

USCMS Undergraduate Summer Internship 2023

Report of Contributions

Contribution ID: 1

Type: **not specified**

Welcome by USCMS

Monday 5 June 2023 09:00 (1 hour)

Session Classification: Morning Session

Contribution ID: 2

Type: **not specified**

Introduction by Interns and Mentors

Session Classification: Morning Session

Contribution ID: **3**

Type: **not specified**

FNAL ID and Badging Time

Monday 5 June 2023 10:00 (1 hour)

Session Classification: Morning Session

Contribution ID: 4

Type: **not specified**

Intro to Computing at FNAL

Session Classification: Morning Session

Contribution ID: 5

Type: **not specified**

CMS Detector - a discovery tool

Monday 5 June 2023 15:10 (1 hour)

Presenter: NAHN, Steve (Fermilab)

Session Classification: Afternoon Session

Contribution ID: 6

Type: **not specified**

Physics Overview

Monday 5 June 2023 14:10 (1 hour)

Presenter: BOSE, Tulika (University of Wisconsin Madison (US))

Session Classification: Afternoon Session

Contribution ID: 7

Type: **not specified**

Unix Tutorial

Tuesday 6 June 2023 10:00 (2 hours)

Presenter: MAMBELLI, Marco (Fermilab (US))

Session Classification: Morning Session

Contribution ID: 8

Type: **not specified**

Unix Exercises

Tuesday 6 June 2023 15:00 (2 hours)

Presenter: MAMBELLI, Marco (Fermilab (US))

Session Classification: Afternoon Session

Contribution ID: 9

Type: **not specified**

Python I

Session Classification: Afternoon Session

Contribution ID: **10**

Type: **not specified**

Python I

Wednesday 7 June 2023 09:00 (3 hours)

Presenter: MOREIRA COIMBRA, Bruno (Fermi National Accelerator Lab. (US))

Session Classification: Morning Session

Contribution ID: **11**

Type: **not specified**

USCMS Talk - The Standard Model

Wednesday 7 June 2023 16:00 (1 hour)

Presenter: ROY, Titas (University of Illinois at Chicago (US))

Session Classification: Afternoon Session

Contribution ID: 12

Type: **not specified**

Python II

Wednesday 7 June 2023 13:00 (3 hours)

Presenter: MOREIRA COIMBRA, Bruno (Fermi National Accelerator Lab. (US))

Session Classification: Afternoon Session

Contribution ID: 13

Type: **not specified**

Git

Thursday 8 June 2023 09:00 (3 hours)

Presenter: MAMBELLI, Marco (Fermilab (US))

Session Classification: Morning Session

Contribution ID: 14

Type: **not specified**

Git Exercises

Thursday 8 June 2023 14:15 (1h 45m)

Presenter: MAMBELLI, Marco (Fermilab (US))

Session Classification: Afternoon Session

Contribution ID: 15

Type: **not specified**

USCMS Talk - Muons

Thursday 8 June 2023 16:00 (1 hour)

Presenter: Prof. BLACK, Kevin (University of Wisconsin-Madison)

Session Classification: Afternoon Session

Contribution ID: **16**

Type: **not specified**

Meet with Mentors

Session Classification: Afternoon Session

Contribution ID: 17

Type: **not specified**

Python for HEP (Scikit-HEP)

Friday 9 June 2023 09:00 (1 hour)

Presenter: LOMTE, SHIVANI

Session Classification: Morning Session

Contribution ID: **18**

Type: **not specified**

Talk

Session Classification: Morning Session

Contribution ID: 19

Type: **not specified**

PyROOT and RDataFrame

Monday 12 June 2023 09:00 (2h 30m)

Presenter: FIDALGO RODRIGUEZ, Guillermo Antonio (University of Puerto Rico at Mayagüez)

Session Classification: Morning Session

Contribution ID: 20

Type: **not specified**

PyROOT and RDataFrame Exercises

Monday 12 June 2023 13:00 (1 hour)

Presenter: FIDALGO RODRIGUEZ, Guillermo Antonio (University of Puerto Rico at Mayagüez)

Session Classification: Afternoon Session

Contribution ID: **21**

Type: **not specified**

Python for HEP (Scikit-HEP)

Tuesday 13 June 2023 10:00 (1h 40m)

Session Classification: Morning Session

Contribution ID: 22

Type: **not specified**

Talk

Session Classification: Afternoon Session

Contribution ID: 23

Type: **not specified**

Review Exercises and Q/A

Tuesday 13 June 2023 14:00 (2 hours)

Session Classification: Afternoon Session

Contribution ID: 24

Type: **not specified**

Exercises

Session Classification: Afternoon Session

Contribution ID: 25

Type: **not specified**

Machine Learning

Wednesday 14 June 2023 09:00 (3 hours)

Presenter: PERVAN, Nikolas (Brown University (US))

Session Classification: Morning Session

Contribution ID: 26

Type: **not specified**

Machine Learning Exercises

Wednesday 14 June 2023 14:15 (2h 15m)

Presenter: PERVAN, Nikolas (Brown University (US))

Session Classification: Afternoon Session

Contribution ID: 27

Type: **not specified**

Talk

Session Classification: Morning Session

Contribution ID: **28**

Type: **not specified**

Talk

Session Classification: Morning Session

Contribution ID: 29

Type: **not specified**

Excercises

Thursday 15 June 2023 14:15 (1h 45m)

Session Classification: Afternoon Session

Contribution ID: **30**

Type: **not specified**

Containers and Apptainer

Friday 16 June 2023 09:00 (3 hours)

Presenter: MAMBELLI, Marco (Fermilab (US))

Session Classification: Morning Session

Contribution ID: **31**

Type: **not specified**

Coding Dojo Exercise

Friday 16 June 2023 13:00 (3 hours)

Session Classification: Afternoon Session

Contribution ID: 32

Type: **not specified**

C++

Thursday 15 June 2023 09:00 (3 hours)

Presenter: PERVAN, Nikolas (Brown University (US))

Session Classification: Morning Session

Contribution ID: 33

Type: **not specified**

Computing and Software for Physics

Monday 5 June 2023 16:10 (1 hour)

Presenter: MELO, Andrew Malone (Vanderbilt University (US))

Session Classification: Afternoon Session

Contribution ID: 34

Type: **not specified**

Cohort building and Introductions (Interns and Mentors)

Monday 5 June 2023 11:00 (2 hours)

Presenters: HOGAN, Julie (Brown University, Bethel University (US)); BELLIS, Matthew (Cornell University/Siena College (US))

Session Classification: Morning Session

Contribution ID: 35

Type: **not specified**

How to do Particle Physics in a Climate Emergency

Presenter: BLOOM, Kenneth (University of Nebraska Lincoln (US))

Session Classification: Afternoon Session

Contribution ID: **36**

Type: **not specified**

Intro to Particle Detectors (EXTERNAL)

EVAN NINER

Ramsey Auditorium

Session Classification: Morning Session

Contribution ID: 37

Type: **not specified**

EXTERNAL Talk - Intro to Particle Physics (Evan Niner)

Session Classification: Afternoon Session

Contribution ID: **38**

Type: **not specified**

USCMS Talk - Higgs

Tuesday 6 June 2023 14:00 (1 hour)

Presenter: PALMER, Chris (University of Maryland (US))

Session Classification: Afternoon Session

Contribution ID: 39

Type: **not specified**

EXTERNAL Talk - Intro to Particle Physics (Evan Niner)

Tuesday 6 June 2023 13:00 (1 hour)

Contribution ID: 40

Type: **not specified**

EXTERNAL Talk - Neutrino Physics (Bryan Ramson)

Thursday 8 June 2023 13:00 (1 hour)

Contribution ID: 41

Type: **not specified**

PyROOT and RDataFrame

Presenter: FIDALGO RODRIGUEZ, Guillermo Antonio (University of Puerto Rico at Mayagüez)

Session Classification: Afternoon Session

Contribution ID: 42

Type: **not specified**

USCMS Talk - How to do Particle Physics in a Climate Emergency?

Friday 9 June 2023 16:00 (1 hour)

Presenter: BLOOM, Kenneth (University of Nebraska Lincoln (US))

Session Classification: Afternoon Session

Contribution ID: 43

Type: **not specified**

USCMS Talk - Supersymmetry

Monday 12 June 2023 16:00 (1 hour)

Presenter: STROBBE, Nadja (University of Minnesota (US))

Session Classification: Afternoon Session

Contribution ID: 44

Type: **not specified**

EXTERNAL Talk - Cosmology: Dark Matter and Dark Energy (Dan Hooper)

Tuesday 13 June 2023 13:00 (1 hour)

Contribution ID: 45

Type: **not specified**

USCMS Talk - PURSUE Alumni (Xinyue Wu - Rochester)

Wednesday 14 June 2023 16:30 (30 minutes)

Presenter: WU, Xinyue

Session Classification: Afternoon Session

Contribution ID: 46

Type: **not specified**

EXTERNAL Talk - Wormholes in the Laboratory (Joseph Lykken)

Thursday 15 June 2023 13:00 (1 hour)

Contribution ID: 47

Type: **not specified**

USCMS Talk - CMS Tracker

Thursday 15 June 2023 16:00 (1 hour)

Presenter: DICKINSON, Jennet Elizabeth (Fermi National Accelerator Lab. (US))

Session Classification: Afternoon Session

Contribution ID: 48

Type: **not specified**

USCMS Talk - Muon Colliders

Friday 16 June 2023 16:00 (1 hour)

Presenter: JINDARIANI, Sergo (Fermi National Accelerator Lab. (US))

Session Classification: Afternoon Session

Contribution ID: 49

Type: **not specified**

Python for HEP (Matplotlib and other tools)

Friday 9 June 2023 13:00 (3 hours)

Presenters: MOREIRA COIMBRA, Bruno (Fermi National Accelerator Lab. (US)); LOMTE, SHIV-ANI

Session Classification: Afternoon Session

Contribution ID: 50

Type: **not specified**

Searching ni shell and collaborating with Git

Monday 12 June 2023 14:00 (2 hours)

Completion of the shell tutorial:

- Use grep and find to search content and files.

Completion of the Git tutorial

- A Python project

- Collaborating using forks and pull requests

Presenter: MAMBELLI, Marco (Fermilab (US))

Session Classification: Afternoon Session

Contribution ID: 51

Type: **not specified**

Entering Research 1: Setting Expectations

Tuesday 6 June 2023 09:00 (1 hour)

This is based on the Center for the Improvement in Mentored Experiences in Research's (CIMER's) Entering Research curriculum is for new students or trainees entering mentored research relationships.

Presenters: PALMER, Chris (University of Maryland (US)); MANTILLA SUAREZ, Cristina Ana (Fermi National Accelerator Lab. (US))

Session Classification: Morning Session

Contribution ID: 52

Type: **not specified**

Entering Research 2: What to do?

Tuesday 13 June 2023 09:00 (1 hour)

This is based on the Center for the Improvement in Mentored Experiences in Research's (CIMER's) Entering Research curriculum. That curriculum is for new students or trainees entering mentored research relationships.

Presenters: PALMER, Chris (University of Maryland (US)); MANTILLA SUAREZ, Cristina Ana (Fermi National Accelerator Lab. (US))

Session Classification: Morning Session

Contribution ID: 53

Type: **not specified**

ROC tour - David Yu

Friday 9 June 2023 11:40 (20 minutes)

Session Classification: Morning Session

Contribution ID: 54

Type: **not specified**

Bonnie Fleming (FNAL Deputy Director for S&T and CRO) talks to interns

Friday 9 June 2023 10:00 (30 minutes)

Session Classification: Morning Session

Contribution ID: 55

Type: **not specified**

Python for HEP (Scikit-HEP) continued

Friday 9 June 2023 10:30 (1h 10m)

Session Classification: Morning Session

Contribution ID: 56

Type: **not specified**

HL-LHC Computing

Wednesday 5 July 2023 16:00 (1 hour)

Presenter: GUTSCHE, Oliver (Fermi National Accelerator Lab. (US))

Contribution ID: 57

Type: **not specified**

WH 14th floor Electronics Lab visit - Danny Noonan

Monday 12 June 2023 11:30 (30 minutes)

Contribution ID: 58

Type: **not specified**

Don Lincoln - TOE

Tuesday 13 June 2023 16:00 (1 hour)

Presenter: LINCOLN, Don (Fermi National Accelerator Lab. (US))

Session Classification: Afternoon Session

Contribution ID: 59

Type: **not specified**

Sidet Tour - Jennet Dickinson

Wednesday 14 June 2023 13:00 (1h 15m)

Session Classification: Afternoon Session

Contribution ID: **60**

Type: **not specified**

Long-lived Particle Search Overview

Wednesday 28 June 2023 16:00 (1 hour)

Presenters: ADAMS, Todd (Florida State University); ADAMS, Todd (Florida State University (US))

Contribution ID: **61**

Type: **not specified**

USCMS Career Talk - Scarlet Norberg

Wednesday 21 June 2023 13:00 (1 hour)

Presenter: NORBERG, Scarlet Rachel (Fermi National Accelerator Lab. (US))

Contribution ID: **62**

Type: **not specified**

USCMS alumni - Intern (David Velasco)

Friday 23 June 2023 16:30 (30 minutes)

Presenter: VELASCO, David

Contribution ID: **63**

Type: **not specified**

5 min - 5 slides

Friday 23 June 2023 09:00 (3 hours)

Contribution ID: **64**

Type: **not specified**

Career Development Session

Monday 26 June 2023 13:00 (1 hour)

Presenter: HOGAN, Julie (Brown University, Bethel University (US))

Contribution ID: 65

Type: **not specified**

Career Development Session

Monday 24 July 2023 13:00 (1 hour)

Presenter: HOGAN, Julie (Brown University, Bethel University (US))

Contribution ID: **66**

Type: **not specified**

The Big Picture

Wednesday 12 July 2023 16:00 (1 hour)

Presenter: QUIGG, Chris (Fermi National Accelerator Lab. (US))

Contribution ID: 67

Type: **not specified**

Top Physics

Thursday 6 July 2023 16:00 (1 hour)

Presenter: ERBACHER, Robin (University of California Davis (US))

Contribution ID: **68**

Type: **not specified**

CMS calorimeters

Wednesday 19 July 2023 16:00 (1 hour)

Presenter: YU, David (University of Nebraska Lincoln (US))

Contribution ID: **69**

Type: **not specified**

Dark Matter

Friday 14 July 2023 16:00 (1 hour)

Presenter: PINNA, Deborah (University of Wisconsin Madison (US))

Contribution ID: 70

Type: **not specified**

Theories Beyond the Standard Model

Wednesday 26 July 2023 13:00 (1 hour)

Presenter: DOBRESCU, Bogdan

Contribution ID: 71

Type: **not specified**

CMS/LPC/HEP/Vision - conversation

Tuesday 13 June 2023 11:40 (20 minutes)

Presenter: KLIMA, Boaz (Fermi National Accelerator Laboratory (FNAL))

Session Classification: Morning Session

Contribution ID: 72

Type: **not specified**

CMS Trigger

Monday 10 July 2023 16:00 (1 hour)

Presenter: HERWIG, Christian (Fermi National Accelerator Lab. (US))

Contribution ID: 73

Type: **not specified**

"Office Hour"

Thursday 6 July 2023 15:00 (59 minutes)

Informal, optional "office hour"

Presenter: BOSE, Tulika (University of Wisconsin Madison (US))

Contribution ID: 74

Type: **not specified**

Meet a USCMS scientist

Friday 21 July 2023 13:00 (1 hour)

Presenter: BERRY, Douglas Ryan (Fermi National Accelerator Lab. (US))

Contribution ID: 75

Type: **not specified**

ML basics

Friday 28 July 2023 16:00 (1 hour)

Presenter: SERGEI V, Gleyzer

Contribution ID: 76

Type: **not specified**

Interns upload posters to the website

Sunday 6 August 2023 09:00 (8 hours)

Contribution ID: 77

Type: **not specified**

Talk 1

Session Classification: Morning Session - Interns' Final Presentations (Each 30 min slot = 15 min slides +5 min Q&A +10 min write feedback)¶

Contribution ID: 78

Type: **not specified**

Talk2

Session Classification: Morning Session - Interns' Final Presentations (Each 30 min slot = 15 min slides +5 min Q&A +10 min write feedback)¶

Contribution ID: 79

Type: **not specified**

Talk 7 - Search for a right-handed W boson decaying to a heavy neutral lepton

Wednesday 9 August 2023 13:00 (30 minutes)

Presenter: LE, Trong

Session Classification: Afternoon Session: Interns' Final Presentations (Each 30 min slot = 15 min slides +5 min Q&A +10 min write feedback)¶

Contribution ID: **80**

Type: **not specified**

Talk 8 - Comparison of Profiling Results for Run 3 and High Pileup LHC Simulation and Reconstruction

Wednesday 9 August 2023 13:30 (30 minutes)

Presenter: MKWANANZI, Bongwe

Session Classification: Afternoon Session: Interns' Final Presentations (Each 30 min slot = 15 min slides +5 min Q&A +10 min write feedback)¶

Contribution ID: **81**

Type: **not specified**

Talk 1 - Training and validation of Machine Learning algorithms in the Endcap Muon Track-Finder

Wednesday 9 August 2023 09:00 (30 minutes)

Presenter: RIGLIONI, Emanuela

Session Classification: Morning: Session - Interns' Final Presentations (Each 30 min slot = 15 min slides +5 min Q&A +10 min write feedback)¶

Contribution ID: 82

Type: **not specified**

Talk 2 - Design of radiation hard thermal interface material for CMS Phase II Inner Tracker

Wednesday 9 August 2023 09:30 (30 minutes)

Presenter: RICKETS, Brendan

Session Classification: Morning: Session - Interns' Final Presentations (Each 30 min slot = 15 min slides +5 min Q&A +10 min write feedback)¶

Contribution ID: 83

Type: **not specified**

Talk 13 - Cosmic Muon Station for Outer Tracker Module Testing

Thursday 10 August 2023 09:00 (30 minutes)

Presenter: VLASKOVIC, Elena

Session Classification: Morning: Session - Interns' Final Presentations (Each 30 min slot = 15 min slides +5 min Q&A +10 min write feedback)¶

Contribution ID: 84

Type: **not specified**

Talk 14 - Cosmic Muon Station for Outer Tracker Module Testing

Thursday 10 August 2023 09:30 (30 minutes)

Presenter: HERNANDEZ, Luan

Session Classification: Morning: Session - Interns' Final Presentations (Each 30 min slot = 15 min slides +5 min Q&A +10 min write feedback)¶

Contribution ID: 85

Type: **not specified**

Talk 19 - Quality assurance of Macro-Pixel Sub-Assemblies (MaPSA) before installation in CMS

Thursday 10 August 2023 13:00 (30 minutes)

Presenter: JAIDEE, I-see Warisa

Session Classification: Afternoon Session: Interns' Final Presentations (Each 30 min slot = 15 min slides +5 min Q&A +10 min write feedback)¶

Contribution ID: 86

Type: **not specified**

Talk 20 - The search for Di-Higgs production in bbWW

Thursday 10 August 2023 13:30 (30 minutes)

Presenter: LIANG, Steve

Session Classification: Afternoon Session: Interns' Final Presentations (Each 30 min slot = 15 min slides +5 min Q&A +10 min write feedback)¶

Contribution ID: 87

Type: **not specified**

Talk 20

Session Classification: Afternoon Session: Interns' Final Presentations (Each 30 min slot = 15 min slides +5 min Q&A +10 min write feedback)¶

Contribution ID: **88**

Type: **not specified**

Talk 3 - Observations of the Top Quark

Wednesday 9 August 2023 10:00 (30 minutes)

Presenter: GLOVER, Jordan

Session Classification: Morning: Session - Interns' Final Presentations (Each 30 min slot = 15 min slides +5 min Q&A +10 min write feedback)¶¶

Contribution ID: 89

Type: **not specified**

Talk 4 - Dimensionality reduction for classification using Higgs dataset

Wednesday 9 August 2023 10:30 (30 minutes)

Presenter: ROMERO, Carlos

Session Classification: Morning: Session - Interns' Final Presentations (Each 30 min slot = 15 min slides +5 min Q&A +10 min write feedback)¶

Contribution ID: 90

Type: **not specified**

Talk 5 - Testing the Efficiency of Machine Learning at Classifying Higgs Boson Decays and Testing the Efficiency of New Triggers in Run 3 data

Wednesday 9 August 2023 11:00 (30 minutes)

Presenter: NARULA, Parveen

Session Classification: Morning: Session - Interns' Final Presentations (Each 30 min slot = 15 min slides +5 min Q&A +10 min write feedback)¶

Contribution ID: 91

Type: **not specified**

Talk 6 - Accurate Modeling of Electron Tagging Efficiency

Wednesday 9 August 2023 11:30 (30 minutes)

Presenter: AYALNEH, Hailemariam

Session Classification: Morning: Session - Interns' Final Presentations (Each 30 min slot = 15 min slides +5 min Q&A +10 min write feedback)¶

Contribution ID: 92

Type: **not specified**

Talk 9 - Reconstruction of mass Using SVfit

Wednesday 9 August 2023 14:00 (30 minutes)

Presenter: SOTO, Gabriel

Session Classification: Afternoon Session: Interns' Final Presentations (Each 30 min slot = 15 min slides +5 min Q&A +10 min write feedback)¶¶

Contribution ID: 93

Type: **not specified**

Talk 10 - Quality Control of ME0 and GE2/1 Test Stands for Phase 2 Upgrade

Wednesday 9 August 2023 14:30 (30 minutes)

Presenter: ABBADI, Sama

Session Classification: Afternoon Session: Interns' Final Presentations (Each 30 min slot = 15 min slides +5 min Q&A +10 min write feedback)¶

Contribution ID: 94

Type: **not specified**

Talk 11 - Optimizing the signal over background ratio in the search for Vector Like-Leptons

Wednesday 9 August 2023 15:00 (30 minutes)

Presenter: OLA, Andrea

Session Classification: Afternoon Session: Interns' Final Presentations (Each 30 min slot = 15 min slides +5 min Q&A +10 min write feedback)¶

Contribution ID: 95

Type: **not specified**

Talk 12 - Analysis Grand Challenge

Wednesday 9 August 2023 15:30 (30 minutes)

Presenter: MONDELLI, Christina (University of Nebraska Lincoln (US))

Session Classification: Afternoon Session: Interns' Final Presentations (Each 30 min slot = 15 min slides +5 min Q&A +10 min write feedback)¶¶

Contribution ID: 96

Type: **not specified**

Talk 15 - Search for a heavy resonance decaying to a pair of Higgs bosons in 4tau final state (boosted)

Thursday 10 August 2023 10:00 (30 minutes)

Presenter: POPPEN, Kristin

Session Classification: Morning: Session - Interns' Final Presentations (Each 30 min slot = 15 min slides +5 min Q&A +10 min write feedback)¶

Contribution ID: 97

Type: **not specified**

Talk 16 - Exploring Geant4 Performance in Optical Processes

Thursday 10 August 2023 10:30 (30 minutes)

Presenter: DE FIGUEIREDO, Felipe

Session Classification: Morning: Session - Interns' Final Presentations (Each 30 min slot = 15 min slides +5 min Q&A +10 min write feedback)¶

Contribution ID: 98

Type: **not specified**

Talk 17 - LLP Tagging at CMS L1 Trigger on Run 4

Thursday 10 August 2023 11:00 (30 minutes)

Presenter: MIRANDA, Michael

Session Classification: Morning: Session - Interns' Final Presentations (Each 30 min slot = 15 min slides +5 min Q&A +10 min write feedback)¶¶

Contribution ID: 99

Type: **not specified**

Talk 18 - GPU Acceleration of Machine Learning Inference

Thursday 10 August 2023 11:30 (30 minutes)

Presenter: GREEN, Hannah (Ohio Wesleyan University)

Session Classification: Morning: Session - Interns' Final Presentations (Each 30 min slot = 15 min slides +5 min Q&A +10 min write feedback)¶¶

Contribution ID: **100**

Type: **not specified**

Organizing committee - distribution of internship certificates

Thursday 10 August 2023 15:00 (1 hour)

Contribution ID: **101**

Type: **not specified**

Summary, Discussion and feedback session (interns and organizers)

Thursday 10 August 2023 14:00 (1 hour)