



RSVP

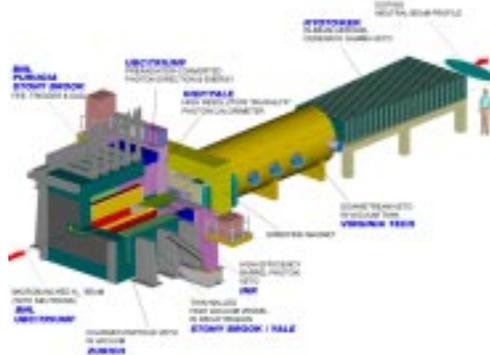
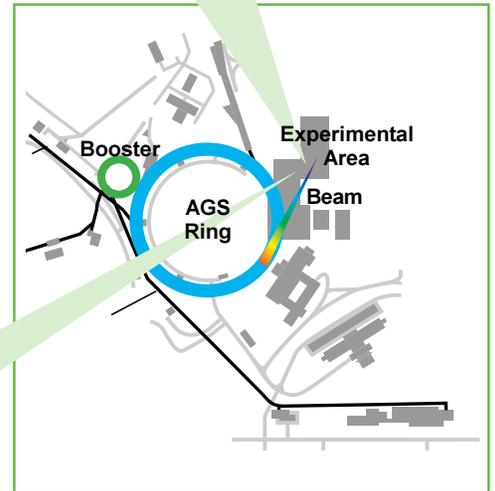
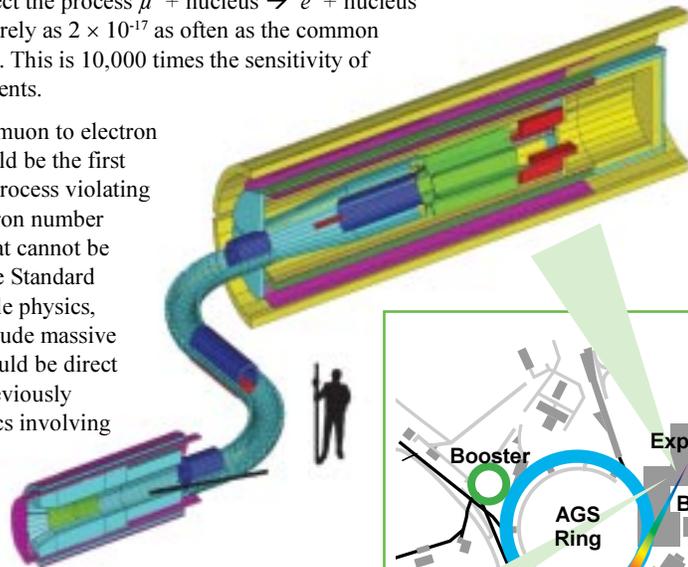
RARE SYMMETRY VIOLATING PROCESSES

The Rare Symmetry Violating Processes proposal comprises two experiments, KOPIO and MECO. It will make use of intense particle beams only available at the Brookhaven Alternating Gradient Synchrotron (AGS) to probe for a fundamental lack of symmetry in the universe.



MECO (Muon to Electron Conversion) is an experiment designed to detect the process $\mu^- + \text{nucleus} \rightarrow e^- + \text{nucleus}$ if it occurs as rarely as 2×10^{-17} as often as the common decay $\mu^- \rightarrow e^- \nu \bar{\nu}$. This is 10,000 times the sensitivity of current experiments.

Observation of muon to electron conversion would be the first evidence for a process violating muon and electron number conservation that cannot be explained by the Standard Model of particle physics, extended to include massive neutrinos. It would be direct evidence for previously unknown physics involving new forces.



KOPIO (K-zero to PI-zerO) seeks to measure the very rare decay $K_L^0 \rightarrow \pi^0 \nu \bar{\nu}$ at a Branching Ratio of 3×10^{-11} .

A measurement of this decay cleanly determines the size of direct CP-violation, the process thought to be responsible for the evolution of our universe into one dominated by matter (not equal parts matter and anti-matter).

This challenging experiment will explore a window of opportunity for new physics, almost 5 orders of magnitude wide, between the current experimental limit and the Standard Model prediction.

KOPIO will compete with and complement the world-wide B-physics program.