Curriculum Vitae

David W. Lawrence

Thomas Jefferson National Accelerator Facility
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Positions:

2005-present: **Staff Physicist**(SSI) Jefferson Lab, Newport News,
Virginia

2004-2005: **Data Acquisition Physicist**(SSI) Jefferson Lab, Newport News,
Virginia

2005-present **Adjunct Professor of Physics**. Christopher Newport University

2004-2007 **Adjunct Assistant Professor**. Experimental Nuclear Physics
University Massachusetts

2003-2004: **Research Assistant Professor**. Experimental Nuclear Physics
University Massachusetts (stationed at Jefferson Lab Accelerator in Newport
News Virginia)

1998-2003: **Senior Postdoctoral Research Associate**,
University of Massachusetts (stationed at Jefferson Lab Accelerator in Newport
News Virginia)

Education:

Ph.D. in Physics, Arizona State University, 1998
Subfield: Experimental Subatomic Physics
Dissertation: *Initial Tests of the πβ Decay Detector*
Advisor: Barry Ritchie

M.S. in Physics. Arizona State University, 1995

B.S. in Physics, University of Oklahoma, 1992

Teaching:

I have taught as an adjunct in the evenings for the last few years at Christopher Newport University. Prior to that, my university-level teaching experience was as a T.A. at Arizona State University. I also participated in a special GAANN program for my first 2 years of grad. school that focused on physics teaching.

Christopher Newport University:
- **PHYS 351** Modern Physics Lecture: Spring 2009
- **PHYS 202L** Physics lab for physical science majors: Spring 2008
- **PHYS 201L** Physics lab for physics/engineering majors: Fall 2006, Fall 2007
- **PHYS 151L** Physics lab for science majors: Fall 2008
- **PHYS 105L** Physics lab for non-science majors: Spring 2006, Spring 2007

Arizona State University: (as grad. student, T.A.)
- Modern Physics Recitation: Spring 1994
- Elementary Physics Lab I: Fall 1992, Fall 1993
- Elementary Physics Lab II: Spring 1993

Research:

I have been involved in several medium energy nuclear physics experiments including PiBeta, CLAS, PrimEx, and most recently GlueX. My research interests have been mainly in the areas of muti-threaded event reconstruction, trigger electronics, data acquisition, calibration, analysis, and simulation. Some specific contributions I have made are:

- **Software Coordinator** for GlueX/Hall-D at Jefferson Lab. I was responsible for coordinating the overall software effort, maintaining the repository, producing and maintaining tagged software releases etc. In addition, I ran regular meetings and reported on the overall status at collaboration meetings 3 times a year.

- **Simulation Studies** for GlueX. I have done numerous simulation studies of the GlueX detector in order to both validate and optimize the design.

- **Charged Particle Tracking Software** for GlueX. I have developed the pattern recognition and track fitting code for GlueX.

- **Embedded Linux** for single board computers like the Motorla MVME5100, and MVME5500.

- **Developed multi-threaded reconstruction software framework** for the GlueX experiment.

- **Data acquisition electronics**: Designed, purchased, and installed complex triggering and fast data acquisition system for PrimEx. The DAQ was based on CODA and used **VXI/VME** with **VxWorks**, **Fastbus**, and **CAMAC**. The system was used on both Linux and SunOS platforms.

- **Analysis Software**: I served as both **Software Group Leader** and **Lead Developer** for PrimEx. I developed a framework for the analysis software using C/C++.

- **Detailed Simulation**: I wrote a simulation package for PrimEx based on **GEANT3**. I have used the simulation to perform detailed studies of room backgrounds and expected detector rates. I also simulated the response of the triggering system.

I was a contributing member of the CLAS collaboration from 1998-2004. My primary contributions there were:

- **CLAS Drift Chamber Maintenance**: I participated in the CLAS on-call pager rotation for 5 years. During this time, I was responsible for analyzing and resolving hardware problems in the course of an experiment as they occurred.

- **CLAS Drift Chamber Calibration**: I wrote a GUI based drift chamber calibration program which incorporated MINUIT fitting routines from CERNLIB. This program is still used to calibrate all CLAS drift chamber data.

- **Pair Spectrometer Triggering Electronics**: I helped design and install the triggering electronics for the Hall-B pair spectrometer. I also incorporated the trigger into the CLAS DAQ system.

- **Photon Tagger**: I have involvement with the photon tagger since doing initial bench tests of the ADML electronics as a graduate student at ASU. I have participated in several tagger maintenance initiatives. I was also key to initial beam tests of the new JLab designed E-counter electronics. I wrote the control programs for these VME based boards which utilized **RPC** in the **VxWorks** environment.

Service to the Field:

- GlueX Collaboration Board member 2005-2006

- Jefferson Lab User's Group Board of Directors 2002-2004

- I have participated in Jefferson Labs' BEAMS program for several years. This program is a science education program aimed at local area 6th graders.

- Served as "Scientific Judge" at Virginia Regional High School Science Bowls since 2003

- I have done numerous science demonstrations at local elementary and middle schools to try and get young people excited about science.

Collaborations:

- GlueX collaboration 2004-present
  (elected member of collaboration board 2006-2008)

- PrimEx collaboration 1998-present

- CLAS collaboration 1998-2004

- πβ experiment 1994-1998

Invited Talks:

July 2006 Grad. Student seminar series; Jefferson Lab, Newport News, Virginia
"MySQL Databases: An Introduction for the Novice"

January 2005 Exotics 2005; Physik Zentrum, BadHonnef,Germany
"GlueX: Search for Gluonic excitations at JLab"

August 2003 Colloquium; Chulalongkorn University, Bangkok, Thailand
"Recent Experimental Evidence of Pentaquarks"

August 2003 Colloquium; Chulalongkorn University, Bangkok, Thailand
"PrimEx: A precision Measurement of the pi0 Lifetime via the Primakoff Effect"

May 2002 Colloquium; MIT-Bates, Massachusetts
"Precision Measurement of $\Gamma(\pi^o \rightarrow \gamma\gamma)$ via the Primakoff Effect"

Contributed Talks:

May 2009 CIPANP 2009; San Diego, CA
   "The GlueX Detector"

March 2009 CHEP'09; Prague, Czech Republic
   "The JANA Calibrations and Conditions Database API"

February 2006 CHEP'06; Mumbai, India
   "*C++ object persistency with JIL*"

November 2003 SESAPS 2003; Univ. of North Carolina, Wilmington, North
   Carolina
   "*Study of the Axial Anomaly Using the $\gamma p \rightarrow \pi^+ \pi^o n$ Reaction Near
   Threashold*"

October 2001 DNP2001 Williamsburg, VA
   "*Measurement of the π^o lifetime via the Primakoff Effect*"

October 2001 DNP2001 Williamsburg, VA
   "*Study of the Axial Anomaly Using the $\gamma p \rightarrow \pi^+ \pi^o n$ Reaction Near
   Threashold*"

October 2000 DNP2000 Williamsburg, VA
   "*Instrumentation for a Precise Measurement of $\Gamma(\pi^o \rightarrow \gamma\gamma)$ from pion
   photoproduction via the Primakoff effect at TJNAF* "

Commercial Consulting:

- Wrote commercial driver for Citizen PPU-231 serial printer under Mac OS 9
- Wrote commericial driver for Bematech MP2000 USB printer under Mac OS
  9 (using USB to serial converter)
- Wrote driver for Citizen PPU-231 printer under OS X with USB interface
- PHP/MySQL based search engine for commercial sites (art-match.com and
  art-host.com)

References:

The following persons have agreed to write letters of recommendation on my behalf upon request:

Alex Dzierba, Chancellor's Professor of Physics Emeritus
Dept. of Physics
Indiana University
(812) 855-9421

Dave Doughty, Chair
Department of Physics, Computer Science, and Engineering
Christopher Newport University
Phone: (757) 594-7365

Curtis A. Meyer, Professor
Dept. of Physics
Carnegie Mellon University
(412) 268-2745

Rory Miskimen, Professor
Department of Physics
University of Massachusetts
(413) 545-2480

Elton Smith, Staff Scientist
Thomas Jefferson National Accelerator Facility
(757) 269-7625

Selected Publications:

Multi-threaded event reconstruction with JANA
D. Lawrence 2008 *J. Phys.: Conf. Ser.* **119** 042018 (6pp)
doi: 10.1088/1742-6596/119/4/042018

C++ Introspection and Object Persistency Through JIL
D. Lawrence, D. Abbott, V. Gyurjyan, E Jastrzembski, C. Timmer, E. Wolin, JLab
Proceedings of the Conference on Computing in High Energy and Nuclear Physics,
CHEP06 (in preparation) (2006)

Design, Commissioning and Performance of the PIBETA Detector at PSI
E. Frlez, D. Pocanic, et al.
Nucl.Instrum.Meth. A526 (2004) 300-347

Final results from the Palo Verde Neutrino Oscillation Experiment
F.Boehm, J.Busenitz, B.Cook, G.Gratta, H.Henrikson, J.Kornis, D.Lawrence, K.B.Lee,
K.McKinney, L.Miller, V.Novikov, A.Piepke, B.Ritchie, D.Tracy, P.Vogel, Y-F.Wang,
J.Wolf
Phys.Rev. D64 (2001) 112001

Cosmic muon tomography of pure cesium iodide calorimeter crystals
E. Frlez, et al. Nucl. Instrum. Meth. A440 (2000) 57-85

The bremsstrahlung tagged photon beam in Hall B at JLab
 D.I. Sober, et al. NIM A440 (2000) 263.