March 27, 2006

Dear Dr. Womack:

I apologize for the lateness of this application for professional development funds. I received information about the Chautauqua courses after the March 15 deadline. I consulted with Dr. Baker about whether you already met to evaluate the proposals and she told me that there were some leftover funds and encouraged me to apply.

I am including all the components of the proposal. Please let me know if you have any questions or if I overlooked any documents.

Respectfully,

Wilson J. Gonzalez-Espada, Ph.D.
Asst. Professor of Physical Science/Science Education
School of Physical and Life Sciences
Arkansas Tech University
1701 N. Boulder Ave. (McEver Hall)
Russellville, AR 72801
(479) 968-0293
(479) 964-0837 fax

1918 mi Hons

REQUIRED Cover Page

APPLICATION FOR PROFESSIONAL DEVELOPMENT GRANT

0. Applicant: Dr. Wilson J. Gonzalez-Espada, Assistant Professor of Physical Science

Choose one:	
[ ] Creative activity [ ] Research activity [X] Professional Enhancement activity	**Date of Last PDG Award** (Semester and Year awarded): No previous PRG award **Date of ATU Faculty Appointment** (Semester and Year): Fall 2001

1. Project Title: Professional training: Using research-based curricula in physics instruction (Chautauqua courses).

2. Name of Project Director: Priscilla W. Laws, David Sokoloff, Ronald Thornton (Instructors).

3. School (abbrev): PLS **4. Department:** Physical Sciences

5. Campus Mail Address: Mc Ever Hall 203 **6. Campus Phone:** 968-0248

7. Amount Requested: $ 1,917.96 **8. Total Cost of Project:** $ 2,537.28

9. Does this project involve: **10. Duration of Project:** June 3-7 and June 9-13, 2006

Yes	No	
[ ]	[X]	human subjects?
[ ]	[X]	animals/animal care facility?
[ ]	[X]	radioactive materials?
[ ]	[X]	hazardous materials?
[ ]	[X]	biological agents or toxins restricted by the USA Patriot Act?
[ ]	[X]	copyright or patent potential?
[ ]	[X]	utilization of space **not** currently available to the PI/PD?
[ ]	[X]	the purchase of equipment/instrumentation/software currently **available** to the PI/PD?

NOTE: If the answer is "yes" to any of the above questions, the investigator must attach appropriate documentation of approval or justification for use/purchase.

SIGNATURES

Jeffrey Raston 2006 mar 27
Department Head **Date**

[signature] 3-27-06
Dean **Date**

This Section to be completed by the Office of Academic Affairs

PDC Committee Award Recommendation: Yes____ No____
PDC Committee Proposal Rank: _____ of _____ Total Proposals.
Recommendation of VPAA: Yes____ No _____
Recommendation of President: Yes____ No _____
Award Date: _____

ARKANSAS TECH UNIVERSITY
PROPOSAL FOR PROFESSIONAL DEVELOPMENT GRANT

Dr. Wilson J. Gonzalez-Espada, Assistant Professor of Physical Science

A. COVER PAGE

B. ABSTRACT

The course PHYS 3042 (Intermediate Physics Laboratory) is a recent addition to the Physical Science/Earth Science Education bachelor's degree. This course aims at "expanding and refining essential content and laboratory skills [of preservice science teachers] through modeling and experimental investigation of topics in classical and modern physics" (Tech Catalog). This course is expected to be taught for the first time in the Fall Semester, 2007. In order to provide my students with research-based curricula and activities in physics education (e.g. Interactive Lecture Demonstrations (ILD), Web-Based ILD, RealTime Physics labs, Activity Based Tutorials, Collaborative Problem-Solving Tutorials, Physics Suite, and Workshop Physics, as well as modeling and video analysis tools), it is my responsibility to receive the appropriate training.

C. PURPOSE / OBJECTIVES

The purpose of this grant is to have the opportunity to receive training in the latest research-based curricula and activities in physics education in order to prepare to teach the course PHYS 3042 (Intermediate Physics Laboratory). Two main objectives are:

- To become proficient in several physics education curricula emphasizing mechanics, heat, and thermodynamics (Course I)
- To become proficient in several physics education curricula emphasizing electricity, magnetism, oscillations, waves, light, and optics (Course II)

D. SIGNIFICANCE / NEED

Research has shown that many students who took introductory physics courses in the standard lecture-recitation format learn to solve quantitative problems, but do not develop a real understanding of physics concepts, and keep most of their misconceptions in this area (Redish & Steinberg, 1999; Thacker, Kim & Trefz, 1994). In the last twenty years, physicists have begun to approach the problems and challenges of physics teaching, learning, and assessment from a scientific perspective by conducting research on the learning and teaching of physics (Gonzalez-Espada, 2002; McDermott & Redish, 1999; Redish & Steinberg, 1999). Physics education research has been growing both in quantity, and in the quality and rigor of the research. Also, they are producing research-based, validated curricula. Unfortunately, most science faculty are not familiar with these essential resources. As a physics educator, it is my responsibility to ensure that pre-service teachers at Arkansas Tech University become familiar with technology-driven physics education curricula. To do a good job teaching my students, appropriate and in-depth training is a very important component. The knowledge I will receive through training can also be used to help those students interested in science fair projects related to physics and to work as a potential resource for local area teachers.

E. PROCESS FOR ATTAINMENT OF OBJECTIVES / GOALS

I will participate in two of the NSF short courses for college teachers (Chautauqua courses):

- Using Research Based Curricula and Tools to Promote Active Learning in Introductory Courses, Part I, by Priscilla W. Laws (Dickinson College), David R. Sokoloff (University of Oregon), and Ronald K. Thornton (Tufts University). This course will emphasize mechanics, heat, and thermodynamics and will be offered June 4-6, 2006 in the facilities of Vernier

Software Co., Beaverton, OR. I am planning on leaving Little Rock on June 3 and returning on June 7.

- Using Research Based Curricula and Tools to Promote Active Learning in Introductory Courses, Part II, by Priscilla W. Laws (Dickinson College), David R. Sokoloff (University of Oregon), and Ronald K. Thornton (Tufts University). This course will emphasize electricity, magnetism, oscillations, waves, light, and optics, and will be offered June 10-12, 2006 in the facilities of Tufts University, Medford, MA. I am planning on leaving Little Rock on June 9 and returning on June 13.

It is very important that I attend both courses with at least one year in advance of teaching PHYS 3042 because I will probably have to buy equipment and supplies for students.

F. DISSEMINATION OF RESULTS

Dissemination of the knowledge I will acquire through training will be disseminated in at least three important ways:

- By teaching PHYS 3042 to all pre-service science teachers seeking certification in Physical Science/Earth Science education.
- By serving as an advisor for high school students interested in working on a science project that requires technology for data collection and analysis, especially through the Arkansas Junior Science and Humanities Symposium (JSHS) and the course PHSC 3213 (Science education for elementary teachers).
- By serving as a potential resource for local area teachers interested in using the physics education curricula.

G. REPEATED REQUESTS

This is not a repeated request.

H. BUDGET

The budget includes the basic expenses related to an out-of state trip between June 3-7 and June 9-13, 2006. It is estimated that the cost of lodging, airline ticket, ground transportation, meals, registration, and incidentals should be about $1,268.64 for each of the two trips (Oregon and Maryland). An itemized budget is attached. It is important to mention that the cost of airline ticket is based on internet data from 3/22/2006. It is known that the cost of airline tickets increases if they are purchased close to the departure date.

It is expected that the department of Physical Science will contribute with 25% of the funds. The university travel form is attached.

I. BIBLIOGRAPHY: Provide standard citations for material referenced.

- Gonzalez-Espada, W. J. (2002). Physics education research in the United States: A summary of its rationale and main findings. *Journal of Science Education/REC*, 4(1), 5-7.
- McDermott, L., and Redish, E., Resource letter: Physics education research, *American Journal of Physics* 67, 755-767, 1999.
- Redish, E. and Steinberg, R., Teaching physics: Figuring out what works, *Physics Today* 52, 24-30, 1999.
- Thacker, B., Kim, E., and Trefz, K., Comparing problem solving performance of physics students in inquiry based and traditional introductory physics courses, *American Journal of Physics* 62, 627-633, 1994.

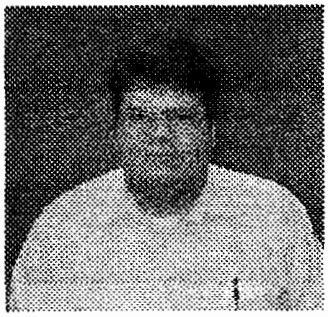
J. APPLICATION VITA

PROPOSED BUDGET
FACULTY RESEARCH GRANT
(Include budget categories as appropriate)

1.	Graduate assistant stipend	0
2.	Non-work study stipend	0
3.	*Supplies (please list items to be purchased and estimated price per item including taxes and shipping, if appropriate):	
	Total estimated supplies	0
4.	Travel (please list travel expenditures by date and estimated costs):	

Travel No. 1	Course I (Vernier Software Co., Beaverton, OR)		
	Airline ticket	$500	
	Hotel 4 nights	$400	
	Ground transportation	$50	
	Meals	$150	
	Registration	$50	
	Airport parking, Incidentals	$50	
	Mileage RSVL – LR airport	$68.64	
	Estimated Price		$1268.64
Travel No. 2	Course II (Tufts University, Medford, MA)		
	Airline ticket	$500	
	Hotel 4 nights	$400	
	Ground transportation	$50	
	Meals	$150	
	Registration	$50	
	Airport parking, Incidentals	$50	
	Mileage RSVL – LR airport	$68.64	
	Estimated Price		$1268.64
	Total estimated travel		$2537.28

5.	*Capital Outlay (please list items to be purchased and estimated price per item including taxes and shipping, if appropriate):	
	Total estimated capital outlay	0
	TOTAL PROPOSED BUDGET	$2537.28



I. PERSONAL INFORMATION

Name: Wilson J. Gonzalez-Espada
Address: 2119 Timberwood Lane
Russellville, AR 72802
Phone/e-mail: (479) 968-0248/wilson.gonzalezespad@atu.edu

II. EDUCATION

Doctorate: Ph.D. Science Education (2001)
The University of Georgia, Athens, GA (1998-2001)
Dissertation: High School Physics Teaching in Puerto Rico: Contextual and Cultural Issues (under Dr. J. Steve Oliver).

Masters: M.A. Science Education (1997)
Interamerican University of Puerto Rico, San German, PR (1995-1997)

Bachelors: B.A. Secondary Education-Physics & Mathematics (1993)
University of Puerto Rico, Rio Piedras, PR (1988-1993)

III. ACADEMIC POSITIONS

2001-2005 **Assistant Professor of Physical Science/Science Education**
School of Physical and Life Science, Arkansas Tech University, Russellville, AR

2000 **Teaching Intern** for the spring course ESCI 4460, Methods of Science Teaching
The University of Georgia, Athens, GA

1999 **Teaching Intern** for the spring course ESCI4440, Methods for Teaching Physical Sciences in the Middle School, The University of Georgia, Athens, GA

1996-1998 **Instructor of Physics and Mathematics**, Department of Physics and Mathematics
Instituto Tecnológico de Puerto Rico, Ponce, PR (VoTech Community College)

1994-1995 **Physics and Chemistry Teacher**
Notre Dame High School, Caguas, PR

1993 **Geometry and Algebra Teacher**
Notre Dame High School, Caguas, PR

IV. PROFESSIONAL EXPERIENCE SINCE 2001

2005 **Summer Research Fellow and REU Co-Mentor**, Center for the Analysis and Prediction of Storms, National Weather Center, Norman, OK.

2005+ **Physical Science Laboratory Coordinator**, Department of Physical Science, Arkansas Tech University.

2004 **Summer Research Fellow**, Center for Applied Research and Evaluation, Arkansas Children's Hospital/University of Arkansas for Medical Sciences, Little Rock, AR

2003 **Summer Visiting Scholar**, Center for Fairness in Assessment, Educational Testing Service, Princeton, NJ

2002+ **University Supervisor** of two student teachers in physical science education, Arkansas Tech University, Russellville, AR

Va. SCHOLARLY ACTIVITIES: PUBLICATIONS SINCE 2001

- Torres, S. M. and Gonzalez-Espada, W. J. (2006). Calculating "g" from acoustic Doppler data. *The Physics Teacher.*
- Gonzalez-Espada, W. J. (2005). Inmigración y multiculturalismo educativo: El caso de los estudiantes dominicanos en las escuelas puertorriqueñas. *Revista Iberoamericana de Educación,* 36(12), 1-9.
- Gonzalez-Espada, W. J., and Trantham, K. (2005). How is energy like money? Using analogies in physics teaching. *School Science Review,* 86(317), 85-90.
- Gonzalez-Espada, W. J. (2005). Succeeding in Introduction to Physical Science: Is mathematics background important? *Journal of the Arkansas Academy of Science,* 58, 60-64.
- Gonzalez-Espada, W. J., Ibarra, Melissa J., Ochoa, Eduardo R., and Vargas, Perla A. (2004). Multicultural medical encounters: The experience at a pediatric clinic. *Journal of the Arkansas Medical Society* (accepted).
- Gonzalez-Espada, W. J. (2005). Las limitaciones del metodo cientifico. *Revista Spin Cero: Cuaderno de Ciencias,* 9, 87-91.

- Gonzalez-Espada, W. J. (2004). Reinforcing physical science concepts with original comic strips. In M. Druger, E. D. Siebert, and L. W. Crow (Eds.) *Teaching Tips: Innovations in Undergraduate Science Instruction*. Arlington, VA: National Science Teachers Association Press.
- Gonzalez-Espada, W. J. (2004). Multicultural education: Helping students succeed in science. *Electronic Journal of Literacy through Science,* 3(12).
- Hemmati, M. and Gonzalez-Espada, W. J. (2003). Thermal behavior inside an igloo: An improved model. *Physics Education*, 38(3), 270-271.
- Gonzalez-Espada, W. J. (2003). Learning and having fun with electric letter soups! *Science Education Review*, 2(3), 79-83.
- Gonzalez-Espada, W. J. (2003). Integrating physical science and the graphic arts with scientifically accurate comic strips: Rationale, description, and implementation. *Revista Electronica de Enseñanza de las Ciencias*, 2(1).
- Gonzalez-Espada, W. J. and Oliver, J. S. (2002). Context and cultural relevance in Puerto Rican high school physics: A quantitative analysis of influencing factors *Proceedings of the 2002 Annual International Conference of the Association for the Education of Teachers in Science*, USA, 7, 682-702. ERIC Document Reproduction Service No. ED (465 602).
- Gonzalez-Espada, W. J. (2002). Physics education research in the United States: A summary of its rationale and main findings. *Journal of Science Education/REC*, 4(1), 5-7.
- Gonzalez-Espada, W. J. (2002). A last chance for getting it right: Addressing misconceptions in Physical Science through independent research. *The Physics Teacher*, 41(1).

Vb. SCHOLARLY ACTIVITIES: SUBMITTED PUBLICATIONS

- Gonzalez-Espada, W. J. (2005). Helping K-12 students and teachers understand science: A synthesis of best practices. *American Scientist*
- Melvin, A. D. and Gonzalez-Espada, W. J. (2005). Teaching physical science with real-time weather data. *Science Scope*
- González-Espada, W. J. (2005). My experience as a visiting faculty at the NWC REU Program. *Journal of Earth System Science Education*
- Zaras, D. S. and Gonzalez-Espada, W. J. (2005). Evaluation of the impact of the NWC REU Program compared with other undergraduate research experiences *Journal of Geoscience Education*
- González-Espada, W. J. and Napoleoni-Milán, R. L. (2005). The impact of the freshman year experience on science students. In J. J. Mintzes and W. H. Leonard (eds.), *Handbook of college science teaching*. Arlington, VA: National Science Teachers Association
- Gonzalez-Espada, W. J. (2005). Status options as pedagogical influence. Ideological beliefs and culturally relevant physics teaching in Puerto Rico. *Journal of Science Education/REC*
- Gonzalez-Espada, W. J., Ibarra, Melissa J., Ochoa, Eduardo R., and Vargas, Perla A. (2005). Physicians and Hispanic Patients' Perceptions of Differential Treatment in an Arkansas Specialized Healthcare Facility. *Journal of Heathcare for the Poor and Underserved*

Vc. SCHOLARLY ACTIVITIES: PROFESSIONAL MEETINGS SINCE 2001

- **Evaluation of the impact of the NWC REU Program compared with other undergraduate research experiences** (with Daphne Zaras). Poster to be presented at the 2006 15th Symposium on Education, American Meteorological Society Meeting. Atlanta, GA.
- **Relative Humidity: What do Students Know About It?** (with Dr. Pamela Heinselman, Daphne Zaras, and Sherman Fredrickson). Paper to be presented at the 2006 15th Symposium on Education, American Meteorological Society Meeting. Atlanta, GA.
- **Evaluating Learning and Performance in the Warning Decision Training Branch's DLOC and AWOC** (tentative title; with Brad Grant and Brandon Miller). Paper to be presented at the 2006 15th Symposium on Education, American Meteorological Society Meeting. Atlanta, GA.
- **Administration, Best Practices, and Evaluation of the National Weather Center REU Program** (with Daphne Zaras). Poster to be presented at the 2005 meeting of the American Geographical Union, San Francisco, CA.
- **Research Experiences for Undergraduates: A Good Idea for Pre-service Teachers?** Paper Presented at the 2005 annual conference of the Southeastern Association for Science Teacher Education, October 14-15, The University of Georgia, Athens, GA.
- **Developing a Survey to Detect Relative Humidity Misconceptions.** Paper presented at the 2005 meeting of the Arkansas, Oklahoma, and Kansas section of the American Association of Physics Teachers, October 7-8, Oklahoma City Community College, Oklahoma City, OK.

- **Mousetrap Vehicles: An Open-Ended Investigation** (with Ed Roberts). 2-hour workshop presented at the 2005 Arkansas Conference on Teaching, November 5, Little Rock, AR.
- **Using Mousetrap Vehicles to Foster Student Learning in Physics** (with Ed Roberts, Pottsville High). Paper presented at the 89th Annual Meeting of the Arkansas Academy of Sciences, April 8-9, 2005, Hendrix College, Conway, AR.
- **Speededness and Classroom Response Systems: A Pilot Study** (with Dr. Daniel Bullock). Paper presented at the 2004 Annual American Association of Physics Teachers Arkansas, Oklahoma, and Kansas (AAPT-AOK) Meeting, University of Arkansas at Little Rock, Little Rock, AR.
- **Succeeding in Introduction to Physical Science: Is Mathematics Background Important?** Paper presented at the 2004 annual conference of the Arkansas Academy of Science (AAS), Little Rock, Arkansas.
- **Scientific Method: Limitations and Alternatives**. Paper presented at the 2004 Arkansas Conference on Teaching, Little Rock, AR.
- **Multicultural Education: Helping Hispanic Students Succeed in Physical Science**. Paper presented at the 2003 Arkansas Conference on Teaching, Little Rock, AR.
- **Integrating Math, Science, and History through Density Explorations**. Paper presented at the 2003 Arkansas Conference on Teaching, Little Rock, AR.
- **Success in Physical Science: The Role of Mathematics Knowledge**. Paper presented at the 2003 Annual American Association of Physics Teachers Arkansas, Oklahoma, and Kansas (AAPT-AOK) Meeting, Kansas State University. Manhattan, KS.
- **The Doppler Effect for a Constantly Accelerating Sound Source Receding from a Stationary Observer: Determining the Acceleration of Gravity Based on Acoustic Data** (with Dr. Jeff Robertson). Paper presented at the 2003 annual conference of the Arkansas Academy of Science (AAS), Fayetteville, Arkansas.
- **Status Options as Pedagogical Influence: Ideological Beliefs and Culturally Relevant Physics Teaching in Puerto Rico**. Paper presented for the 2003 VII Congreso Puertorriqueño de Investigacion en la Educacion, Centro de Investigaciones Educativas, Universidad de Puerto Rico, Rio Piedras, PR
- **Learning Science Through Art: The Use of Comic Strips in Synthesizing Scientific Information**. Paper presented at the 2002 Arkansas Conference on Teaching, Little Rock, AR
- **How is Energy like Money: Analysis and Opposing Viewpoints of Using Qualitative Analogical Reasoning in Physics Instruction** (with Dr. Kenneth Trantham). Paper presented at the 2002 Annual American Association of Physics Teachers Arkansas, Oklahoma, and Kansas (AAPT-AOK) Meeting, East Central University, Ada, OK.
- **Making Puerto Rican High School Physics Contextual and Culturally Relevant: A Statistical Analysis of Influencing Factors**. Paper presented at the 2002 International Conference of the Association of Educators and Teachers of Science (AETS), Charlotte, NC
- **The Nature of Physics: Opposing Viewpoints and Implications for Classroom Practice**. Paper presented at the 2001 Annual American Association of Physics Teachers Arkansas, Oklahoma, and Kansas (AAPT-AOK) Meeting, University of Arkansas, Fayetteville, AR
- **La Influencia del Libro de Texto en los Aspectos Contextuales y Culturales de la Enseñanza de Fisica en las Escuelas de Puerto Rico**. Paper presented at the 2001 VI Congreso Puertorriqueño de Investigacion en la Educacion, Centro de Investigaciones Educativas, Universidad de Puerto Rico, Rio Piedras, PR

Vc. SCHOLARLY ACTIVITIES: LECTURES SINCE 2001

- **The Role of Professional Scientists in K-12 Education**. Guest speaker at the Summer 2005 NWC REU Program, Center for the Analysis and Prediction of Storms, National Weather Center, Norman, OK.
- **Physicians and Hispanic Patients' Perceptions of the Medical Encounter**. Guest speaker at the Spring 2005 General Pediatric Clinic Research Seminar, Arkansas Children's Hospital, Little Rock, AR
- **Basic Skills in Multicultural Science Education**. Guest speaker in the course PHSC 3213, Science in Elementary School, Arkansas Tech University, Russellville, AR, 2004 (15 students).
- **Oops! The OTHER Scientific Method**. Guest speaker at the 38th Arkansas Junior Science and Humanities Symposium, Arkansas Tech University, Russellville, AR, 2004.(5 sessions).
- **Puerto Rican Music: A Sampler**. Guest speaker in the course AMST 2003, American Studies: The Latino Experience, Arkansas Tech Univeristy, Russellville, AR, 2003
- **Looks Like Science, Sounds Like Science, Feels Like Science... Is it Really Science?** Guest speaker at the 36th Arkansas Junior Science and Humanities Symposium, Arkansas Tech University, Russellville, AR, 2002.(5 sessions).
- **Cultura y Contexto en la Enseñanza de Fisica en la Escuela Secundaria Puertorriqueña**. Guest speaker at the CETP Project seminar series, University of Puerto Rico at Cayey, PR, 2001

Using Research Based Curricula and Tools to Promote Active Learning in Introductory Courses

PRISCILLA W. LAWS, Dickinson College, DAVID R. SOKOLOFF, University of Oregon and RONALD K. THORNTON, Tufts University

(A) June 4-6, 2006 in Portland, OR
(B) June 10-12, 2006 in Medford, MA
Apply: CAL
Apply: HAR

Note: Course I will be held at Vernier Software and Tecchnology in Beaverton, OR (near Portland), and Course II will be held at Tufts University, Medford, MA (near Boston). (Participants do not need to have completed Course I to enroll in Course II.)

Return to Top

Widespread physics education research has shown that a majority of students have difficulty learning essential physics concepts in the best of traditional introductory courses. These Chautauqua courses are designed for those interested in making learning in their introductory course more active either within the traditional course structure of lectures, labs, and recitation hours, or by re-structuring their course (e.g., into a workshop or studio course).

Participants in these hands-on courses will be introduced to physics education research-based strategies for each component of the introductory course: Interactive Lecture Demonstration (ILDs)s, Web-Based ILDs, RealTime Physics labs, Activity Based Tutorials, Collaborative Problem-Solving Tutorials and Workshop Physics, as well as modeling and video analysis tools. The tools and software used in this workshop are available for Macintosh and Windows computers. Results of studies on the effectiveness of these curricula will also be presented. Those interested in making major changes in their introductory physics programs are especially encouraged to attend.

Participants will receive current versions of the curricula, along with Teaching Physics with the Physics Suite, a comprehensive book by E.F. Redish (University of Maryland) on strategies for implementing physics education research-based curricula.

Return to Top

We will discuss the design of introductory physics courses adapted to the needs of institutional settings ranging from small colleges to large universities. We will also explore effective methods for evaluation of the learning of physics concepts and quantitative reasoning skills. Studies have demonstrated substantial and persistent learning by students who have used the materials presented in this course.

Course I will focus on first semester topics: mechanics, heat and thermodynamics. Use of computers will include data collection and analysis with microcomputer-based laboratory (MBL) tools, basic mathematical modeling using MBL software and spreadsheets, and basic interactive video analysis.

Course II will focus on second semester topics: electricity and magnetism, oscillations and waves and light and optics. In addition to use of computers for data collection and analysis (using MBL tools) this course will explore more advanced mathematical modeling and more advanced video analysis. (NOTE: Participants do not need to have completed Course I to enroll in Course II.)

Reasonably priced accommodations will be arranged for these courses.

For college teachers of: introductory physics and other introductory science and mathematics disciplines. **Prerequisites:** none.

Return to Top

***Dr. Laws** is a Research Professor of Physics at Dickinson College where she and her colleagues developed a workshop method for teaching physics without lectures. Students in Workshop Physics courses use several related computer applications including spreadsheets linked dynamically to graphs for modeling, microcomputer interfacing for real-time data collection, and video analysis software. She is also co-author of the new text, **Understanding Physics**. **Dr. Sokoloff** is Professor of Physics at the University of Oregon where he integrates classroom testing on research-based curricula with the assessment of conceptual learning in introductory courses with large enrollments. He is the principal author (along with Ronald Thornton and Priscilla Laws) of **Real-Time Physics**–computer-supported active learning laboratories for use in traditional university settings. He is also co-author (along with Ronald Thornton) of **Interactive Lecture Demonstrations** (ILDs) which are used to create an active learning environment in lecture classes. **Dr. Thornton** is director of the Center for Science and Mathematics Teaching of the Physics and Education Departments at Tufts University where he directs the development of software for microcomputer-based laboratory (MBL) tools for real-time collection and analysis of data, for modeling and for vector visualization, and curricula designed to be used with these. The center conducts research on student learning in physics. The MBL software has won awards from EDUCOM, Computers in*

Return to Top

*Physics, and the Dana Foundation. He is currently working (with David Sokoloff) on web-based delivery of ILDs, and the development of ILDs in other science disciplines. (**RealTime Physics**, **Interactive Lecture Demonstrations**, **Workshop Physics**, **Understanding Physics**, **Activity Based Tutorials**, and **Teaching Physics with the Physics Suite** are all published by John Wiley and Sons.)*

ARKANSAS TECH UNIVERSITY
TRAVEL REQUEST
DATE 3/27/2006

NAME OF TRAVELER Wilson I. Gonzalez-Espada

DESTINATION Tufts University, Medford, MA

PURPOSE OF TRAVEL Professional Development Training - Chautauqua

TRANSPORTATION:
Personal Car ✓ LR airport & back
University Sedan _____
University 8 Passenger Van _____
University 15 Passenger Van _____
University 29 Passenger Bus _____
University Other (please specify) _____

DEPARTURE: June 9 @ am. (Month, Day, Time) RETURN: June 13 @ pm. (Month, Day, Time)

Estimated Cost of Trip:

Transportation RSVL-LR Airport $8 LR Airport-RSVL $8	.39/Mile, Personal Car	$ 68.64
	.39/Mile University Car	$ _____
	.39/Mile University Van	$ _____
	.53/Mile 29 Pass Bus	$ _____
Vicinity Mileage		$ _____
Meals & Lodging		$ 550.00
Air Fare		$ 500.00
Taxi Fare		$ 50.00
Rental Vehicle (Must be pre-approved by V.P. for Administration & Finance)		$ ✓
Registration		$ 0.00
Miscellaneous (Must be listed)		$ 50.00

workshop materials, airport parking

Total Cost of Trip $ 1268.64

APPROVAL: _____
Vice President or Dean of School

JWR

CHARGE TO: _____
Department Name

CODE NUMBER: _____

ARKANSAS TECH UNIVERSITY
TRAVEL REQUEST
DATE 3/27/2006

NAME OF TRAVELER Wilson J. Gonzalez-Espada

DESTINATION Beaverton, Oregon

PURPOSE OF TRAVEL Professional Development Training - Chautauqua.

TRANSPORTATION:
Personal Car ✓ to airport & back.
University Sedan _____
University 8 Passenger Van _____
University 15 Passenger Van _____
University 29 Passenger Bus _____
University Other (please specify) _____

DEPARTURE: June 3, 2006, AM (Month, Day, Time) RETURN: June 7, 2006 PM. (Month, Day, Time)

Estimated Cost of Trip:

Transportation RSVL-LR airport RT / Airport-RSVL	.39/Mile, Personal Car	$ 68.64
	.39/Mile University Car	$
	.39/Mile University Van	$
	.53/Mile 29 Pass Bus	$
Vicinity Mileage		$
Meals & Lodging		$ 580.00
Air Fare		$ 500.00
Taxi Fare		$ 50.00
Rental Vehicle (Must be pre-approved by V.P. for Administration & Finance)		$ —
Registration		$ 50.00
Miscellaneous (Must be listed) Parking, workshop materials, Other.		$ 0.00
Total Cost of Trip		$ 1268.64

APPROVAL: _____
Vice President or Dean of School

GWR

CHARGE TO: _____
Department Name

CODE NUMBER: _____