Moore’s law of exponentially increasing circuit density has greatly benefited scientific instrumentation. As detection volumes shrink from cm or mm 1-D length scales to μm 2-D (and even 3-D) scales, a corresponding increase in readout electronics compactness is required. The solution is generally a custom integrated circuit (IC), designed for a specific instrumentation application.

LBNL has been designing custom integrated circuits for a variety of applications for more than 20 years. This talk will highlight current activities and projects in high-energy physics, astrophysics, synchrotron radiation research and other areas. The design process, and some of the challenges, will be described as well.