



FS Club

News Events Partnerships



NEW PHYSICS, NEW TECHNOLOGIES, & NEW PERSPECTIVES: SEARCHING FOR THE MISSING 96% OF THE UNIVERSE

Claire Malone, PhD Candidate, High Energy Physics, University of Cambridge

Wednesday, 08 December, 10:00 GMT

A Word From Today's Chairman



Professor Michael Mainelli

Executive Chairman

Z/Yen Group

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Today's Agenda



- 10:00 – 10:05 Chairman's Introduction
- 10:05 – 10:25 Keynote Address - Claire Malone
- 10:25 – 10:45 Questions & Answers

Today's Speaker



Claire Malone

PhD Candidate, High Energy Physics

University of Cambridge

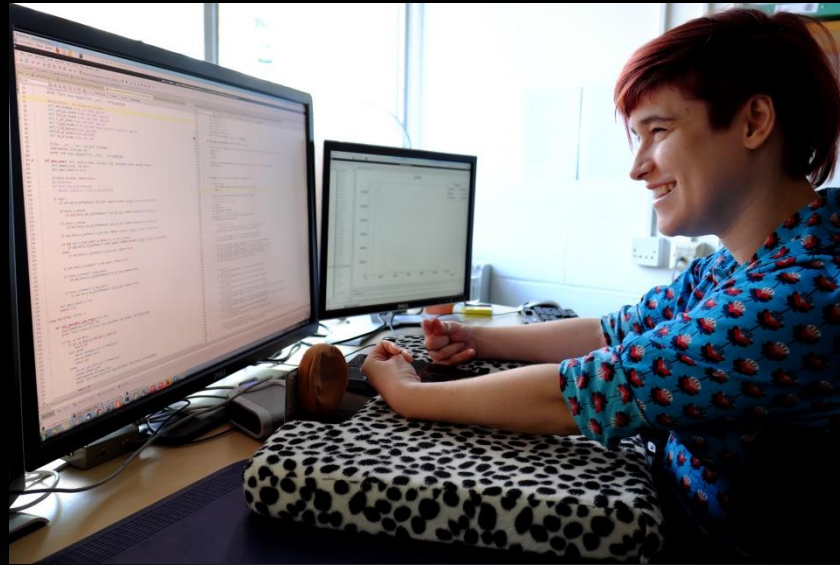
NEW PHYSICS, NEW TECHNOLOGIES, & NEW PERSPECTIVES: SEARCHING FOR THE MISSING 96% OF THE UNIVERSE

Z/Yen Group - 8th December 2021

Claire Malone (TWT: @GeeknProud)

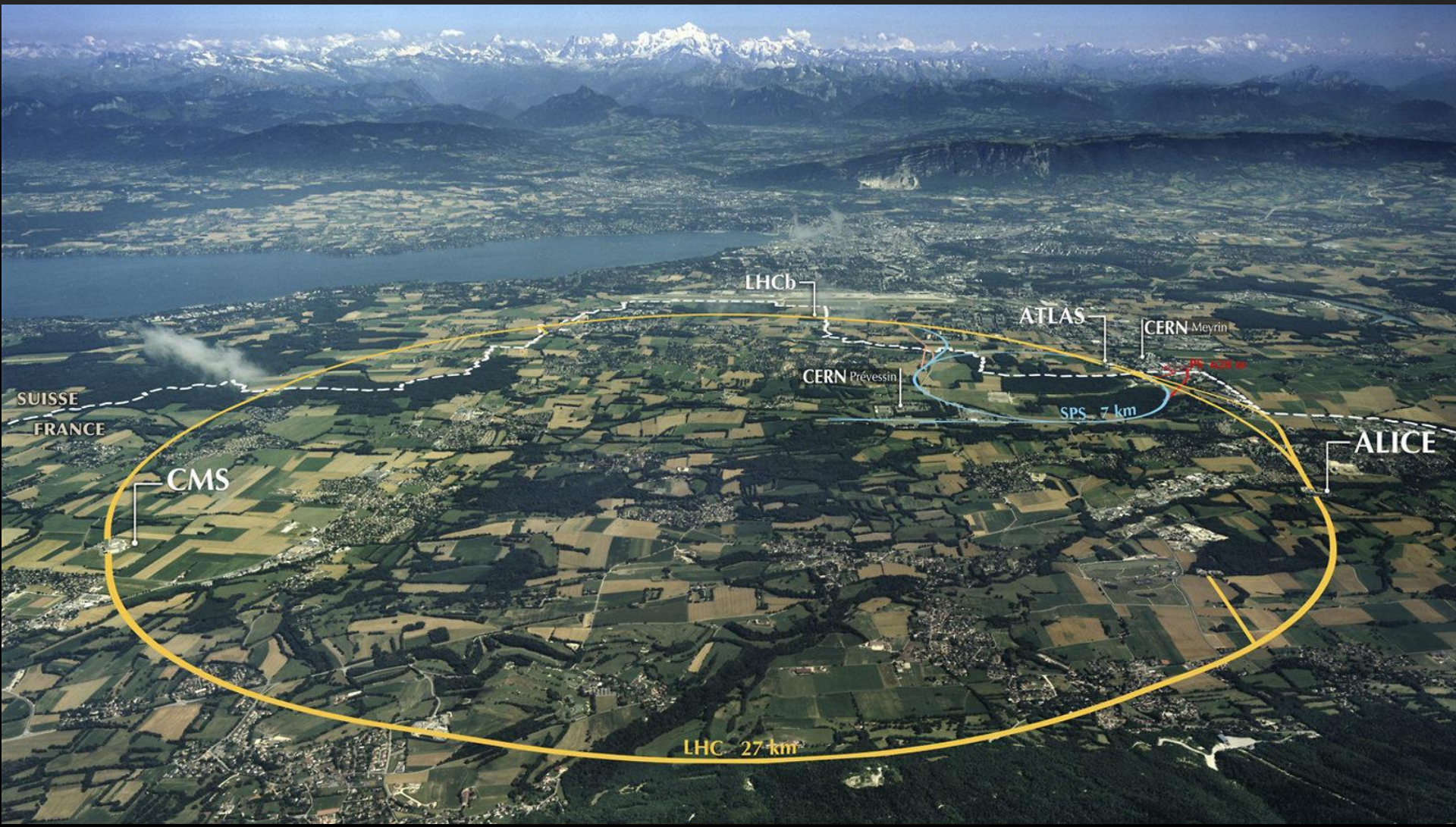
WHO DO YOU THINK YOU ARE?

- The archetypal geeky kid at school
- Graduated with an MSci in Physics from Imperial College, London in 2014
- Currently completing a PhD in Particle Physics at the University of Cambridge, which involved working at the European Organization for Nuclear Research (CERN) for a number of months



PRACTICALITIES OF SCHOOL





SUISSE
FRANCE

CMS

LHCb

ATLAS

CERN Meyrin

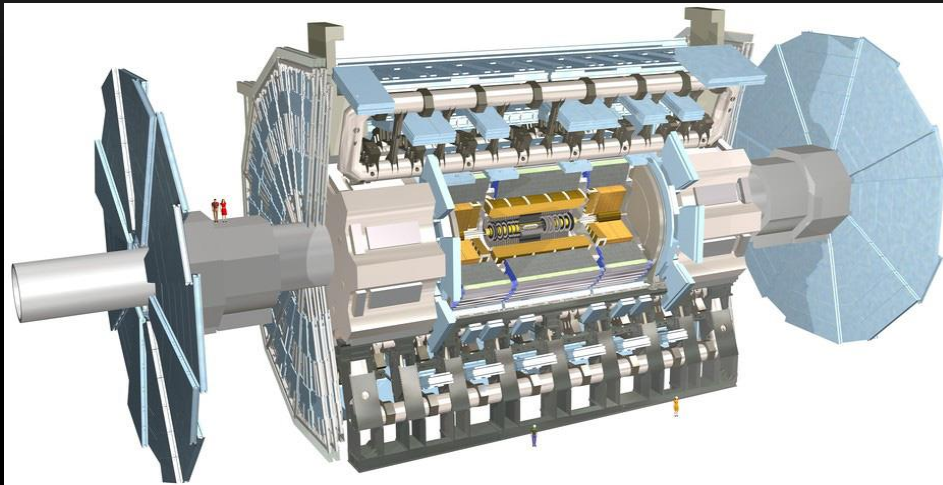
CERN Prévessin

SPS 7 km

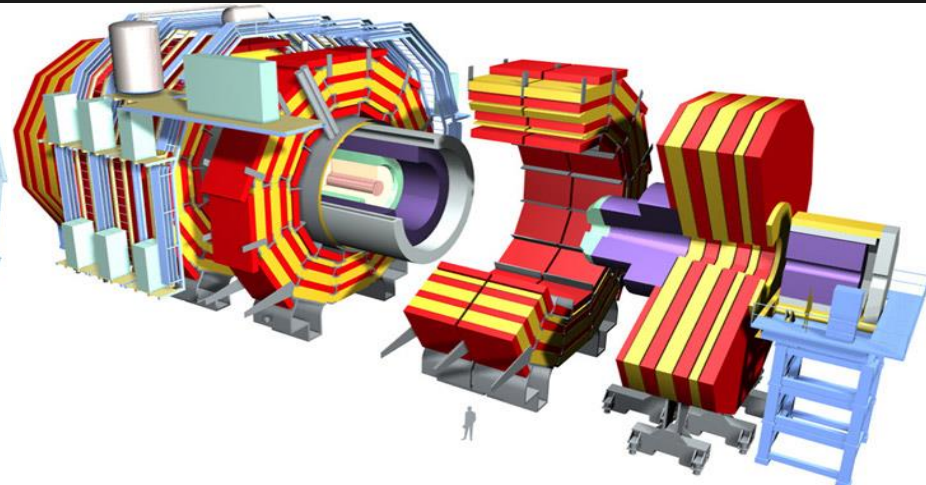
ALICE

LHC 27 km

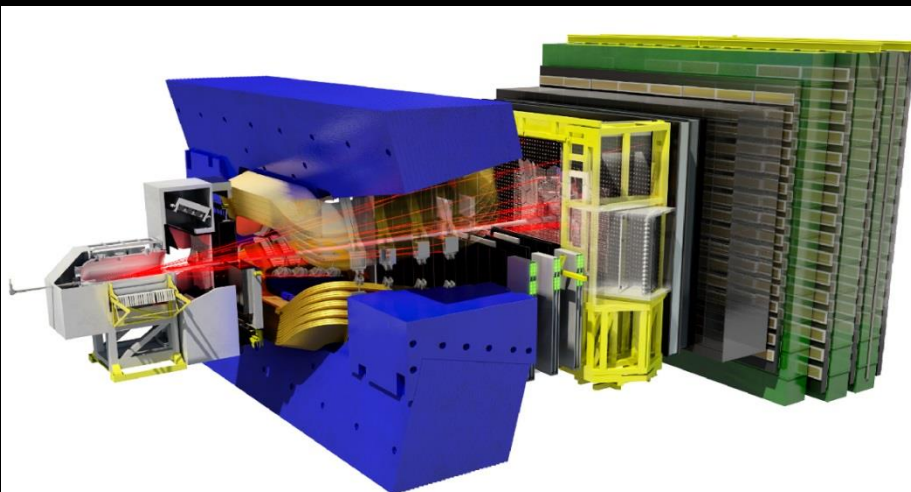
THE 4 MAIN EXPERIMENTS AT CERN – AND THEIR SUPERB ACRONYMS



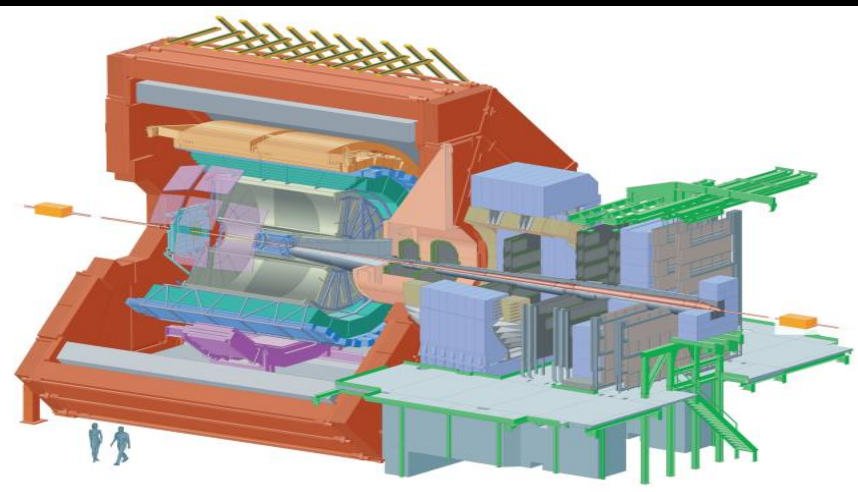
A Toroidal LHC ApparatuS (ATLAS)



Compact Muon Solenoid (CMS)



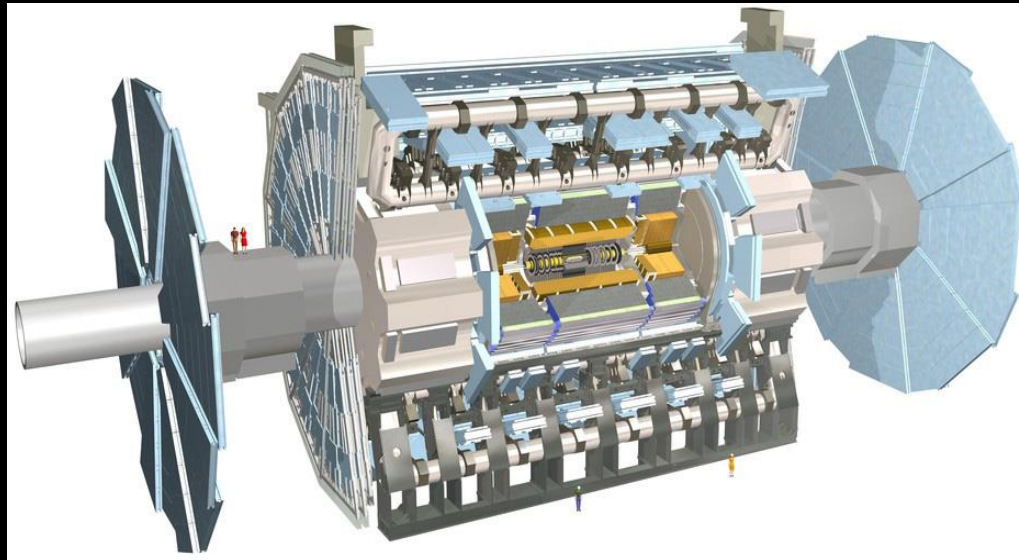
Large Hadron Collider beauty (LHCb)



A Large Ion Collider Experiment (ALICE)

THE “BEST”* DETECTOR AT CERN

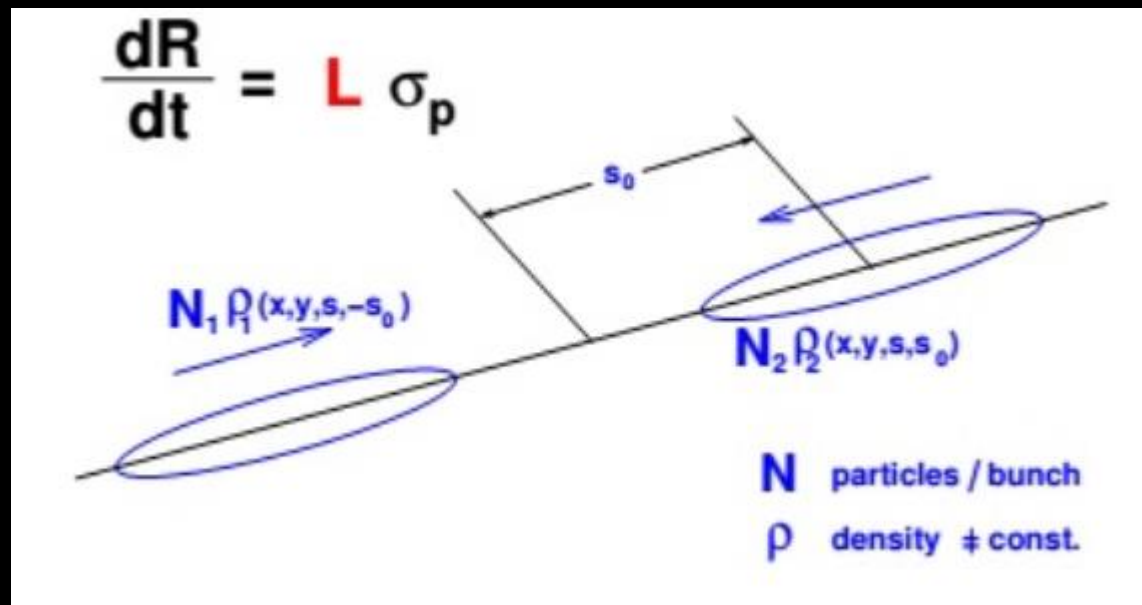
- ATLAS is a multi purpose particle physics experiment
- Millions of protons are collided any second at the center of ATLAS
- How do we provide a good estimate of the “amount” of collisions?



*Taking a completely objective viewpoint of course! 😊

WHAT IS LUMINOSITY?

$$\mathcal{L} = \frac{\text{Rate of interactions of a process } [s^{-1}]}{\text{Cross-section for that process } [cm^{-2}]} = \frac{dR/dt}{\sigma_p}$$



LUMINOSITY OF PROTON COLLISIONS

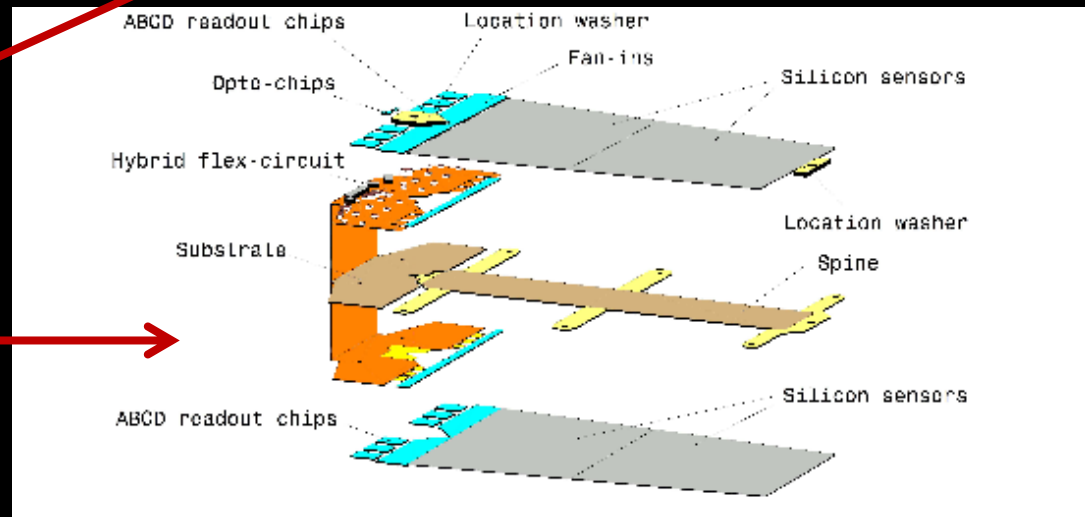
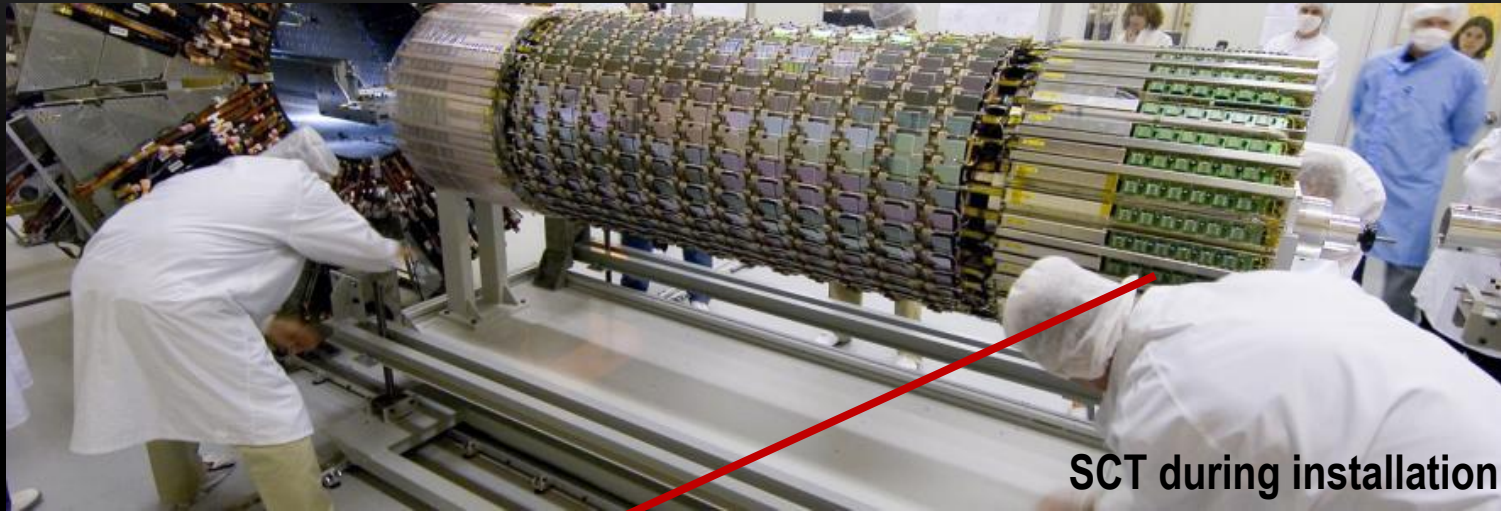
Collision Event at
7 TeV



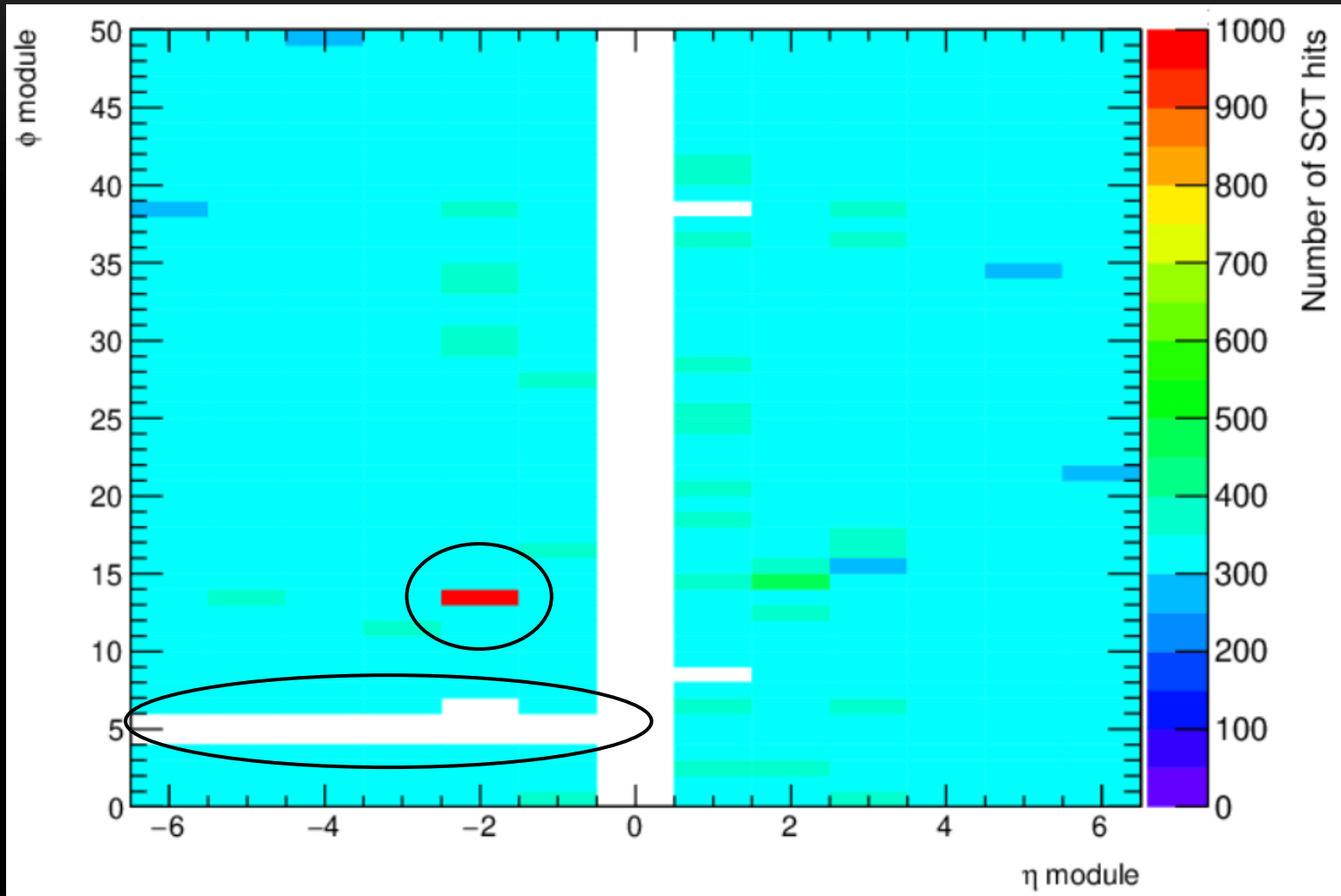
2010-03-30, 12:58 CEST
Run 152166, Event 316199

<http://atlas.web.cern.ch/Atlas/public/EVTDISPLAY/events.html>

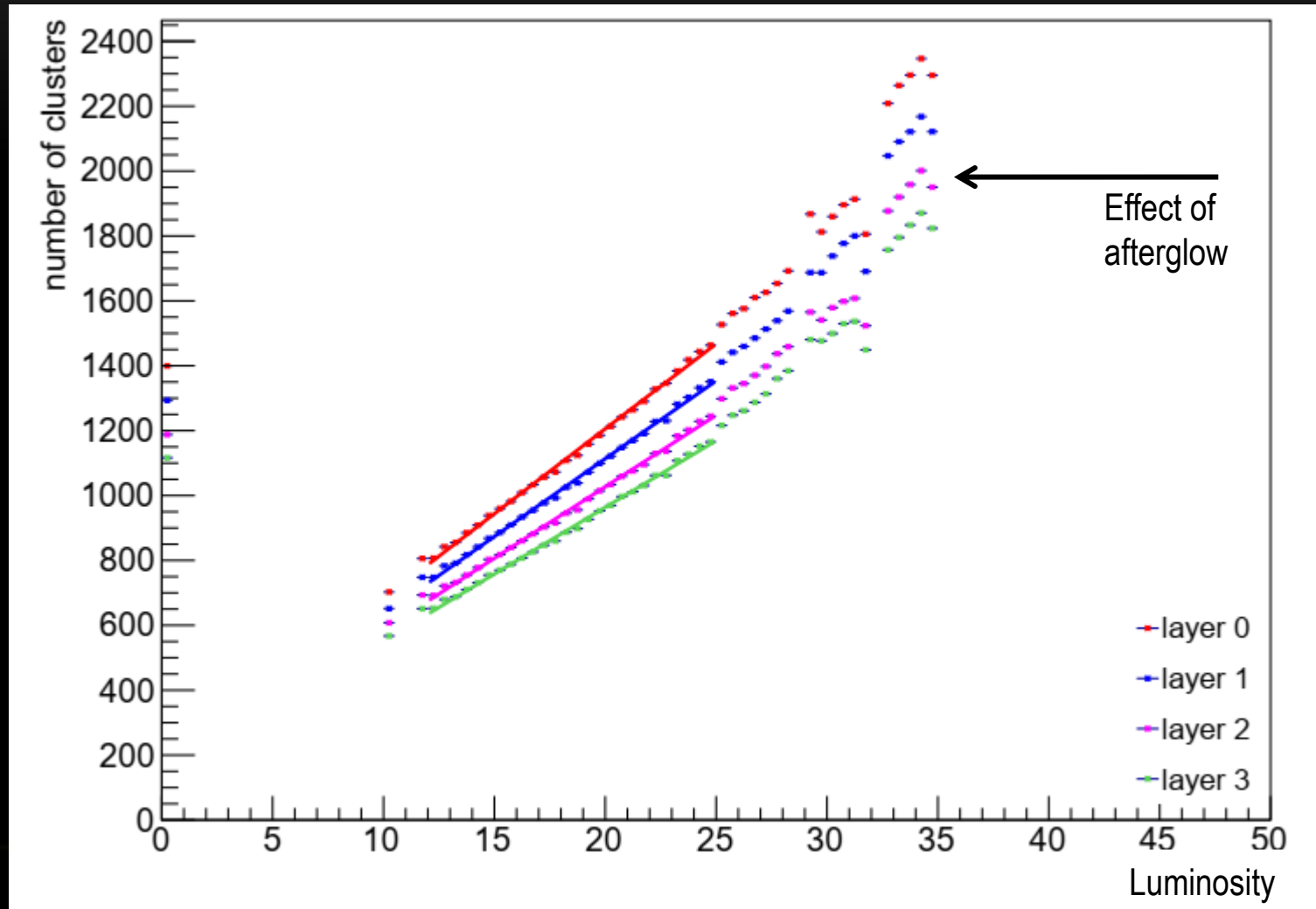
THE ATLAS SEMI CONDUCTOR TRACKER (SCT)



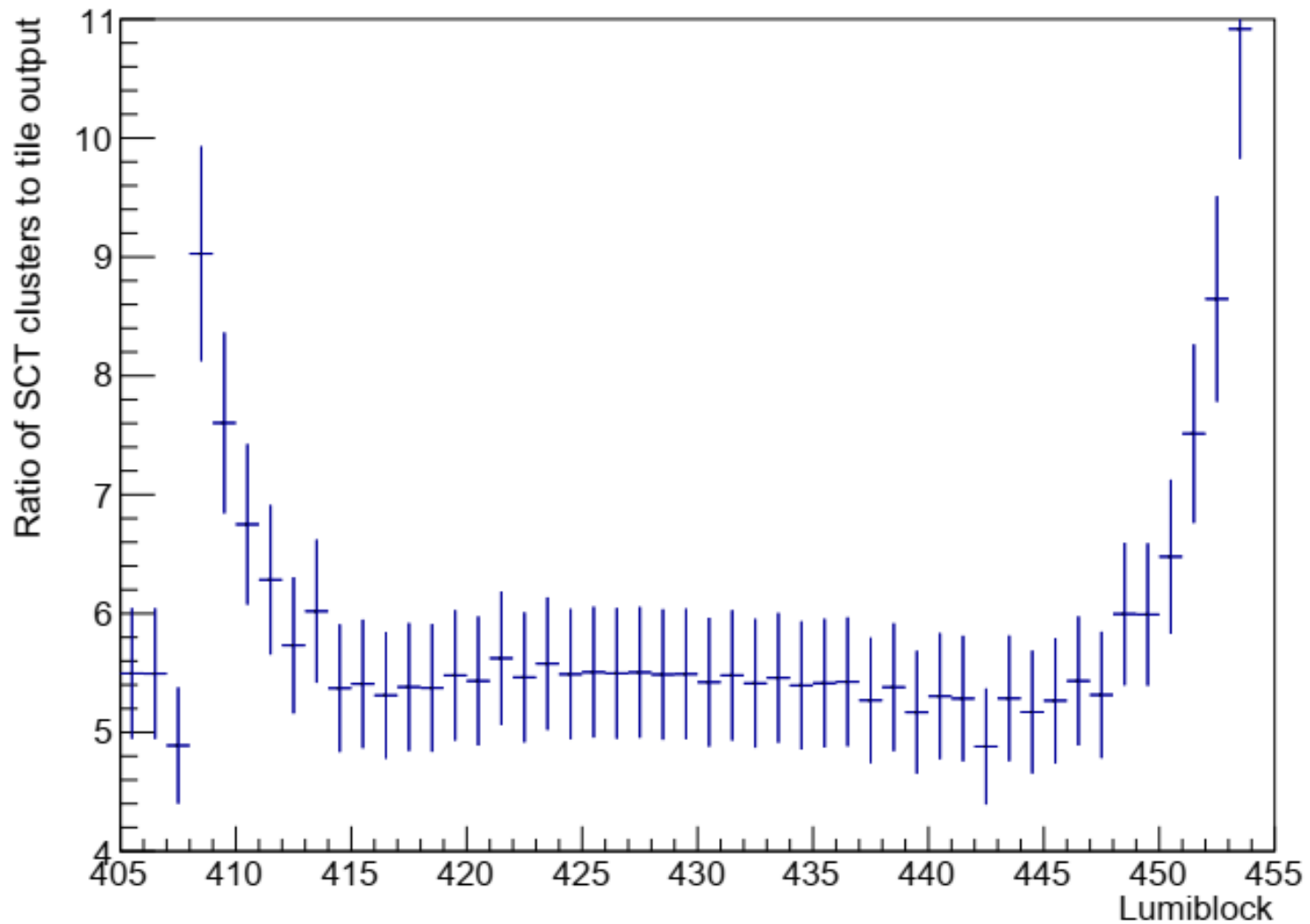
"HITMAP" OF A SCT MODULE



POSITIVE RESULTS – A LINEAR RELATIONSHIP



COMPARISON TO OTHER LUMINONIMETERS





THANKS FOR LISTENING

That's all Folks!



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Thank You For Listening



Forthcoming Events

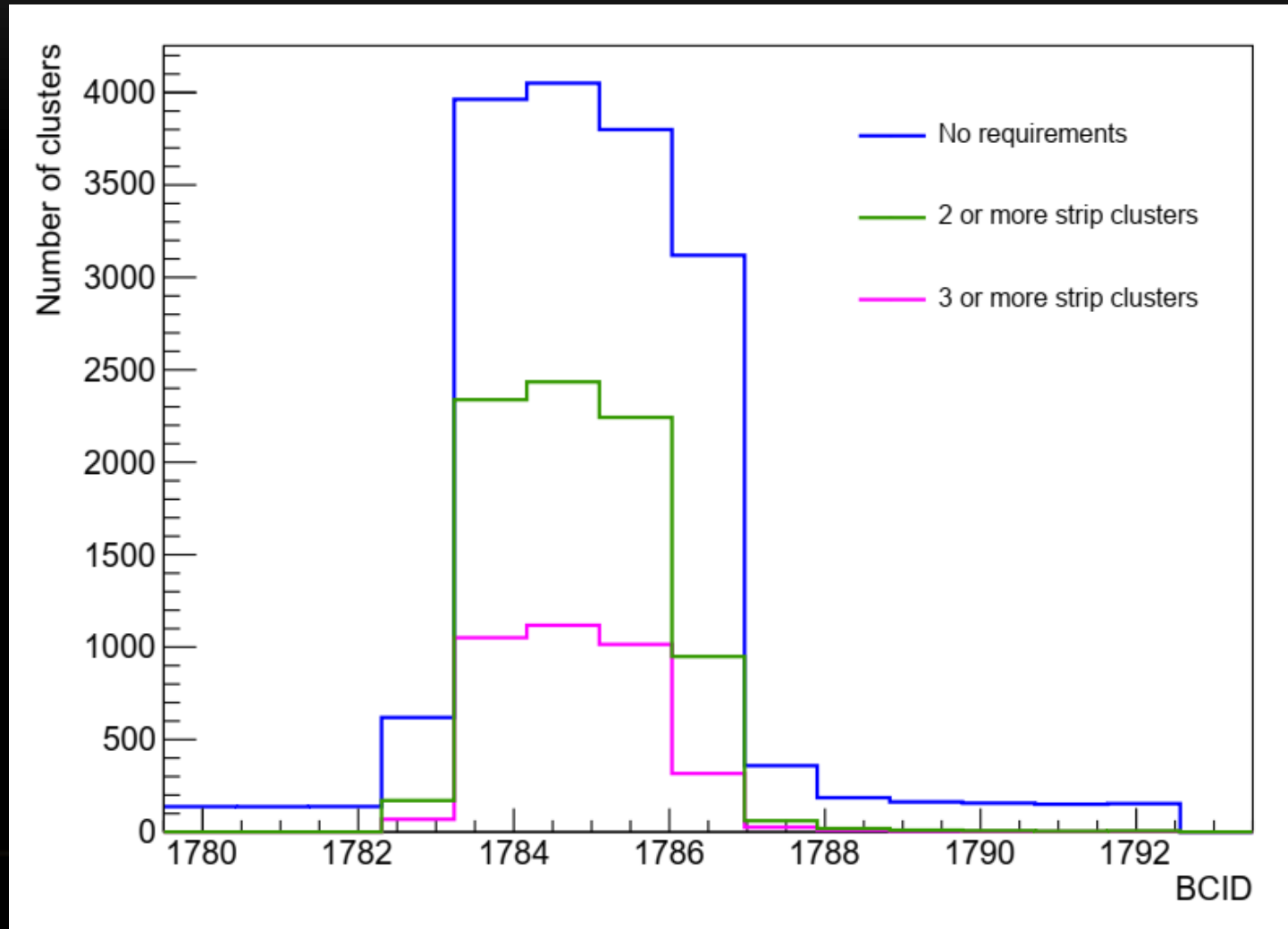
- Fri, 10 Dec (10:45-11:30) The Employee Voice: Share Plan Vote
- Mon, 13 Dec (15:00-15:45) Scattering The Seeds Of Evil: Birkbeck & Lifelong Learning After Brexit & Covid
- Wed, 15 Dec (15:00-15:45) CommunityZ Chest: David Bannister
- Thu, 06 Jan (15:00-15:45) How Insecure Are Your Websites? The Enigma of Digital Certificates (PKI)

Visit <https://fsclub.zyen.com/events/forthcoming-events/>

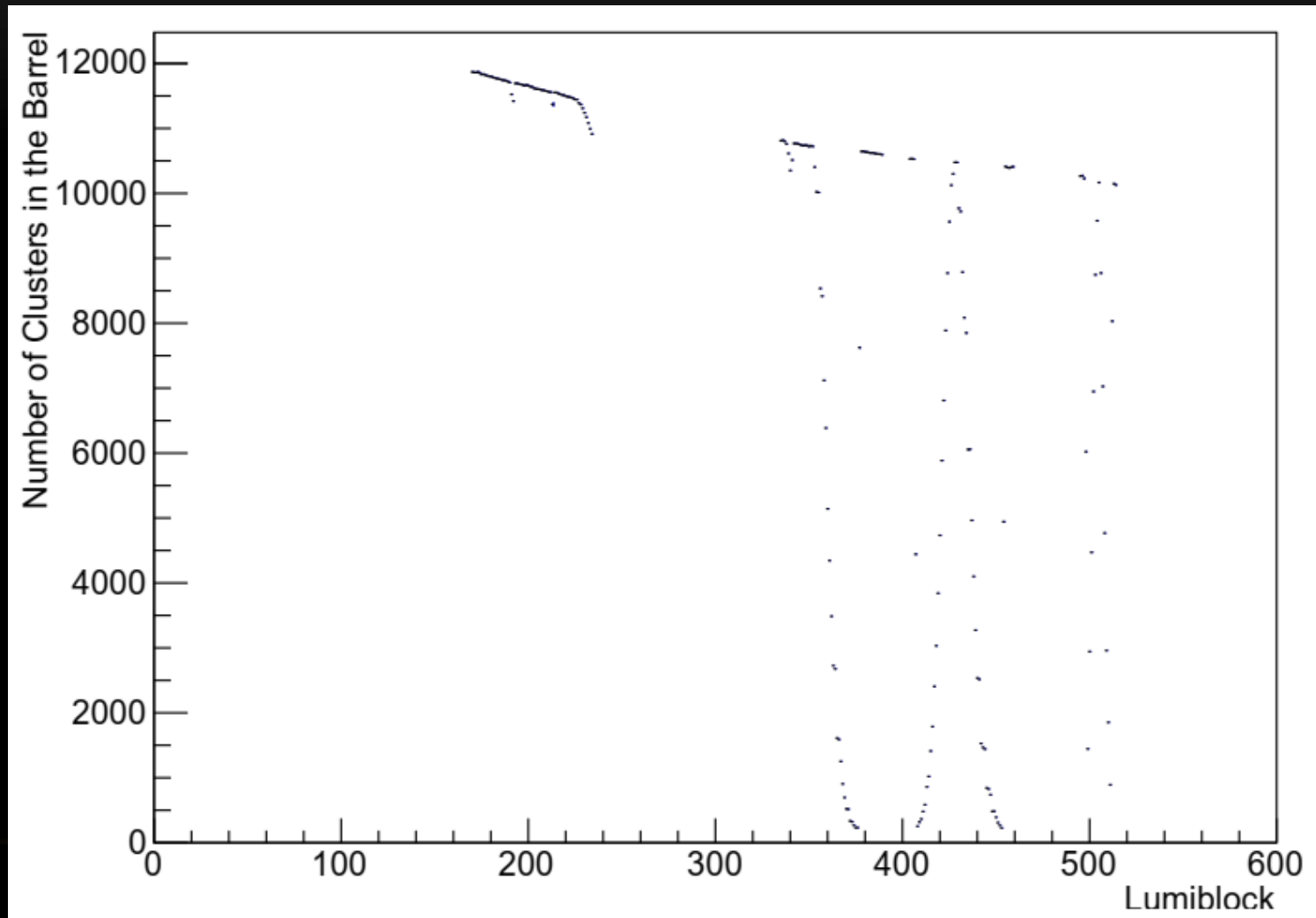
Watch past webinars <https://www.youtube.com/zyengroup>

BACK-UP

NUMBER OF CLUSTERS VS BCID IN RELATION TO REQUIREMENTS ON CLUSTER SIZE



NUMBER OF CLUSTERS OVER PERIOD OF MULTIPLE LUMINOSITY SCANS



NUMBER OF CLUSTERS OVER PERIOD OF MULTIPLE SCANS DEPENDENT ON CLUSTER SIZE

