

Andrew Leister

Curriculum Vitae

Phone: +1-703-851-8919
andrew.leister@yale.edu

21 Pearl St.
New Haven, CT 06511

Education

Yale University – New Haven, CT 06520

PhD Candidate in Physics May 2015 Expected Completion

Expected Dissertation Topic: Physics with High Energy Taus

Advisor: Sarah Demers

MS in Physics May 2011

The College of William and Mary – Williamsburg, VA 23186

BS with Honors in Physics May 2009

Thesis: "Design and Construction of the MTest Detector"

Additional Major in Applied Mathematics

Continuing Education:

ATLAS Tau Workshop: Oxford University, Oxford Mar 2012

ATLAS Tau Workshop: Universität Freiburg, Freiburg Oct 2010

Academic Honors and Awards

Yale University Physics Qualifying Exam: Pass with Distinction Fall 2010

College of William and Mary Graduate Summa Cum Laude Spring 2009

College of William and Mary Physics Department
graduating honors Spring 2009

Cissy Paterson Prize for Excellence in Mathematics Spring 2009

ΦBK National Honor Society Member – Alpha Chapter Fall 2008

Don Edward Harrison Jr Award for Excellence in Physics Fall 2008

E Gary Clark Memorial Physics Scholarship Spring 2008

Monroe Scholarship for summer research based on
academic qualifications Fall 2005

College of William and Mary Dean's List Fall 2005 – Spring 2009

Experience

Graduate Research

Sep 2009 – Present

Yale University

New Haven, CT

European Organization for Nuclear Research (CERN)

Geneva, Switzerland

ATLAS is one of four detectors built to detect the products of 14 TeV proton-proton collisions from the Large Hadron Collider (LHC) at the European Organization for Nuclear Research (CERN). The Tau Combined Performance group is responsible for organizing and overseeing all experimental activity

involving the tau lepton at ATLAS. My plan for a graduate thesis is to analyze physical data involving taus to improve experimental conditions and observe signatures of exotic particles, primarily the neutral Z' gauge boson.

In the summers of 2010 and 2011 I have worked with the ATLAS data quality monitoring group as a representative from the tau combined performance group. The purpose of the data quality monitoring group is to assess data from the ATLAS detector to determine if the detector has performance issues that would interfere with the quality of physics data. In 2010 I established several automated checks to assess the quality of histograms that are crucial to the tau performance group. In 2011, in addition to continuing the checks, I was assigned the role of tau data quality monitoring expert, responsible for writing and maintaining the software code used for tau data quality monitoring.

More recently I have shifted my interests to tau identification, or developing methods used for identifying taus. In particular, I will be working to distinguish taus from electrons at high transverse energy.

Teaching Assistant

Yale University

Sep 2009 – May 2011

New Haven, CT

In Fall 2009 I held office hours for three hours a week and graded for a calculus-based introductory physics lecture. In Spring 2010 and Fall 2010 I conducted and graded weekly laboratory courses for introductory level physics. In Spring 2011 I conducted and graded an advanced level modern physics laboratory course.

Post Undergraduate Research Assistant

Fermi National Accelerator Laboratory (Fermilab)

June 2009-Aug 2009

Batavia, IL

As a continuation of my undergraduate work with the MINERvA detector, I moved to Fermilab to continue construction of the scintillator planes (2.5 cm-thick cross sections) for the detector. This work focused on final stages of construction, which involved connecting the outer segments to the inner parts of the detector and performing final tests for quality. Work in the latter half of the summer involved uninstalling defective detector planes from the NuMI (Neutrinos at the Main Injector) beam-line tunnel.

Undergraduate Research Assistant

The College of William and Mary

Aug 2008-May 2009

Williamsburg, VA

Working with Professor Jeffrey Nelson, I worked to design and begin construction on the MTest detector, a smaller version of the MINERvA detector used for neutrino oscillation research at Fermi National Accelerator Laboratory. The purpose of the MTest is primarily to provide calibrations for MINERvA. As part of the work done, several tests were performed to determine which materials would be ideal to support the detector under experimental conditions. Alongside this work, construction on MINERvA (begun during previous summer REU) was continued to further understanding of the functions and inner workings of the detector.

Thesis: physics.wm.edu/Seniorthesis/SeniorThesis2009/Leister.pdf

Physics Research Experience for Undergraduates (REU) May 2008-Aug 2008
The College of William and Mary Williamsburg, VA

In preparation for senior thesis work, I began work on the MINERvA detector with Professor Jeffrey Nelson. The detector used foam scintillator and wavelength-shifting fiber technology to provide precise measurements for neutrino detection at Fermi National Accelerator Laboratory (Fermilab). The work performed this summer involved constructing planes (2.5 cm-thick cross sections of the detector) to be sent to Fermilab for final construction phases. The construction involved using epoxy to assemble scintillator segments into place, inserting wavelength-shifting fibers and injecting epoxy to secure them, arranging fibers to create output to experimental circuitry, and covering detector in material to prevent light leaks. Tests involving an ammeter and light source were performed to ensure each plane met specific standards for sensitivity to light.

Science Undergraduate Laboratory Internship (SULI) May 2007-Aug 2007
Thomas Jefferson National Accelerator Facility (Jefferson Lab) Newport News, VA

Working with the Helium-3 (^3He) group under Dr. J.P. Chen at Jefferson Lab, I performed an experiment using a laser-interferometer setup to measure the density of a ^3He cell to be used for neutron spin-structure studies. This density measurement is important because it is used to calculate the experimental cross section for the cell's use with the facility's electron beam. This research provided introductory experience in LabVIEW and ROOT software.

Notes and Publications

Internal ATLAS notes

ATLAS Note for Tau Data Quality Monitoring: Sep 14, 2011
The Commissioning Plan for Tier0 Tau Combined Performance Data Quality
Provides an overview to taus with ATLAS, the methodology of tau data quality, and details of histograms used for data quality monitoring

References

Professor Sarah Demers sarah.demers@yale.edu +1-203-432-3720
Principal Investigator of Yale group working with tau leptons at ATLAS

Professor Jeffrey Nelson jknel@wm.edu +1-757-221-3579
Principal investigator of neutrino studies group at the College of William and Mary