18.01 Luminosity Functions in Globular Clusters, E. W. GREEN, Univ. of Texas. Final results are presented from a study of the bolometric luminosity functions (LF's) of bright giants in 17 galactic globular clusters. Comparison of the observed LF's with theoretical ones indicates: (1) there is marginal support for a higher value of $Y = 0.30$, rather than 0.20, from the position and size of the "bump" on the giant branch; and (2) the clusters nearest the galactic center appear to be deficient in stars at the red giant tip, relative to well-studied clusters at approximately the sun's galactocentric distance. The difference between the two groups is significant at a 5 to 6σ level. The effect does not correlate with metallicity, and is shown to be independent of small number statistics, presence of field stars, or possible radial gradients. Under the assumption that all HB's have $M_r \sim 0.6$, possible variations in either the numbers of AGB stars, numbers of first RGB stars, or in the MS initial mass function, are insufficient to explain the observed differences.

The inescapable conclusion is that at least some globular clusters near the galactic center must have HB's that are brighter than those of "typical" clusters near the sun, by several tenths of a magnitude or more. This result is in direct contradiction with the predictions from RR Lyrae stars in NGC 6171 and NGC 6723. Evidence for and against two possible causes of a more luminous HB - namely, higher $Y$ and a larger $M_{core}$ (due to faster rotation?) - is discussed.