

## EDUCATION

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

## EXPERIENCE

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

## SELECTED PUBLICATIONS

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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

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1. 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.
2. 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

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- **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:** MacOS, UNIX
- **Other Software Tools:** Git, Docker, LaTeX, Microsoft Office, Adobe Illustrator

## LANGUAGES

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

## TEACHING

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- **Teaching Assistant** at CU Boulder      Fall 2019  
*General Physics 1*
- **Teaching Assistant** at CU Boulder      Spring 2020  
*Experimental Physics 1*
- **Teaching Assistant** at CU Boulder      Fall 2020  
*Experimental Physics 2*

## AWARDS

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- 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