



Physics & Astronomy Colloquium Spring 2011

Senior Project Presentations

“The Effect of Math Skills in the Physics 5A Course”

The effect of math skills on overall success in an introductory, non-calculus physics course is studied by comparing the results from a math diagnostic test to the final grades of students in the physics 5A course at CSU Sacramento during the spring 2010, fall 2010, and spring 2011 semesters. The data suggests a correlation between initial math skills and final grades. Students with poor initial math skills in the fall 2010 and spring 2011 semesters were also offered a set of tutorial sessions in an effort to help improve their final grades. These students performed significantly higher than students of the same math skill that did not take the tutorial sessions.

Arthur “AJ” Sisneros



“Neutron Activation Analysis: A Study of Radioactive Contaminants in Materials”

In order to obtain faster and more accurate measurements of radioactive contaminants within a sample of titanium we expose it to a neutron flux. This flux will activate stable and quasi stable (extremely long half lives) isotopes into unstable nuclei that possess shorter half lives on the order of minutes to days. The resulting decays are counted in a Germanium Crystal Detector, which obtained a complex gamma spectrum. A mathematical model was used to recreate the production of the measured isotopes in the neutron flux and the resultant decays. Using this model we calculated the mass percent of the contaminate isotopes inside the titanium sample. The mathematical model accounts for two types of neutron activation, fast or thermal activation, since this determines which contaminate is the source of detected signals. By looking at the percent abundances, neutron absorption cross-sections and the resulting mass percents of each contaminate it is possible to determine the exact source of measured signals. Additionally a unique ratio method was implemented to cross check the mathematical model. Our results have verified that for fast neutron activation and thermal neutron activation the method is accurate and comparable to other counting methods.

Charles Dresser



“The Effects of Group Density on the Evolution of Galaxies”

Compact groups of Galaxies, as defined by Hickson (1982), have some of the densest environments anywhere; therefore, any environmental contribution to galaxy evolution, due to galaxy-galaxy interaction, should be most evident in these groups. For this project, a sample of compact groups with elliptical galaxies will be selected and the selected elliptical galaxies will be studied in different levels of density in order to determine how the local density of the group is influencing galaxy evolution. Data will be collected through on-line data archives such as the Sloan Digital Sky Survey (www.SDSS.com).

German Valencia

Thursday, May 12, 2011

4:20pm in MND 1015

Open and free to the public