Nuclear PANthers

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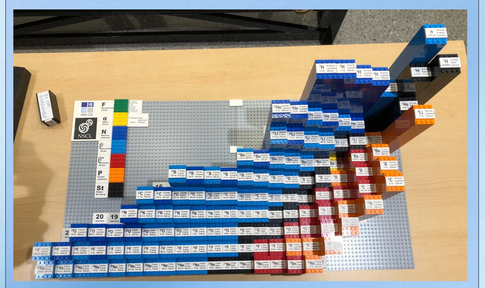
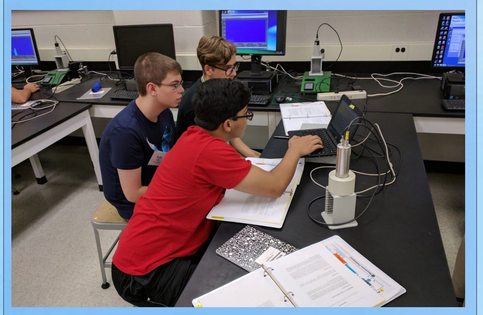
Day 1

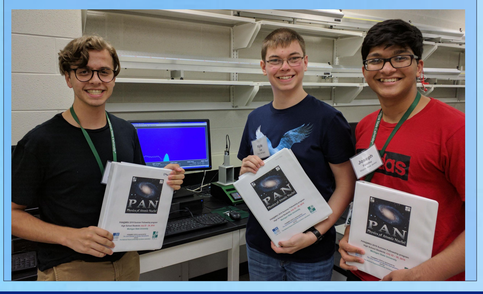
- Marble Nuclei
- Tour of NSCL
- Nuclear Experimentation



Day 2

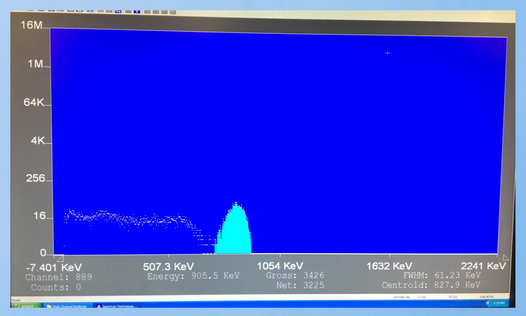
- Radiation Detectors
- Lab Safety
- Gamma Spectroscopy





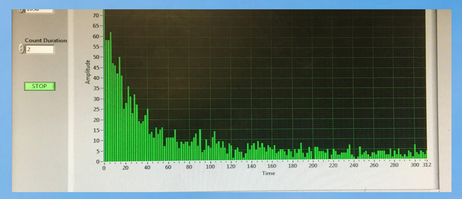
Experiment #1: Gamma Spectroscopy

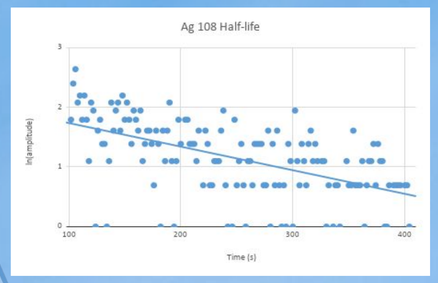
- The purpose was to identify a mysterious element using gamma spectroscopy.
- The elements Cobalt 60 (1173 KeV & 1332 KeV) & Cesium 137 (662 KeV) with known energy levels were used to calibrate the graphs
- We graphed the mysterious source and the found centroid in region of interest (827.9 KeV).
- We used an online database to identify the mysterious element
- The mysterious element was determined to be Manganese-54

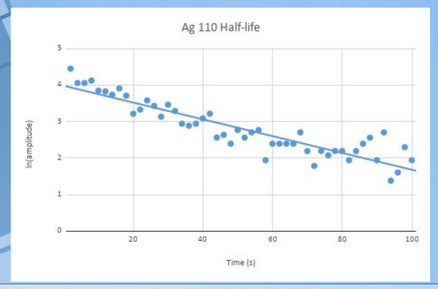


Experiment #2: Half-life

- Purpose of lab to experimentally determine half-lives of Silver 108/110.
- It was difficult to determine since both sources were mixed in the natural silver coin.
- We used AMBE-nuclear decay to bombard a silver coin with neutrons and cause beta-decay.
- We used a Geiger-Mueller tube to measure the ionization of the gas.
- The half-lives were determined by making a graph of the natural log of the amplitude and using the slope of the line.
- We determined half-life of silver 108 and 110 to be 2.41 minutes and 30.13 seconds respectively.
- Actual half-lives are 2.37 minutes and 24.6 seconds with 2.60% and 18.37% error.

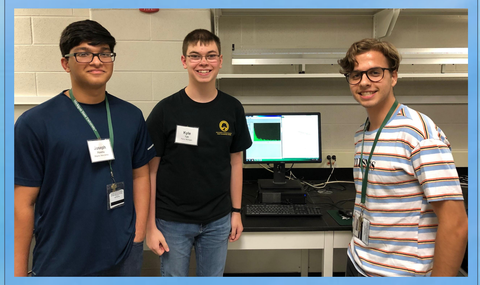






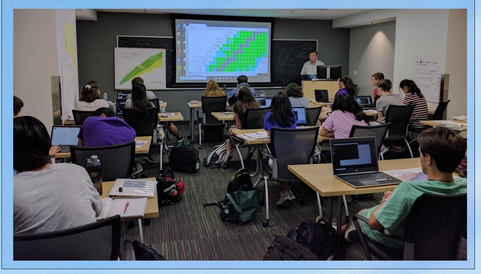
Day 3

- Nuclear Astrophysics
- Research Roundtable
- Half-life lab



Day 4

- Astronomy
- Nuclear Properties Theory
- Neutron Capture Activity



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