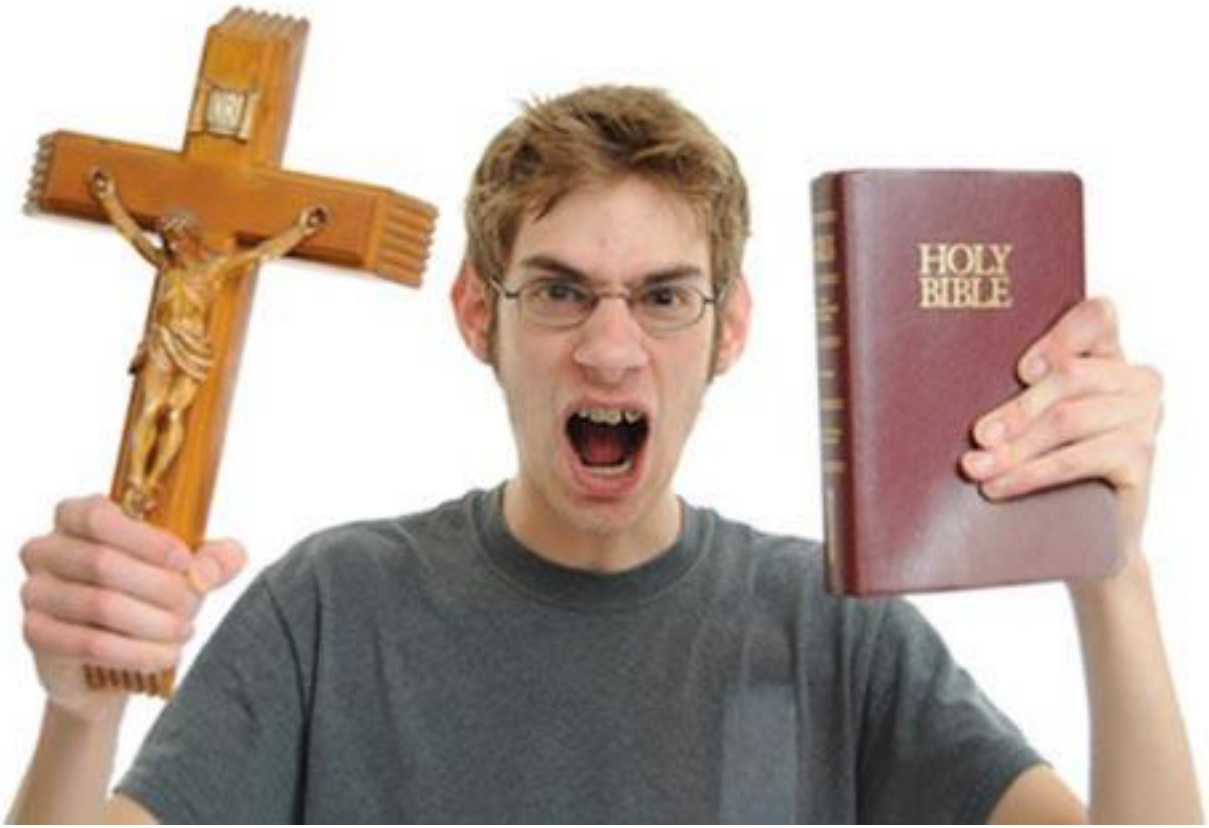
Making the most of your 10 minutes of fame

Dave.Barney@cern.ch

I am not going to evangelize!



Presentation skill ≠ 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!

Matteo – Silicon

Passionate

Lot of content in 1 minute

Good picture

No text

Non-verbal communication

Tamar – Quantum Entanglement

Structure of slides – like a story

Kept audience wondering

Kept audience involved

Different levels at same time

Good pace

Mateusz – Trackers

Each slide has relevant caption

Professional

Pictures were great!

Cartoon was good!

Mareike – Badminton

Nice structure

Personal

Summarised things very well

Every picture relevant

Used text when necessary

Thorben - American Football

Descriptive slides

Big pictures - like a movie

Played with expectations

1 message on one slide

Personal

Alessandra - CMS

Brief

Said everything necessary

Self-explanatory picture

Attractive images

Thomas

Focused on what audience needs to know

Looked professional (slides)

No "filler"

Good flow

Passionate!

Nikos – Mass spectrometer

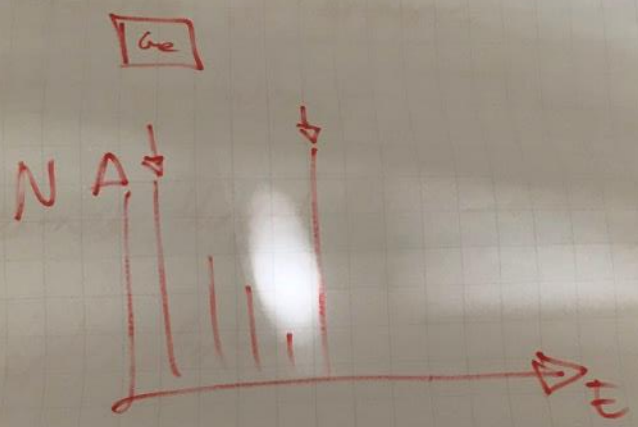
Very happy – passionate

Nikos is a salesman!

Kept it simple

Got the message across

Valerie



No slides! Helps keep attention

Simple plot – understandable

Right amount of information

Irene – languages

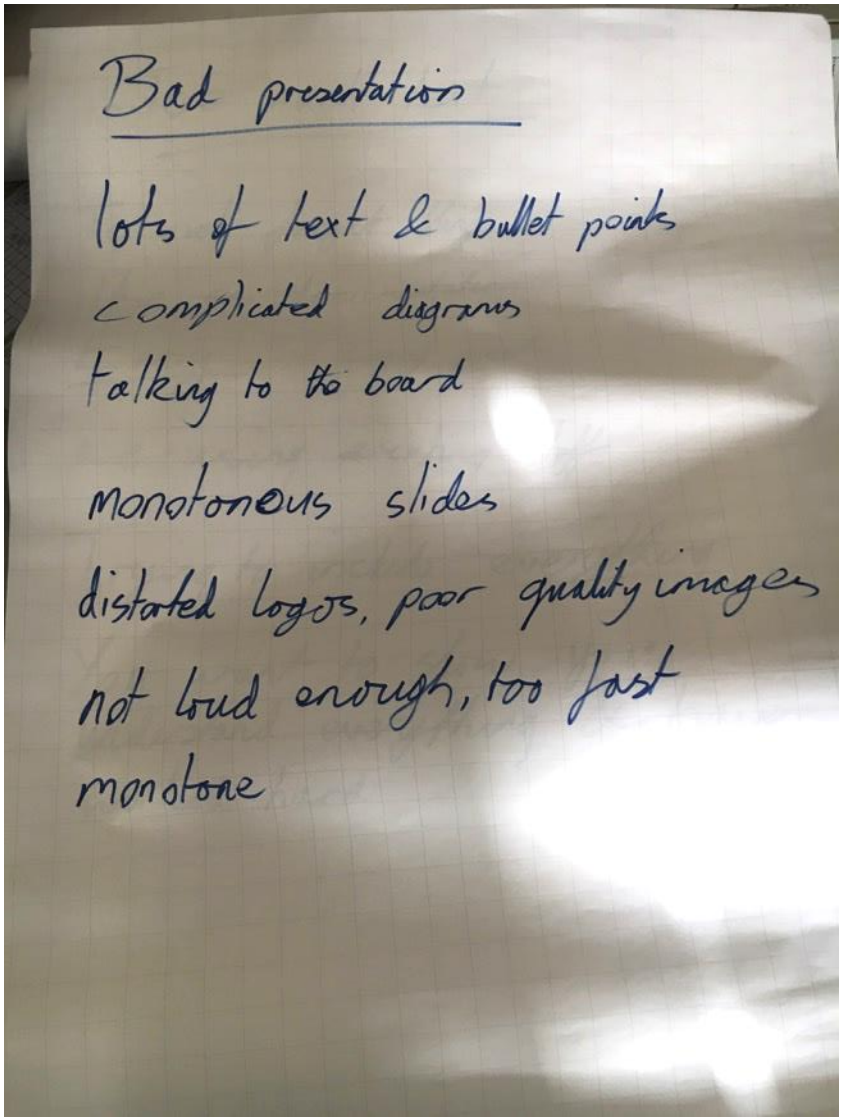
Essential & artistic

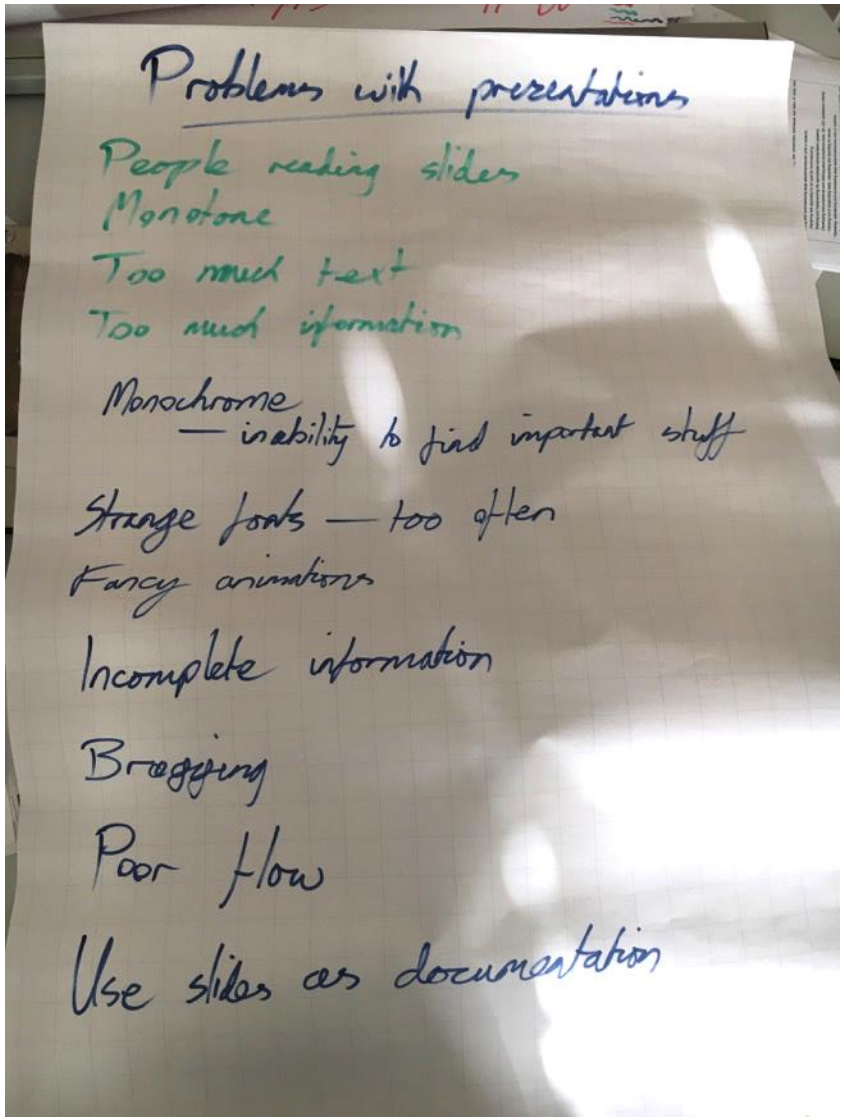
Not overloaded

Learned things!

Kept attention

What are the most common problems with presentations?





Why do people put too much information into a presentation?

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 ≠ 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 <u>not</u> the “what”

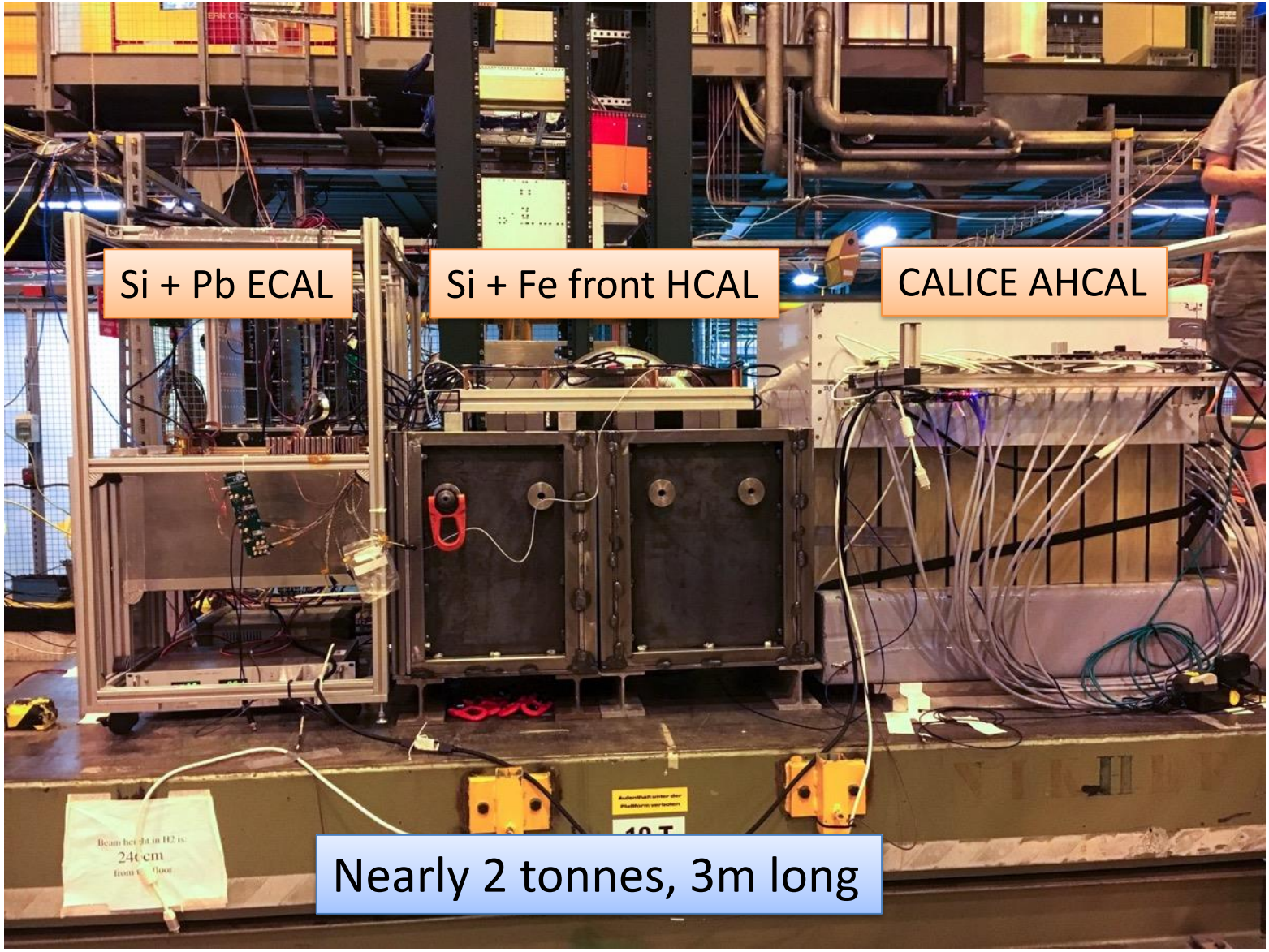
It is the “***so what?***”

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

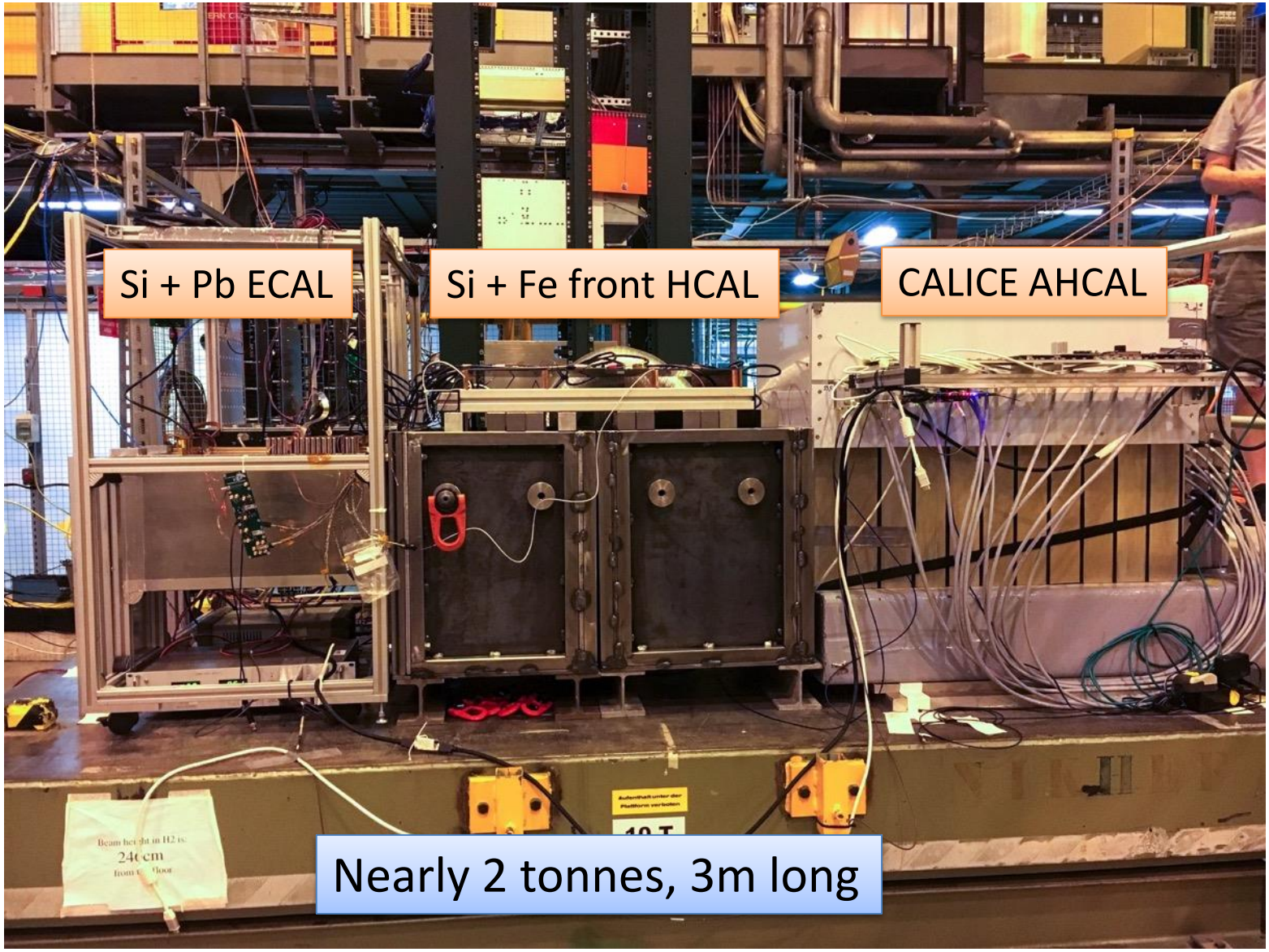
Even if the “so what?” is the only text on your slide, an offline reader will be able to understand the important points of the presentation

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: Decoding NASA

Look at your handouts. 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

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

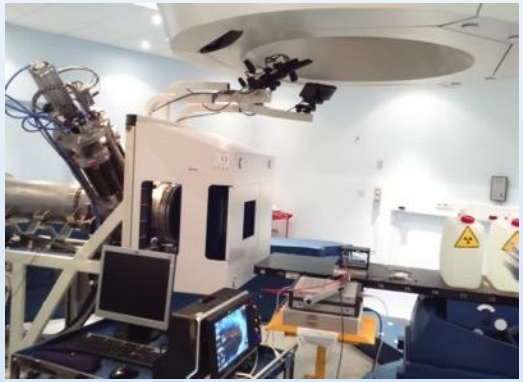
Good examples:

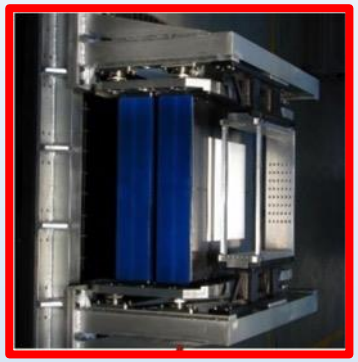
Pros vs cons

Checklists

Beam monitoring in charged particle therapy

Parallel-plate ionization chambers





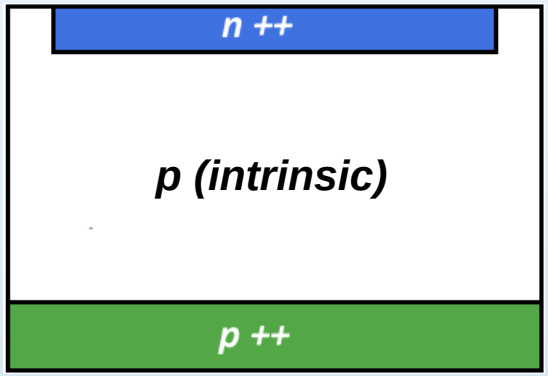
PROS:

- 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 ±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

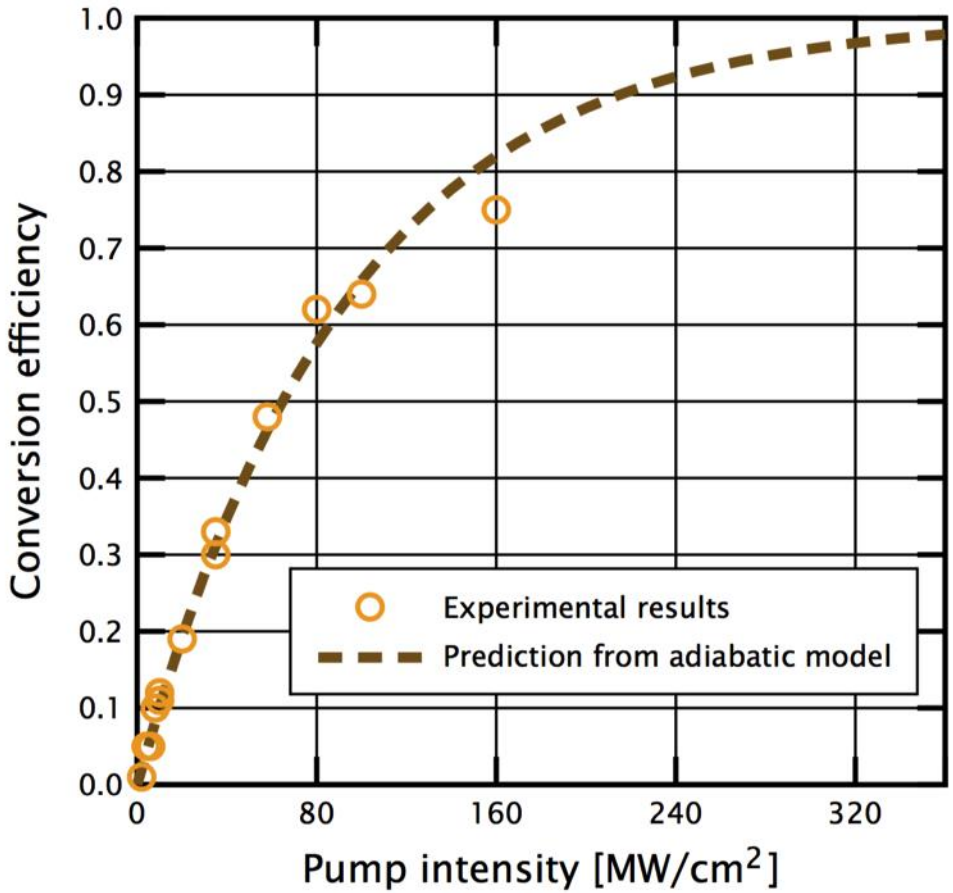
GUIDELINE #2:
FOCUS ON YOUR MAIN MESSAGES & USE BULLET LISTS APPROPRIATELY

Plots

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

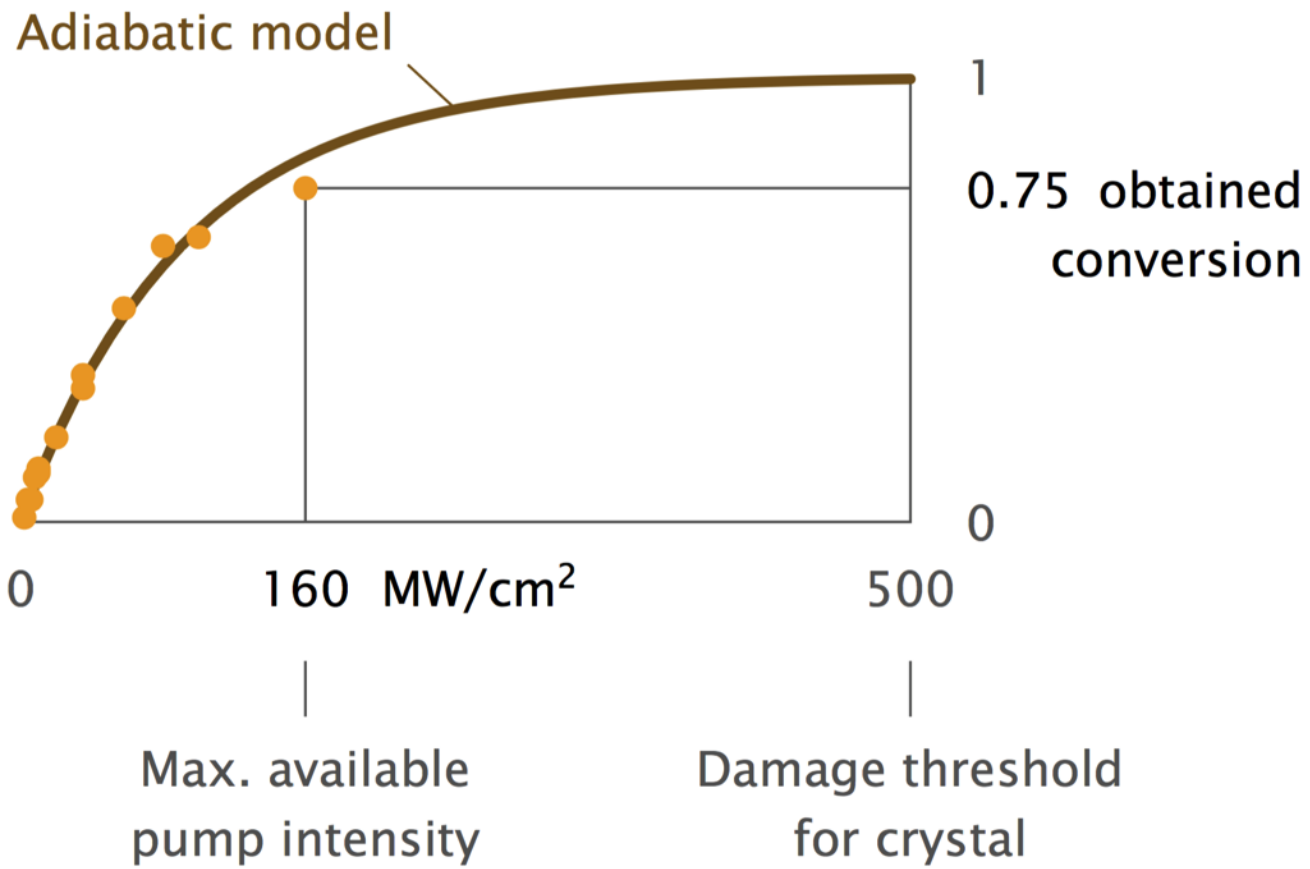
http://www.treesmapsandtheorems.com/barriers

Efficiency of adiabatic frequency conversion



- Maximum pump intensity available experimentally: 160 MW/cm^2
- λ_1 = 1530 nm; λ_2 = 1064 nm (Q-switched Nd:YLF)
- The maximum demonstrated conversion efficiency was 75 percent
- Periodically poled crystal can get damaged from 500 MW/cm^2 of pump intensity

The conversion approaches 100% for high enough pump intensity



Global Reconstruction - Full Simulation Reconstruction and Detector Performance: Photons

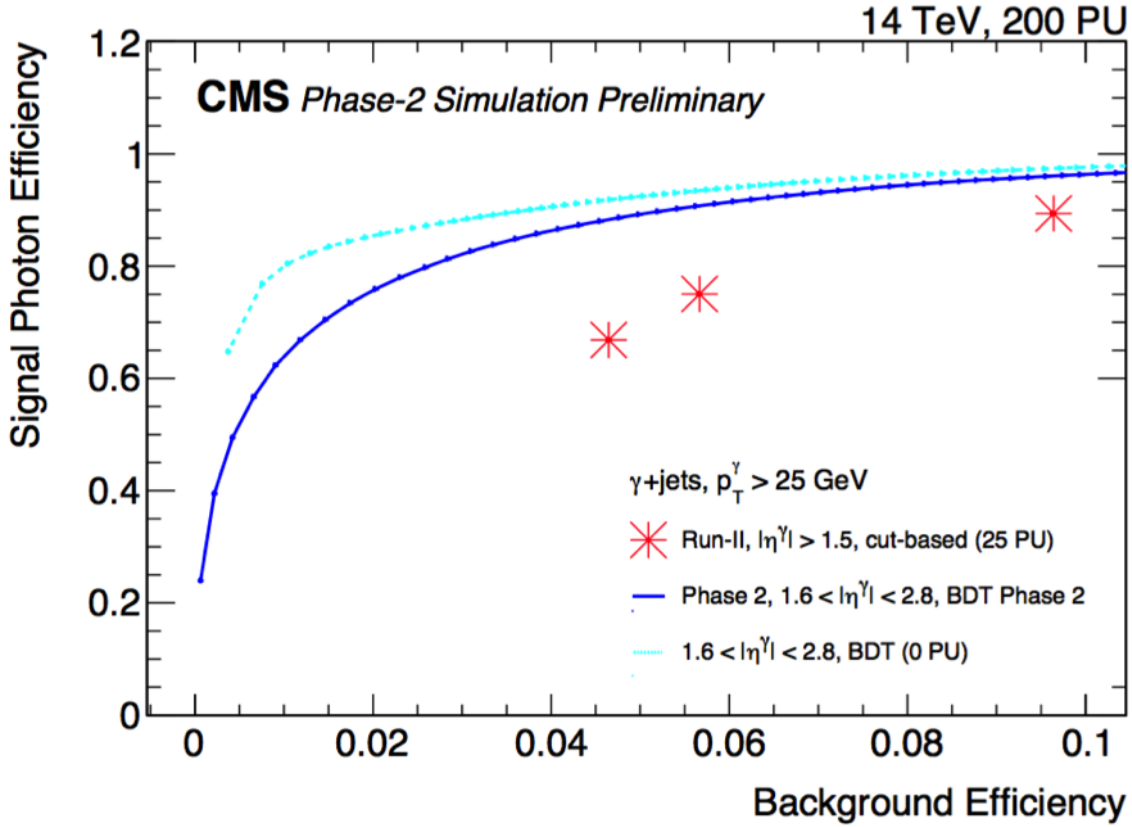


Figure 11.6: Photon efficiency versus photon-misidentification probability in simulated γ+ jets events for the BDT training. Signal photons are matched within $\Delta R(\eta, \varphi) < 0.1$ to isolated photons generated within the kinematic phase space $p_T^\gamma > 25$ GeV and $1.6 < |\eta_\gamma| < 2.8$. 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 γ + jets produced using the Run 2 conditions (average pileup of 25 pp collisions at $\sqrt{s}$ = 13 TeV).

Exercise 3: You have 10 minutes to simplify the slide on DropBox called "Exercise3.pptx"

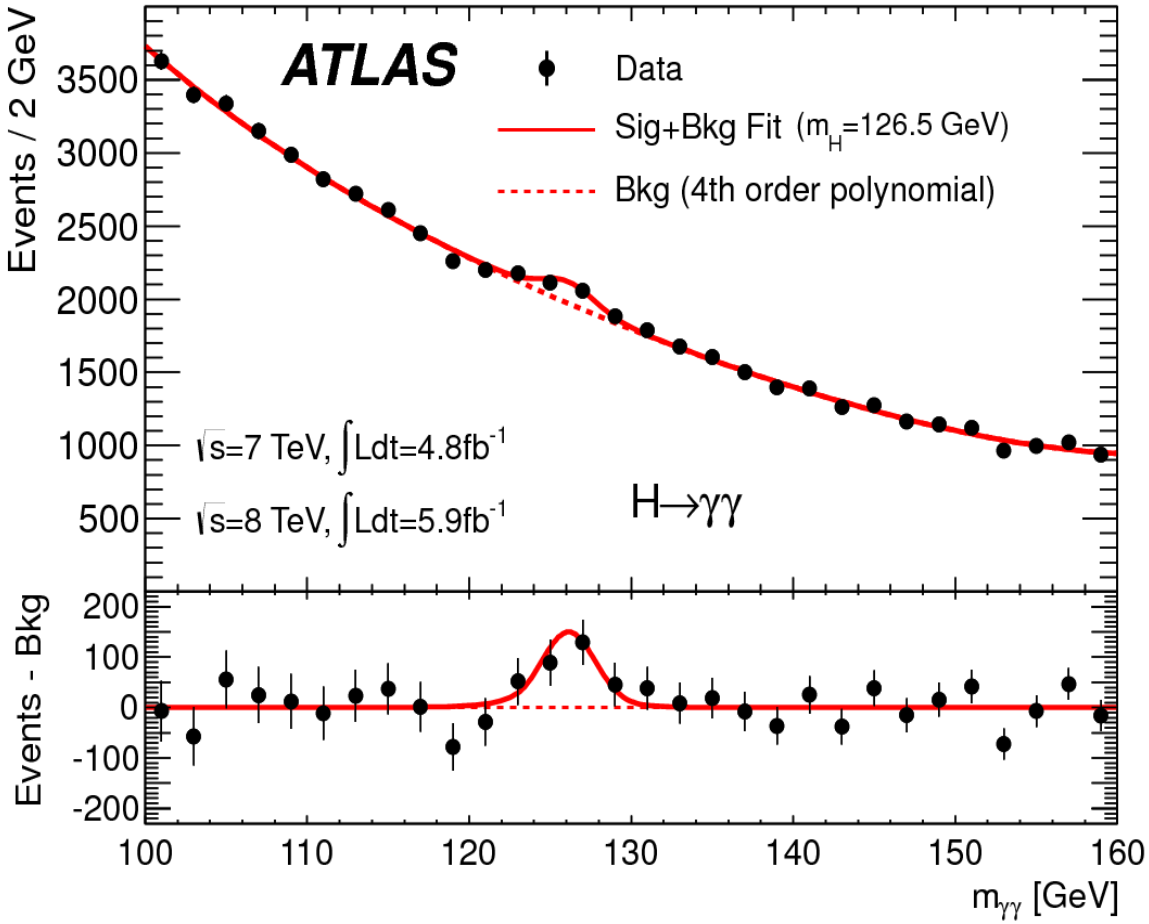
Upload any slides to Dropbox using filename:

3_<Yourname>.<extension>

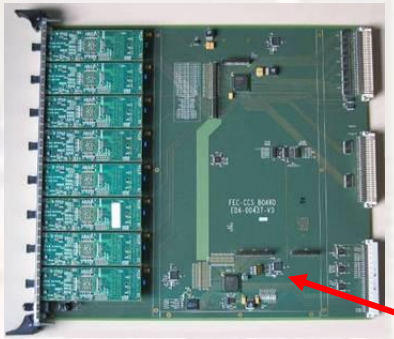
I will choose 3 at random to show

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

Maximize your signal to noise ratio!



ECAL Electronics Chain

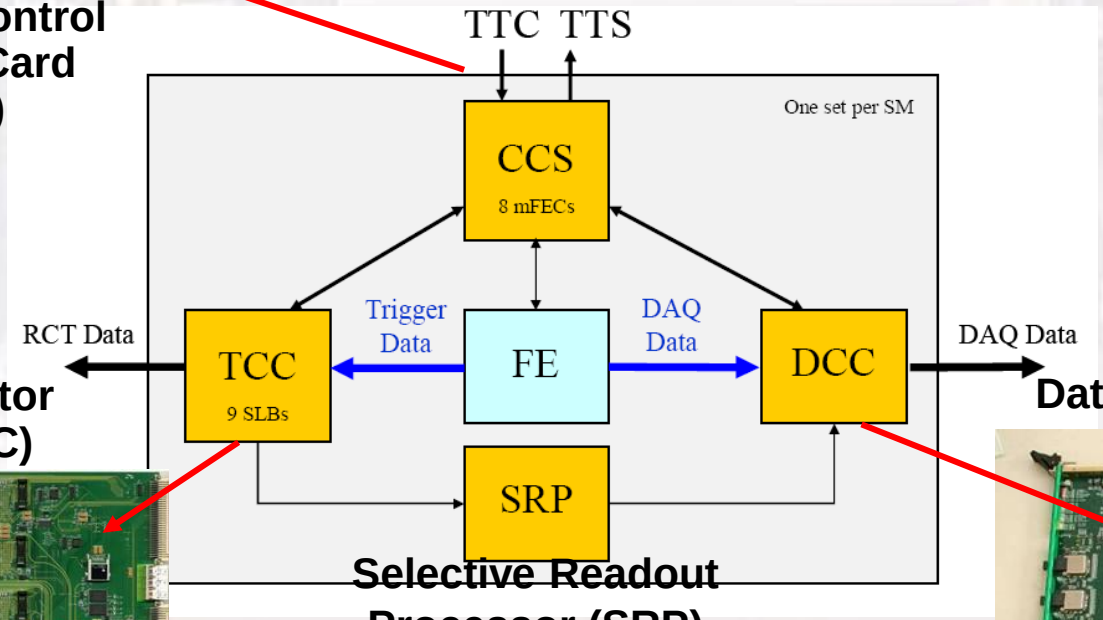


Clock & Control System Card (CCS)

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



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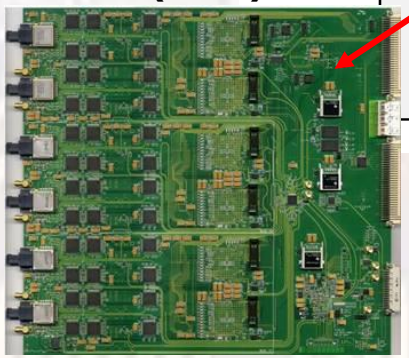
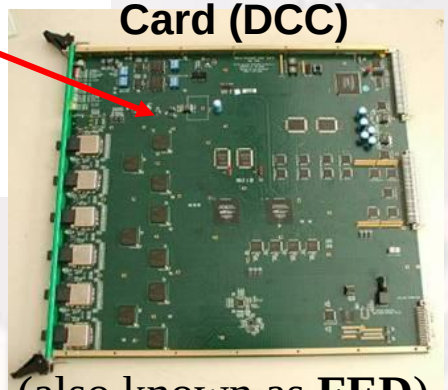


Selective Readout Processor (SRP)

Data Concentrator Card (DCC)



(also known as **FED**)

TTC: Trigger and Timing Card
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mezzanine

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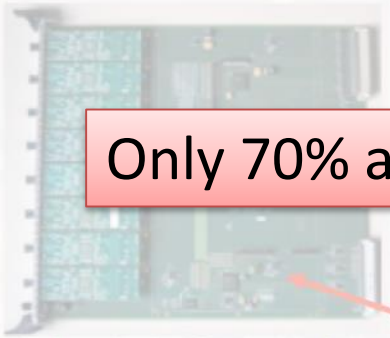
Only 70% area can be used for something useful!



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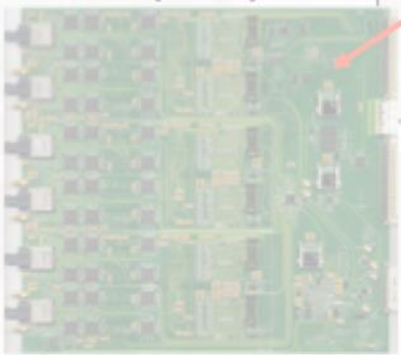

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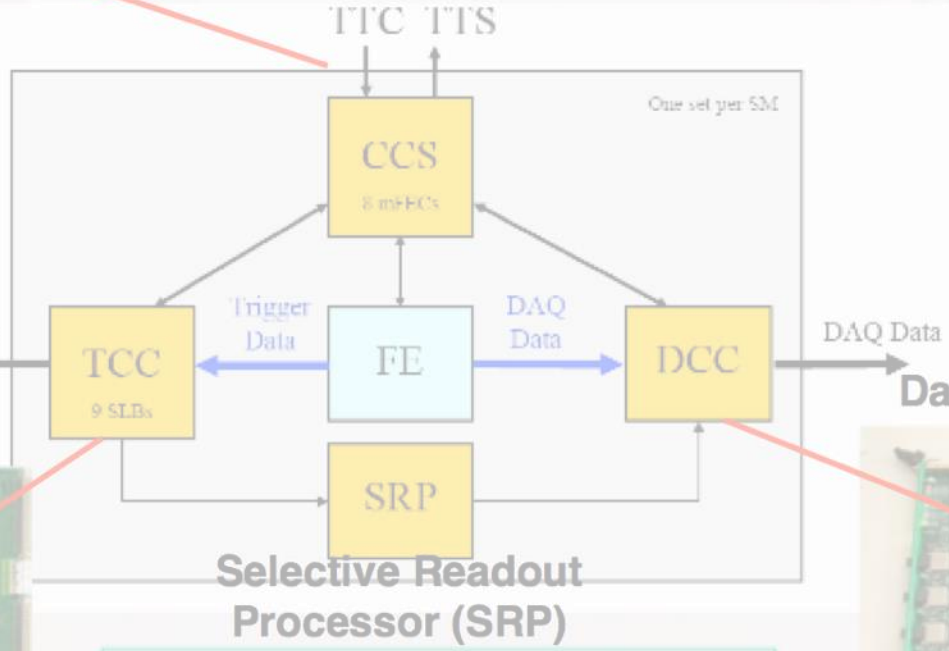

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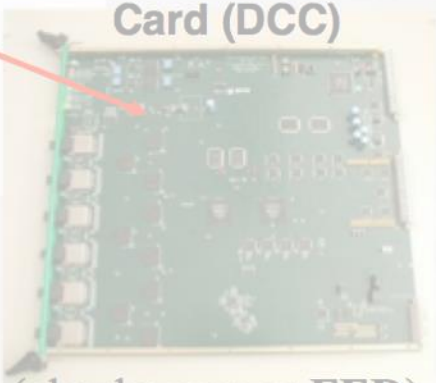

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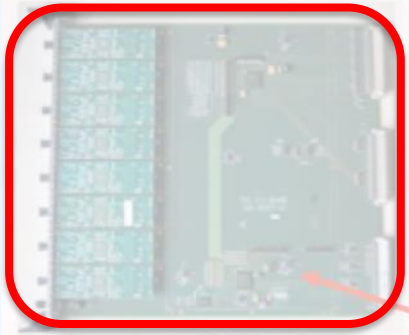

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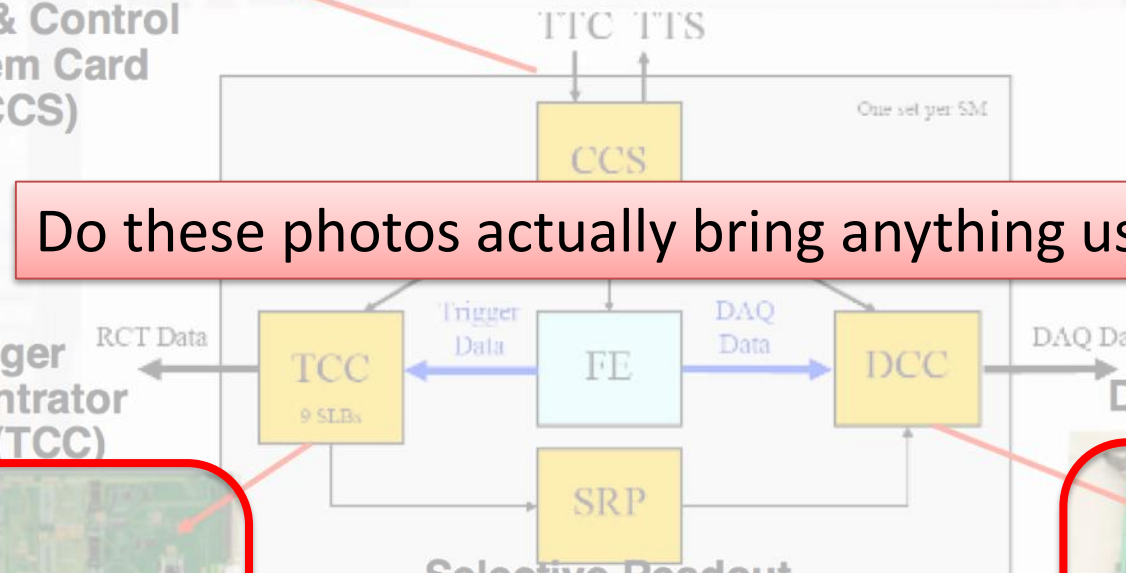
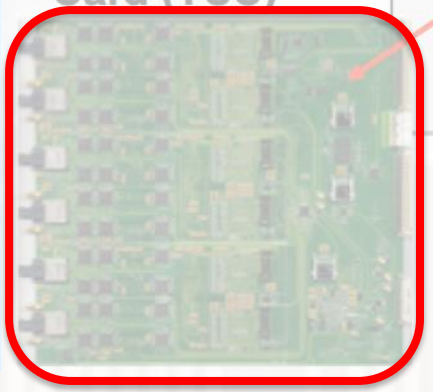


Do these photos actually bring anything useful?

Trigger Concentrator Card (TCC)



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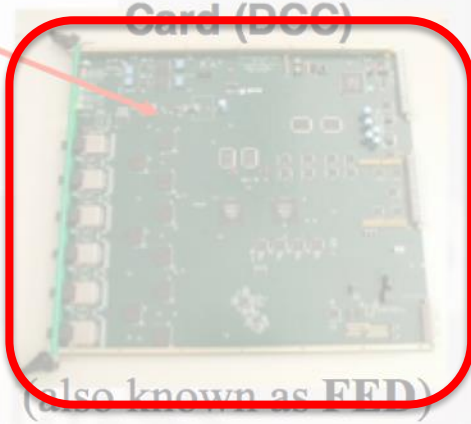

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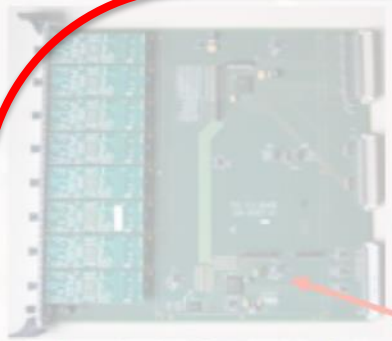
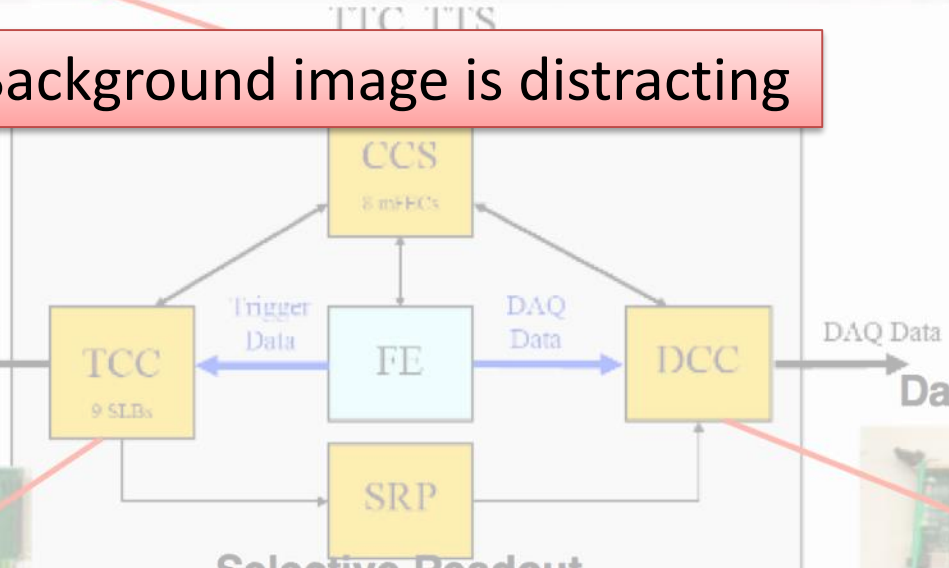
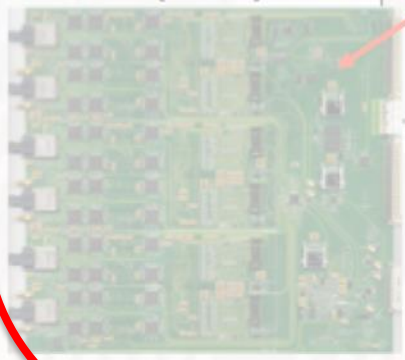


Clock & Control System Card (CCS)

Background image is distracting



Trigger Concentrator Card (TCC)



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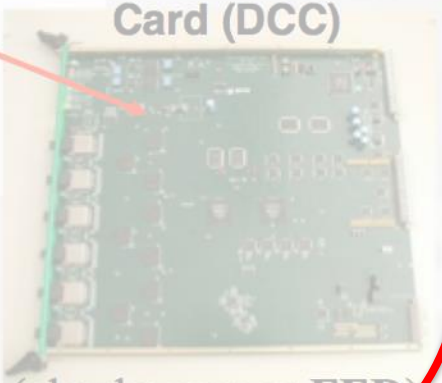

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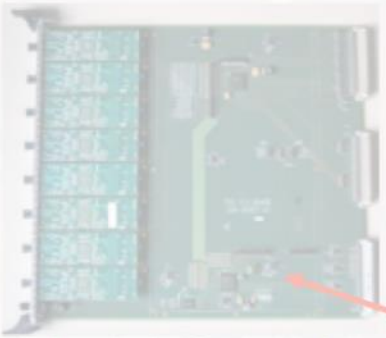

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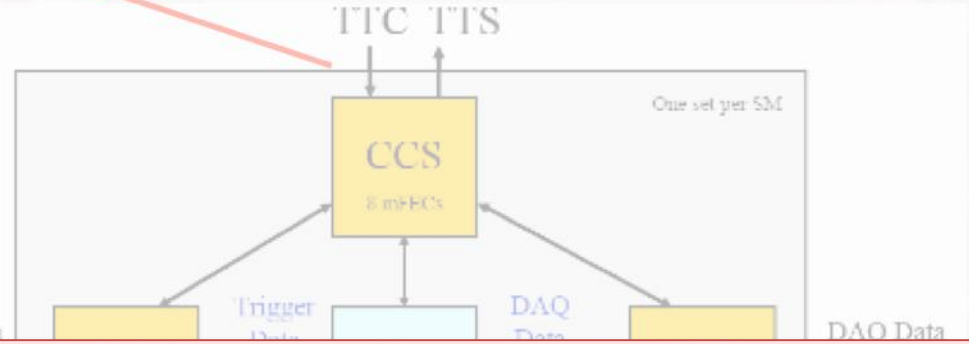
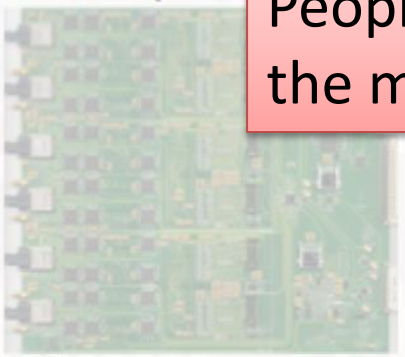


Trigger Concentrator Card (TCC)

Concentrator Card (DCC)

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



Processor (SRP)

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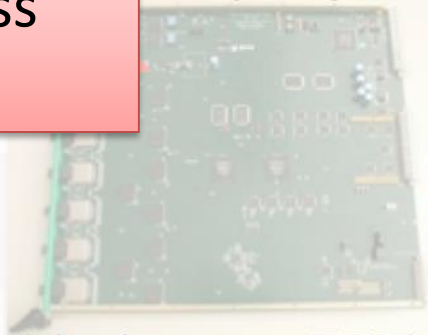

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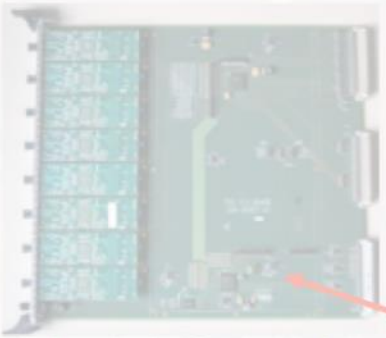
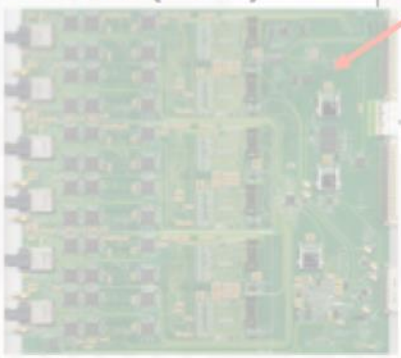
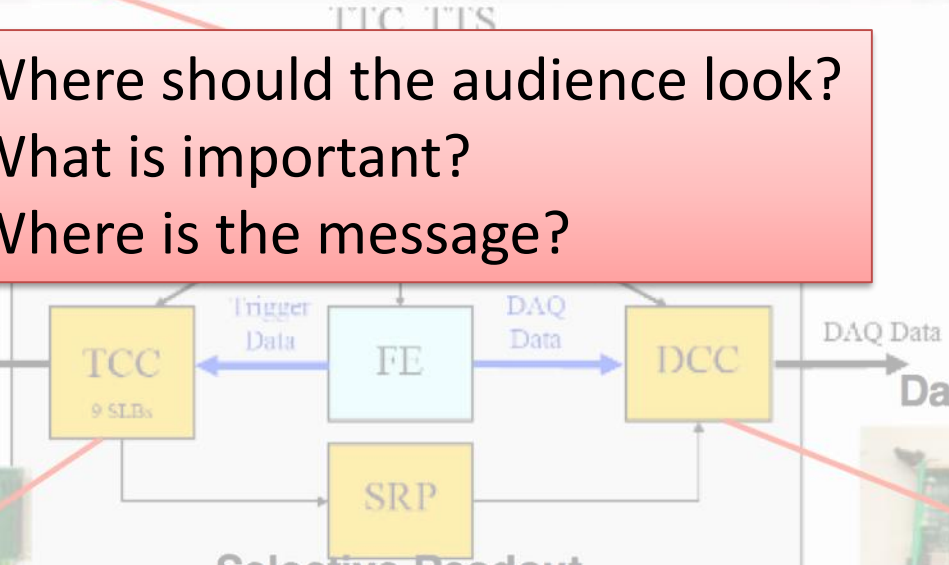


Clock & Control System Card (CCS)

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



Trigger Concentrator Card (TCC)



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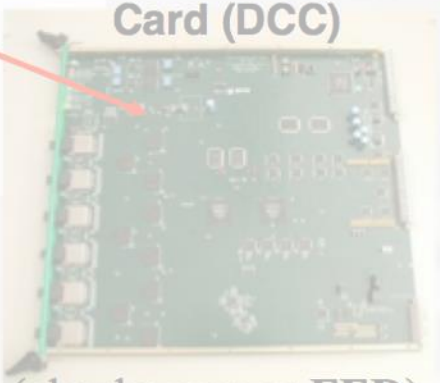
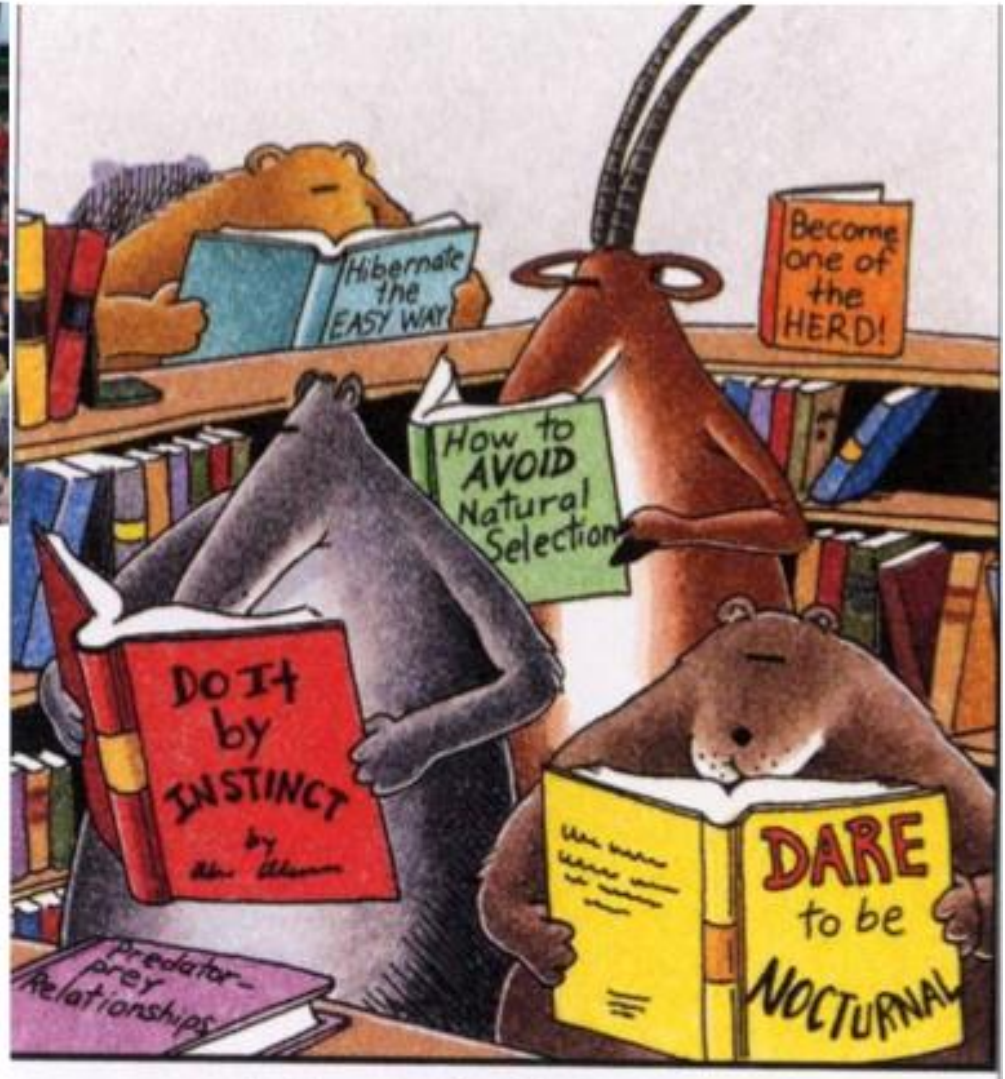


Data Concentrator Card (DCC)

(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

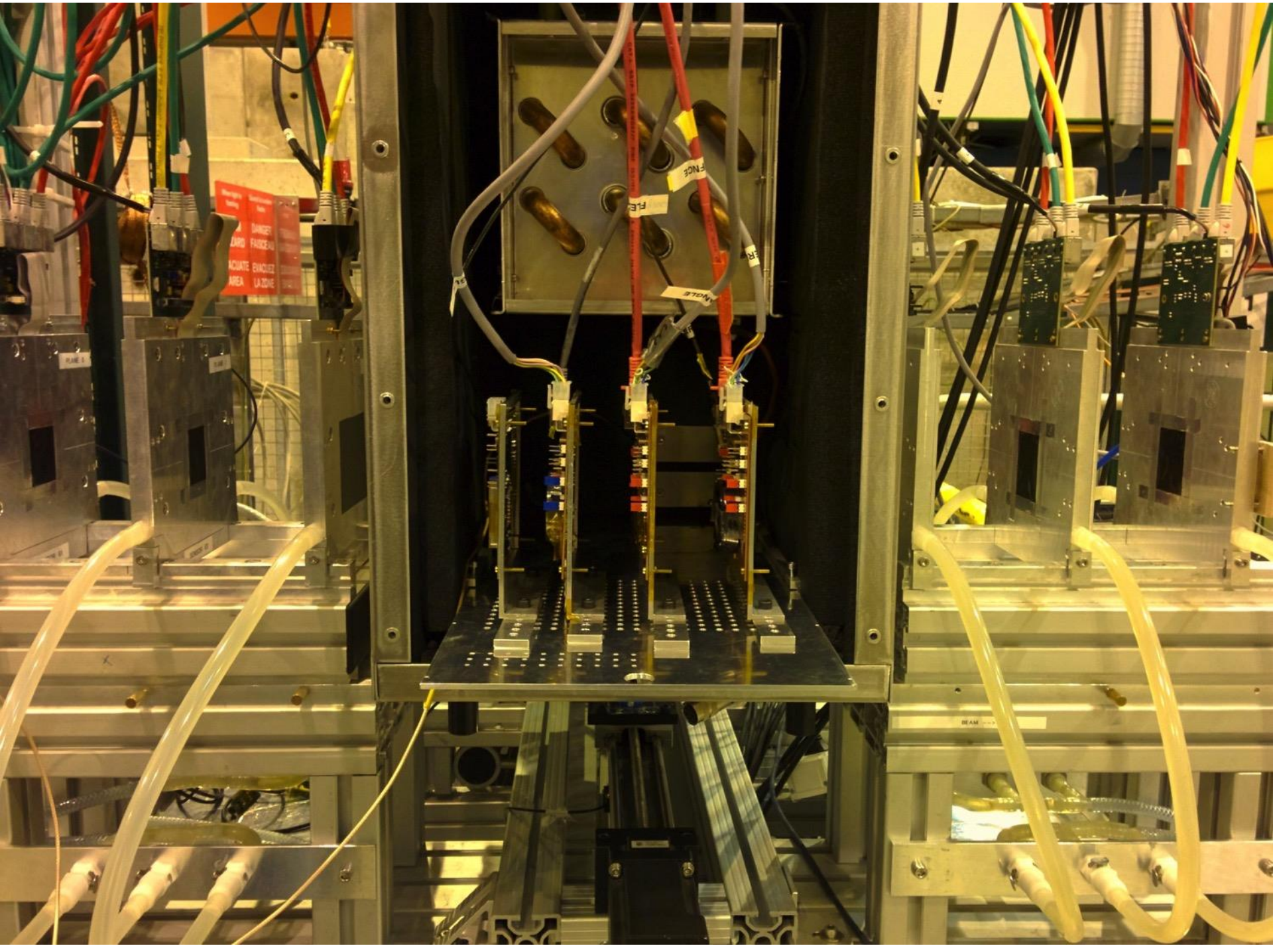
What we do at CERN:
Smash things together, see what happens!

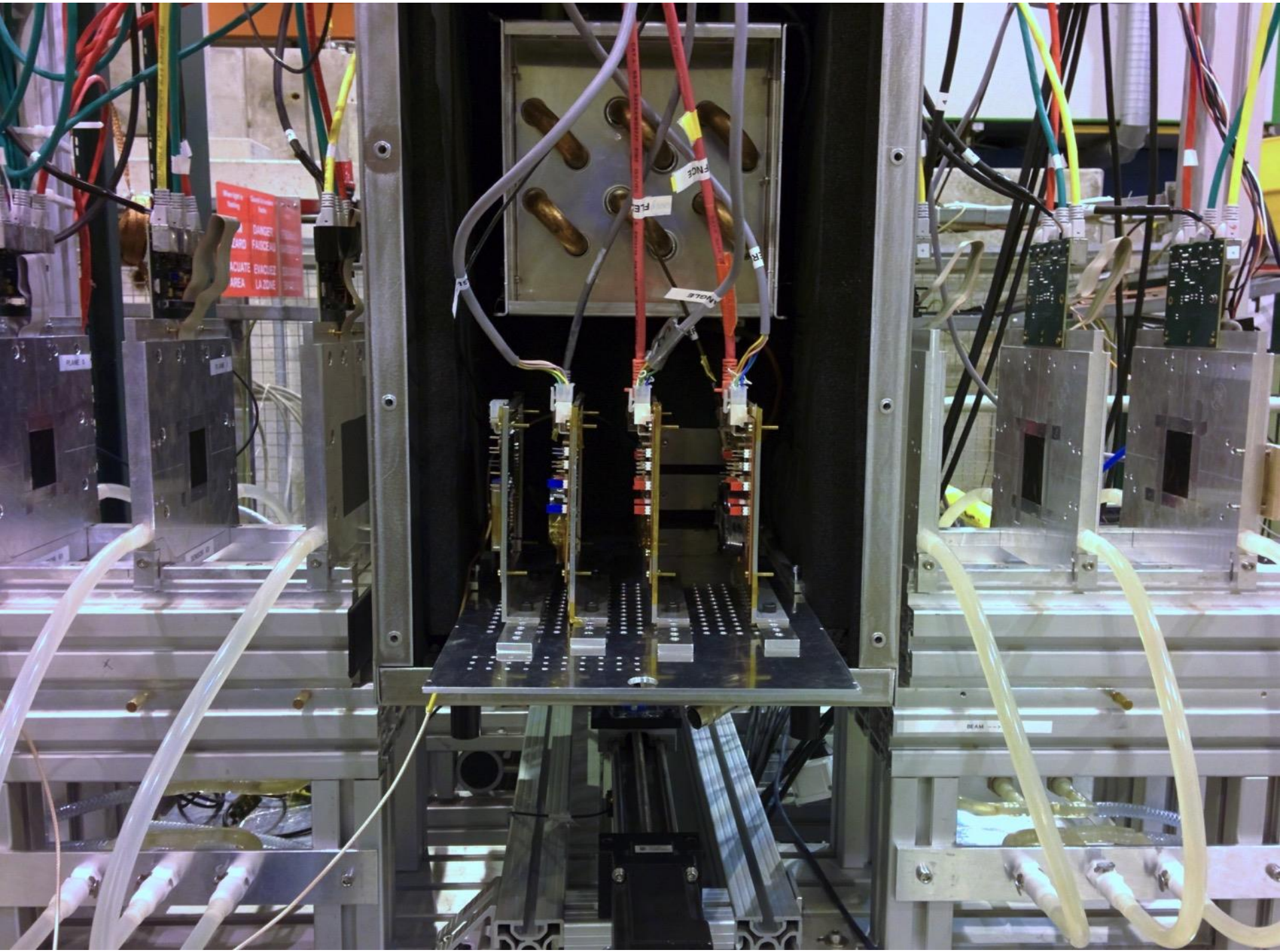
Before the particle accelerator

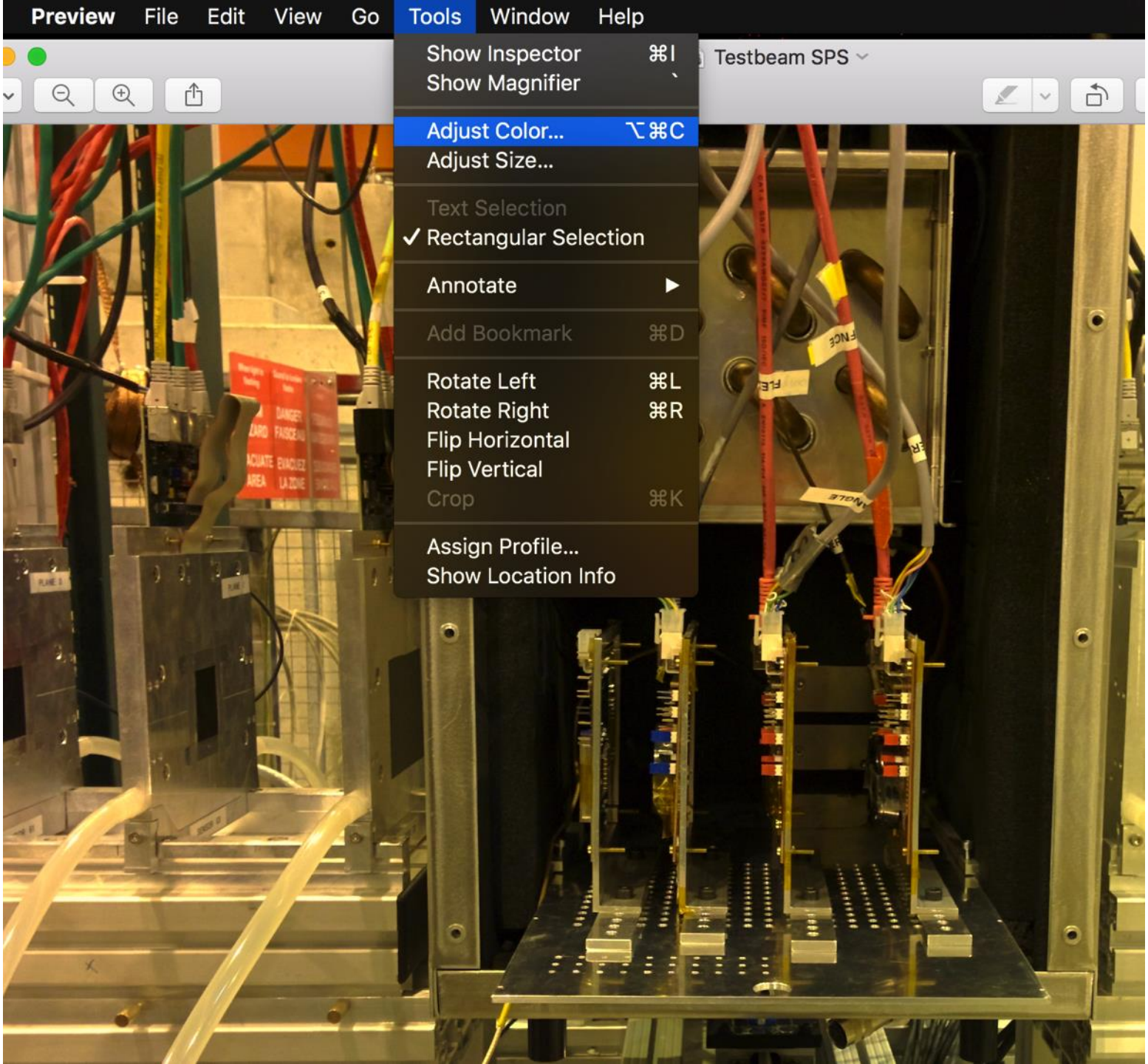
Photos – especially from beam areas
(with special thanks to Clara Nellist)

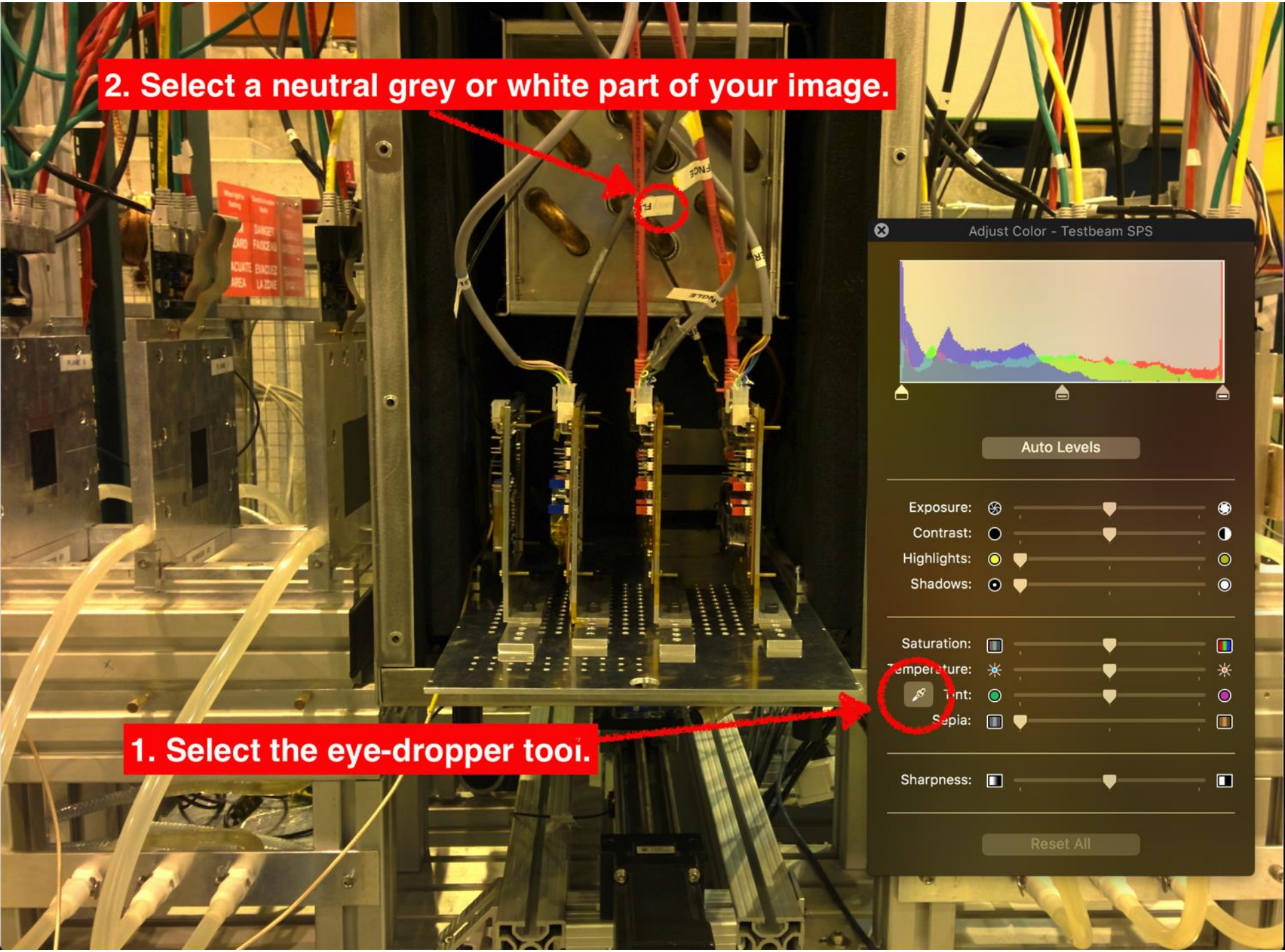
Do they add something useful to the presentation?

If so, make them look good!






Preview
File
Edit
View
Go
Tools
Window
Help
Testbeam SPS
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


2. Select a neutral grey or white part of your image.
1. Select the eye-dropper tool.
Adjust Color - Testbeam SPS
Auto Levels
Exposure:
Contrast:
Highlights:
Shadows:
Saturation:
Temperature:
Tint:
Sepia:
Sharpness:
Reset All

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?

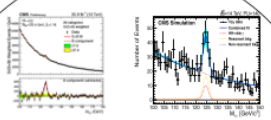
Even more important to grab the attention as you do not have a captive audience!

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

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



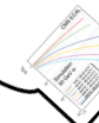
Physics Motivation

Mass resolution with ~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

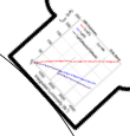
End Caps

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



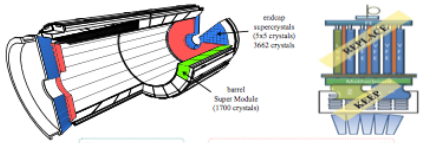
Dark Current

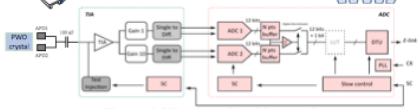
- APD hadron damage
- gets worse in HL-LHC
- cooling from 18 to 9 °C
- 35% noise reduction



ECAL Legacy

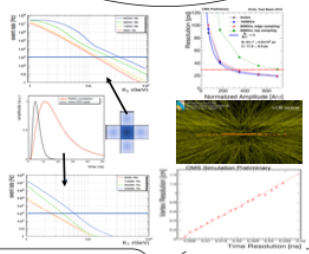
5x5 arrays of crystals
APDs in barrel
Vacuum Photo Triodes in end caps
5 identical Very Front End readouts
one Front-End (FE) card for transmission
separate readout per channel, triggered by overall sum
40 MHz sampling ADC with 3 gains





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



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

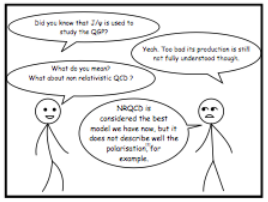
Precision Timing

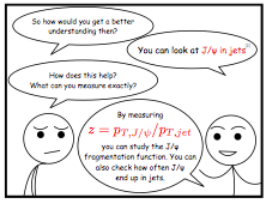
higher sampling rate
measuring time-of-flight from vertices
precise vertex discrimination
precise angle between di-photons
enhancing mass resolution

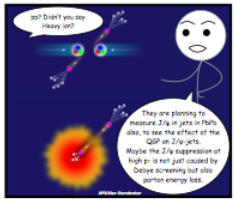
For further details, please refer to TDR-17-002 which will come out soon.

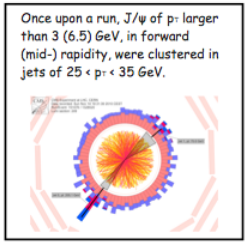
Fragmentation of jets into J/ψ with CoMicS

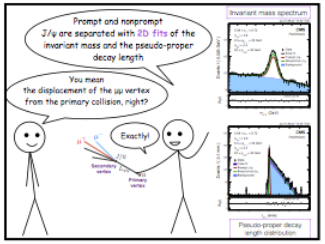
Batoul Diab

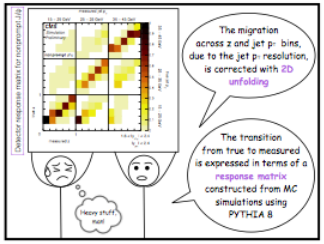


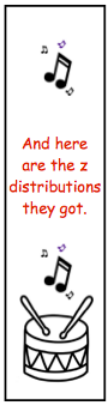


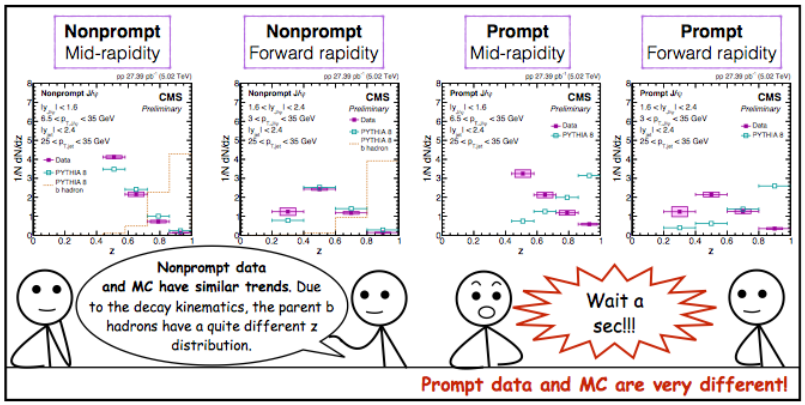


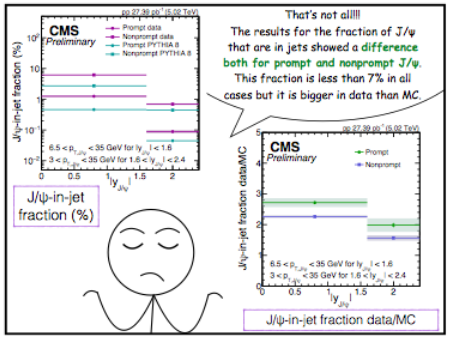


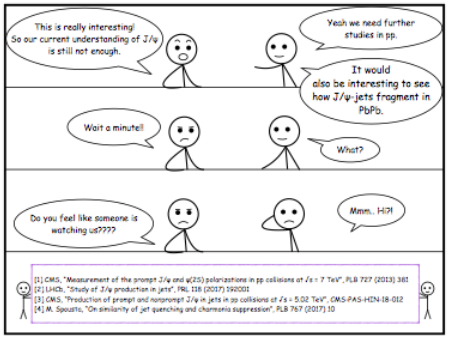












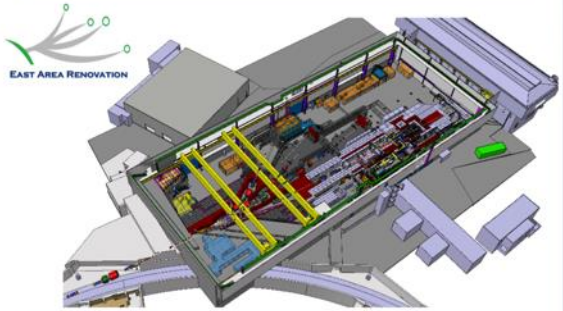
[1] CMS, "Measurement of the prompt J/ψ and ψ(2S) polarizations in pp collisions at $\sqrt{s}$ = 7 TeV", PLB 727 (2013) 381
[2] LHCb, "Study of J/ψ production in jets", PRL 118 (2017) 192001
[3] CMS, "Production of prompt and nonprompt J/ψ in jets in pp collisions at $\sqrt{s}$ = 5.02 TeV", CMS-PAS-HIN-18-012
[4] M. Spousta, "On similarity of jet quenching and charmonia suppression", PLB 767 (2017) 10

The End

GUIDELINE 5:
DON’T BE AFRAID TO BE DIFFERENT

How to finish a talk?

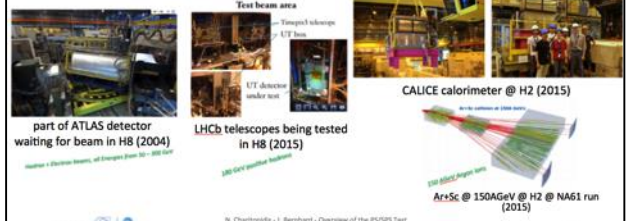
Thank you for your attention!



J.Bernhard, 24-01-2017 The East Area Renovation Project 12

Thank you !

Questions ?



part of ATLAS detector waiting for beam in H8 (2004)

LHCb telescopes being tested in H8 (2015)

CALICE calorimeter @ H2 (2015)

Ar+Sc @ 150AGeV @ H2 @ NA61 run (2015)

28/12/17 N. Charitonidis - J. Bernhard - Overview of the PS/SPS Test Beam Facilities - 5th BTTB 21

Thanks for attention!

17

THANK YOU!

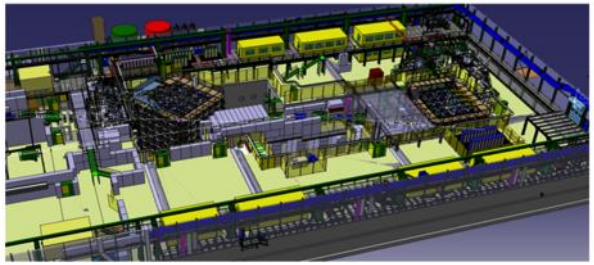
irradiation-facilities.web.cern.ch
Contact: Irradiation.Facilities@cern.ch

CERN

Thank you for your attention!

PSI, 24.01.17 Page 20

The end ! Thank you. Questions ?



28/12/17 N. Charitonidis - The new beam line design for CENF - 5th BTTB 20

CMS INFN

Thank you for your attention!

UNIVERSITÀ DI PISA

5th Beam Telescopes and Test Beams Workshop 2017, Barcelona *24-27 January 2017* 15

Thank you

Thank you for your attention

The authors gratefully acknowledge the financial support from the projects
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"MSMT č. LM2015058", "IGA no. PrF/2016/002"

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Thanks

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?

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: Working in pairs, you have 15 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: **4_<Yourname>.<extension>**

I will choose some at random for presentation!

Guideline #1:

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focus on your main messages

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

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