Matrix Computations and Scientific Computing Seminar

Organizer: Jim Demmel and Ming Gu

Wednesday, 12:10–1:00 pm, 380 Soda Hall

Oct 8 **Laura Grigori**, INRIA Paris, currently visiting UC Berkeley
Enlarged Krylov subspace methods for reducing communication

In this talk we discuss iterative methods for solving sparse linear systems of equations of the form Ax=b. We introduce a new approach for reducing communication in Krylov subspace methods that consists of enlarging the Krylov subspace by a maximum of t vectors per iteration, based on the domain decomposition of the graph of A. The obtained enlarged Krylov subspace is a superset of the classic Krylov subspace. Thus it is possible to search for the solution of the system Ax=b in the enlarged Krylov subspace instead of the classic one. We show in this talk that the enlarged Krylov projection subspace methods lead to faster convergence in terms of iterations and parallelizable algorithms with less communication, with respect to Krylov methods.

This is a joint work with Sophie Moufawad and Frederic Nataf.