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Advanced Physics  
Cosmic Ray Detector

## **Redacción Sobre El Detector de Cosmic Rays**

On May 6, 2008, a human being Professor Matthew Jones from QuarkNet came and lectured to the Advanced Physics class. QuarkNet is an organization that helps high school students to gain knowledge about the happenings in particle physics. He also brought a cosmic ray detector. He showed us different things with this. There are currently three of these types of machines in the Lafayette area that visit various high schools.

Particle physics is the study of the small particles that are involved in radiation. The first radiation discovered was uranium. There was some black substance on the outside of an envelope that had uranium substances inside. The film had a weird pattern on it.

One man figured that if you went up into the atmosphere in a hot air balloon that there would be less radiation; however, this was not true. In this he discovered that radiation was coming into the atmosphere from somewhere else in our universe. There are cosmic rays which produce this radiation. They are made up of particles called muons. These indescribably small particles don't obey the normal laws of physics. Instead of following the  $d=rt$  formula, there is a more complex one instead. The cosmic ray detector measures the occurrence of these particles. We are constantly being bombarded with approximately fifty of these a second. They have dug extremely deep mines (about a mile and a half) where you might only be hit by one a minute or so.

He also spoke about the different particle accelerators there are. He showed us pictures of Fermilab near Chicago and CERN in Europe. Many countries have to collaborate to build these multi-million dollar projects. There are many people that are required to run one. There was a sixteen story building that looked quite miniscule in comparison with Fermilab, and he also pointed out an airport that looked like a large ant.

Professor Jones also described an experiment that high school students would be able to perform with a cosmic ray detector. They could count the occurrences of cosmic rays in a day and also record the air pressure. They could then chart this data. He told us that it would show us that there are fewer cosmic rays on days with high pressure.

Quarks are the small particles that make up the things in an atom. We used to think that the protons, neutrons, and electrons were the smallest particles, but we now know that these are made of quarks. A proton is made of two upquarks and a downquark, and a neutron is made of two downquarks and a upquark (or it might be the other way around).

Professor Jones seems to be a very intelligent person. It was interesting to learn about these things even if I might not fully understand them. I appreciate his willingness to talk to us.