DMRG and DMFT - a possible marriage?

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In the last years, dynamical mean-field theory (DMFT) has emerged as a leading method for the description of strongly correlated materials, with an increasing shift towards more realistic models of substances, accounting for multiple bands, Hunds coupling, better momentum resolution and so forth. Progress in this field is centrally tied to advances in impurity solvers, where great progress has been achieved. Nevertheless, current impurity solvers face undesirable limitations. The density-matrix renormalization group (DMRG) would seem a perfect tool for an impurity solver, but not much has been achieved for many years. In this talk I want to present how DMRG can now be turned into a realistic impurity solver for DMFT, giving access to problems that even the most advanced Monte-Carlo methods in that field cannot treat.