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NEEDS ASSESSMENT

Puerto Rico is a Hispanic, historically underserved and underrepresented jurisdiction in STEM disciplines. Interest in STEM learning is very evident—especially in the 12 to 18 age group—but the opportunities are limited.

I feel there is a need for polar science education and outreach in Puerto Rico. Knowledge about this aspect of geoscience is basically nil. Throughout my career I have attended presentations with renowned scientists on all main branches of science, but never have I seen a lecture on this topic. And the idea would be to bring not only the facts of polar science, but also the story of my South Pole expedition—a unique, personal experience with an authentic, original voice that will be both captivating and memorable. People like listening to stories, and they remember them more vividly than just bare concepts. Children, particularly, are attracted to and compelled by stories, as these are concrete experiences of someone's life and not mere abstractions.

I have also perceived a need to involve Puerto Rican educators with real, meaningful research projects in the STEM arena. I would like to volunteer as a role model in this context. I myself, as most STEM educators in the island—and because of limitations within the educational system that will be explained later on—have never had the chance to connect with researchers and do real science. This needs to change, and the transformation needs to take place immediately.

My PolarTREC South Pole expedition will strengthen and enhance my teaching in two specific areas, which arise from the above mentioned needs. First, it will allow me to add geoscience—and specifically, polar science—content to both my regular classes and outreach lectures; and second, by participating in a hands-on, science research project, I will be better able to teach students—and the community—how scientists work, and how real science is done.

I will address some specific points below:

Student needs related to specific curricula

I feel my students need to relate to role models that will inspire them to learn science and to do science. There are not many people in the island that teach good science—or that do science, for that matter—so I believe that bringing my story to them will help fulfill this deficiency.

Changes I would like to make to my teaching methods

My teaching is fundamentally content-based (i.e. based on factual knowledge), a philosophy that

I have found to yield superior results with my science classes. Relationships between facts—and the inherent hierarchy of primary vs secondary facts—can only be built when there is a wide, rich base of concepts that have been learned and understood. I would like, however, to test and explore other hands-on methods and activity based-approaches that could enhance my teaching philosophy.

Things I expect to learn

I expect to learn both factual science (high energy astronomy, polar science, etc.) and also how scientists work, and how real science is done. I do have clear ideas on these topic which I convey in the classroom, but a hands-on experience would help me to strengthen these areas and achieve better results with my students.

As told, it is rare for Puerto Rican educators to obtain opportunities to participate meaningful research projects in the STEM arena. I believe my participation in an actual research project will provide unique insights about the workings of science that would be impossible to obtain anywhere else.

Concepts I would like to teach better

I would like to learn more—and strive to teach better—concepts of high-energy astronomy such as cosmic ray detection, neutrino detection, as well as the theories and models that attempt to explain the generation of these particle streams.

Expectations related to ethnicity, etc.

As explained, Puerto Rico is a Hispanic, historically underserved and underrepresented jurisdiction in STEM disciplines.