1027-62-230 **Noureddine El Karoui*** (nkaroui@stat.berkeley.edu), UC Berkeley, Department of Statistics, 367 Evans Hall, Berkeley, CA 94720-3860. *Some properties of the largest eigenvalues of complex Wishart matrices for fairly general population covariance.*

Sample covariance matrices, i.e matrices of the type X^*X, where X is an $n \times p$ random matrix play a key role in multivariate statistical analysis. Their eigenvalues are of particular interest in widely used techniques such as Principal Component Analysis. For datasets for which p and n are both large, the standard asymptotics (which assume that p is held fixed and n goes to infinity) fail to give statistically useful approximations.

However, using tools from random matrix theory, it is possible to obtain precise results (central limit-type theorems) about the fluctuation behavior of the largest eigenvalue of these matrices, if one is willing to make distributional assumptions about the entries of the matrix X. In particular, the limiting laws that appear in these problems are very often Tracy-Widom distributions, as opposed to Gaussian distributions when p is held fixed. I will discuss recent developments in this area of research, stressing the fact that we can know handle the case where there is a general covariance structure within the rows of X, at least when the entries of X are complex Gaussian. (Received February 27, 2007)