

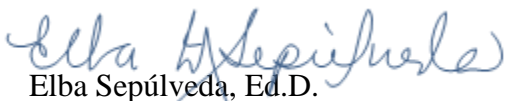
January 21, 2018

Dear Program Director:

CROEM is a boarding school for talented students selected for their high performance. The school is specialized in Math and Science. It is located in Cerro Las Mesas in Mayaguez Puerto Rico. As a Physics, Physics Applied to Electronics and Robotics (PAER), Computer Science and research professor at CROEM, I will be delighted to continue integrating QuarkNet curriculum as well as the activities provided.

We have an enrollment of about 250 students. Our school has 100% of Hispanic enrollment with a 50% of female. This is an important factor to develop a research-technology agenda that will impact economically disadvantaged pre-college and teachers from Puerto Rico. I strongly consider that UPRM will continue as the resource provider for Particle Physics content and will be of great benefit to our students to have this learning experiences before going to the university. I support them and I hope you strongly consider them for the proposal they are applying for.

Sincerely yours,



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QuarkNet at CROEM



What is CROEM

I am Dr. Elba M. Sepúlveda. I work at CROEM that is a boarding school for talented students selected for their high performance. The school is specialized in Math and Science. It is located in Cerro Las Mesas in Mayaguez Puerto Rico.

In my Physics, Physics Applied to Electronics and Robotics (PAER) and Research classes we talk about the origin of the universe, the fundamental forces, the composition of matter, dark matter and dark energy. Those topics seem to be fascinating areas of study

for my students which plan to study at university.

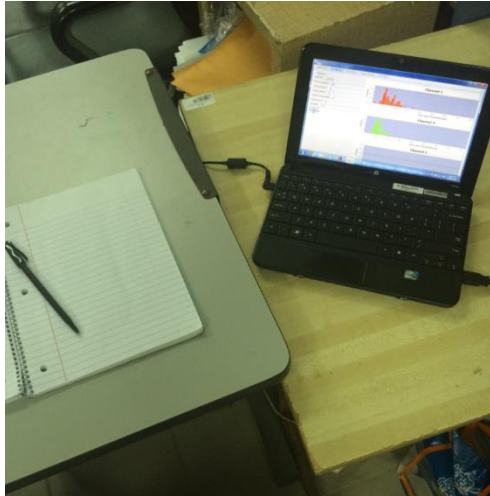
Our Resource Center

UPRM is a great partner providing activities to let them explore over the classroom that difficult topics and have the opportunity to talk to scientist. They talk about recent research that most of the times have not been published yet. These experience is what make students think very seriously about their future. Sometimes is so good that some of them decide to study those hard fields to give new science contributions to our humanity.

The particle detector

One of the most interesting activities for research available at classroom is the particle detector. Students can learn about cosmic rays. I had the opportunity of being the mentor for more than 15 students that used the particle detector for their own experiments.





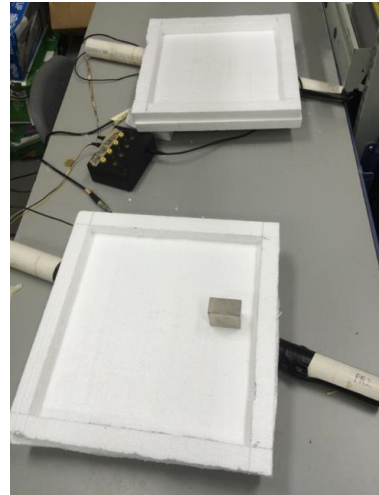
Flux studies made by students

Students can make their research posters. Some of the experiments required to learn about how cosmic rays are produced. It is produced when a proton collides with a molecule in the atmosphere. A flux study was made using collected data at the University of Puerto Rico in Mayaguez. The recorded data was collected from the collisions occurred during a 24 hours period. The study revealed that there is an average incidence of 8,400 muons per square meter by minute for channel 3 and 8,250 muons per square meter by minute for channel 4.

Muon studies

Muons are the particles that the detector can count. The system is presented in the image. This image shows a device constructed by one of our students. He wanted to know how particles deflects in the presence of magnetic fields.

Other studies requires the student to do statistical tests to compare sets of data. In other projects students learn about binary and hexadecimal numbers and how to convert them. This is a good way of motivate them to do works like scientists do.



Masterclasses

Over the years QuakNet has been of great benefit to our school. Students' participation in Quarknet Master Class was a remarkable experience for them. This activity permitted them to learn about Particle Physics, integrate previous knowledge, help scientists in the classification of events from the Large Hadron Collider and receive excellent conferences from different scientists as well as teachers.



Inspiring

UPRM and QuarkNet have done an excellent job in gathering the teachers, the students and the scientist. I hope this activity will continue. As a teacher and scientist I think the future is in our hands, inspire and give the opportunity to our children to grow, but to grow with a strong science base. ***They will be able to do extraordinary things that you never think it was possible to do.***

