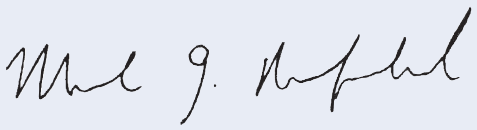
The ability to manage and reduce power dissipation is key to the design of computing systems ranging from handheld devices through high-performance servers. Increasingly, overall system performance is being constrained by power-related factors including power delivery, power densities, and heat-removal capabilities. Thus, we must address power at all levels of the system performance stack: from technology, circuits, and microarchitecture through the multiple software layers. In addition, power-efficient design must take place at all stages of the development cycle and must be supported by power-aware development tools. This has always been the case for battery-powered devices, but is now becoming standard operating procedure in the design of high-performance systems.

The papers in this special issue of the *IBM Journal of Research and Development* represent significant efforts ranging from low-power circuits through power-efficient workload management. This research has enabled leading-edge system design which has resulted in higher performance and more energy-efficient products.



Michael G. Rosenfield
Director, Austin Research Laboratory
IBM Research Division