

# Communicating your work and why that is important

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(also Visitor at University of Oxford and VUB)



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# Let me introduce myself

- 🇳🇱 MSc University of Amsterdam (2000)
- 🇳🇱 🇺🇸 PhD based at Fermi National Accelerator Laboratory (2005)
- 🇬🇧 Postdoc Imperial College 2005-2007
- 🇺🇸 Postdoc Cornell University 2007-2010
- 🇳🇱 2010 Assistant Prof Vrije Universiteit Brussel
- 🇳🇱 2015 Associate Prof Vrije Universiteit Brussel
- 🇳🇱 2019 Full Prof Vrije Universiteit Brussel

2021: Helmholtz recruitment:

🇩🇪 Lead Scientist at DESY and professor at UniHH

international links:

- 🇬🇧 Visiting professor Oxford
- 🇬🇧 long standing collaboration with University of Bristol (shared PhDs)
- 🇺🇸 LPC Distinguished Researcher Fermilab
- 🇳🇱 Visiting professor at Vrije Univ. Brussel



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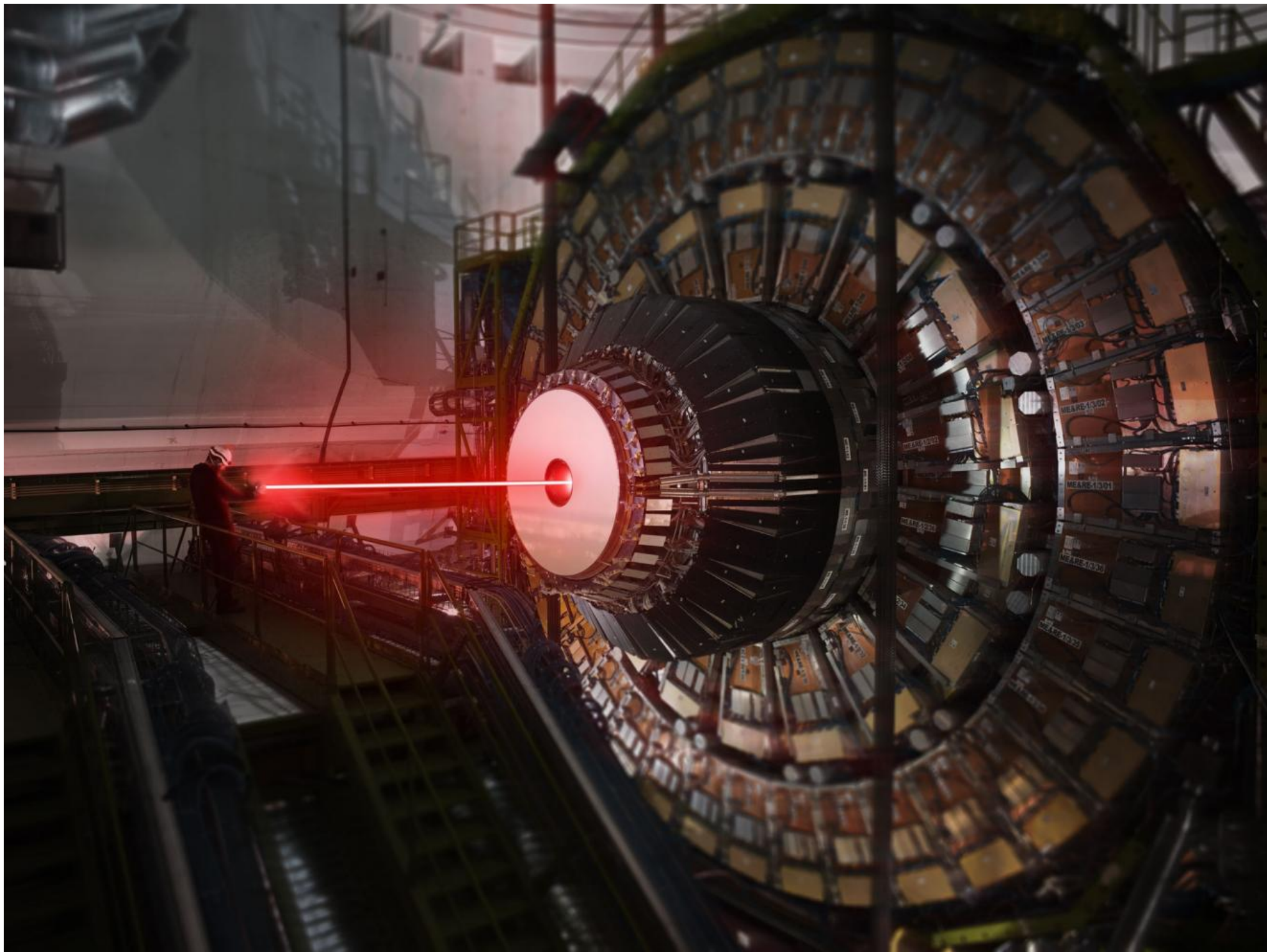
# disclaimer

This talk was originally presented at the CMS Data Analysis School at Fermilab, where 100+ physicists get a one-week crash course about LHC physics analysis tools



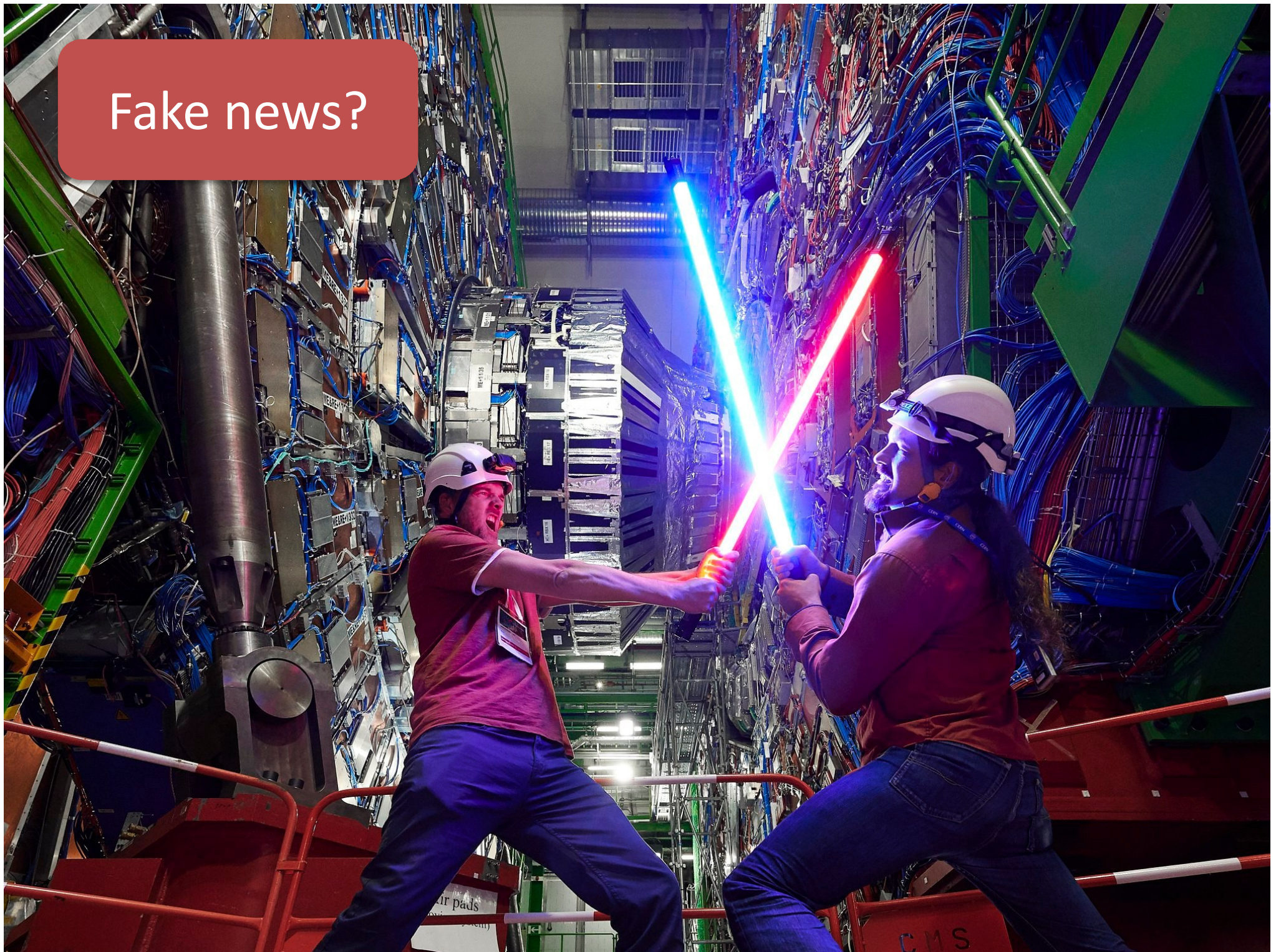
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Fake news?





This talk is about communicating what we do



# Why?



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# To improve the world?



src: IPPOG



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# To make sure science is supported?



EPA

src: IPPOG



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# To inspire future scientists?



src: IPPOG



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# To encourage scientific thinking?

**A Handy Flowchart For the Anti-Vaccine Science Denier**

**VACCINES CAUSE AUTISM!**

"Findings of this meta-analysis suggest that vaccinations are not associated with the development of autism or autism spectrum disorder. Furthermore, the components of the vaccines (thimerosal or mercury) or multiple vaccines (MMR) are not associated with the development of autism or autism spectrum disorder."

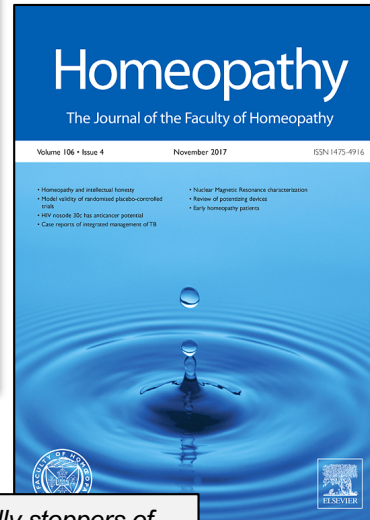
**VACCINES CAUSE DIABETES!**

"In this large, population-based, case-control study, we did not find an increased risk of type 1 diabetes associated with any of the routinely recommended childhood vaccines."

**VACCINES CAUSE MS!**

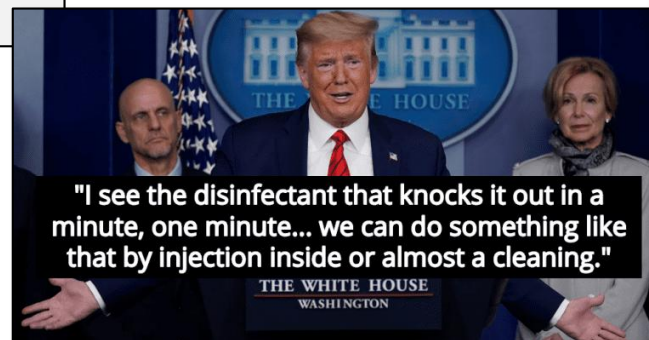
"We found no longer-term association of vaccines with MS or any other acquired central nervous system demyelinating syndromes, which argues against a causal association."

**YOU CAN'T TRUST SCIENCE!**



*"More and more studies show that kids are actually stoppers of the disease and they don't get it and transmit it themselves, so we should be in a posture of — the default should be getting back to school kids in person, in the classroom."*

— Education Secretary Betsy DeVos, [in an interview on "The Conservative Circus"](#) (iHeart radio), July 16



src: IPPOG



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# And yes this is needed

YouTube CH CERN

**Large Hadron Rap**  
alpinekat • 8.1M views • 11 years ago  
Rappin' about CERN's Large Hadron Collider! Links below... Apparently YouTube fixed the sound! Still, Will Barras made two ...  
and the things that it discover 4:49

**I'm a Physicist At CERN We've Done Something We Shouldn't Have Done part one**  
Paranoid Times • 6.5M views • 4 years ago  
If you like my videos and want to support more content on my heavily censored, demonetized channel: \* Patreon: ...  
CC

**The CERN black hole**  
BrainReleaseValve • 5.3M views • 12 years ago  
<http://www.brainreleasevalve.com/> Stolen from Misunderstood Universe. Because its HILARIOUS. Yes, I know this can't happen.  
0:38

**Robin and The Backstabbers - Sat dupa Sat (CERN campaign)**  
TheLunoStudio • 4.7M views • 5 years ago  
Sat după sat " e parte a campaniei "România la CERN in 2015" dezvoltată de Luno. Regia: Andrei Fântână DoP: Alex Grigoraș ...  
4K 3D 2:48

**Why This Stuff Costs \$2700 Trillion Per Gram - Antimatter at CERN**  
Physics Girl • 3.1M views • 8 months ago  
Physics Girl is on Patreon! => <https://www.patreon.com/physicsgirl> There's a factory in Europe that makes antimatter! It's the ...  
11:30

**這個組織, 平均智商**  
**160+**  
11:35

**一個平均智商超過160的組織每天都在幹什麼, CERN | 老高與小茉 Mr & Mrs Gao**  
老高與小茉 Mr & Mrs Gao • 3M views • 1 year ago  
地球上有一樣一個組織, 他的成員平均智商都在160以上, 他的實驗有可能創造宇宙。 ————— 相關鏈接: ...

**Sacrificio humano en el CERN**  
DrossRotzank • 2.7M views • 3 years ago  
Canal de Richie From Boston: <https://www.youtube.com/channel/UCuNfok7ozooi0LZgp6JJS4A> Video: ...  
9:12

**Anonymous - Everyone Needs to Pay Attention to This! (CERN ALERT MESSAGE 2017-2018)**  
Anonymous Official • 2.3M views • 2 years ago  
Anonymous - Everyone Needs to Pay Attention to This! (CERN ALERT MESSAGE 2017-2018) JOIN US: <https://goo.gl/2mQaI0> ...  
11:37

**Scientist and the Elite Try to Hide What Really Happened at CERN, Demonic Entities, Extra Dimensions**  
A & Q Productions • 2.1M views • 1 year ago  
Scientist are beginning to get more and more "religious". What has happened at CERN the past few Years? And What are they up ...  
CC 35:32

**Step inside the Large Hadron Collider (360 video) - BBC News**  
BBC News • 1.4M views • 4 years ago  
A 360 tour of CERN that takes you deep inside the Large Hadron Collider – the world's greatest physics experiment - with BBC ...  
4K 360° 3:15

**Cern - The Message (Magdelayna's Apollo Mix)**  
Magdelayna • 1.4M views • 5 years ago  
Please Subscribe to my channel for more sounds like this! My new Artist Album is available here ...  
9:08

**CERN · 宇宙を破壊するやばすぎる実験なのか? (下ネタあり)**  
Naokiman Show • 1.3M views • 2 years ago  
ツイッターを開設したのでフォローよろしくお願いします! <https://twitter.com/naokimanshow>  
CERN · 宇宙を破壊するやばすぎる実験なのか? ...  
7:46



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Fake news?  
(x160+)

# How?



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Different in many aspects  
But common solutions



SAME SAME  
BUT DIFFERENT



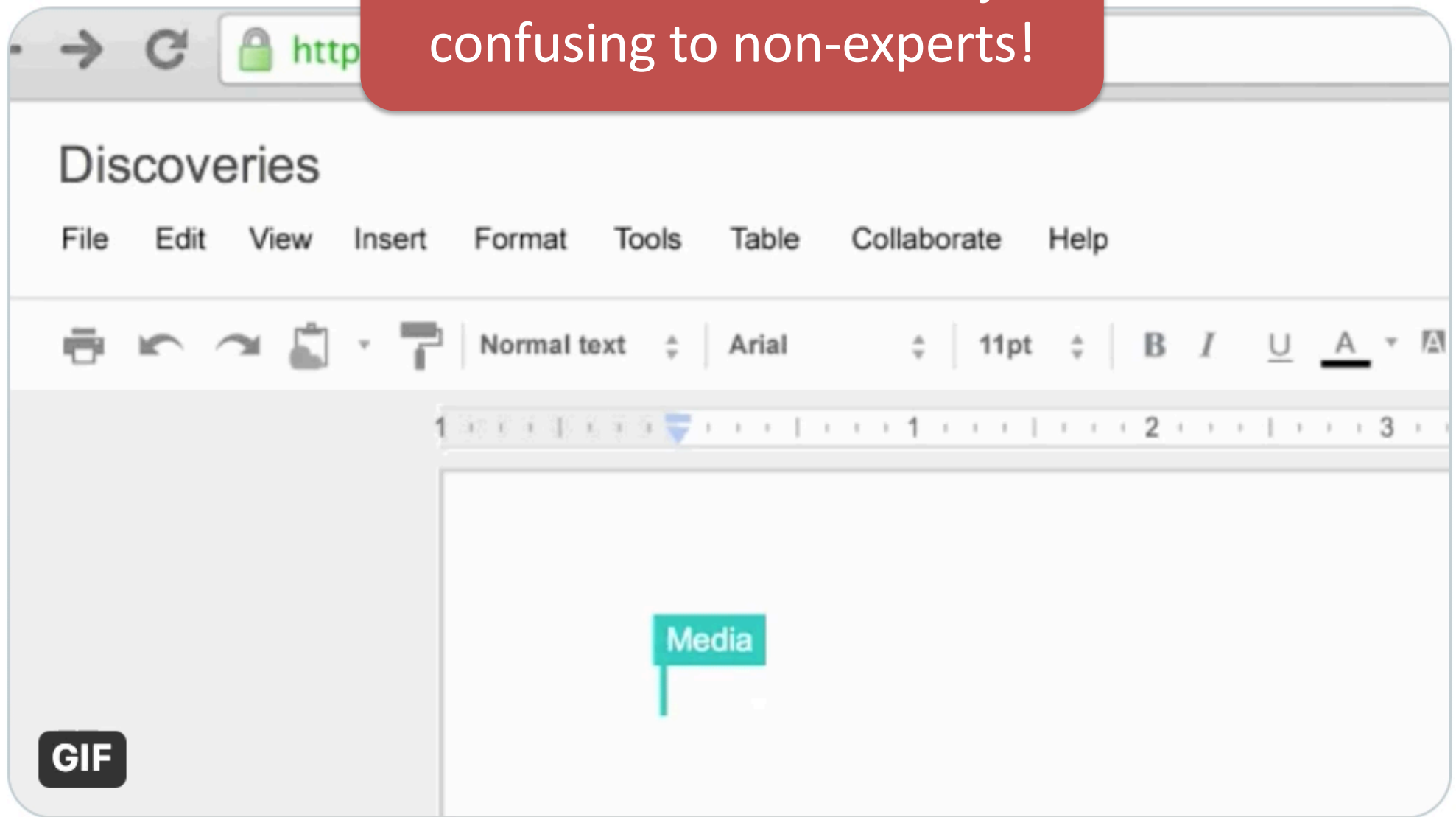
# How not?



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Too much information is just  
confusing to non-experts!



WE NEED SOME NEW JARGON,  
THE PUBLIC ARE STARTING TO  
UNDERSTAND WHAT WE'RE  
TALKING ABOUT!



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# How?



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IT'S ~~NOT~~  
ABOUT YOU

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# Audience always influences how you communicate

## what is the audience :?

Weekly university group meeting



# Audience always influences how you communicate

what is the audience :?

Journal paper



# Audience always influences how you communicate

## what is the audience :?

Journal paper (in Science/Nature and arguably Phys.Rev.Lett)



# Audience always influences how you communicate

## what is the audience :?

Explaining your work to your family



# Audience always influences how you communicate

## what is the audience :?

Explaining a result in the newspaper





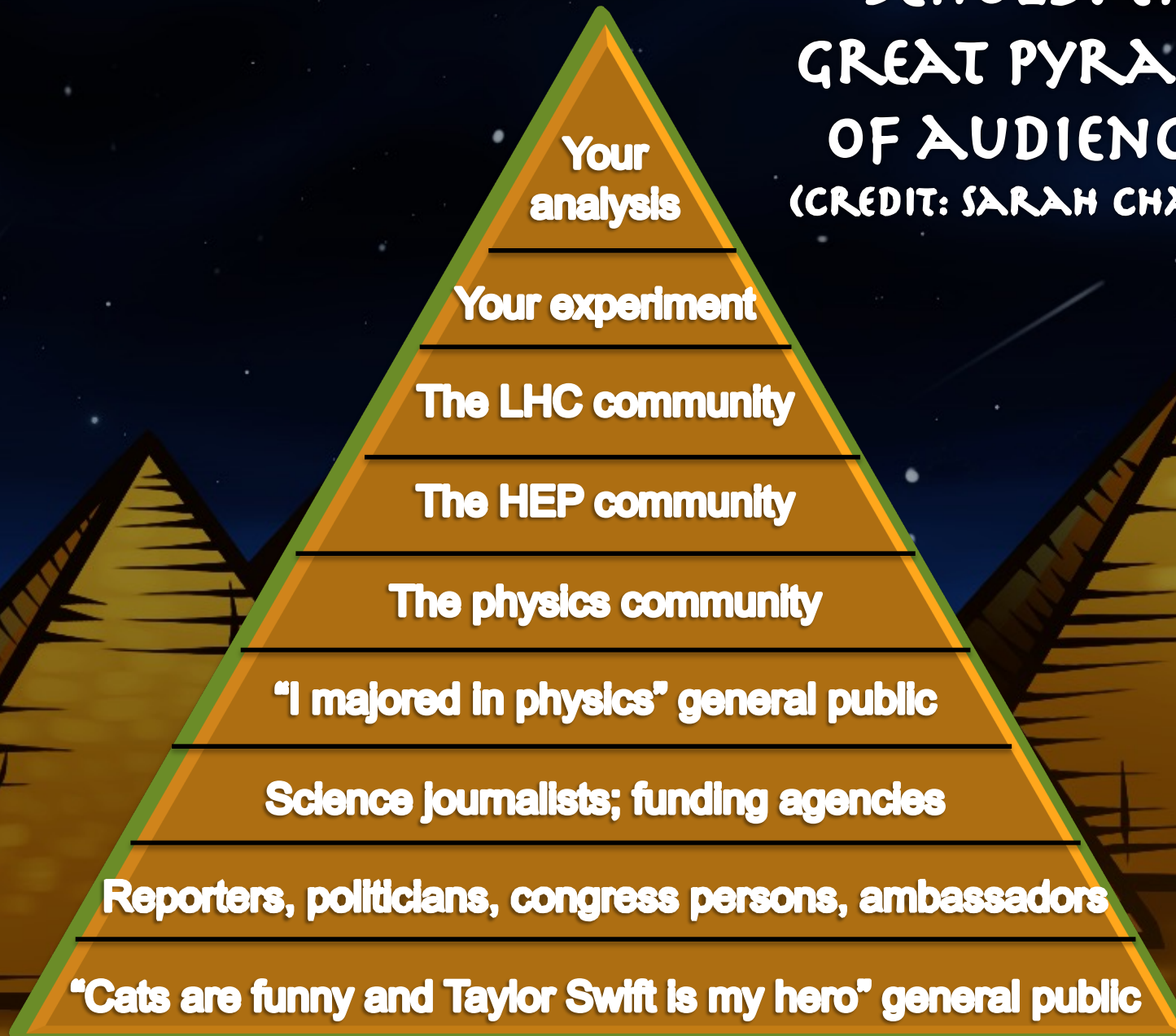
# Audience always influences how you communicate

## what is the audience :?

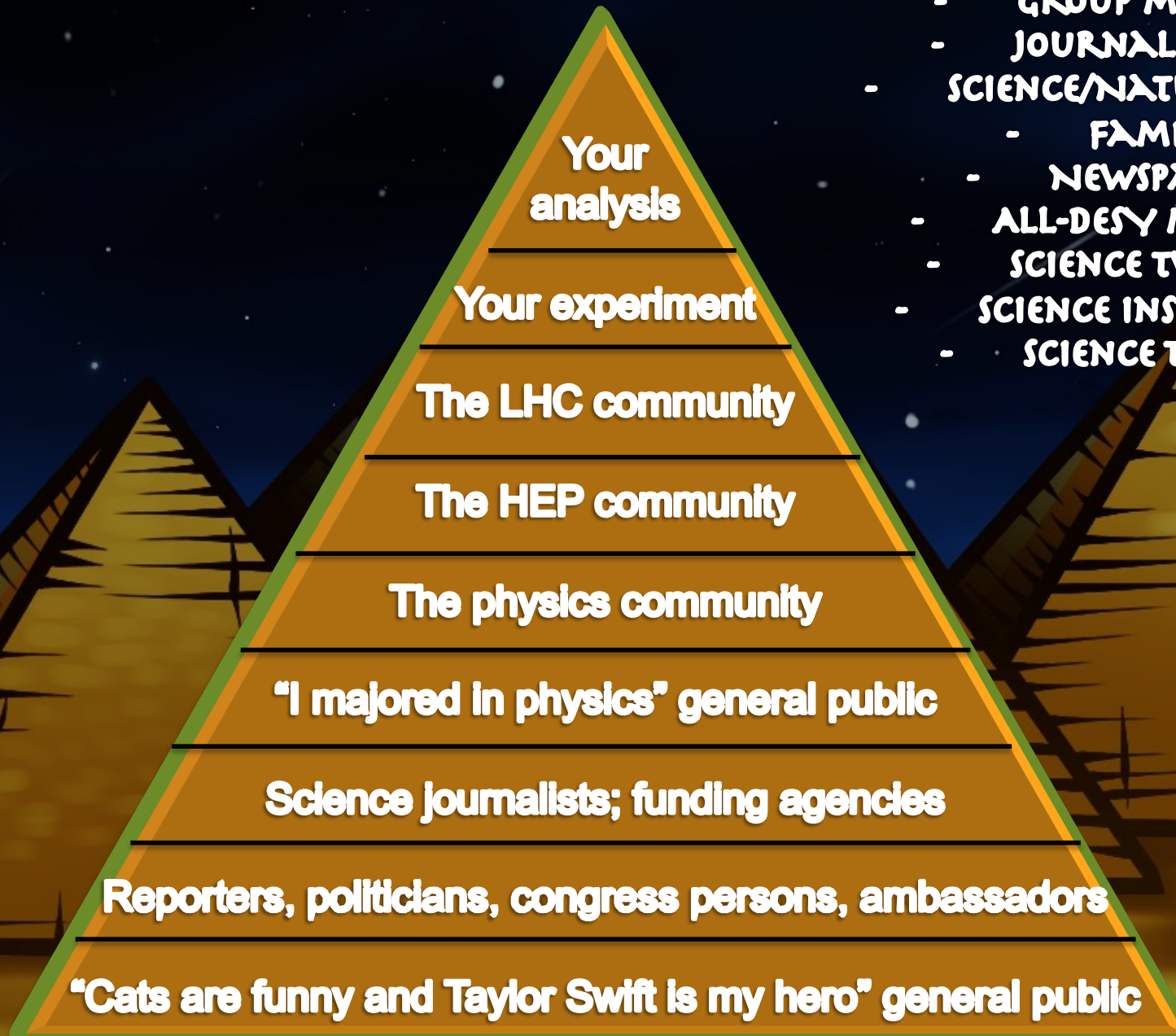
Explaining your work during an all-DESY meeting



**BEHOLD! THE  
GREAT PYRAMID  
OF AUDIENCES!**  
(CREDIT: SARAH CHARLEY)



# ANNOTATION EXERCISE



- GROUP MEETING
- JOURNAL PAPER
- SCIENCE/NATURE PAPER
  - FAMILY
  - NEWSPAPER
- ALL-DESY MEETING
- SCIENCE TWITTER
- SCIENCE INSTAGRAM
- SCIENCE TIKTOK



# Audience always influences how you communicate



All (good) outreach targets different audiences



Press   
media



# Example from the LHC: CMS briefings



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# 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

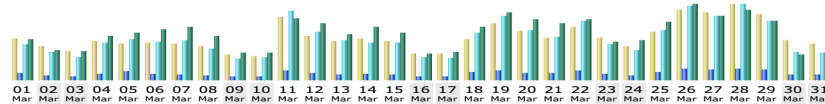
e-Print: 1906.11903 [hep-ex]

DOI: 10.1103/PhysRevD.100.072001 (publication)

Report number: CMS-B2G-18-005, CERN-EP-2019-129

Experiments: CERN-LHC-CMS

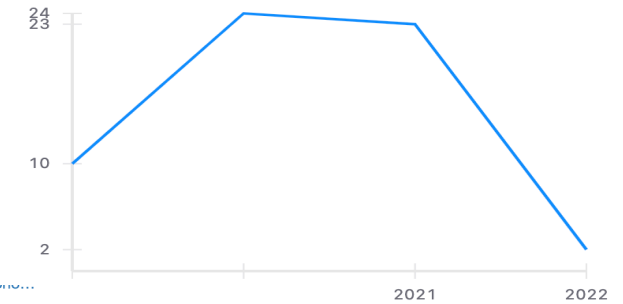
View in: OSTI Information Bridge Server, HAL Archives Ouvertes, CERN Document Server, ADS Abstract Service



Website traffic

Day	Number of visits	Pages	Hits	Bandwidth
01 Mar 2019	561	1,423	6,923	1.19 GB
02 Mar 2019	457	907	5,440	906.31 MB
03 Mar 2019	389	722	4,414	877.66 MB
04 Mar 2019	529	1,194	7,199	1.29 GB
05 Mar 2019	497	1,685	7,797	1.40 GB
06 Mar 2019	509	1,278	7,424	1.50 GB
07 Mar 2019	498	1,104	7,666	1.56 GB
08 Mar 2019	463	912	6,118	1.29 GB
09 Mar 2019	353	653	4,145	809.60 MB
10 Mar 2019	319	732	4,495	828.91 MB
11 Mar 2019	865	1,842	13,255	1.82 GB
12 Mar 2019	595	1,325	9,282	1.66 GB
13 Mar 2019	533	1,108	7,621	1.35 GB
14 Mar 2019	559	1,192	7,239	1.56 GB
15 Mar 2019	529	1,098	7,141	1.40 GB
16 Mar 2019	364	756	4,414	808.53 MB
17 Mar 2019	359	707	4,293	843.64 MB
18 Mar 2019	556	1,472	9,168	1.56 GB
19 Mar 2019	774	1,890	12,308	1.99 GB
20 Mar 2019	668	1,440	9,524	1.80 GB
21 Mar 2019	580	1,370	8,276	1.65 GB
22 Mar 2019	722	1,937	11,412	1.80 GB
23 Mar 2019	573	1,171	6,826	1.12 GB
24 Mar 2019	464	947	5,666	1.16 GB
25 Mar 2019	655	1,537	9,685	1.72 GB
26 Mar 2019	949	2,250	14,246	2.22 GB
27 Mar 2019	917	2,001	12,426	1.88 GB
28 Mar 2019	1,025	2,242	14,528	2.07 GB
29 Mar 2019	894	1,943	11,429	1.74 GB
30 Mar 2019	543	1,036	5,471	772.73 MB
31 Mar 2019	495	971	5,166	834.07 MB

Citations per year



**CMS Experiment CERN** @CMSEExperiment · Mar 29  
[CMS physics summary]: Leaving no stone unturned in when searching for #supersymmetry, also when it shows as particles disappearing halfway in the CMS detector. One of the over 37 new CMS results for #Moriond! cms.cern/news/new-morio... cms.cern/news/delayed-j...  
View Tweet activity

**CMS Experiment CERN** @CMSEExperiment · Mar 28  
[CMS physics summary]: Quarks, the Next Generation? One of the over 37 new CMS results for #Moriond! Read more: cms.cern/news/new-morio... pic.twitter.com/9dpFJ1TcwC  
View Tweet activity

**CMS Experiment CERN** @CMSEExperiment · Mar 28  
[CMS physics summary]: Delayed jets -> heavy new particles don't travel exactly at the speed of light and the timing of the CMS calorimeter can be used to find the decay product. One of the over 37 new CMS results for #Moriond cms.cern/news/delayed-j... pic.twitter.com/oWQsXpmyD  
View Tweet activity

**CMS Experiment CERN** @CMSEExperiment · Mar 27  
New for Moriond: Search for new particles in jets plus missing energy, including disappearing tracks cms.cern/news/new-morio... pic.twitter.com/6arD9MaNvx  
View Tweet activity

**CMS Experiment CERN** @CMSEExperiment · Mar 27  
New for #Moriond: First measurement of the effect of virtual Higgs bosons on #topquarks cms.cern/news/new-morio... pic.twitter.com/pWtwOZYzy  
View Tweet activity

Twitter: compare difference

28/03/2019  
17:03

[CMS physics summary]: Quarks, the Next Generation? One of the over 37 new CMS results for #Moriond!



49.2K



998  
531



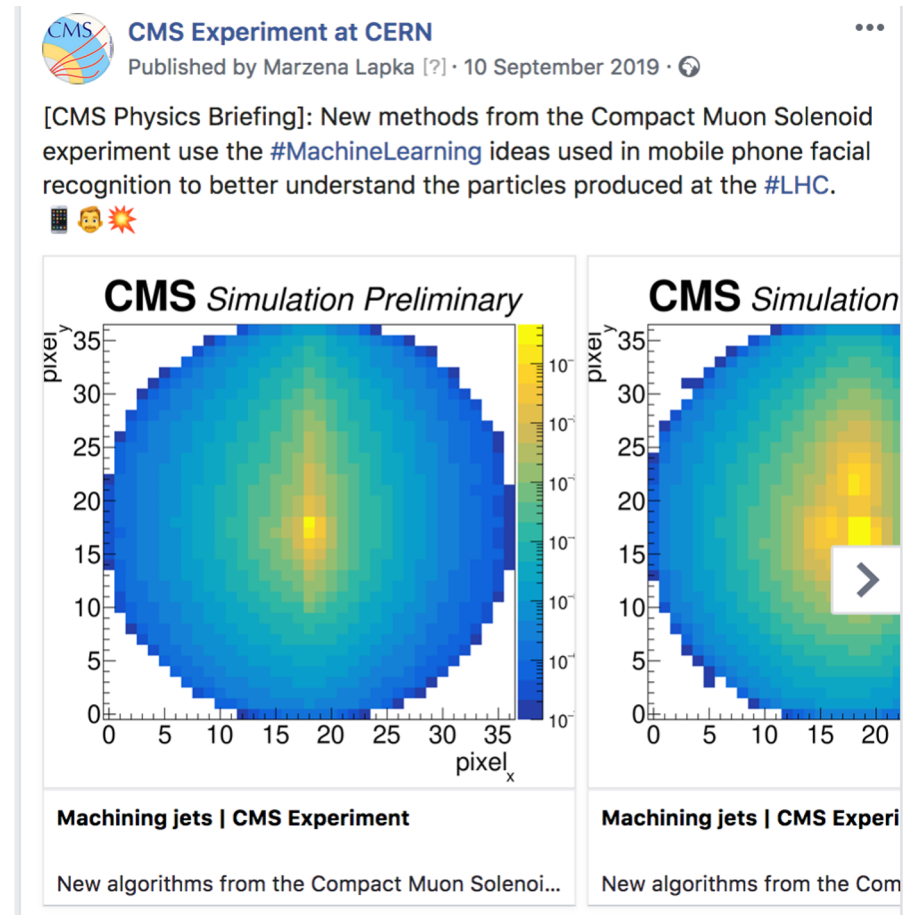
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# General advice from years experience:

To reach the general public is not so different from reaching other scientists

- Have great appealing pictures!
- Event displays! Videos!
- Catchy title that sparks curiosity!
- Connect to the people (if possible with personal story)
- Always talk about why the result is important
  - that is more important than the really technical difficult work you had to do to get there
- Explain the science

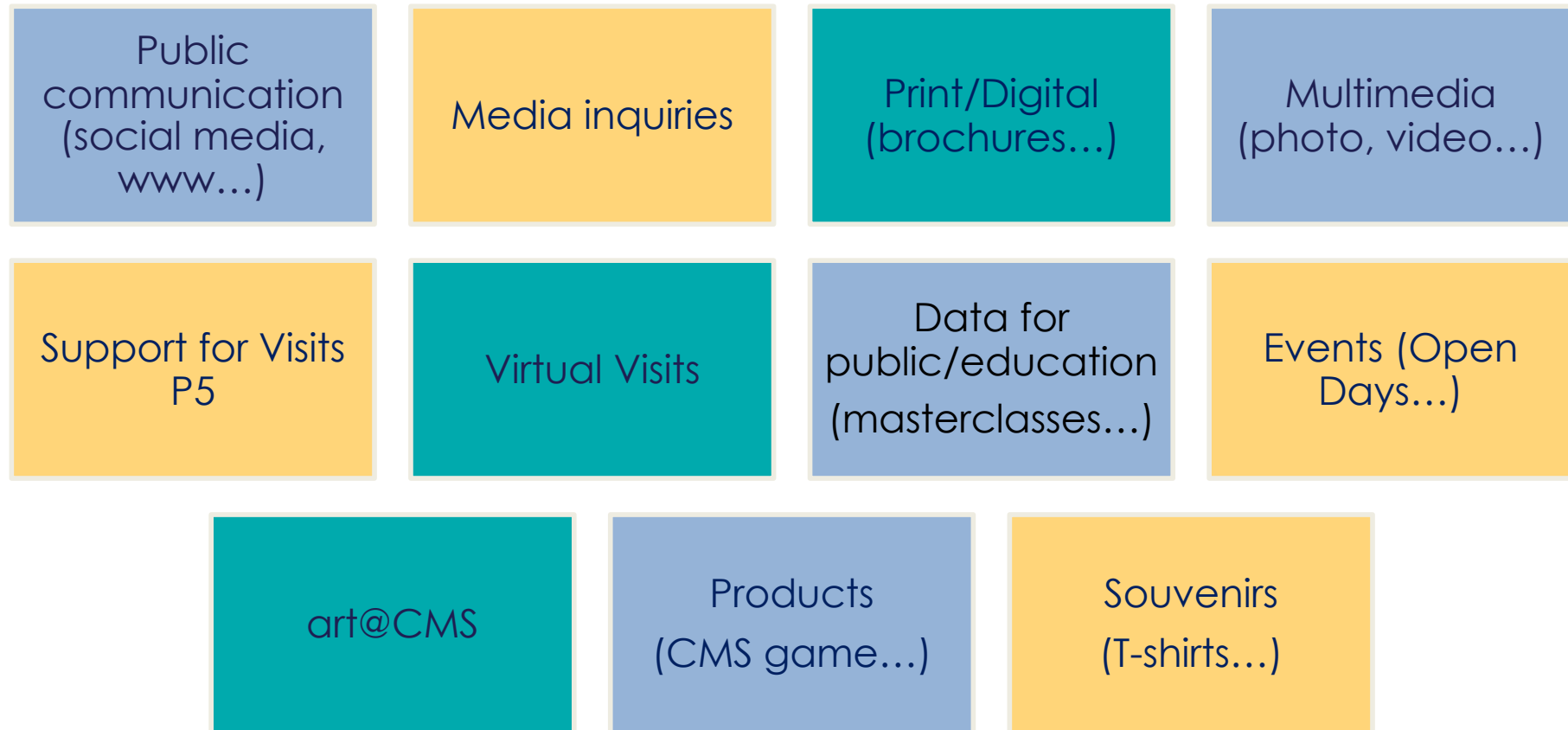


# Papers?

- 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



# Science communication: something for everyone





# advice on science on social media



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# Discussion that makes you look bad does not help the greater good

TROLL MAKE INTERNET MAD.  
TROLL LIKE ANGER.  
TROLL WANT PEOPLE AS  
MISERABLE AS TROLL.



PoorEXcuses.com



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# Answering straw man/unrelated arguments does not help the greater good





# Amplifying what you did not want amplified

- You are representing your community to the outside world when you react to these posts
- Particularly when many people are reading along
- Almost always, ignoring is better than getting in toxic discussions
  - And always take the high road as insulting can be used against you!

Setting an example is  
not the main means of  
influencing others, it is  
the **ONLY** means.

Albert Einstein

still a good quote (almost certainly not by Einstein)



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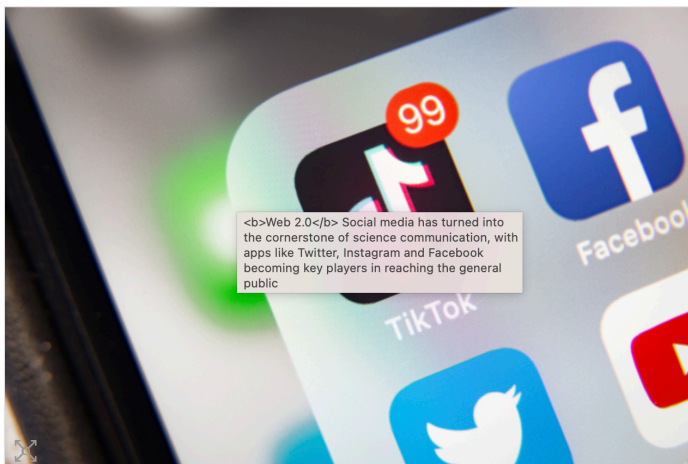
# Some great resources

- TED talk “How social media made me a better scientist” by Sasha Weiditch
  - And many more! Just spend some time on science social media and get inspired
- [CERN courier: from sea quarks to sea shanties](#)

## From sea quarks to sea shanties

30 September 2021

As TikTok dethrones Facebook as the most downloaded app, with 850 million downloads in 2020 alone, Craig Edwards looks at how high-energy physicists are taking advantage of the social-media phenomenon.



**Web 2.0** Social media has turned into the cornerstone of science communication, with apps like Twitter, Instagram and Facebook becoming key players in reaching the general public

**Tweet or Perish: Science Communication – Career Boost or Waste of Time?**

October 27, 2021  
link will follow  
Europe/Berlin timezone

Enter your search term

++++ If the workshop is fully booked, please send an e-mail to [graduateschool@pier-hamburg.de](mailto:graduateschool@pier-hamburg.de) to be added to the waiting list.++++

Overview

Registration

PIER Education Platform

Contact

✉ [theresa.schredelseker@...](mailto:theresa.schredelseker@...)

☎ +49-40-8998-5503



### Tweet or Perish: Science Communication – Career Boost or Waste of Time?

The requirements for a successful academic career are already plentiful and overwhelming for many: designing and conducting experiments, publishing research results, supervising, teaching and acquiring funding. However, most recently, communicating your research to a public audience appears to be another box that needs to be ticked as the final touch to your resumé or to fulfill your grant conditions. But what exactly is Science Communication and is it really yet another requirement for a present-day academic career? Should you be active on Social Media to be a more successful academic or is it a colossal hype bubble feeding on your precious time?

Dr. **Theresa Schredelseker**, molecular biologist, science blogger and coordinator for Postdocs at PIER, the partnership between DESY and Universität Hamburg, is trying to give some answers in this talk.

Starts Oct 27, 2021, 2:00 PM  
Ends Oct 27, 2021, 4:00 PM  
Europe/Berlin

link will follow  
online

Theresa Schredelseker

Tweet-or-Perish.pdf

- DESY has trainings and tutorials for all of these matters too
- Also see previous events, e.g.:
- <https://indico.desy.de/event/30712/>
- If you ever get a chance to do media training: DO IT
- Theresa Schredelseker (PIER) is connected, welcome to comment on future events



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# Final notes

- Communicate your science for others not your thing?
  - Outreach can improve your work as a scientist too
  - Communication and similar "soft skills" are essential as a professor
  - And by now are also regularly evaluated in job selections/CVs
  - And the experience allows you to better explain your work to other scientists
  - And to the funding agency 😊



# Thanks for your attention

Questions?



**@CMSexperiment**

*follow us and share  
our content!*



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