- 2005-04 - Washington U., Seattle (as Ellis, Stephen D.)

Author Details (#115)

NAME HISTORY

- Ellis, Simon C. (8 Papers)
- Ellis, S.C. (7 Papers)
- Ellis, S. (1 Paper)

AFFILIATION HISTORY (2 DISTINCT)

- 2009-10 - Unknown (as Ellis, S.C.)
- 2008-01 - Unknown (as Ellis, S.C.)
- 2006-02 - Anglo-Australian Observ. (as Ellis, Simon C.)
- 2005-04 - Unknown (as Ellis, S.C.)
- 2001-10 - Unknown (as Ellis, S.C.)
- 2000-11 - Unknown (as Ellis, S.)

- [Large Transverse Momentum Phenomena: An Experimental and Theoretical Review](#) (as "Ellis, S.D.", p: 64.94%)
- [Implications of parton model concepts for large transverse momentum production of hadrons](#) (as "Ellis, S.D.", p: 75.08%)
- [Inclusive reactions, finite-energy sum rules and reggeon-particle scattering](#) (as "Ellis, S.D.", p: 70.40%)
- [Decays of the Upsilon' and the Structure of the Resonances at 10-GeV](#) (as "Ellis, Stephen D.", p: 64.19%)
- [jets in hadron-hadron collisions](#) (as "Ellis, S.D.", p: 66.79%)

- [The k band luminosity function of high redshift clusters](#) (as "Ellis, S.C.", p: 70.03%)
- [The colour-magnitude relations of clj1226.9+3332, a massive cluster of galaxies at z=0.89](#) (as "Ellis, Simon C.", p: 74.03%)
- [Characterization and on-sky demonstration of an integrated photonic spectrograph for astronomy](#) (as "Ellis, S.C.", p: 70.03%)
- [The x-ray evolution of clusters of galaxies to z=0.9](#) (as "Ellis, S.", p: 78.87%)
- [The case for OH suppression at near-infrared wavelengths](#) (as "Ellis, S.C.", p: 70.03%)

Coming soon

Content, metadata and feature enhancement

Back to the users

- Personal libraries, alerts
- Claim-my-papers (with arXiv and ORCID)
- Submit theses and old non-arXiv material
- Attach non-text material (high level data files)
- OCR of library holdings (with D4Science-II)
- Advanced feeds (with ADS, arXiv, Publishers)



Full-text search

The screenshot shows a web browser window with the URL `http://inspire-hep-dev.cern.ch/search?ln=en&p=qcd+monte+carlo&f=fulltext`. The page features the INSPIRE logo with a large red 'DEV' watermark. A navigation bar contains links for HEP, HELP, SPIRES, HEPNAMES, INST, CONF, EXP, and JOBS. A search bar contains the text 'qcd monte carlo' and is set to 'fulltext' mode. Below the search bar are options for sorting (latest first, desc, or rank by) and displaying results (25 results, single list). The output format is set to 'HTML brief'. A yellow banner indicates that 13 records were found and the search took 0.03 seconds. The first result is 'Quantum chromodynamics on the lattice' by Christof Gatttringer and Christian B. Lang, published in Lect.Notes Phys. 788 (2010) 1-211. A snippet of the text is shown in a grey box. The second result is 'Cosmology of neutrinos and extra light particles after WMAP3' by Marco Cirelli and Alessandro Strumia, published in JCAP 0612 (2006) 013.

qcd monte carlo - Search Results

<http://inspire-hep-dev.cern.ch/search?ln=en&p=qcd+monte+carlo&f=fulltext>

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HEP :: HELP :: SPIRES HEPNAMES :: INST :: CONF :: EXP :: JOBS

Search Results: qcd monte carlo

Search: qcd monte carlo fulltext Search Browse

Search Tips :: Advanced Search

Sort by: latest first desc. - or rank by - Display results: 25 results single list Output format: HTML brief

HEP 13 records found Search took 0.03 seconds.

1. **Quantum chromodynamics on the lattice.**
Christof Gatttringer, Christian B. Lang (Graz U.). 2010. 211 pp.
Published in *Lect.Notes Phys.* **788** (2010) 1-211

[References](#) | [BibTeX](#) | [LaTeX\(US\)](#) | [LaTeX\(EU\)](#) | [EndNote Journal Server](#)

Snippets courtesy of Springer
... which allows for both theoretical understanding and computational analysis. Lattice **QCD** has become a standard tool in elementary particle physics. As of an advanced student for a first reading on lattice **QCD**. This imaginary student brings as a prerequisite knowledge of higher and we had to make some painful choices. We discuss **QCD** but omit most other lattice field theory applications like scalar address all ongoing activities, in particular concerning the role of **QCD** in electroweak theory. Subjects like glueballs, topological excitations, and approaches **QCD** on the lattice - a first look

[Detailed record](#) - [Similar records](#)

2. **Cosmology of neutrinos and extra light particles after WMAP3.**
Marco Cirelli (Yale U.), Alessandro Strumia (Pisa U. & INFN, Pisa). IFUP-TH-2006-16. Jul 2006. 16 pp.
Published in *JCAP* **0612** (2006) 013
e-Print: [astro-ph/0607086](https://arxiv.org/abs/astro-ph/0607086)

[References](#) | [BibTeX](#) | [LaTeX\(US\)](#) | [LaTeX\(EU\)](#) | [EndNote](#)

... light colored particles typically form hadrons not lighter than the **QCD** scale; one can however imagine a colored scalar with a 'tachionic' bare squared mass, fine tuned to almost cancel

Figure extraction



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Home > Searches for new physics in lepton final states

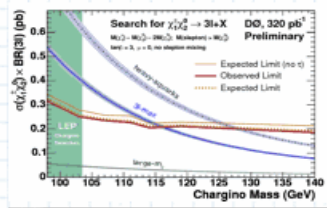
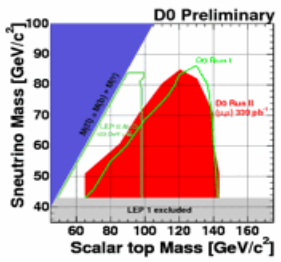
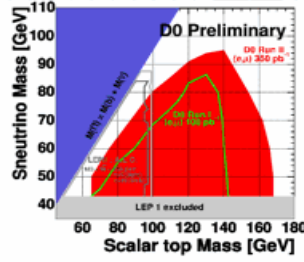
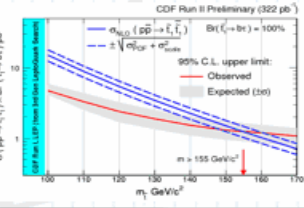
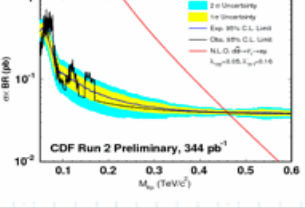
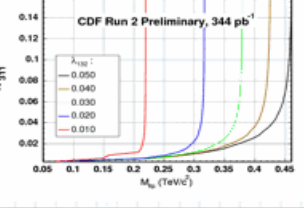
Information | **References (11)** | Citations (0) | Fulltext | Plots

Searches for new physics in lepton final states.

CDF and D0 Collaboration (Catalin I. Ciobanu (Illinois U., Urbana) for the collaboration) *et al.* [Show all 1 authors.](#)
Jun 2006

Presented at [SPIRES Conference C06/03/11.1](#) (Conference information coming soon) e-Print: [hep-ex/0606036](#)

Abstract: Final states containing charged leptons could provide some of the most distinctive signatures for observing physics beyond the Standard Model. We present searches for new physics using 0.32-0.45 /fb of data accumulated at the Tevatron. No significant evidence of a signal is found, and in most cases the tightest constraints to date are set on the exotic processes investigated.

Keyword(s):
Authors supplied: CDF, D0

Coming later

- Holistic recommender system (logs, cites, text)
- Crowdsourcing of keywording (tagging)
- Semantic layer (did-you-mean and classification)
- ORE'ish aggregation of cite/people/data/papers
- (Semantic) image search
- Platform for high-level data preservation

NOTE: Looking for PhD/Post-Docs – e-mail me

Lesson learnt

- Understand users/authors drivers and barriers
- Invest in value-added service for scientists
 - Harvesting and curation
 - Visibility, accessibility, efficiency
- Co-operation, collaboration, partnerships

Aim – ACCELERATE SCIENCE



Thank you !

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<http://inspirebeta.net>

Additional resources:

R. Heuer *et al.* *Innovation in Scholarly Communication:*

Vision and Projects from High-Energy Physics

<http://arxiv.org/abs/0805.2739>

A.Gentil-Beccot *et al.* *Information Resources in High-Energy Physics:*

Surveying the Present Landscape and Charting the Future Course

<http://arxiv.org/abs/0804.2701>

A.Gentil-Beccot *et al.* *Citing and Reading Behaviors in HEP:*

How a Community Stopped Worrying about Journals

and Learned to Love Repositories

<http://arxiv.org/abs/0906.5418>