

## Colloquia Feedback: Classically Forbidden Askaryan Radiation

This presentation was very informative and did a great job explaining why determining the trajectory of cosmic rays is so difficult. Figure 19 was very helpful when understanding the diffraction of the rays through ice which explains why this study is being done in Antarctica. The propagation in the Antarctic ice was interesting where this presentation did a great job explaining the difference between classical and non-classical propagation that was observed. I learned that the classical propagation examination techniques limit the volume of the detectors from the density of the ice which is why we are able to detect the reflection of the rays horizontally off the ice. Ultimately, I really began to understand the impact that high-energy particles have on our understanding of the physical universe. As we begin to observe these high-energy particles interact with our planet it gives us an insight into the cosmic scale of physics.

I found the material very interesting as I mentioned above because it gives students a real-life example of where their studies can be taken. It allows us students to understand where and how to apply our knowledge to the real-life situations to help us create a better understanding of the physical world around us. The most interesting material I found was how we can apply the better understanding of cosmic waves to find answers to larger questions around us like black holes. Studying this interaction of these particles with our planet helps us learn more about questions throughout cosmic space.

I believe future presentations should be focused on integrated applied physics studies that students can relate to. I think if these presentations are focused on relatable subjects that have to do with current events like SpaceX for example you will have a more consistent audience that can learn where they can take their knowledge after school. Subjects based around giving students a more global view of the cosmos and physical world around us would bring a more consistent audience. However, it is important to tailor your presentation based on the audience you are expecting to get the most success and audience interaction. I enjoyed the last presentation however, the only possible problem was that the subject was very complex and may have required more time to have the best impact on the audience. Aside from projects like SpaceX's expanding the human race into an interstellar race I think another subject that would draw a good-sized audience is a presentation on gravitational waves. As well as explaining the LIGO project's progression towards finding a better understanding of gravitational waves. This may be a good subject because it can be spread among other subjects like black holes and neutron stars. Finally, I believe you should definitely continue the colloquia series because it not only gives you an opportunity to practice your presenting techniques but gives students an example of what you do outside of teaching which may increase classroom participation. You definitely inspired me to further my knowledge of physics and confirmed the passion I have for physics and the unanswered questions of the cosmos.

I hope this feedback was helpful for your future presentations and wasn't too confusing. I had some trouble mastering the information because it had been awhile since the presentation. But I also would love to help you prepare for the next. I am going to summarize my suggestions for your next presentations below.

Suggestions for next presentation:

- 1) SpaceX and the race to transform the human race into an interstellar race:
- 2) LIGO and the study of gravitational waves:
- 3) Putting the Cosmos into Perspective (new addition):
  - a. I recently read a book written by Neil DeGrasse Tyson called "Astrophysics for People in a Hurry." This was a very interesting book that I enjoyed because he was able to fit the creation of the cosmos from the big bang to the present day into a calendar year. I believe something related this subject would be a very interesting presentation which maps a view and scale of the cosmos. The size and rate of expansion of the universe was very interesting and can encompass many additional subjects as well.