Memristors are novel devices which can be used in applications such as memory, analog circuits, neuromorphic systems, as well as logic gates. This talk is focused on logic design with memristors. In this talk several memristor-based logic families are introduced – IMPLY logic gate, MAGIC (Memristor Aided Logic), memristor-based PLA, and hybrid memristor-CMOS logic gates. Design considerations for memristor-based logic design are discussed, as well as the computer architecture insights for the use of memristors as logic gates in addition to memory.