

Making the most of your 10 minutes of fame

Dave.Barney@cern.ch



I am not going to evangelize!



Presentation skill $\neq$ soft skill

YOU are the only expert in the room

Don't assume too much of your audience!

Exercise 1: You have 10 minutes to prepare a 1-minute presentation on your favourite topic (not necessarily particle physics!)

Upload any slides to Dropbox using filename:
1_<Yourname>.<extension>

I will choose 5 at random for presentation!

Jonathon (Frisbee)

Simple

Learn something new

Energetic

Pictures - not much text

Passionate

Green layout

Presented as an expert

Anastazja (sailing)

Short

Pictures

Informative

Specific - had a goal

Zina (free time)

Smiling

Talking spontaneously

Posture/movement

Structure

Looked @ audience

Tony (Dark Matter)

Information on the slides

Knowledgeable

Passionate

Comprehensive

Structure was good

Iben (CMS Secretariat)

Made audience laugh

Way it was presented

Lot in 1 minute

Useful

Included a follow-up email

To the point

What are the most common problems with presentations?

Problems

Low voice

Incorrect level

— not understanding audience

Reading the slides

not well defined

passive

Lots of text

too many slides

no structure

Problems

Absence of page numbers

No title

Bad colour scheme

No pictures

Bad use of laser pointer

Going over time

Mondone

Too many animations

Why do people put too much information into a presentation?

Too much info

Want to say everything

Use slides as documentation

Afraid to forget things

Lack of preparation time

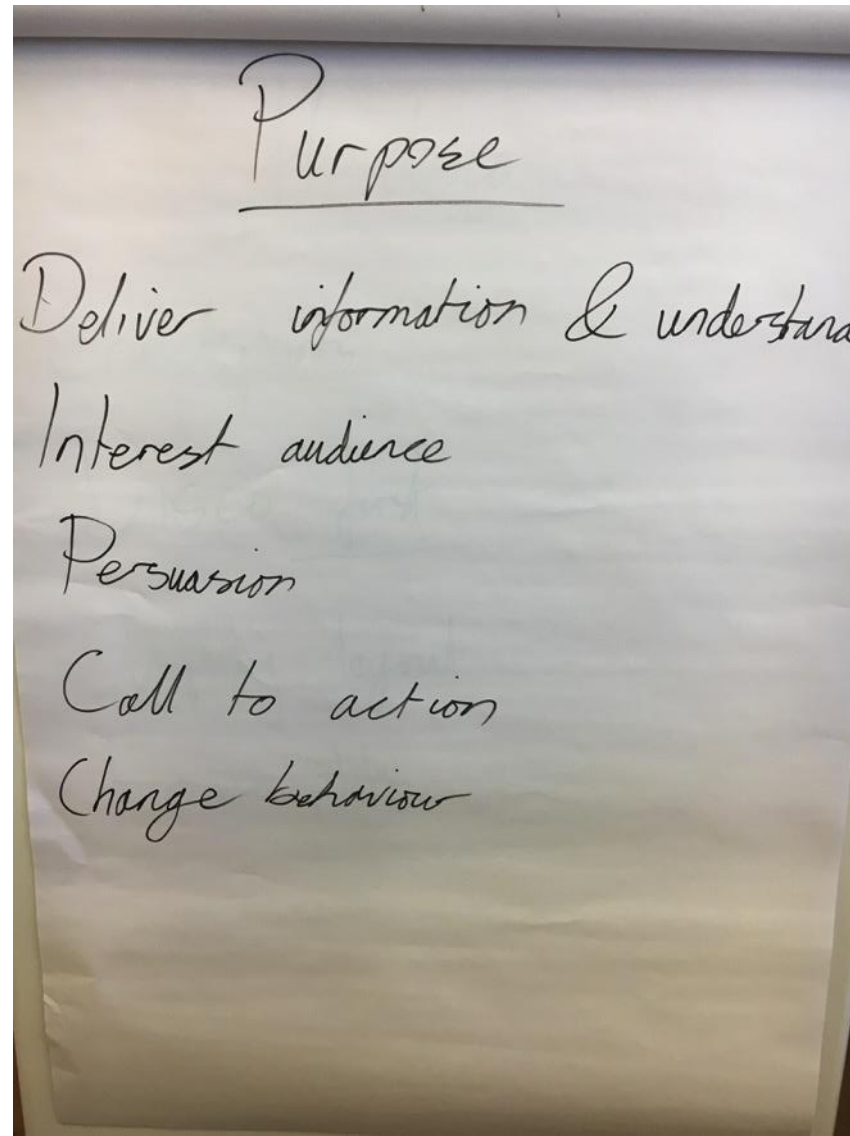
Afraid of questions

Reusing presentations

GUIDELINE #1:

THE PRESENTATION IS FOR THE AUDIENCE

What is the purpose of a presentation?



What is the purpose of a presentation?

For the audience to understand
one or more **messages**

And possibly act upon those messages

message $\neq$ information

Supercars of Geneva (1/3)



Koenigsegg Agera in Geneva



The only Koenigsegg Agera
in Switzerland is the official CMS taxi!



What is a message?

It is not the “what”

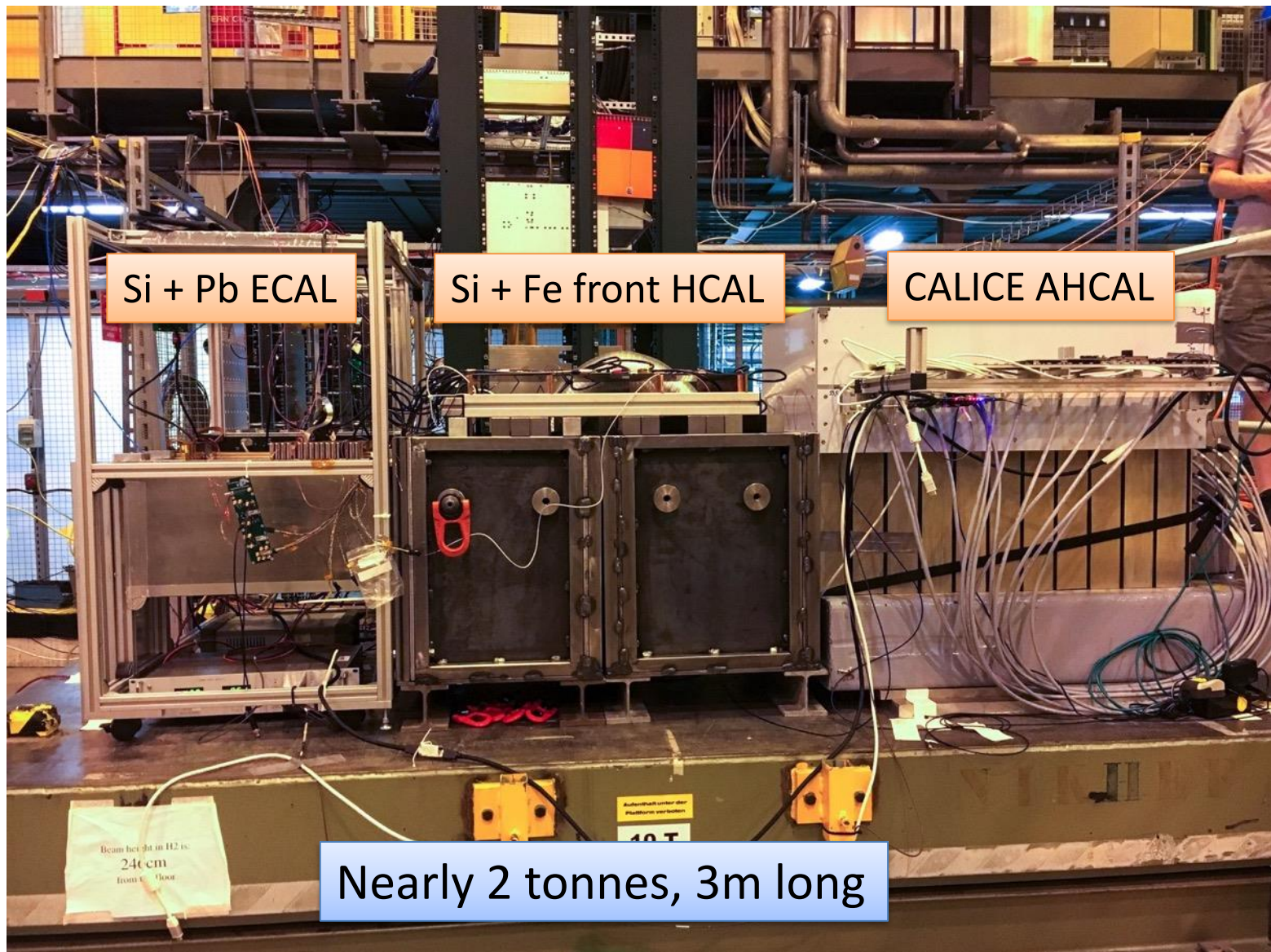
It is the “*so what?*”

Including the “so what?” explicitly on your slides is a basic redundancy

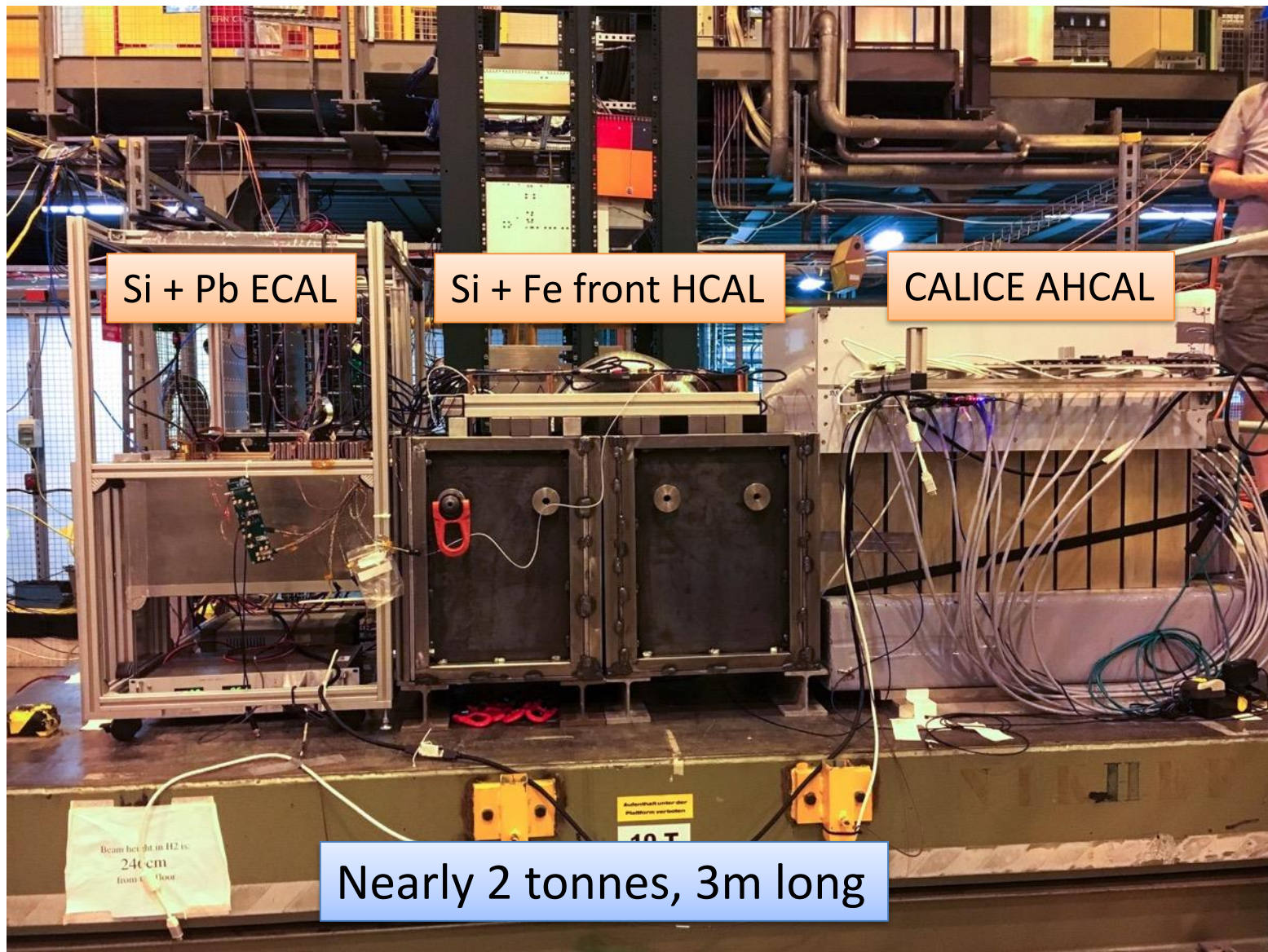
Even if the “so what?” is the only text on your slide, an offline reader will be able to understand the important points of the presentation

The “title” part of your slide is perfect for putting the “so what?”

HGCAL Beamtest 2017



Full prototype HGCAL is at the limit of what can be placed on the CERN SPS H2 moving table



Omitting the “so what?” or not being clear can have serious consequences...

For a pretty extreme view, take a look at:

https://www.inf.ed.ac.uk/teaching/courses/pi/2016_2017/phil/tufte-powerpoint.pdf

And a nice response:

<http://web.mit.edu/5.95/readings/doumont-responds-to-tufte.pdf>

Review of Test Data Indicates Conservatism for Tiles Penetration

- The existing SOFI on tile test data used to create Crater was reviewed along with STS-107 Southwest Research data
 - Crater overpredicted penetration of tile coating significantly
 - Initial penetration to described by normal velocity
 - Varies with volume/mass of projectile(e.g. 200ft/sec for 3cu. In)
 - Significant energy is required for the softer SOFI particle to penetrate the relatively hard tile coating
 - Test results do show that it is possible at sufficient mass and velocity
 - Conversely, once tile is penetrated SOFI can cause significant damage
 - Minor variations in total energy (above penetration level) can cause significant tile damage
 - Flight condition is significantly outside of test database
 - Volume of ramp is 1920cu in vs 3 cu in for test

Exercise 2: look at your handout or open the slide on DropBox called “[Exercise2.pdf](#)”

Work in pairs! You have 5 minutes to determine the three most important conclusions from this slide

Some context & glossary:

This concerns a **US Space Shuttle**

- **Tiles** = the special foam tiles covering the Space Shuttle
- **Crater** = simulation program
- **SOFI** = spray-on foam insulation, used on the separate fuel tanks of the space shuttle
- **ramp** = piece of debris
- **cu in** = cubic inch

1) The “Crater” simulation is not a realistic representation of what happened

2) A penetration of the tile cannot be ruled out

3) If this happened, the consequences could be catastrophic



GUIDELINE #2:

FOCUS ON YOUR MAIN MESSAGES

Bullet lists have their uses, but
don't overdo it!

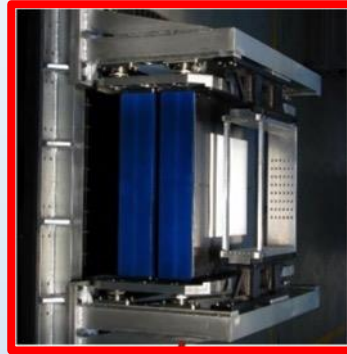
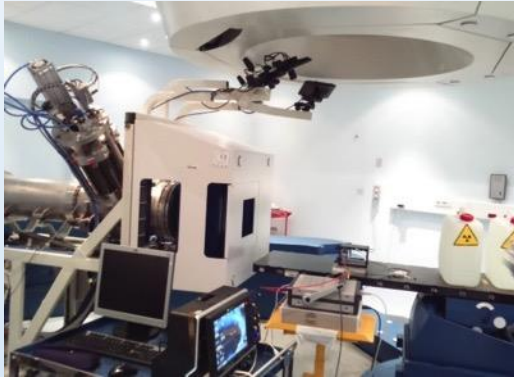
Good examples:

Pros vs cons

Checklists

Beam monitoring in charged particle therapy

Parallel-plate ionization chambers



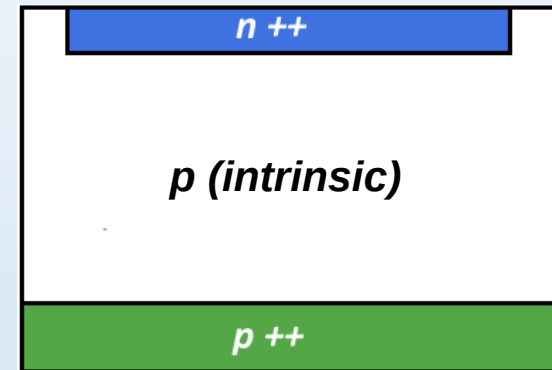
PROS:

- Robust, stable, radiation resistance

CONS;

- Slow response time
- Limited sensitivity
- Measurement of number of particles from the produced charge depends on energy
- Daily QA and calibration measurements.

Silicon detectors



PROS:

- Good sensitivity (single particle detection)
- Small signal duration (direct count of number of particles)
- Fine segmentation -> beam profile
- Time resolution (measurement of beam energy with time-of-flight techniques)

CONS:

- Pile-up effects at high frequencies
- Radiation resistance.

Practical Aspects in irradiation test organization

- Ensure that **facility is compliant with your requirements** (energy, flux, etc.)
- Ensure that your **system is compliant with facility requirements** (dimension, operation, safety, etc.)
- Respect instructions of the facility about **positioning and alignment of your samples**. Get this checked by facility staff before going, if possible
 - spare devices can be useful if re-test needed
- Dosimetry usually (but not always) done by facility staff. When this is available, it is likely to be accurate typically $\pm 10\%$
 - **dosimetry may be complex**
 - possibly **bring your own reference dosimeter**. This is even more important when the experimental team is not present during irradiation
- Inform the facility about the need of maintaining equipment **for post-irradiation measurements** (annealing tests, etc.)
- **Personnel Dosimetry**: always required when working with ionizing radiation

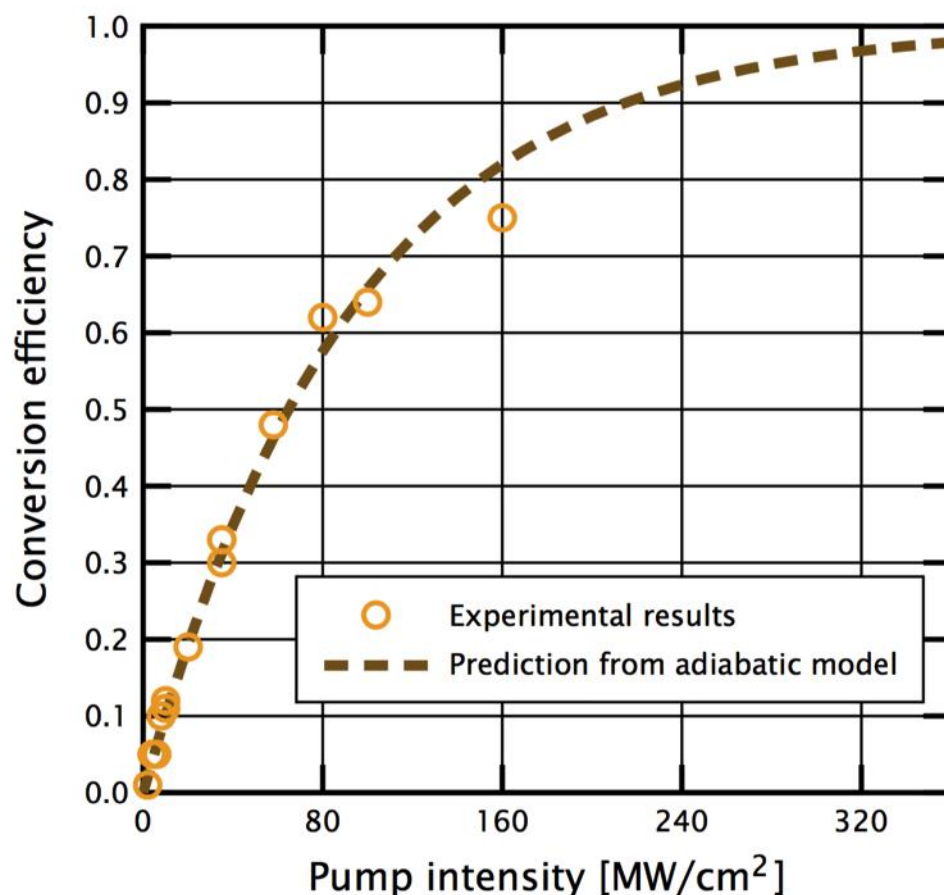
Federico Ravotti, "Dosimetry Techniques and Radiation Test Facilities for Total Ionizing Dose Testing", Short course RADECS2017

Plots

The following is taken from the excellent “Traditions, templates, and group leaders” by Jean-Luc Doumont

<http://www.treesmapsandtheorems.com/barriers>

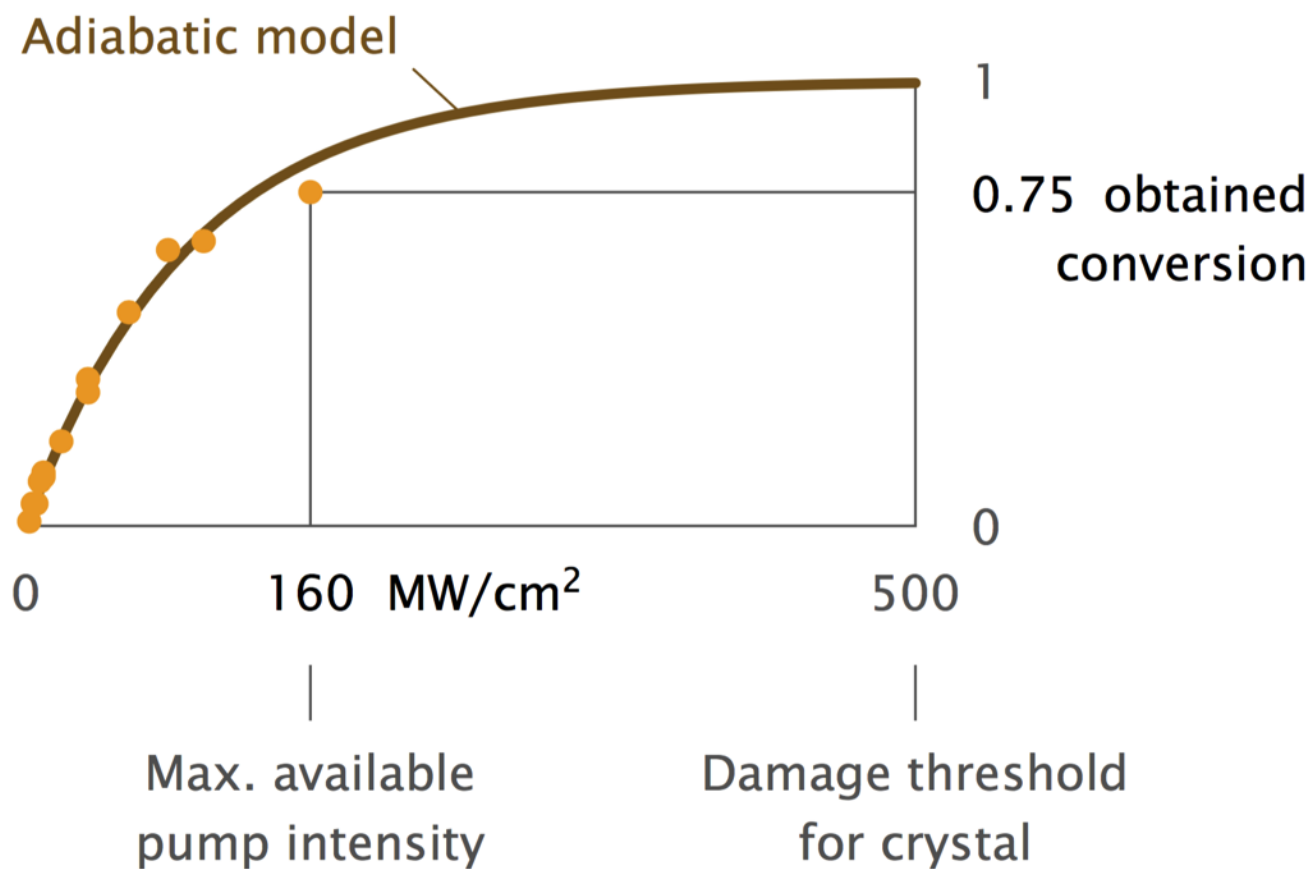
Efficiency of adiabatic frequency conversion



- Maximum pump intensity available experimentally: 160 MW/cm²
- $\lambda_1 = 1530$ nm; $\lambda_2 = 1064$ nm (Q-switched Nd:YLF)
- The maximum demonstrated conversion efficiency was 75 percent
- Periodically poled crystal can get damaged from 500 MW/cm² of pump intensity



The conversion approaches 100%
for high enough pump intensity



Global Reconstruction - Full Simulation

Reconstruction and Detector Performance: Photons

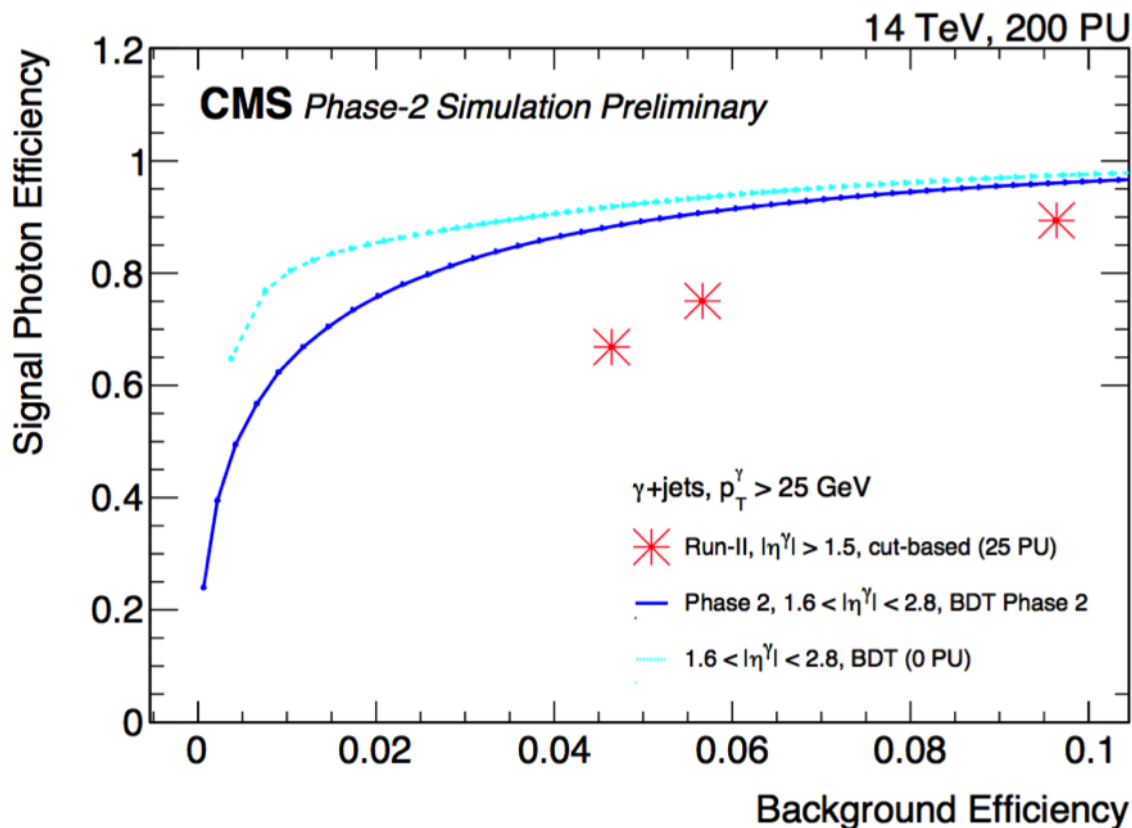


Figure 11.6: Photon efficiency versus photon-misidentification probability in simulated $\gamma + \text{jets}$ events for the BDT training. Signal photons are matched within $\Delta R(\eta, \phi) < 0.1$ to isolated photons generated within the kinematic phase space $p_T^\gamma > 25 \text{ GeV}$ and $1.6 < |\eta_\gamma| < 2.8$. Misidentified photons are defined as reconstructed photons found in the same kinematic phase space but not matched to an isolated generated photon. The performance of a Run 2 cut-based ID is also presented, evaluated on a similar sample of $\gamma + \text{jets}$ produced using the Run 2 conditions (average pileup of 25 pp collisions at $\sqrt{s} = 13 \text{ TeV}$).

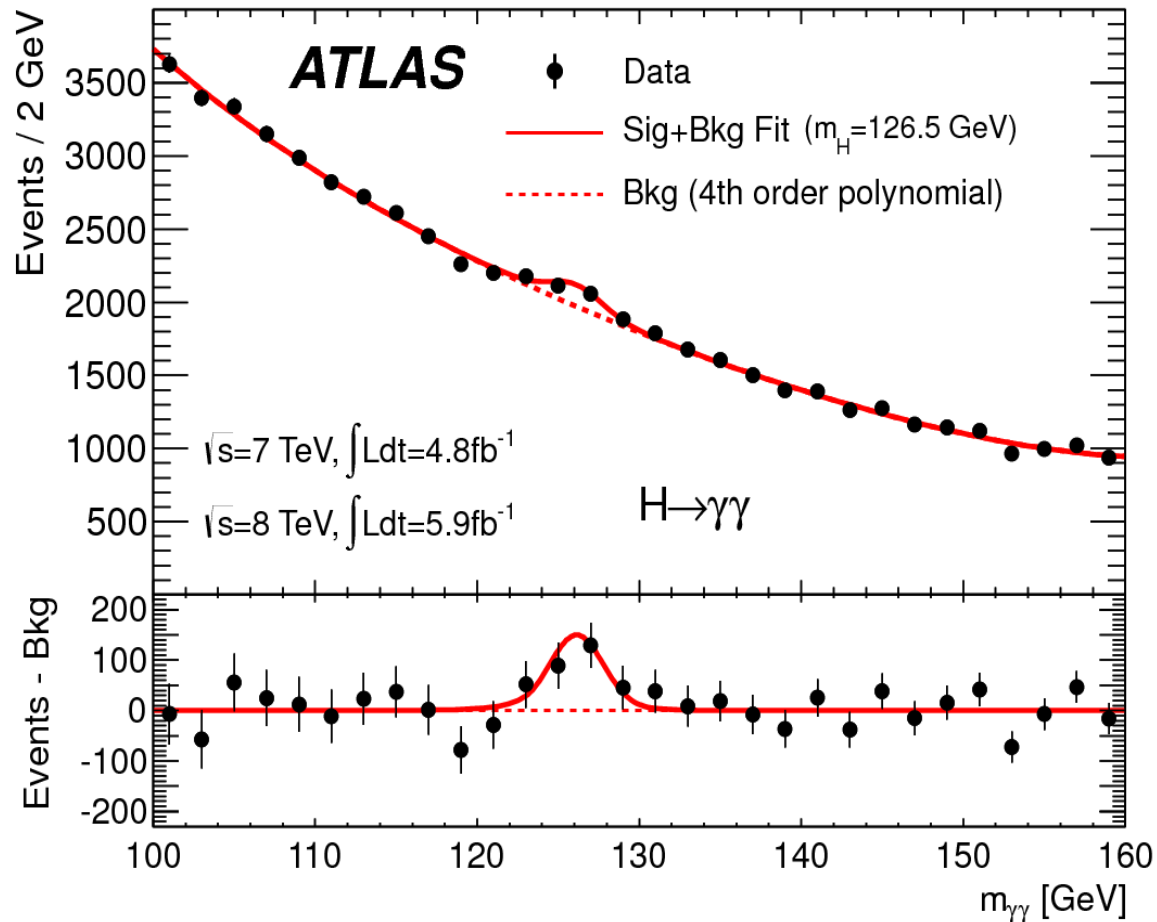
Exercise 3: You have 5 minutes to simplify
the slide on DropBox called
“Exercise3.pptx”

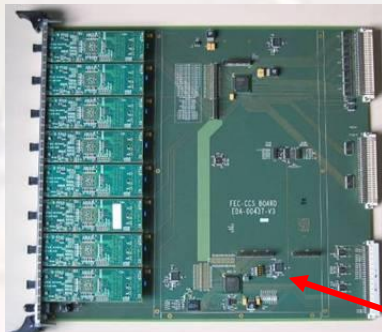
Upload any slides to Dropbox using filename:
3_<Yourname>.<extension>

I will choose 5 at random to show

GUIDELINE 3:
DON'T MAKE THE AUDIENCE WORK
TOO HARD TO UNDERSTAND
PLOTS/FIGURES

Maximize your signal to noise ratio!





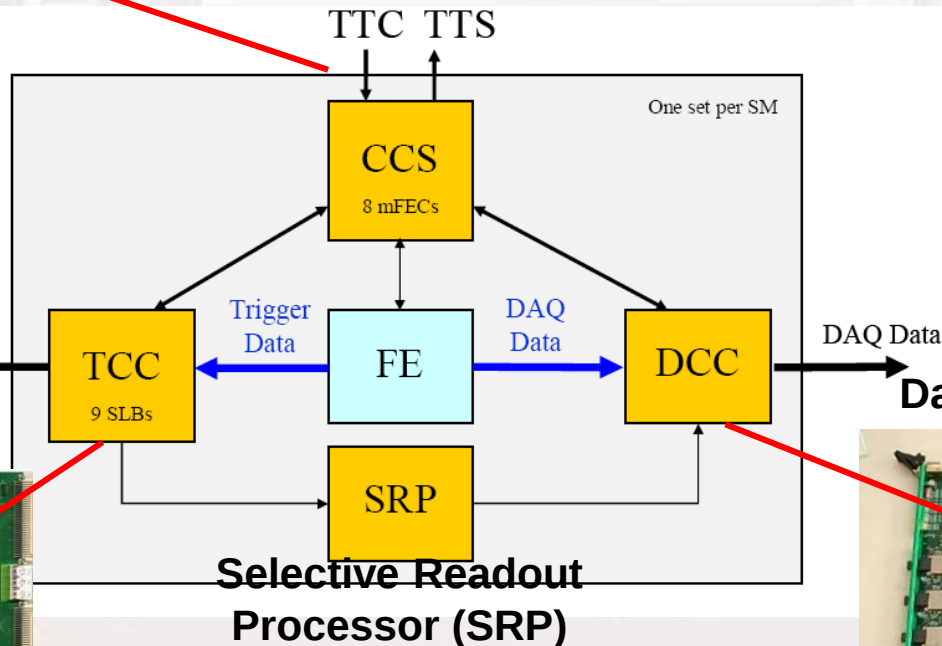
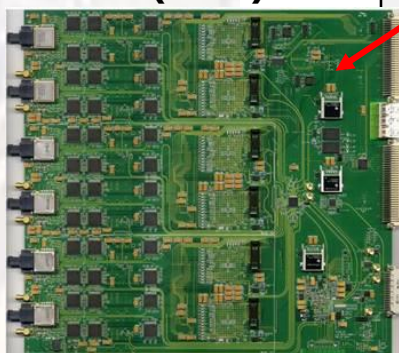
Clock & Control System Card (CCS)

Trigger Concentrator Cards (TCCs) receive FE card trigger primitives

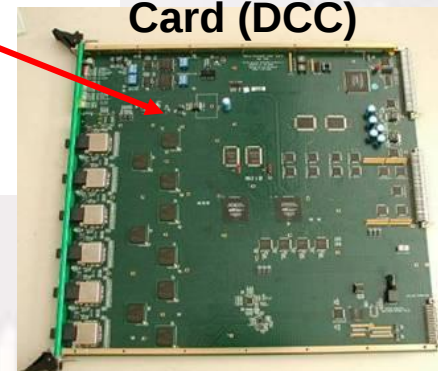
TCCs send trigger tower energy sums to Regional Calorimeter Trigger (RCT) at 40 MHz

Data Concentrator Card (DCC) reads FE data and TCC information upon L1 accept; performs data reduction and transfers to DAQ

Trigger Concentrator Card (TCC)



Data Concentrator Card (DCC)



(also known as **FED**)

TTC: Trigger and Timing Card
TTS: Trigger Throttling System
mFEC: mezzanine Front End Controller card
(connects to FE card via token ring)
SLB: Synchronization and Link Board
mezzanine

Only 70% area can be used for something useful!

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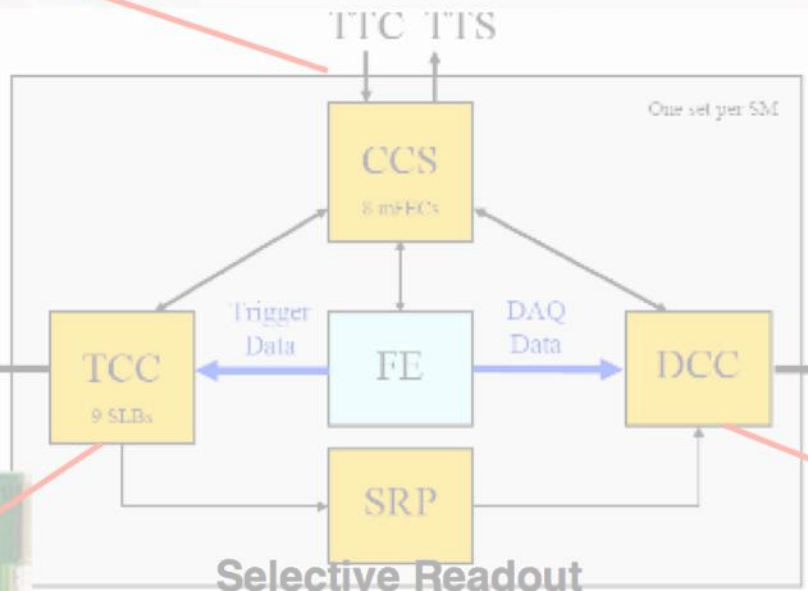
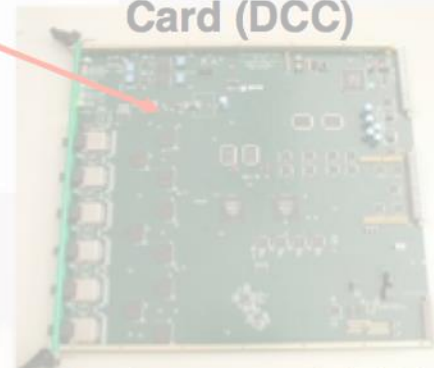
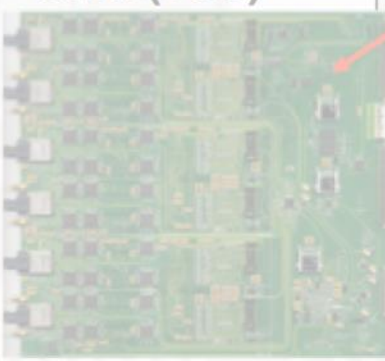
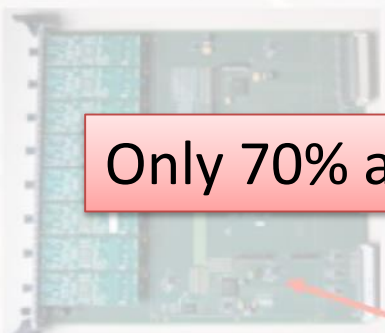
Trigger Concentrator Card (TCC)

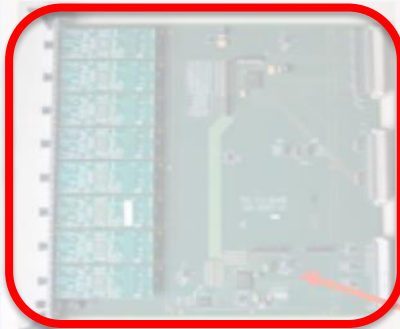
Data Concentrator Card (DCC)

Selective Readout Processor (SRP)

TTC: Trigger and Timing Card
TTS: Trigger Throttling System
mFEC: mezzanine Front End Controller card
(connects to FE card via token ring)
SLB: Synchronization and Link Board mezzanine

(also known as **FED**)



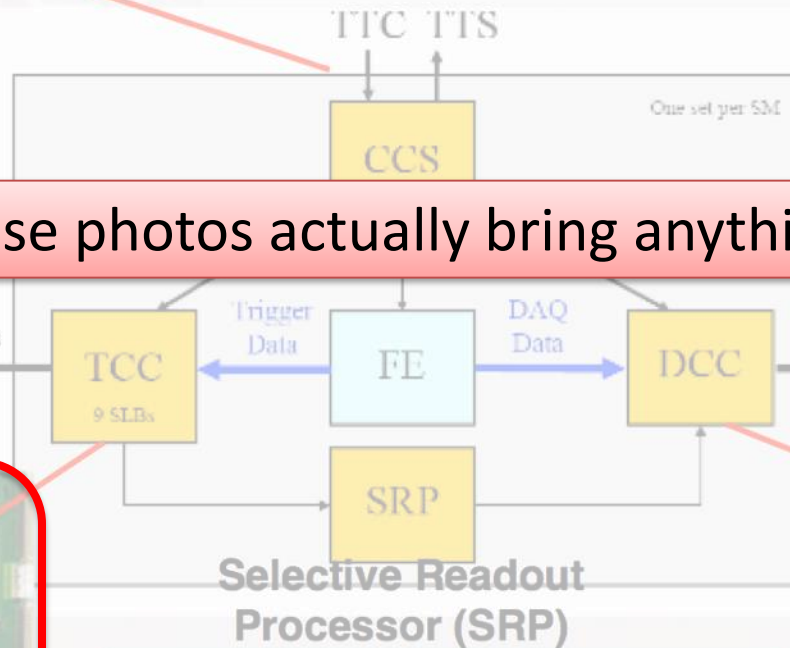
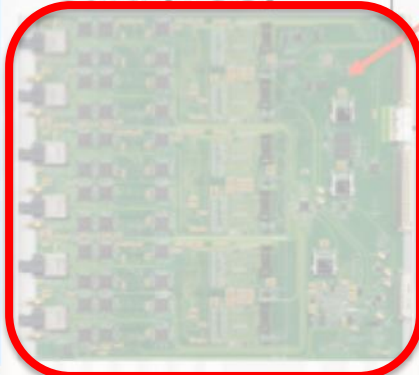


Clock & Control System Card (CCS)

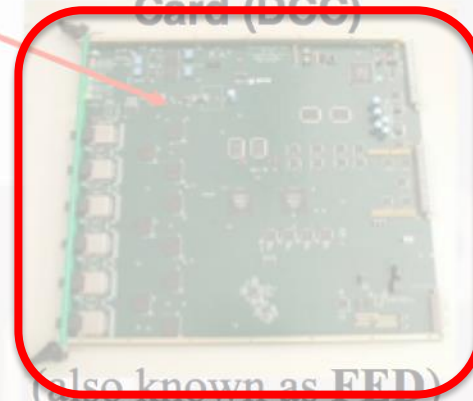
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Data Concentrator Card (DCC) reads FE data and TCC information upon L1 accept; performs data reduction and transfers to DAQ

Do these photos actually bring anything useful?

Trigger Concentrator Card (TCC)

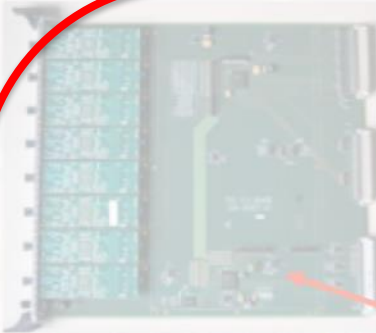


Data Concentrator Card (DCC)



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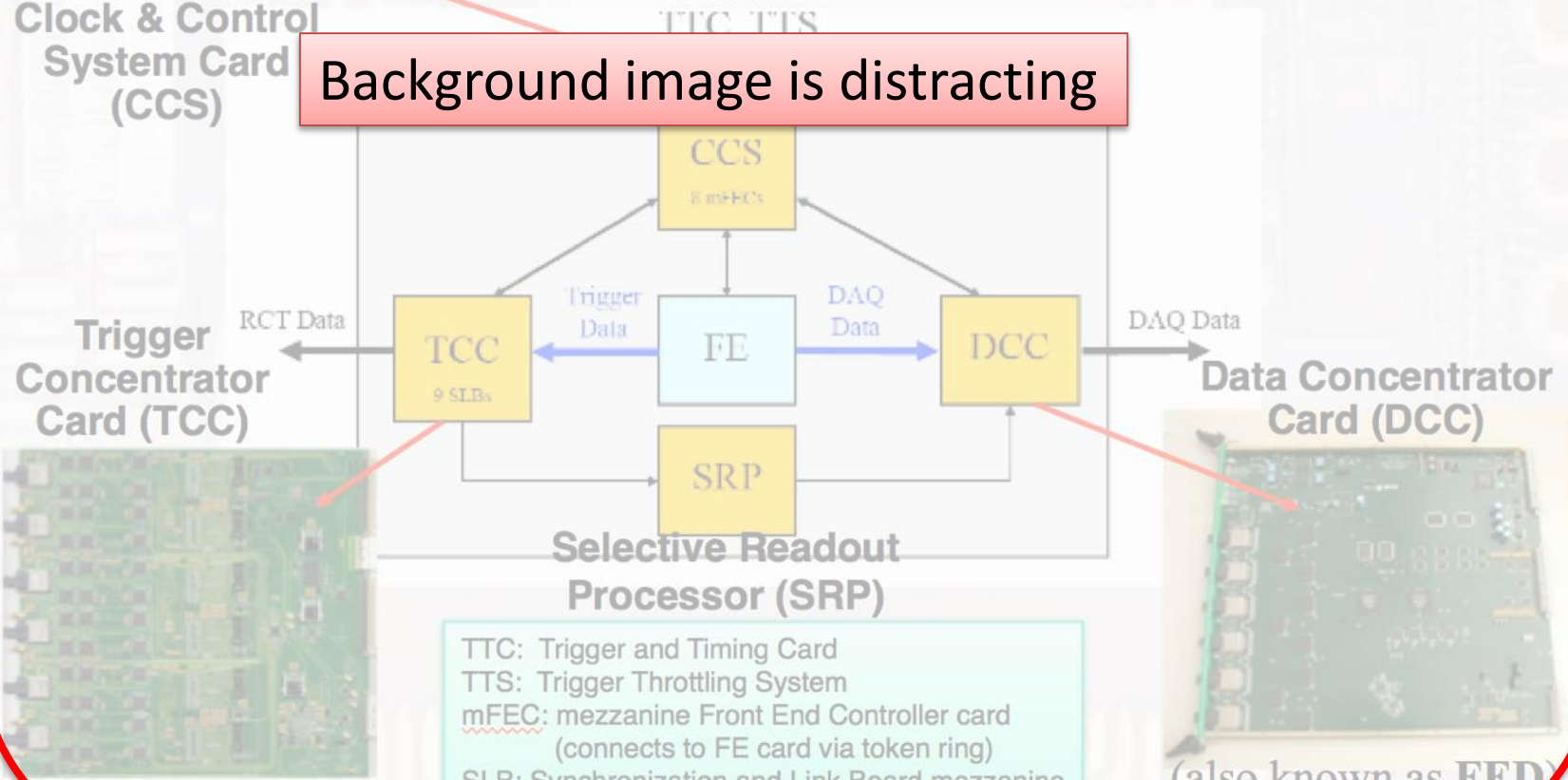
Clock & Control System Card (CCS)

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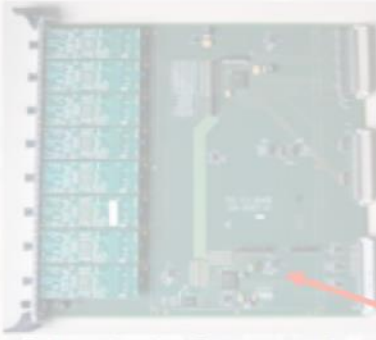
Data Concentrator Card (DCC) reads FE data and TCC information upon L1 accept; performs data reduction and transfers to DAQ

Background image is distracting



TTC: Trigger and Timing Card
 TTS: Trigger Throttling System
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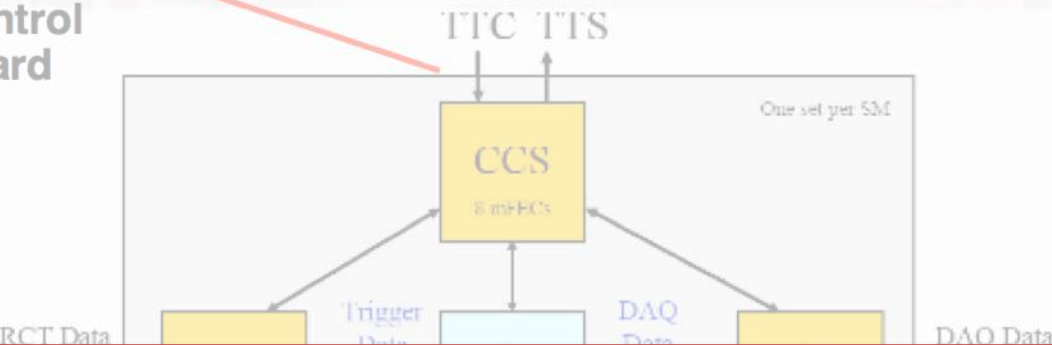
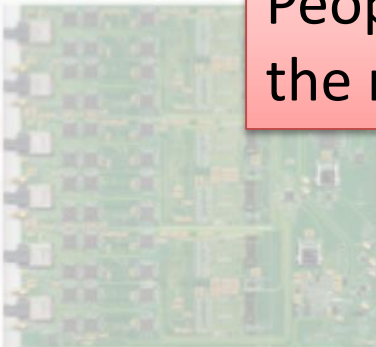
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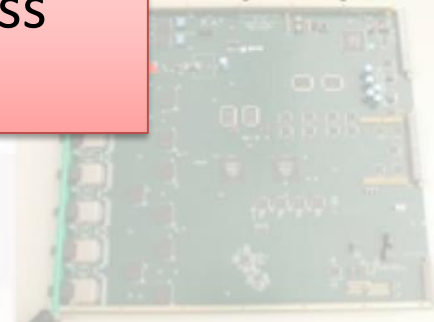


So many abbreviations - need a glossary!
People will read this and perhaps miss the main message!

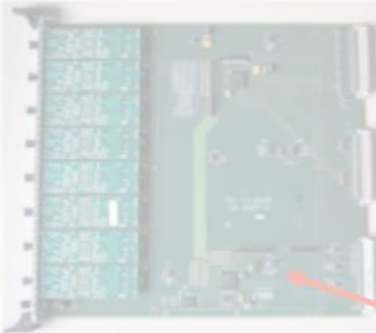
Processor (SRP)

TTC: Trigger and Timing Card
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Concentrator Card (DCC)



(also known as **FED**)



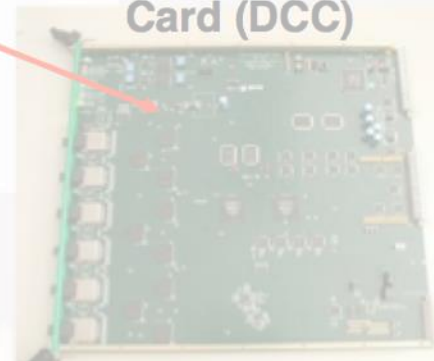
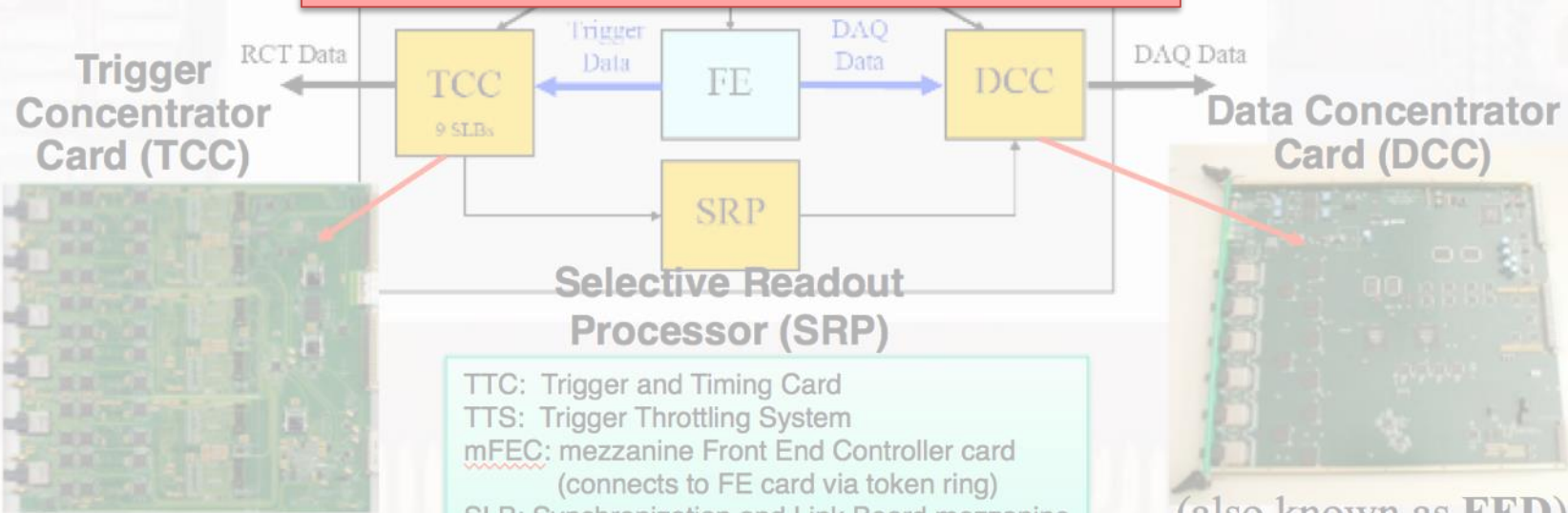
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Where should the audience look?
What is important?
Where is the message?

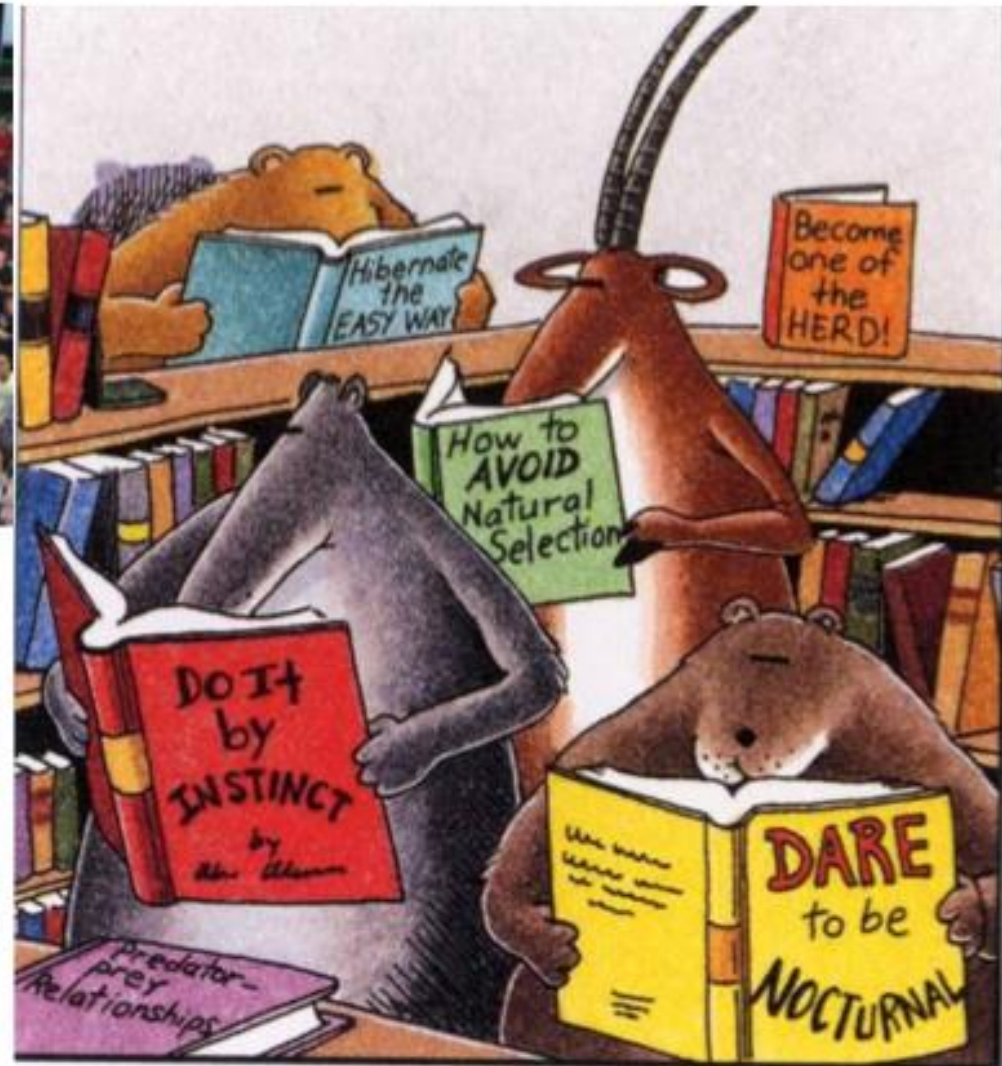


(also known as **FED**)

Images and cartoons:

Can be great, but be careful not to decrease your S/N and lose your main message(s)!

If I have a novel idea, how do I navigate?



In the animal self-help section

- Numerous discussions, several levels many stages,
- Long process: "how can it be known to the outside world, that the idea was mine" particularly to pertinent committees
- Options and metrics to get individual recognition.
- Motivations to seek more new ideas and/or help career promotion?

Challenge #6

What we do at CERN:
Smash things together, see what happens!

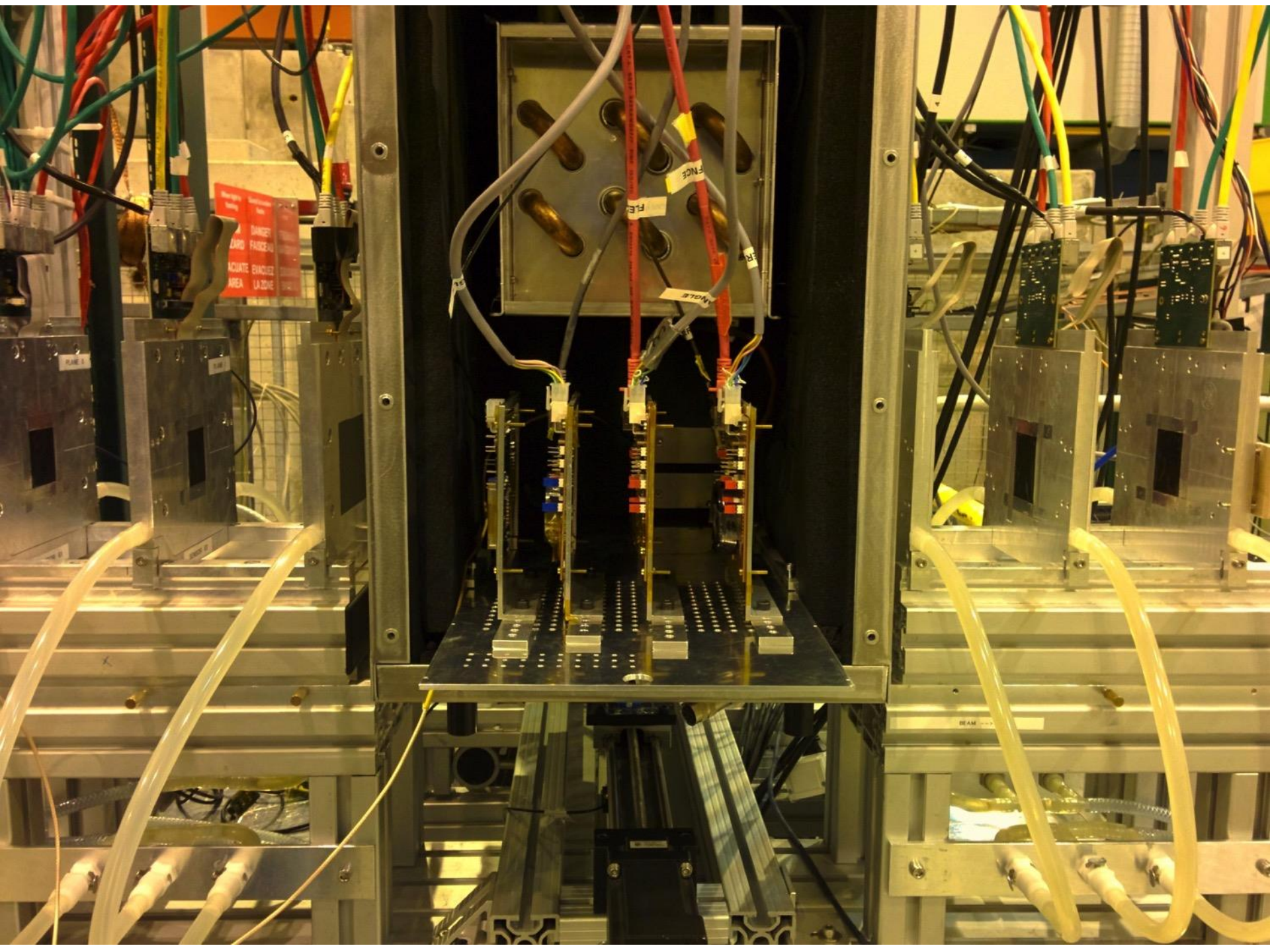


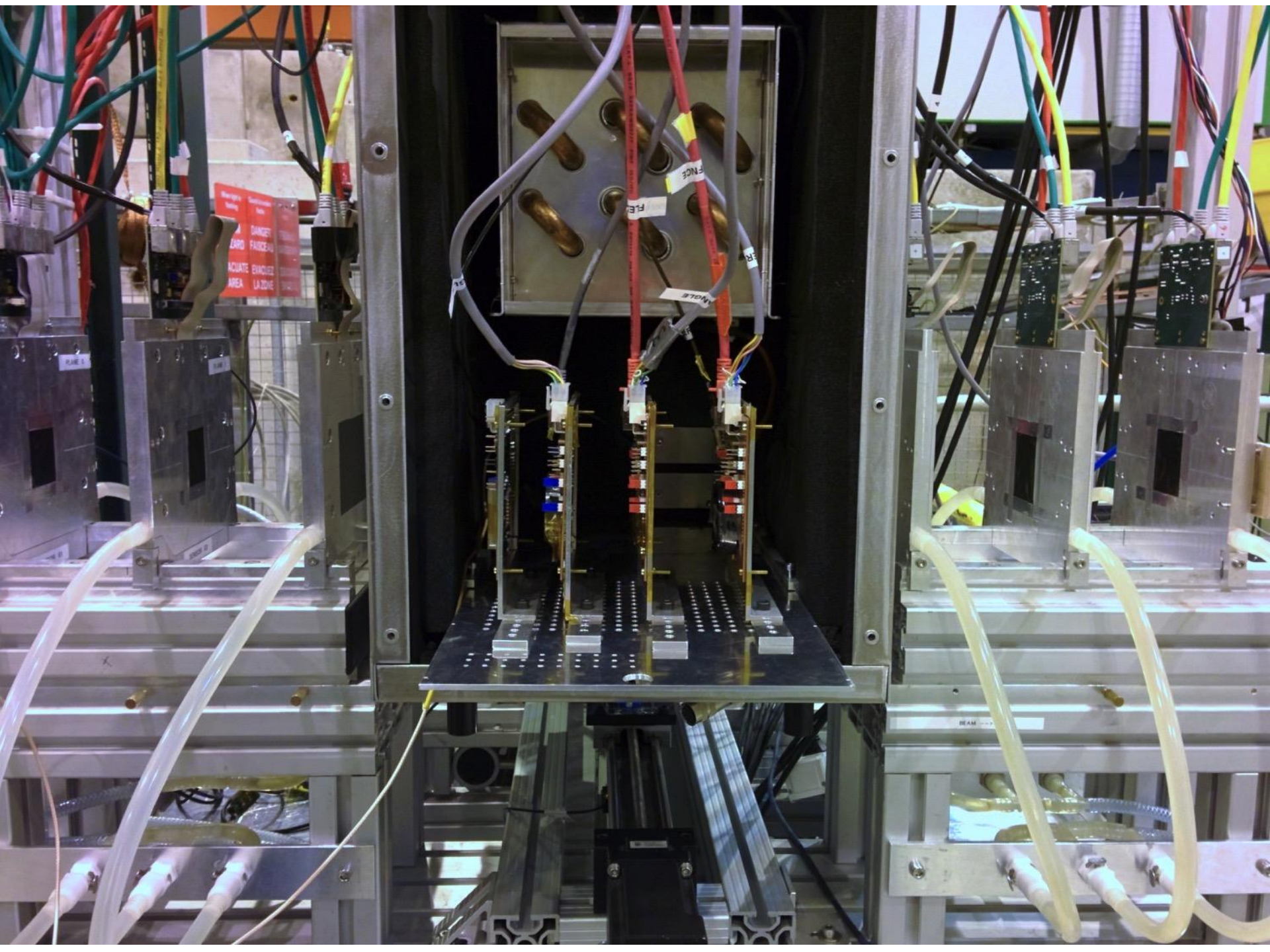
Before the particle accelerator

Photos – especially from beam areas
(with special thanks to Clara Nellist)

Do they add something useful to the
presentation?

If so, make them look good!





Preview File Edit View Go Tools Window Help

Show Inspector ⌘I
Show Magnifier

Adjust Color... ⌘C
Adjust Size...

Text Selection
✓ Rectangular Selection

Annotate ▶

Add Bookmark ⌘D

Rotate Left ⌘L
Rotate Right ⌘R
Flip Horizontal
Flip Vertical
Crop ⌘K

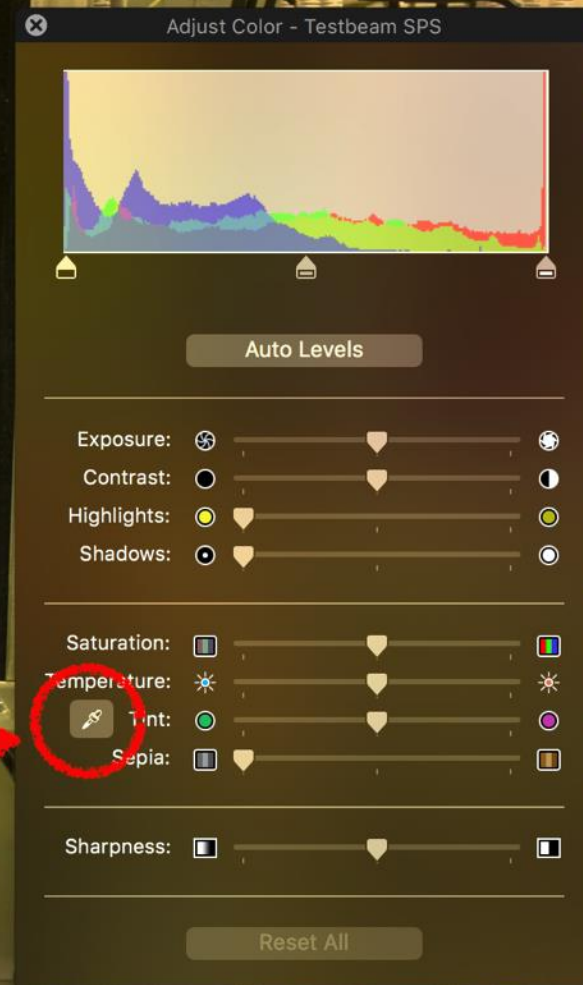
Assign Profile...
Show Location Info

Testbeam SPS ▾



2. Select a neutral grey or white part of your image.

1. Select the eye-dropper tool.



GUIDELINE 4:

**MAXIMIZE YOUR S/N RATIO & DON'T
BE AFRAID TO USE MORE SLIDES!**

Content ordering: dare to be different?

Most presentations follow a standard format:

- title
- overview of talk
- what we did
- what we found
- what this means
- what do we do next

This is the exciting stuff!

e.g.

https://indico.cern.ch/event/197461/contributions/1478916/attachments/290953/406672/ATLAS_Higgs-CERN-seminar-2012.pptx

But compare to a newspaper...

Trump back-pedals on Russian meddling remarks after outcry

Republicans and Democrats attack president's comments in press conference with Putin

● [Opinion: Republicans followed Trump off a cliff of treachery](#)



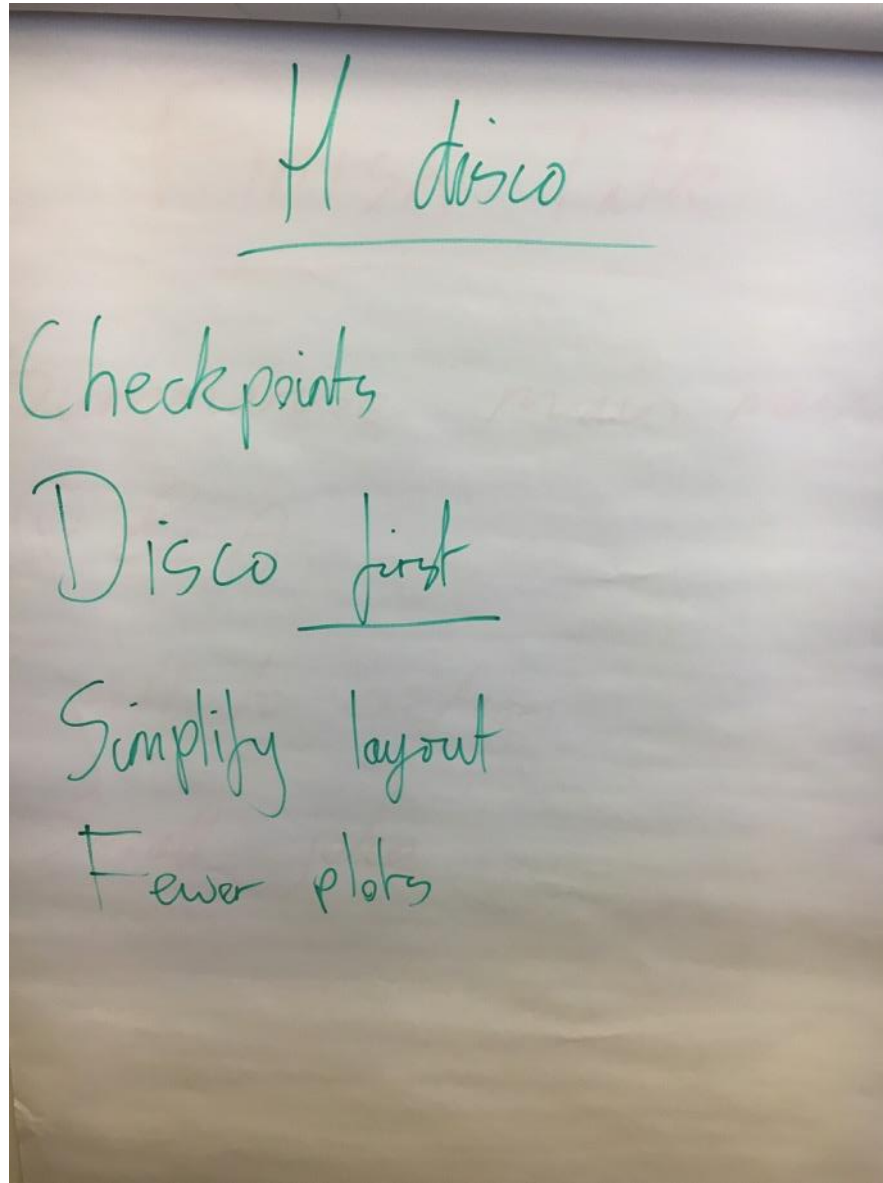
▲ Trump backflips on Russia interference – video

Donald Trump sought to partially reverse course on Tuesday in the face of furious, bipartisan criticism of his public undermining of US intelligence agencies during a press conference with [Vladimir Putin](#) in Helsinki.

The US president sought to bring closure after more than 24 hours of bitter recrimination by saying he had simply misspoke when he said in Finland that he saw no reason to believe [Russia](#) had interfered in the 2016 US election.

- Headline – get attention!
- Image – get attention!
- overview of article
- details
- links to more information

So how *could* the Higgs discovery
have been announced?



And what about posters?

Even more important to grab the attention as you do not have a captive audience!

A poster is essentially an abstract for a paper: summarize main points and show reader where to get more information

The CMS ECAL Upgrade for Precision Crystal Calorimetry at the HL-LHC

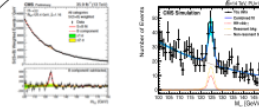


SCINT2017
Chamonix - France



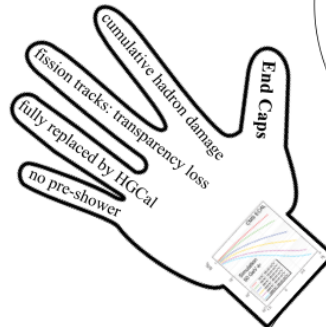
Institute for Research in
Fundamental Sciences

Arash Jofrehei
on behalf of CMS Collaboration
arash.jofrehei@cern.ch

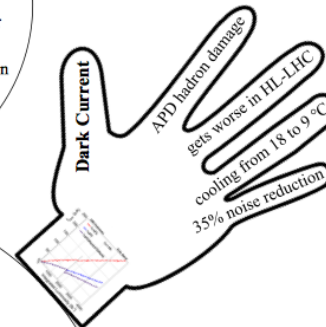


Physics Motivation

Mass resolution with $\sim 1\%$ precision crucial for discovery of Higgs boson.
Analyzing di-Higgs production will shed light on vacuum stability of universe.
+ many other beyond standard model studies



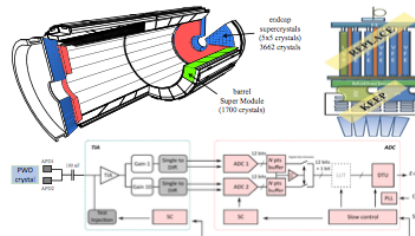
End Caps
fission tracks: transparency loss
fully replaced by HGCal
no pre-shower
cumulative hadron damage



Dark Current
APD hadron damage
gets worse in HL-LHC
cooling from 18 to 9 °C
35% noise reduction

ECAL Legacy

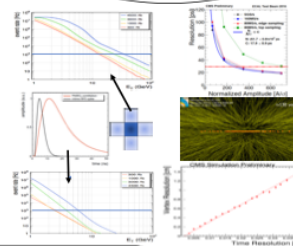
5x5 arrays of crystals
APDs in barrel
Vacuum Photo Triodes in end caps
5 identical Very Front End readouts
one Front-End (FE) card for transmission
separate readout per channel, triggered by overall sum
40 MHz sampling ADC with 3 gains



Barrel Electronics Upgrade

faster optical links (4 fibers needed) – No buffer
single crystal trigger primitive
160 MHz sampling with two gains
mitigate dark current, out-of-time pile up, spikes
precision timing is possible

For further details, please refer to TDR-17-002 which will come out soon.

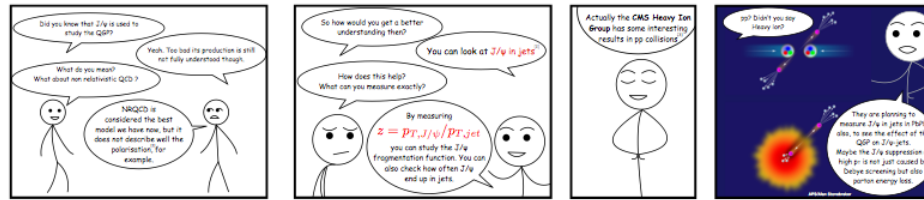


Spike Rejection

energy deposit in the APD bulk
EM-shower-like but faster
currently rejected by topological cuts
single crystal triggering + pulse shape discrimination will be added

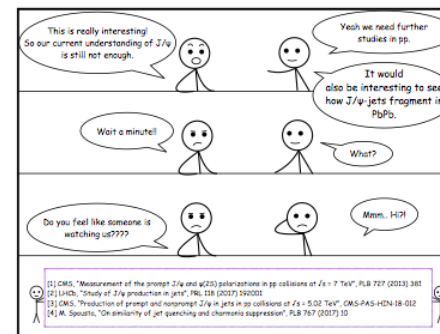
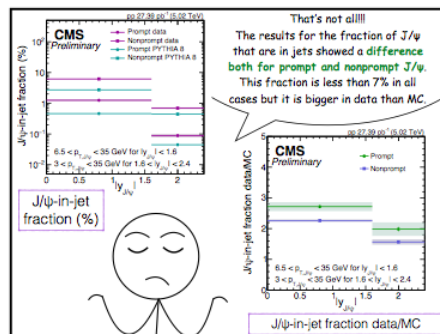
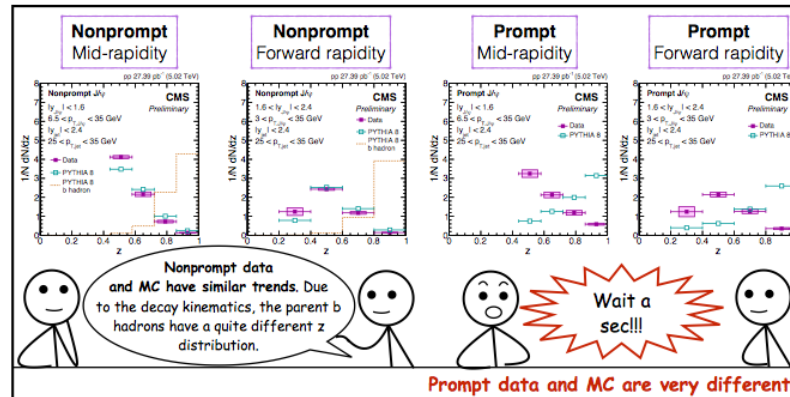
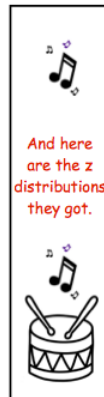
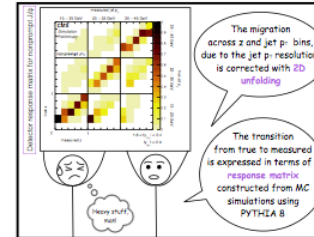
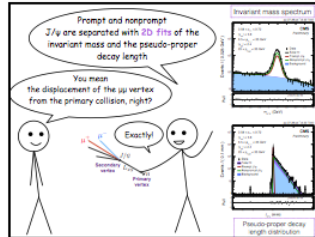
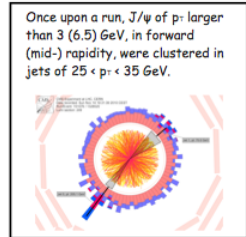
Precision Timing

higher sampling rate
measuring time-of-flight from vertices
precise vertex discrimination
precise angle between di-photons
enhancing mass resolution



You mean like jet quenching?^[4]

Maybe let's take a look together at their results.

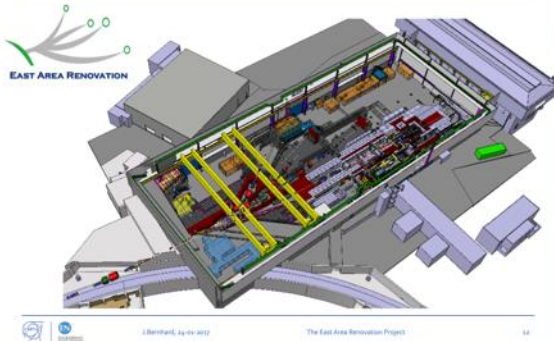


[1] CMS, "Measurement of the prompt J/ψ and $\psi(2S)$ polarizations in pp collisions at $\sqrt{s} = 7$ TeV", PLB 727 (2013) 361
 [2] LHCb, "Study of J/ψ production in jets", PRD 158 (2017) 152001
 [3] CMS, "Production of prompt and nonprompt J/ψ in jets in pp collisions at $\sqrt{s} = 5.02$ TeV", CMS-PAS-HIN-08-002
 [4] M. Spalardi, "On sensitivity of jet quenching and charmion suppressor", PLB 767 (2017) 10

GUIDELINE 5:
DON'T BE AFRAID TO BE DIFFERENT

How to finish a talk?

Thank you for your attention!



Thank you !

Questions ?



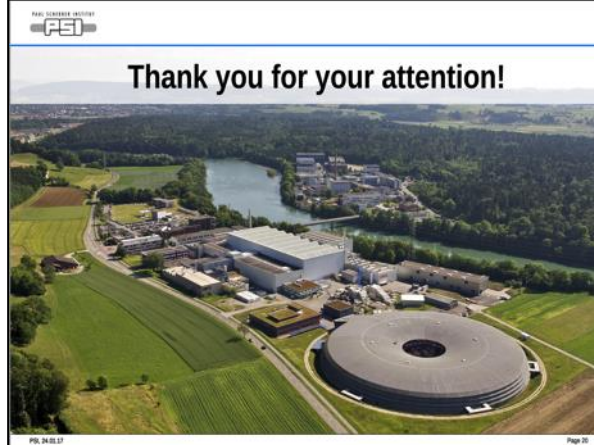
Thanks for attention!

THANK YOU!

irradiation-facilities.web.cern.ch
Contact: Irradiation.Facilities@cern.ch



Thank you for your attention!



The end ! Thank you. Questions ?



Thank you

Thank you for your attention

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"MSMT c. LM201505B", "IGA no. PrF/2016/002"

Thanks



Thank
you
for your attention!



UNIVERSITÀ DI PISA
24-27 January 2017

Thank you for your patience ...

... unlikely many many issues not covered:

signal formation and digitization

readout

buses

hw configuration

hw control

sw configuration

sw control

monitoring

...

How to finish a talk?

Finish Talk

Summarize main messages

Q & A

Call to action

Small joke

Guideline #1:

the presentation is for the audience

Guideline #2:

focus on your main messages

spend 70% of your time in planning; 30% in using ppt

Guideline 3:

**don't make the audience work too hard to understand
plots/figures**

Guideline #4:

**maximize your s/n ratio & don't be afraid to use more
slides!**

Guideline #5:

Don't be afraid to be different

Exercise 4: You have 10 minutes to modify the 1-minute presentation you made earlier.

Upload any slides to Dropbox using filename:
4_<Yourname>.<extension>

I will choose 3 at random for presentation!

Exercise 5: Working in pairs, you have 20 minutes to modify and simplify a presentation you have made in the last six months, to max. 5 slides (3 minutes)

Upload any slides to Dropbox using filename: **5_<Yourname>.<extension>**

I will choose 2 at random for presentation!

Guideline #1:

the presentation is for the audience

Guideline #2:

focus on your main messages

spend 70% of your time in planning; 30% in using ppt

Guideline 3:

**don't make the audience work too hard to understand
plots/figures**

Guideline #4:

**maximize your s/n ratio & don't be afraid to use more
slides!**

Guideline #5:

Don't be afraid to be different