Review: Volume Graphics
- pros
  - formidable technique for data exploration
- cons
  - rendering algorithm has high complexity!
  - special purpose hardware costly (~$3K-$10K)

Review: Isosurfaces
- 2D scalar fields: isolines
  - contour plots, level sets
  - topographic maps
- 3D scalar fields: isosurfaces

Review: Isosurface Extraction
- array of discrete point samples at grid points
- 3D array: voxels
- find contours
  - closed, continuous
  - determined by iso-value
- several methods
  - marching cubes is most common

Review: Marching Cubes
- create cube
- classify each voxel
- binary labeling of each voxel to create index
- use in array storing edge list
  - all 256 cases can be derived from 15 base cases
- interpolate triangle vertex
- calculate the normal at each cube vertex
- render by standard methods
Review: Direct Volume Rendering Pipeline
- do not compute surface

Review: Transfer Functions To Classify
- map data value to color and opacity
- can be difficult, unintuitive, and slow

Review: Volume Rendering Algorithms
- ray casting
  - image order, forward viewing
- splatting
  - object order, backward viewing
- texture mapping
  - object order
  - back-to-front compositing

Review: Ray Casting Traversal Schemes