

# Zoltan/Zoltan2

Parallel partitioning, load balancing, task placement, graph coloring, matrix ordering, unstructured communication utilities, distributed directories

## ■ Partitioning & load-balancing support many applications

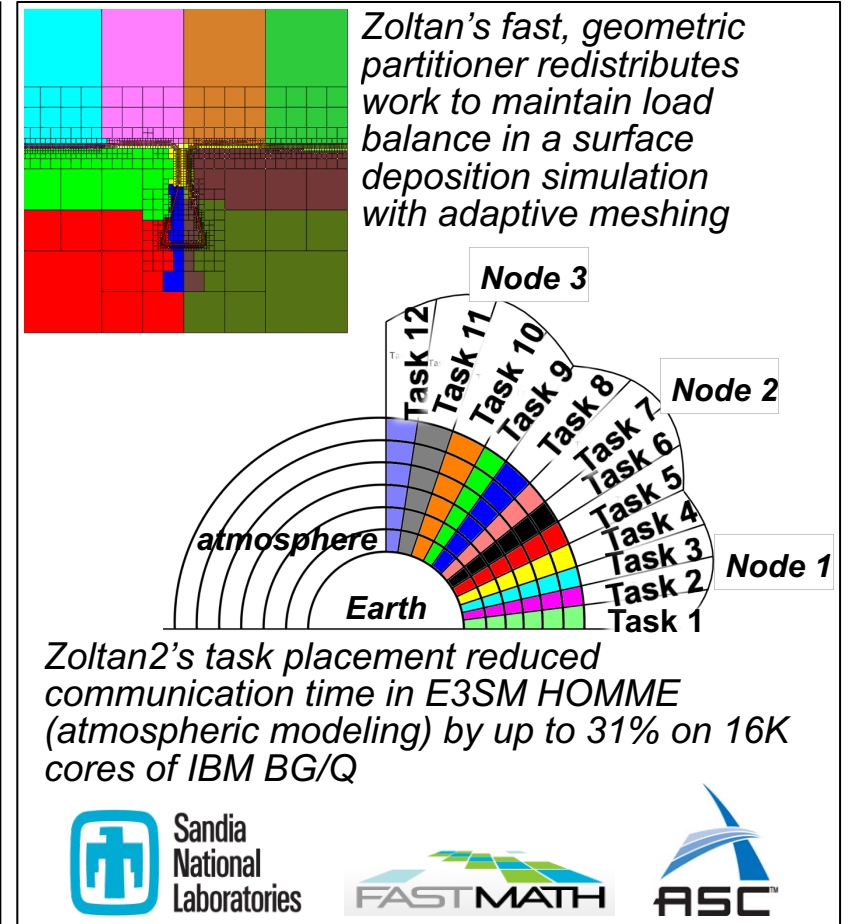
- Fast geometric methods maintain spatial locality of data (e.g., for adaptive finite element methods, particle methods, crash/contact simulations)
- Graph and hypergraph methods explicitly account for communication costs (e.g., for electrical circuits, finite element meshes, social networks)
- Single interface to popular partitioning TPLs: XtraPuLP (SNL, RPI); ParMA (RPI); PT-Scotch (U Bordeaux); ParMETIS (U Minnesota)
- MPI+X geometric partitioning using Kokkos for GPU and multicore

## ■ Architecture-aware MPI task placement reduces application communication time

- Places interdependent MPI tasks on “nearby” nodes in network
- Reduces communication time and network congestion

## ■ Graph algorithms for coloring, ordering, connectivity

## ■ Use as a stand-alone library or as a Trilinos component



<https://www.cs.sandia.gov/Zoltan>