1106-VO-817 **Charles Puelz*** (cpuelz@rice.edu), **Mark Embree** and **Jake Fillman**. *An $O(N^2)$ Eigenvalue Algorithm for Period–N Jacobi Operators.*

Aperiodic physical systems may be mathematically modeled by quasiperiodic Jacobi operators, popular examples of which include Fibonacci, period doubling, and Thue-Morse operators. Their spectra yield beautiful and interesting mathematical and physical insight. For example, some spectra are provably Cantor sets, and one can use these objects to study electron propagation in quasicrystals. A useful technique in studying these sets is to approximate them with the spectra of related *periodic* Jacobi operators of increasingly long period. These periodic spectra may be computed as eigenvalues of matrices, whereby we arrive at a challenging largescale eigenvalue problem in which all the eigenvalues (often clustered) are required. We present an $O(N^2)$ eigenvalue algorithm for computing the spectrum of a general period–N Jacobi operator, and then we apply this method to study relevant quasperiodic operators. (Received September 07, 2014)