

RESPONSIBLE CONDUCT OF RESEARCH

4/14/15

Heidi Schellman - Oregon State Physics

Responsible Conduct of Research

2

- NSF funded postdocs and students are required to take an RCR course
- Online component – modules with quizzes
 - <https://www.citiprogram.org/>
 - Takes about 20 minutes/module
 - Print out your final page and give to Kelly so that we have a record of completion.
- In person component – this course
 - 1 PM on Fridays
 - Faculty and other students are welcome to join us and participate

https://www.citiprogram.org/

The screenshot shows the CITI Program website interface. At the top, there is a blue header with the CITI PROGRAM logo and the text "Collaborative Institutional Training Initiative at the University of Miami". To the right of the header is a search bar labeled "Search Knowledge Base". Below the header is a navigation menu with links for "Main Menu", "My Profiles", "My CEUs", "My Reports", and "Support".

The main content area is titled "Main Menu" and features a section for "Oregon State University Courses". This section contains a table with the following data:

Course	Status	Completion Report	Survey
Physical Science Responsible Conduct of Research Course 1.	Not Started	Not Earned	

Below the table, there is a section titled "My Learner Tools for Oregon State University" which lists several options:

- Add a Course or Update Learner Groups
- View Previously Completed Coursework
- Update Institution Profile
- View Instructions page
- Remove Affiliation

Modules

Required Modules		
	Date Completed	Score
Responsible Conduct of Research (RCR) Course Introduction (ID: 1522)	Incomplete	0/0 (0%)
Research Misconduct (RCR-Basic) (ID: 16604)	Incomplete	0/0 (0%)
Data Management (RCR-Basic) (ID: 16600)	Incomplete	0/0 (0%)
Authorship (RCR-Basic) (ID: 16597)	Incomplete	0/0 (0%)
Peer Review (RCR-Basic) (ID: 16603)	Incomplete	0/0 (0%)
Mentoring (RCR-Basic) (ID: 16602)	Incomplete	0/0 (0%)
Conflicts of Interest (RCR-Basic) (ID: 16599)	Incomplete	0/0 (0%)
Collaborative Research (RCR-Basic) (ID: 16598)	Incomplete	0/0 (0%)
Responsible Conduct of Research (RCR) Course Conclusion (ID: 1043)	Incomplete	0/0 (0%)

5

Writing papers and plagiarism

4/14/15

Plagiarism

6

- As graduate students you will be writing papers and a dissertation.
- One of the most common forms of academic dishonesty is **plagiarism**, the use of someone else's work as your own.
- <http://www.wpacouncil.org/node/9>
 - ▣ Is osu policy
- <http://www.northwestern.edu/provost/policies/academic-integrity/how-to-avoid-plagiarism.html>
 - ▣ Has examples

Germany

German defence minister resigns in PhD plagiarism row

Karl-Theodor zu Guttenberg had been stripped of doctorate by University of Bayreuth

Helen Pidd in Berlin

Tuesday 1 March 2011 06.41 EST



Shares

184



Karl-Theodor zu Guttenberg as the fearless man of action on a German navy frigate in the Mediterranean. Photograph: Fabrizio Bensch/EPA

He was voted Germany's most popular politician, a chisel-jawed, gelled-haired aristocrat who held such rock-star status that his party used to play an AC/DC track every time he took to the stage. But Karl-Theodor zu Guttenberg has resigned as defence minister after being engulfed by a plagiarism scandal, leaving the ruling coalition with a serious charisma vacuum.

His departure is a huge blow for Chancellor Angela Merkel and her Christian Democratic Union party (CDU). Already weakened after defeats in recent regional

Advertisement

This cloud makes data make a difference.

Microsoft Cloud

See how →

- Last week the University of Bayreuth stripped Guttenberg of his doctorate after he admitted substantially copying (inadvertently, he said) from other sources. He blamed the errors on his busy schedule: when he finished his thesis in 2006, he was juggling his duties as an MP and raising two daughters with his TV presenter wife, the equally blue-blooded Countess Stephanie von Bismarck. The admission led to him being dubbed the minister for cut-and-paste, or Baron zu Googleberg.

Things you need to do

9

- Cite your sources
- Put any directly quoted material in quotes
- Understand when you are paraphrasing other work and make it clear.
 - ▣ The intro section to your thesis is often a historical section. Need to explain how you learned this.
- Credit figures and tables drawn from other work.
- And get written permission to use any copyrighted material!

Self-plagiarism?

The D0 detector [15, 16] comprises a central tracking system, a calorimeter, and a muon system. The central tracking system consists of a silicon microstrip tracker and a scintillating fiber tracker (CFT). The CFT provides coverage for charged particles at detector pseudorapidities of $|\eta_{\text{det}}| < 1.7$. Three liquid argon and uranium calorimeters provide coverage of $|\eta_{\text{det}}| < 3.5$ for electrons: the central calorimeter (CC) up to $|\eta_{\text{det}}| < 1.1$ and two end calorimeters (EC) in the range $1.5 < |\eta_{\text{det}}| < 3.5$. Gaps between the cryostats create an inefficient electron detection region between $1.1 < |\eta_{\text{det}}| < 1.5$ that is excluded from the analysis. Each calorimeter consists of an inner electromagnetic (EM) section, followed by hadronic sections.

466 papers have had to describe the same apparatus.

The D0 detector is described in detail elsewhere [17–20]. The main components are the central tracking system, the calorimeter system, and the muon detectors. The central-tracking system is located within a 2 T solenoidal field and consists of two different trackers. Located closest to the interaction point is the silicon microstrip tracker (SMT) and surrounding that is the central fiber tracker (CFT). The SMT is an assembly of barrel silicon detectors in the central region, along with large-diameter disks in the forward regions for tracking at high pseudorapidity (η) [21]. The CFT consists of eight concentric coaxial barrels each carrying two doublet layers of scintillating fibers. The liquid-argon calorimeter system is housed in three cryostats. The central calorimeter (CC) covers up to $|\eta| = 1$, and two end calorimeters (EC) are located in the forward regions, extending coverage to $|\eta| = 4$. In the intercryostat region (ICR) between the CC and EC cryostats, there is a scintillating intercryostat detector (ICD) between $1.1 < |\eta| < 1.4$ that recovers some energy from particles passing through the ICR. Closest to the collisions are the electromagnetic (EM) regions of the calorimeter followed by hadronic layers of fine and coarse segmentation.

The bad stuff

11

- A postdoc once pointed out that one of our co-authors had lifted a whole paragraph describing the theory (with correct citations) from a competing group's publication.
- This is outright plagiarism. We caught it at the draft phase.

Authorship

12

- Who is on the paper?
- Who comes first (my field tends to do alphabetical).
- Need to agree on this up front!
 - ▣ Small groups can suffer from infighting/exploitation
 - ▣ Large groups can have institutional rivalries about who gets on from organization X.

American Physical Society guidelines

13

□ http://www.aps.org/policy/statements/02_2.cfm

“Publication and Authorship Practices

Authorship should be limited to those who have made a significant contribution to the concept, design, execution or interpretation of the research study. All those who have made significant contributions should be offered the opportunity to be listed as authors. Other individuals who have contributed to the study should be acknowledged, but not identified as authors. The sources of financial support for the project should be disclosed.

Plagiarism constitutes unethical scientific behavior and is never acceptable. Proper acknowledgement of the work of others used in a research project must always be given. Further, it is the obligation of each author to provide prompt retractions or corrections of errors in published works.

Case studies in physics

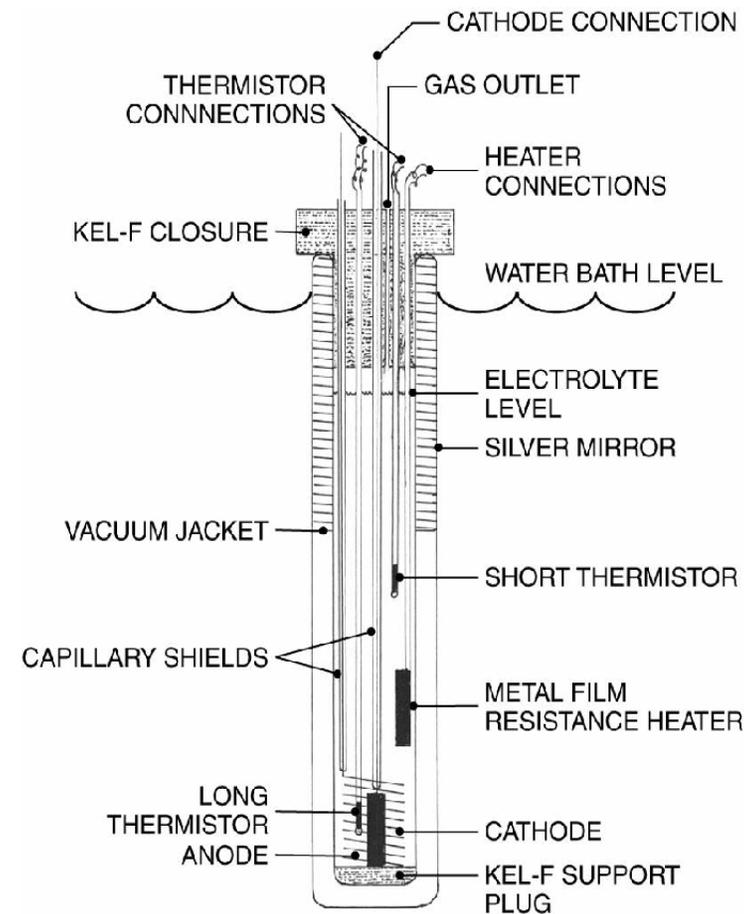
14

- Cold fusion (1989)
- Premature Higgs (2011)

1989

15

- ❑ Pons and Fleischmann announce Cold Fusion
- ❑ Electrolysis of heavy water
- ❑ Deuterium enters palladium cathode
- ❑ See temperature rise
- ❑ Detect fusion products like Helium in water



4/14/15

Show the movie

16

- [https://
www.youtube.com/
watch?v=8M0i2fh8IGI](https://www.youtube.com/watch?v=8M0i2fh8IGI)

Big press conference



Motivations

18

- Stanley Pons and Martin Fleischmann are not quite ready to report
- But other groups may also be seeing something
- University Tech transfer people push them to get there first!
- And it all goes downhill from there

Not consistently reproducible

19

- Stephen Jones
(Brigham Young) sees
slight neutron excess
- John Bockris Texas
A&M sees tritium
- Nathan Lewis (Caltech)
sees nothing
- General consensus that
no fusion is occurring
- Probable cause
 - ▣ Liquid not mixed
leading to hot spot
near thermometer
 - ▣ Helium was probably
naturally occurring
 - ▣ Neutron counters were
crude
- Legitimate
experimental errors

What made it bad?

20

NY Times May 3, 1989

“Many speakers at the meeting reported failure in their efforts to elicit information or comments from Dr. Pons. “

"Pons would never answer any of our questions," Dr. Lewis told an audience of 1,800 physicists, "so we asked Los Alamos National Laboratory to put our questions to him instead, since they were in touch with him."

NY Times **June 15, 1990**

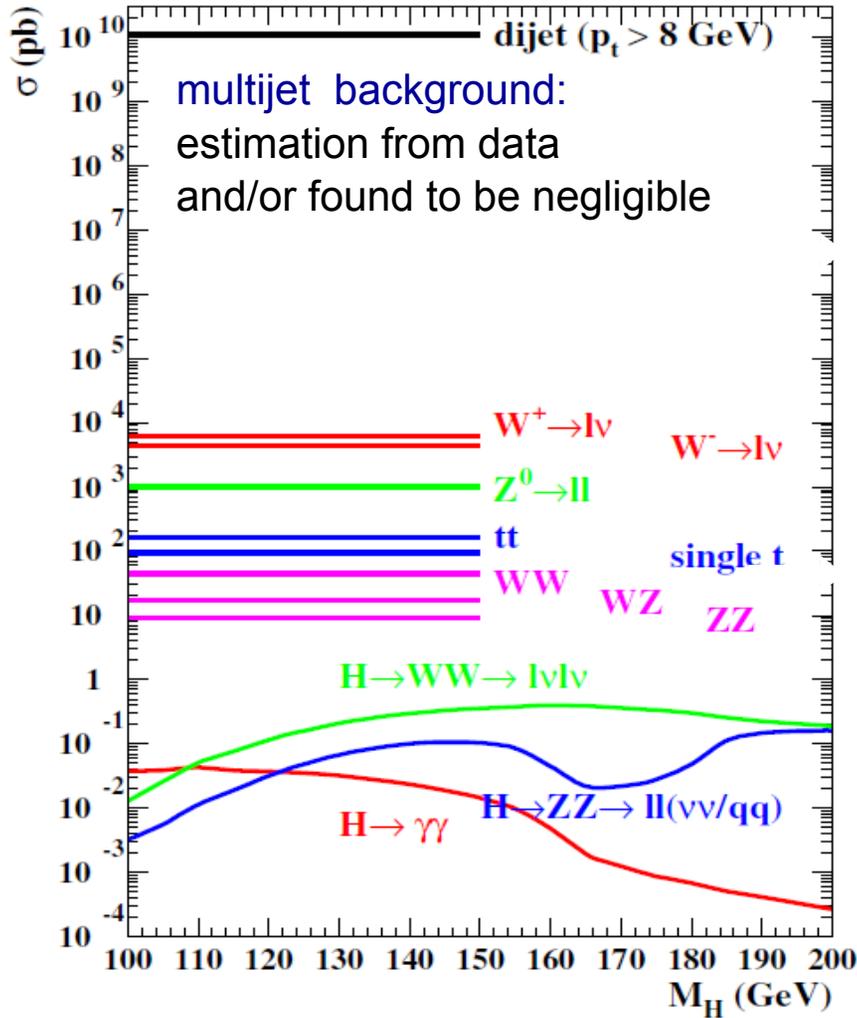
"The response of the A&M researchers and administration to these concerns was limited at best," the magazine said. "Instead of taking positive steps to guard their results against fraud, Bockris and his co-workers principally offered arguments as to why they thought fraud was unlikely, sometimes exaggerating their case in the process."

21

Case study in wishful thinking

4/14/15

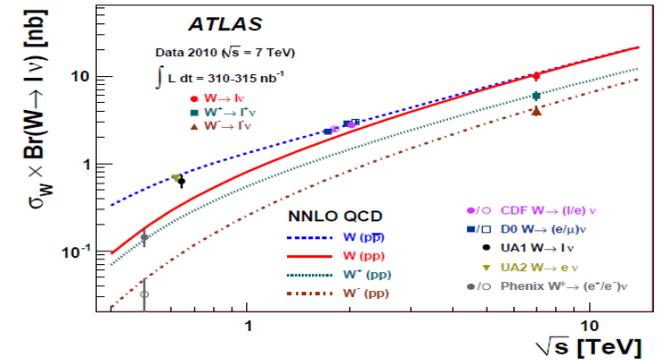
The Higgs Challenge: Tiny Signal-to-Background Ratio



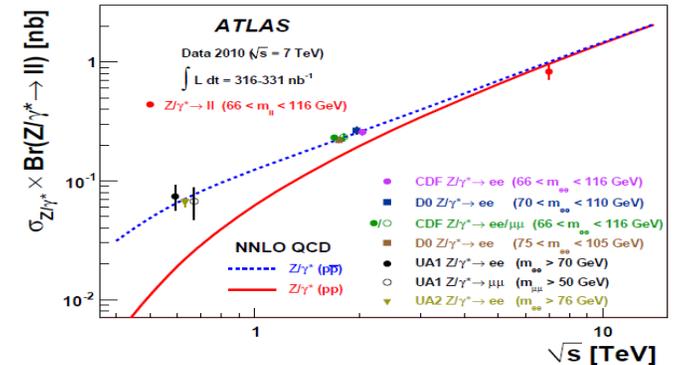
< 1 detectable Higgs boson
per 10^{12} collisions

measurements of "EW" backgrounds

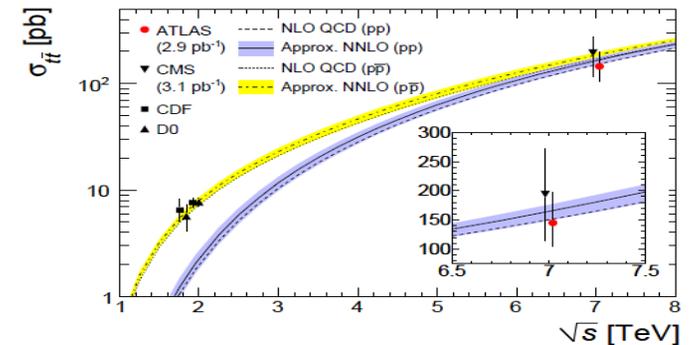
W^+, W^-



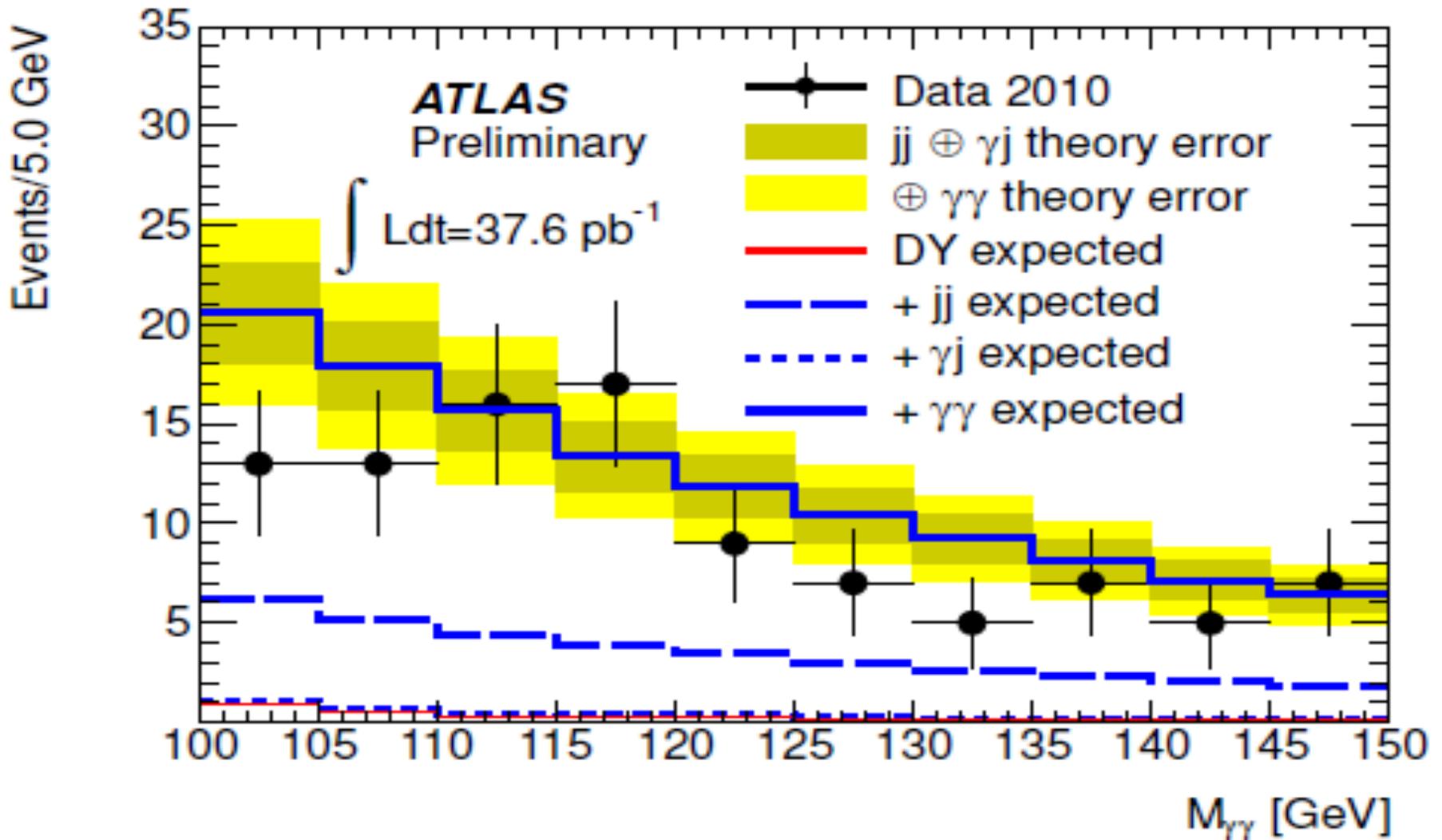
Z/γ^*



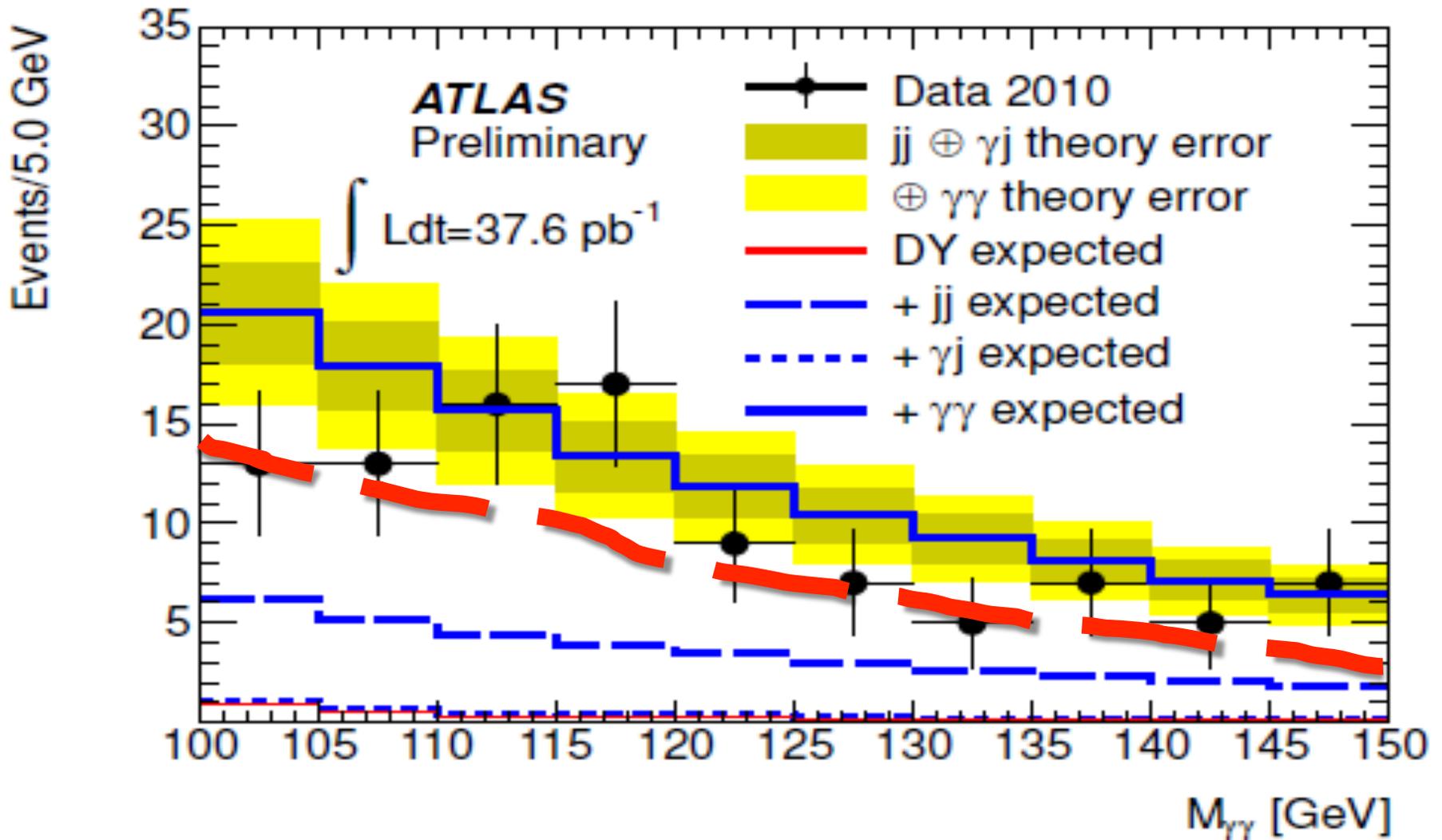
top pairs



Data compared to background calculate the normal way



But what if the background were lower?



“not even wrong” blog...

25

This Week's Rumor

April 21st, 2011

A commenter on the previous posting has helpfully given us the abstract of an internal ATLAS note claiming observation of a resonance at 115 GeV. It's the sort of thing you would expect to see if there were a Higgs at that mass, but the number of events seen is about 30 times more than the standard model would predict. Best guess seems to be that this is either a hoax, or something that will disappear on further analysis. But, since spreading well-sourced rumors is more or less in the mission statement of this blog, I think I'll promote this to its own posting. Here it is:

Internal Note

Report number ATL-COM-PHYS-2011-415

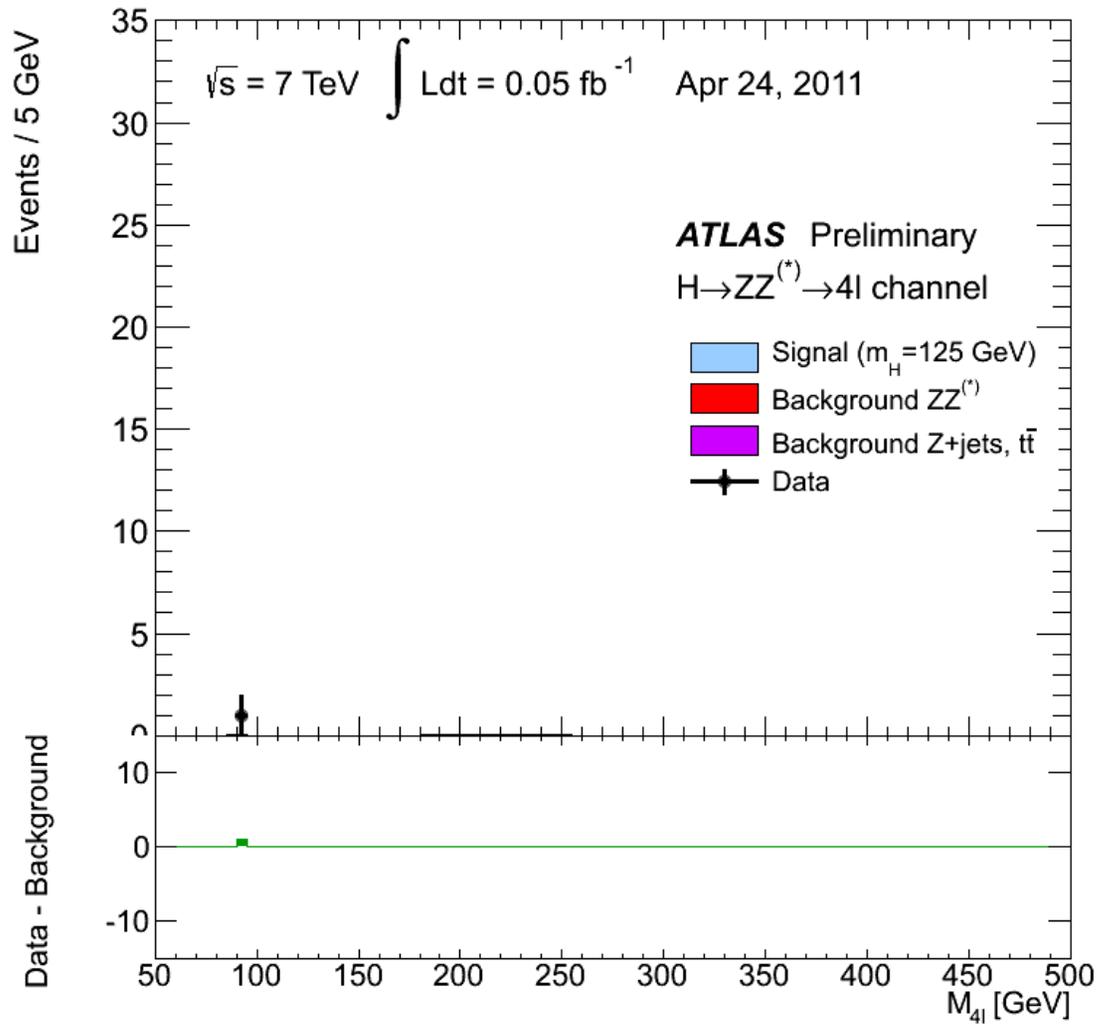
Title Observation of a $\gamma\gamma$ resonance at a mass in the vicinity of 115 GeV/c² at ATLAS and its Higgs interpretation

4/14/15

□ <http://www.math.columbia.edu/~woit/wordpress/>

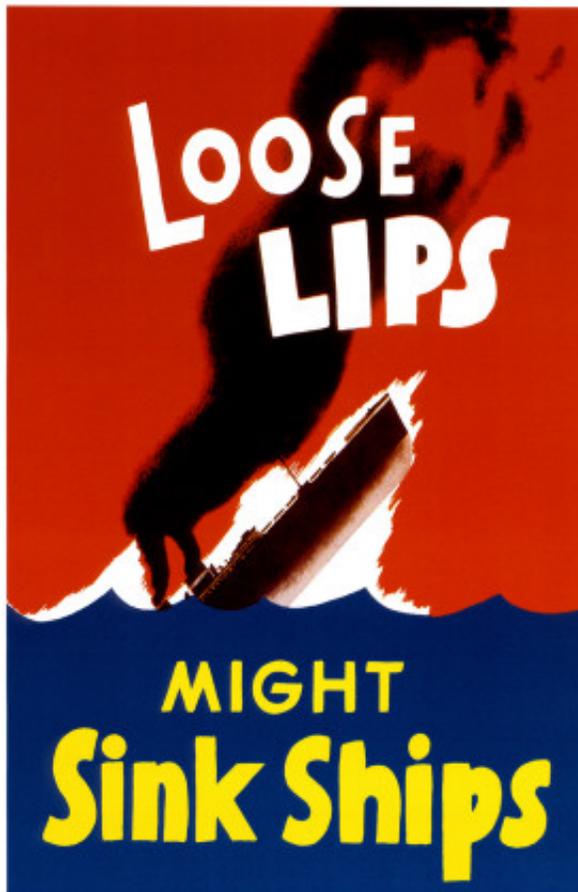
Where it actually was

26



When should you discuss data?

27



- It is important to present data when it has been fully understood
 - ▣ Internal notes
 - ▣ Grant applications
 - ▣ Seminars
 - ▣ Conferences
 - ▣ Arxiv
 - ▣ Publication
 - ▣ Review Articles