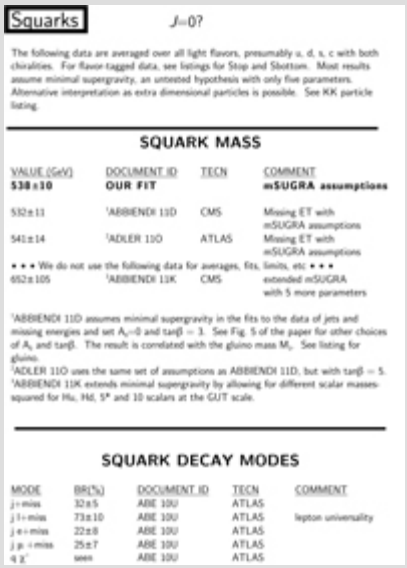
Around the World

From Symmetry Breaking: Rewriting textbooks and remeasuring the particle data booklet at the LHC



Squarks J=0?

The following data are averaged over all light flavors, presumably u, d, s, c with both chiralities. For flavor-tagged data, see listings for Stop and Sbottom. Most results assume minimal supergravity, an untested hypothesis with only five parameters. Alternative interpretation as extra dimensional particles is possible. See KK particle listing.

SQUARK MASS

VALUE (GeV)	DOCUMENT ID	TECN	COMMENT
530 ±10	**OUR FIT**		**mSUGRA assumptions**
532±11	[1] ABBIENDI 11D	CMS	Missing ET with mSUGRA assumptions
541±14	[2] ADLER 11O	ATLAS	Missing ET with mSUGRA assumptions
• • • We do not use the following data for averages, fits, limits, etc • • •			
652±105	[3] ABBIENDI 11K	CMS	extended mSUGRA with 5 more parameters

[1] ABBIENDI 11D assumes minimal supergravity in the fits to the data of jets and missing energies and set A_0=0 and tanβ = 3. See Fig. 5 of the paper for other choices of A_0 and tanβ. The result is correlated with the gluino mass $M_{\tilde{g}}$. See listing for gluino.
[2] ADLER 11O uses the same set of assumptions as ABBIENDI 11D, but with tanβ = 5.
[3] ABBIENDI 11K extends minimal supergravity by allowing for different scalar masses squared for H_u, H_d, 5^* and 10 scalars at the GUT scale.

SQUARK DECAY MODES

MODE	BR(%)	DOCUMENT ID	TECN	COMMENT
j+miss	32±5	ABE 10U	ATLAS	
j l+miss	73±10	ABE 10U	ATLAS	lepton universality
j e+miss	22±8	ABE 10U	ATLAS	
j μ +miss	25±7	ABE 10U	ATLAS	
$q\,\chi^0$	seen	ABE 10U	ATLAS	

Theorist Hitoshi Murayama's prediction for a page in the PDG in 2016.

Textbooks were being rewritten during last week's Physics at LHC conference.

"I was sitting in the session, listening to the ALICE talk by Andrea Dainese from Padova on Wednesday morning, and suddenly I knew: I could replace all the textbook bubble-chamber pictures from the sixties in my lectures," said DESY's Thomas Naumann, a member of the ATLAS collaboration.
Read more...

-- Barbara Warmbein

Calendar

Upcoming meetings, conferences, workshops

7th Positron Source Collaboration Meeting
DESY, Hamburg, Germany
15-16 July 2010

TeV Particle Astrophysics 2010
Paris, France
19-23 July 2010

35th International Conference on High Energy Physics (ICHEP2010)
Palais des Congrès, Paris, France
21-28 July 2010

First Baseline Assessment Workshop
KEK, Tsukuba, Japan
7-10 September 2010

Feature Story

The ILC, a very special market for high purity niobium

First 9-cell cavities manufactured by Hitachi, Ltd (front) and Toshiba, Inc. (rear) as manufacturing studies for ILC in Japan coordinated by KEK, in addition to the already ongoing efforts by Mitsubishi Heavy Industries, Ltd. *Image: Nobu Toge*

The ILC will have an ultra-cold and complex heart made of niobium, a rare, soft, grey, and ductile transition metal. Some 18,000 radio frequency (RF) accelerating cavities for the ILC will be made of niobium, which becomes superconductor when cooled to nearly absolute zero.

The global annual production of niobium in 2007 was 58,000 tonnes, and it is expected to grow up to 45 percent more in 2010 with a positive trend towards economic recovery. Although it is a 'rare' material, the reserves of niobium are assumed to be enough to cover the current world demand for 500 years – well enough to supply the ILC cavities and many other projects which uses or will use niobium-based superconducting RF systems...
Read more...

-- Rika Takahashi

Readers Write

Indian women in science

Following ILC NewsLine special issue of 3 June featuring Women in science, we received a short letter from Abhay Deshpande (KEK) mentioning Indian programmes and associations for Indian women scientists and engineers.

From the Indian perspective, there are many more issues when it comes to encouraging women to follow science, for that matter any career path. Fortunately, researchers in India realised this quite at an early stage and we have a good forum as well. May I introduce you " Women in science, an Indian Academy of Science initiative". They have published a book called "Daughter's

Director's Corner

Celebrating the fiftieth anniversary of the laser

Theodore Maiman with the first working laser at Hughes Research Laboratory in 1960 *Photo Credit: HRL Laboratories, LLC, from laserfest.org website*

This year we are celebrating the 50th anniversary of Theodore Maiman's demonstration of the first working laser at Hughes Research Laboratory in 1960. The laser has become so common that what began as an acronym describing a physics phenomenon (LASER for Light Amplification by Stimulated Emission of Radiation) is now commonly understood noun worldwide. In the English language, it is defined in the Compact Oxford English dictionary as: "laser: a device that generates an intense narrow beam of light by stimulating the emission of photons from excited atoms or molecules." The development of the laser from a fundamental physics discovery to a multibillion-dollar industry and its pervasive and unforeseen impacts on how we live, make a very powerful case for the value of basic research.
Read more...

-- Barry Barish

Director's Corner Archive

Image of the Week

Code name IHP-01

XXV Linear Accelerator Conference (LINAC10)
Tsukuba, Japan
12-17 September 2010

Upcoming school

Fifth CERN-Fermilab Hadron Collider Physics Summer School
Fermilab, Batavia, IL, USA
16-27 August 2010

GDE Meetings calendar

View complete ILC calendar

of Lilavati" which is very well received. Professor Rohini Godbole, convener for ILC in India is a member of the "Panel on Women in Science". We also have an active *Women Scientists' Association* in India.

-- Abhay Deshpande, KEK

In the News

From *SLAC Today*
29 June 2010
Crafting the World's Smallest Beam
"That minuscule beam is needed for next-generation colliders including the International Linear Collider and the Compact Linear Collider. Packing more electrons and positrons into a thinner beam makes it more likely that individual particles will collide, increasing the number of collision events recorded."
Read more...

From *NPR (Blog)*
29 June 2010
The Dark Universe
"We are living through golden times. At least when it comes to cosmology and particle physics."
Read more...

From *Yle.fi*
29 June 2010
Suomalaiset kehittämään tulevaisuuden hiukkaskiihdytintä
"...Tekesin mukaan suomalaispanostus vahvistaa Suomen asemaa CLIC-törmäyttimen teknologiatoimittajana ja suomalaisten erityisosaamista lineaaritörmäyttimillä tehtävässä tutkimuksessa..."
Read more... (in Finnish)

From *dw-world.de*
28 June 2010
Race for knowledge spurs physics research at CERN
"The Large Hadron Collider is coming late to the party and has a lot to prove in the particle physics community. It's no surprise then that a little competitive jockeying plays a role in CERN's research strategy."
Read more...

This nine-cell cavity, called "IHP-01" (LL-type design), built with large-grain Niobium sheets, arrived from IHEP, Beijing for vertical-testing at KEK in June, 2010. *Image Nobu Toge*

Announcements

arXiv preprints

1006.5424
Development of ultra-light pixelated ladders for an ILC vertex detector

1006.5337
Cherenkov Detector Prototype & Testbeam 2009

1006.5268
Observing the Coupling between Dark Matter and Higgs Boson at the ILC

1006.4858
Bound states of UED level-1 KK quarks at the Linear Collider

1006.4811
Constraints of dark matter direct detection experiments on the MSSM and implications on LHC Higgs search

1006.4589
Pair production of Higgs bosons associated with *Z* boson in the left-right twin Higgs model at the ILC

1006.4226
Irradiation test on FD-SOI Readout ASIC of Pair-monitor