

# Sneha Vireshwar Dixit

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**EDUCATION:** Washington College (August 2020-May 2023) (Early graduation)  
B.S. in Physics + Mathematics | GPA : 4.00

## RESEARCH EXPERIENCE:

### Exploring Dark Matter Interactions w. SM Particles

March 2022-Present

Advisor : Dr. Digesh Raut

- Exploring properties of WIMP dark matter and its interactions with standard model particles.
- Using Wolfram Mathematica and the FeynCalc package to build and solve a freeze-out model of dark matter.
- Won competitive grants from Cater Society of Junior Fellows and John S. Toll Science Fellows Program.
- Links to : [Presentation Slides](#)

### US CMS Student Researcher | Fermilab

May-August 2022

Advisors : Dr. Nick Smith, Dr. Oksana Shadura

- Contributed to CMS Software ver. 10.6.X as a USCMS PURSUE intern at Fermilab.
- Developed computer program to convert CMS OpenData from before 2016 to the new NanoAOD datatype.
- Used C++, ROOT, Python for developing + debugging config files.
- Generated output files that make CMS OpenData accessible to researchers without technical difficulties.
- Links to : [GitHub Repository](#), [Pull Request on CMSSW 10.6.X](#), [Presentation Slides](#)

### Modelling Top-Quark Background for Di-Higgs search @ LHC

May-July 2022

Advisor : Dr. Suyog Shrestha

- Worked with CERN physicist Dr. Suyog Shrestha as a student contributor to the ATLAS Project @ CERN.
- Simulated top-quark background signals using ROOT and C++ on a Linux system.
- Used real Higgs Boson data from LHC @ CERN, Geneva to check simulations using statistical methods.

## SKILLS:

**Programming:** Python, ROOT, C++, HTML, CSS, Wolfram Mathematica, Linux, Bash/Shell, Virtual Machines with Docker, Git and Github, design and analysis of algorithms.

**Research:** Literature review, scientific modelling, grant writing, scientific report writing, advanced lab skills.

## TEACHING EXPERIENCE:

### Curriculum Design | Washington College

May-August 2022

- Ideated math bridge course to help students with weak math backgrounds adjust to intro-level STEM courses.
- Prepared curriculum and teaching materials from scratch for a 1 week student delivered course.
- Delivered course, resulting in STEM professors saving upto 2 hours of class time in the first 3 weeks of classes.

### Physics+Math tutor | Washington College

October 2021-Present

- Facilitated upto 2 letter grade improvements in test performance for tutored students.
- Led tutor training as senior tutor at Washington College's Quantitative Skills Centre.

## OUTREACH:

### Particle physics outreach in Bengaluru, India

August 2022-Present

- Used my work from Summer 2022 at Fermilab to create a weeklong particle physics outreach session targeting high school students in my home city, Bengaluru, India.
- Used python instead of ROOT and Linux to improve accessibility in low-income schools.
- Curriculum developed from scratch with inputs from Dr. Amitabh Lath and Dr. Suyog Shrestha.
- Aimed at helping students discover new career pathways and break free from societal pressures to pursue engineering and medicine.

### Improving science education in public schools in Bengaluru, India

July 2022-Present

- Working with non-profit Curiouscity to improve science education among public school students in my home city, Bengaluru, India.
- Designed simple, thought provoking, cost-effective experiments that can be repeated by students at home to explore scientific concepts.
- Researched and designed posters and articles to help students grasp concepts and become curious about science.