1038-55-186   **J. P. May*** (`may@math.uchicago.edu`), Department of Mathematics, 1118 E. 58th Street, University of Chicago, Chicago, IL 60615. *What are E infinity ring spaces and E infinity ring spectra?*

E infinity ring spectra were defined in 1972,but the term has since acquired several alternative meanings. The same is true of several related terms from the 1970's. The new formulations are not always known to be equivalent to the old ones and even when they are, the notion of "equivalence" needs discussion: Quillen equivalent model categories can be quite seriously inequivalent. Part of the confusion stems from a gap in the modern resurgence of interest in E infinity structures. E infinity ring spaces were also defined in 1972, and have never been redefined. They were central to the early applications and they tie in to modern applications. We summarize the relationships between the old notions and various new ones, explaining what is and is not known. (Received February 08, 2008)