

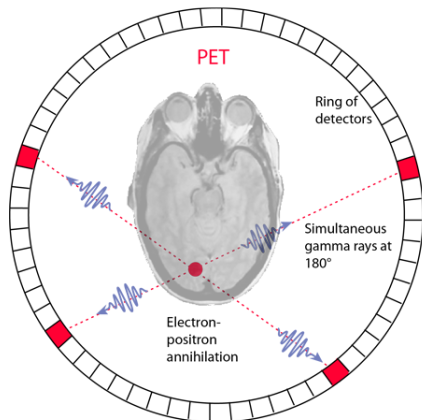
# Physics Department Seminar

May 2, Friday at 2 PM in Science Building Room 250

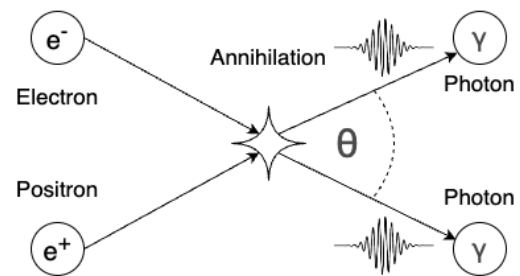
## Electron-Positron Annihilation of Radioactive Isotope $^{22}\text{Na}$

Blayne Hass

Studies of gamma radiation have advanced our knowledge of the cosmos, as well as improved modern medical screenings such as Positron Emission Tomography (PET).



Gamma radiation is produced during collision of an electron and positron that are ejected from the nuclei of radioactive isotopes during beta decay. The electron and positron collide shortly after emission, transforming their mass into energy in the form of photons. This transformation is known as electron-positron annihilation.



Experiments that study the process of e-p annihilation generally require equipment that is not readily available to undergraduate students. We setup a simple experiment and collected data with a  $^{22}\text{Na}$  source for a student project in Advanced Lab. The results show that the most common form of gamma radiation is the emission of two gamma rays in opposite directions, which agrees with conservation laws. A more active  $^{22}\text{Na}$  source is required to improve the accuracy of the measurements at different emission angles.