Objective

• Develop readiness for scientific data analysis and visualization at extreme scale.
  – Address challenges of emerging architectures.
• In addition to designing our own algorithms, build a toolkit that enables others to build algorithms.

Technology

• The Dax Toolkit: a visualization toolkit containing a framework that reduces the challenges of writing highly concurrent algorithms.
• Current investment is 3 year project.
• Supports simple porting across CPU and GPU architectures.
• Algorithms written at higher abstraction have performance comparable to alternates written by experts with APIs providing full access to parallel features.

Impact

• Dax applied to analysis of N-body cosmology simulation to identify void, pancake, filament, and clump features.
• Requires expensive operation of finding cells in irregular, self-intersecting mesh.
• Dax demonstrates finding cells while yielding speedups of up to 22 × with multiple cores and 65 × using a GPU.