

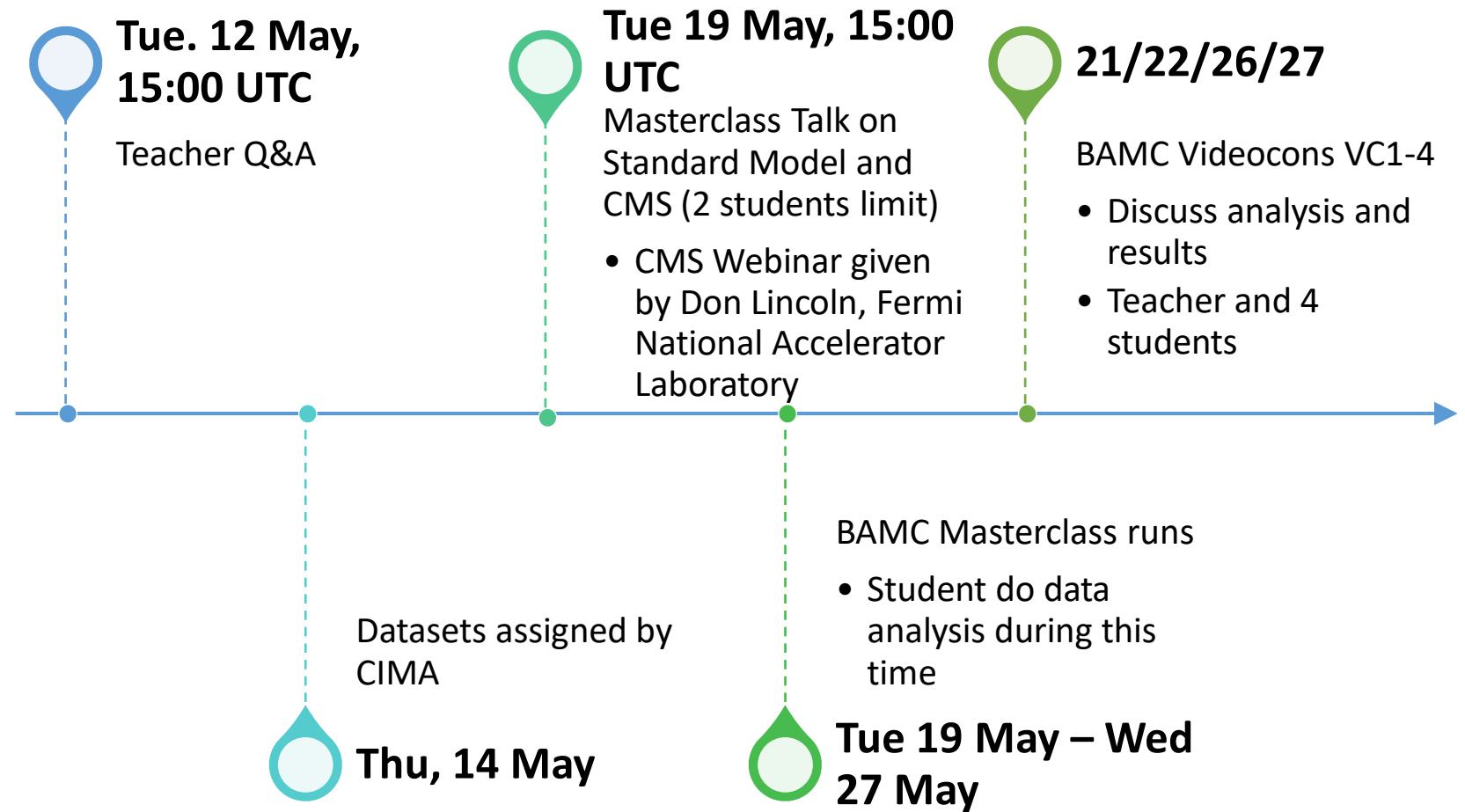


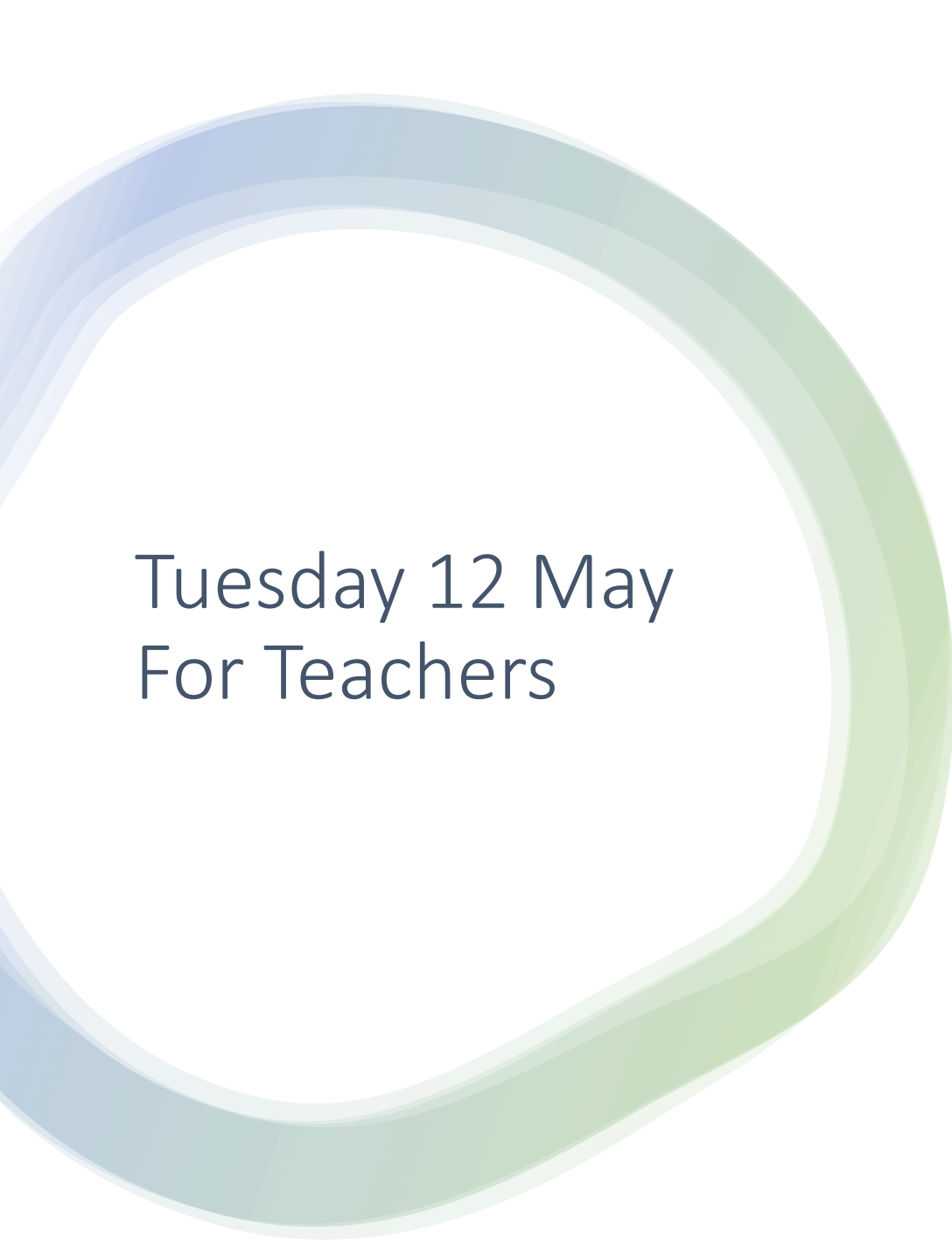
Big Analysis of Muons in CMS (BAMC)

Masterclass May 2020

Vandna Luthra, Gargi College, New Delhi


Timeline of Events






Tuesday 12 May
For Teachers

- Q&A Videoconference on the BAMC Zoom Channel
- Recording at <http://cern.ch/go/s7zs>.



Tuesday 12 May and
Wednesday 13 May

- Registration for Final Videoconference
 - Teachers with students register in Doodle poll at <https://doodle.com/poll/3664bms8um2yisfz> (teacher *only* registers)
 - Individual adults register in Doodle poll at <https://doodle.com/poll/8g6szqp5v8pkzi9h>.
- Must register to be assigned data.



From Thursday 14
May – Tuesday 19
May

- Assign datasets in CIMA
- Tell students about Student Prep activities
- Have a videoconference with your students to explain the process/expectations and to answer any questions.
- Students should also watch all the screencasts before the masterclass so they are familiar with everything



Student Prep Activities

Recommended:

- Rolling with Rutherford
- The Particle Adventure

Others:

- Histograms: The Basics
- Dice, Histograms and Probability
- Calculate the Z Mass

Rolling with Rutherford



Main link: <https://quarknet.org/data-portfolio/activity/rolling-rutherford>



How to prepare at home:

<https://quarknet.org/content/comments-adapting-data-activities-teaching-online#rwr>



Teacher's notes:

https://quarknet.org/sites/default/files/RwRTeacherNotes_31oct2019.pdf



Paper template:

https://quarknet.org/sites/default/files/rwr_template_4target_0.pdf

THE PARTICLE ADVENTURE
THE FUNDAMENTALS OF MATTER AND FORCE

Supported by
the DOE and NSF

LANGUAGES MIRROR SITES

Android App Available now | Apple App Available now


An award-winning interactive tour of quarks, neutrinos, antimatter, extra dimensions, dark matter, accelerators and particle detectors from the Particle Data Group of Lawrence Berkeley National Laboratory.

The Particle Adventure

<https://particleadventure.org/>

Assign datasets in CIMA

- Assign a dataset to every pair of students
- These will be on CIMA under BAMC-XXMay2020, where XX=date of your videocon
- Assign these when they come out (Around 14 May)
- Collaborate online and work together on the analysis
- Both students look at iSpy to determine Final and Initial states etc.
- One student fills in CIMA with other watching



Have a videoconference with your students

- Point out the Student Prep activities
- All students should watch the screencasts on the Student Launch page to understand how to do the measurement
- Ideally make sure they are able to access the links, websites and iSpy and CIMA before the masterclass



Tuesday 19 May

- Talk on Standard Model and CMS – more information coming
- 2 students can join along with a teacher
- This talk will be recorded for the students who are not able to participate live.

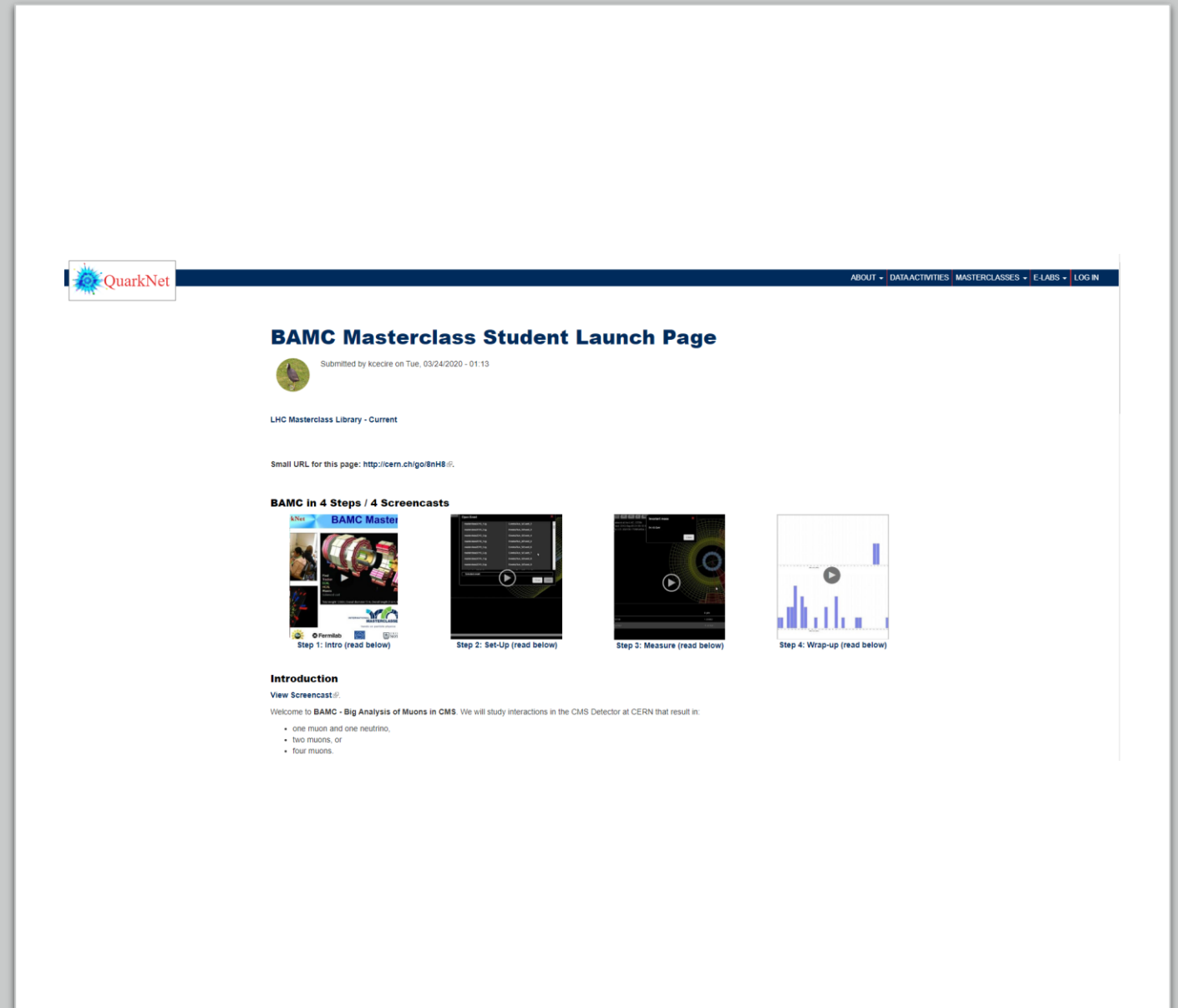
Tuesday 19 May – last
videoconference

Masterclass runs

(but you can start early if your students are ready).

BAMC Masterclass Student Launch Page

- Follow the steps and instructions given on the website:
 - Introduction
 - Set –Up
 - Measure
 - Wrap-Up



The screenshot shows the QuarkNet website header with navigation links: ABOUT, DATA ACTIVITIES, MASTERCLASSES, E-LABS, and LOGIN. The main content area is titled "BAMC Masterclass Student Launch Page" and includes a submission date of 03/24/2020. It lists the "LHC Masterclass Library - Current" and provides a small URL: <http://cern.ch/go/nH8>. Below this, a section titled "BAMC in 4 Steps / 4 Screencasts" features four video thumbnails: "Step 1: Intro", "Step 2: Set-Up", "Step 3: Measure", and "Step 4: Wrap-up". An "Introduction" section follows, titled "Introduction" and "View Screencast", with a welcome message and a list of topics: "one muon and one neutrino", "two muons, or", and "four muons".



1. Introduction

- This masterclass will study interactions in the CMS Detector at CERN that result in:
 - One muon and one neutrino
 - Two muons, or
 - Four muons
- All other interactions are considered background.
- Purposes:
 - Find the ratio of W^+ to W^- events (from one muon and one neutrino)
 - Find the masses of parent particles – the particles that transform into 2 muons or 4 muons




1. Introduction

- What you should do:
 - Watch the Screencast:
<https://screencast-o-matic.com/watch/cYeZjuytrO>
 - Read the Slides:
https://quarknet.org/sites/default/files/bamc_analysis_24mar2020.pdf



2. Set-up iSpy and CIMA online

- Make sure you have the datafile that was assigned to you
- Watch the Screencast:
<https://drive.google.com/file/d/1ZlnRcm8XJK3Zbpdk1c3RLcEAZaIO9IEK/view>
- Read the instructions on the Student Launch page to set up iSpy and CIMA



3. Do the Measurements

- Watch the screencast:
https://drive.google.com/file/d/10_PFLAE77s4PZoHsoDCdMBGc1cbyKgr5/view
- Make sure you open each measurement on both iSpy and CIMA
- Start with Event 1 and work through as many as you can (There are 100 in total)



4. Wrap-Up

- Watch the screencast: <https://screencast-o-matic.com/watch/cYeTbNykCy>
- Discuss the Mass Histograms and Results in combination of all schools and students in your BAMC Masterclass Videoconference



Videoconferences
21/22/26/27 May

- Masterclass Videoconference
 - 4 students
 - Discuss analysis of schools and other students
 - Recorded for other students to watch afterwards

A decorative graphic consisting of several overlapping, wavy, horizontal bands. The bands are colored in shades of blue and green, with some areas appearing lighter due to transparency. The overall shape is roughly rectangular, spanning most of the width of the page.

Thank You