Douglas Raymond Davis

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Education

- **PhD in Experimental Elementary Particle Physics** August 2014 — present (Graduating end of 2020)

  Duke University, Durham, NC, USA

  - Thesis research: Single top quark physics using dilepton final states with the ATLAS detector at the LHC.
  - Candidacy status as of April 2017
  - Goshaw Family Fellowship (twice, 2014 — 2015 Academic year, and 2018)

- **BS in Physics (with Special Honors)** Graduated May 2014

  The University of Texas at Austin, Austin, TX, USA

  - Thesis title: *A Monte Carlo study of the NuMI Neutrino Beam in the MicroBooNE Detector.*
  - Multiple undergraduate merit based scholarship awards.

Experience

- **Graduate Student Researcher & ATLAS Experiment Collaborator** Fall 2014 — present

  Duke University & CERN

  - **Lead analyst** measuring the production of a top quark in association with a W boson at the LHC: developed data analysis pipelines for processing terabytes of data, trained boosted decision tree classifiers for separating signal from background, and performed statistical tests comparing experimental observations against theoretical models. *Dissertation research* (Feb. 2018 – Present).
  - **Deputy coordinator/Particle Identification coordinator** of the Transition Radiation Tracker software group: co-lead the activities of this ATLAS sub-detector group. Developed and maintained data analysis API, oversaw junior student projects calibrating existing particle identification tools and prototyping machine learning based classification tools. (2016 – 2018).
  - **Graduate student mentor** to multiple undergraduate researchers: guided undergraduate students on software projects ranging from building graphical event displays to training deep neural networks (2016 – Present).
  - **Teaching Assistant** for undergraduate courses: a Modern Physics Laboratory course and an Introduction to Astronomy course. (2015 – 2016).

- **Undergraduate Researcher** 2012 — 2014

  UT Austin & Fermilab

  - **Undergraduate researcher** constructing and developing simulation and reconstruction software for a cosmic ray muon telescope. Used simulations to study the exposure of the MicroBooNE detector to an auxiliary source of data.

Computing (links: GitHub, CERN GitLab)

- Proficient Programming: C++, Python
- Capable Programming & Scripting: Bash, C, Clojure, Emacs Lisp.
- Operating Systems, Libraries, and Tooling: Unix/Unix-like OSes, the SciPy & PyData stacks (NumPy, SciPy, Matplotlib, Pandas, etc.), Scikit-learn, LightGBM, pybind11, conda(-forge), Boost, OpenMP, Emacs, Git, CMake, Sphinx, containerization, continuous integration/testing.
- Open Source Software Projects: pygram11 (GitHub link)

Mentoring, Outreach

- North Carolina Science Festival, State-wide Star Party telescope operator.
- Physics Dept. peer mentor at The University of Texas at Austin.