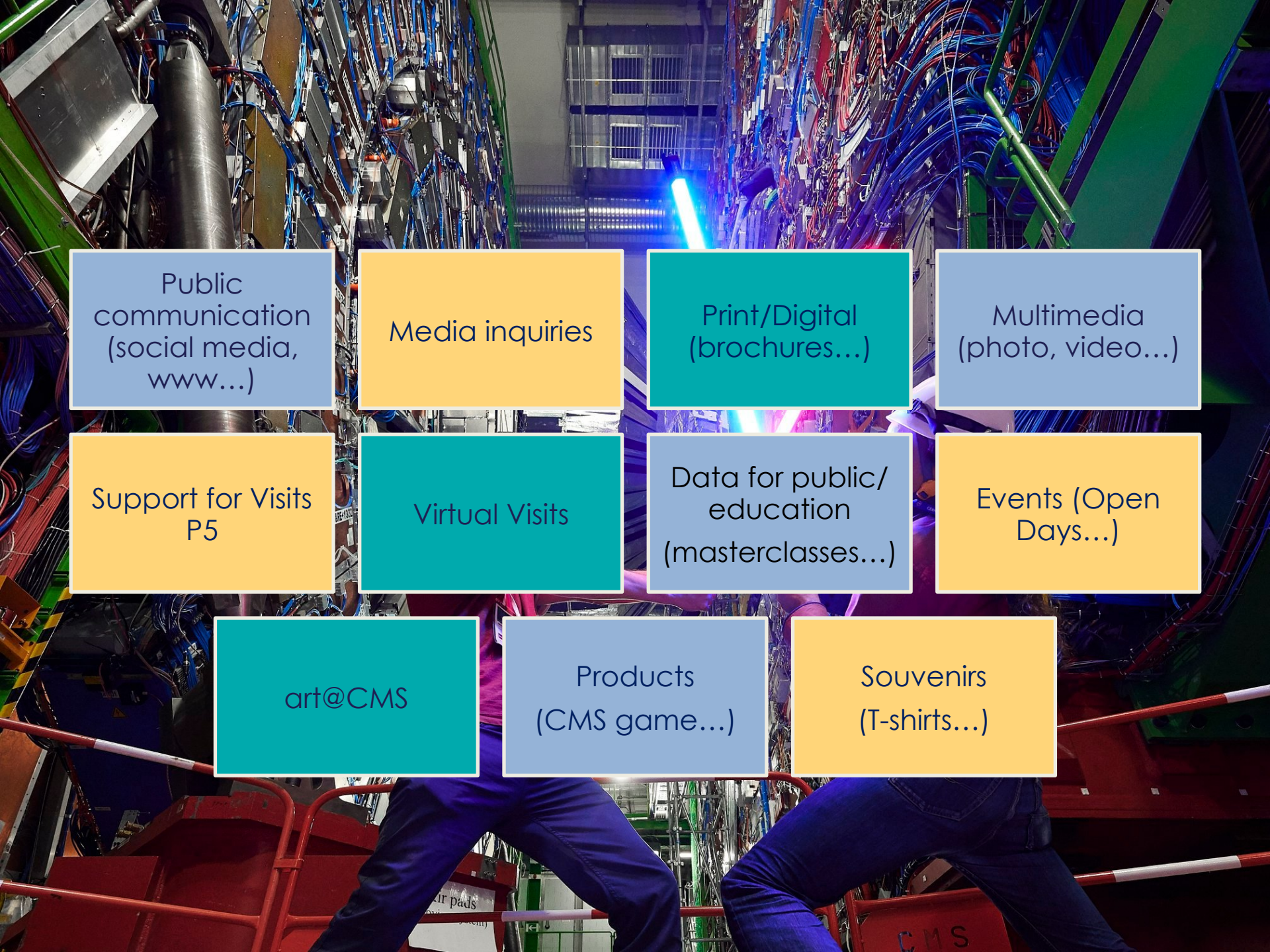
CMS Physics Briefings

Freya Blekman
DESY and Hamburg University

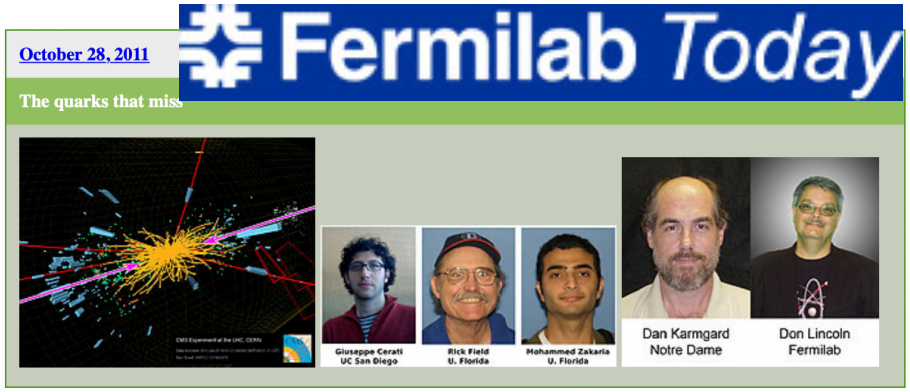
on behalf of the CMS Collaboration

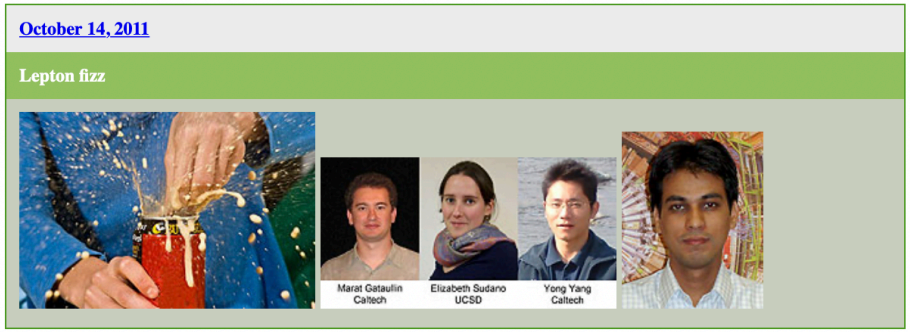

Public communication (social media, www…)
Media inquiries
Print/Digital (brochures…)
Multimedia (photo, video…)
Support for Visits P5
Virtual Visits
Data for public/ education (masterclasses…)
Events (Open Days…)
art@CMS
Products (CMS game…)
Souvenirs (T-shirts…)

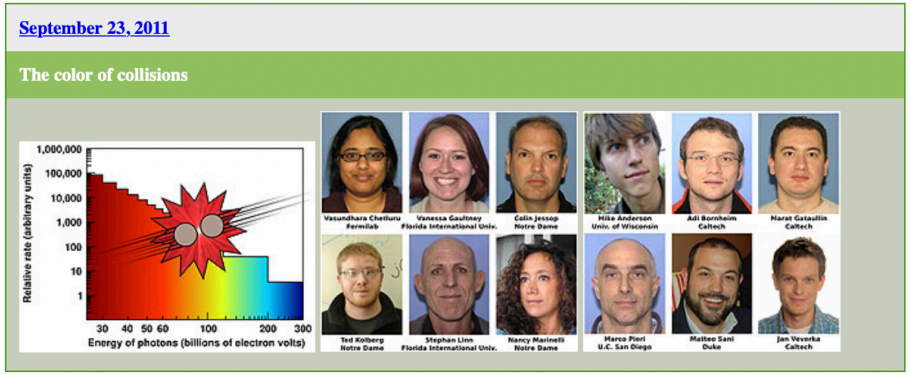

Even some other scientists ask:
“Have you done anything since the Higgs Boson discovery?”

Papers beyond arxiv/journal/inspirehep?

- CMS papers tweet
  - There is an automatic bot that tweets any PAS or paper
  - Including animated .gif of all figures in paper!
- More relevant for communication to scientists in the field
- Also: searchable papers on web site





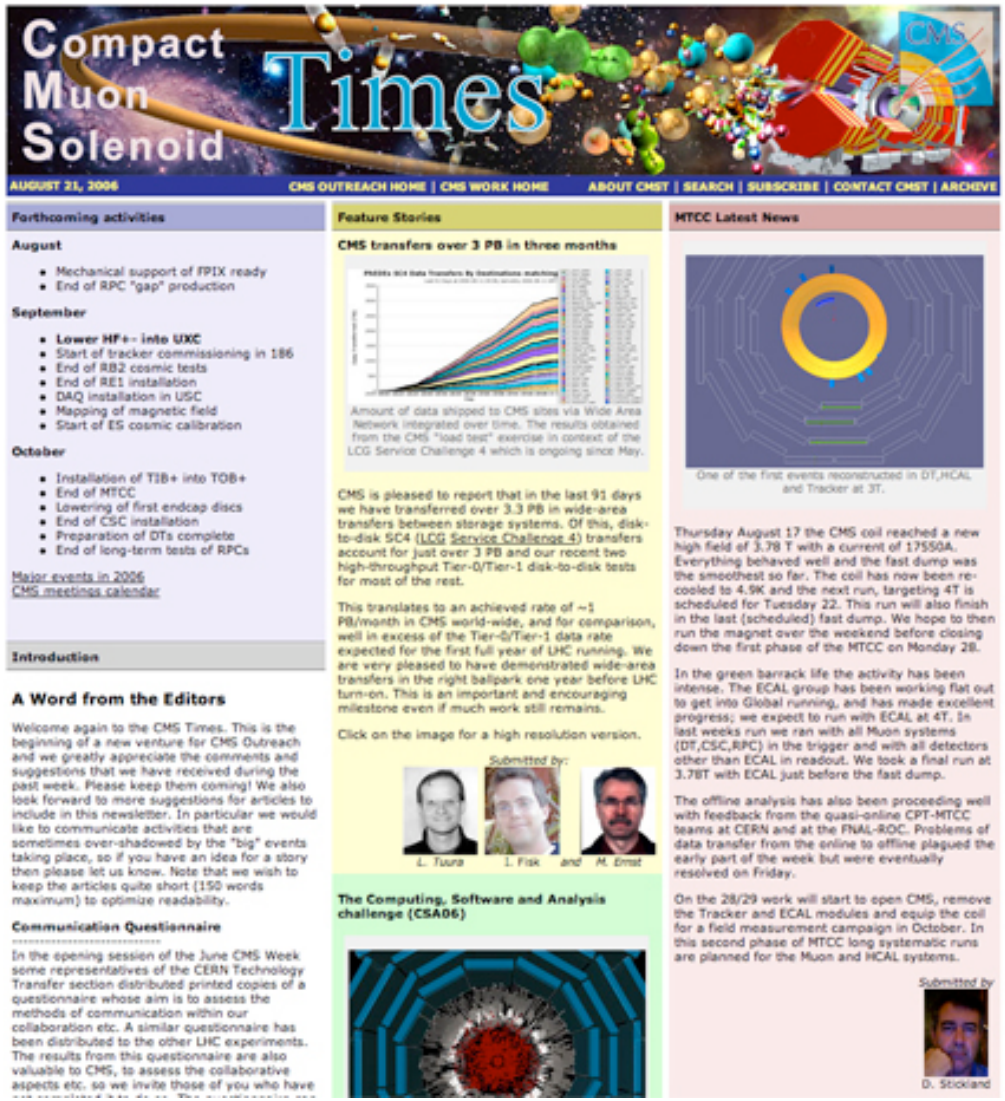


Examples of trailblazers (just from CMS):

Fermilab Today

CMS Times

https://www.fnal.gov/pub/today/archive.html



Examples of trailblazers (just from CMS):

Fermilab Today

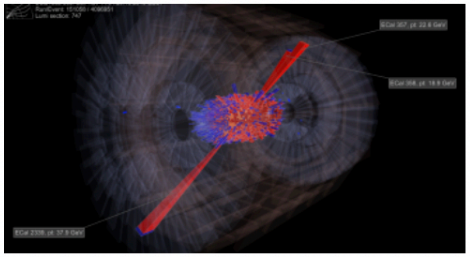
CMS Times

https://cds.cern.ch/record/979798?ln=en

CMS news about physics

- Of course: CMS has been consistently producing news items since Run 1
- These were (typically) written by the communications team
- Results chosen by Spokespeople et.al.

- Infrequent and did not always reach many people

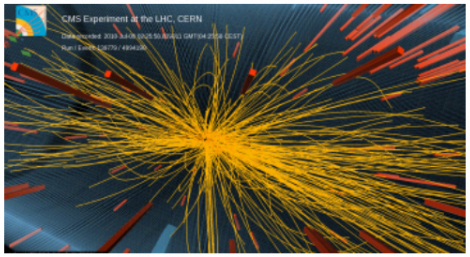


FIRST Z BOSONS DETECTED BY CMS IN HEAVY-ION COLLISIONS

04 NOV 2010 | ACHINTYA | PHYSICS

Z bosons produced in collisions of heavy ions have been observed for the first time by the CMS experiment at CERN's Large Hadron Collider (LHC). CMS observed 10 events containing a distinctive candidate Z boson reconstructed from a pair of electrons...

READ MORE



NEW TWO-PARTICLE CORRELATIONS OBSERVED IN THE CMS DETECTOR AT THE LHC

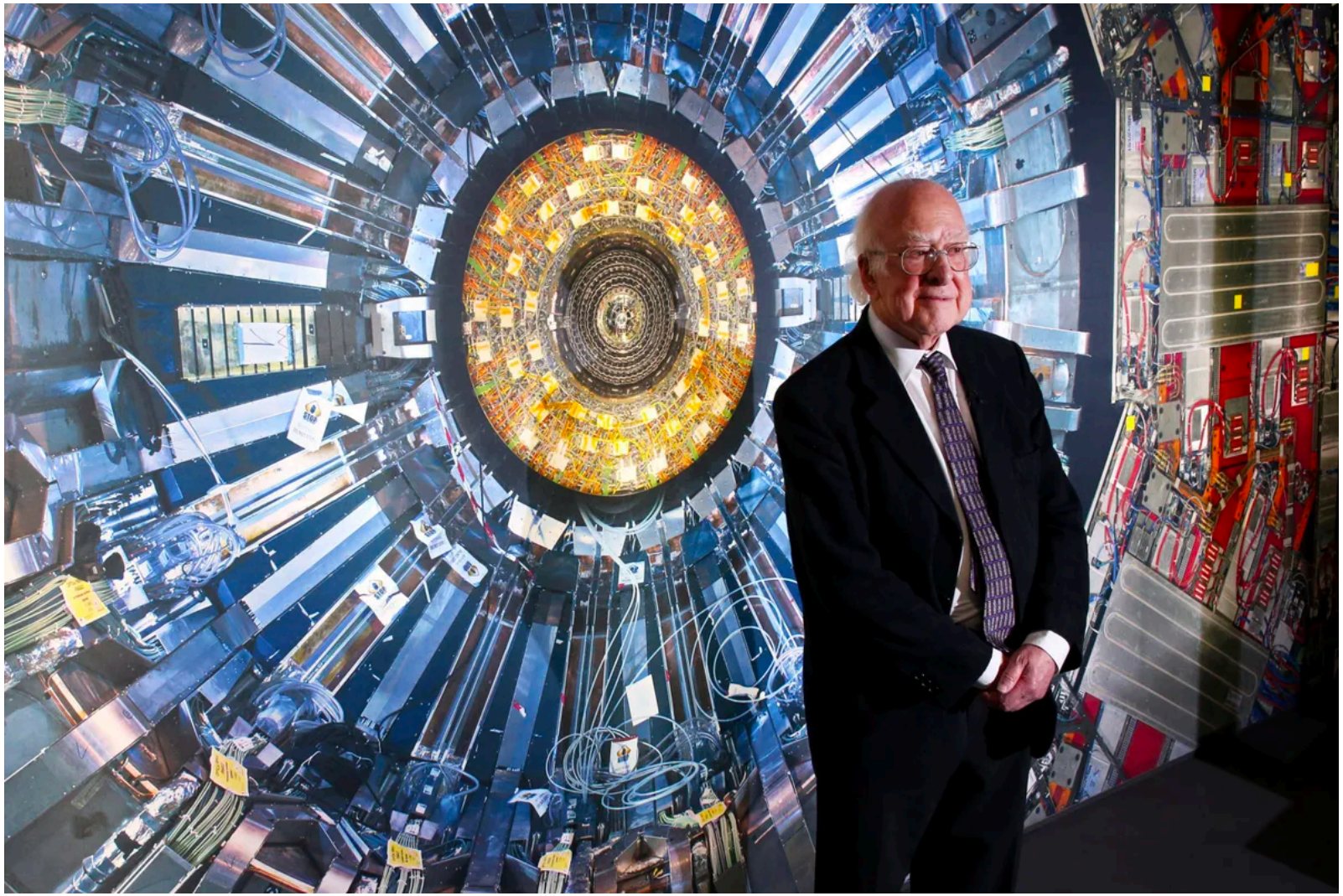
21 SEP 2010 | ACHINTYA | PHYSICS

The CMS Collaboration at CERN released today a paper entitled "Observation of Long-Range Near-Side Angular Correlations in Proton-Proton Collisions" that details signs of a new phenomenon in proton interactions. A study of "high multiplicity"...

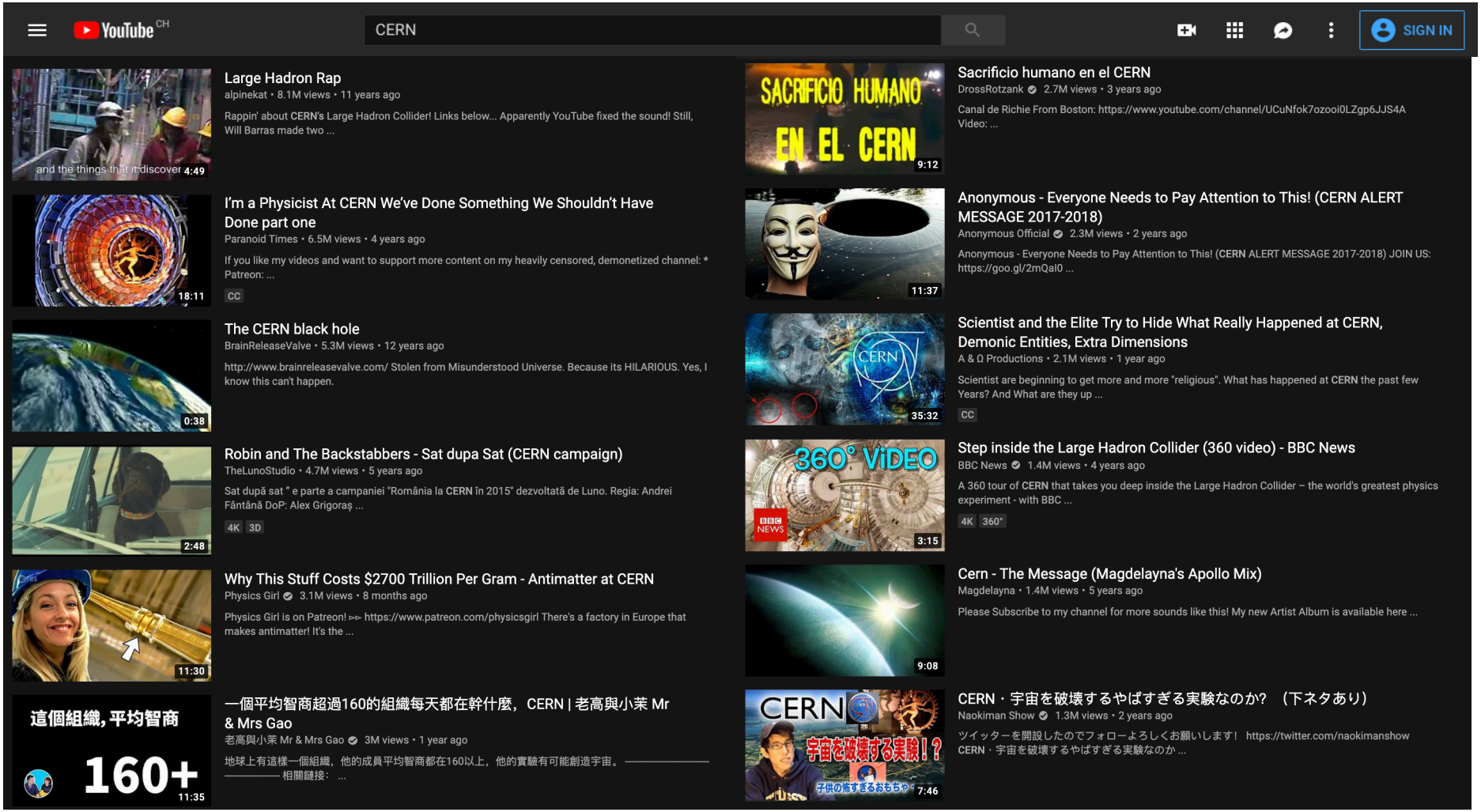
READ MORE

What changed?

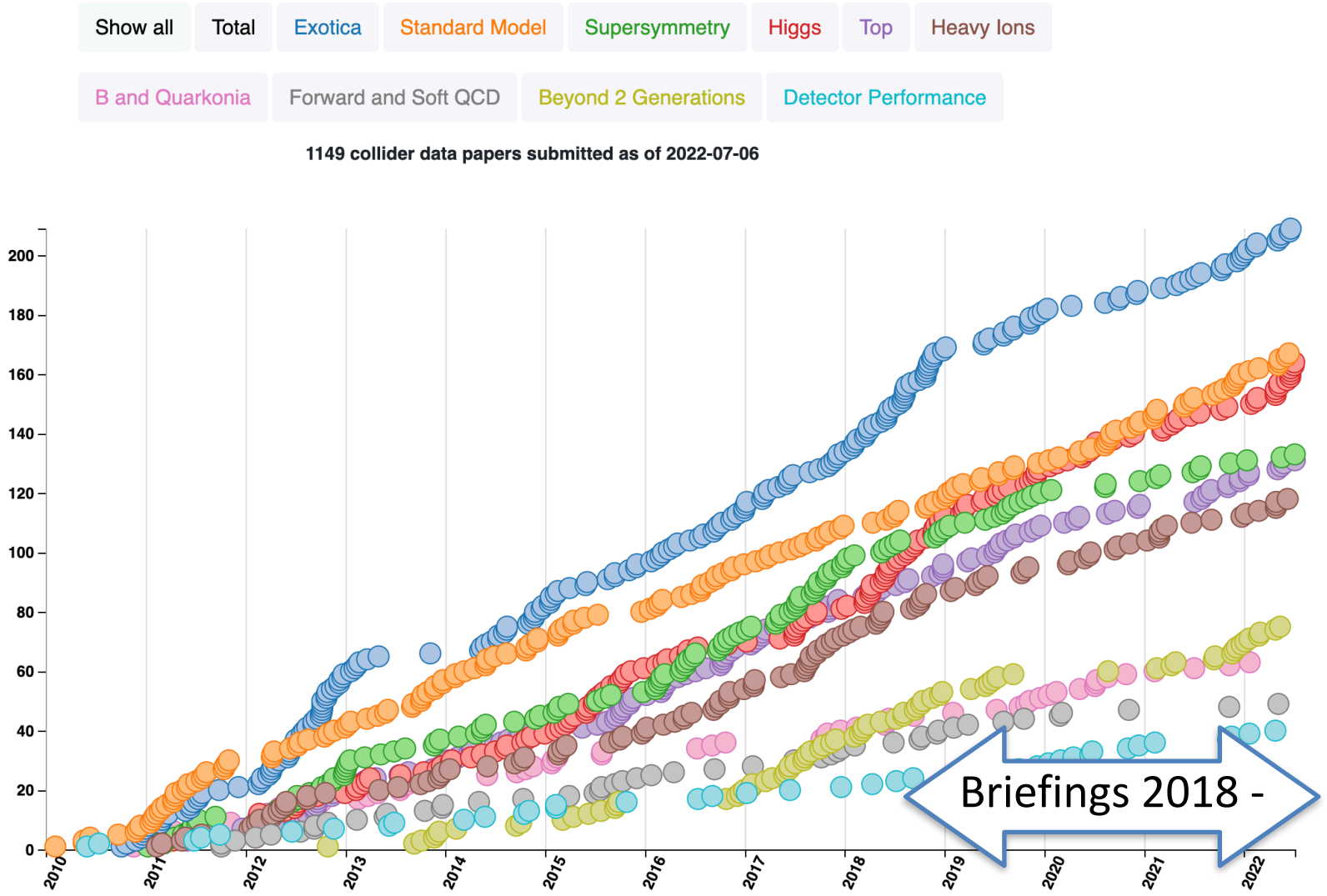
What changed?



What changed?



But also


Show all
Total
Exotica
Standard Model
Supersymmetry
Higgs
Top
Heavy Ions
B and Quarkonia
Forward and Soft QCD
Beyond 2 Generations
Detector Performance
1149 collider data papers submitted as of 2022-07-06
200
180
160
140
120
100
80
60
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2010
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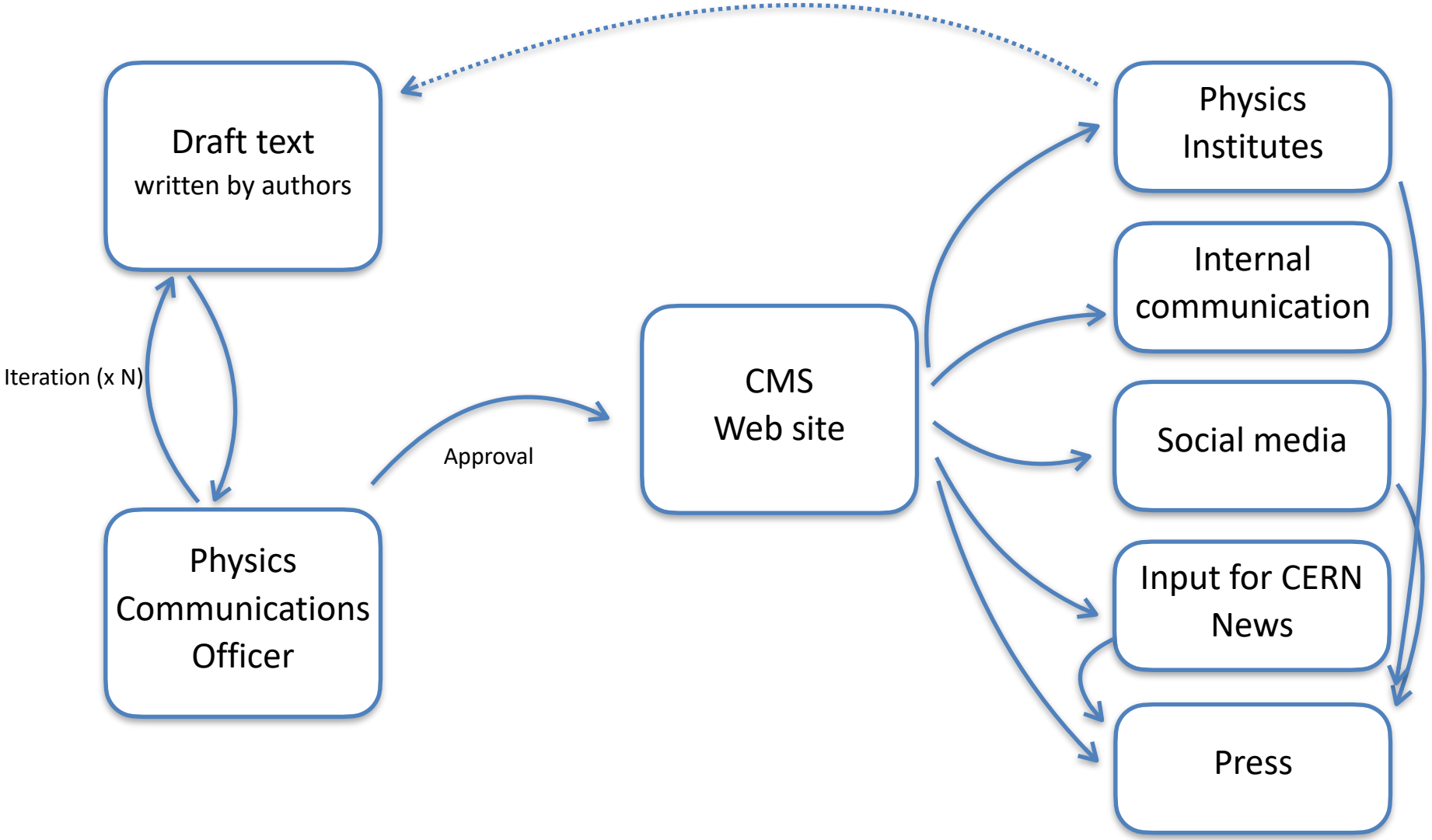
2022
Briefings 2018 -

Briefings: The plan



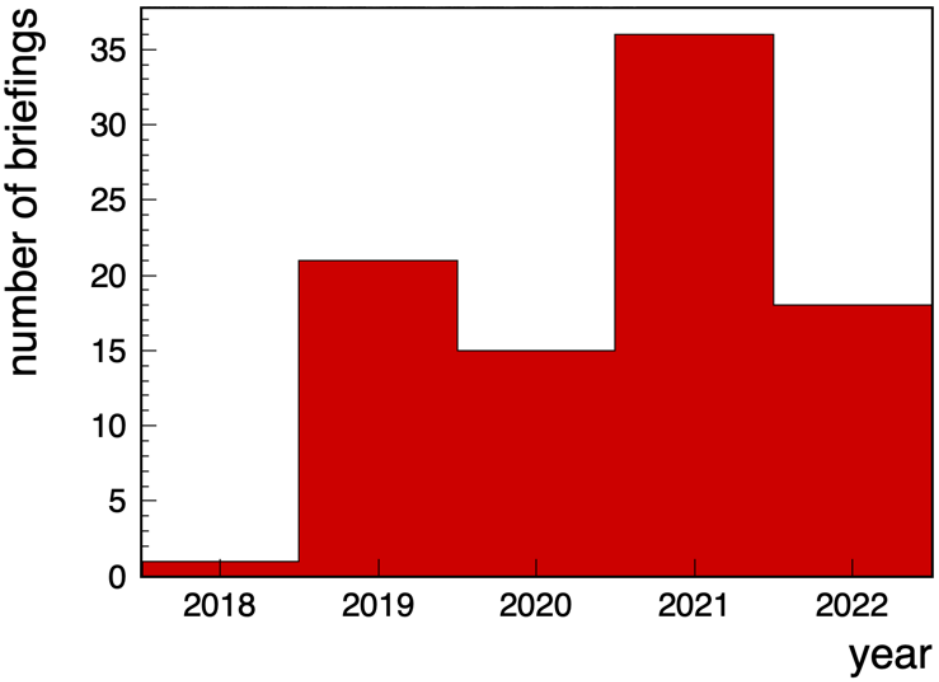
Bottom-up: collaboration-sourced texts

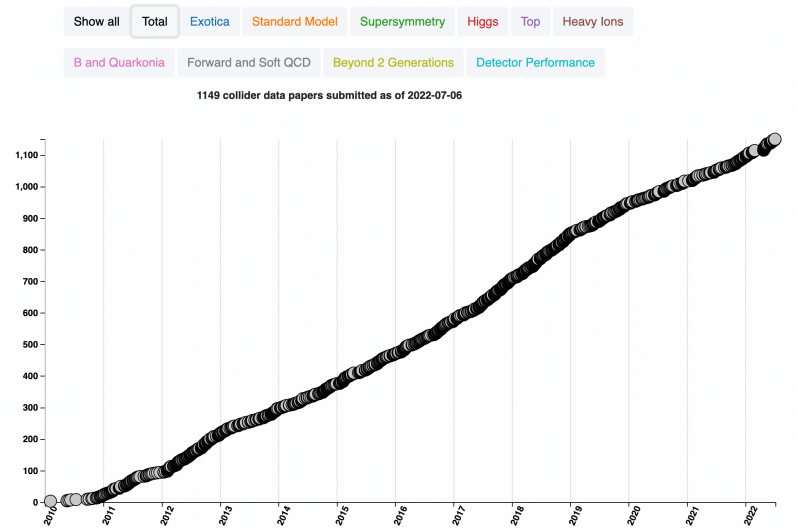
Anyone who wants to write a briefing gets to do so*

First draft (almost) always by authors

*of course for high profile topics we make sure we have a briefing

Briefings: now about 1/3 of papers





Anyone who wants to write a briefing gets to do so*

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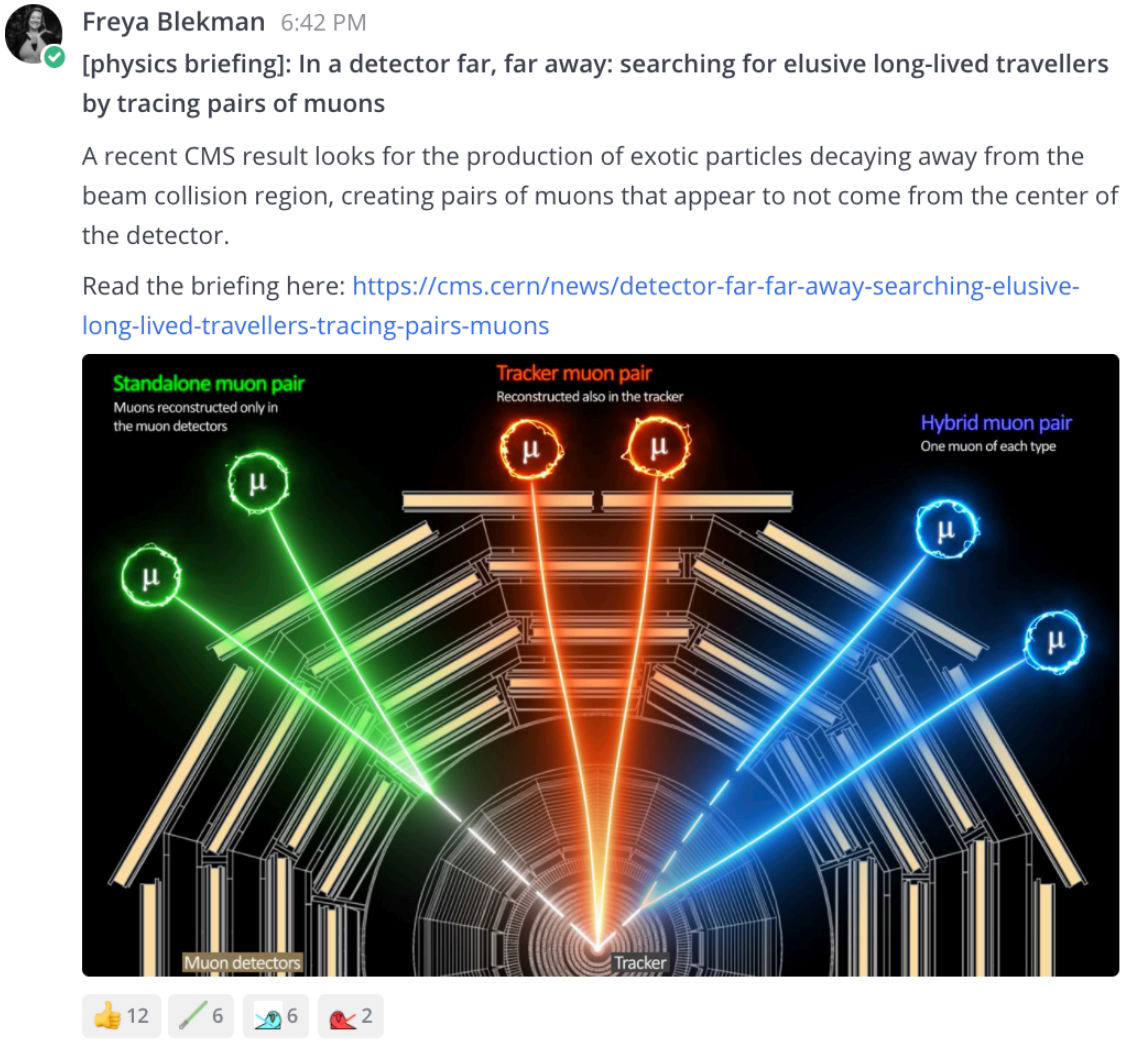
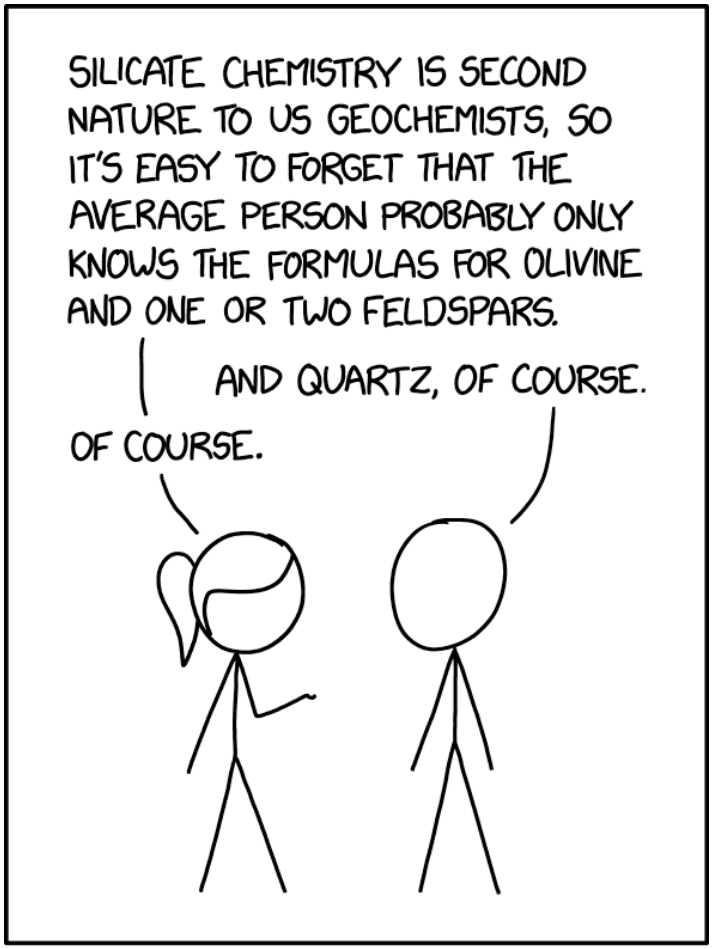
*of course for high profile topics we make sure we have a briefing

Internal communication

- Diverse physics program means diverse physicists
- Briefings also useful inside collaboration
- Low(er)-threshold way to keep track of CMS results



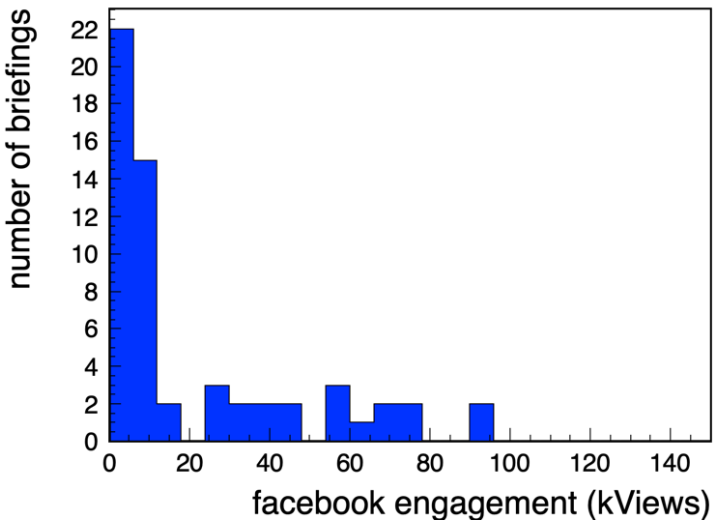
Briefings are posted on CMS internal channels too!

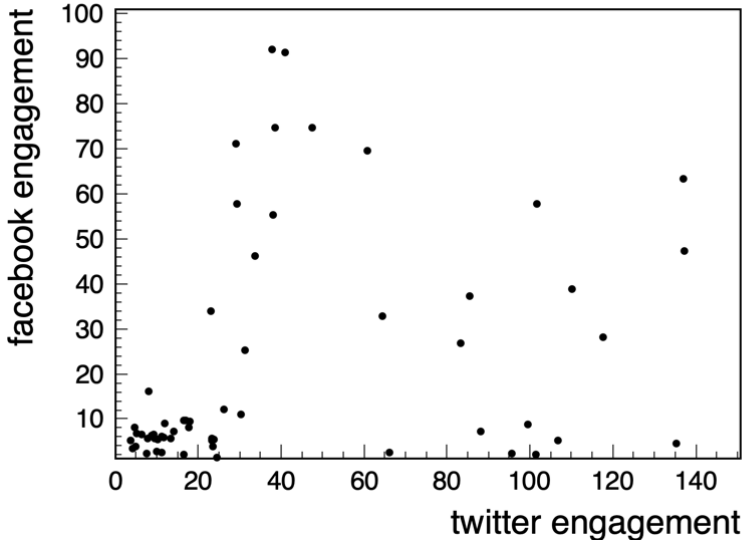


EVEN WHEN THEY'RE TRYING TO COMPENSATE FOR IT, EXPERTS IN ANYTHING WILDLY OVERESTIMATE THE AVERAGE PERSON'S FAMILIARITY WITH THEIR FIELD.

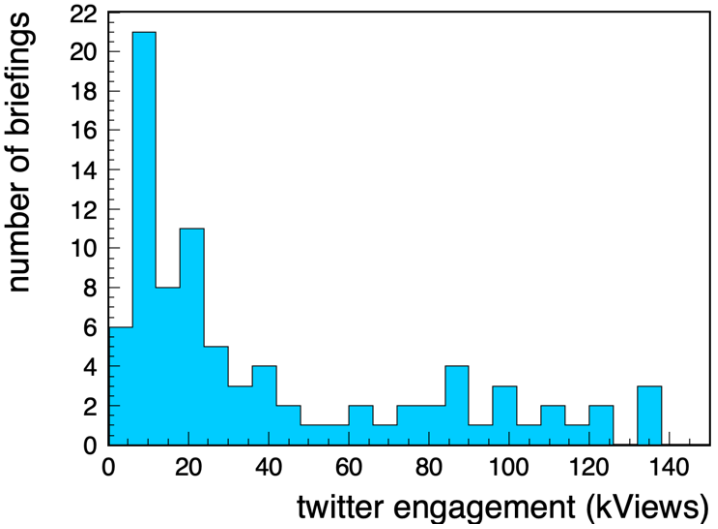
src: xkcd

Briefings in social media, analysis



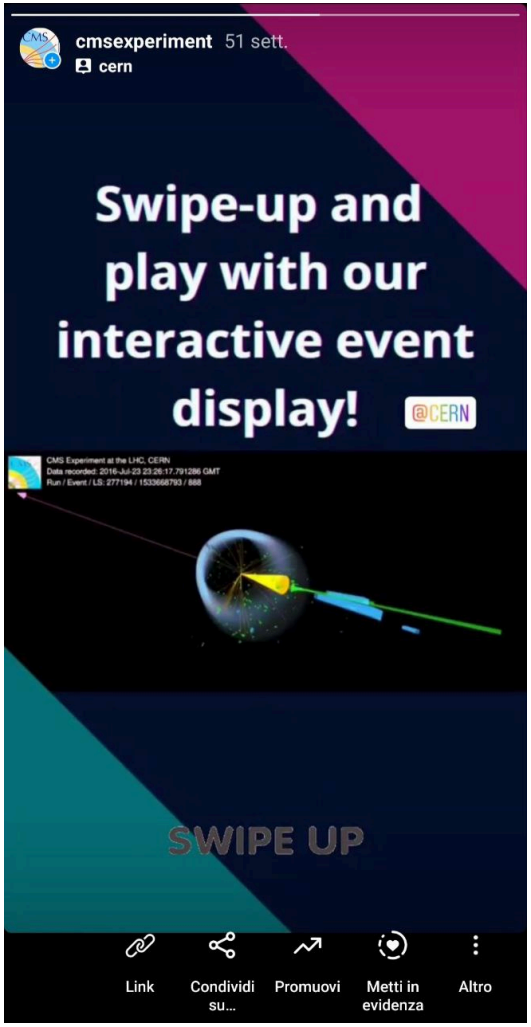


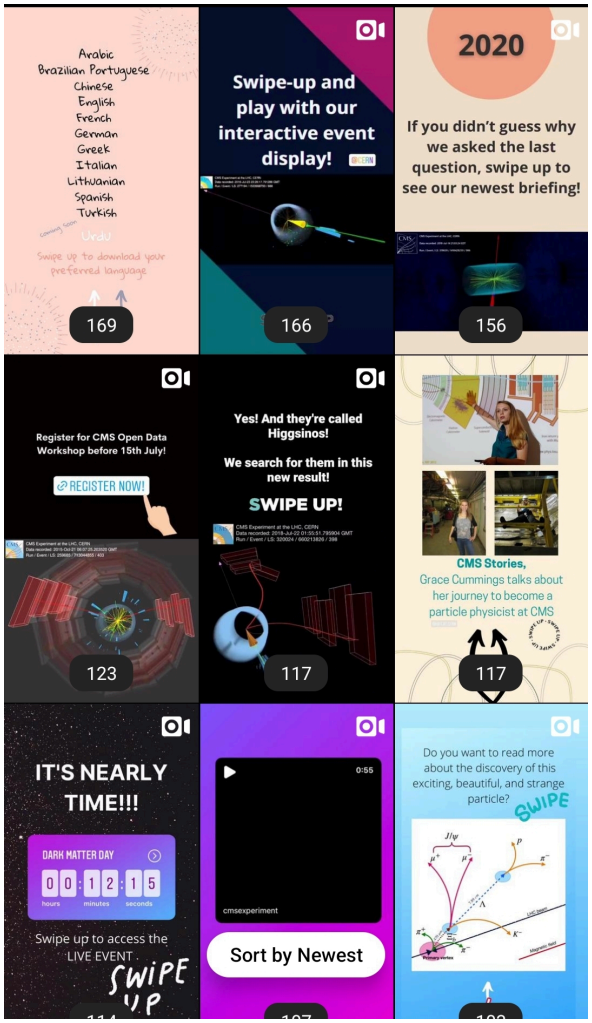
- Correlation between social media networks 30%
- CERN share has huge influence on going viral
  - To be expected, many more followers
  - CERN share decision driven by physics importance but also graphics/quality text
- Reads on web site: consistent at few % of engagement (typical for social media)



And yes of course we are on instagram

(And growing)





“Best in class” (from last 2 years)

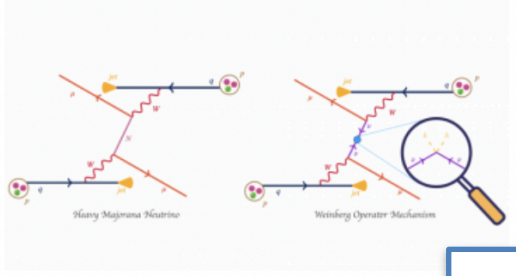
(In alphabetical order)

CMS analysis code	Title	Web link
B2G-20-007	TWICE THE HIGGS, TWICE THE FUN!	https://cms.cern/news/twice-higgs-twice-fun
EGM-17-001	FINDING ELECTRONS AND PHOTONS WITH THE CMS DETECTOR	https://cms.cern/news/finding-electrons-and-photons-cms-detector
EXO-20-013	SEARCHING FOR THE DARK SIDE OF THE UNIVERSE	https://cms.cern/news/searching-dark-side-universe
EXO-20-030	LIVE LONG AND PROSPER: SEARCHING FOR THE LONG-LIVED RELATIVES OF THE HIGGS BOSON	https://cms.cern/news/live-long-and-prosper-searching-long-lived-relatives-higgs-boson
HIG-21-013	LIFE OF THE HIGGS BOSON	https://cms.cern/news/life-higgs-boson
HIN-19-001	HEAVY METAL HITS THE TOP	https://cms.cern/news/heavy-metal-hits-top
HIN-21-009	USING LIGHT TO MAKE COUSINS OF THE ELECTRON	https://cms.cern/news/using-light-make-cousins-electron
LUM-17-003	ILLUMINATING! COUNTING LHC COLLISIONS WITH CMS	https://cms.cern/news/illuminating-counting-lhc-collisions-cms
SMP-18-014	A TALE OF TWO COLLIDERS AND THE UNRIVALLED PRECISION ON THE Z INVISIBLE WIDTH	https://cms.cern/news/tale-two-colliders-and-unrivalled-precision-z-invisible-width
SUS-19-004	UNDER THE RADAR: SEARCHING FOR STEALTHY NEW PARTICLES	https://cms.cern/news/under-radar-searching-stealthy-new-particles
TOP-18-012	WHAT DOES THE DECAY OF A BOTTOM QUARK LOOK LIKE?	https://cms.cern/news/what-does-decay-bottom-quark-look

Shared characteristics:

“Fun” titles, animations/video/.gifs and appealing graphics (and event displays) for social media

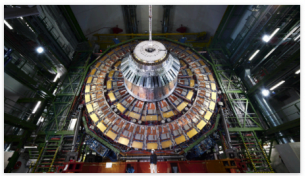
Briefing as source for science communication



TWO ENDS OF A SEESAW 25 APR 2022

Neutrinos (ν) are the most intriguing particles in nature. The evolution in our understanding about the characteristics of the neutrinos is also very interesting. The apparent non-conservation of energy in beta decay led Pauli to predict, in 1933, a...

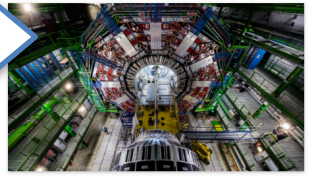
READ MORE



CMS on the lookout for new physics

The CMS experiment awaits LHC Run 3 to explore several analyses showing small disagreements with theory expectations

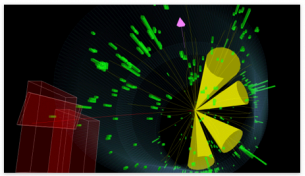
News | Physics | 17 June, 2022



CMS tries out the seesaw

The collaboration has put the seesaw model of neutrino mass to a new test

News | Physics | 04 May, 2022



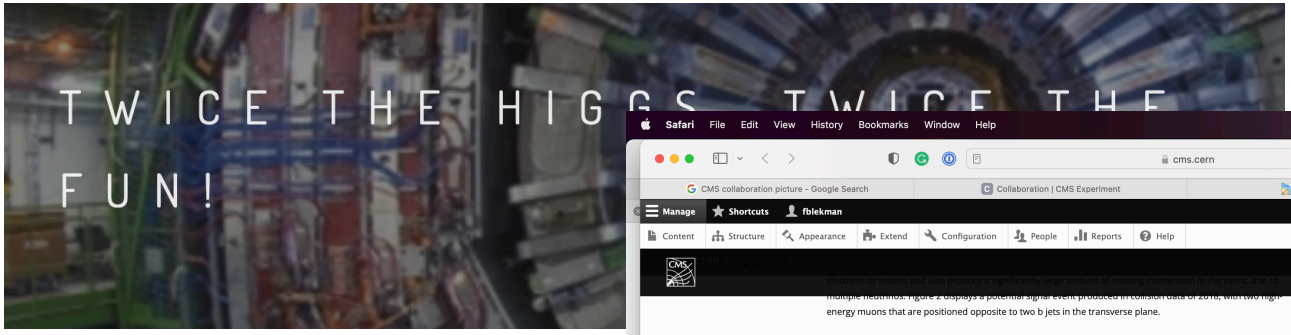
CMS measures the mass of the top quark with unparalleled accuracy

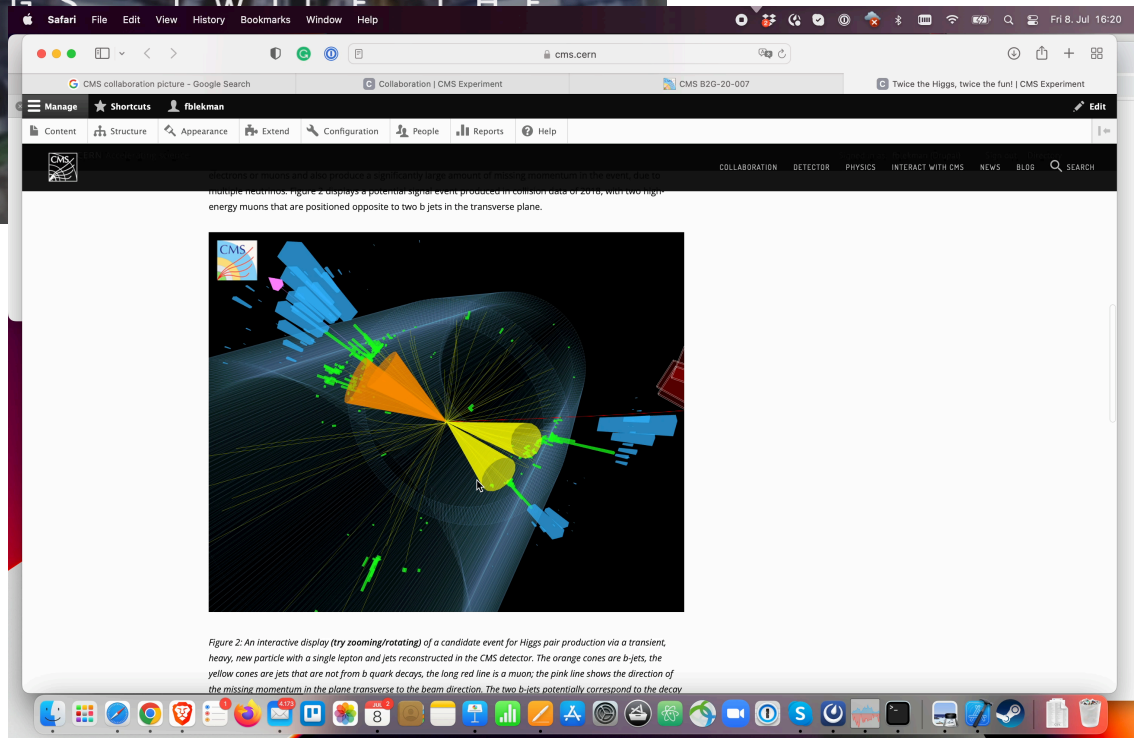
Precise knowledge of the top-quark mass is of paramount importance to understand our world at the smallest scale

News | Physics | 19 April, 2022

A large fraction of CMS news articles on CERN, FNAL, Symmetry magazine start out as physics briefings

Examples of innovation



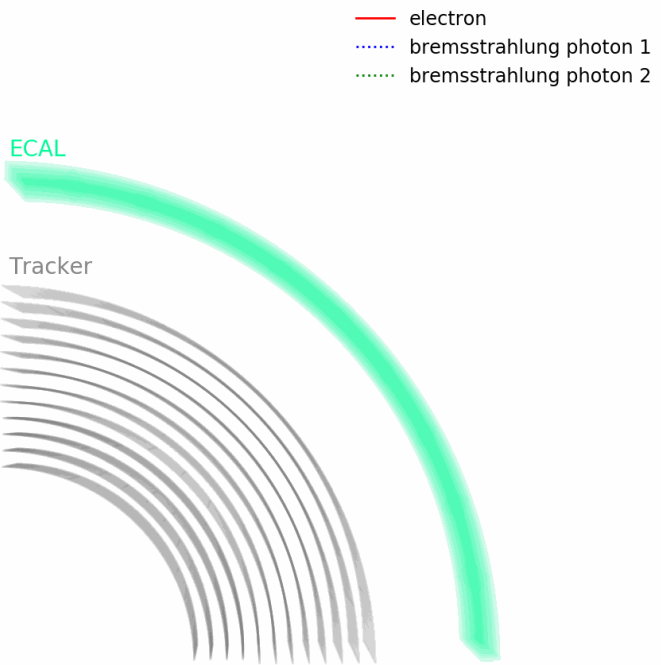


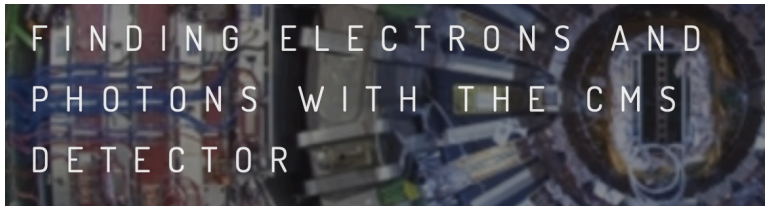
Interactive
event displays!

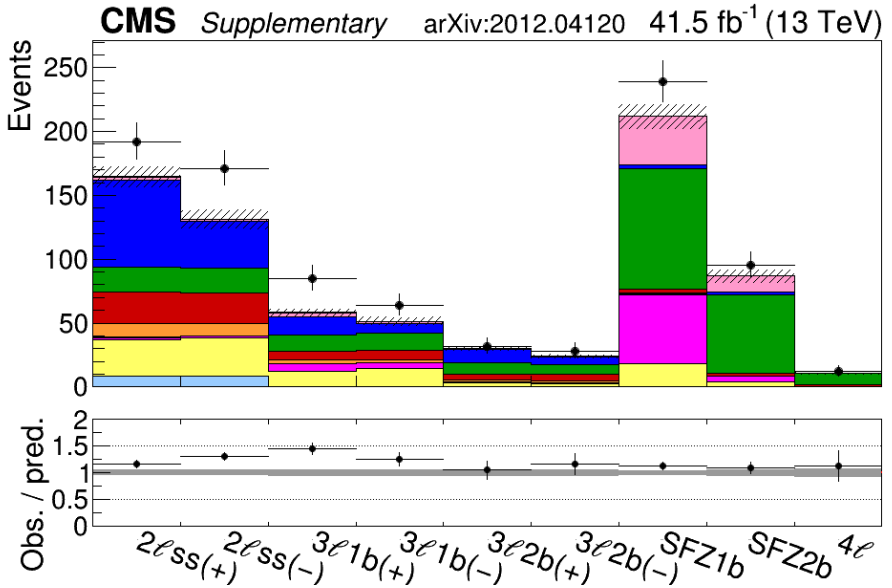
Example: https://cms3d.web.cern.ch/B2G-20-007/

Examples of innovation

Many creative uses of animated .gif





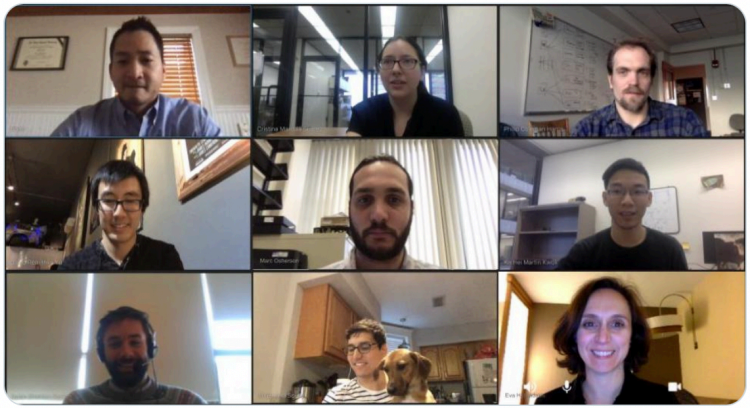


ECR acknowledgement

And many, many more videos on instagram stories

CMS Experiment CERN
@CMSExperiment

CMS results involve a lot of remote collaboration. The #scientists who worked on the tools to select the jets necessary for the result below (and other similar signatures) met regularly via #videoconferencing. Read more about searching for light bosons: cms.cern/news/casting-l...



2:41 pm · 10 Apr 2019 · Hootsuite Inc.

CMS Experiment CERN
@CMSExperiment

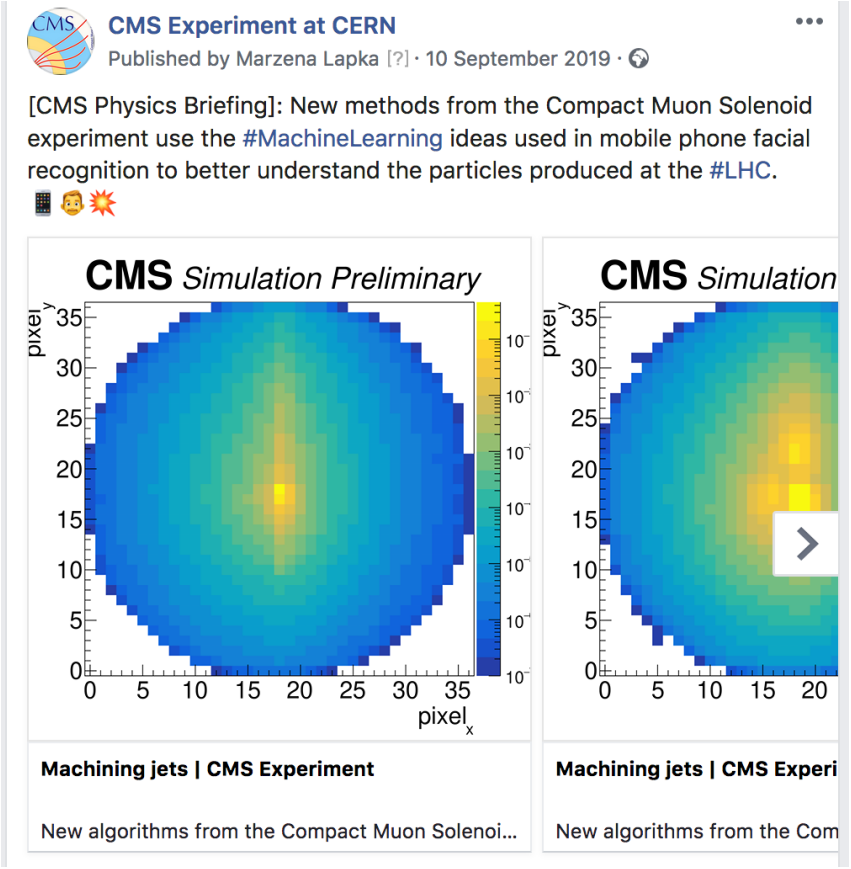
[CMS Physics Briefing]: CMS physicist Dr Rajdeep Chatterjee talks about what it is like to measure the mass of the Higgs boson to the precision of 0.1%! cms.cern/news/cms-preci...

10:30 am · 21 Oct 2019 · Twitter Web App

Conclusions

To reach the technically-inclined general public is not so different from reaching other scientists - but some things count more:

- Have great appealing pictures!
- Event displays! Videos!
- Catchy title that sparks curiosity!
- Always talk about why the result is important
  - that is more important than the really technical difficult work needed to do to get there
- Focus on the take-home message of the science

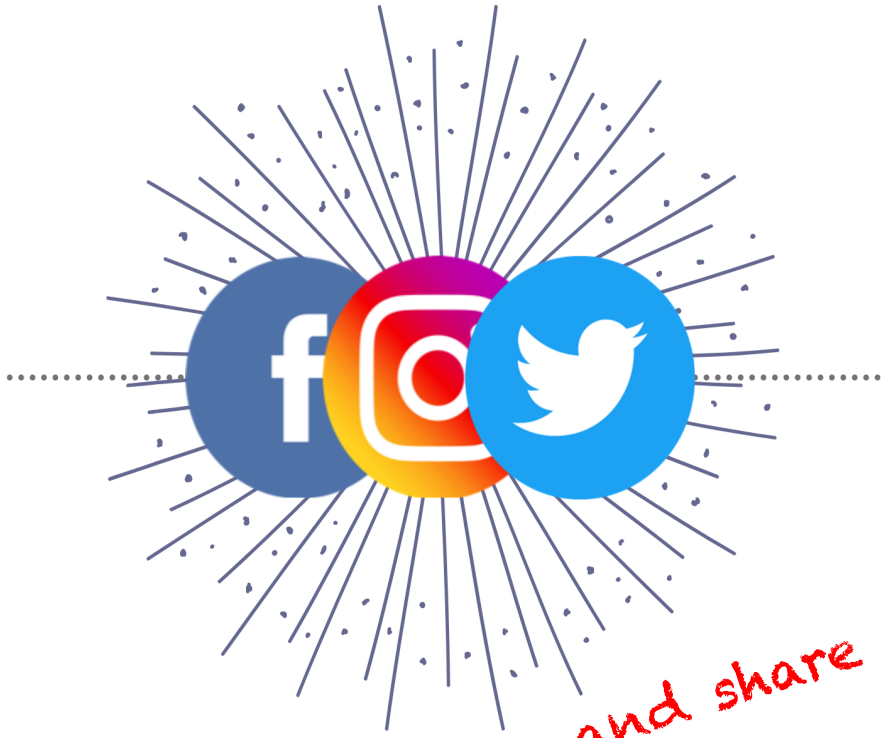


Thank you

CMS Physics Briefings

- Target audience: (non-hep)scientists, journalists, funding agency, science-knowledgable general public

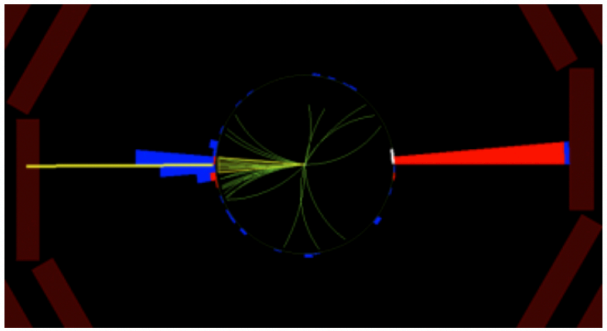
- Crowd sourced by collaboration
  - Innovation by young scientists as far as science communication (.gifs, videos, event displays)
  - Experience for young scientists, learn how to write accessible texts
- about 1/3 CMS papers now has one
- using social media to advertise
- great source for science communication aimed at more general audiences (and fruitful collaboration with CERN, labs, etc)



follow us and share our content!

Backup

Early example: “Quarks, the next generation”

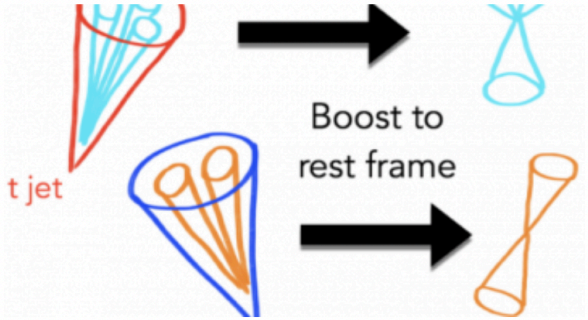


CASTING LIGHT ON THE DARK SECTOR

05 APR 2019

There is copious astrophysical and cosmological evidence for dark matter, but no indication of how it was produced, how it interacts with regular matter, or how it could fit into an inclusive model of particle physics. One possibility is that dark...

READ MORE

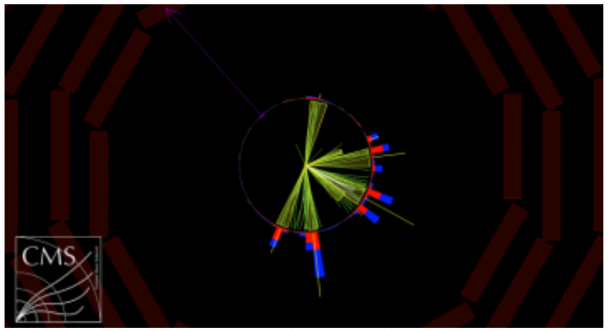


NEW FOR MORIOND: QUARKS: THE NEXT GENERATION?

26 MAR 2019

Since the discoveries of the third generation of quarks and leptons starting in the 1970s, physicists have asked the natural question "Can there be more generations?". One of the first key results from the Large Electron Positron collider LEP...

READ MORE



NEW FOR MORIOND: CATCHING DISAPPEARING PARTICLES

26 MAR 2019

Over the past century, physicists have developed a theory governing the fundamental interactions of elementary particles, known as the Standard Model of Particle Physics. Thus far, it has stood up to many experimental tests with an extraordinary...

READ MORE

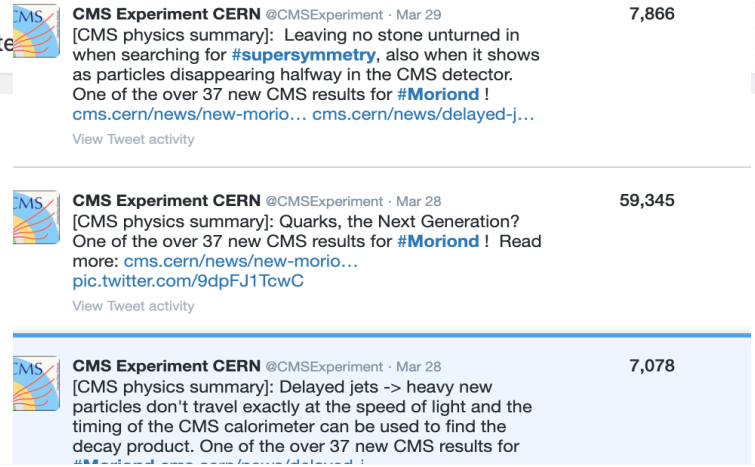
Early example: “Quarks, the next generation”

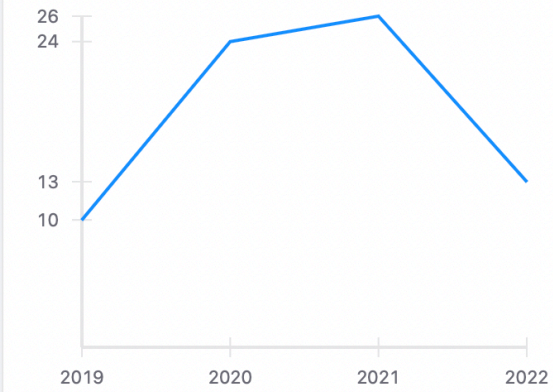
Search for pair production of vectorlike quarks in the fully hadronic final state

CMS Collaboration • Albert M Sirunyan (Yerevan Phys. Inst.) Show All(2338)
Jun 27, 2019

30 pages
Published in: *Phys.Rev.D* 100 (2019) 7, 072001
Published: Oct 9, 2019
e-Print: 1906.11903 [hep-ex]
DOI: 10.1103/PhysRevD.100.072001 (publication)
Report number: CMS-B2G-18-005, CERN-EP-2019-129
Experiments: CERN-LHC-CMS
View in: OSTI Information Bridge Server, HAL Archives Ouvertes, CERN Document Server, ADS Abstract Service

pdf cite 73 citations





Credit: Achintya Rao