

Stuart Levy

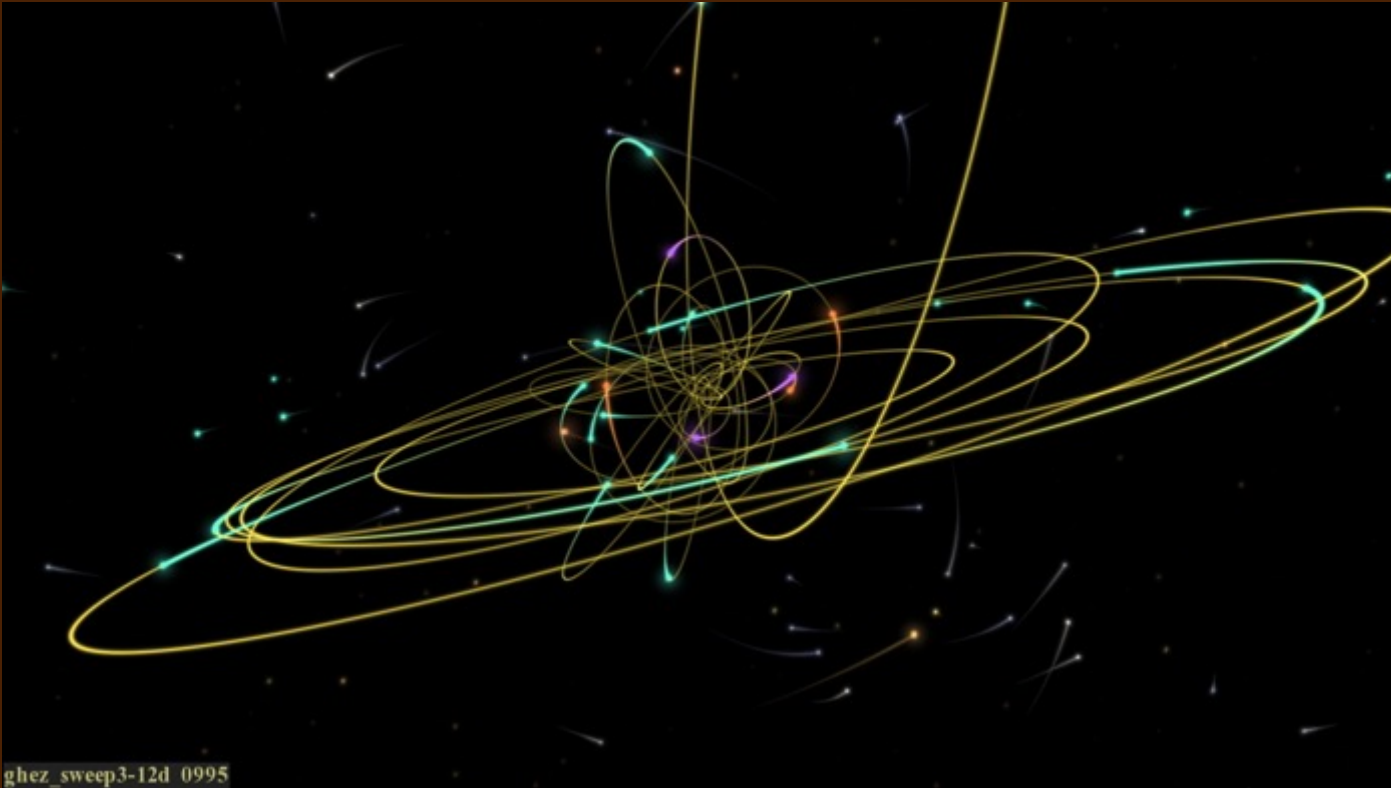
programmer, systems person

some background in
physics, astronomy, math

I like collaborating with scientists

Astronomy & Physics

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8/26/2020

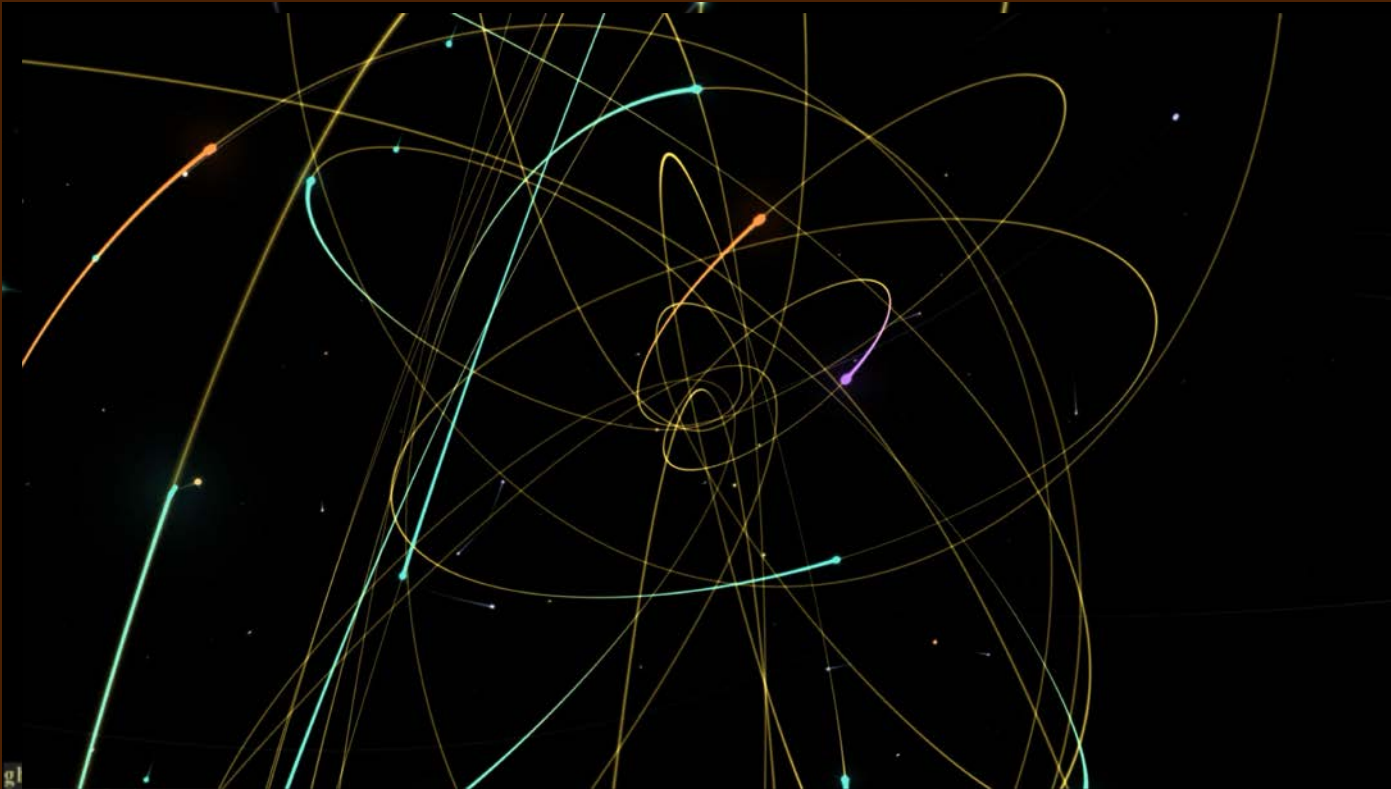


Andrea Ghez – stars orbiting Milky Way central black hole

Astronomy & Physics

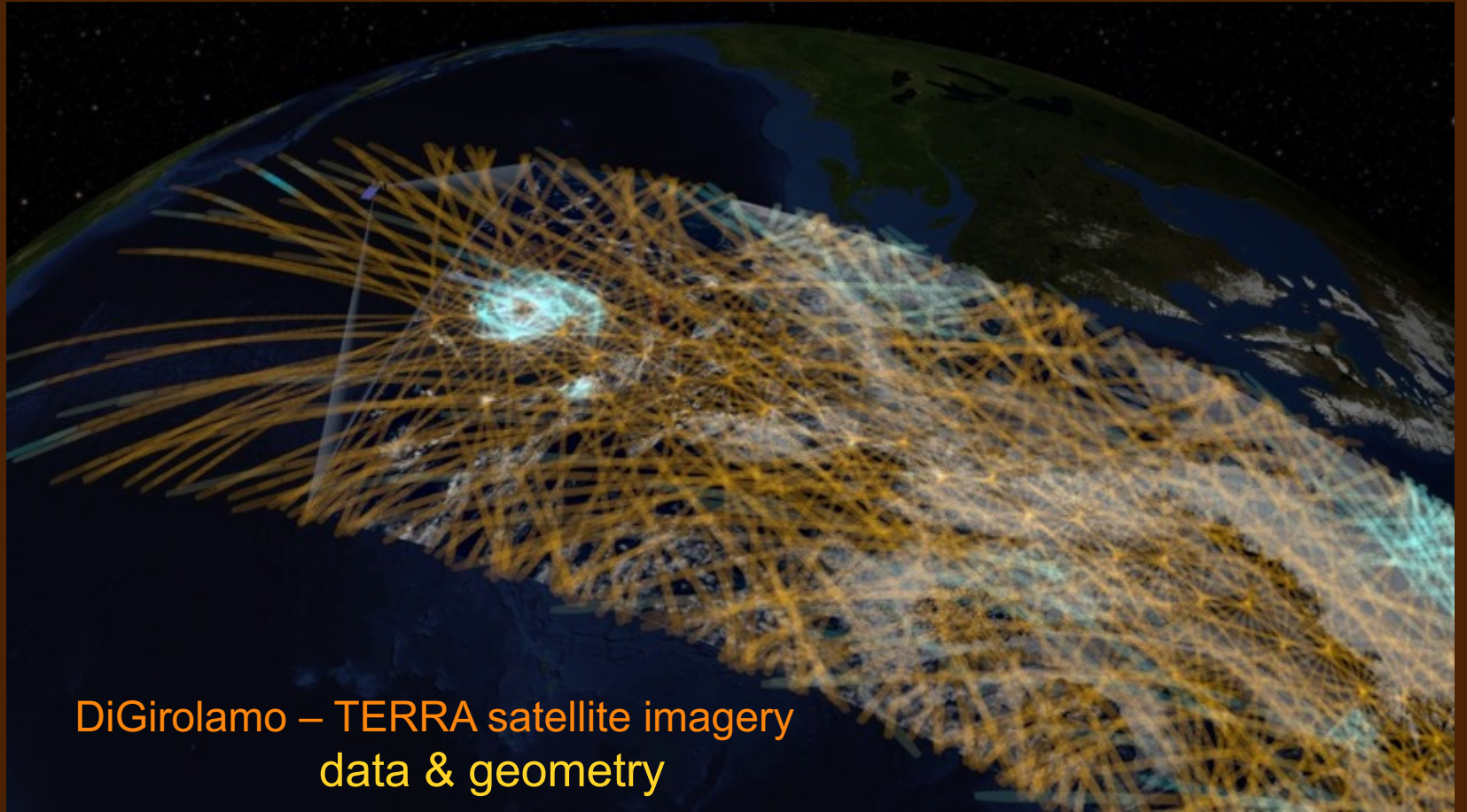
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I like collaborating with scientists



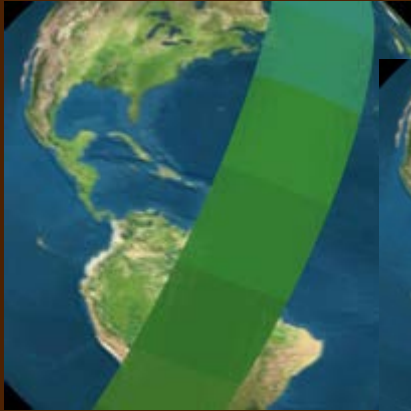
Andrea Ghez – stars orbiting Milky Way central black hole

... collaborating with scientists ...



Math (3-D geometry!)

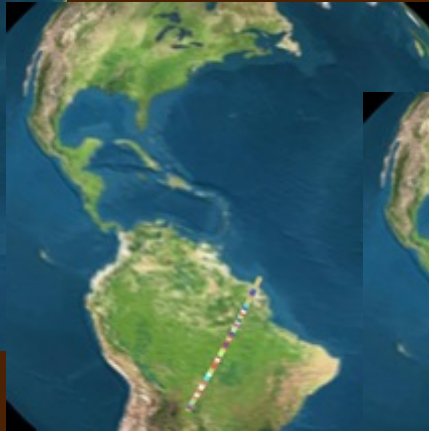
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MODIS



MISR



ASTER



MOPITT



CERES

System architecture
(what limits HDF access speed?)

DiGirolamo – TERRA satellite imagery
data & geometry



DiGirolamo – TERRA satellite imagery
data & geometry

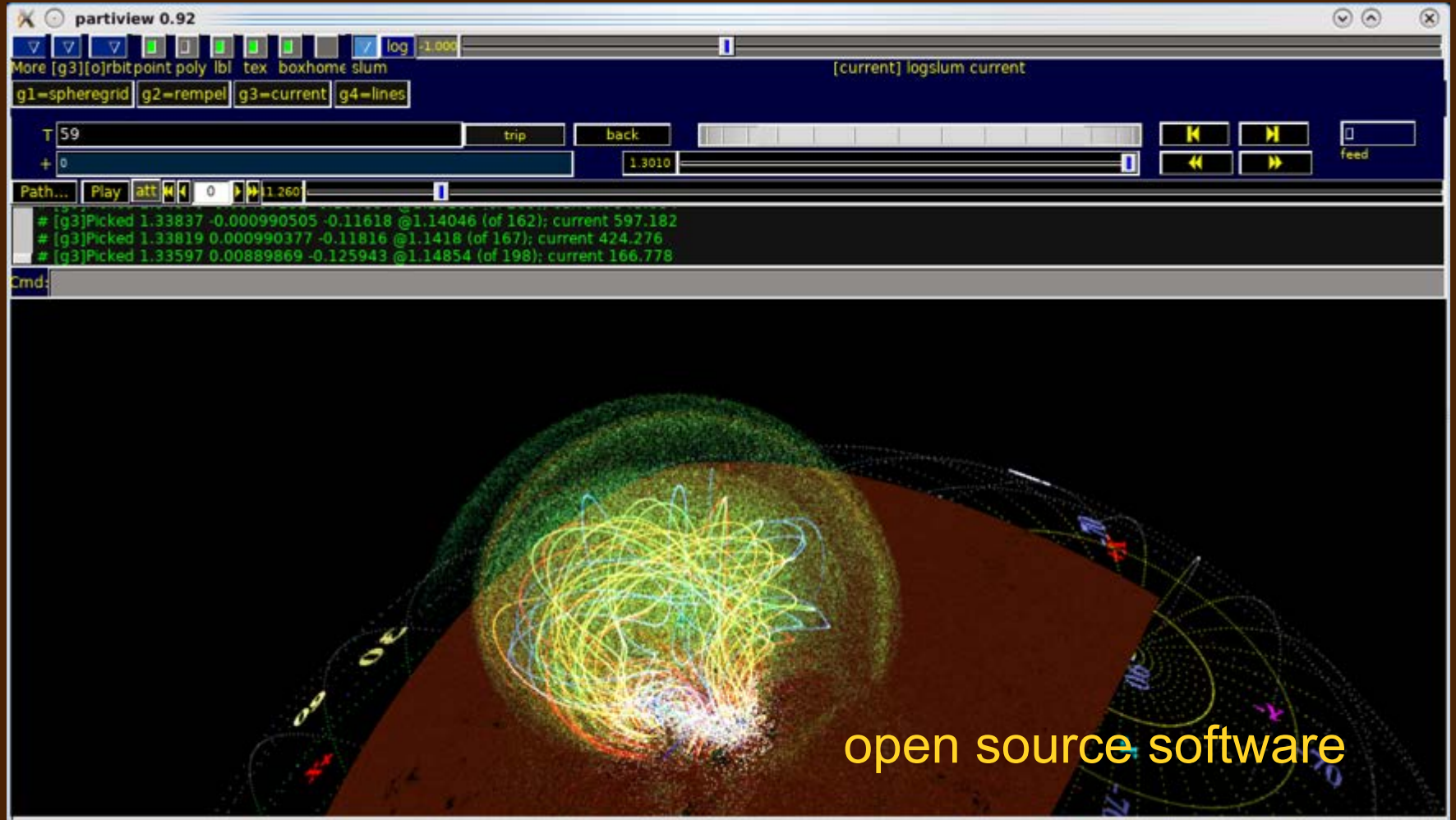
System architecture



4K stereo movieplayer
streaming I/O → graphics

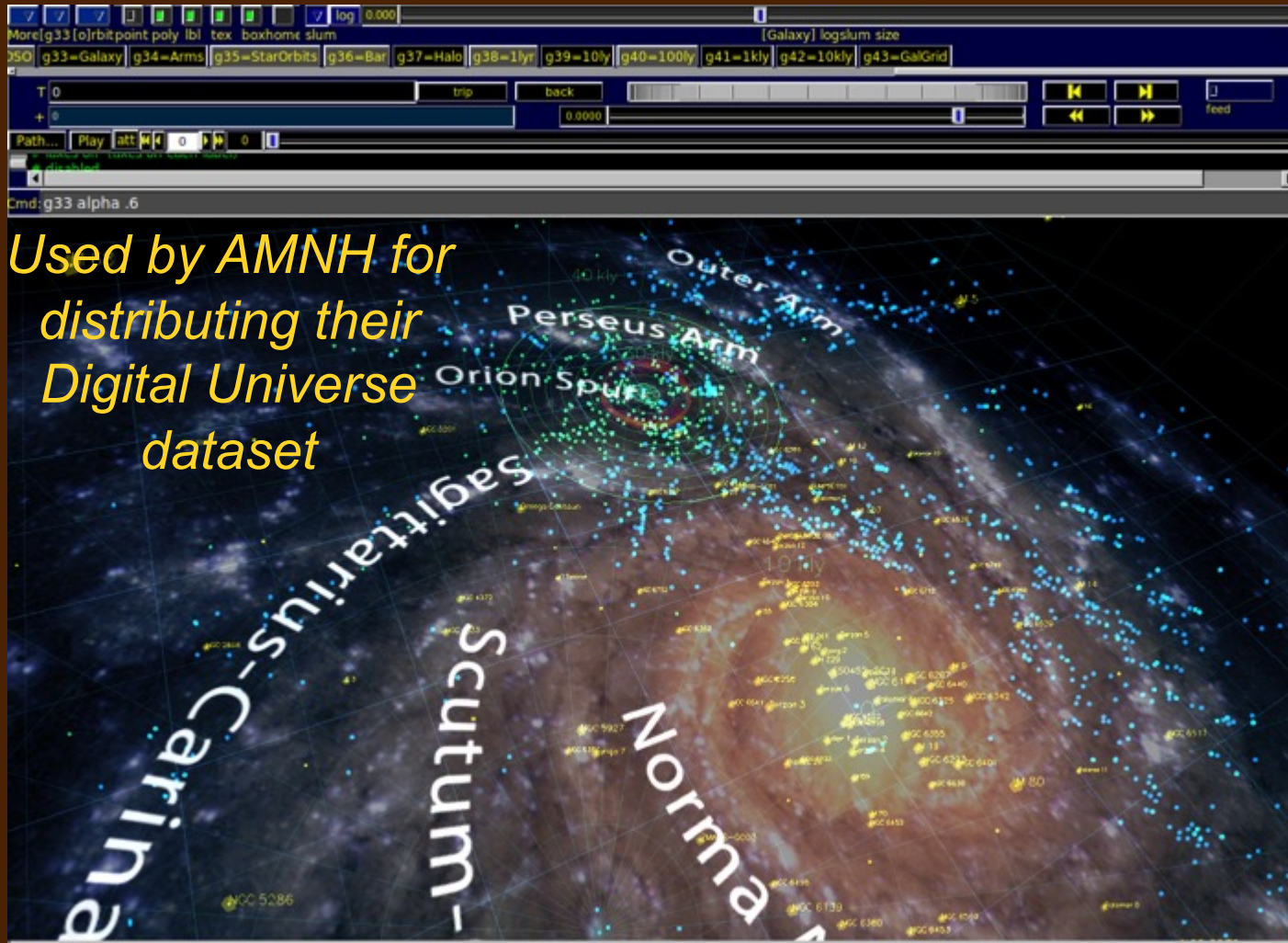
Interactive 3-D tools – partiview

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Interactive 3-D tools – partiview

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Used by AMNH for
distributing their
Digital Universe
dataset

Interactive 3-D tools

Math for precision 3-D



Software integration

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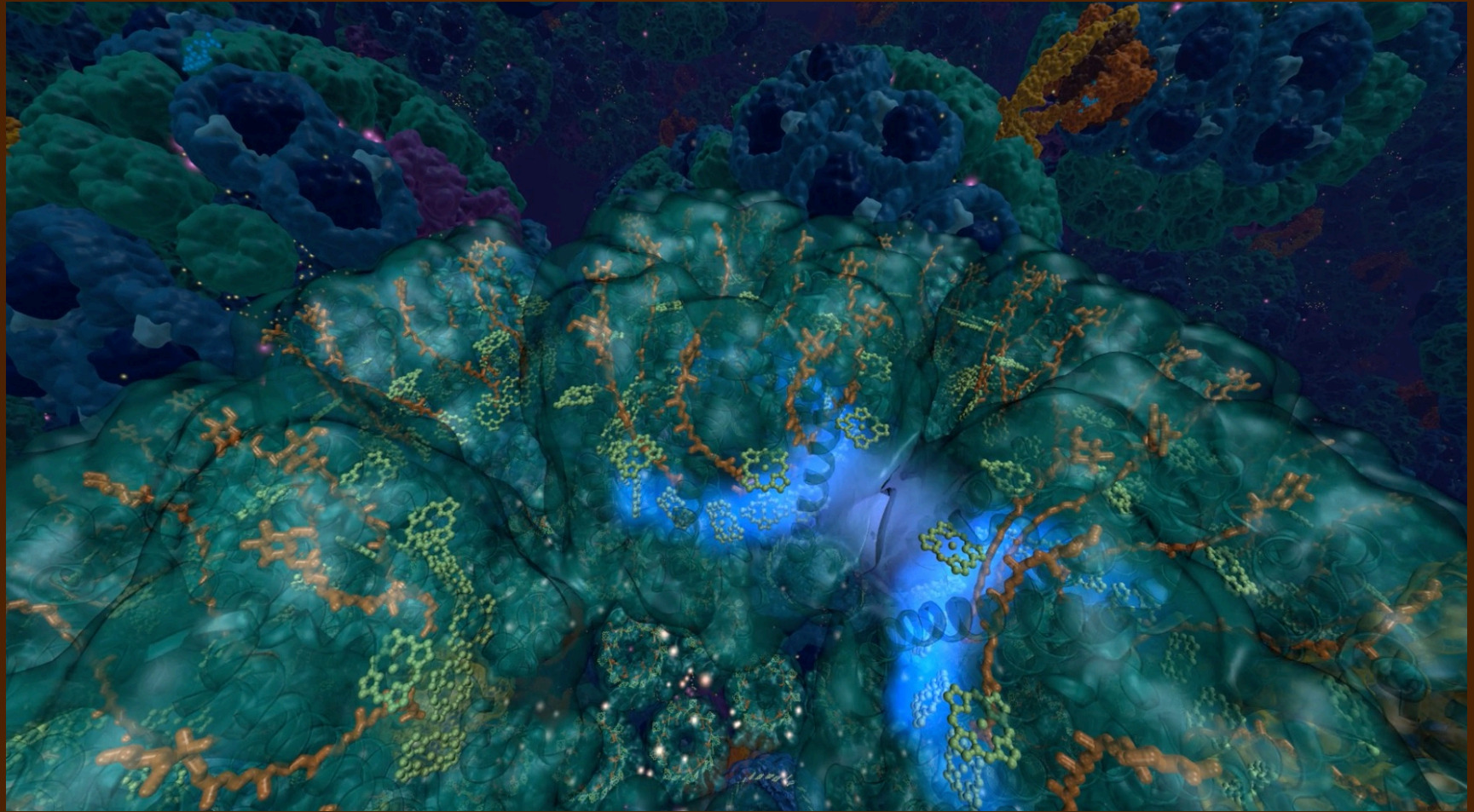
The screenshot displays a desktop environment with several windows. The top-left window, titled 'vmdr', shows a 3D visualization of a protein structure in a golden-brown color, set against a green and blue background. The top-right window, titled 'VMD TachyonL-OpIIX Interactive Ray Tracer', shows a 3D visualization of a protein structure in a blue and green color, set against a dark blue background. A central text box with a black border and orange text reads 'Virtual → TCBG's Director VMD'. The bottom-left window is a terminal window titled 'slevy@junco-0fc:~/bd5/bopearth/vmdr' showing a list of command-line arguments for the vmdr application. The bottom-right window is a terminal window titled 'slevy@junco-0fc:~/bd5/bopearth/vmdr' showing a list of command-line arguments for the vmd application.

Virtual → TCBG's Director VMD

```
slevy@junco-0fc:~/bd5/bopearth/vmdr
File Edit View Search Terminal Help
[...]
```

```
slevy@junco-0fc:~/bd5/bopearth/vmdr
File Edit View Search Terminal Help
[...]
```

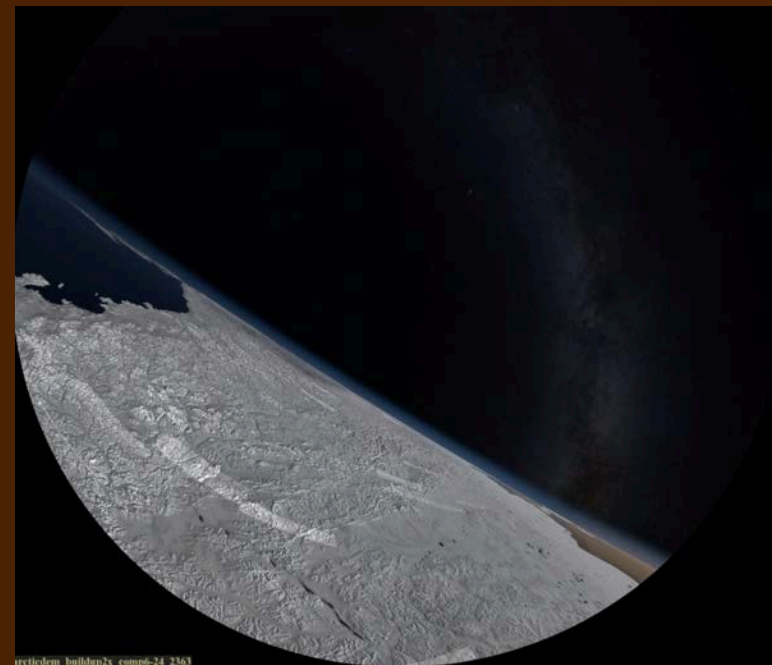
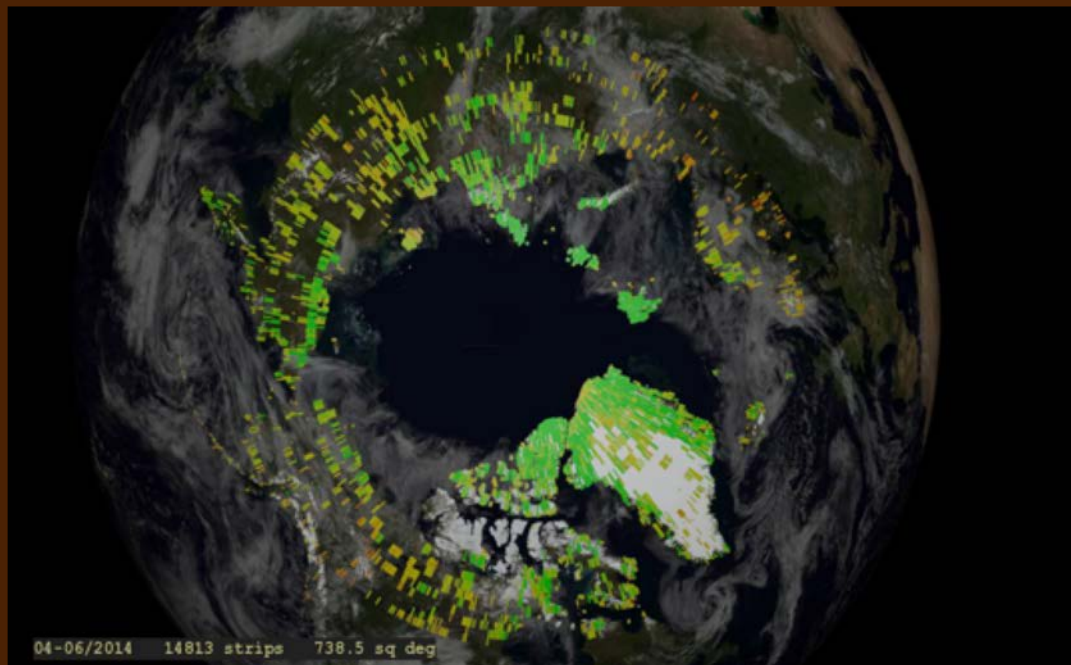
Software integration



Turning VMD into a graphical puppet for AJ to control from Houdini

“Atlas of a Changing Earth”

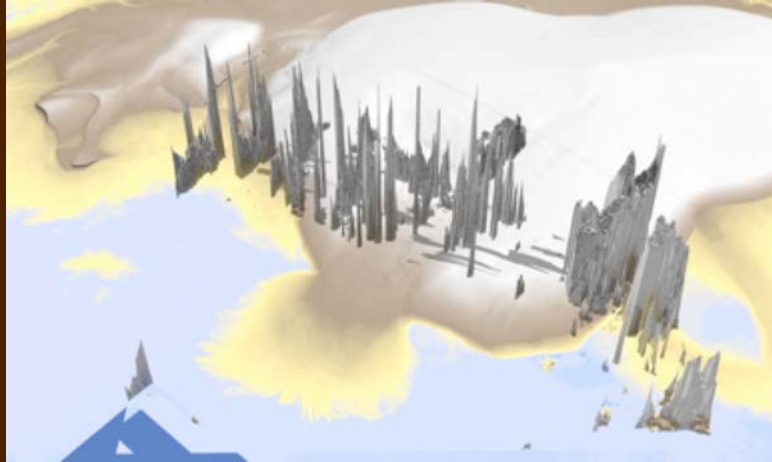
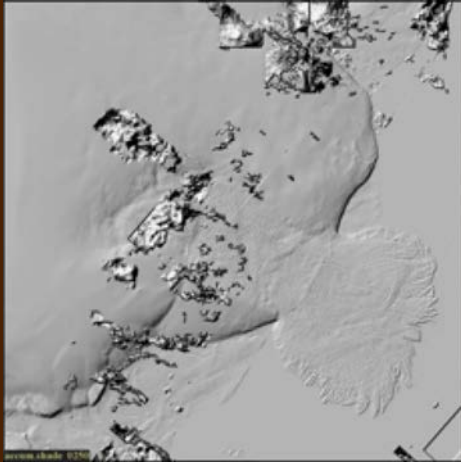
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Featuring large-scale satellite altitude-mapping (DEM) data

“Atlas of a Changing Earth”

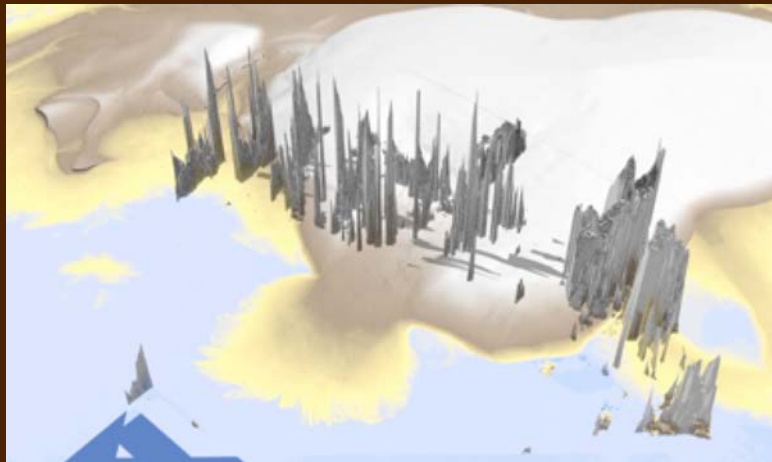
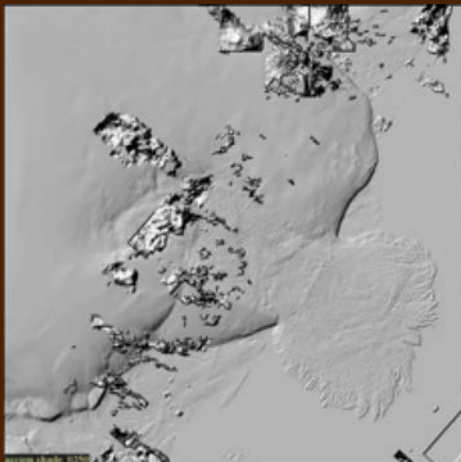
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Visualizing time-evolution of the landscape

“Atlas of a Changing Earth”

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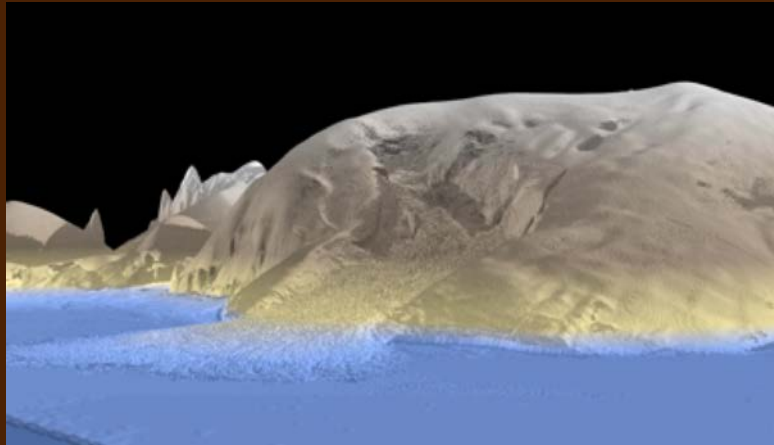
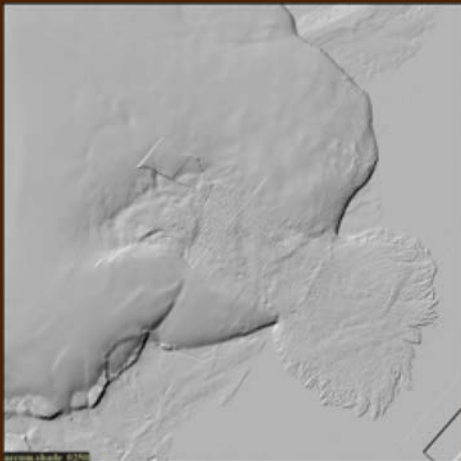
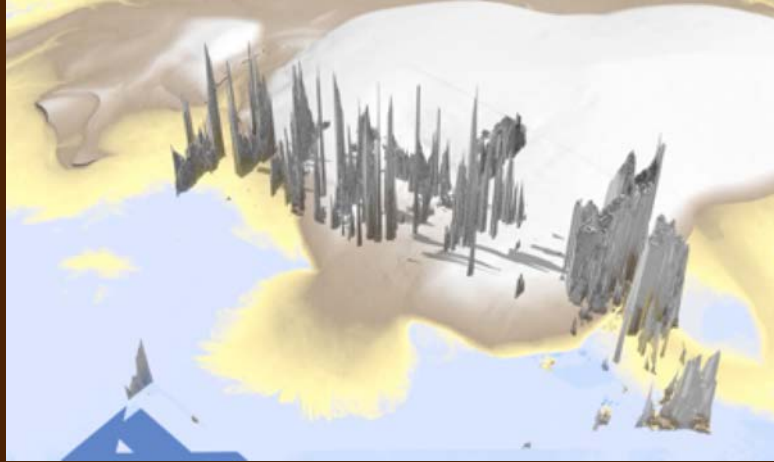
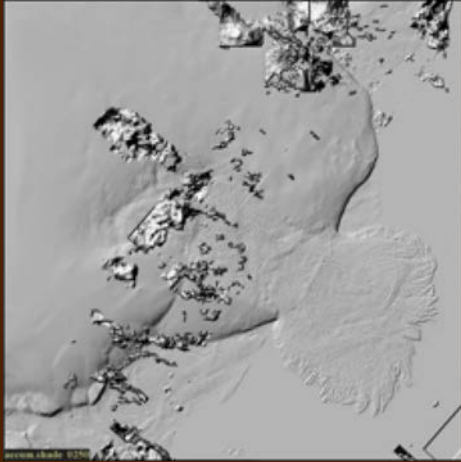
Visualizing time-evolution of the landscape

satellite DEM observations
plagued by clouds and misalignments

Group effort to identify/mask/align ...

“Atlas of a Changing Earth”

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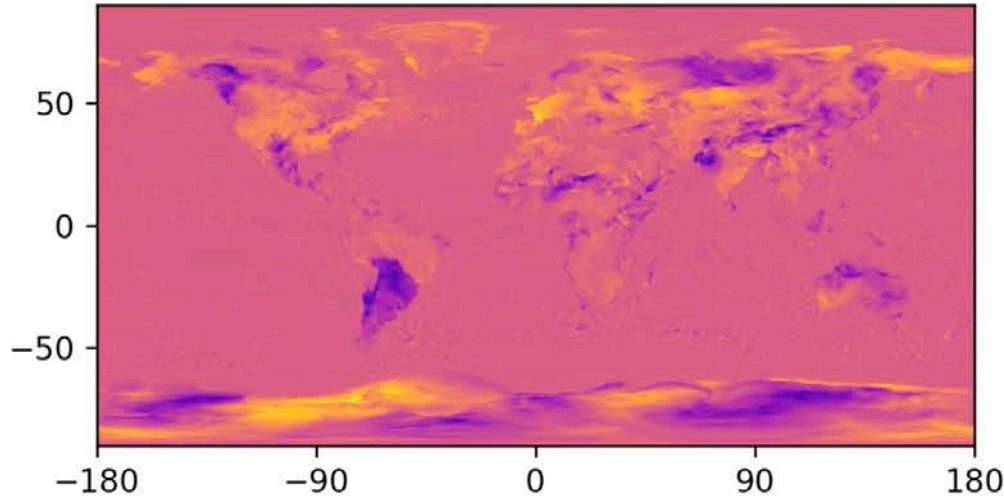


Visualizing what?

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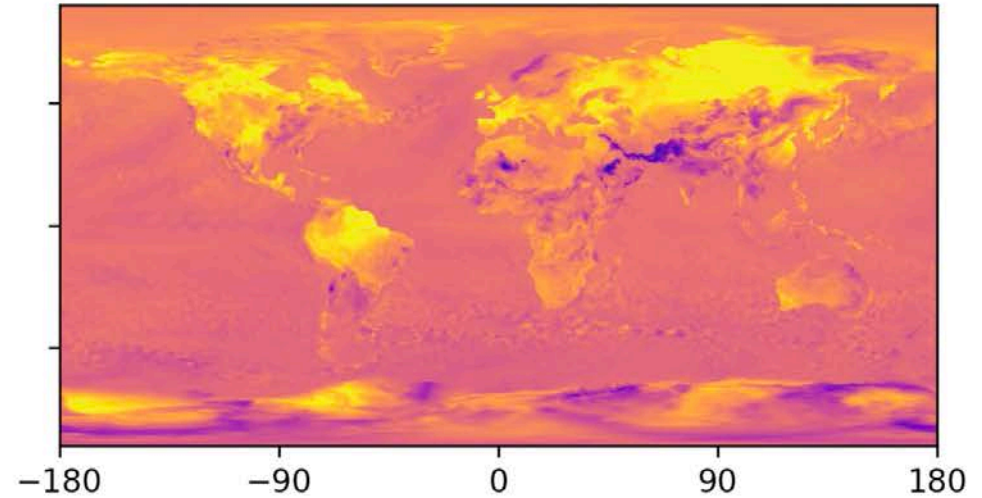
maxTS 2000 vs 2100 northern summer - diff from per-point NSummer-year-2000 median ~ 08/06

Year 2000 model



-20 -15 -10 -5 0 5 10 15 20
deltaT (C) from year-2000 median

Year 2100 model



-20 -15 -10 -5 0 5 10 15 20
deltaT (C) from year-2000 median

Normalization to show “How different is the future from the present?”