Justin A. **Williams**

Particle Physicist · Ph.D Candidate

3721 Pinnacle Ct, Lawrence, KS, 66049

850-933-0854 | justinwilliams@ku.edu | justinawilliams

Education

The University of Kansas (KU) — *Lawrence, KS*

Ph.D in Physics — *2016-2021*

- Awarded the Madison and Lila Self Graduate Fellowship

The University of West Florida (UWF) — *Pensacola, FL*

B.S. in Physics and Mathematics — *2012-2016*

- Athletic scholarship for the UWF Men's Basketball team

Skills

Programming	Python, C/C++, Fortran, Linux, Bash, LaTeX, SAS, Mathematica, cmssw
Data Analysis	Statistical Modeling, Machine Learning, Monte carlo
Communication	Biweekly collaboration presentations, International speaking engagements
Leadership	Captain of collegiate basketball team, President of Student Athlete Advisory Committee, Graduate Student Representative

Experience

The University of Kansas / CERN — *Lawrence, KS*

Graduate Research Assistant — *2016 - PRESENT*

- Utilized 100 fb^{-1} of data from the Large Hadron Collider to study Beyond Standard Model physics in photon interactions.
- Analyzed and modeled large amounts of data to search for events with new physics.
- Presented updates at biweekly collaboration meetings and many international conferences.
- Mentored undergraduate students as they began their first experience with physics research.

Madison and Lila Self Graduate fellowship — *Lawrence, KS*

Fellow — *2016 - PRESENT*

- Engaged in the leadership development program targeted for general education and training in communication, management, innovation, and leadership.
- Interacted with nationally prominent experts to gain broad knowledge of public policy topics.
- Attended an intensive government and science policy seminar held in Washington, D.C.

US Large Hadron Collider Users Association — *Washington D.C.*

LHC User — *2018*

- Collaborated with 30 other physicist to advocate for particle physics funding with members of congress for three days in Washington D.C.

KU Physics Department — *Lawrence, KS*

Graduate Student Representative — *2018 - Present*

- Elected by the department to represent and advocate for the graduate student body in departmental assemblies.

UWF Men's Basketball — *Pensacola, FL*

Team Captain — *2015-2016*

- Orchestrated team meetings and operated as a liaison for my NCAA division II basketball team as the elected captain.

UWF Student Athlete Advisory Committee (SAAC) — *Pensacola, FL*

President — *2015-2016*

- Organized and executed 4 charity events to raise money for Make-A-Wish foundation resulting in the most profit in UWF SAAC history.

UWF Physics Department — *Pensacola, FL*

UWF Research Scholar — *2014-2016*

- Utilized exact diagonalization in Fortran to simulate long-range interactions in 36 site geometrically frustrated spin systems with Dr. C. N. varney for over 200 hours.

Extracurricular Activity

Loaves and Fishes Soup Kitchen — *Pensacola, FL*

Volunteer — *2012 - 2016*

- Served food and presented motivational messages to 120 members of the homeless community on a weekly basis.

Learning Machine Learning club — *S.Korea*

Member — *Jun. 2012 - PRESENT*

- Actively participate in a student-run organization that delves into the idea of machine learning techniques and its applications into physics research.

Honors & Awards

2016 **Madison and Lila Self Graduate fellow**,
2016 **University of West Florida Physics Student of the year**,
2015 **Student Athlete Leadership Award**,
2015 **The University of West Florida Outstanding Undergraduate Student**,
2016 **NABC Good Works Team**, Finalist for community service
2015 **Athletic Directors Association Academic Achievement award**,
2014 **Phi Kappa Phi Honors Society**,
2012 **Nautilus Scholarship**,
2015 **Who's Who Award**,
2015 **Summer Undergraduate Research Program Scholar**,

Presentations

CMS Exotica Workshop — *Athens, GR*

Presenter — *Nov 2018*

- Diphoton Analysis with Intact Protons

Particle Physics on the Plains — *Lawrence, KS*

Presenter — *Oct 2018*

- Anomalous Coupling Studies with Intact Protons at the LHC

Exploring the Dark Side of the Universe — *Guadeloupe, FR*

Presenter — *Jun 2018*

- CT-PPS Physics Results and Prospects

LHC Forward Physics Working Group Workshop — *Madrid, SP*

Presenter — *Mar 2018*

- CT-PPS Physics Results and Prospects

US Large Hadron Collider Users Association — *Chicago, IL*

Presenter — *Oct 2017*

- Photon Photon Physics with CT-pps

International Conference for New Frontiers in Physics — *Crete, GR*

Presenter — *Aug 2017*

- Search for Anomalous Quartic Photon Couplings At The lhc

TOTEM Collaboration Meeting — *Malaucene, FR*

Presenter — *Jun 2017*

- Exclusive Diphoton Analysis in CT-PPS

LHCC — *Geneva, switzerland*

Presenter — *Mar 2017*

- Quartic Anomalous Photon Couplings At The LHC in CMS and TOTEM

LHC Forward Physics Working Group Workshop — *Trento, Italy*

Presenter — *Sep 2016*

- Anomalous Quartic 4γ Studies

Publications

First measurement of elastic, inelastic and total cross-section at $\sqrt{s}$=13 TeV by TOTEM and overview of cross-section data at LHC energies: TOTEM Collaboration

Eur.Phys.J C

DOI: 10.1140/EPJC/S10052-019-6567-0

Feb 2019

CT-PPS Physics Results and Prospects

Proceedings Of Science

DOI: 10.22323/1.335.0032

Sep 2018

Observation of proton-tagged, central (semi)exclusive production of high-mass lepton pairs in pp collisions at 13 TeV with the CMS-TOTEM precision proton spectrometer

JHEP

DOI: 10.1007/JHEP07(2018)153

Jul 2018

First measurement of elastic, inelastic and total cross-section at $\sqrt{s}$=13 TeV by TOTEM and overview of cross-section data at LHC energies

Eur.Phys.J C

DOI: 10.1140/EPJC/S10052-019-6567-0

Dec 17

First determination of the ρ parameter at $\sqrt{s}$ = 13 TeV – probing the existence of a colourless three-gluon bound state

CERN

CERN-EP-2017-335

Dec 2017