

**ICM-9403-63** Parallel GCD for Sparse Multivariate Polynomials on Shared Memory Multiprocessors, Mohamed Omar Rayes and Paul S. Wang.

ABSTRACT A new parallel GCD algorithm (probabilistic), using a divide-and-conquer strategy, for sparse multivariate polynomials is described. The computation for an  $n$ -variable GCD is divided into two independent GCD subproblems each with half the number of variables. Each subproblem is recursively subdivided in the same way. The parallel solutions of these small subproblems combine to give the GCD of the original problem. The algorithm also takes advantage of the sparseness present in all the variables from the very beginning making it more efficient. The algorithm has been implemented on a Sequent Balance with 26 processors. Actual timings and comparisons with another sparse parallel GCD scheme are also presented.