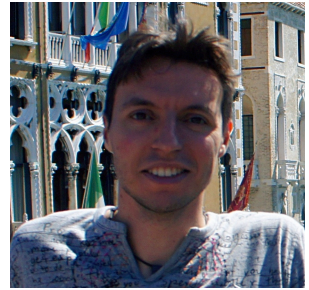


# LEPP JOURNAL CLUB

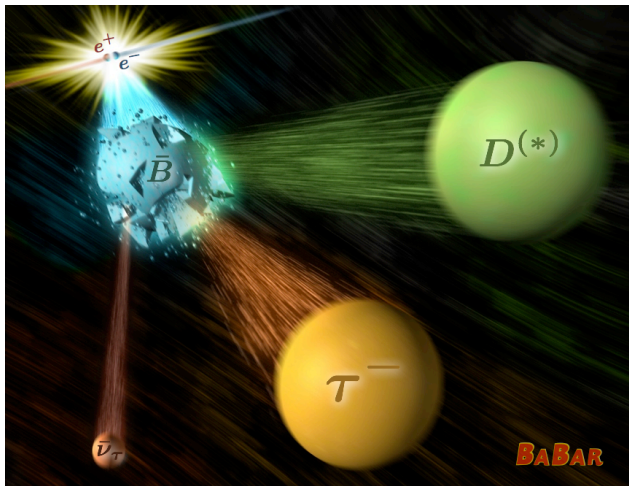
## Manuel Franco Sevilla

UCSB



## Evidence for an excess of $B \rightarrow D^{(*)} \tau \nu$ decays and implications for Two-Higgs-Doublet Models

Based on the full BaBar data sample, we report improved measurements of the ratios  $R(D^{(*)}) = B(B \rightarrow D^{(*)} \tau \nu) / B(B \rightarrow D^{(*)} l \nu)$ , where  $l$  is either  $e$  or  $\mu$ . These ratios are sensitive to new physics contributions in the form of a charged Higgs boson. We measure  $R(D) = 0.440 \pm 0.072$  and  $R(D^*) = 0.332 \pm 0.030$ , which exceed the Standard Model expectations by 2.0 and 2.7 sigma, respectively. Taken together, our results disagree with these expectations at the 3.4 sigma level. This excess cannot be explained by a charged Higgs boson in the type-II two-Higgs-doublet model (2HDM). New kinematic distributions presented here exclude large portions of the more general type-III 2HDM, but there are still solutions within this model compatible with the results.



## Friday

## May 10, 4:00pm

301 Physical Sciences Building

(Refreshments, 3:45pm)

