

**CALL FOR PAPERS, POSTERS, AND DEMOS**  
**2009 Spring Meeting**

**Colorado/Wyoming Section  
of the  
American Association of Physics Teachers**

and the

**Society of Physics Students Zone 14**



Colorado School of Mines  
Golden, CO 80401  
April 17-18, 2009

Welcome Fellow Physicists!

On behalf of the Executive Board of the [CO/WY Section AAPT](#), and as Faculty Advisor to the Colorado School of Mines SPS Chapter, I would like to encourage you to join physics colleagues from across the greater Colorado and Wyoming regions for a full weekend of learning, sharing, and experiencing hands-on physics. Our program invites teachers at all levels – high school, two- and four-year college, and university ranks – to contribute a paper, present a poster, or just enjoy the invited talks, sessions, and workshops. This meeting is being held in conjunction with the [SPS Zone 14 Meeting](#), so undergraduate and graduate students will have the opportunity to interact effortlessly with their peers and faculty mentors from various institutions.

We'll start our engines on Friday afternoon with a field trip to the home of car No. 78 and the Furniture Row NASCAR Garage. Witness firsthand restrictor plates, horsepower limits, and burning rubber. After the field trip, we'll return to the Mines campus for a barbecue dinner. On Friday evening, Diandra Leslie-Pelecky from the physics department at the University of Texas at Dallas will keep our engines tuned with an invited talk called "NASCAR: The Science Behind the Speed", illustrating how basic scientific principles can be used to appreciate one of America's most popular sports. After Diandra's talk, we'll have an ice cream social. All interested SPS members will then head across campus to the Golden Bowl for an evening of spirited bowling.

Sam Sampere, Physics Instructional Lab Manager at Syracuse University and a leader of the AAPT Summer Meeting's *Lecture Demonstrations Workshop*, will begin our Saturday morning with an overview of the PIRA 200 (200 demonstrations organized by the Physics Instructional Resource Association that professionals believe to be essential in teaching about the most common physics phenomena). Sam will also perform his favorite demos from all areas of physics. After a short break, we'll have a series of contributed paper presentations open to all students and faculty who wish to present. All reasonable topics are welcome. Students are encouraged to present summaries of undergraduate research projects, summer internships, senior design projects, as well as graduate student thesis or dissertation research. Technical papers from physics faculty and staff are also welcome that address best teaching practices, physics education research, introductory and advanced lab techniques, pedagogical studies, and all varieties of topical physics research.

A pair of workshops is scheduled after lunch. Brian Jones, the Director of "The Little Shop of Physics" at Colorado State University in Fort Collins, will provide everyone with an overview of his "Little Shop of Physics" science outreach program, then lead a workshop for both teachers and SPS members that wish to learn more about hands-on science education outreach. Diandra Leslie-Pelecky will keep her motor running on Saturday, too, and present a workshop called "Building SPEED" that will run concurrently with Brian's workshop. Both Brian's workshop and Diandra's workshop will feature numerous "make-and-take" activities that will provide attendees with ready-to-use demonstrations for their classes.

After these workshops, refreshments will be provided at the SPS Poster Session. Relax a bit, and take advantage of the opportunity to meet some new faces in physics and acknowledge their work. To culminate our meeting, the SPS Chapter at the Colorado School of Mines will be sponsoring a Lecture Demonstrations Contest on Saturday afternoon. All students that attend the SPS Zone 14 Meeting are encouraged to bring a demonstration to share. Each demonstration must be complete – this includes all the physical equipment to perform the demo, as well as a set of instructions explaining how to perform it. Each demo will be randomly assigned to a pair of students. Students will then have a short period of time to setup their demo, learn how to perform it, and then share it with the larger meeting audience at the contest. Each presentation will be judged by a set of three judges, similar to that seen on "American Idol". The judging will be in the spirit of both constructive feedback (like Simon Cowell), as well as just fun, colorful remarks to add some light to the event. At the end of the contest, all of the demos will be given away as door prizes, with preference to those teachers that serve our high schools. This will be a great way to get students active at our meeting, as well as arouse interest in our high school physics community.

Here's to a great weekend at the Colorado School of Mines, one full of physics fun and sharing!

Chuck Stone  
Program Host and Chair

## Program Highlights and Mines Campus Parking

### Friday April 17, 2009

All Friday activities are located in or around Room 102 of the CTLM Building (CTLM 102)

For the location of the CTLM Building, do a Google map search on [1660 Cheyenne Street Golden, CO 80401](#)

**Mines Campus Parking:** Free campus parking is available in the parking lot adjacent to the **CTLM (Bldg 15)**

For the location of this parking lot, do a Google map search on [970 18<sup>th</sup> Street Golden, CO 80401](#)

Time	Activity	Location
4:00 pm	Registration begins	South lobby, 1 <sup>st</sup> floor of CTLM
4:30 pm	Cars depart Mines for field trip to NASCAR Garage	South lobby, 1 <sup>st</sup> floor of CTLM
4:30 pm - 5:00 pm	Carpool caravan to NASCAR Garage	Various cars
5:00 pm - 6:00 pm	Tour NASCAR Garage Contact person at garage: John Parks (303) 322-2008	Furniture Row NASCAR Garage 4000 Forest Street Denver, CO 80216
6:00 pm - 6:30 pm	Registration continues	South lobby, 1 <sup>st</sup> floor of CTLM
	Depart NASCAR Garage to return to Mines	Various cars
6:30 pm - 7:30 pm	Barbecue Dinner	On patio in front of CTLM 102
7:30 pm - 8:30 pm	"NASCAR: The Science Behind the Speed" Diandra Leslie-Pelecky, Professor of Physics The University of Texas at Dallas	CTLM 102
8:30 pm - 9:00 pm	Ice Cream Social	On patio in front of CTLM 102
9:00 pm - Midnight	SPS Bowling	Golden Bowl 525 24 <sup>th</sup> Street Golden, CO 80401

### Saturday April 18, 2009

All Saturday activities are located within walking distance of Room 102 of the CTLM Building (CTLM 102)

For the location of the CTLM Building, do a Google map search on [1660 Cheyenne Street Golden, CO 80401](#)

**Mines Campus Parking:** Free campus parking is available in the parking lot adjacent to the **CTLM (Bldg 15)**

For the location of this parking lot, do a Google map search on [970 18<sup>th</sup> Street Golden, CO 80401](#)

Time	Activity	Location
7:30 am	Registration begins	South lobby, 1 <sup>st</sup> floor of CTLM
8:00 am - 9:30 am	"PIRA 200, TAP-L, and My Favorite Lecture Demos" Sam Sampere, Physics Instructional Lab Manager Syracuse University	CTLM 102
9:30 am - 9:45 am	Refreshment Break	Lobby in front of CTLM 102
9:45 am - 11:45 am	Contributed Paper Presentations	Berthoud Hall 241 & CTLM 102
11:45 am - 1:00 pm	Lunch and Business Meeting Choose site for next CO/WY Section Meeting	Slate Café 2 <sup>nd</sup> floor of the Student Center
1:00 pm - 3:00 pm	Workshop: "The Little Shop of Physics" Brian Jones, Professor & Director of "Little Shop" Colorado State University in Fort Collins  Workshop: "Building SPEED – Science Participation: Education, Engagement, & Diversity" Diandra Leslie-Pelecky The University of Texas at Dallas	Berthoud Hall 243  CTLM 223
2:45 pm - 3:00 pm	Students: Setup posters and select contest demos	South lobby, 1 <sup>st</sup> floor of CTLM
3:00 pm - 4:00 pm	Refreshment Break and SPS Poster Session	South lobby, 1 <sup>st</sup> floor of CTLM
4:00 pm - 5:00 pm	SPS Lecture Demonstrations Contest & Door Prizes	CTLM 102

## Field Trips, Great Food, Invited Talks, and Workshops

**Friday April 17, 2009**

[4:30 pm - 6:30 pm = Field Trip to the Furniture Row NASCAR Garage](#)

Join Professor Diandra Leslie-Pelecky, the author of *The Physics of NASCAR*, for an under-the-hood and behind-the-scenes scientific look at car No. 78 that races weekly on the NASCAR circuit. Located in Denver, the Furniture Row group is the only NASCAR Sprint Cup team headquartered west of the Mississippi River.

NOTE: You will want to depart Mines by 4:30 pm for the field trip to the garage. The tour will run from 5:00 pm to 6:00 pm, then we will return to the Mines campus by 6:30 pm. You are welcome to join the 4:30 pm caravan at Mines, or simply meet at the garage at 5:00 pm. The “Program Highlights” section lists the address.



[6:30 pm - 7:30 pm = Barbecue Dinner](#)

Master chef Shay Robinson will oversee a grill that will tantalize the palates of meat lovers and vegetarians.

[7:30 pm - 8:30 pm = Invited Talk “NASCAR: The Science Behind the Speed”](#)

Diandra Leslie-Pelecky, Professor of Physics

The University of Texas at Dallas



A group of racecars piloted by the best drivers in NASCAR are turning a corner. Without warning, one of the cars suddenly hits the outside wall. There were no engine failures, no flat tires, and none of the cars touched. So what happened? This is the question that sparked physics professor Diandra Leslie-Pelecky’s interest in the science of NASCAR. What she thought would be a ten-minute search of the web turned into a book, *The Physics of NASCAR*, which takes NASCAR (and science) fans behind the scenes at top race shops, onto the asphalt at Texas Motor Speedway, and into the garage with the Gillett Evernham Motorsports’ No. 19 car and its crew. Her talk guides the audience through an understanding of what it takes to make racecars faster and safer, and why driving a stock car is much harder than one might think. Diandra’s talk is filled with examples of current NASCAR science, including why drivers seem to be asking their crew chiefs to help them to get their cars to turn better, how SAFER (Steel and Foam Energy Reduction) barriers revolutionized track safety, why designing tires for the “new car” is such a challenge, and how something

as simple as leaving an oil-tank lid slightly askew could lead to a competitive advantage. Her popular website, [www.stockcarscience.com](http://www.stockcarscience.com), includes weekly entries about topical science-related happenings in NASCAR.

[8:30 pm - 9:00 pm = Ice Cream Social](#)

Let your imagination and diet run wild with a selection of various ice cream delicacies!

[9:00 pm - Midnight = SPS Bowling](#)

Take a roll at ten pins, with lanes that have automatic scoring machines. Go for a “turkey” and a “sombbrero”.

## Field Trips, Great Food, Invited Talks, and Workshops

**Saturday April 18, 2009**

[8:00 am - 9:30 am = Invited Talk "PIRA 200, TAP-L, and My Favorite Lecture Demos"](#)

Sam Sampere, Physics Instructional Lab Manager

Syracuse University



Sam Sampere will start Saturday off with a trio of resources that teachers at all levels will find useful. As one of the leaders of the AAPT Summer Meeting's *Lecture Demonstrations Workshop*, Sam will begin with an overview of the PIRA 200 (200 demos organized by the Physics Instructional Resource Association that professionals believe to be essential in teaching about the most common physics phenomena). He will then discuss the value of TAP-L, a listserv created for the purpose of discussing various topics related to **T**eaching **A**pparatus (TAP) (meaning demo or lab equipment). TAP-L is housed at North Carolina State University and is primarily, but not exclusively, for the college physics settings. The people who usually subscribe to TAP-L are professionals who engage at various times in designing, purchasing, setting up, organizing, creating, performing, and cleaning up after various demonstrations of physical phenomena. Sam will also perform his favorite demos from all areas of physics.

[11:45 am - 1:00 pm = Lunch and Business Meeting](#)

Enjoy all-you-can-eat grub at the Slate Café complete with meat and vegetarian options. Discuss business with the CO/WY Section Officers, and volunteer to host the next CO/WY Section Meeting at your institution.

[1:00 pm - 3:00 pm = Workshop "The Little Shop of Physics"](#)

Brian Jones, Professor & Director of "The Little Shop of Physics"

Colorado State University in Fort Collins

Brian Jones will provide everyone with an overview of his "Little Shop of Physics" science outreach program, then lead a workshop for both teachers and SPS members that wish to learn more about hands-on science education outreach. This workshop will feature numerous "make-and-take" activities that will provide attendees with ready-to-use demonstrations for their classes. For details see <http://littleshop.physics.colostate.edu/>



[1:00 pm - 3:00 pm = Workshop "Building SPEED – Science Participation: Education, Engagement, & Diversity"](#)

Diandra Leslie-Pelecky, Professor of Physics

The University of Texas at Dallas



Diandra Leslie-Pelecky is nationally recognized for her work in science education at all levels. She has worked extensively with K-12 schools, future science teachers, and the public, focusing on teaching methods that help students understand that science is a process by which to understand the world, not a collection of facts to be memorized. In this workshop, Diandra will provide the audience with a number of "make-and-take" activities that will illustrate how principles of auto racing can be used to address statewide science standards. Her educational materials on the science of motorsports for middle schools and high schools can be found at [www.buildingspeed.org](http://www.buildingspeed.org)

[4:00 pm - 5:00 pm = SPS Lecture Demonstrations Contest & Door Prizes](#)

All students are encouraged to bring a demonstration to the meeting. Each demonstration must be complete – this includes all the physical equipment to perform the demo, as well as a set of instructions explaining how to perform it. At 3:00 pm, each demo will be randomly assigned to a pair of students. Students will then have a short period of time to setup their demo, learn how to perform it, and then share it with the larger meeting audience at the contest. Each presentation will be judged by a set of three judges, similar to that seen on "American Idol". At the end of the contest, all of the demos will be given away as door prizes.

## Call for Papers and Posters Guidelines

Each participant may only present one Contributed Paper or one SPS Poster, although co-authorship on multiple presentations is allowed.

### General Guidelines: Contributed Papers

- Presented on Saturday April 18, 2009 9:45 am – 11:45 am
- Contributed Papers are 15 minutes in duration, with 3 minutes for questions included in the 15 minutes.
- All students and faculty who wish to present may contribute a paper. All reasonable topics are welcome.
- Students are encouraged to present summaries of undergraduate research projects, summer internships, senior design projects, as well as graduate student thesis or dissertation research.
- Technical papers from physics faculty and staff are also welcome that address best teaching practices, physics education research, introductory and advanced lab techniques, pedagogical studies, and all varieties of topical physics research.
- Computer projectors will be provided in all presentation rooms. Laptop computers will be available, but all presenters are strongly encouraged to bring their own laptops to avoid hardware and software formatting difficulties, as well as audio and video streaming problems.

### General Guidelines: SPS Posters

- Presented on Saturday April 18, 2009 3:00 pm – 4:00 pm
- SPS Posters must not exceed 4 feet in height and 4 feet in width.
- SPS Posters will be setup between 2:45 pm and 3:00 pm on Saturday afternoon.
- All presenters should provide their own poster displays and mounting materials.
- Poster presenters should plan to be available to answer questions during the entire poster session.
- Any graduate, undergraduate, or high school student who has conducted research may present a poster.
- Students are encouraged to present summaries of undergraduate research projects, summer internships, senior design projects, as well as graduate student thesis or dissertation research.

### Specific Guidelines: Submit all Contributed Papers and SPS Posters with the following information:

1. Title (of Paper or Poster) TITLES OF ABSTRACTS ARE LIMITED TO 10 WORDS
2. Presenter's full name
3. Presenter's institution
4. Presenter's complete mailing address
5. Presenter's phone number
6. Presenter's email address
7. Abstract (of Paper or Poster). ABSTRACTS MUST BE FEWER THAN 150 WORDS

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## Submitting Papers and Posters

From the **Specific Guidelines**, email items 1-7 about your Contributed Paper or SPS Poster to Chuck Stone at

**cstone@mines.edu**

In the Subject line of your email, please state

**Submission for 2009 Spring Meeting**



**Submissions must be received by  
1:00 pm MDT on Friday April 10, 2009**

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# SPS Lecture Demonstrations Contest Guidelines

## General Guidelines

- Presented on Saturday April 18, 2009 4:00 pm – 5:00 pm
- All high school and college students attending the meeting are encouraged to bring a demo to share.
- Each demonstration must be complete. This includes
  - a proper name for the demo
  - a brief summary of the physics principle(s) demonstrated
  - all the physical equipment needed to perform the demonstration
  - contact information of all the students who helped design the demonstration
  - a set of clearly written instructions explaining how to perform the demonstration
  - eye protection, fire extinguisher, gloves, etc. that may be needed to safely perform the demonstration
- Demonstrations brought to the contest must be constructed by teams of 2 or more students.
- Each team must construct and bring to the meeting at least 2 identical demonstrations for the contest.
- Demonstrations should employ easy-to-find materials, be easily reproduced, and inexpensive to build.
- Demonstrations may not use open flames, noxious gases, volatile liquids, or large amounts of  $\text{LN}_2$  or  $\text{H}_2\text{O}$ .

## Timeline

- 3:00 pm = Each demonstration will be randomly assigned to a pair of students from the same school.
- 3:00 pm - 3:30 pm = Students (in teams of two) will be able to open their demo and learn how to perform it safely and correctly. Team members cannot perform a demo their school brought to the contest or they helped build, nor are they allowed to consult with members of the original design group.
- 3:30 pm - 4:00 pm = All demos will be quarantined!

**NOTE: If you are presenting an SPS Poster, you still have the responsibility to be at the Poster Session from 3:00 pm – 4:00 pm to answer questions about your work.**

- 4:00 pm = SPS Zone 14 Councilor Rudi Michalak will randomly select the first pair of students to present.
- Each team will have 4 minutes to present their demo, followed by a 1-minute round of judging.
- Each presentation will be judged by a set of three judges, similar to that seen on "American Idol". The judges will be evaluating each team on the physical quality of the demo materials, how well the demo addresses curriculum needs, the clarity and quality of the team presentation, the correct use of physics principles & vocabulary communicated during the presentation, and the success or failure of the effort.
- The judging will be in the spirit of both constructive feedback (like Simon Cowell), as well as just fun, colorful remarks to add some light to the event. Each judge will score the demo on a scale of 1 to 10.
- At the end of each presentation, a new team will be randomly selected to present.

## Door Prizes and Trophy

- At the end of the contest, all of the demos will be given away as door prizes, with preference to those teachers that serve our high schools.
- While the demos are being given away, team scores will be tallied. The winning team will have their team members' names inscribed on a traveling **SPS Zone 14 Lecture Demonstrations Trophy**.



## Questions?

- If you have any questions about the SPS Lecture Demonstrations Contest, email Charles Pearl at

**[cpearl@mines.edu](mailto:cpearl@mines.edu)**



## Lodging

Overnight accommodations have been reserved for Friday April 17, 2009 and Saturday April 18, 2009 at the following two hotels, both located approximately 6 miles (12 minutes) from the Colorado School of Mines.

**Comfort Suites**  
11909 West 6<sup>th</sup> Avenue  
Golden, CO 80401  
Phone: (303) 231-9929

**Fairfield Inn**  
11907 West 6<sup>th</sup> Avenue  
Golden, CO 80401  
Phone: (303) 231-9939



**Hotel Parking:** Both hotels have plenty of free on-site parking in their parking lots  
For the location of these hotels, do a Google map search on [11909 West 6<sup>th</sup> Avenue Golden, CO 80401](#)

**Mines Campus Parking:** Free campus parking is available in the parking lot adjacent to the **CTLM (Bldg 15)**  
For the location of this parking lot, do a Google map search on [970 18<sup>th</sup> Street Golden, CO 80401](#)

**Common Amenities:** Both hotels are managed by the same agency, and offer the same common amenities:

- 100 rooms have been reserved for Friday April 17, 2009
- 100 rooms have been reserved for Saturday April 18, 2009
- Each room (a King Suite or a Double Queen Suite) will cost \$77.39 per night (\$69.00 rate, plus \$8.39 tax)
- A first night room and tax deposit, charged to a major credit card, must accompany all reservations
- A free continental breakfast is offered on Saturday and Sunday mornings from 7:00 am – 10:00 am
- Free high-speed internet service is offered in both hotel lobbies and all rooms
- Both hotels have an indoor heated pool and a hot tub
- Both hotels are 100% smoke-free
- Check-in time is 3:00 pm
- Check-out time is 11:00 am

**For Reservations:  
Call the hotel of your choice and refer to the  
SPS/AAPT Zone Meeting Room Block**



**Reservations must be made on or before  
April 10, 2009 to get the \$69.00 room rate!**



**Registration Form**  
**2009 Spring Meeting**  
**CO/WY Section AAPT and SPS Zone 14**

Name \_\_\_\_\_

Institution \_\_\_\_\_ Circle Type: HS 2-yr Coll 4-yr Coll Univ Other

Mailing Address \_\_\_\_\_

Phone Number \_\_\_\_\_ Email Address \_\_\_\_\_

**Registration Fees**  
 (circle the one single Fee you are paying)

Teachers and All Other Scientific Professionals			Students (High School and College)
Friday Only April 17, 2009	Saturday Only April 18, 2009	Friday & Saturday April 17-18, 2009	Friday & Saturday April 17-18, 2009
\$13	\$27	\$34	\$18

**Registration Fees Include ...**

Friday April 17, 2009		Saturday April 18, 2009	
4:30 pm - 6:30 pm	Field Trip to NASCAR Garage	8:00 am - 9:30 am	“PIRA 200, TAP-L, and My Favorite Lecture Demos”
6:30 pm - 7:30 pm	Barbecue Dinner	9:30 am - 9:45 am	Refreshments
7:30 pm - 8:30 pm	“NASCAR: The Science Behind the Speed”	9:45 am - 11:45 am	Contributed Paper Presentations
8:30 pm - 9:00 pm	Ice Cream Social	11:45 am - 1:00 pm	Lunch and Business Meeting
9:00 pm - Midnight	SPS Bowling	1:00 pm - 3:00 pm	MAKE-AND-TAKE WORKSHOPS “The Little Shop of Physics” “Building SPEED”
		3:00 pm - 4:00 pm	Refreshments SPS Poster Session
		4:00 pm - 5:00 pm	SPS Lecture Demos Contest & Door Prizes

Complete form, endorse check payable to **CSM Society of Physics Students**, then mail this form and check to:

**Chuck Stone**  
**Department of Physics**  
**Colorado School of Mines**  
**1523 Illinois Street**  
**Golden, CO 80401**



**Registration Forms and Fees must be received by**  
**1:00 pm MDT on Friday April 10, 2009**