

Noah Zipper

Email: noah.zipper@colorado.edu
noahzipper@gmail.com
LinkedIn: [noah-zipper](#)
GitHub: github.com/nzipper

EDUCATION

University of Colorado Boulder Ph.D. in High-Energy Physics, Advisor: Keith Ulmer	Boulder, CO 2022–Current
University of Colorado Boulder M.S. in High-Energy Physics, Advisor: Keith Ulmer	Boulder, CO 2019–2022
University of Michigan Ann Arbor B.S. in Physics, GPA: 3.74/4.00	Ann Arbor, MI 2014–2018

EXPERIENCE

University of Colorado Boulder Graduate Researcher for CMS Group	Boulder, CO Summer 2019–Current
<ul style="list-style-type: none">– Measuring lepton flavor anomalies with CMS detector data– Developing nanosecond-fast machine learning algorithm implementations on FPGAs for data selection– Designing efficient data selection (trigger) systems for future long-lived particle detector proposal– Optimized real-time particle track identification pipeline using HLS for CMS upgrades– Calculated heavy flavor particle-tagging efficiencies for supersymmetry search	
University of Michigan Undergraduate Researcher for ATLAS Group	Ann Arbor, MI Fall 2015 – Winter 2018
<ul style="list-style-type: none">– Validated FPGA signal performance circuits using VHDL for upgrades to ATLAS muon spectrometer– Performed thermal testing for detector cooling enclosures– Optimized isolation scale factors for photon identification in electromagnetic calorimeter	
Lawrence Livermore National Laboratory Summer Research Scholar	Livermore, CA Summer 2018
<ul style="list-style-type: none">– Analyzed X-Ray spectra of relativistic electron plasmas to study laser wakefield accelerators– Used MATLAB to build models for calculating photon temperatures	
CERN Research Intern	Geneva, Switzerland Winter 2018
<ul style="list-style-type: none">– Background estimation for ATLAS analysis of Higgs boson with associated top quark– Calculated signal purities for Higgs boson coupling categories using a 2D Sideband method	

SELECTED PUBLICATIONS

1. A. Tumasyan *et al.* [CMS Collaboration], “2024 Data Collected with AXOL1TL Anomaly Detection at the CMS Level-1 Trigger,” CMS Detector Performance Summary (2024), [<https://cds.cern.ch/record/2904695>].
2. A. Tumasyan *et al.* [CMS Collaboration], “Anomaly Detection in the CMS Global Trigger Test Crate for Run 3” CMS Detector Performance Summary (2023), [<https://cds.cern.ch/record/2876546>].

3. CMS Collaboration, “Combined search for electroweak production of winos, binos, higgsinos, and sleptons in proton-proton collisions at $\sqrt{s} = 13$ TeV,” CMS-PAS-SUS-21-008 (2023), [<https://cds.cern.ch/record/2853345>].
4. A. Tumasyan *et al.* [CMS Collaboration], “Search for electroweak production of charginos and neutralinos at $\sqrt{s} = 13$ TeV in final states containing hadronic decays of WW, WZ, or WH and missing transverse momentum,” Phys. Lett. B **842**, 137460 (2023), [arXiv:2205.09597 [hep-ex]].
5. CMS and ATLAS Collaborations, “Snowmass White Paper Contribution: Physics with the Phase-2 ATLAS and CMS Detectors,” CERN Report, CMS-PAS-FTR-22-001, ATL-PHYS-PUB-2022-018 (2022).
6. A. Tumasyan *et al.* [CMS Collaboration], “Search for higgsinos decaying to two Higgs bosons and missing transverse momentum in proton-proton collisions at $\sqrt{s} = 13$ TeV,” JHEP **2022**, 14 (2022) [arXiv:2201.04206 [hep-ex]].

CONFERENCE TALKS

1. N. Zipper, *Precision Flavor Measurements and Real-Time Anomaly Detection at the CMS Detector*, APS 4 Corners Meeting 2024, Flagstaff, Arizona, USA, October 2024.
2. N. Zipper, *Testing a Neural Network for Anomaly Detection in the CMS Global Trigger Test Crate during Run 3*, Topical Workshop on Electronics for Particle Physics (TWEPP) 2023, Geremeas, Sardinia, Italy, October 2023.
3. N. Zipper, *Search for Electroweak SUSY in Hadronic Final States with the CMS Detector*, The XXIX International Conference on Supersymmetry and Unification of Fundamental Interactions, University of Ioannina, Ioannina, Greece, June 2022.

SKILLS

- **Programming Languages:** Python, C++, Shell Scripting, MATLAB, some HTML & CSS
- **Python Libraries:** Numpy, Pandas, Scikit-Learn, TensorFlow (Keras), hls4ml, SQLite, Dask, ROOT
- **Programmable Logic/Hardware:** HLS and VHDL for FPGAs, Soldering
- **Operating Systems:** UNIX, MacOS
- **Other Software Tools:** Git, Docker, LaTeX, Microsoft Office, Adobe Illustrator

LANGUAGES

- **English:** Mother tongue
- **Italian:** Conversational proficiency

TEACHING

- | | |
|--|-------------|
| • Teaching Assistant at CU Boulder
<i>General Physics 1</i> | Fall 2019 |
| • Teaching Assistant at CU Boulder
<i>Experimental Physics 1</i> | Spring 2020 |
| • Teaching Assistant at CU Boulder
<i>Experimental Physics 2</i> | Fall 2020 |

AWARDS

- | | |
|---|------------------|
| • APS 4 Corners Harry Lustig Award Finalist | 2024 |
| • NSF GRFP Honorable Mention | 2022 |
| • Student Travel Grant, APS DPP | 2018 |
| • James B. Angell Scholar | 2018 |
| • Poster presentation, US ATLAS Workshop | 2017 |
| • University Honors | 2014, 2015, 2017 |