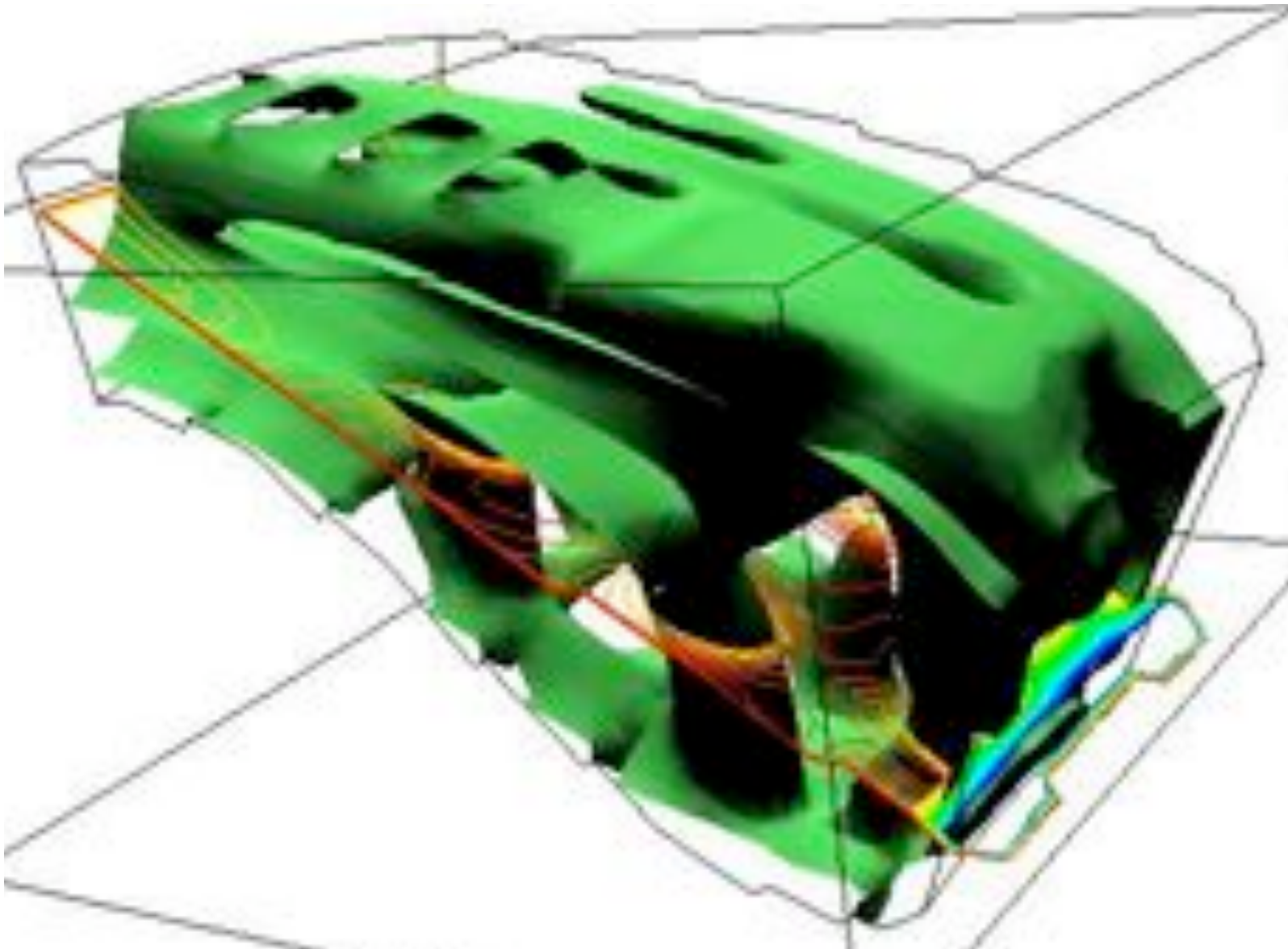


HCI/Geol/CS 558 X

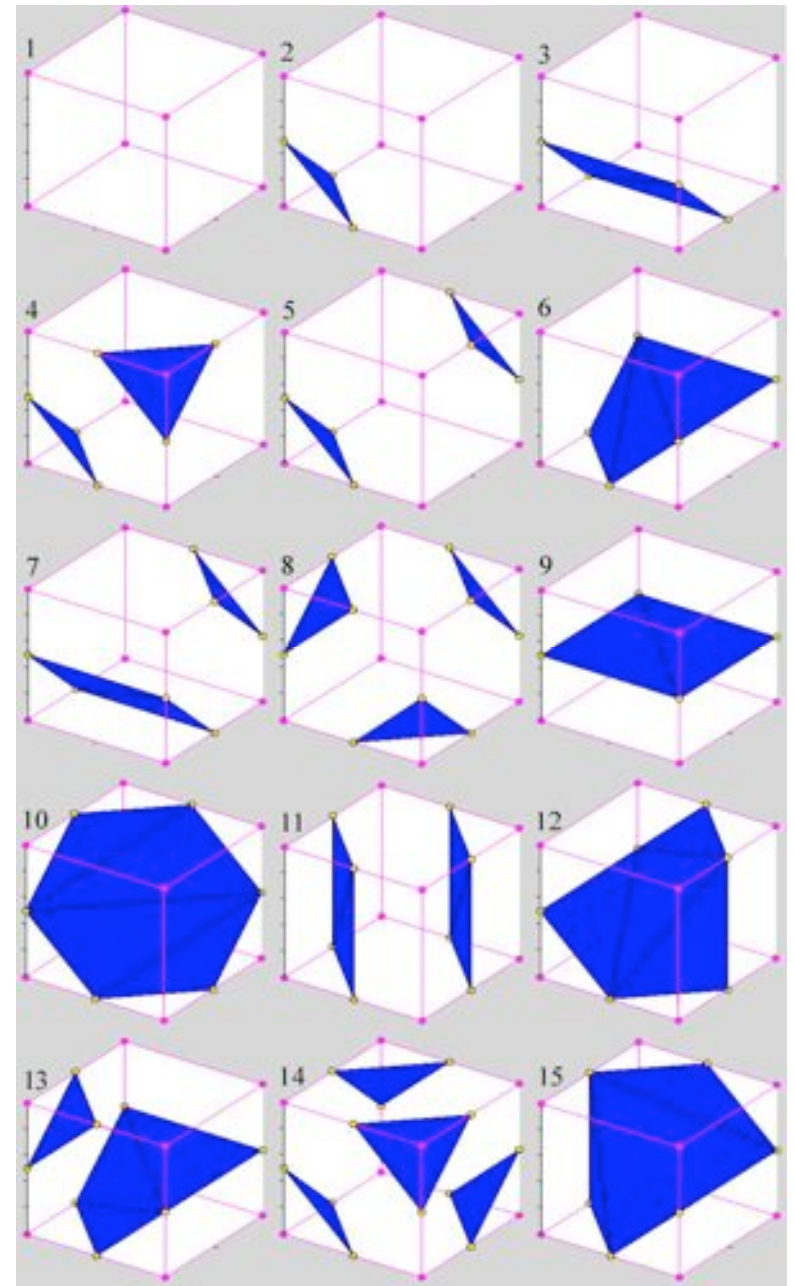
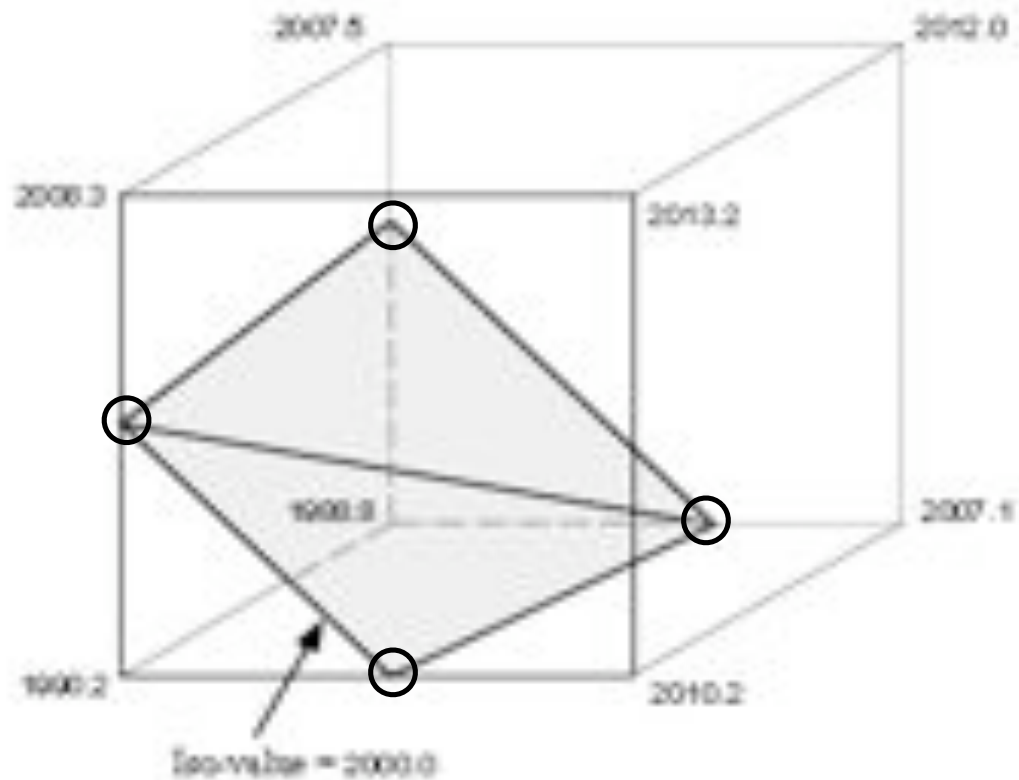
**Lecture 4: Visualization
techniques (II)**

1/30/07

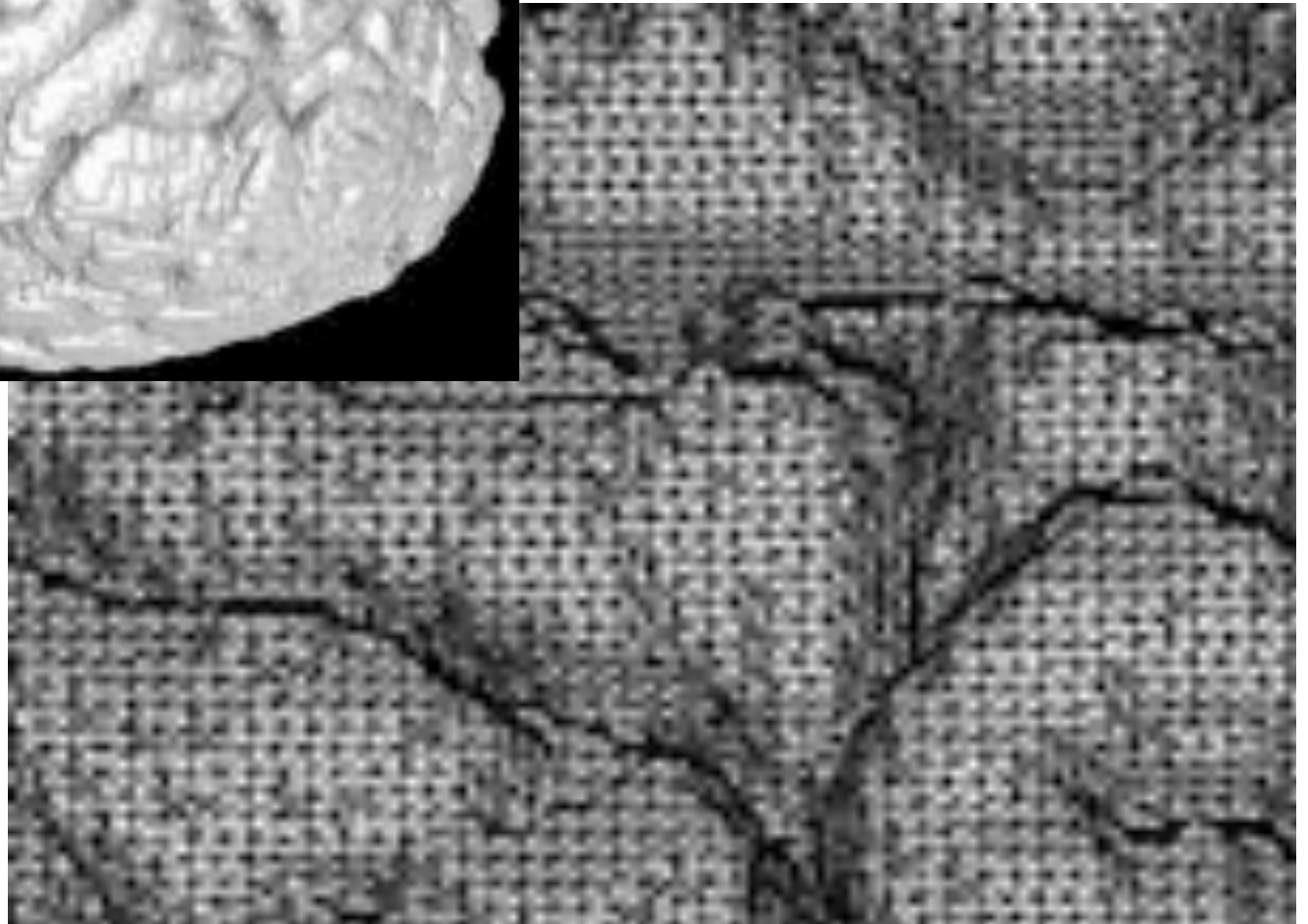
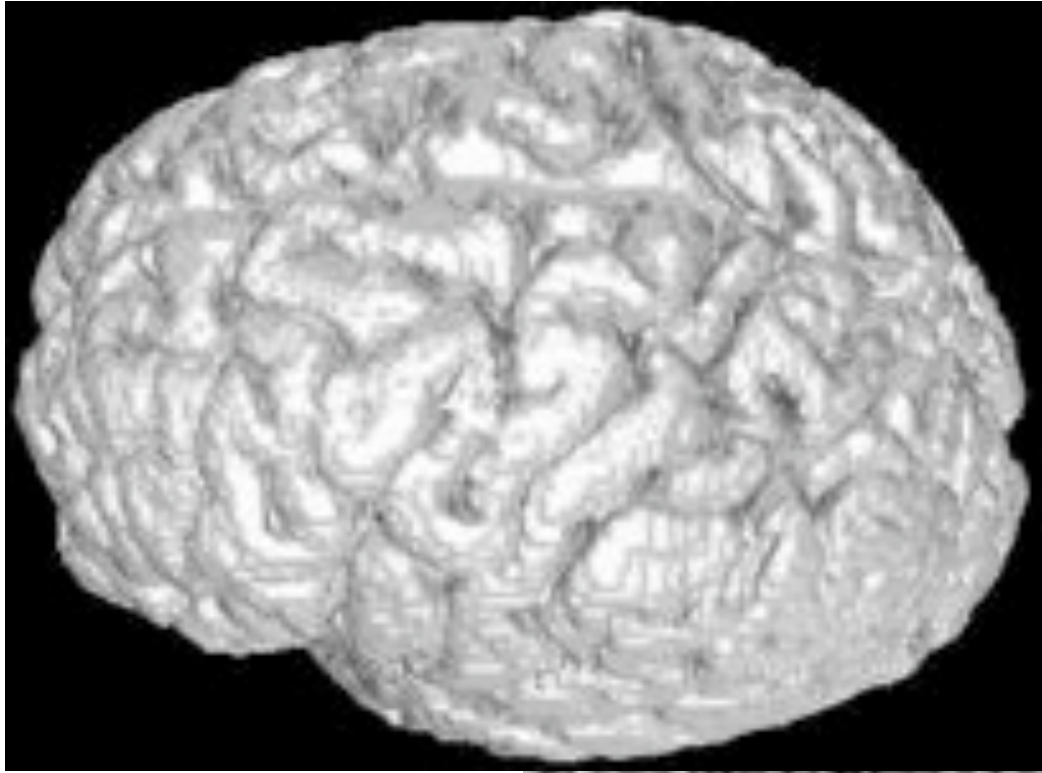
- Iso surfaces - review
- Rubbersheeting, clip-planes, slabs
- No lab this Thursday
- lab/homework instead



- What do you see? How is it different from DX?



Marching cubes (Bill Lorensen,
 1987)
 clarification: triangle vertices can
 be on a corner - just not all 3!



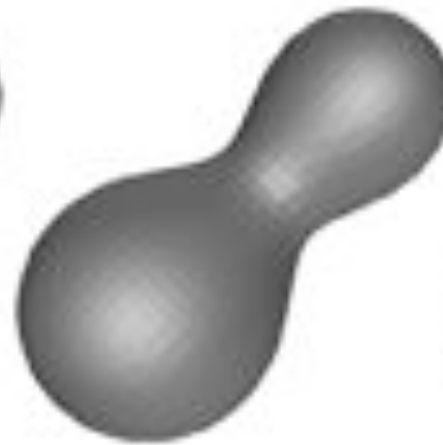
Effect of a cell (grid) size:



Grid size=5
220 Facets



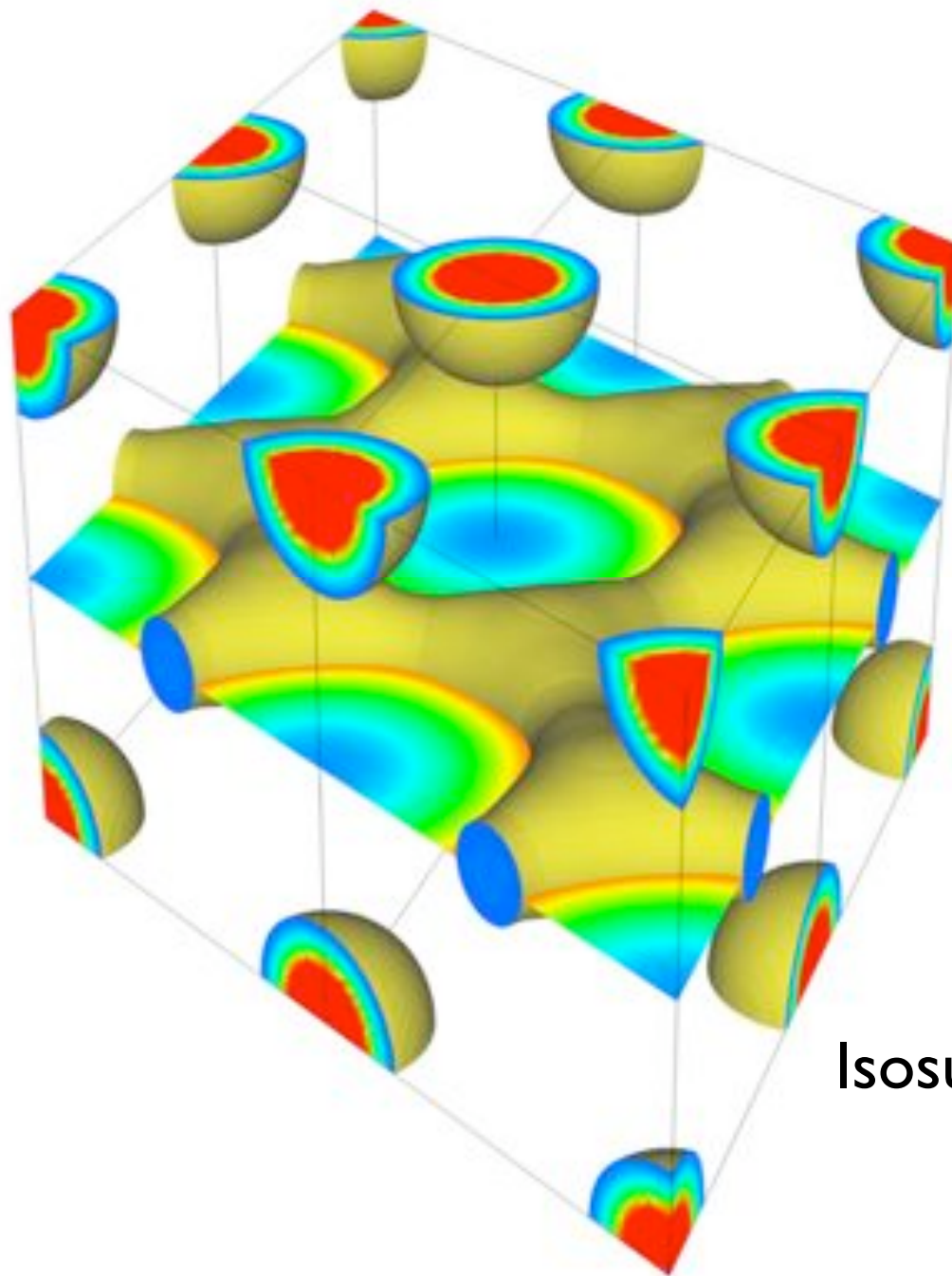
Grid size=2
1700 Facets



Grid size=1
6800 Facets



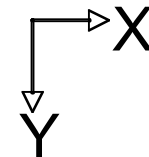
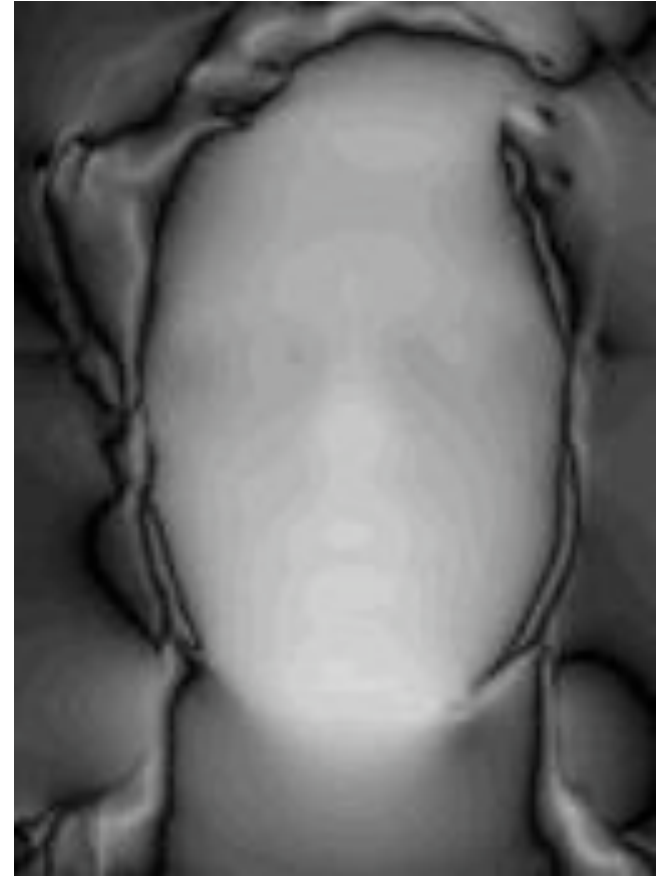
Grid size=0.5
27000 Facets

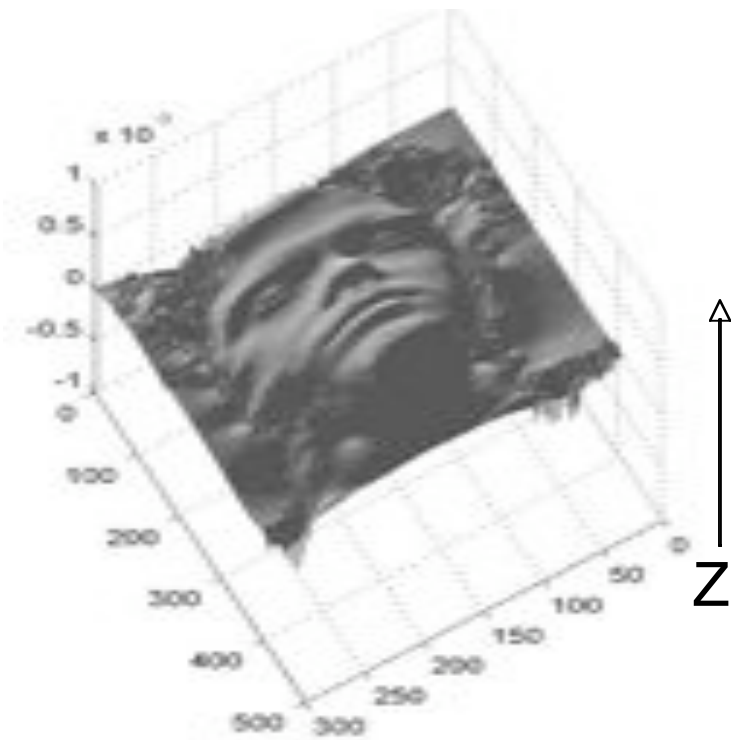


Isosurface or not?

Rubbesheeting

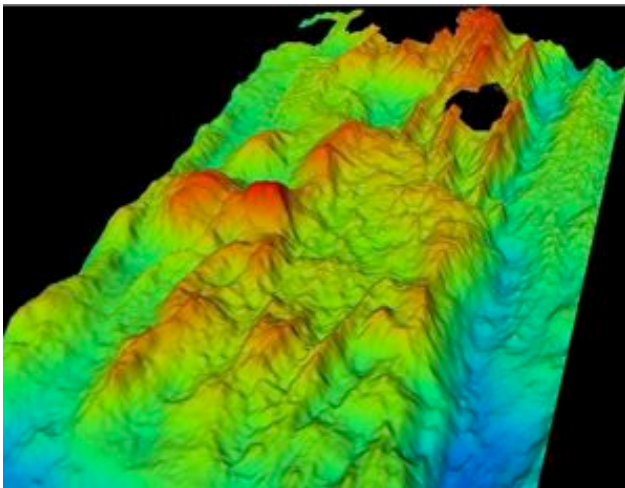
- Visualizes a height-map (elevation-grid)
- Takes a scalar surface (grid cells with x,y and value)
- Displaces each point by an amount based on pixel (cell) value



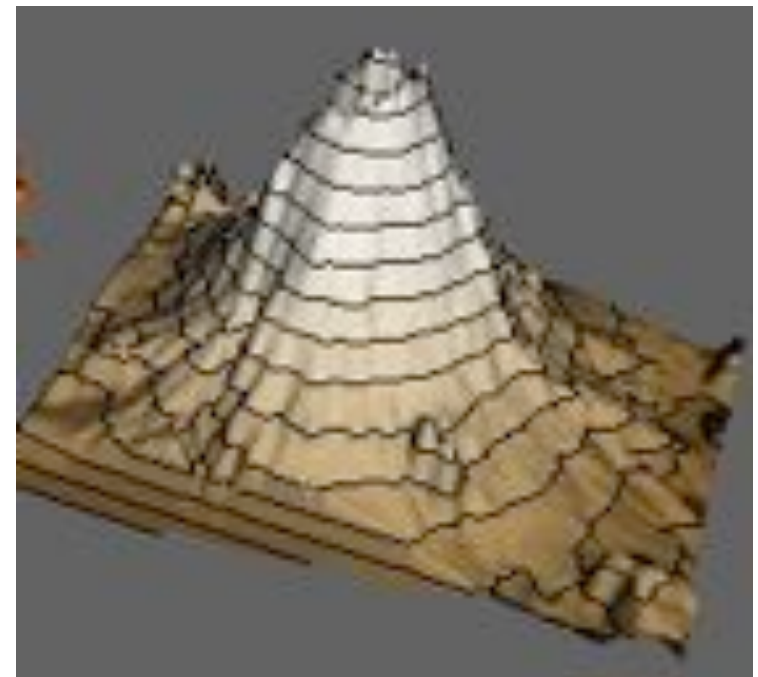


2D grid shown as actual elevation, each cell is moved up or down depending on the z-component of the data (so-called 2.5 D)

Note the different scales on X Y vs Z!

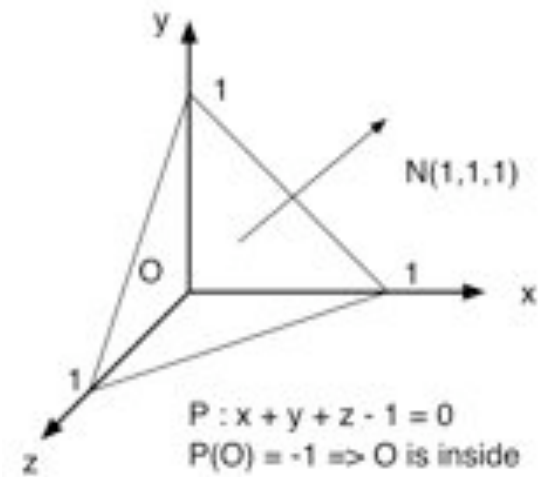


mechanisms?

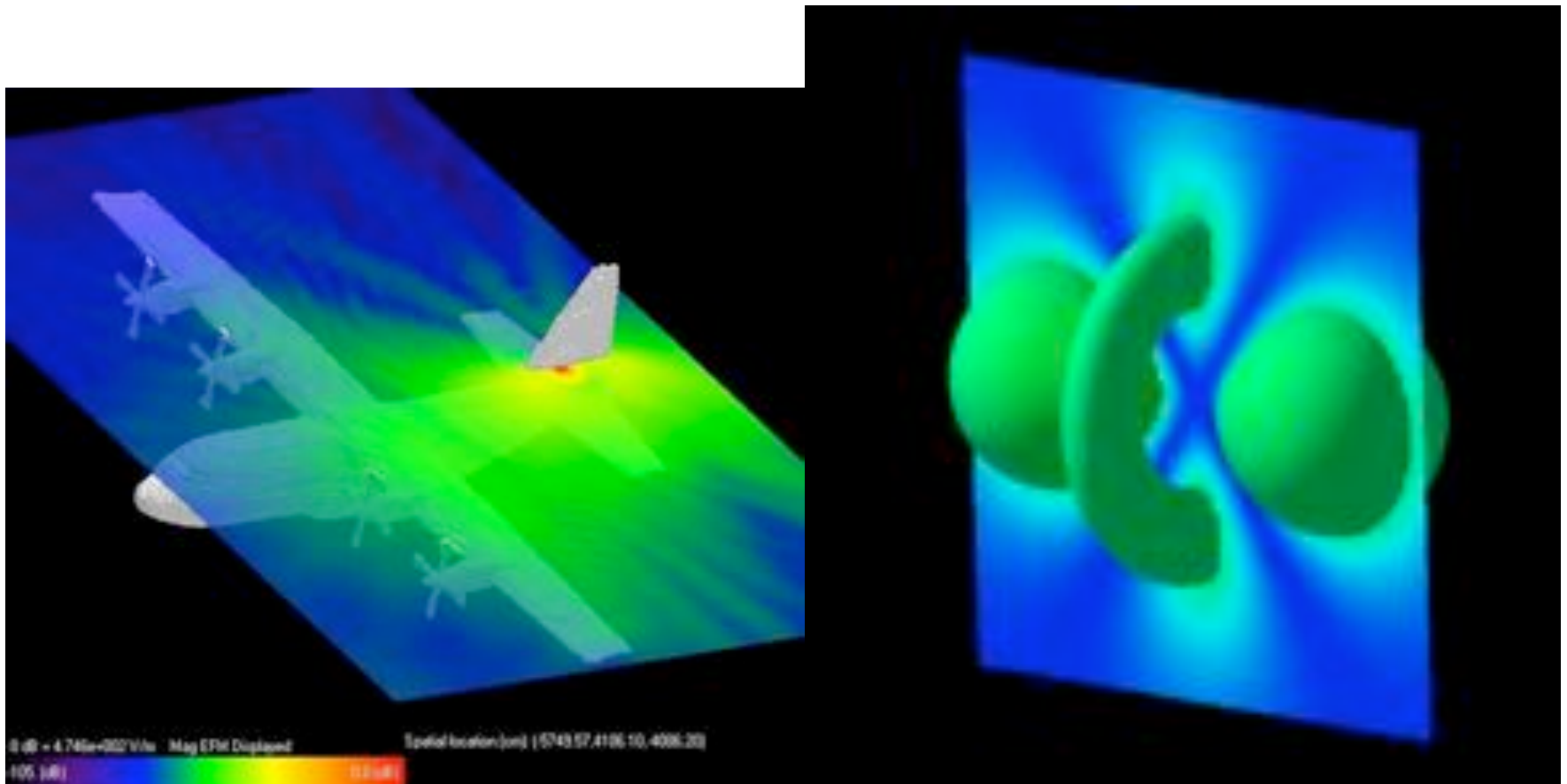


Clip plane

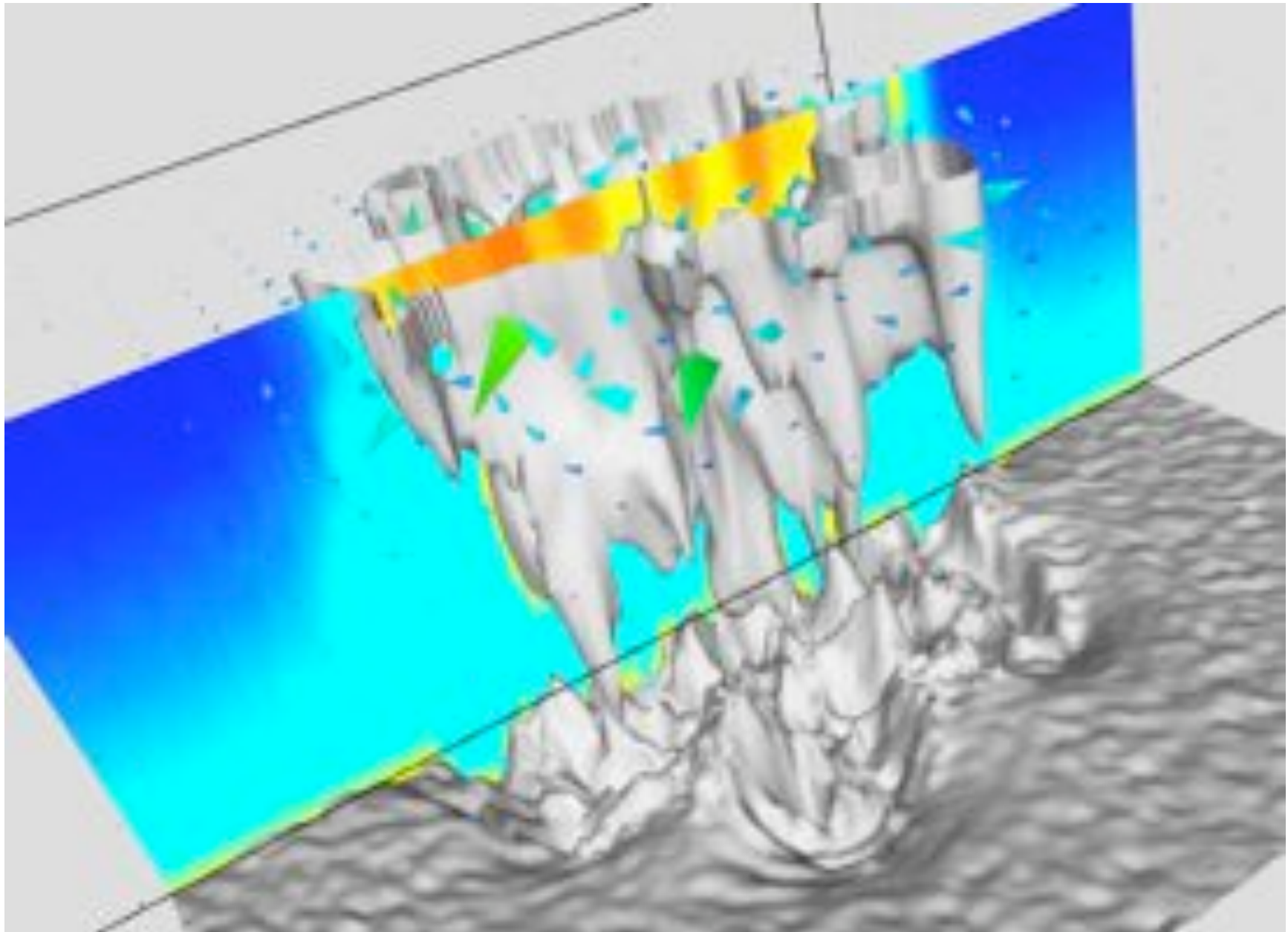
- Typically used with 3D grid data (interpolation - ? dep.?)
- How to define a the position of a plane in 3D?
 - Specify intersections with x, y, z axis (draw)
 - Arbitrary orientation: 1.2 , 3.2 , 5.7 (0, 0, 0 ?)
 - DX: special case of “Slab”:
 - only orthogonal (90 degree) - example?
 - 0, 2, 0 1, 0, 0 0, 0, -3

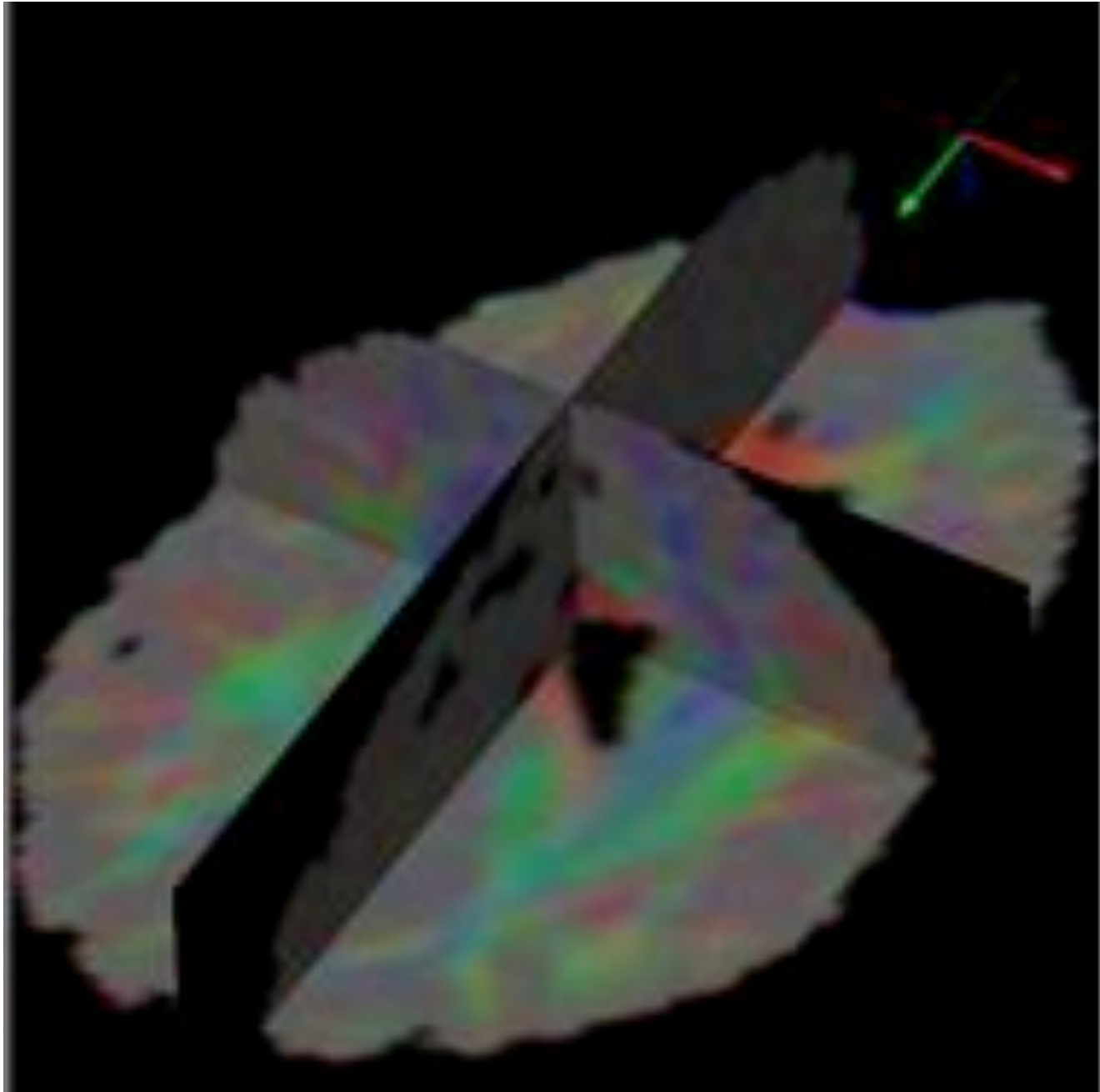


make colors (2D image) at intersection 3D grid with plane:

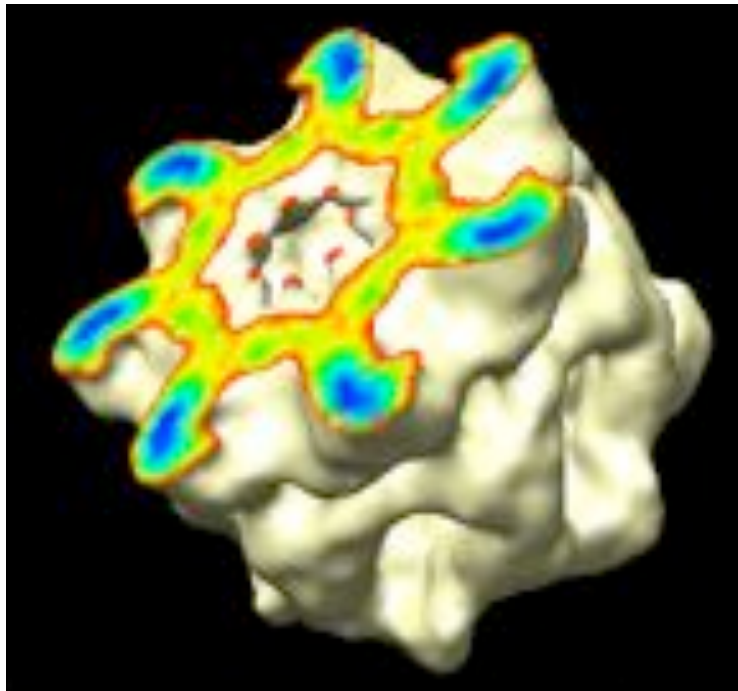


plane definition ?

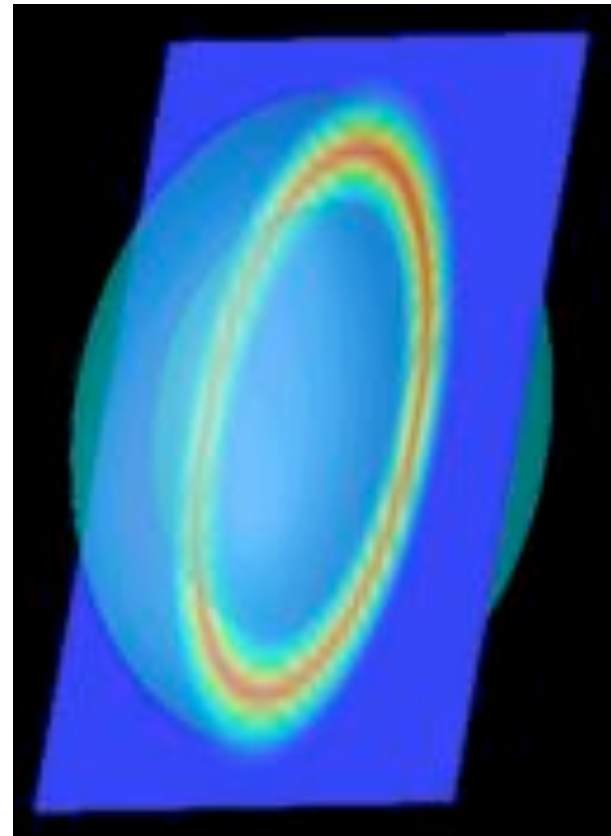
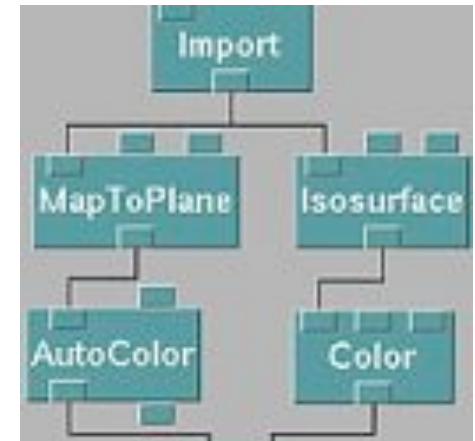




DX - MapToPlane

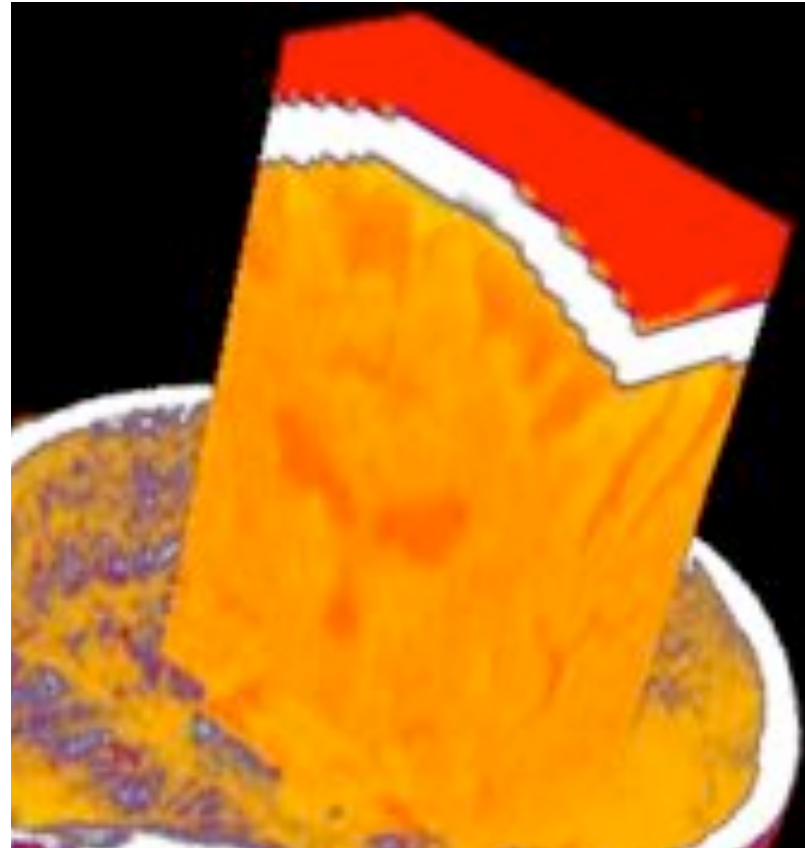


- arbitrary plane definition
- (similar to OpenGL clip plane?)



DX Slab module

- plane with a “thickness”
- need to set 3 slab dimensions
- slab with 0 thickness = clip plane



- Homework/lab: import and visualize
- Import data/dem.ascii (copy to your folder!)
- Grid data, single timestep, Block
- 4 lines of header:
- size 441 by 438, ASCII, “column”
- Grid positions 0,1 (?), data type: byte (0 - 255)

P2

CREATOR: XV version 3.10a-jumboFix+Enh of 20050501

441 438

255

19 19 19 19 19 19 19 19 19 21 21 22 22

25 26 26 28

- save as dem.general
- make network: New Visual Program ...
- Import module: dem.general
- Use: autocolor, rubbersheet, isosurface, ...
- Do not simply use Visualize Data ... from import!
- What is it?
- Send me 3 screenshots (Ksnapshot)