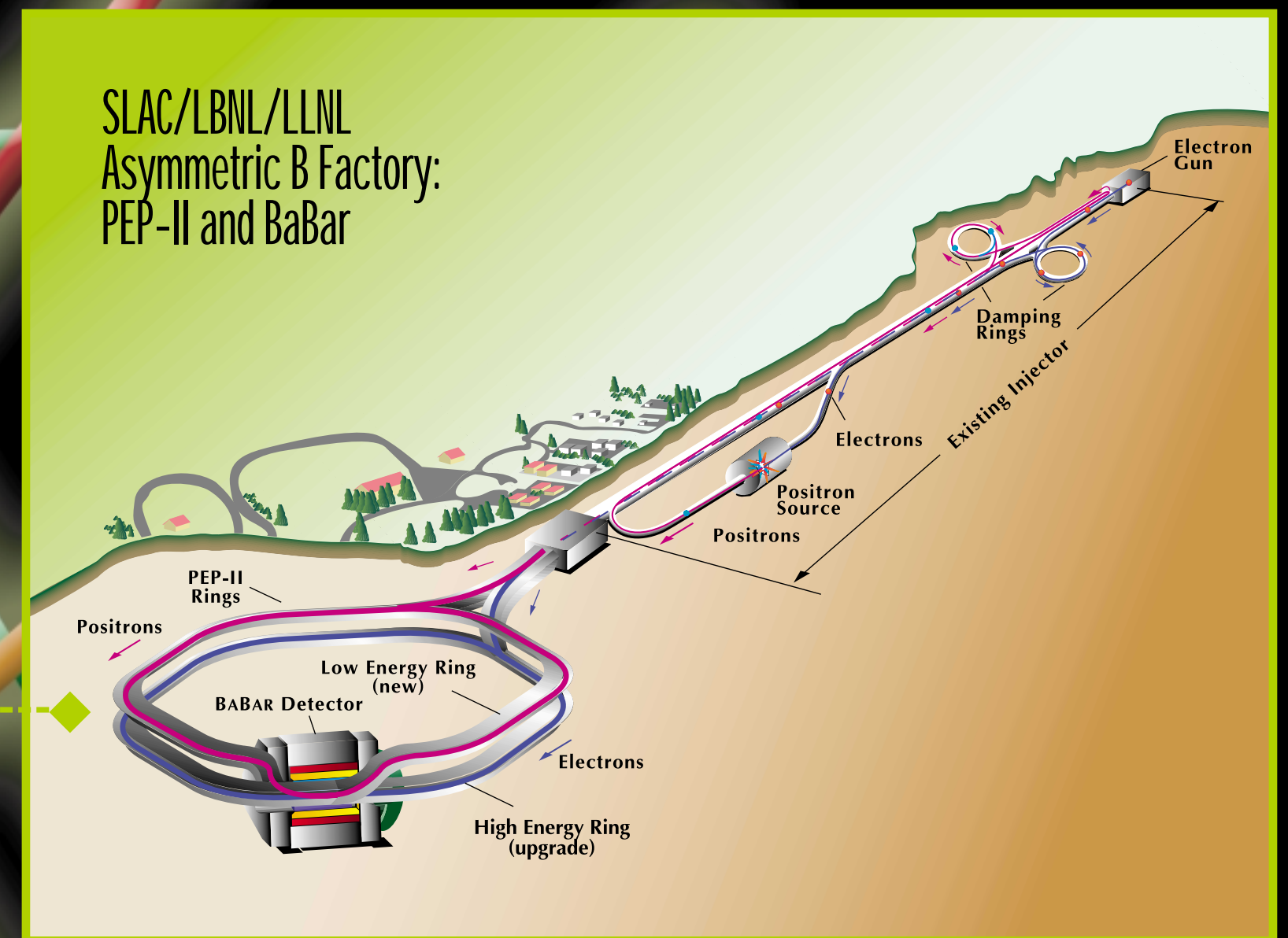


SLAC B Factory PEP-II & BABAR

The B Factory is SLAC's leading particle physics program. Since start up in 1999 about 124 million $B\bar{B}$ pairs, produced in collisions between beams of electron and positrons in the PEP-II storage rings, have been recorded. The study of B quark and anti-B quark decay by the BABAR collaboration has greatly increased the understanding of CP-violation. Among the papers published by BABAR, two highlights are the measurement of $\sin 2\beta$ in July 2001 and the identification of the $\beta_s(2317)$ meson in April 2003.

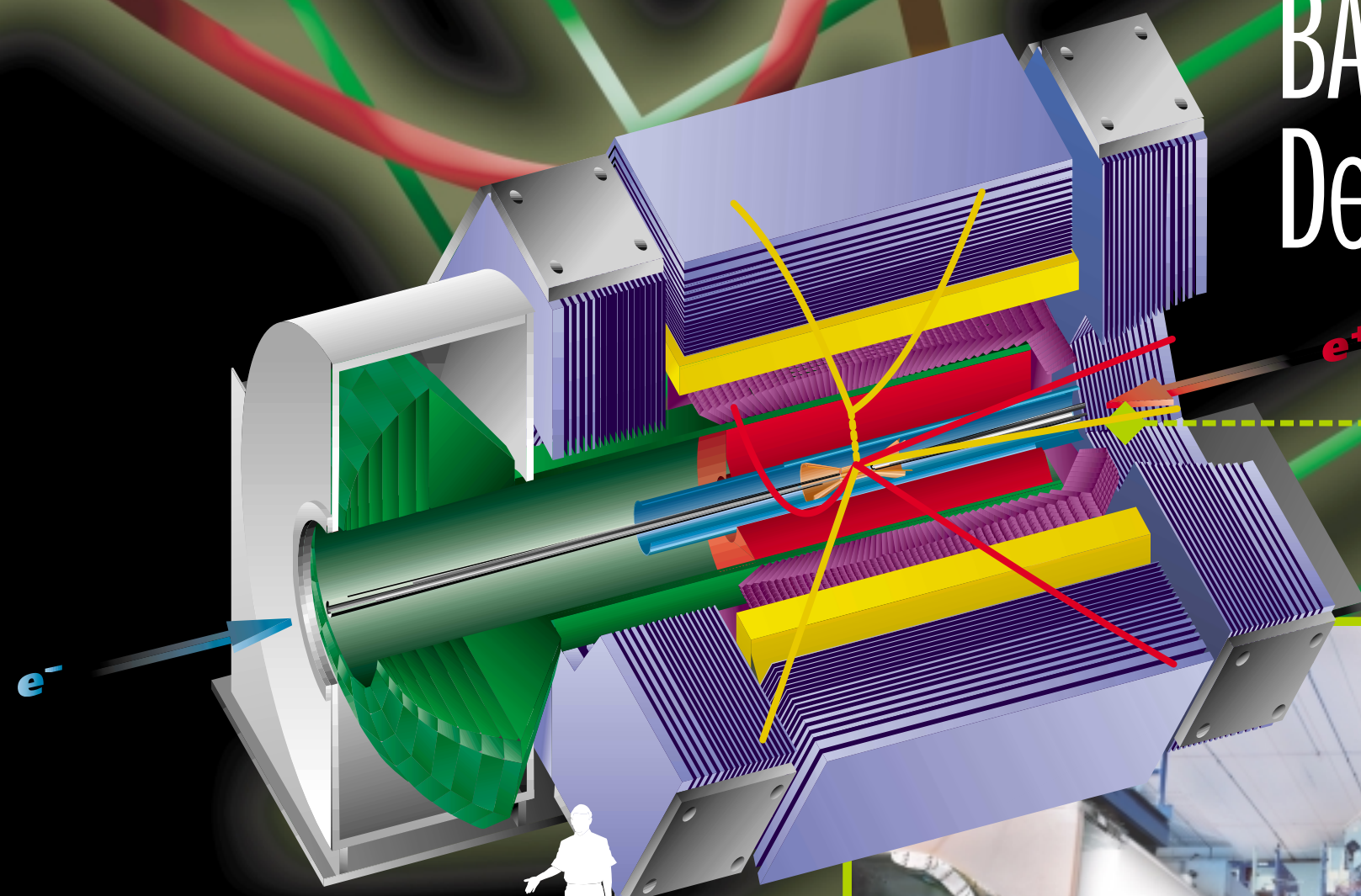
B Factory Overview



PEP-II Collider

PEP-II is an asymmetric energy e^+e^- B-Factory Collider located at SLAC operating at the $\Upsilon(4S)$ resonance. PEP-II has delivered, over the past five years an integrated luminosity to the BABAR detector of over 139 fb⁻¹ and has reached a luminosity of $6.58 \times 10^{33}/\text{cm}^2/\text{s}$.

BABAR Detector

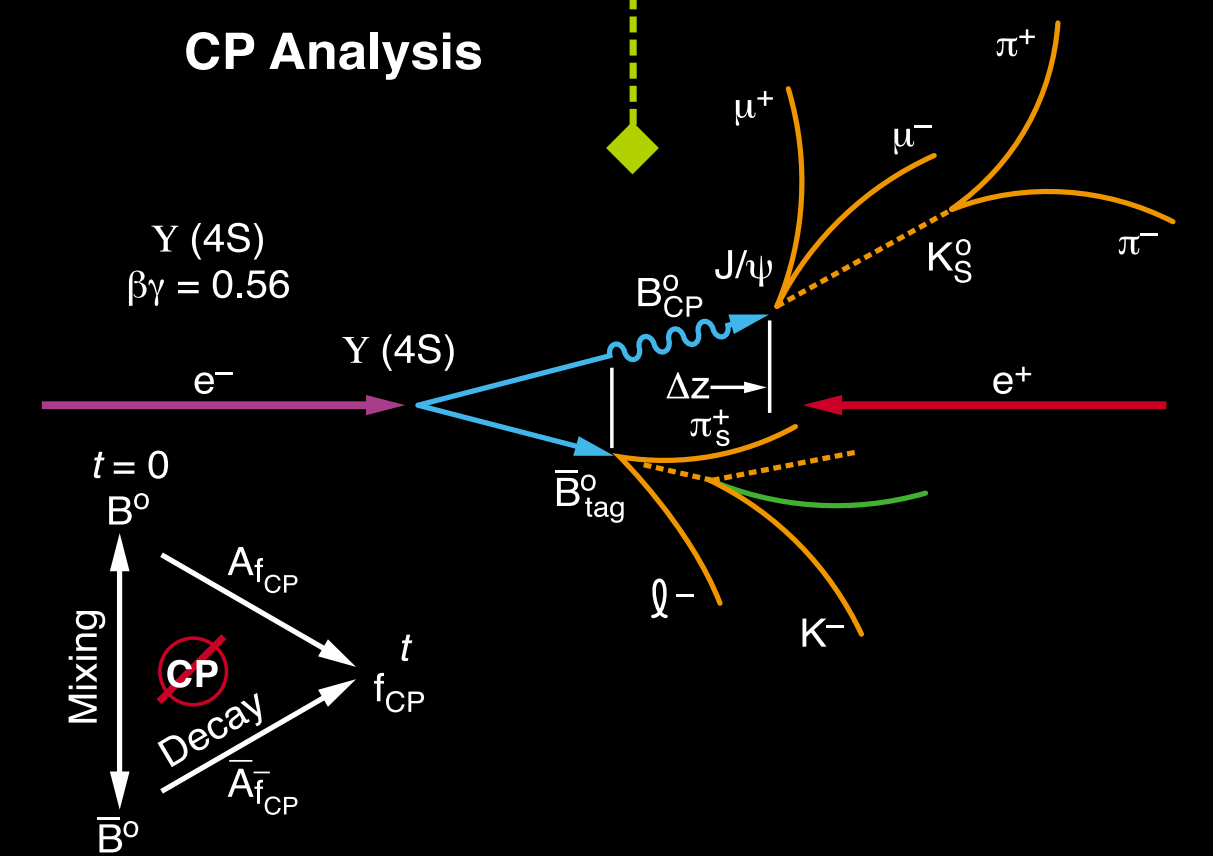


- Muon/Hadron Detector
- Magnet Coil
- Electron/Photon Detector
- Cherenkov Detector
- Tracking Chamber
- Support Tube
- Vertex Detector



BABAR, the detector for the SLAC PEP-II Asymmetric B Factory, is designed to perform comprehensive studies of beauty and charm mesons and tau leptons. BABAR was constructed by an international collaboration of more than 575 scientists from more than 75 institutions coming from 10 countries. The principal goal is to investigate CP violation in B meson decays.

CP Analysis



- Reconstruct one B Decay B_{CP} Ex: $B^0 \rightarrow J/\psi K_S^0$
- Measure the Decay Time Difference Δt from the Separation Δz of the Decay Vertices
- Determine the Flavor of B_{CP} at $\Delta t = 0$ by Identifying the Flavor of the Second Partially Reconstructed \bar{B}_{tag}^0
- Obtain the Asymmetry Between the Number of Decays Tagged as B or \bar{B} Flavor as a Function of Δt