ATLAS Outreach Highlights

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on behalf of the ATLAS Outreach Group

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3-7 October 2016 Tbilisi Georgia
ATLAS outreach highlights

• ATLAS public website
• Social media
• Data sonification: Quantizer
• Citizen science projects: ATLAS@home, Higgs Hunters
• Virtual visits to ATLAS control room
• International Masterclasses
• ATLAS open data
• European researchers night at CERN
Goals of ATLAS Outreach

- Share scientific goals and achievements of ATLAS and particle physics
- Encourage support for ATLAS, the LHC and particle physics research
- Fulfil our social obligation, directly through dialogue
- Engage geographically, socially or economically remote audiences
- Attract and retain the next generation of scientists and science educators
- Provide educational resources for science communication
- Train and encourage for the members of our collaboration to communicate
The ATLAS Outreach Group

The ATLAS outreach team is very active, promoting particle physics to a broad range of audiences including physicists, policy makers, students and teachers, the general public and media.

The full ATLAS outreach group includes all 3000 members of the collaboration.

Public engagement & communication
- acting as guides for visits
- hosting local exhibitions, events or public talks
- giving interviews to local media or writing blogs

Education
- acting as guides for educational visits and virtual visits
- presenting talks, seminars and masterclasses

Sharing enthusiasm for science and physics

The core outreach group is primarily engaged in developing platforms, content and strategy to facilitate these activities.
New public website

- Launched 8 March 2016
- Engage public: news stories, evergreen content and opportunity to learn more about ATLAS
- Core message: ATLAS, Physics, Collaboration, Detector/Technology

http://atlas.cern/
New public website

Communicate and educate
New public website

Launched 8 March

http://atlas.cern/

Social Media

Engage new audiences
Connects people with ATLAS
Brings traffic to the website

Facebook likes: 20 k
Twitter followers: 39 k
Google+ followers: 123 k

http://atlas.cern/
Website:
~ 6300 visits
~ 4500 users

Soundcloud:
pre-recorded music tracks
~3200 plays

Listen to live events

Popularisation of science

Data sonification:
• Property of sound, such as the pitch, mapped to a physical property, such as speed
• Various different software packages available for turning numbers into sounds

Events:
• Quantizer website launched May 2016
• Berlin MusicTechFest May 2016
• Live concert Victoria, Canada July 2016
• NIME music conference August 2016
• ICHEP 2016
• Composer Simonne Jones sonification mix
• Computer-Human Interaction 2016
Citizen science project

Higgs Hunters

- A collaboration between Oxford, Birmingham and New York Universities
- The first particle physics venture on Zooniverse, a collection of web-based citizen science projects
- Invites online volunteers to participate in classifying off-centre vertices

More than 30,000 volunteers from 179 countries participated, classifying 980,000 features of interest on about 39,000 distinct images

Non-expert volunteers are capable of identifying the decays of long-lived particles with an efficiency and fake-rate comparable to that of the ATLAS algorithms

Survey of volunteers indicates an appetite for further LHC-related citizen science projects
Citizen science project

- A research project that uses volunteer computing to run simulations
- No knowledge of particle physics required
- Opportunity for people to show support for science research
- Download program which runs simulation software inside a virtual machine
- Each workunit downloads a small set of input data and runs for ~1 to 2 hours

Multi-core app
- Performance study of ATLAS job statistics based on the jobs from over 1 month period
- Using more cores in one vm saves memory usage
- Using big number of cores can significantly reduce the CPU performance.
- Applicable to all cloud computing platforms, not just on ATLAS@home
Virtual Visits

- Digital Communications Award 2012
- Virtual visits continue to be popular
- Excellent resource to connect with school and university students
- All languages supported, thanks to CERN based group members who can tune the content to enhance connection with home institutes or countries
- So far in 2016, 39 visits from more than 14 countries

https://indico.cern.ch/category/3599/
International Masterclasses

- IPPOG is a network of scientists, science educators and communication specialists working across the globe in science education and public outreach for particle physics
- High school students attend a hands-on ‘scientist for one day’ session in 1 of 200 centres.
- Long running and consistently popular. Not exclusively ATLAS
- Social media initiative physicsIMC set up at CERN November 2015

2016:
- 46 countries from all continents; Slovenia, Venezuela, Peru, and Argentina participating for the first time
- 228 Masterclasses video conferencing with CERN, of which 125 ATLAS
- 48 Masterclasses video conferencing with Fermilab, of which 15 ATLAS

http://ippog.web.cern.ch/
ATLAS opendata

- Data: 1 fb⁻¹ of 8 TeV ATLAS data released
- Analysis tools for educational use: 3 levels of accessibility
- Documentation for each level to guide the user
- Currently aimed at University students and post graduate researchers
- Forum for questions and feedback

opendata.atlas.cern
ATLAS opendata

- Data visualisation 4 processes: H→WW, WW, top pair, Z
- Make cuts with cursor on one variable and immediately see the effects on the other variables
- Expected number of events for 1 fb$^{-1}$ shown, along with significance of Higgs signal
ATLAS opendata

Data
- Data and MC: ROOT tree format
- 1 fb$^{-1}$ of data from period D
- egamma $\sim$ 33.6 M events + muons $\sim$ 33.8 M events
- Datasets available to be downloaded individually or bulk download
- Also available on the CERN open data portal

Tools
- Analysis software to run and modify
- Seven analyses prepared: H$\rightarrow$WW, WW, ZZ, top pair, Z, W, Z'
- Follow analysis steps to produce histograms
- Available in GitHub repository, as zip file or on the CERN open data portal

Set of Data samples

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<th>File type</th>
<th>Name</th>
<th>Description</th>
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<th>Size</th>
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Set of MonteCarlo (MC) samples

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ATLAS opendata

Virtual Machines to run on any operating system

- **Medium Version:**
  
  Compressed size \(~10.6\) GB  
  Uncompressed size of \(~22\) GB  
  Scientific Linux OS 6.7, ROOT v6-07-06, opendata software  
  Complete set of datasets of the ATLAS release (Data & MC)

- **Small Version:**
  
  Compressed size \(~4.6\)GB (~11GB)  
  Scientific Linux OS 6.7, ROOT v6-07-06, opendata software

- **NET Version:**
  
  Compressed size of \(~5.2\)GB (~17GB)  
  It’s size will reduce \(~40\)% into the coming weeks

- **Micro version:**
  
  Compressed size \(~1\)GB (~2GB). Not GUI, expert users  
  Will be available on USB stick

13 TeV data expected 2017!
ATLAS opendata

- Achieving international impact
- Release peak: will re-advertise when new data or tools available
- Bounce rate and page visit length average for a website

Bounce Rate is the percentage of visitors that abandon the site after the first interaction with the site. 40 to 55% is average.

The average page visit ~1 minute.
• The European Commission's initiative opens hundreds of science sites across Europe to the general public
• 7th year
• Screenings of scientific documentaries and short films
• Guided tours to ATLAS Visitors Centre
Summary

• Communication is both central and essential to the scientific process

• The ATLAS outreach team is very active, promoting particle physics

• Many outreach platforms
  Online: webpages, blogs, social media, webcast channels, virtual visits
  Local: visitor centre, underground visits, local events
  Remote: Institute events, masterclasses, travelling exhibits

• Broad target audience
  physicists, policy makers, students and teachers, the general public and media