



**DEPARTMENT OF THE AIR FORCE**  
THE DEPARTMENT OF PHYSICS  
USAF ACADEMY, COLORADO

15 April 2005

Dear Selection Committee,

Overview

The purpose of this letter is to nominate the US Air Force Academy, Society of Physics Students Chapter 7502 and our Physics Department Faculty for the Blake Lilly Prize. We have approximately 80 undergraduate physics majors and 30 faculty members who participate in a wide range of activities to inspire school children about the beauty of physics. In this letter, I will highlight activities from the past academic year. However, this year is not unique. When joined the team 20 months ago, I discovered a thriving community of physics advocates. Our students and faculty conduct activities include Physics is Phun shows, Ask Dr Science e-mail exchanges, Women-in-Science, and Science Olympiad, among others. Each of these will be elaborated below.

Physics is Phun Shows

Dr Gabriel Font-Rodriguez has coordinated our faculty and cadets to perform 18 shows for 663 students this academic year alone! Our shows targeted audiences ranging from second grade through fifth grade at about eight different elementary schools. Typically we bring a host of physics marvels to the elementary school, but sometimes the children come visit our campus.

Attached to this nomination are photographs from a couple of these events and thank-you letters sent by a Carver Elementary School's fourth grade class. The fourth graders wrote comments like, "It would be cool to be a scientist" and "I learned that electricity can make magnets, and magnets make electricity".

Ask Dr Science

Cadet Aaron Stikeleather has coordinated with Mrs. Linda Wallmark, a fourth grade teacher in Oregon, and 23 of our physics majors to engage in a dialog with elementary school students from Salem-Keizer School District in Salem, Oregon. The format and title were requested by Mrs. Wallmark. Students from Mrs. Wallmark's elementary school in Salem, Oregon write a question about once a week. Our cadets reply with a little information about themselves and an answer tailored to a fourth grade level. The goal is to both motivate their science education and provide the students with college age role models. Attached are some sample questions and responses.

This program revives a project called "Science Pals" that Capt Dawn Rhymer operated when she was stationed in our department three years ago.

Other activities as the opportunities arise

In addition to the regular programs, we have ad-hoc engagements including support for programs organized by other science organizations. Here are a few examples.

Each year our faculty and physics majors operate the Physics Lab for the Southern Colorado Regional Science Olympiad. This year we had six physics majors, led by Cadet Adam King



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along with Captain Mario Serna and Captain Christian Wohlwend as faculty advisors, design and operate the contest for 64 high school participants.

On April 4<sup>th</sup> 2005, Dr Heidi Mauk and five female cadets from physics and related majors operated several workshops at a "Girls in the Middle" conference in La Junta, CO for 150 junior high school girls. The conference is designed to increase interest in math and science by presenting the young teenage women with college and professional female role models, while teaching math and science in small groups.

Our department observatory is often opened to external audiences to encourage science appreciation. In past years, before military security had to tighten in response to September 11<sup>th</sup> 2001, we hosted monthly observatory open houses attended by the citizens of Colorado Springs. We still provide escorted experiences at the observatory. I have attached pictures of a Boy Scout Troop visit from Nebraska to our observatory coordinated and hosted by two of our physics majors (Cadet Joseph Evans and Cadet Michael Toth) in early October 2004. The Boy Scout leader Jeff Brittan said, "The scouts were inspired. Neither the scouts nor any of our scout leaders had ever seen a real observatory. It is just like in a movie."

### Conclusion

Although I have highlighted a few student leaders and a few faculty leaders, our entire Physics Department Faculty and all of the physics majors have contributed to make outreach to school children a part of our culture. As you can tell, the outreach activities are not central to one advisor or one of our majors, but rather they are the result of an atmosphere in our department of volunteerism, service, love for physics, and a desire to share that passion with the next generation. I hope your prize is able to recognize our special group for their labors of love.

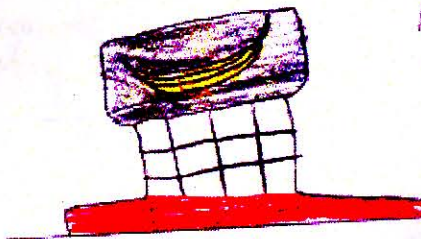
Sincerely,



MARIO A. SERNA, Capt, USAF  
SPS Chapter 7502 Faculty Advisor

**Thank-You Notes from "Physics is Phun"**

Dear Capt. Serna,  
 I'd like to thank you for "Physics is Phun" at Carver. I learned a lot about electricity. My favorite part was the balloon with the liquid Nitrogen. The molecules squeezed together in the cold, & bounced off the walls in warm, making the balloon bigger.  
 Sincerely,  
 E. J. E.



My favorite part of your presentation was when you froze the banana. I learned that physics can be anything in the world. All you have to do is take away

Thank you for  
 coming to Carver Dona

My favorite part of your presentation was learning about how to make electricity and magnets. I learned that electricity can make a magnet and a magnet can make electricity.

Thank you for coming to Carver.

Jessica

My favorite part of your presentation was when I got to go up and my hair was going up because of electricity. I learned that you don't need wires for a light bulb to light up.

Thank you for coming to Carver.

Megan English



and science is cool and they should come again