US-CERN Virtual Visits: Building Transcontinental Connections in High Energy Physics

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Division of Particles & Fields
August 2, 2017
Outline

1. What are Virtual Visits?

2. United States involvement; using VVs as:
   - An educational tool
   - A contribution to pop culture
   - A political advocacy opportunity

3. Future efforts & expansion
What is a Virtual Visit?

• Live conversation via videoconference, held in participant’s preferred language, between physicists from ATLAS/CMS and remote locations around the world
• Provides access to the ATLAS Control Room and CMS Experimental Cavern
• Over 30,000 people from all seven continents have participated since program launch in 2010
In 2017 so far:
- ATLAS: 28 visits, 4 American
- CMS: 39 visits, 1 American

Great potential for additional US involvement!
Why Virtual Visits?

• **Easy to use**: requires only a device with an internet connection

• **Encourage engagement**: majority of visit is Q&A, exposure to specific role models (female/minority hosts)

• **Versatility**: option to broadcast or publish publicly, advertise on social media, or keep entirely private
Educational Virtual Visits

• Partnership with QuarkNet: masterclasses
• Provides training opportunity for hosts on both ends of the teleconference
• CMS survey: 98% of participants expect that VVs “will increase the interests of the participants in STEM”

01. ATLAS
Holy Comforter Episcopal School, Tallahassee, Florida
21 February 2017

02. ATLAS + LIGO
North Carolina School of Science and Mathematics, Durham NC
23 March 2017

03. ATLAS
Greenhill School, Addison, Texas
9 May 2017
Broadening Diversity

• ‘Projecting Particles’ initiative: deepening physics education through media arts for secondary school students in underserved communities
  • Virtual Visit by Steve Goldfarb, 2013
  • Lakota Cosmology festival, 2017
  • Working with Native American & Cuban students

• 120,000 in person visits per year —> extend opportunity to various nationalities, languages, and socioeconomic backgrounds
Visits to Alternative Audiences: Pop Culture & Festivals

• Science is cool!

• 2017 Festival Visits:
  1. Physics Festival at Texas A&M University (CMS)
     • April 1 in College Station, Texas
  2. Moogfest Music, Art, and Technology Festival (ATLAS)
     • May 18-21 in Durham, North Carolina
     • Hosted by Mark Kruse, Kate Shaw, Steven Goldfarb
Government and VIP Visits

• **Goal:** achieve benefits of in person government visits, while lowering barrier to entry of participation

• Collaboration with **US LHC User’s Association:**
  • Serving as ex-officio member of Executive Committee & liaison to APS Council
  • Advertisement distributed on Congressional visit in March 2017

CMS/ATLAS/LIGO Visit to Fort Hays State University

- High school teacher workshop on incorporating modern physics into the classroom
- Congressional contact: interest from Sen. Jerry Moran (R-KS) and Rep. Roger Marshall (R-KS)
Conclusions & Future Efforts

American Schools
Expand access for American students in schools across the country

Congress
Engage Congress, either via direct office VVs or from participation in constituency visits

Pop Culture
Continued participation in festivals & other general public appearances, while searching for new opportunities

Diversity
Target underrepresented groups (gender, race, socioeconomic status, educational background)
Get involved!

Contact atlas-outreach@cern.ch or cms-outreach@cern.ch to become a guide or request a visit
Resources

“ATLAS and CMS Virtual Visits: Bringing Cutting Edge Science into the Classroom and Beyond”. https://cds.cern.ch/record/2132292

Future and Past Events:
— ATLAS http://cern.ch/atlas-virtual-visit
Meet the Team

ATLAS Virtual Visit team:
- Claire Adam Bourdarios
- Steve Goldfarb

CMS Virtual Visit team:
- Marzena Lapka
- Angelos Alexopoulos

American operators:
- Chris Martin
- Julia Gonski

+ many others!