

JAMES R. ZABEL

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CURRENT POSITION

Adjunct Professor in Physics – *San Jacinto College* – Houston, TX June, 2017 – Present

- Developed curriculum, lectures, homework, and exams for algebra- and calculus-based introductory physics courses.
- Courses include Mechanics & Heat and Electricity & Magnetism both for non-majors and engineering students.
- Proctored laboratory experiments for each of the courses.

AREAS OF SPECIALIZATION

Physics; Experimental Particle Physics

As a member of the Compact Muon Solenoid (CMS) Collaboration at CERN in Geneva, Switzerland, I partook in research that analyzed high energy particle collisions generated by the Large Hadron Collider (LHC) to make precision measurements of the top quark and search for evidence of SuperSymmetry by searching for top squark pair production. As well, I contributed to the maintenance, calibration, and upgrade of the Silicon Pixel Subdetector, the central most component of CMS detector, used to help reconstruct charged particle tracks and identify interaction vertices.

EDUCATION

PhD in Physics – *Rice University* – Houston, TX May, 2017

- Member of the US-CMS Collaboration through the Bonner Nuclear Laboratory
- Thesis: *Search for Direct Top Squark Pair Production via the Fully Hadronic Final State from proton-proton Collisions at $\sqrt{s} = 13$ TeV*

Master of Science in Physics – *Rice University* – Houston, TX August, 2013

- Thesis: *Occupancy Study of the CMS Pixel Subdetector for the Phase 1 Upgrade*

Bachelor of Science in Physics & Mathematics – *The University of Texas at Austin* – Austin, TX May, 2007

TEACHING EXPERIENCE

Teaching Assistant & Lab Assistant – *Rice University* – Houston, TX January, 2010 – May, 2011

- Teaching Assistant for Introduction to Nuclear and Particle Physics
 - Graded homework assignments and recorded grades.
 - Led several problem sessions designed to assist students with homework assignments.
- Lab Assistant for Mechanics and Electricity & Magnetism (two sections of each course)
 - Responsible for mastery of the lab and lab materials to effectively proctor laboratory experiments.
 - Graded lab reports and pre-lab quizzes and recorded grades.

Grader – *The University of Texas at Austin* – Austin, TX August, 2006 – May, 2007

- Graded homework assignments and recorded grades for a variety of courses in mathematics.
- Courses included: College Algebra, Discrete Mathematics, Linear Algebra, and Differential Equations.

Tutor – *The University of Texas at Austin* – Austin, TX May, 1998 – May, 1999

- One-on-one tutoring, as well as drop-in tutoring in group settings, of core curriculum in Mathematics and Physics.
- Topics included: College Algebra, Calculus, Differential Equations, Mechanics, and Electricity & Magnetism.

RESEARCH EXPERIENCE

Graduate Student – *Rice University* – Houston, TX & Geneva, Switzerland May, 2009 – May, 2017

- Designed, developed, and implemented a calibration that helped to monitor and configure the CMS Pixel subdetector.
- Designed, developed, and performed a simulation used to estimate data rates and flux for the upgrade components that replaced the original CMS Pixel subdetector. For this work I was awarded a Master of Science in Physics.
- Assisted in day-to-day operations of the CMS Pixel subdetector ensuring the apparatus was calibrated, configured, and functional thus providing key information necessary for the reconstruction of proton-proton collisions.
- Assisted in analyses concerning the measurement of the top quark pair production cross section.
- Assisted in analyses concerning searches for the supersymmetric partner to the top quark. Primary work centered on analyzing the QCD multijet background to isolate procedures that utilize statistical methods to improve the predicted yields and uncertainties.

Undergraduate Lab Assistant – *Julius-Maximilians-Universität* – Würzburg, Germany May, 2006 – August, 2006

- Assisted in the construction of a new Photoemission Spectrometer.
- Designed a sample tray platform meeting the specific needs of the experimental apparatus.
- Created CAD drawings for several major components of the apparatus.

PUBLICATIONS

Selected Publications as a member of the CMS collaboration

CMS Physics Analysis Summary SUS-2016-049 2017

Search for direct top squark pair production in the fully hadronic final state in proton-proton collisions at $\sqrt{s} = 13$ TeV corresponding to an integrated luminosity of 35.9 fb^{-1}

CMS Physics Analysis Summary SUS-2016-029 2016

Search for direct top squark pair production in the fully hadronic final state in proton-proton collisions at $\sqrt{s} = 13$ TeV corresponding to an integrated luminosity of 12.9 fb^{-1}

CMS Physics Analysis Summary SUS-2016-008 2016

Searches for pair production of third-generation squarks in $\sqrt{s} = 13$ TeV pp collisions

CMS Physics Analysis Summary SUS-2016-007 2016

Search for direct production of top squark pairs decaying to all-hadronic final states in pp collisions at $\sqrt{s} = 13$ TeV

CMS Physics Analysis Summary SUS-2016-005 2016

Search for stop pairs in the all-hadronic final state at 13 TeV

CMS Analysis Note 2016-437 2016

Search for direct production of top squark pairs in the fully-hadronic final state with data collected in pp collisions at $\sqrt{s} = 13$ TeV using the entire 2016 dataset

CMS Analysis Note 2016-180 2016

Search for direct production of top squark pairs in the fully-hadronic final state with data collected in pp collisions at $\sqrt{s} = 13$ TeV in 2016

CMS Analysis Note 2016-179 2016

Search for supersymmetry in events with soft b-jets and large missing transverse energy in the all-hadronic final state with data collected in pp collisions at $\sqrt{s} = 13$ TeV in 2016

CMS Analysis Note 2015-027 2015

Search for supersymmetric top quarks in pp collisions at $\sqrt{s} \approx 13$ TeV

CMS Analysis Note 2010-172 2010

Selection of $t\bar{t}$ Candidates in the Electron + Jets Channel

Measurement of top-antitop cross section using the semileptonic topology: electron plus jets with one or more b-tags

Full list of publications as a member of the CMS collaboration can be found on inspire:

2009 – 2017

<http://inspirehep.net/search?ln=en&as=1&m1=e&p1=james+zabel&f1=author>

TALKS

Presenter – *Bonner Lab Seminar - Rice University* – Houston, TX May 5, 2016

- Title: “*Super Symmetric Top Quark Search in the 0-Lepton Final State.*”

Presenter – *American Physical Society - April Meeting* – Denver, CO April 14, 2013

- Title: “*Occupancy Study of the Phase 1 Upgrade to the CMS Pixel Sub-detector*”

Presenter – *CMS Phase 1 Pixel Upgrade Workshop* – Grindelwald, Switzerland August 30, 2012

- Title: “*Data Rate & Flux Analysis for Pixel Phase 1 Upgrade*”

PROFESSIONAL DEVELOPMENT

Coursework

UNIV 599 - **Teaching Portfolio** – *Rice University* – Houston, TX Fall 2015

UNIV 502 - **Practicum in College Teaching** – *Rice University* – Houston, TX Summer 2015

UNIV 501 - **Research on Teaching and Learning** – *Rice University* – Houston, TX Spring 2015

UNIV 500 - **Principles of Effective College Teaching** – *Rice University* – Houston, TX Fall 2014

Workshops

Talking about Your Teaching During First-Round Interviews October 8, 2014

Striking a Balance: How to Manage Our Teaching Workloads March 28, 2014

Designing Effective Courses and Syllabi March 14, 2014

Tips and Techniques for Engaging Students February 28, 2014

The Parts of Teaching Nobody Ever Talks About: Classroom Management, Advising, and More! February 14, 2014

PROFESSIONAL EXPERIENCE

Coordinator & Librarian – *Dynamic Reprographics* – Austin, TX July, 2007 – May, 2009

- Managed, prepared, and prioritized incoming orders for architectural, engineering, and construction reprography.
- Maintained a database keeping up to date records for ongoing architectural projects.

Senior Escalations Engineer – *Polycom, Inc.* – Austin, TX October, 2000 – March, 2005

- Individually managed customer issues requiring engineering support for resolution. This included data entry, face to face customer dialogue and relations, reproduction of issues, analysis of issues to determine root causes, coordination with engineering to create resolutions, documentation of resolved issues, and developing new testing procedures.
- Onsite customer visits to analyze technical issues, gather detailed information, and troubleshoot with engineering support.
- Provided detailed technical information for the marketing, sales, and technical support departments.
- Analyzed system documentation to ensure technical accuracy.
- Developed a protocol for tracking customer issues.
- Managed beta programs which included providing beta software and working with beta sites to find issues, gather information, and resolve these issues with engineering support.
- Integrated Polycom’s products with third party custom control equipment.
- Competitively analyzed video and audio quality between Polycom and other market leading products.

SQA Test Script Writer & Tester – *Polycom, Inc.* – Austin, TX

August, 1999 – October, 2000

- Created detailed test scripts outlining testing procedures required to correctly facilitate organized testing for the SQA department.
- Comprehensively tested Polycom's videoconferencing systems and Global Management System to ensure the quality of software and hardware.

GRANTS, HONORS, & AWARDS

Melvin J. Rieger Scholarship Fund in Physics

Fall 2006 – Spring 2007

Walter E. Millett Endowed Undergraduate Scholarship in Physics

Spring 2006