# Mohit Srivastav

*Bio Sketch*

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*Ph.D. Student at Johns Hopkins University*

## Education

**2022**
**Ph.D. Candidate**, Johns Hopkins University (JHU)

**2018–22**
**B.S. Physics, B.A. Computer Science**, University of Virginia (UVA)
Highest Distinction in Physics, High Distinction in Computer Science with Thesis

**2014–18**
**IB & Advanced Diploma**, South Lakes High School

## Publications

CMS Collaboration. Measurement of the higgs boson mass and width using the four-lepton final state in proton-proton collisions at $\sqrt{s} = 13$ tev, 2024.

## Experience

### Research

**2022**
**Off-shell Higgs Boson**, *CMS Joint 4-Lepton Study Team (CJLST)*
○ Produced constraints on the mass and width of the Higgs Boson, as well as anomalous Higgs Boson couplings, with the CMS detector at CERN [1]
○ Working on the $\kappa$ Framework extension included in the CMS Higgs Grand Combination
○ Working on new off-shell analysis examining Higgs production modes in the off-shell region

**2022**
**Spin-Parity Analysis of a Tetraquark Candidate**, *CMS B-Physics*
○ Finding the spin and parity of 3 low-mass resonances which constitute a candidate for a tetraquark, a new type of matter
○ BPH-24-002 in progress

**2022**
**JHUGen/JHUGen-MELA Development**, *Johns Hopkins University*
○ Developer for the JHUGen Package, which includes a Monte Carlo generator as well as a reweighting scheme
○ Created new Python bindings using PyBind11 to release a version of JHUGen-MELA in Python
○ Writing documentation for the JHUGen-MELA package utilizing Doxygen
○ Version 7.5.7 released Dec. 20, 2024

**2020–22**
**Optimizing Cuts for Experimental Dead-time**, *Mu2e Collaboration*
○ Utilized machine learning to minimize experimental deadtime at high beam intensities
○ Studied the aging of test-stand di-counters for particle detection
○ Culminated in my Distinguished Majors Interdisciplinary Thesis in Computer Science

### LHC Service Work

**2022**
**CMS Tracker Alignment**, *Tracker Alignment Group*
Provide alignments for the CMS tracker and validate performance over time

**2022**
**Parton Showering and Filtering**, *CJLST*
○ Worked in conjunction with experts to establish better parton showering for off-shell Higgs Boson simulation to better match data
○ Produced a better filter for the 4-lepton channel to be used in off-shell Higgs Boson simulation

## Conference Proceedings

**2024**
**The Higgs Boson Width and Couplings from Off-shell Production**
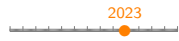USCMS Meeting – Princeton, NJ

**2024**
**JHUGen-MELA Tutorial for Higgs SM EFT**
LPC EFT Workshop – University of Notre Dame, IN

**2024**
**JHUGen-MELA Tutorial for Off-shell Higgs Study**
LPC Off-shell Higgs Boson Workshop – Fermi National Accelerator Laboratory, IL

**2023**
**Analysis of Hadronic Resonance Structures in the $J/\psi J/\psi$ Invariant Mass Spectrum**
American Physical Society April Meeting – Minneapolis, MN

**2022**
**Improvements to Cosmic Muon Identification Using Machine Learning**
Virginia Space Grant Consortium Research Symposium – Norfolk, VA

**2021**
**Improvements to Cosmic Muon Identification Using Machine Learning**
APS Meeting of the Division of Particles and Fields – Florida State University, FL

## Awards and Honors

**2024**
**CMS IRIS-HEP Analysis Software Training (March. 2024)**

**2023**
**URA P5 Fermilab Travel Grant (Dec. 2023)**

**2021**
**Mitchell Undergraduate Research Scholarship (June. 2021)**

**2021**
**Virginia Space Grant Consortium Research Scholarship (Apr. 2021)**

**2021**
**SULI Argonne Lab REU (January 2021)**
Accepted, did not go due conflict with research plans

**2020**
**DAAD Rise Research Fellowship REU (March 2020)**
Accepted, cancelled due to COVID-19

**2020**
**SULI Jefferson Lab REU (January 2020)**
Accepted, cancelled due to COVID-19

## Select Teaching Experience

**Head TA**, *Classical Mechanics for Majors*, Fall 2024
Head TA for Physics 1 for Physics Majors

**TA**, *General Physics Lab*, Fall 2023 – Spring 2024
TA for General Physics Lab 1 & 2

**TA**, *Computer Algorithms*, Summer 2020 – Spring 2021
TA for CS 4102

**TA/Head TA**, *Introductory Computer Science in Python*, Spring 2019 – Spring 2022
TA and Head TA for CS 1110/1111

## Other Experience

**2023–24**
**Fitness Monitor**, *Ralph O'Connor Rec Center*, JHU
Helped manage facilities, play music, and interact/help patrons at the gym

**2019–21**
**Treasurer**, *International Relations Organization*, UVA
Managed taxes and finances on the order of $30k for the 501c3 International Relations Organization at the University of Virginia