

## Alex R. Dzierba

### HOME ADDRESS

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### EDUCATION

Ph. D. Experimental Particle Physics, University of Notre Dame - 1969  
B. S. Physics, Canisius College (Buffalo, NY) - 1964

### WORK EXPERIENCE

<b>Physicist</b>	EG&G Odon, IN	July 2008 - Present
<b>Distinguished Visiting Fellow</b>	Jefferson Lab Newport News, VA	May 2006 - May 2008
During this period I traveled to Jefferson Lab every other week to work on preparations for the upgrade of Jefferson Lab.		
<b>Chancellor's Professor Emeritus</b>	Indiana University Bloomington, IN	May 2006 - Present
<b>Chancellor's Professor</b>	Indiana University Bloomington, IN	May 2005 - May 2006
The Chancellor's Professor rank is one of the Named and Distinguished Professor Ranks at Indiana University.		
<b>Professor</b>	Indiana University Bloomington, IN	August 1973 - May 2005
I was appointed Assistant Professor in 1973, Associate Professor in 1976 and Full Professor in 1979.		
<b>Scientific Associate</b>	CERN Geneva, Switzerland	August 1985 - August 1986
CERN is the European Center for Nuclear Physics Research located in Geneva, Switzerland. During this period I was on sabbatical leave from Indiana University.		
<b>Program Officer</b>	National Science Foundation Washington, D.C.	May 1982 - August 1983
I was Program Officer for Elementary Particle Physics at the National Science Foundation. My responsibility was to review and recommend funding for US university groups. During this period I was on leave from Indiana University.		
<b>Research Fellow</b>	California Institute of Technology Pasadena, CA	July 1969 - August 1973
I was appointed Research Fellow in 1969 and Senior Research Fellow in 1971. I worked on research in experimental particle physics.		

## OTHER APPOINTMENTS

**GRE Physics Examiner** Educational Testing Services June 1998 - Present  
Princeton, NJ

I am a member of the Board of Examiners for the Graduate Record Exam (GRE) in Physics. The Board vets questions and approves the final version of the exam given internationally twice a year.

**Trustee-at-Large** SURA June 2002 - Present  
Washington, DC

The Southeastern Universities Research Association (SURA) is the managing body of Jefferson Lab in Newport News, VA.

**DOE Review Committee Member** Brookhaven Lab May 2008  
Upton, Long Island, NY

I am a member of a Department of Energy Committee that will review the national effort in Lattice Quantum Chromodynamics calculations to be held at Brookhaven National Laboratory.

**Chair, Search Committee** Indiana University May 2007 - May 2008  
Bloomington, IN

I am chairing the Search Committee to select the Director of the Indiana University Cyclotron Facility which also provides the proton beam for the Midwest Proton Radiotherapy Facility.

**Review Committee Member** CSSM at U. of Adelaide November, 2001  
Adelaide, Australia

I served on the committee reviewing the Center for the Subatomic Structure of Matter (CSSM) at the University of Adelaide in Australia.

**Review Committee Member** UC Santa Barbara February, 2001  
Santa Barbara, CA

I served on the committee reviewing the College of Creative Studies at the University of California at Santa Barbara, CA.

**Chair of the Users Group** Brookhaven National Lab 1991 - 1994  
Upton, Long Island, NY

I chaired the Users Executive Committee of the international group of users of the Alternating Gradient Synchrotron and Relativistic Heavy Ion Collider at Brookhaven National Laboratory. In that capacity I organized the annual meetings and made several trips visiting members of the Congress and their staff to discuss issues of funding for high energy physics.

## HONORS

I received the Physics Department Excellence in Teaching Award each year from 1995 through 1999.

I received the Indiana University Trustees Teaching Award in 2000 and 2001.

I was given the Indiana University Distinguished Research Lecture Award in 2004 and gave a public lecture: *Exotic Mesons and the Confinement of Quarks*. An interesting consequence was that Prof. Don Freund of the IU School of Music composed a fantasy for a wind ensemble that he named after my lecture. His composition premiered at the IU Musical Arts Center on February 15, 2005. The music is available on my website.

Elected Fellow of the American Physical Society in 1998.

## PRINCIPAL INVESTIGATOR

From 1985 to 1990 I was Co-Principal Investigator of a 6-faculty member Department of Energy (DOE) Grant for High Energy Physics Research. From 1990 until recently I was Principal Investigator of our DOE Particle/Nuclear Physics Grant which supports two faculty members, a Senior Scientist, three postdoctoral fellows, an electronics engineer, a technician and three graduate students. The annual grants varied between \$300K and \$400K depending on the level of construction for experiments.

## COLLABORATION SPOKESPERSON

High energy/nuclear physics experimental research is typically carried out by multi-institutional collaborations led by a *spokesperson*. Spokespersons coordinate the activities of the collaboration, present the science and technical case to funding agencies and national review committees and generally officially represent the collaboration. I have been spokesperson for several collaborations.

**GlueX** - This collaboration consists of 75 physicists from 20 institutions in the US, Canada, Europe, Russia and Australia. I was the founding spokesperson of this collaboration until recently. The collaboration was formed in 1997. The project is a search for a new state of matter, exotic mesons, using multi-GeV photons as a probe. In order to carry out the project, a new detector will be housed in a new experimental hall at the electron accelerator at Jefferson Lab. The cost of the GlueX experiment is \$30M and the accelerator will be upgraded in energy to carry out this experiment. During the last 10 years we have carried out a program of R&D on new detector technology. The project has undergone successful external reviews and construction will start in about 18 months with first beam to be delivered in 2014. GlueX is the flagship physics project for the \$300M upgrade of the Jefferson Lab accelerator. The physics of the project is described a cover story article in American Scientist, for which I was lead author. The article can be downloaded from a link on my website.

**Meson Spectroscopy at Brookhaven** - I was the founding spokesperson for the so-called E852 collaboration at Brookhaven National Lab to study the spectrum of mesons. The project was approved in 1990. My group at Indiana University was responsible for the largest detector sub-system, a photon detector consisting of 3000 blocks of lead-glass. The group designed the detector, read-out electronics, including 3000 channels of fast encoding ADC's and mechanical support. We finished data-taking in 1995 and published several papers.

**Meson Spectroscopy at Fermilab** - I was spokesperson for an experiment at Fermilab (near Chicago, IL) to study the spectrum of mesons at ultra-high energies. The experiment took data from 1976 to 1980.

## TEACHING EXPERIENCE

At Indiana University, faculty members who are actively involved in research normally teach one course per semester. Most courses meet three times per week. Information on some of the courses I have taught is available on my website. Some of the courses I taught during my tenure at Indiana University include:

**Honors Physics** - I developed this course in 1994 and taught it for eight years. The course is a two-semester course intended for incoming freshmen who are high academic achievers. Class enrollment is limited to 25 students. It is a calculus-based introductory physics course that met five days per week. Class sessions were a blend of lectures, discussion and an introduction to laboratory techniques. A classroom in the physics building, with computers and lab equipment, is dedicated to this course and students have access to this room 24 hours a day. Students designed and carried out lab projects, working in teams. Most of the students who have taken this course have gone on to graduate studies at schools such as Berkeley, Caltech, U. of Chicago, Cornell, M. I. T. and Oxford. This course is still being taught and is one of the more popular courses in the Physics Department. I am currently writing a textbook based on this course.

**Analytical Mechanics** - This is a two-semester course which I taught for two years for undergraduate seniors and graduate students. It covers Lagrangian and Hamiltonian mechanics, central forces, rigid-body motion, oscillating systems, relativity, chaos and numerical techniques. I taught this course for two years.

**Optics** - This is a one-semester course that includes a lab. It is usually taken by undergraduate juniors. The course covers geometric and physical optics. I taught this course twice.

**Electricity and Magnetism** - This is a two-semester course that is usually taken by undergraduate sophomores and juniors. The course covers static electricity, static magnetism, Maxwell's equations, radiation and relativity. I taught this course for three years.

**Analog and Digital Electronics** - This is a two-semester course that I taught for two years.

**Mathematical Physics** - This is a two-semester course for graduate students that I taught for a year.

**Elementary Particle Physics** - This is a two-semester course for graduate students that I taught for two years. It covers the physics of particle detectors and detectors and the theory of elementary particles.

#### **OTHER TEACHING ACTIVITIES**

In 2004 I initiated a B.S. track in Applied Physics in the Physics Department. This is a track intended to prepare students for jobs in industry or labs after college. The curriculum for this program includes standard undergraduate physics courses, a course in instrumentation and a requirement that students spend one or two summers working as interns. Several of the students in the program have interned at national labs and locally at NSWC Crane and at ProCure.

From 1990 through 2005, between three and five undergraduates per year worked in my research group. These students typically worked ten hours per week during the semester and full-time during the summer months. They worked on aspects of detector design and construction and data analysis. Students wrote technical notes, made presentations at weekly meetings and at times to collaboration meetings as well.

Seven Indiana University students earned their Ph.D.'s in elementary particle physics under my direction.

For the past 15 years I have given two to three lectures or lecture/demonstrations per year to elementary school students and/or high school students. Last year I also gave lectures to college students and high school teachers at Jefferson Lab.

#### **PERSONAL INFORMATION**

Born in Buffalo, NY - March 27, 1942

Married to Linda K. Dzierba (Owner/Broker - Dzierba Real Estate Services)

Children: Alex Jr (41), Robert (40), Carolyn (39) and Christopher (19)

Hobbies: Scuba-diving, photography, carpentry

## REPRESENTATIVE PUBLICATIONS

I am author or co-author of 85 articles in refereed journals. What follows are several of the more recent publications.

1. A. Dzierba, *QCD with a Light Touch*. A book review of *The Lightness of Being* by Physics Nobel Laureate Frank Wilczek, Amer. Sci. **97** 165 (2009).
2. A. R. Dzierba, R. Mitchell, E. Scott, M. R. Shepherd, P. Smith, M. Swat, S. Teige, A. P. Szczepaniak S. P. Denisov, V. Dorofeev, I. Kachaev, V. Lipaev, A. V. Popov, D. I. Ryabchikov, V. A. Bodyagin and A. Demianov, *Partial wave analysis of the  $\pi^-\pi^-\pi^+$  and  $\pi^-\pi^-\pi^+$  systems and the search for a  $J^{PC} = 1^{-+}$  meson*. Phys. Rev. **D73**, 072001 (2006).
3. A. R. Dzierba, C. A. Meyer and A. P. Szczepaniak, *Reviewing the evidence for pentaquarks*. Based on the talk given by A. Dzierba at the 1st Meeting of the APS Topical Group on Hadronic Physics (GHP2004), Batavia, Illinois, 24-26 Oct 2004. Published in J.Phys.Conf.Ser. **9** 192 (2005).
4. S. Denisov, A. Dzierba, R. Heinz, A. Klimenko, V. Samoilenko, E. Scott, P. Smith and S. Teige, *Systematic studies of timing characteristics for 2-m long scintillation counters*. Nucl. Instr. Meth. **A525** 183 (2004).
5. A. R. Dzierba, D. Krop, M. Swat, S. Teige and A. P. Szczepaniak, *The Evidence for a pentaquark signal and kinematic reflections*. Phys. Rev. **D69** 051901 (2004).
6. A. P. Szczepaniak, M. Swat, A. R. Dzierba, and S. Teige, *Study of the  $\eta\pi$  and  $\eta'\pi$  spectra and interpretation of possible exotic  $J^{PC} = 1^{-+}$  mesons*. Phys. Rev. Lett. **91** 092002 (2003).
7. A. R. Dzierba, J. Gunter, S. Ichiriu, R. Lindenbusch, E. Scott, P. Smith, M. R. Shepherd, S. Teige, M. Swat, A. P. Szczepaniak, S. P. Denisov, A. V. Popov, D. I. Ryabchikov, L. I. Sarycheva and J. Napolitano, *Study of the  $\eta\pi^0$  spectrum and the search for a  $J^{PC} = 1^{-+}$  meson*. Phys. Rev. **D67**, 094015 (2003).
8. A. Dzierba, *The science of confinement and the GlueX/Hall D project at Jefferson Lab*. Int. J. Mod. Phys. **A18** 397 (2003).
9. S. Denisov, A. Dzierba, R. Heinz, A. Klimenko, I. Polezhaeva, V. Samoylenko, E. Scott, A. Shchukin, P. Smith, C. Steffen, S. Teige and S. Volodina, *Characteristics of the TOF counter for the GlueX experiment*. Nucl. Instr. Meth. **A494** 495 (2002).
10. A. Dzierba, C. Meyer and E. Swanson, *The search for QCD exotics*. Amer. Sci. **88** 406 (2000).
11. A. Dzierba and N. Isgur, *Mapping quark confinement by exotic particles*. CERN Cour. **40N7** 23 (2000).