1074-49-4 **Emmanuel Candes*** (candes@stanford.edu). *Recovering the unseen: Some recent advances in low-rank matrix reconstruction.*

We discuss two surprising phenomena. The first is that one can recover low-rank matrices exactly from what appear to be highly incomplete sets of sampled entries; that is, from a minimally sampled set of entries. Further, perfect recovery is possible by solving a simple convex optimization program, namely, a convenient semidefinite program. The second is that exact recovery via convex programming is further possible even in situations where a positive fraction of the observed entries are corrupted in an almost arbitrary fashion. These facts have lots of consequences and applications we shall discuss. (Received August 29, 2011)