

Matrix Computations & Scientific Computing Seminar

Organizer(s): James Demmel, Ming Gu & Beresford Parlett

Wednesday, 11:00am–12:00pm, 380 Soda

Sept. 9 **Prof. William Kahan**, UC Berkeley

Hyperbolic Interpolation and Iteration towards a Zero

Given a real function $f(x)$ about which we know how to compute its value, we seek one of its Zeros z , a root of the equation $f(z) = 0$, starting from some first guess(es). This z should be the limit of a sequence of presumably improving guesses $x[n+1] := Hf(x[n], x[n-1], x[n-2])$ computed for $n = 0, 1, 2, 3, \dots$ in turn by a Hyperbolic Iterating Function Hf to be defined. It will be compared with a few others, and its application to an eigenproblem will be analyzed in detail. The bigger questions are ...

"When is a computed result at least about as accurate as the data and the arithmetic's precision deserve? And how much is that much accuracy worth?"