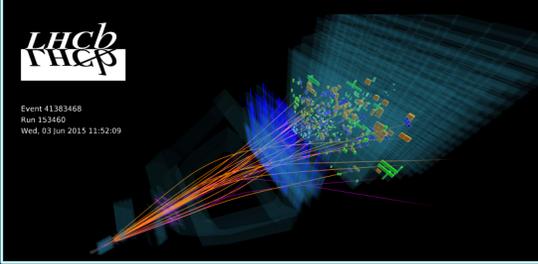
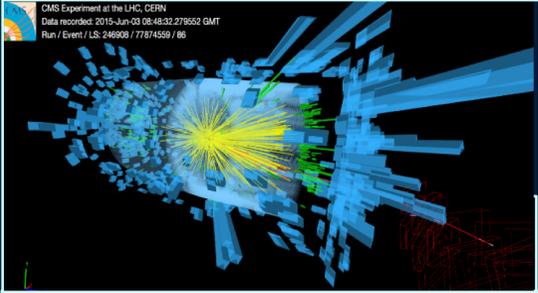
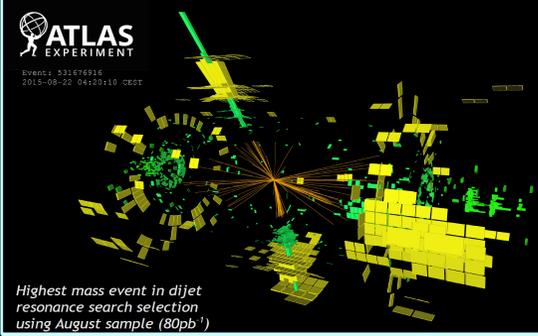
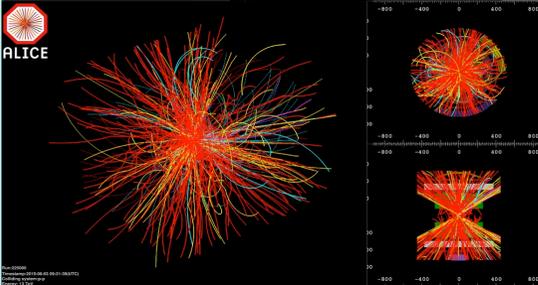




US LHC Users Association



US LUEC Chair Report

Harvey Newman/ Sheldon Stone

Fermilab

Oct 1 - 25 2015

Annual US LUA Meeting at Fermilab Wednesday October 24, 2018 Agenda



- ☐ **16:00 – 17:30 Executive Committee Meeting:
Sunrise Room, Wilson Hall**

- ☐ **17:30 – 19:00 Welcome Reception: Wilson Hall**

- ☐ **NOTE: The main sessions will be in the IARC building**
(<http://saturdaymorningphysics.fnal.gov/location-of-iarc/>).



Annual US LUA Meeting

Thursday October 25, 2018 Agenda



- 09:00 - 09:10 **Welcome to Fermilab 10'**
Speaker: Nigel Lockyer (Fermilab)
- 09:10 - 09:30 **Codes of conduct and Fermilab access 20'**
- 09:30 - 09:55 **US-LUA Chair's report 25'**
Including committee reports
Speakers: Harvey Newman (Caltech), Prof. Sheldon Stone (Syracuse University)
- 10:00 - 10:25 **Status and outlook for the LHC 25'**
Speaker: Rende Steerenberg (CERN)
- 10:30 - 11:00 **Coffee Break**
- 11:00 - 11:25 **LHCb Status and Outlook 25'**
Speakers: Dr. marina artuso (syracuse university), Prof. marina artuso (syracuse university)
- 11:30 - 11:55 **CMS Status and Outlook 25'**
Speakers: Meenakshi Narain (Brown University), Meenakshi Narain
- 12:00 - 12:25 **US LHC accelerator program 25'**
Speaker: Giorgio Ambrosio (FNAL TD/MSD)
- 12:30 - 12:40 **Group Photo**
- 12:40 - 13:30 **Lunch**
- 13:30 - 13:55 **Energy Frontier Colliders and the Snowmass Process 25'**
Speakers: Prof. Young-Kee Kim Kim (The University of Chicago), Young-Kee Kim (FNAL)
- 14:00 - 14:25 **ALICE Status and Outlook 25'**
Speaker: Prof. Claude Pruneau (Wayne State University)
- 14:30 - 15:30 **Cross-experiment discussion: breakout sessions**
Conveners: Corrinne Mills, Harvey Newman (Caltech)
Location: Wilson Hall
- 15:30 - 16:00 **Afternoon Break**
- 16:00 - 17:10 **Young Physicists' Lightning Round Session 1 ****
- 17:30 - 18:45 **Careers panel ****
- 19:30 - 21:30 **Banquet at Two Brothers Roundhouse**

Friday, October 26, 2018

- 09:00 - 09:25 HEP visit to DC (Gov't Relations report) 25'
Speakers: Yangyang Cheng (Cornell University), Dr. Yangyang Cheng (Cornell University)
- 09:30 - 10:30 Young Physicists' Lightning Round Session 4: Connection to CERN: <https://indico.cern.ch/event/765503/>
- 10:30 - 11:00 **Coffee Break**
- 11:00 - 11:25 Supporting young physicists (Quality of Life committee; ACCU) 25'
- 11:30 - 11:50 DOE office of HEP perspective 20'
Speaker: Dr. Thomas LeCompte (Argonne National Laboratory)
- 11:50 - 12:10 DOE office of NP perspective 20'
Speakers:
- 12:10 - 12:30 NSF Office of EPP perspective 20'
Speakers: Prof. Randal Ruchti Ruchti (National Science Foundation), Prof. Randy Ruchti (University of Notre Dame and National Science Foundation)
- 12:30 - 13:30 **Lunch**
- 13:30 - 14:30 Young Physicists' Lightning Round Session 3
- 14:30 - 15:30 Cross-experiment discussion: breakout sessions
Conveners: Corrinne Mills, Harvey Newman (Caltech)
Location: Wilson Hall
- 15:30 - 16:00 **Afternoon Break** (Wilson Hall)
- 16:00 - 16:25 ATLAS Status and Outlook 25'
Speaker: Sarah Demers (Yale)
- 16:30 - 17:30 Young Physicists' Lightning Round Session 4

Annual US LUA Meeting 2017

Careers Session Thursday Afternoon



Dongwook Jang was involved in Higgs research at CDF until 2006 and SUSY research at CMS until 2012 at LPC. He is currently working at HERE Technologies as a principal data scientist and handling map related data.



Jamie Antonelli: Jamie worked on the CMS experiment for a decade, as a PhD student at Notre Dame and then as a Postdoc at Ohio State. He was stationed at FNAL from 2015-2017, so he may look familiar. In early 2018 he started his current role as a data scientist at Vizient, a health care improvement company in downtown Chicago.



Jennifer Hobbs completed her undergraduate and graduate studies at Northwestern University (BA: Integrated Science, Math, Physics, MS: Physics, PhD: Physics), working on the MINERvA project at Fermilab for 4 years. During her PhD she shifted her research focus to computational neuroscience and machine learning and now works as a Senior Data Scientist at STATS, using machine learning to generate, understand, and analyze spatiotemporal player tracking data in sport.



Tom Gadfort: Thomas is currently a senior data scientist with Arity, a company that uses telematics data to make transportation safer. Prior to life as a data scientist in Chicago, Thomas worked on D0, ATLAS, and the muon g-2 experiment at Fermilab."



Thank You Fermilab, FRA and the LPC For Hosting Our 2018 Meeting



Our Hosts also in 2008,
2010, 2012, 2015 and 2017



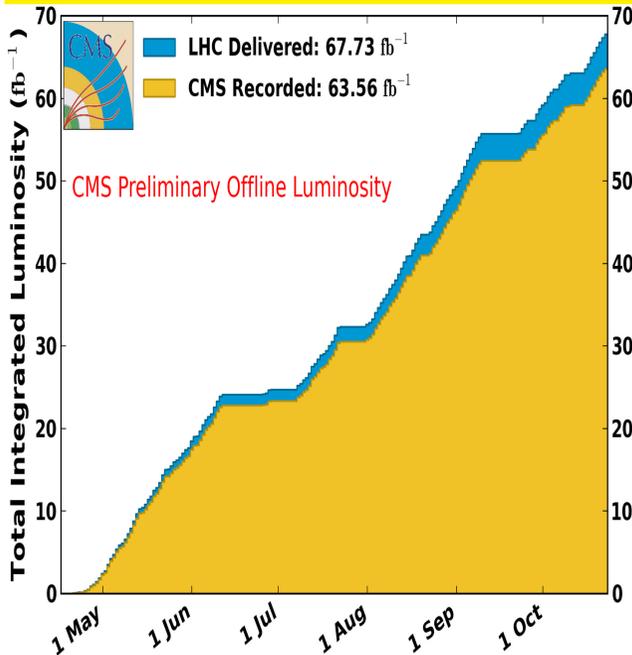
We Greatly Appreciate your strong support:
for US LUA (and US LUO before it) from the Start

- **To Fermilab and the Tevatron over 50 Years:** for Showing the Way to hadron collider physics at the TeV Scale
- **To Dan Green on his 75th:** for leadership in US CMS and CMS, building the path to discoveries
- **To Patty McBride:** for leadership in IUPAP C11, US CMS and now CMS as the new Deputy Spokesperson
- **To Joel Butler:** for his many leading roles including great success as CMS Spokesperson in 2017-18
- **To the LPC and its Leaders:** for defining a new collaborative mode and focal point for LHC physics

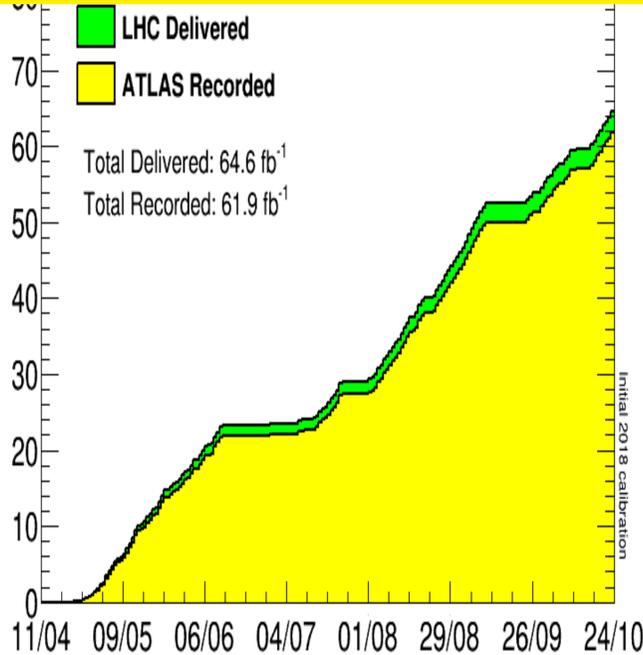


Thanks to the LHC Team: Remarkable Performance & Availability in Run2

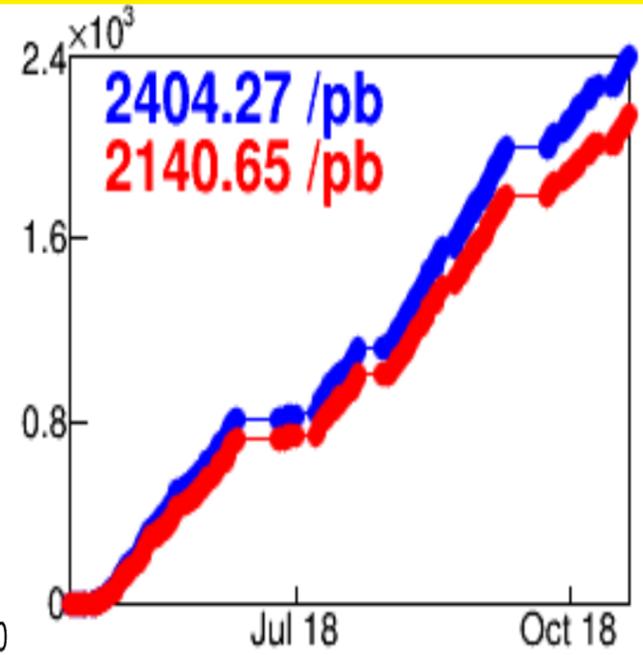
CMS



ATLAS



LHCb



150+/Inverse Femtobarns During Run2 each in ATLAS, CMS
with $\beta^* = 30-25$, 2556 Bunches, New Optics

6.6 Inverse Femtobarns During Run2 in LHCb

Talk today by Rende Steerenberg

LHC Run 2 and Beyond



Embarked on a
River of Discovery

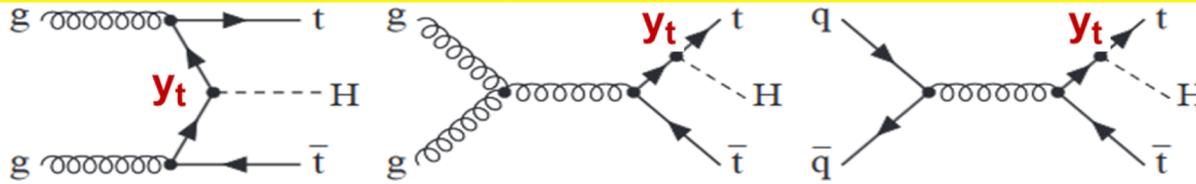




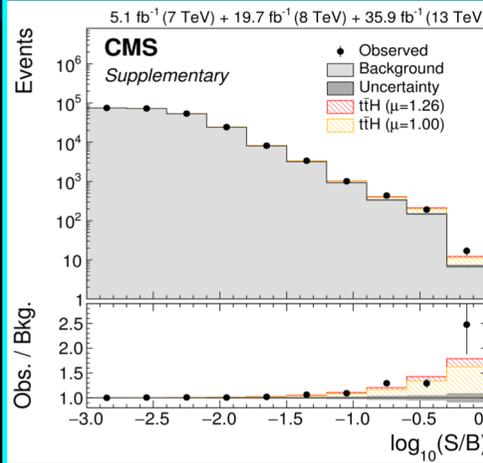
Observation of $t\bar{t}H$ Production !

Direct Top Yukawa Measurement

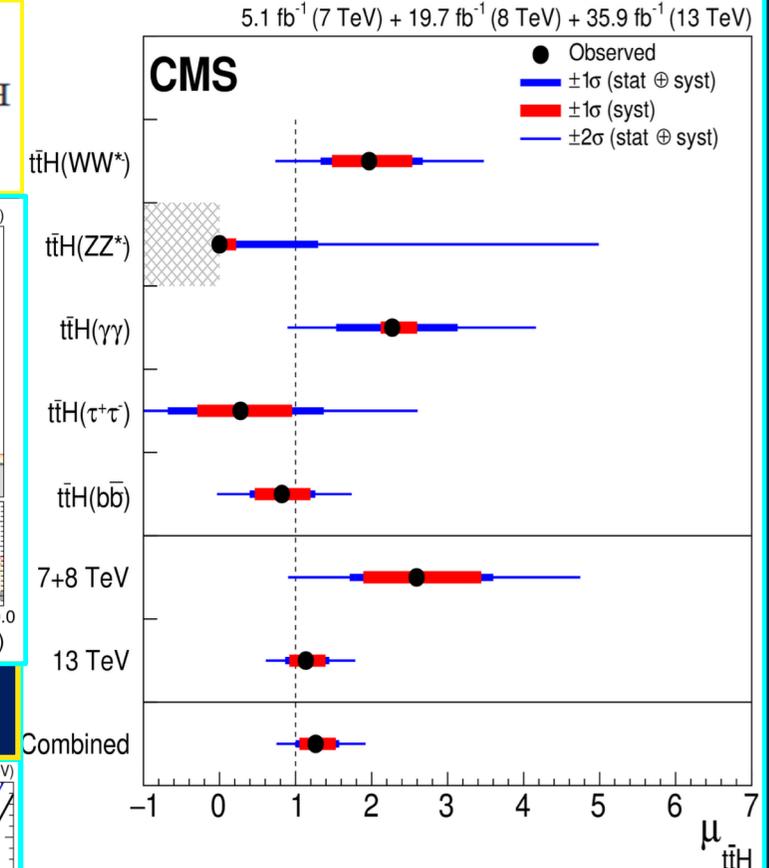
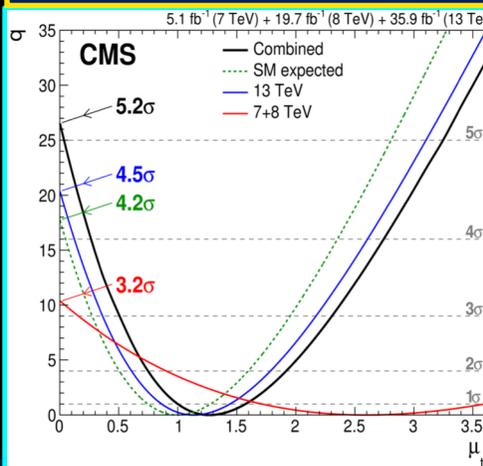
[Phys. Rev. Lett. 120, 231801\(2018\)](#)



- SM Top Yukawa (~ 1) already probed through gluon fusion production and $H \rightarrow \gamma\gamma$ decay
- But direct observation yields more information: e.g. disentangle possible BSM loop contributions
- $t\bar{t}H$ cross section at 13 TeV: **0.51 pb** (4X Larger than 8 TeV)
- Small x-section but good S/B; Combine many channels: $H \rightarrow$ hadrons ($bb, \tau\tau, WW$), Leptons ($WW, ZZ, \tau\tau$), Photons ($\gamma\gamma$)
- Main background: t - \bar{t} (measured), $t\bar{t}W$, $t\bar{t}Z$ (from theory (MC))



$\mu_{t\bar{t}H}$ Signal Strength



Best Fit $\mu(t\bar{t}H) = \sigma/\sigma_{SM}$
 $1.26 +0.31 -0.26$
Significance 5.2σ
(4.2σ expected)

Talk by Davide di Croce today;
and Carmen Diez Pardos at ICHEP

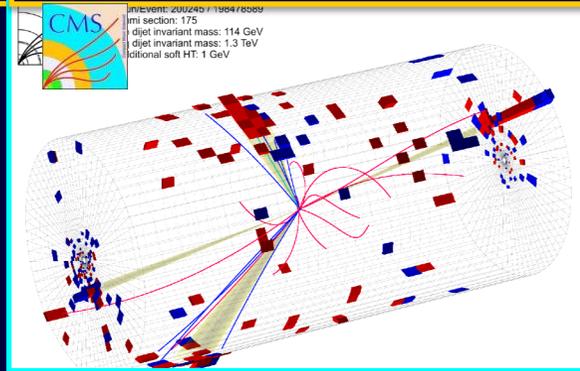


Higgs \rightarrow $b\bar{b}$ Observation !

Coupling to 2nd Gen Fermions, Down Type Quarks 77/fb, Including 41/fb of 2017 Data

- Largest BR (58%) but very large Background
- ➔ Use WH, ZH: Greater S/B; Direct probe of Yukawa Coupling
- 5 VH Channels $Z(\ell\ell)+H(bb)$, $Z(\nu\nu)+H(bb)$, $W(\ell\nu)+H(bb)$
- Signatures: two b-jets; Leptons and/or E_T^{Miss}
- Three Channels: 0,1,2 Leptons from V decay
- Validated with VZ, where $Z \rightarrow b\bar{b}$ (5-15X VH cross section)
- Improvements: DNN for b-jet ID, regression improves mass resolution, MVA techniques for better S/B separation

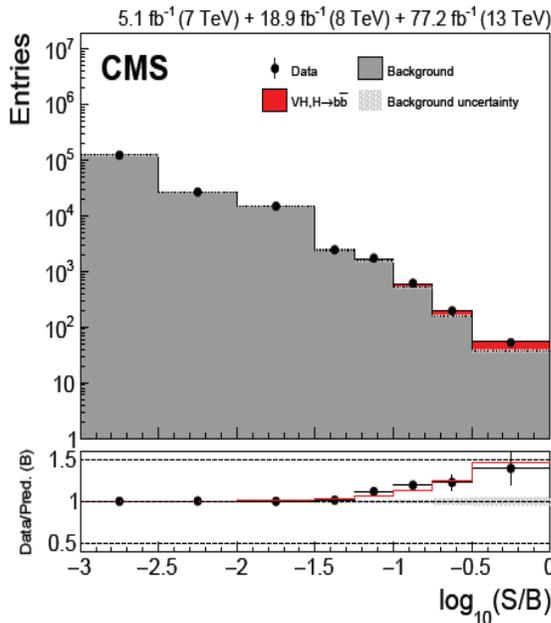
H \rightarrow $b\bar{b}$ Candidate



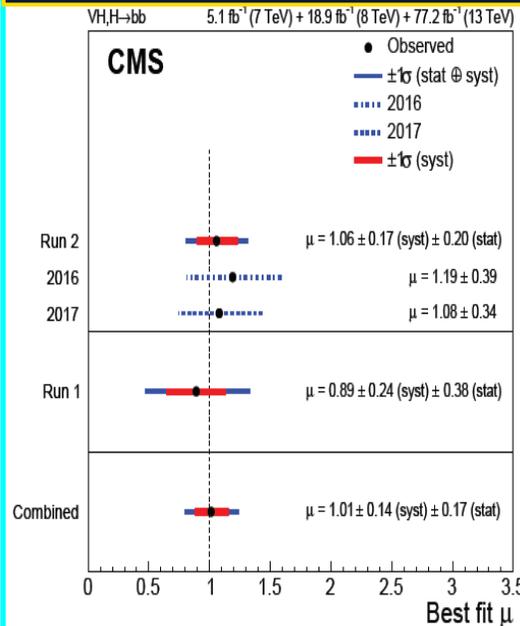
Backgrounds: V+Jets, VV, Top, QCD



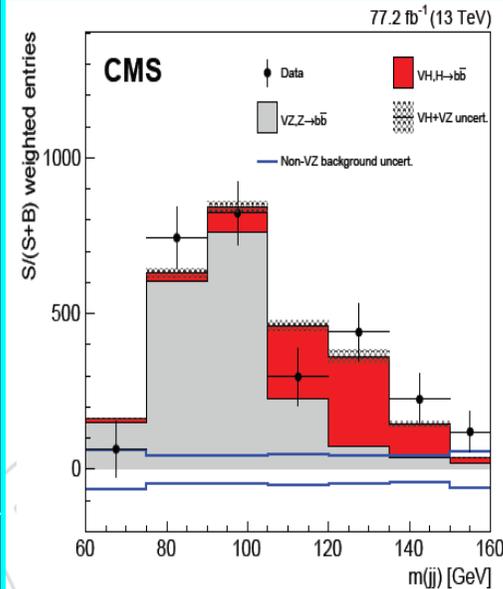
Events vs Log (S/B)



$$\mu = 1.01 \pm 0.17 \pm 0.14$$



$l\bar{l}$ weighted by Higgs S/(S+B)



Significance All Data

5.6 σ

Observed

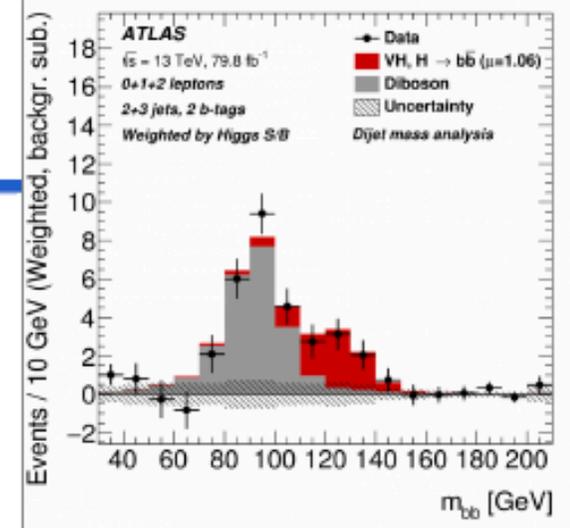
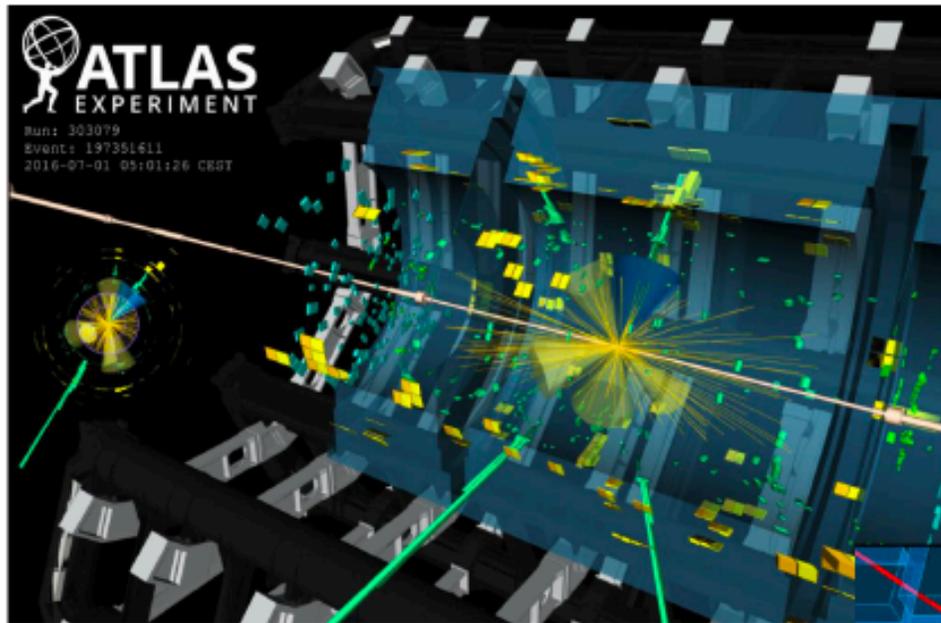
5.5 σ

Expected

$$\mu =$$

$$1.04 \pm 0.20$$

Some physics Highlights from ATLAS

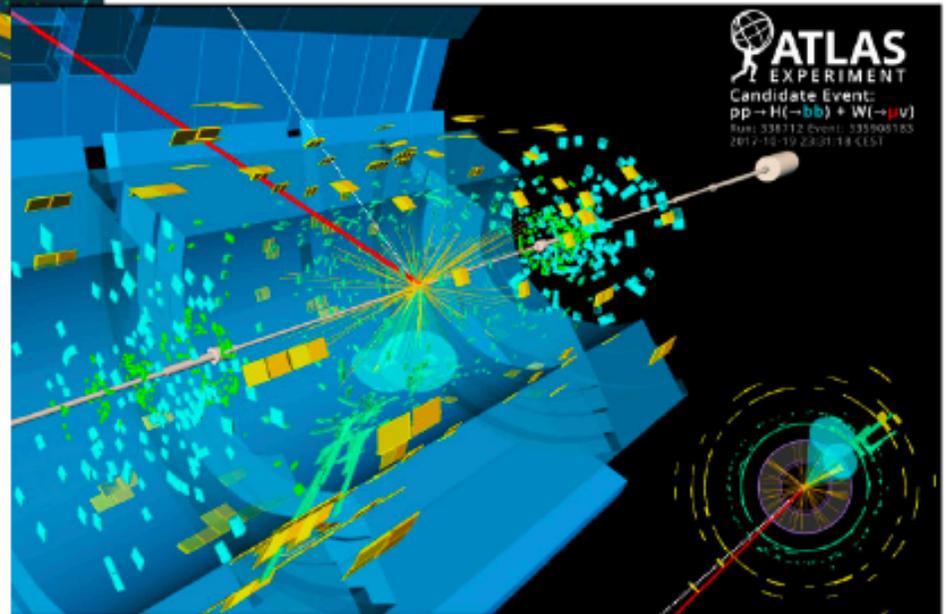
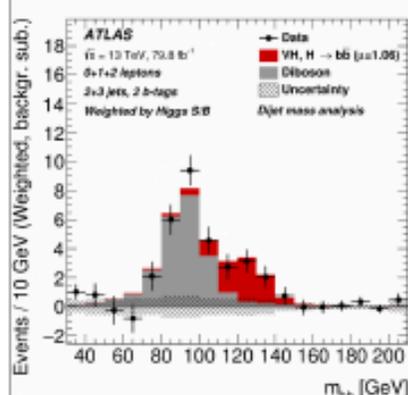


Observation of $H \rightarrow bb$ decays and VH production
 ICHEP Seoul, 9th July

Phys. Lett. B786 (2018) 59

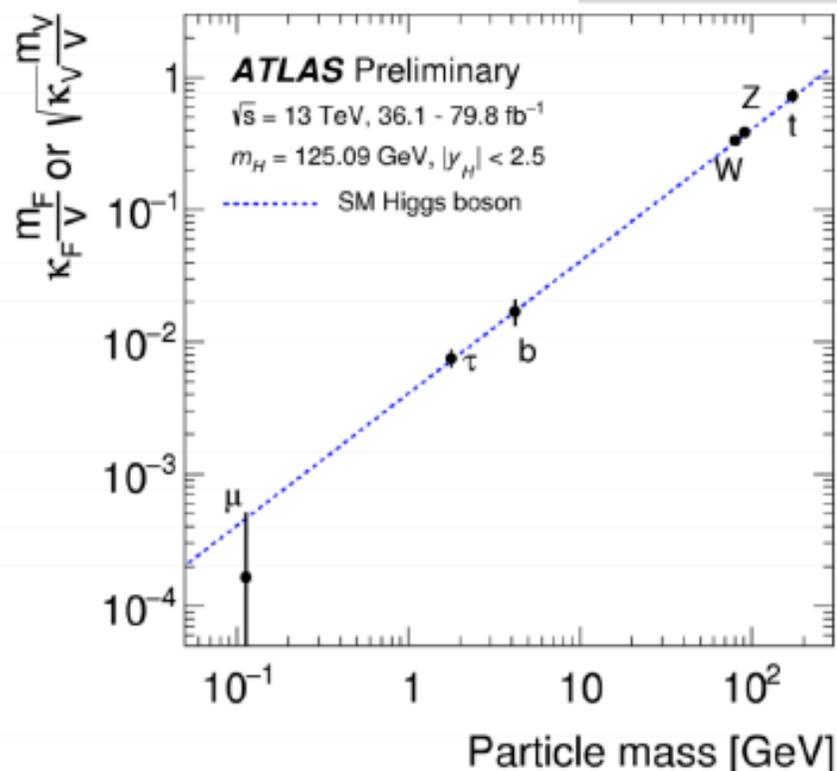
Observation of $t\bar{t}H$ production
 LHC Conference, Bologna, 4th June

Phys. Lett. B784 (2018) 173



Combination of Higgs boson results

ATLAS-CONF-2018-031



Interaction with gauge bosons

H → ZZ* [ATLAS-CONF-2018-018](#)

Well established in Run 1

H → WW* [ATLAS-CONF-2018-004](#)

6.3σ (5.2 σ) obs (exp) Run 2 only

Yukawa coupling to fermions

Top-quark tH

6.3σ (5.1σ) obs (exp)

[arXiv:1806.00425](#) **80 fb⁻¹**

b-quark H → bb

5.4σ (5.5σ) obs (exp)

[ATLAS-CONF-2018-036](#)

80 fb⁻¹

τ-lepton H → ττ

6.4σ (5.4σ) obs (exp)

[ATLAS-CONF-2018-021](#)

Muon H → μμ

σ_{limit}/σ_{SM} < 2.1 (obs)

[ATLAS-CONF-2018-026](#)

80 fb⁻¹

c-quark H → cc

σ_{limit}/σ_{SM} < 104 (obs)

[PRL 120 \(2018\) 211802](#)

- Fermionic couplings established for τ leptons, b- and t-quarks
- Next steps: increase precision, address rarer decays (H → μμ, H → cc (?))

$B^- \rightarrow K^- e^+ e^-$

Phys. Rev. Lett. 113 (2014) 151601

- $$R_K \equiv \frac{\mathcal{B}(B^- \rightarrow K^- \mu^+ \mu^-)}{\mathcal{B}(B^- \rightarrow K^- e^+ e^-)}$$

- LHCb** $R_K = 0.745^{+0.090}_{-0.074} \pm 0.036$

for $1 < q^2 < 6 \text{ GeV}^2$, 2.6σ

from SM. Actually measure

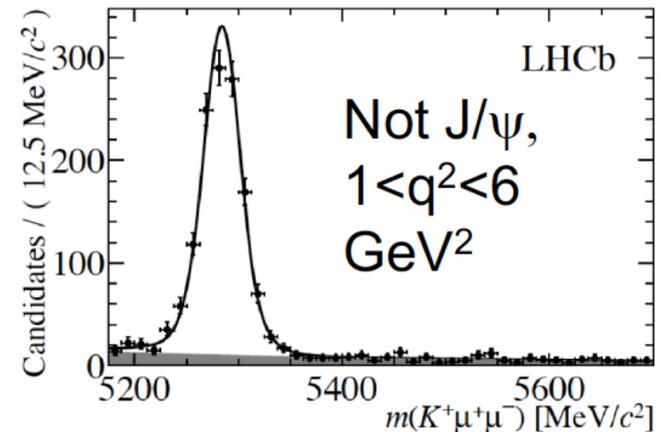
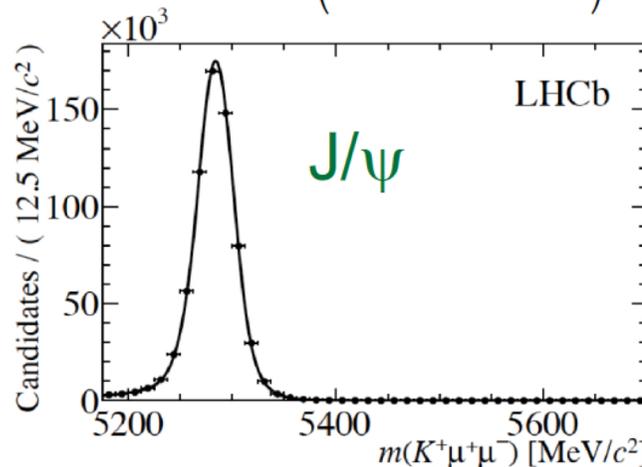
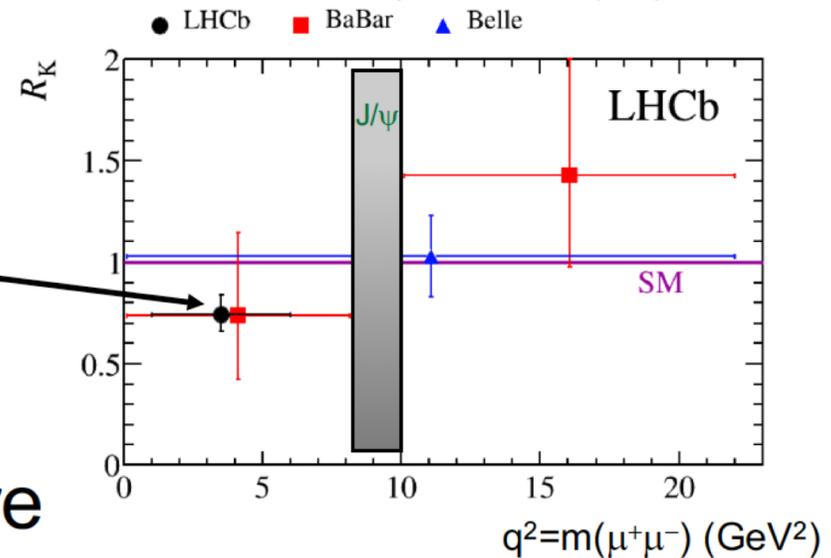
the double ratio:
$$R_K \equiv \frac{\mathcal{B}(B^- \rightarrow K^- \mu^+ \mu^-) / \mathcal{B}(B^- \rightarrow K^- J/\psi, J/\psi \rightarrow \mu^+ \mu^-)}{\mathcal{B}(B^- \rightarrow K^- e^+ e^-) / \mathcal{B}(B^- \rightarrow K^- J/\psi, J/\psi \rightarrow e^+ e^-)}$$

- Measured

\mathcal{B} for $K e e$

agrees with

SM prediction



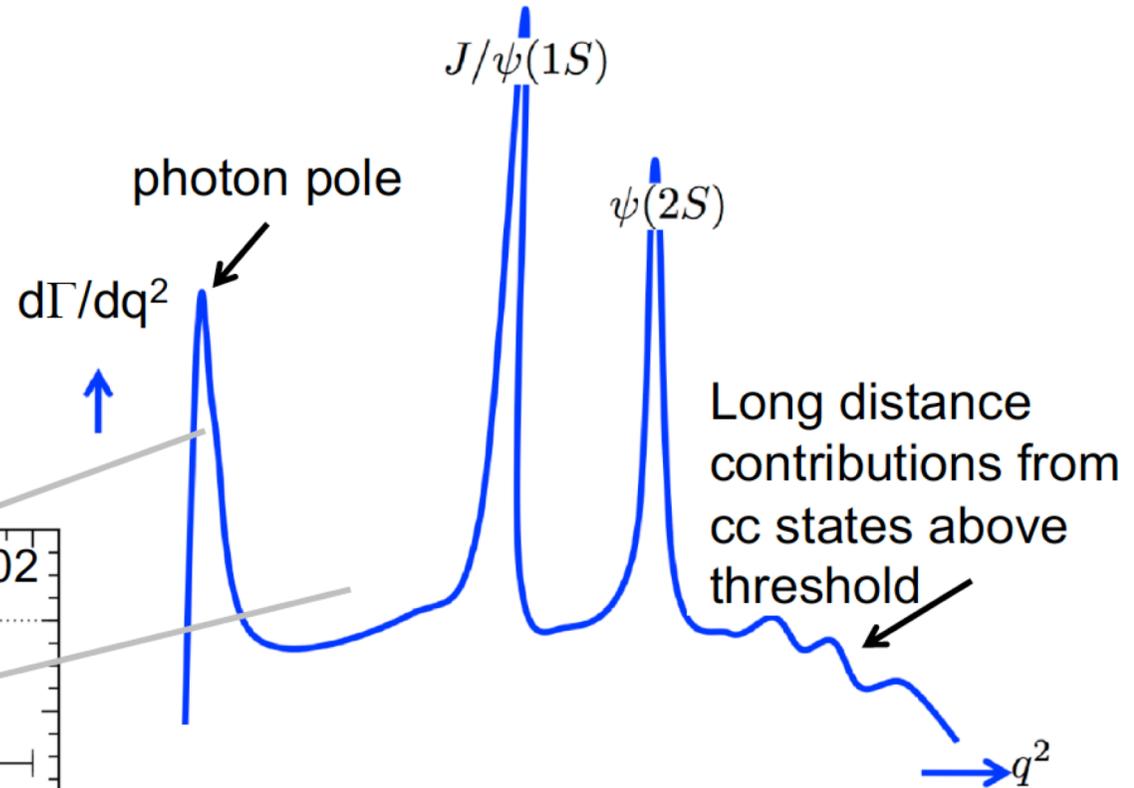
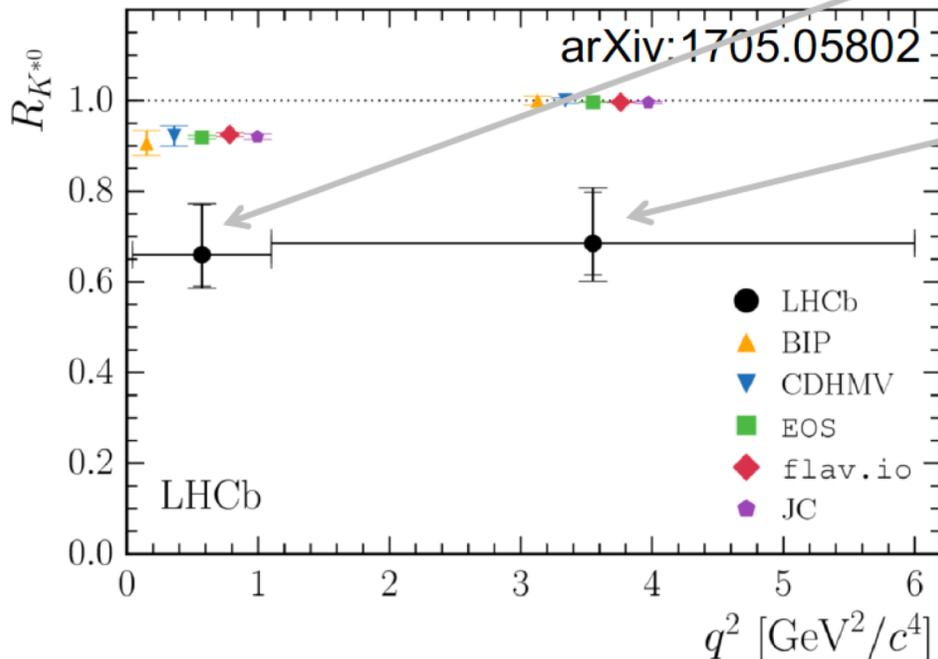
$B^0 \rightarrow K^{*0} e^+ e^-$

SM expectations

$$R_{K^*} \equiv \frac{\mathcal{B}(B^0 \rightarrow K^{*0} \mu^+ \mu^-)}{\mathcal{B}(B^0 \rightarrow K^{*0} e^+ e^-)}$$

Also measured as a double ratio

LHCb data



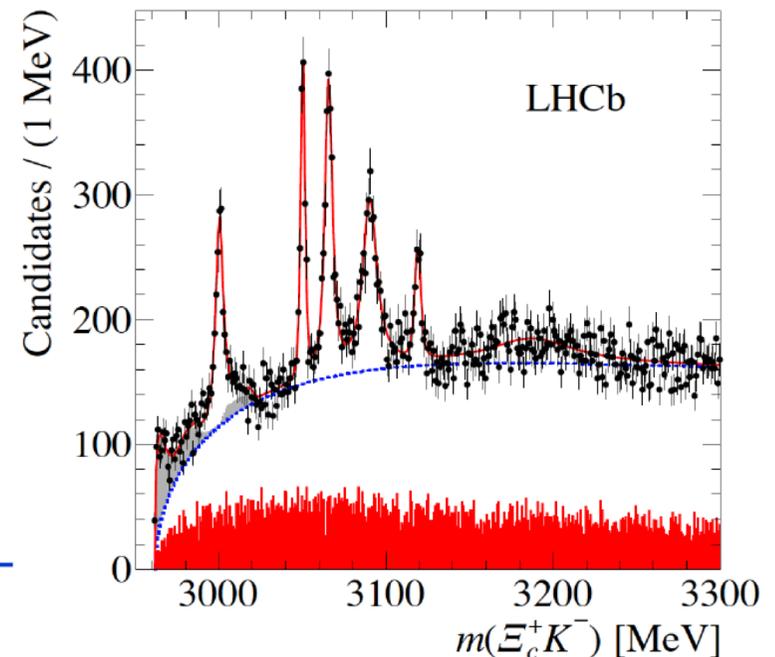
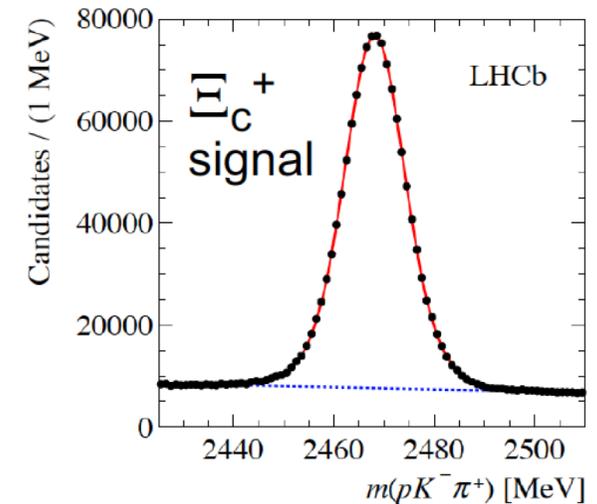
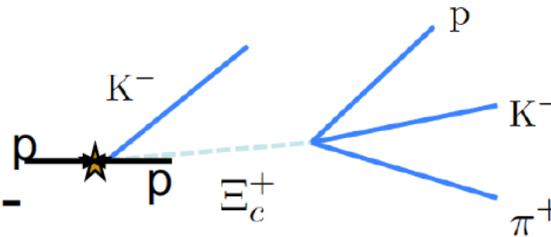
■ $R_{K^*} = 0.660^{+0.110}_{-0.070} \pm 0.024, 0.045 < q^2 < 1.1$

■ $R_{K^*} = 0.685^{+0.113}_{-0.069} \pm 0.047, 1.1 < q^2 < 6.0$

■ Each $\sim 2.4\sigma$ from SM

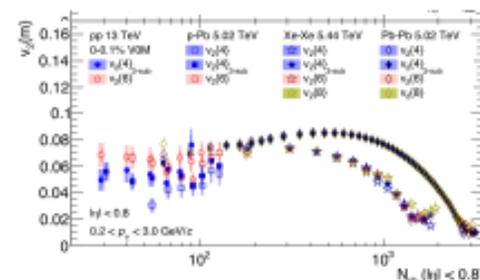
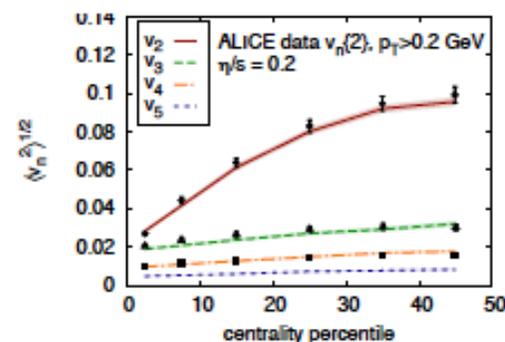
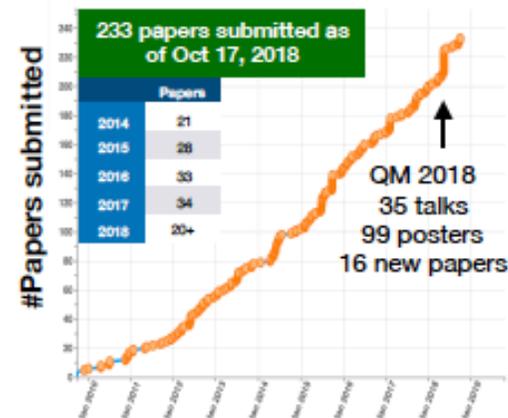
Discovery of 5 Ω_c states

- $\Omega_c \rightarrow \Xi_c^+ K^-$, first find
- $\Xi_c^+ \rightarrow p K^- \pi^+$,
- Then add a K^-
- Find 5 new states whose quark content is css
- Narrow widths, order a few MeV may be explained by the internal structure being a cs diquark



Summary

- A wealth of results...
 - 4 collisions systems; several beam energies
 - 233 papers as of Oct 17, 2018
 - ~ 30 papers/annum
 - 100s of conference contributions/annum
- Homing in on some properties of the QGP
 - Initial state conditions
 - EoS: Shear viscosity
 - Hadro-chemistry
 - Transport coefficients
- Increasing evidence of collective behavior in large multiplicity p+p and p+Pb collisions but origin of behavior (initial/final state) still debated.
- Much more to come w/ Run 2 and w/ Run 3 upgrades...





US LHC Users Association (US LUA)

<http://www.uslua.org>

- ❑ **Represents the entire community: Universities and Labs**
 - ➔ **Covers the LHC experiments and LARP (Accelerator R&D)**
 - ➔ **Forum for information and concerns; special “international” needs**
- ❑ **Established as a non-profit tax exempt association, headquartered in DC, collocated & hosted by URA since May 2013**
- ❑ **In our 13th year; 6th as US LUA: Successor to the US LHC Users Organization, approved by the LHC experiments & LARP in April 2007**
- ❑ **Mission Statement:**

“The purpose of USLUA is to provide a **forum for discussions** of the US participation in the LHC research program, with a **focus on how best to enhance scientific participation in the discoveries** expected from this research. In particular, USLUA aims to **help the US LHC community work effectively with their colleagues at CERN while in the US**, and to adapt to work at CERN and to living in the environs of the CERN laboratory. USLUA also **provides communication channels between scientists working on the LHC experiments, the US agencies supporting this research and the US Congress.**”
- ❑ **Working in close cooperation: UEC, SLUO, US LHC Ops Program, ACCU**



US LHA Executive Committee: Now 14 Members

2018 Membership (2 Year Terms)

Name	Institution	Collaboration	Term Expires
<input type="checkbox"/> Darin Acosta	Florida	CMS	2018
<input type="checkbox"/> Jahred Adelman (Elections)	NIU	ATLAS	2018
<input type="checkbox"/> Usha Mallik (ACCU Rep.)	Iowa	ATLAS	2018
<input type="checkbox"/> Jane Nachtmann	Iowa	CMS	2018
<input type="checkbox"/> Toyoko Orimoto	Northeastern	CMS	2018
<input type="checkbox"/> Sheldon Stone (Vice Chair)	Syracuse	LHCb	2018
<input type="checkbox"/> David W. Miller (Observer)	U. Chicago	ATLAS	
<input type="checkbox"/> Viviana Cavalieri	BNL	ATLAS	2019
<input type="checkbox"/> Yangyang Cheng	Cornell	CMS	2019
<input type="checkbox"/> Verena Martinez Outschoorn	U. Mass	ATLAS	2019
<input type="checkbox"/> Corrinne Mills	UIC	CMS	2019
<input type="checkbox"/> Harvey Newman (Chair)	Caltech	CMS	2019
<input type="checkbox"/> Gianluca Sabbi (Secretary)	LBL	LARP	2019
<input type="checkbox"/> Anthony Timmins	U. Houston	ALICE	2019
<input type="checkbox"/> Gordon Watts (Treasurer)	Washington	ATLAS	2019
<input type="checkbox"/> <u>Totals:</u> CMS 6, ATLAS 6, LHCb 1, ALICE 1, LARP 1; 1 Observer			
<input type="checkbox"/> Ex-Officio: US ATLAS and CMS PMs, Deputies, CB Chairs, IB Chairs;			

Nominations for the 2019-20 US LUEC Term Will Open Next Week



US LUEC Sub-Committees

- **Quality of Life:** Usha Mallik (Chair and ACCU Representative); Darin Acosta, Verena Martinez Outschoorn, Viviana Cavaliere, Harvey Newman, Corrinne Mills, Toyoko Orimoto, Anthony Timmins
- **Gov't Relations:** Yangyang Cheng (Chair), Jahred Adelman, Harvey Newman, Usha Mallik, Verena Martinez Outschoorn, Corrinne Mills, Gianluca Sabbi, Anthony Timmins
- **Outreach:** Verena Martinez Outschoorn (Chair), Jahred Adelman, Harvey Newman, Toyoko Orimoto, Gianluca Sabbi, Julia Gonski, Jane Nachtmann
- **Web Presence:** Viviana Cavaliere (Chair), Gordon Watts, Darin Acosta, Jane Nachtmann, Toyoko Orimoto
- **Finance, Fund Raising:** Gordon Watts (Chair), Harvey Newman
- **Communications:** Darin Acosta (Chair), Yangyang Cheng, Toyoko Orimoto, Gordon Watts, Julia Gonski
- **Annual Meeting TF:** H. Newman (Chair); Corrinne Mills, Verena Martinez, Anthony Timmins
- **Rules & Elections Taskforce:** Jahred Adelman (Chair); Gianluca Sabbi, Usha Mallik, Harvey Newman, Sheldon Stone



US LHC Users Association (US LUA)

Activities (1)

□ Annual Fall Meetings

□ Focus: Young Physicists' Work ! Lightning Round - a tradition -

thanks to Verena Martinez, Jessica Metcalfe, Corrinne Mills;

Also: Sridhara Dasu; Julia Thom, Gordon Watts, Darin Acosta, et al

□ Review the LHC experimental & accelerator program, view from Washington, Careers Session: Corrinne Mills

□ Discussion of issues that affect US LHC users at home & abroad

□ Annual HEP Visits to Washington DC: 2019 will be our 12th Annual Trip

Coordinated with FNAL UEC, SLUO; DPF, DPB and URA

□ 2017 LR Winners+ Joined Us; Some of our best spokespeople !

□ October 2017 task force trip for FY18 budget: well-timed and effective

□ Great occasions to highlight our science, the impact and need

➔ Talk reviewing the 2018 Trip by Yangyang Cheng



HEP DC Trip March 2018: 54 People, 13 from USLUA

350+ Offices in Congress, Executive, Funding Agencies

Including Senate, House, NSF, DOE HQ, DOE Germantown, White House OSTP & OMB
Senate & House Appropriations Committees: CJS, Energy and Water; House SST: Energy, R&T; Senate Energy & NR: Energy; Senate CST: Science, Space and Competitiveness



**22 Women, 35
Early Career**

#heptakesthehill18



USLUA

1. Dan Antrim
2. Sapta Bhattacharya
3. Yangyang Cheng
4. Aaron Dominguez
5. Scott Ely
6. Kevin McDermott
7. Harvey Newman
8. Michela Paganini
9. Sal Rappoccio
10. Savannah Thais
11. Sean-Jiun Wang
12. Justin Williams
13. Jingyu Zhang

Special thanks UEC: Joseph Zennamo, Justin Vasel, Carrie McGivern, Fernanda Psihas, **Breese Quinn**

<http://www.fermilab-uec.org/mediaWiki/index.php?title=DC2018>



US LHA **Activities (2):** Helping the US Community Adapt to Work at CERN and Life in the Region

- ❑ **Quality of Life Committee:** Usha Mallik, Chair
 - We have get-togethers of students and young postdocs at CERN. Success: 200+ at these parties. Spokespeople, DG, Ombuds, key staff as speakers
 - ➔ We plan more – Volunteer to help !
- ❑ We provide Information everyday important issues: starting work at the lab, hostels; ***health insurance***, visas, taxes, hostels, time management, careers, etc.
 - A comprehensive website will be set up with Darin Acosta's help.
 - For now see his New Student Orientation Guide: <https://www.dropbox.com/s/xl2cbiak035vaye/NewStudentOrientationAtCERN.pdf?dl=0>
- ❑ A Young Volunteers' Group has been set up by the QOL Committee (thanks Usha !). It meets periodically with newcomers + other young people to answer their questions
- ❑ We help them when and where needed to solve problems, and/or refer them to appropriate people to get help while respecting their privacy.
- ❑ We have helped some graduate students first hand who were having problems, and have worked with ACCU to improve the handling of such cases at CERN





US LHA Activities (3)

- ❑ In 2015 we Launched Our Website www.uslua.org:
 - ❑ Thanks to Tulika Bose and Gordon Watts
 - ❑ Links to Useful Information: New Student Orientation Guide, Newcomers Guides
- ➔ *We are On Facebook and Twitter:*
Thanks to Toyoko Orimoto and Tulika
- ❑ Outreach about the LHC Program
 - ❑ At National Events (more follows); During VIP Visits to CERN
 - ❑ Working actively with the US LHC Ops Program, US LHC Communications
- ❑ **Media Training:** how to talk to Congress, the public, media
Thanks to Sarah Charley: Sessions are available on request at CERN this Fall and Winter;
These are useful for the Annual DC Trip, and on other occasions
- ❑ **Partial support for young people going to conferences,** including in other fields – on a pilot basis, from this year



Visit www.uslua.org Thanks to Tulika Bose and Gordon Watts

- Home
- US LUA Registration
- Articles and Bylaws
- Relocation Guide for CERN
- Executive Committee
- News Archive
- Meeting Archive
- Purpose and Structure



About US LUA

An introduction to the US LUA – a letter from the Chair.

Purpose and Structure

The US LHC Users Association (US LUA) is composed of scientists and engineers who carry out research and development using the Large Hadron Collider experiments and accelerator systems. These include people based at CERN and those working mainly from their home institutions. The purpose of USLUA is to provide a forum for discussions of

Search the US LUA:

Follow us



Member Login

New Student Orientation to CERN

Darin Acosta

Relocation Guide for CERN

Introduction

This page has been created for the US LHC Users Association by Tony Liss. It draws heavily on the extremely informative ATLAS "Coming to CERN" page created by Alexia Leyval. Thanks Alexia!

There are many other sources of helpful information. An excellent website is the [Newcomer Welcome Center](#). See also the [USCMS Twiki](#). Feedback and recent information are always welcome.

Orientation to CERN

Here is an [orientation presentation](#) for members of your group who are moving to or visiting CERN. This is based on a presentation given regularly at Duke and modified by ACCU and USLUA Exec Committee member Darin Acosta. Please let us know if you have updates or corrections, as information changes, though we will try to keep the info here current.

Visiting CERN – banking

For anyone visiting CERN short-term, as well as those in the process of moving here longer-term, there is a [useful comparison here](#) (done in October 2011) about ATM cards, credit cards, fees, and exchange rates.

Before coming to CERN

The [CERN Bulletin](#) from 20 September 2010 describes the visa situation for CERN visitors.

This has some further [information about VISAS](#) for France and Switzerland

Upon Arrival

Transport, registration at CERN, computing accounts

Housing

Short- and long-term accommodation, resources for furniture, cleaning, etc.

Transportation

Public transportation, car rental and purchase, licenses, insurance

Health

Emergencies, hospitals, insurance

Darin Acosta's Newcomer's Guide:
[https://www.dropbox.com/s/xl2cbiak035vaye/
NewStudentOrientationAtCERN.pdf?dl=0](https://www.dropbox.com/s/xl2cbiak035vaye/NewStudentOrientationAtCERN.pdf?dl=0)



Newcomers Guides

www.uslua.org

THE WELCOME CENTER

- Home
- activities & travel
- before you arrive
- children
- culture
- dining
- finance & legal
- health
- housing & telephone
- jobs & tips for spouses
- language & education
- news & information
- shopping & services
- transportation & mobility
- visas & identification
- what's on

<http://newcomerwelcomecenter.weebly.co> 



WELCOME TO OUR RESOURCE GUIDE

This site is dedicated to those of you who are new to CERN or have not yet arrived. All of us expats went through the "newcomer" experience. We created this site hoping to make your transition easier. We found every bit of this information invaluable, and hope this guide on how to "survive and thrive" will help you integrate.

Thanks to those who make the site more useful to us all by sending us any information that you feel is missing, or any tips that you would like to share with this community.

Other Valuable Resources

from the US CMS and US ATLAS Program Offices

<https://twiki.cern.ch/twiki/bin/view/Main/USCMSProjectOfficeCERN>

<http://www.usatlas.bnl.gov/twiki/bin/view/Support/CERNVisitorInfo>

Newcomers Guide

How to Survive and Thrive

- ➔ At CERN
- ➔ In Switzerland
- ➔ In France
- ➔ Visas, permits
- ➔ Health (Insurance, Emergency Contacts)
- ➔ Getting a Bank Acct.
- ➔ Exchange Rates
- ➔ Finances & Jobs
- ➔ Taxes
- ➔ Childcare
- ➔ Finding Housing
- ➔ Internet, Telephone
- ➔ Schools
- ➔ Buying a Car
- ➔ Shopping
- ➔ Transport, Mobility
- ➔ Learning French
- ➔ Culture, Dining
- ★ Whole Experience



US LHA Activities (4): National and International Events

- ❑ Our US LHA Booth at ICHEP ➔
- ❑ Visited by hundreds of attendees
- ❑ Tee Shirts (Raffle), Brochures, Postcards and Buttons
- ❑ Thanks to David Miller, Toyoko Orimoto, Verena Martinez, Corrinne Mills
- ❑ US LHA Booth in 2017 !
 - ❑ Quark Matter Conference in February 2017 ! (Nuclear Physics)
- ❑ Considering a Booth at the "April" 2018 APS Meeting





USA SCIENCE & ENGINEERING FESTIVAL
FREE EXPO: APRIL 16 & 17, 2016
STEM APRIL 14 | **SNEAK PEEK FRIDAY** APRIL 15
WALTER E. WASHINGTON CONVENTION CENTER - WASHINGTON D.C.

FOUNDING & PRESENTING HOST: **LOCKHEED MARTIN**

USA Science & Engineering Festival in DC: the largest STEM education event

<http://usasciencefestival.org>

HOME ABOUT 2016 FESTIVAL VOLUNTEER SCHOOL PROGRAMS AFFILIATE EVENTS NEWSROOM EXHIBITORS SIGN-UP FOR NEWSLETTER

An ideal forum to educate the public, and show our science!

- ❑ **Over 300 Schools, 750 STEM organizations**
- ❑ **More than 365,000 visitors over 4 days**
- ❑ **Dozens of Congressmen, dignitaries; heads of state**

Our US LUA Booth in 2016: Separate but “linked” to JHU and Fermilab booths; thanks to Andrei, Randy for help and advice

2016: With thanks to the efforts of Julia Thom (Cornell) and her students, and Ilija Vukotic for the ATLAS Rift !

USLUA in 2014 joined the existing Fermilab exhibit: Higgs event display, games, CR detector; staffed booth with young LHC scientists.

**US LUA Joined forces with Johns Hopkins and Fermilab for a great exhibit at the 2018 USA Science and Engineering Festival
Great thanks to Verena Martinez, David Miller, Andrei Gritsan et al**



USA Science and Engineering Festival

April 7-8 2018



US LUA



We have come a long way;
we have a long way to go.
We will need your support.

If your group members or colleagues involved
in the LHC Program are not already US LUA
Members, **ask them to please sign up at**
www.uslua.org

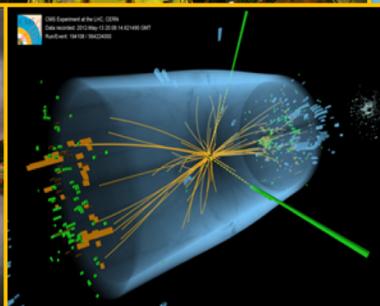
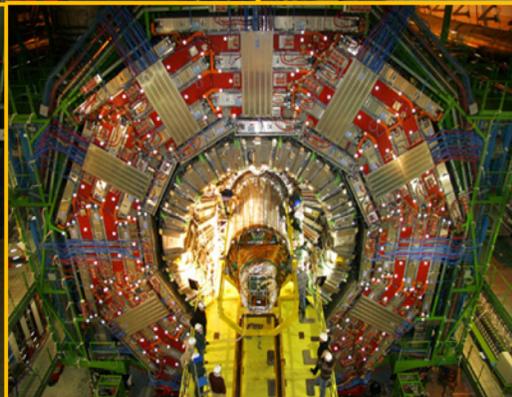
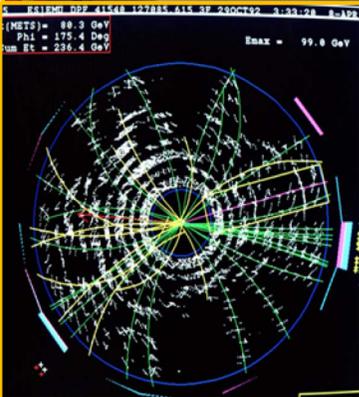
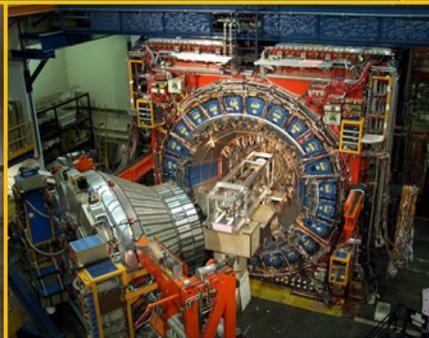
US LHC Users Association



The End

Fermilab

50 Years of Discovery





$B_s \rightarrow \mu^+ \mu^-$

- 1st evidence from LHCb, subsequent results from CMS & Atlas. New LHCb result with more data (4.4/fb⁻¹) & improved analysis

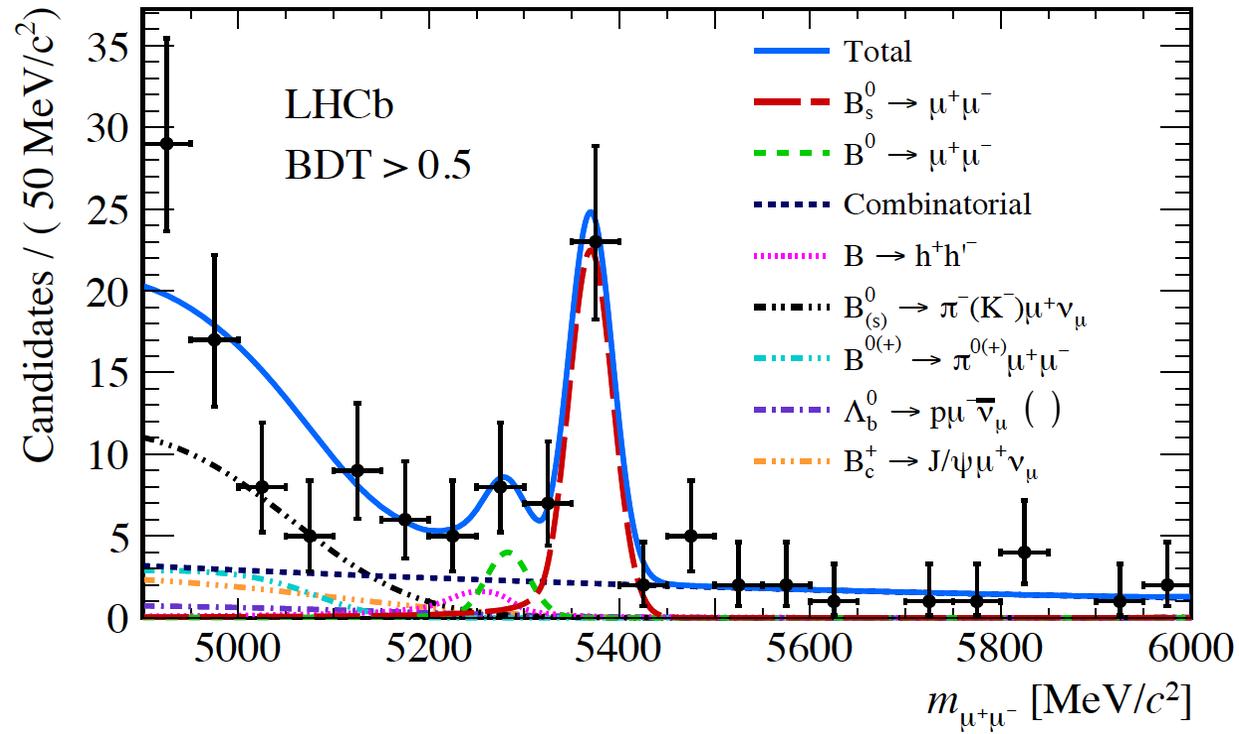
R. Aaij et. al, PRL 118, 191801 (2017)

- $\mathcal{B}(B_s \rightarrow \mu^+ \mu^-) = (3.0 \pm 0.6^{+0.3}_{-0.2}) \times 10^{-9}$

- $\mathcal{B}(B^0 \rightarrow \mu^+ \mu^-)$

< 0.34x10⁻⁹ at 95% CL

First observation in a single exp. > 5 σ





HEP DC Trips: Joint Effort of UEC, US LUA, SLUO with DPF on Behalf of Entire US HEP Community

- ❑ Communicate the nature, excitement, importance of the physical sciences, and the key roles of HEP in particular
 - ❑ To science, education, innovations and to the leadership of the nation
 - ❑ Visit as many Congressional Offices as possible; build upon or develop as strong ongoing connections as possible
 - ❑ Establish and develop the foundation that leads to the funding needed by HEP
 - ❑ Also in hard or controversial times: the value of the long term science mission
- ➔ Boosted by our unity (the P5 Report), the grand breakthroughs in science (LIGO and past Nobel Prizes among them)
- ➔ Inspiring the young to fulfill their aspirations



**Running for ~35 Years
US LUA for 11 Years**



USA Science and Engineering Festival

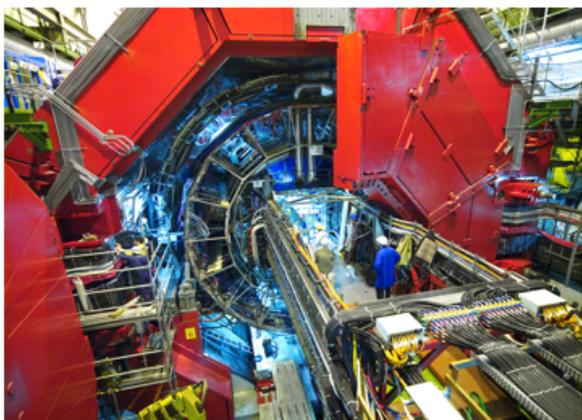
April 7-8 2018



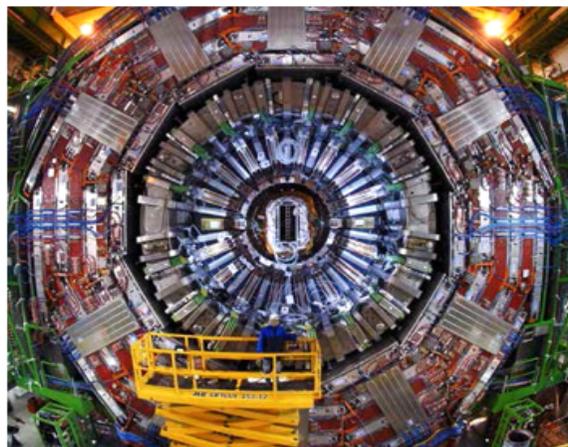


USLUA: US LHC Users Association

Please join us in supporting the scientists and engineers throughout the US and overseas, exploring the frontier of the highest energies with the Large Hadron Collider



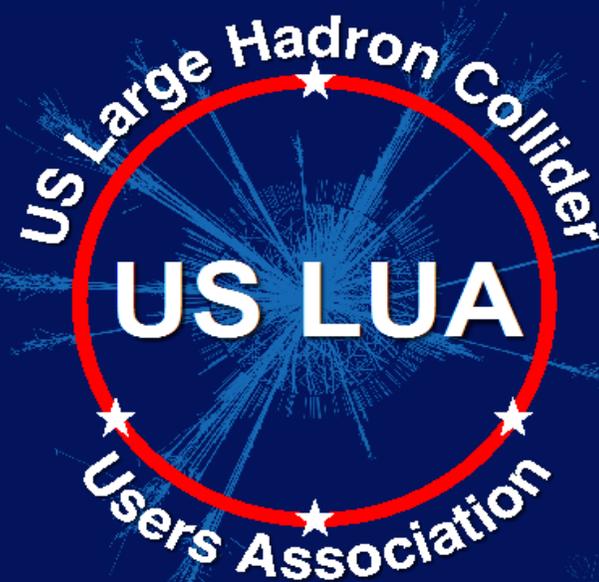
High Energy Physics: Building for Discovery

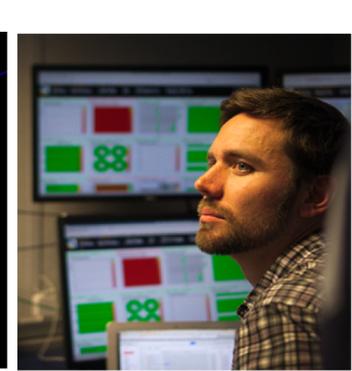
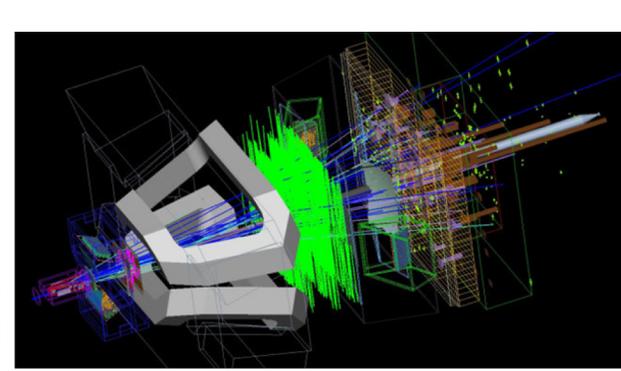


Follow us on
Facebook & Twitter



For more information
about USLUA, please visit
<http://www.uslua.org>





The US LHC Users Association (USLUA) is composed of scientists and engineers who carry out research and development using the Large Hadron Collider experiments and accelerator systems

The purpose of USLUA is to provide a forum for discussions of the US participation in the LHC research program, with a focus on how best to enhance scientific participation in the discoveries expected from this research

USLUA activities include:

- An annual meeting, including presentations by young collaborators in a “lightning round” competition
- A US HEP community visit to members of Congress in Washington, DC
- Networking events for young scientists stationed at CERN
- Outreach activities, such as a booth at the US Science and Engineering Festival

USLUA provides resources on:

- Relocation to CERN
- Health insurance while abroad
- Dealing with taxes and finances while abroad
- Resolving conflicts while working at CERN

To receive updates on USLUA events, join our mailing list, at:
<http://www.uslua.org>

