

Dr. Darrel W. Smith
Curriculum Vitae

Email: smith@erau.edu
Phone: 928.777.6663
Fax: 928.777.3827

Department of Physics & Astronomy
Embry-Riddle Aeronautical University
3700 Willow Creek Rd.
Prescott, AZ 86301

Education

1975–1979 Ph.D, Physics (specialization in high-energy physics) UC Irvine
(Dissertation: “Antiproton-deuteron production of Λ 's below 1 GeV/c”
PI—Jonas Schultz
1972–1975 M.A. Physics UC Irvine
1970–1972 B.A. Physics UC Irvine

Employment:

2018—present Professor of Physics, Embry-Riddle Aeronautical University
1996–2017 Professor of Physics, Embry-Riddle Aeronautical University (tenured)
Department Chair, Department of Physics & Astronomy
1990–1996 Associate Professor Physics, Embry-Riddle Aeronautical University
1985–1990 Associate Research Physicist, UC Riverside
1982–1985 Visiting Scientist, CERN and Assistant Research Physicist, UC Riverside
1979–1982 Post-Doc, UC Irvine

Research Activities

2018—present Search for Sterile Neutrinos using the Coherent Captain Mills (CCM) detector at Los Alamos National Lab.
2009–2018 UG cosmic ray research lab at ERAU. Investigating how cosmic ray muons interact with the hydrogen and carbon nuclei.
2007–Present Exotic Propulsion for future space missions (e.g., manned mission to Mars)
2000–2013 MiniBooNE experiment at Fermilab, search for massive neutrinos
1990–1999 LSND (Large Scintillator Neutrino Detector) at Los Alamos National Laboratory, search for massive neutrinos (dark matter)
1985–1990 DZero experiment at Fermilab, construction of the silicon vertex detector for discovering the top quark. PI—Anne Kernan
1982–1985 UA1 experiment at CERN, discovery of the W^{\pm} and Z^0 particle, first evidence for the unification of electromagnetic and weak interactions. PI—Carlo Rubbia and Anne Kernan
1979–1982 IMB proton decay, search for proton decay, and neutrino astrophysics
PI—Fred Reines
1975–1979 Lambda production in antiproton-deuteron collisions. PI—Jonas Schultz
1972–1975 Kaon, pion, and resonance production in antiproton-proton collisions

Publications Found at this URL:

<http://physicsx.pr.erau.edu/CV%20and%20Publications/publications.pdf>

Grant Activity

2008-2015	Principle Investigator, NSF-STEM grant for space physics students. \$598K
1997-2001	Principle Investigator, NSF grant. \$160K
1995-1997	Principle Investigator, Received an NSF Creativity Award. \$80K
1992-1995	Principle Investigator, NSF grant. \$145K
1991-1995	Principle Investigator, FAA grant from the Department of Transportation to start an Airway Science Lab at ERAU-Prescott. \$298K + matching funds of \$300K.
1982-1990	Assistant and Associate Research Physicist (CERN, UC Riverside) supported by a DOE grant
1979-1982	Post-Doc supported by a DOE grant
1972-1979	Graduate Student on AEC, ERDA, and DOE (Department of Energy) grants

Computer skills, data analysis, etc.

- Extensive use of Fortran for data analysis and Monte Carlo simulation programs (e.g., GEANT)
- Extensive use of Mathematica for visualization of physics solutions (research and classroom)
- Track fitting in silicon detectors—eventually used to discover the top quark.
- System administrator for VMS (VAX) computers; knowledgeable in Unix and Linux
- Built computers and wrote code in assembler language to readout data from small and large experiments.
- Proficient in LaTeX—the journal style equivalent of MS Word.
- Set up experiments using VME and VMX readout electronics, including the writing of on-line data acquisition software.

Activities and Awards while at Embry-Riddle (starting 1990)

- 1991 Submitted and “received” the first FAA Airway Sciences grant on our campus (\$298K). This was used to build the Air Traffic Control lab on campus.
On August 1, I installed the first internet connection on an ERAU campus.
I’m the original “registered” owner of the **erau.edu** domain name.
- 1992 Submitted and “received” my first NSF grant
Outstanding Faculty Award—for setting up the Internet in Prescott: ERAU, Yavapai College, and the Yavapai Library Network.
Elected to be the faculty representative to the ERAU Board of Trustees (1992-1997)
Attended the Computing in High Energy Physics conference in Annecy, France where Tim Berners-Lee (who also received his BA in physics) presented his development of the world-wide web (www).
- 1993 Wrote and designed ERAU’s first webpage using a LINUX server. It was the first web page in the state of Arizona.
- 1994 Received my second Outstanding Faculty Award--“keeping the ERAU-Prescott campus open in Prescott.”
- 1995 Received my second NSF Grant, along with an **NSF Creativity Award**. This was the first NSF Creativity Award earned by an ERAU researcher.

- 2000 Asked by the Board of Trustees to lead the search for the University's VP of Academics. I did this while I was on my sabbatical.
- 2001 Submitted our proposal for a new Space Physics program before the DB Faculty Senate; unfortunately, it was September 11th and I had to return 6 weeks later to get it approved. This is the only undergraduate program in Space Physics in the world.
- 2003 First incoming class of Space Physics students. Daytona Beach starts their Space Physics program 2 years later (2005) based on our success.
I became the department chair of the new Physics Department
- 2005 Hired new faculty to expand the Space Physics program. Three of these faculty were part of the LIGO experiment (Laser Interferometer Gravitational wave Observatory). Their work led to the discovery of Gravitational Waves in 2015.
- 2009 Submitted and "received" an NSF-STEM award to support Space Physics students with \$598,000 of scholarships for 6 years.
- 2012 Proposed to start an Astronomy degree with Dr. Rachford as the program chair. The degree program formally started in 2013.
- 2014 Accepted our first Ph.D student on the Prescott Campus, Marek Szczepanczek. He was a LIGO graduate student and earned his Ph.D. in 2018. A second Ph.D. student has started her graduate work in the LIGO experiment, Kelly Ault.
- 2015 Banner year for the LIGO faculty. The first direct measurement of Gravitational Waves—100 years after Einstein predicted their existence (1915).
- 2016
- ERAU-Prescott space physics faculty and students share in the monetary award called the Special Breakthrough Prize totaling \$3M. The prize is shared among the LIGO collaborators and is not offered on a regular basis, but only on special occasions for outstanding discoveries. The investment in our three, new faculty "paid off."
 - Elected Chair of the American Physical Society (4-Corners Section). My primary responsibility was planning the yearly conferences and growing the membership in the section.
 - Assisted Dr. Archie Dickey with the plans and details for the new STEM building, in particular, the planetarium project and the science labs on both floors.
 - Nominated and selected by the Prescott faculty senate to be their faculty representative in the search for ERAU's next president. Dr. Barry Butler was selected and he will be our next ERAU President.
- 2017 Stepped down from being department chair. I was department chair for the last 15 years.
- 2018 Joined the CCM experiment at Los Alamos. This experiment is designed to search for sterile neutrinos that might explain the curious results seen in short-baseline neutrino experiments (e.g., LSND, and MiniBooNE). It uses the pulsed neutron source at the LANL Lujan Center. UG students from Embry-Riddle are also working on this project and we're making 2-3 trips a semester to Los Alamos to work on the experiment.
- 2019 The CCM experiment received word (April) that it is now a "fully funded" LANL project for the next 3 years. I'm going on sabbatical this fall 2019 and I plan to work on the CCM experiment at Los Alamos National Lab (TA-53).