



Communicating ATLAS

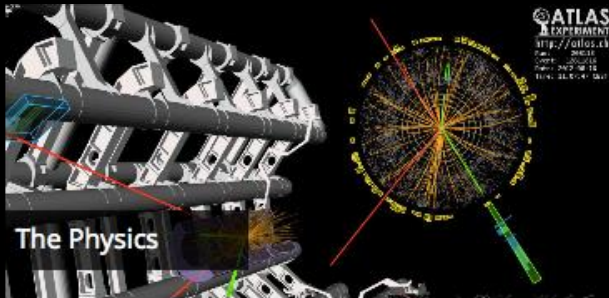
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# How ATLAS tailors its public communication

Luis R Flores Castillo, for the ATLAS  
Collaboration  
Shanghai, China, 15.05.2017

# Key themes

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## Physics:

The fundamental questions of nature that ATLAS is seeking to answer



## Detector:

The world-leading technology employed and developed for detectors, electronics, and computing, often with important applications outside our field

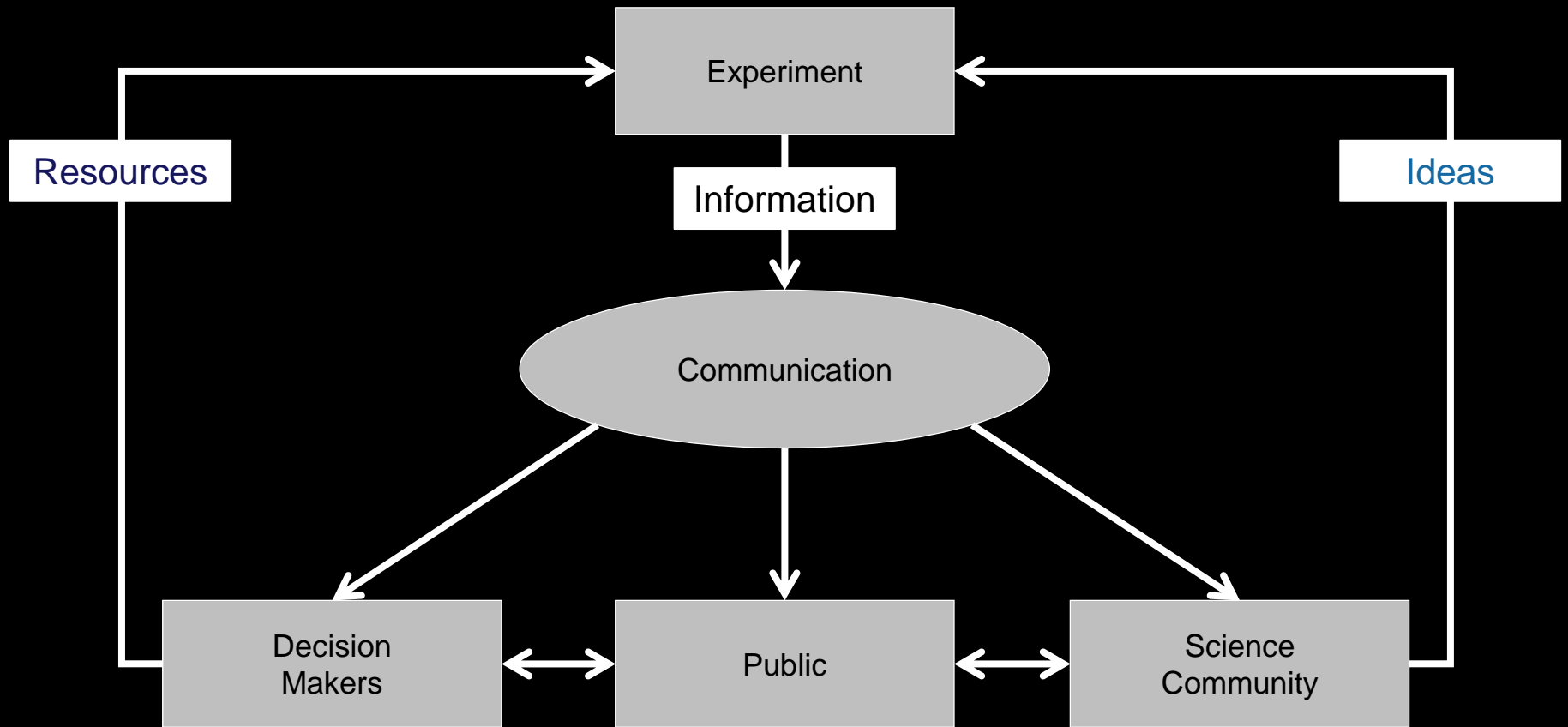


## Collaboration:

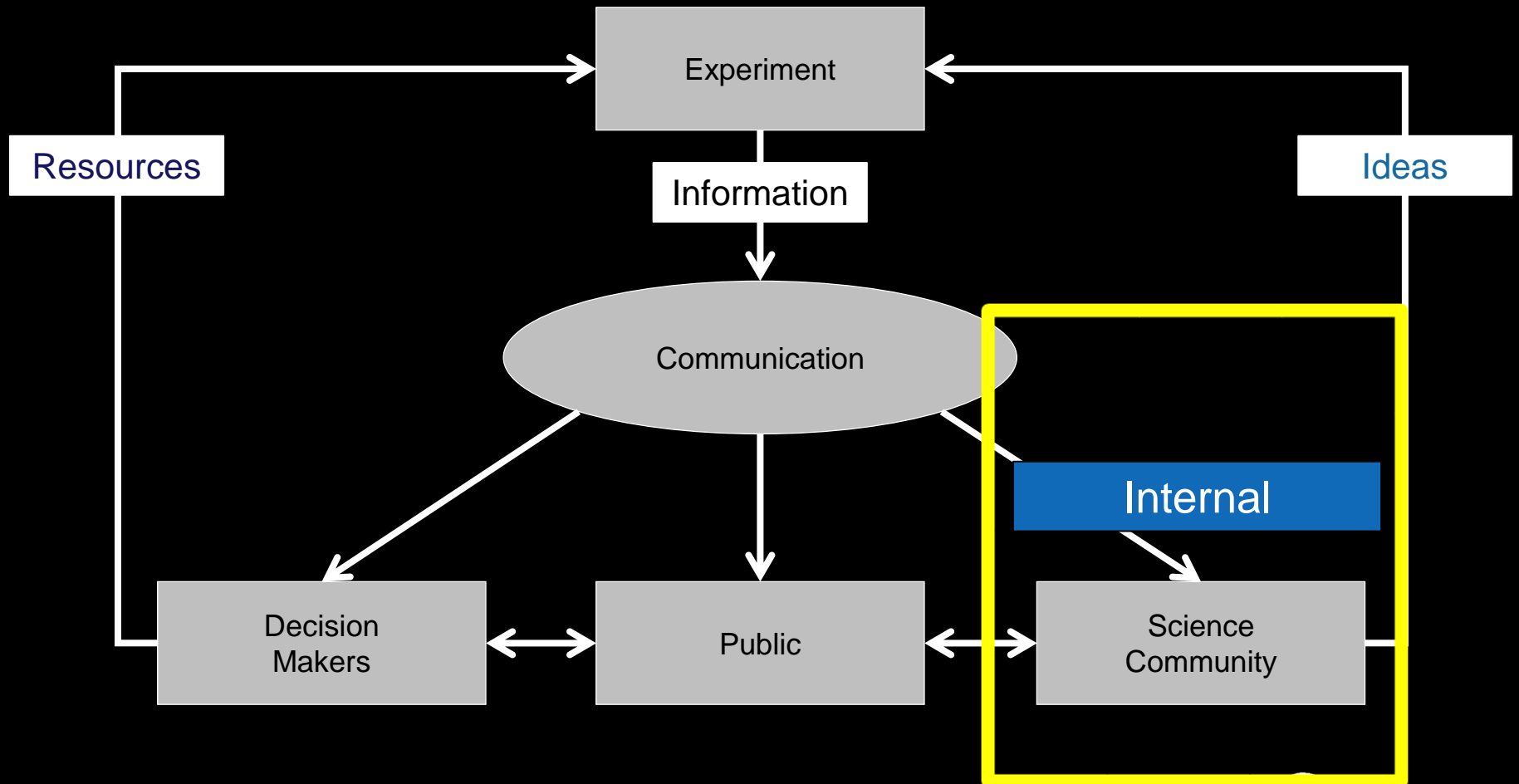
The thousands of scientists from all over the world, working together to advance our understanding of the universe

# The basics

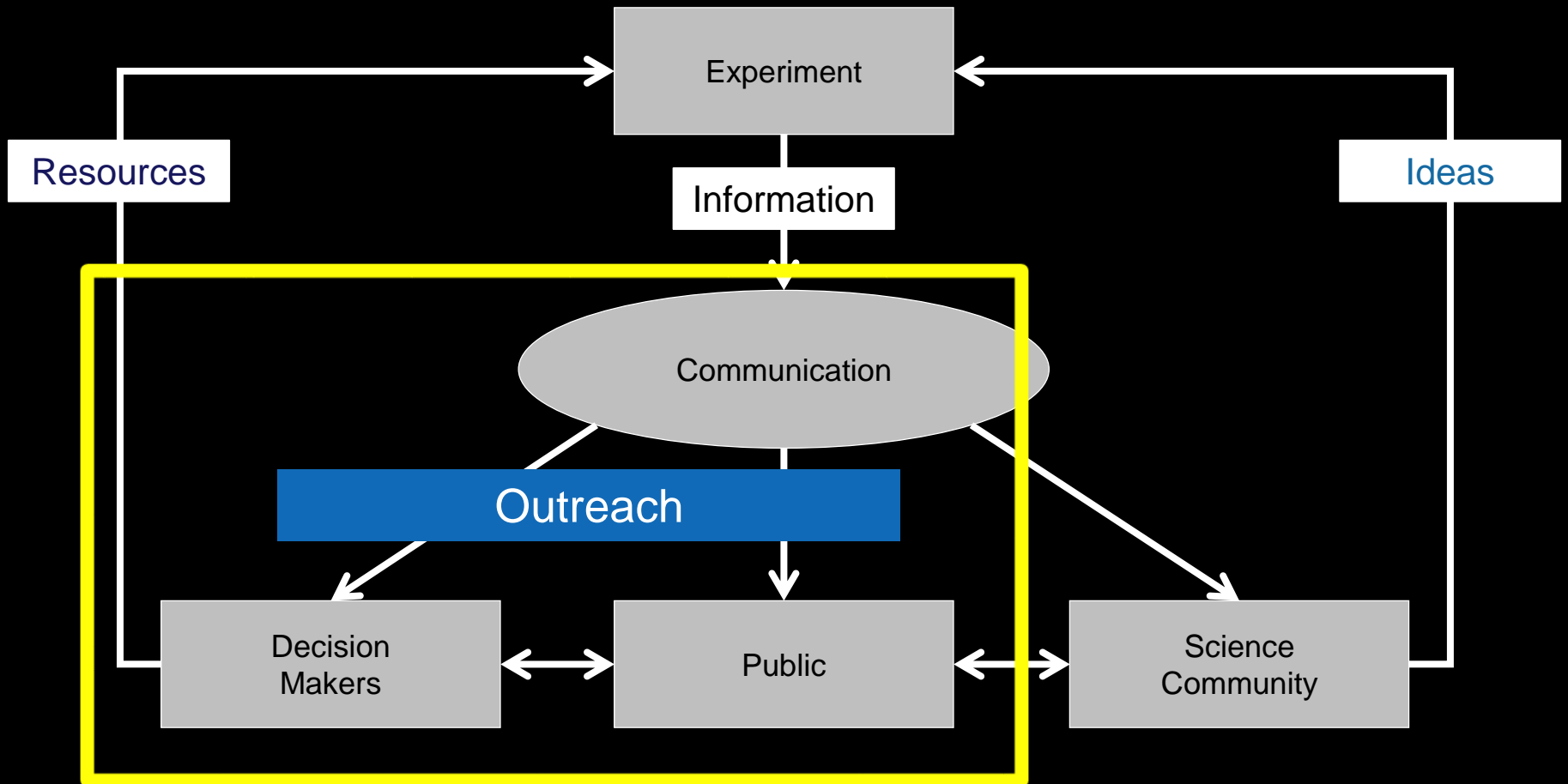
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# The basics



# The basics





# “General Public”

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Diverse interests, aims and concerns

Communication should be designed accordingly

Segment audience into recognizable demographics

- Emotional background,
- age,
- existing level of interest in science
- ...

Select and design platforms accordingly

# Audiences

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## Curious citizens

- Interested in ATLAS & CERN
- Eager to engage
- No formal physics expertise



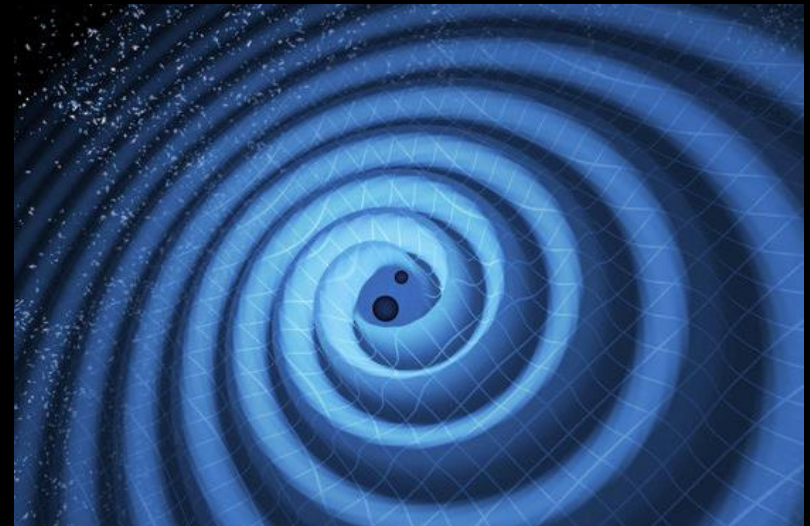


# Audiences

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## Scientific community (internal & external to ATLAS)

- Appreciation for HEP
- May or may not have an expert understanding of experimental HEP



# Audiences

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## Students and Educators

- Aim to be informed about particle physics & ATLAS
- Little or no knowledge of the field
- May not be engaged with the subject



# Audiences

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## Policy makers

- Interested in impact on society, prestige, results, ...
- No formal physics expertise





# Audiences

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## Dis-engaged public

- No strong interest in physics or science
- May be only generally aware of CERN/ATLAS (e.g., “God particle”)



# Audiences

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## Press

- Looking for latest results and developments
- Little/medium knowledge of the field
- Prone to sensationalism  
(end of the world, LHC-killer weasels,...)

roflposters.com

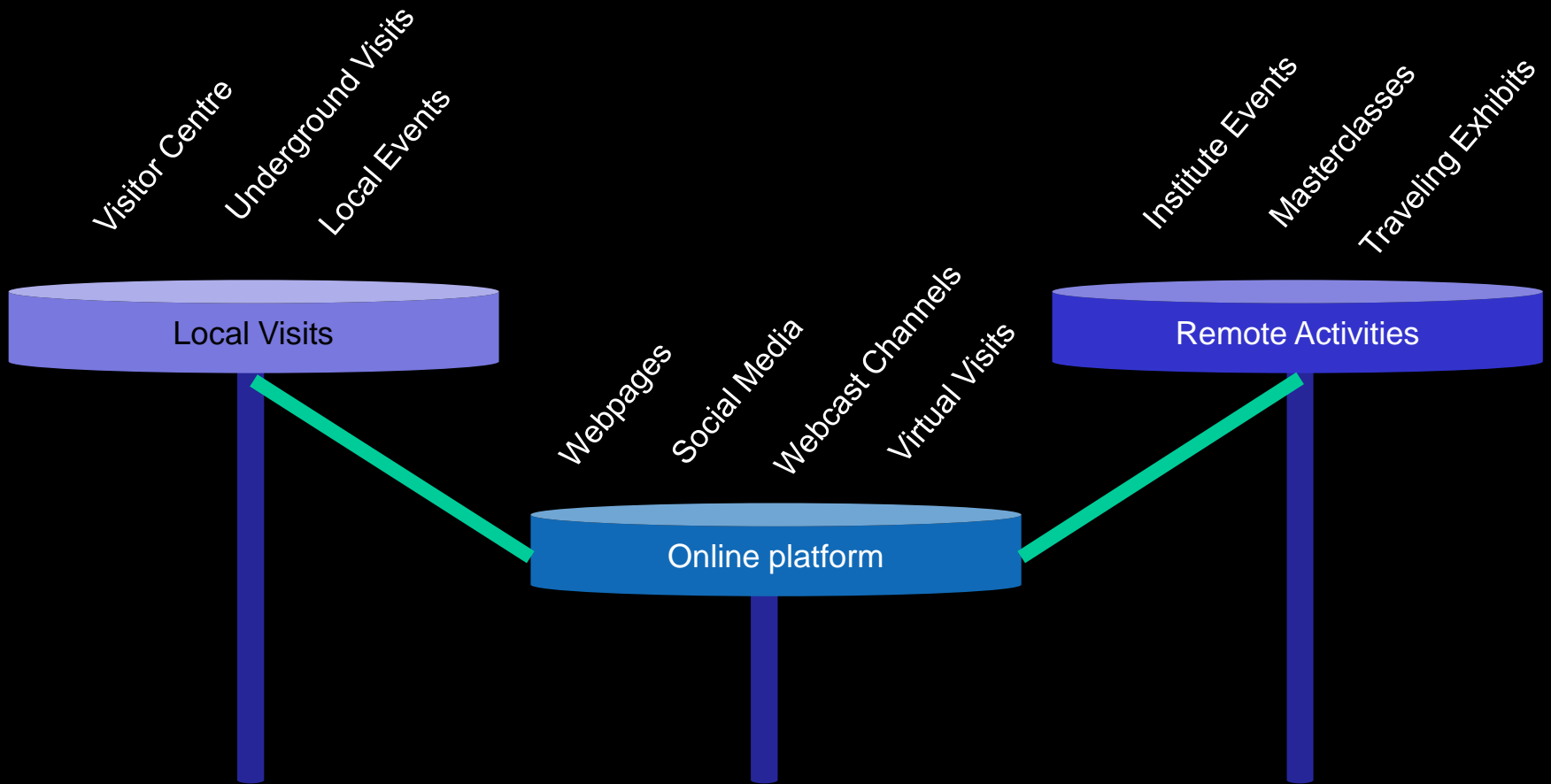


**LARGE HADRON COLLIDER**


OPERATIONAL 2008



# Outreach Platforms



Access to [Collaboration Site](#) Search ATLAS



**Discover**

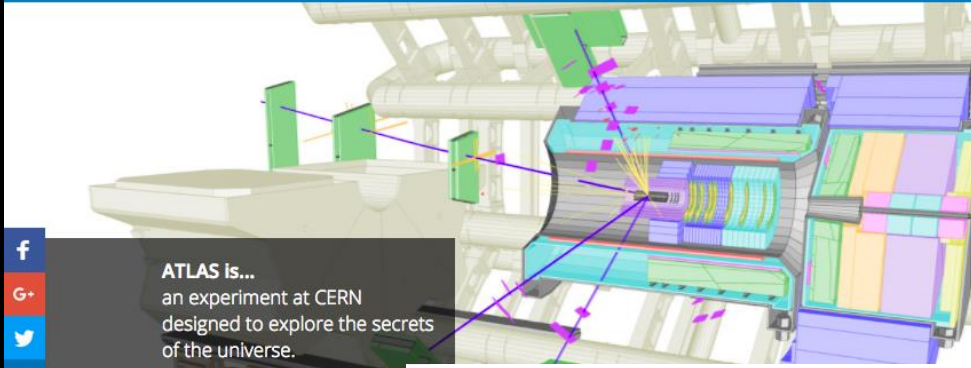
About, Physics,  
Collaboration, Detector

**Resources**

Multimedia, Activities,  
Education, Visit, Press

**Updates**

News, Physics Briefings,  
Blog, Statements



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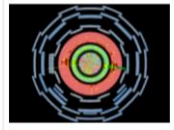
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**ATLAS is...**  
an experiment at CERN  
designed to explore the secrets  
of the universe.

[Learn more →](#)

**Discover ATLAS**




[See Live Collisions in the ATLAS Detector.](#)  
[Meet Live Collisions in the ATLAS Detector.](#)

**Discover more about ATLAS:**

- About the Experiment
- The Physics
- The Collaboration
- The Detector & Technology
- Physics Results

**Resources**

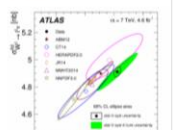


From the Archives: Cables from Central Trigger Processor

Find and download material:

- New Colouring Book
- Images, Animations, Video
- Activities & Games
- Educational Programmes
- Visit ATLAS
- ATLAS Press Kit


**Updates**



How strange is the proton? - *Physics Briefing*, 25 Jan 2017

**Other recent updates:**

- Return of the top quark! - *Physics Briefing*, 13 Jan 2017
- The Trouble with Terabytes - *ATLAS News*, 14 Dec 2016
- Measuring the W boson mass - *Physics Briefing*, 13 Dec 2016



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Switzerland  
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## Evergreen content

### Inner Detector



Measures the momentum of each charged particle

### Calorimeter



Measures energies carried by neutral and charged particles

### Muon Spectrometer



Identifies and measures the momenta of muons

### Magnet System



Bends the trajectories of each charged particle to allow the measurement of its momentum

### Trigger and Data Acquisition System



A specialised multi-level computing system, which selects physics events with distinguishing characteristics

### Computing System



Developing and improving computing software used to store, process and analyse vast amounts of collision data at 100 computing centres worldwide

### Technology Transfer

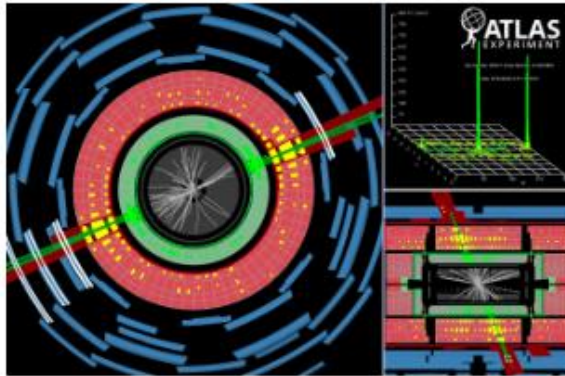




# Updates: News

## ATLAS highlights from Moriond

By Dan Tovey, 2nd April 2017



The highest-mass dijet event measured by ATLAS (mass = 8.12TeV). (Image: ATLAS Collaboration/CERN)

At this year's *Rencontres de Moriond*<sup>#</sup>, the ATLAS collaboration presented the first results examining the full 2015 and 2016 LHC data at 13 TeV proton-proton collision energy. Thanks to outstanding performance of the CERN accelerator complex last year, this new dataset is almost three times larger than that available at ICHEP, the last major particle physics conference held in August 2016.

The significant increase in data volume has greatly improved ATLAS' sensitivity to possible new particles predicted by theories beyond the Standard Model. At the same time, it has also allowed ATLAS physicists to perform precise measurements of the properties of known Standard Model particles.

A selection of Moriond 2017 highlights are explored below; find the full list of ATLAS public results [here](#), with recent Run 2 results [here](#).

**The search for supersymmetry**

## Beams return to the ATLAS Experiment

### ATLAS physicists record the first "beams splashes" of 2017

By Katarina Anthony, 29th April 2017

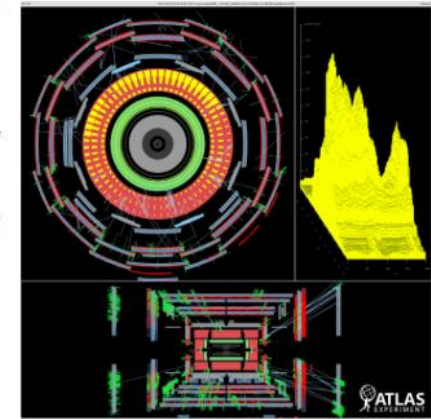
With the year's first proton beams [now circulating in the Large Hadron Collider](#), physicists have today recorded "beam splashes" in the ATLAS Experiment.

Like a giant wave striking the shore, [beam splashes](#) are generated when circulating protons hit collimators in the beam pipe, leaving a spray of particles to wash across the ATLAS detector. They provide signals that illuminate the various sub-detectors, allowing physicists to synchronise the ATLAS detector elements to the LHC's clock. This is one of the final actions before protons once again collide in the heart of ATLAS.

The arrival of beam splashes marks the start of a new year of exploration, which should see records set for instantaneous luminosity. "To study the high-energy frontier, we need to keep our detector at its best performance," says Masaya Ishino, ATLAS Deputy Run Coordinator. "This requires tremendous effort, not only in the control room, but also from our physicists all over the world. We are ready to cope with the high instantaneous luminosity expected, the highest the ATLAS Experiment has ever seen."

"ATLAS teams have worked very hard over the last months to prepare the experiment for the luminosity challenge," confirms Alexander Oh, ATLAS Run Coordinator. "We have made various improvements during the year-end-technical-stop and are eager to see protons colliding again. Our goal is to take collision data with the highest possible efficiency and quality to optimally explore the physics at 13 TeV energy."

With collisions scheduled for the end of May, ATLAS physicists will use the coming weeks to prepare: fine-tuning the subdetectors, testing the trigger and data acquisition systems, and monitoring the circulating beams.



Event display of a "beam splash" seen by the ATLAS Experiment on Saturday 29 April, 2017. The collimator position is 140m in front of the ATLAS interaction point. Left figure shows an axial view of the various components of the ATLAS detector. Right figure shows the energy deposits in the cells of the ATLAS calorimeter. Lower panel shows longitudinal cross-section of ATLAS; the spray of particles enters from the left-hand side. (Image: ATLAS Collaboration/CERN)



# Updates: Physics briefings

## New insight into the Standard Model

ATLAS releases the first study of a pair of neutral bosons produced in association with a high-mass dijet system

By ATLAS Collaboration, 9th May 2017

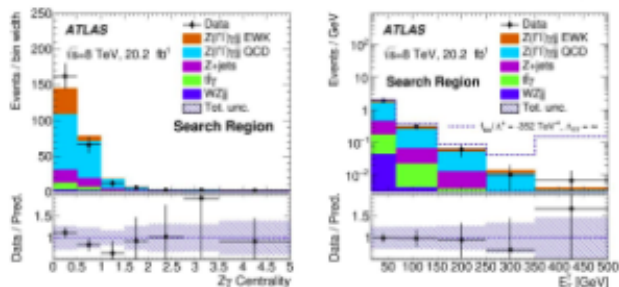


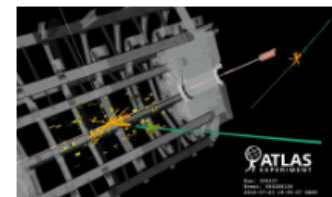
Figure 1: Distribution of (a) the centrality of the Z boson-photon ( $Z\gamma$ ) system and (b) the transverse energy of the photon. These studies show data collected by ATLAS in 2012 (black points) compared to Standard Model predictions (coloured histograms). The signal that is looked for is displayed as the dark red histogram and the main background is shown as the light blue one. The bottom panels show the ratio of the data to the sum of all the predictions. The error band (blue) shows the total uncertainty on these predictions. A sign of new physics could appear as an enhancement at large momentum, as shown by the dotted blue line in (b). (Image: ATLAS Collaboration/CERN)

Ever since the LHC collided its first protons in 2009, the ATLAS Collaboration has been persistently studying their interactions with increasing precision. To this day, it has always observed them to be as expected by the Standard Model. Though it remains unrefuted, physicists are convinced that a better theory must exist to explain certain fundamental questions: What is the nature of the dark matter? Why is the gravitational force so weak compared to the other forces?

## Physics Briefing

### Searching for new symmetries of nature

6th April 2017 – The fundamental forces of nature are intimately related to corresponding symmetries. For example, the properties of electromagnetic interactions (or force) can be derived by requiring the theory that describes it to remain unchanged (or invariant) under a certain localised transformation. Such an invariance is referred to as a symmetry, just as one would refer to an object as being symmetric if it looks the same after being rotated or reflected. The particular symmetry related to the forces acting among particles is called gauge symmetry.

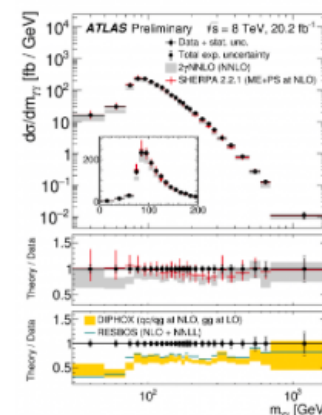


## Physics Briefing

### Improving our understanding of photon pairs

5th April 2017 – High-energy photon pairs at the LHC are famous for two things. First, as a clean decay channel of the Higgs boson. Second, for triggering some lively discussions in the scientific community in late 2015, when a modest excess above Standard Model predictions was observed by the ATLAS and CMS collaborations.

[Read more →](#)



# Updates: Blogs

## An insider view of the "marten affair"

Friday morning, 29 April 2016: what was expected to be a productive shift turned out to be very different.

By [Saverio D'Auria](#), 7th June 2016

I was taking shifts as "shift leader", which means that for 8 hours I am coordinating the data-taking operations. 7 am, start of shift, and for the past hour the detector has been in a state that can be best summarized as "challenging".

The night shifter informs me that while there was stable beam in the accelerator, and the experiment was happily recording data from proton-proton collisions, we had a power cut. The status screen is full: more than 8000 single alarm lines are present. "Bon courage," he says, as the recovery operations will occur during my shift.

Normally, the control room is staffed with eight people 24/7, but there are already six more at 7 am today; the system administrator is restarting the servers. For about two hours, experts could not remotely access the computers which control the detector, though the network was working fine here at Point 1.

Usually, a power cut requires no less than a week. Clear there was something more unusual heating up. These magnets are superconducting and warm up completely, it can take weeks already at 22 K. I was looking at this w



A beech marten (*Martes foina*) who had nothing at all to do with this incident. (Image: [Sohul Cicek/Wikimedia](#))

## About the author



Saverio D'Auria graduated in Bologna in 1989 with a master thesis on the vertex tracker for the ZEUS experiment at the HERA accelerator, in Hamburg. He has obtained a PhD from the University of Bologna for research on using Gallium Arsenide crystals to detect radiation, for particle physics and medical imaging. Since then, he has worked as a post-doc and then as a researcher at the University of Glasgow (UK) and Trieste/Udine (Italy).

developing pixel detectors for ATLAS and for medical imaging. In 1999, he re-joined the U. of Glasgow team to participate in Run 2 of the CDF experiment at Tevatron, near Chicago, where he contributed to assembling, testing, commissioning and operating the silicon-strip tracker, and to studying properties of particles containing b-quarks. He joined the ATLAS collaboration again in 2005, contributing to the test commissioning and operation of the Semi Conductor Tracker. His present interests are focused on measuring the couplings of the Higgs boson, via the associated production of top pairs and a Higgs boson, and on the search for resonances decaying into pairs of top quarks. He teaches graduate and undergraduate courses at the U. of Glasgow.

## ICHEP results presented with style!

There are many ways of presenting results in an engaging manner, and over the past few days at ICHEP I've seen some great examples

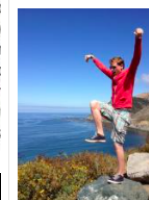
By [James Howarth](#), 8th August 2016



Bruno Lenzi delivers talk about ATLAS di-photon results. (Image: [Clara Nellist/ATLAS Experiment](#))

For those of you with an affinity for Twitter, you'll know that the ICHEP press crew have been utilising all of their data to present interesting results as they're presented at ICHEP. The tweet barrage so intense you'd think Orlando Bloom had been spotted surfing past the conference hall. I googled that reference in a crowded conference hall and the press team's occult powers and it's beyond even 1/100th of the cool stuff I've seen over the past few days. I mention my word count, so instead I'd like to mention how often I don't get much attention; how physics is, and, more importantly, how to do it well.

## About the author

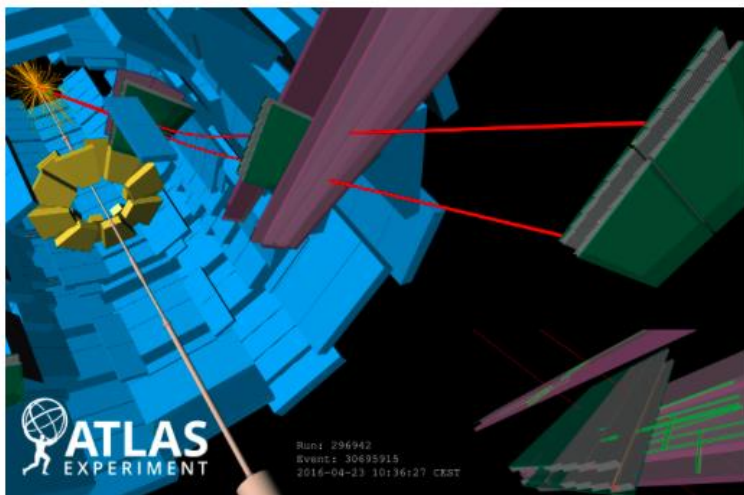


James Howarth is a postdoctoral research fellow at DESY, working on top quark cross-sections and properties for ATLAS. He joined the ATLAS experiment in 2009 as a PhD student with the University of Manchester, before moving to DESY, Hamburg in 2013. In his spare time he enjoys drinking, arguing, and generally being difficult.

# Updates: Statements

## ATLAS continues to explore the 13 TeV frontier

By Katarina Anthony, 9th May 2016



One of the early collision events with stable beams recorded by ATLAS in 2016. (Image: ATLAS Experiment/CERN)

Geneva, 9 May 2016. ATLAS is back and better than ever! With 13 TeV beams [circulating in the Large Hadron Collider](#), the ATLAS experiment is now recording data for physics. This milestone marks the start of the second year of “[Run 2](#)” as ATLAS continues its exploration of 13 TeV energy frontier.

Anticipation is high for 2016, with the year set to deliver exciting new results for physicists around the world. From precision studies of the Higgs boson to searches for new particles, this year's data will deepen our understanding of Nature. "We welcome the first 13 TeV collisions of the year with the careful preparation and great expectations of a good friend's anticipated encounter," says Alessandro Cerri, ATLAS Run Co-Coordinator. "Together, we are ready for new, exciting explorations!"

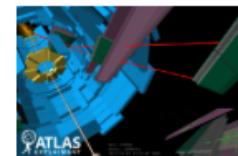
## Press Statement

### Press Statement

#### ATLAS continues to explore the 13 TeV frontier

ATLAS is back and better than ever! With 13 TeV beams circulating in the Large Hadron Collider, the ATLAS experiment is now recording data for physics. This milestone marks the start of the second year of “Run 2” as ATLAS continues its exploration of 13 TeV energy frontier.

[Read more →](#)

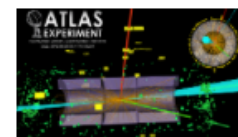


### Press Statement

#### Shedding New Light on the Higgs

Today, at the Large Hadron Collider Physics conference (LHCP2015#), the ATLAS# and CMS collaborations presented the most precise measurements yet of Higgs boson properties. By combining Run 1 data from both experiments, the new measurements paint a clear picture of how the Higgs boson is produced, decays, and interacts with other particles.

[Read more →](#)

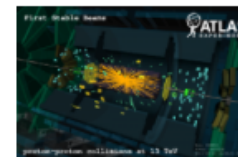


### Press Statement

#### ATLAS Begins Recording Physics Data at 13 TeV

Today ATLAS and other particle physics experiments at CERN's Large Hadron Collider (LHC) began recording physics data from 13 TeV proton collisions, which allow for precision studies of the Higgs boson and other Standard Model particles, as well as the search for new particles with higher masses. The new data will bring a deeper understanding of nature.

[Read more →](#)



# Website statistics

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Month	Unique visitors	Number of visits	Pages	Hits	Bandwidth
Jan 2017	28,641	41,454	129,866	657,779	50.01 GB
Feb 2017	32,134	43,330	132,923	992,558	71.59 GB
Mar 2017	30,489	42,530	155,613	910,736	76.30 GB
Apr 2017	24,910	35,262	79,276	511,561	41.30 GB
<b>May 2017</b>	<b>15,418</b>	<b>19,433</b>	<b>42,237</b>	<b>256,200</b>	<b>18.17 GB</b>



# Multimedia



Videos  
Photographs  
Images  
GIFS

# Social media



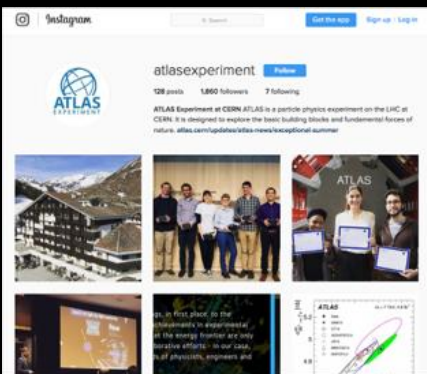
[www.twitter.com/ATLASexperiment](https://www.twitter.com/ATLASexperiment)

~ 23,000 Followers



[www.facebook.com/ATLASexperiment](https://www.facebook.com/ATLASexperiment)

~48,000 Followers



[www.instagram.com/ATLASexperiment](https://www.instagram.com/ATLASexperiment)

~ 2,000 Followers

# Social media aims

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- Show what science is being done and how
  - Make it accessible to a wide audience
  - Highlight the human side
- Share information / physics updates / discoveries
- Engage the public / foster interactions
- Direct people to the website

Always with our messages:

Physics, Detector, Collaboration



# Social media posts

**ATLAS Experiment at CERN**  
Published by Clara Nellist · 30 September 2016 ·

World map showing the 94 different nationalities that make up the ATLAS Collaboration. #SciencisGlobal



6,101 people reached

Like Comment Share

Belisario Lazanas Angelo, Paul Jeffries and 102 others

37 shares

Write a comment...

**ATLAS Experiment** @ATLASexperiment · Feb 4

Looking for an #actuallylivingscientist? We've got over 4000 of them! Here are just a few at our collaboration meeting at NYU last year.



Like Comment Share

**ATLAS Experiment at CERN** shared Weltmaschine's post.  
Published by Clara Nellist · 24 November 2016 ·

New pictures of the #LHCpopbook by Weltmaschine which is on sale at CERN and all good bookstores world-wide. Now exists in English, French and German! A MUST for the Christmas stocking!  
For more information, visit: <http://atlasexperiment.org/popupbook/>

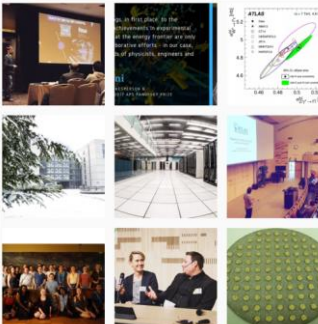


Weltmaschine added 4 new photos.  
24 November 2016 ·

Einblicke in die Welt der Teilchenphysik am CERN: anschauliche Darstellungen und Erklärungen zum LHC und einem ATLAS Experiment at CERN-Detektor für den Eigenbau...


See more

See Translation



**ATLAS Experiment at CERN**  
Published by Clara Nellist · 29 September 2016 ·

Flavia Dias from The University of Edinburgh presented her work on the ATLAS Fast Calorimeter Simulation at #ICHEP2016 in August. #TBT



"I presented the latest developments on the ATLAS Fast Calorimeter Simulation, software used to model the interactions of particles inside the detector, with techniques that are 500 times faster than the detailed simulation and keep the accuracy needed for physics analyses."  
- Flavia Dias  
University of Edinburgh

8,715 people reached


Like Comment Share

Belisario Lazanas Angelo, Christian Riegel and 100 others

3 shares

**ATLAS Experiment at CERN** with Luckey Kumar.  
Published by Clara Nellist · 8 February ·

ATLAS physicist, Mateusz Dydmal presenting the "light-by-light" measurement submitted by ATLAS to Nature Physics yesterday at the Quark Matter conference in Chicago.



5,997 people reached

Like Comment Share

Samuel de la Torre, Neha Yadav and 111 others

20 shares

Write a comment...

Suraj Chhappala Thanks for sharing, was this recorded? a link to the paper if there is one? THANK YOU

Like Reply Message · 9 February at 10:55

1 Reply

**ATLAS Experiment** @ATLASexperiment · Mar 14

The next two years will be quite demanding. We are facing many challenges in parallel... - Karl Jakobs  
[atlas.cern/updates/atlas-...](https://atlas.cern/updates/atlas-...)



"The next two years will be quite demanding. We are facing many challenges in parallel: operating the detector under increasing LHC luminosity, and efficiently collecting and analysing the data - all the while we continue ramping-up work on our extensive upgrade projects."

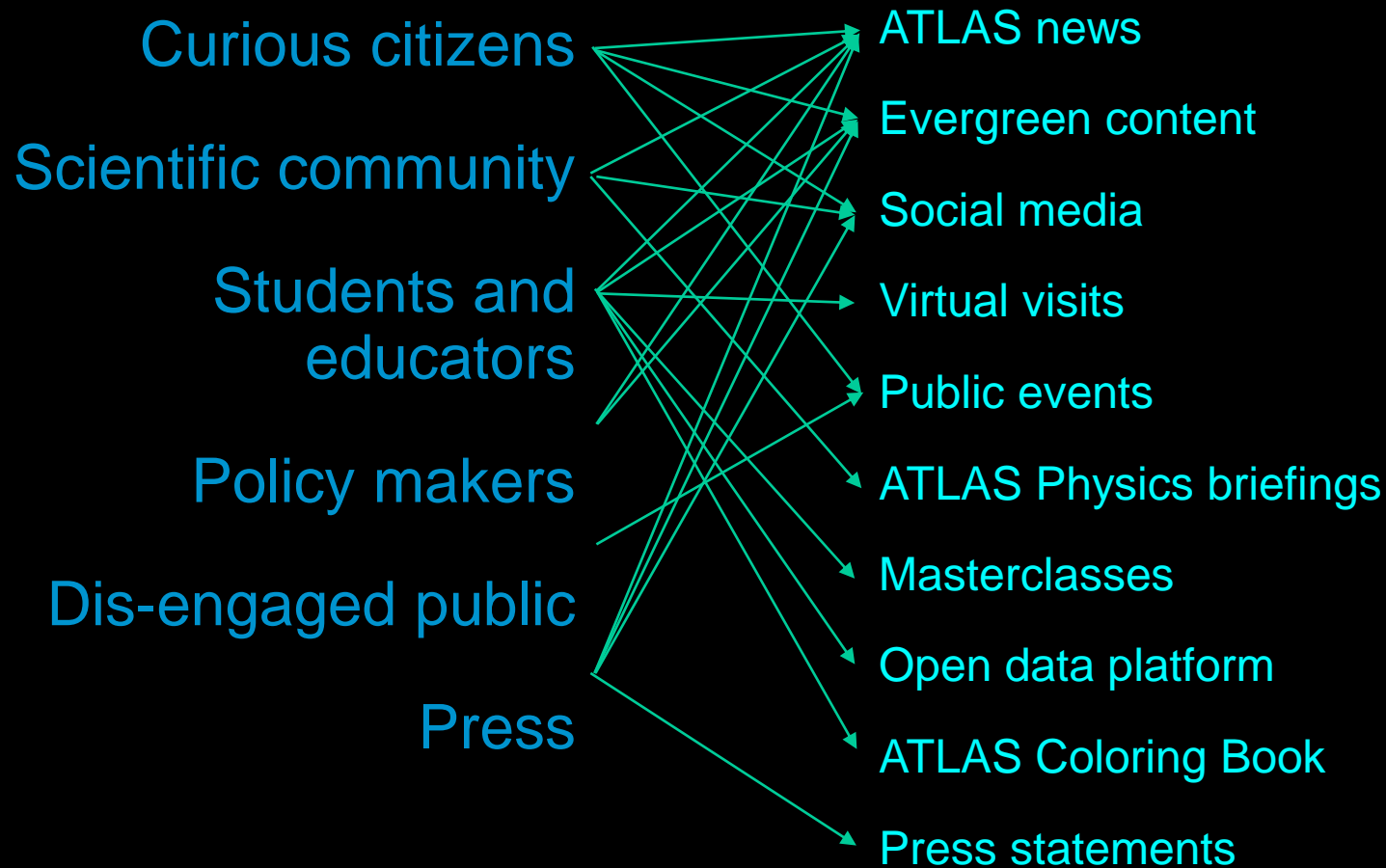
KARL JAKOBS  
NEW ATLAS SPOKESPERSON

Like Comment Share



# The Matrix

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# In closing ...

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Aim to use various platforms to communicate tailored messages to our audiences

Our mission:

to engage new audiences

to better engage with those we have