

The CLEO Experiment



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WEST
TRANSFER
LINE

EAST
TRANSFER
LINE

CESR

LINEAR
ACCELERATOR

STORAGE
RING

The CLEO experiment at the Cornell Electron Storage Ring (CESR), accumulated data from Nov. 1979 to Mar. 2008. Both the machine and the detector underwent several different major phases defined by the implementation of new technologies, mostly locally developed. The improved sensitivities usually resulted in major discoveries. Many particles were first seen at CLEO and many important decay modes were first seen, or measured with far more accuracy than done before. Discoveries include the first observations of the $\Upsilon(3S)$, $\Upsilon(4S)$, B^0 , B^- , DS , $\Upsilon(1D)$ and $DSJ(2460)$ mesons, and the Σc^+ , Σc^{*+} , Σc^{*++} , Σc^{*0} , Ξc^0 , Ξc^{*0} , and Ξc^{*+} baryons. First observations of new processes include b-quark semileptonic decays, the rare semileptonic decay $b \rightarrow ul\nu$, the "Penguin" process $b \rightarrow s\gamma$, and the important exclusive decays $B \rightarrow J/\psi KS$, and $D^+ \rightarrow \mu\nu$. Recently, the differential decay rates for $D \rightarrow \pi e \nu$ and $D \rightarrow Ke \nu$ and the decay rates for $DS^+ \rightarrow \mu^+ \nu$ and $DS^+ \rightarrow \tau^+ \nu$ have been measured with unprecedented accuracy, posing a challenge to Lattice QCD calculations. Finally, quantum correlations in charm produced at threshold are exploited to provide unique contributions to charm mixing and to enable the precision determination of the CKM angle γ .

September 10, 2009

Refreshments-3:30 room 201

Lecture 4:00 room 211