STANFORD UNIVERSITY
DEPARTMENT OF STATISTICS

DEPARTMENTAL SEMINAR

4:15 p.m., Tuesday, March 21, 2006
Sequoia Hall Room 200
(Cookies at 3:45 in 1st Floor Lounge)

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John von Neumann's Analysis of Gaussian Elimination and the Invention of Modern Computing

Just when modern computers were being invented (those digital, electronic, and programmable), John von Neumann and Herman Goldstine wrote a paper to illustrate the mathematical analyses that they believed would be needed to use the new machines effectively and to guide the development of still faster computers. Their foresight and the congruence of historical events made their work the first modern paper in numerical analysis. Von Neumann once remarked that to found a mathematical theory one had to prove the first theorem, which he and Goldstine did concerning the accuracy of mechanized Gaussian elimination, but the paper was about more than that. Von Neumann and Goldstine described what they surmised would be the significant questions once computers became available for computational science, and they suggested enduring ways to answer them.

This talk takes a broad view of the evolution of computing before computers, a good part of it connected to statistics, and then briefly describes the highlights of von Neumann and Goldstine's results.