What's up with the Astronomer*?
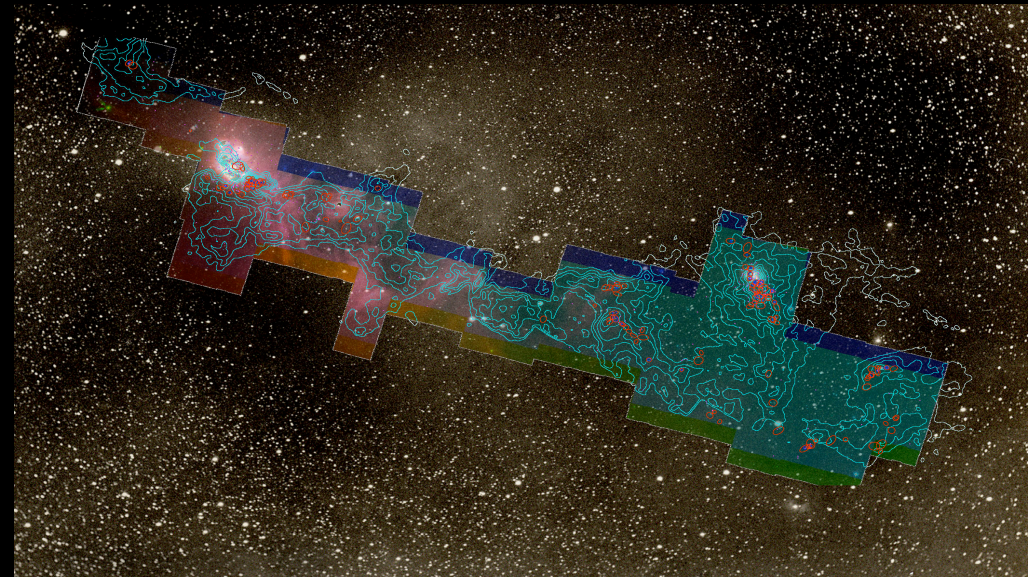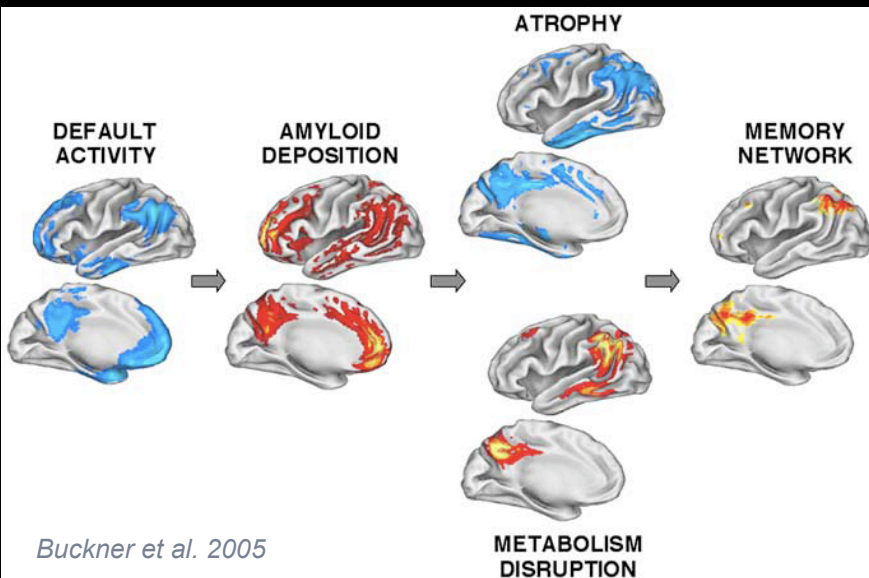
Buckner et al. 2005

Anatomy & Demographics in Star Formation
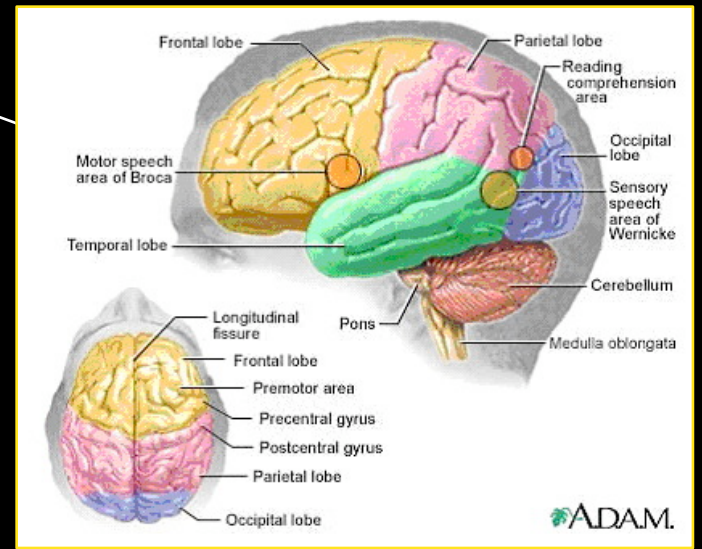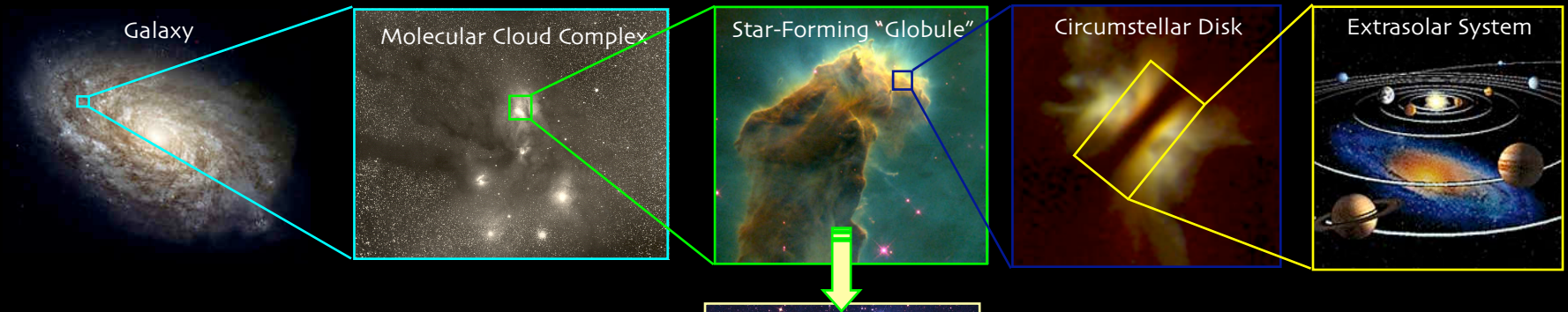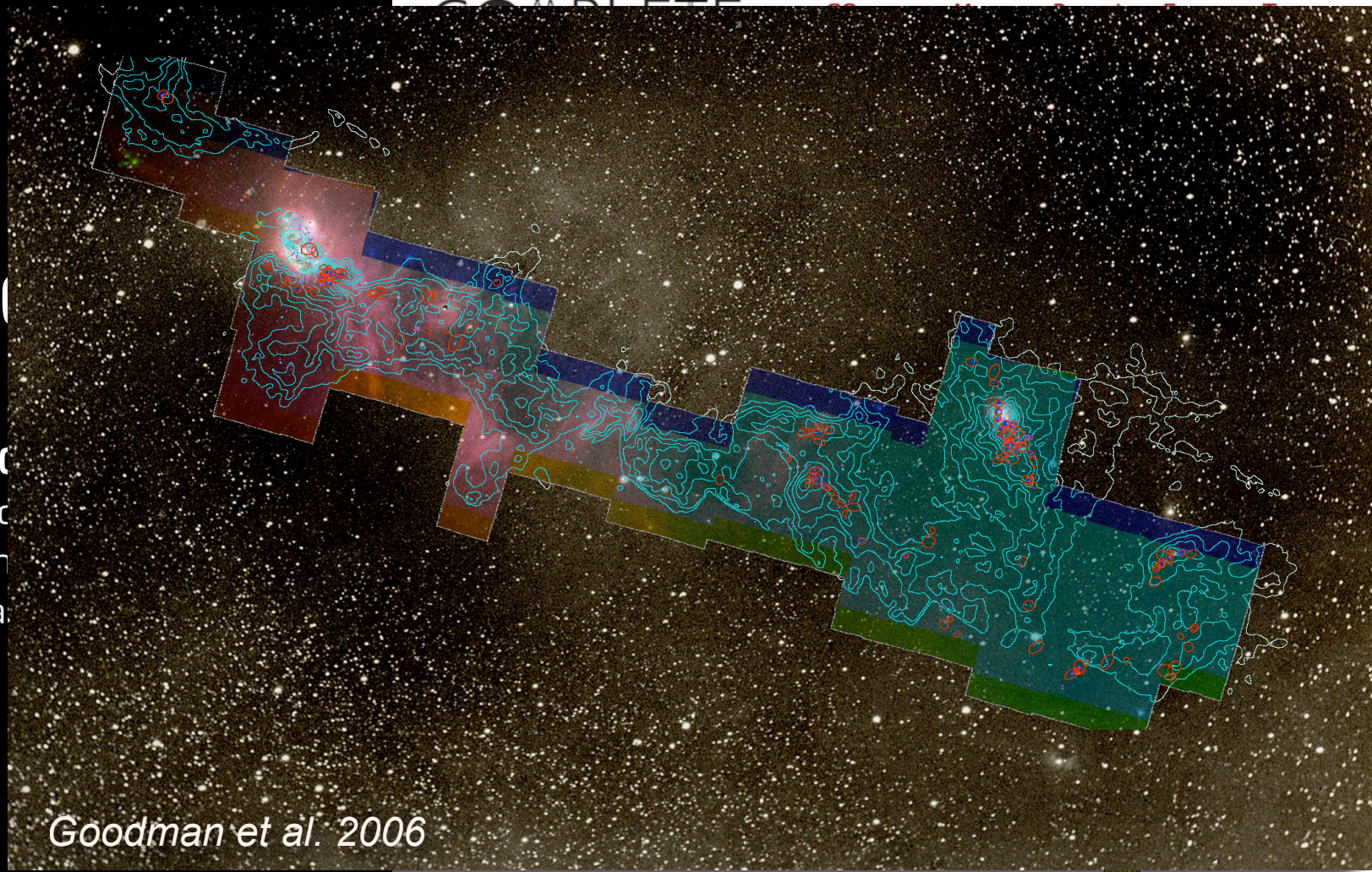
Goodman et al. 2006

The AstroMed Story

Computer Scientist

Computer Scientist

"Viz has failed the scientific community…"

Astronomer

COMPLETE =COordinated Molecular
Probe Line Exinction Thermal Emission

mm peak (Enoch et al. 2006)

sub-mm peak (Hatchell et al. 2005, Kirk et al. 2006)

^{13}CO (Ridge et al. 2006)

mid-IR IRAC composite from c2d data (Foster, Laakso, Ridge, et al. in prep.)

Optical image (Barnard 1927)

"Slices"

"KEITH"

"PERSEUS"

Image size: 520 x 274
View size: 1305 x 733
WL: 63 WW: 127

A

thirteenCO_249.tif
thirteenCO_249.tif
thirteenCO_249.tif
thirteenCO_249.tif
0

127

64

L

R

0

Im: 21/249
Zoom: 227% Angle: 0

P

11:04:53 AM
7/26/05
Made In OsiriX

The AstroMed Story
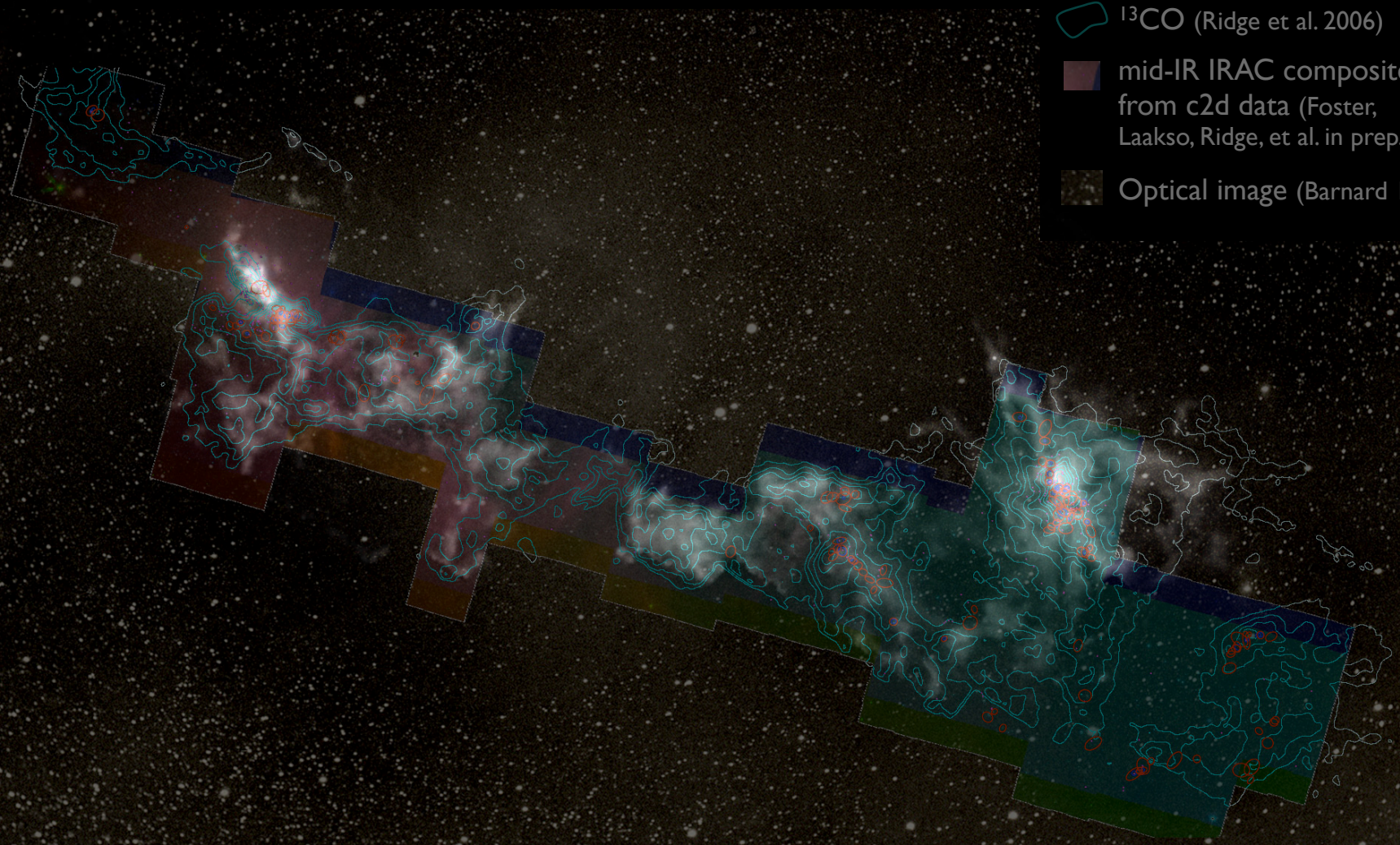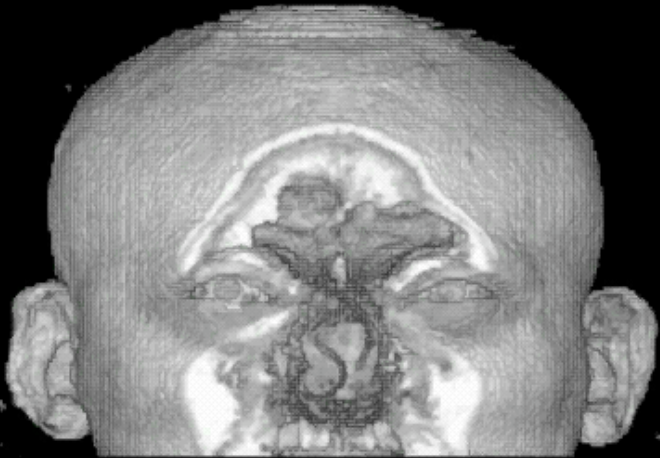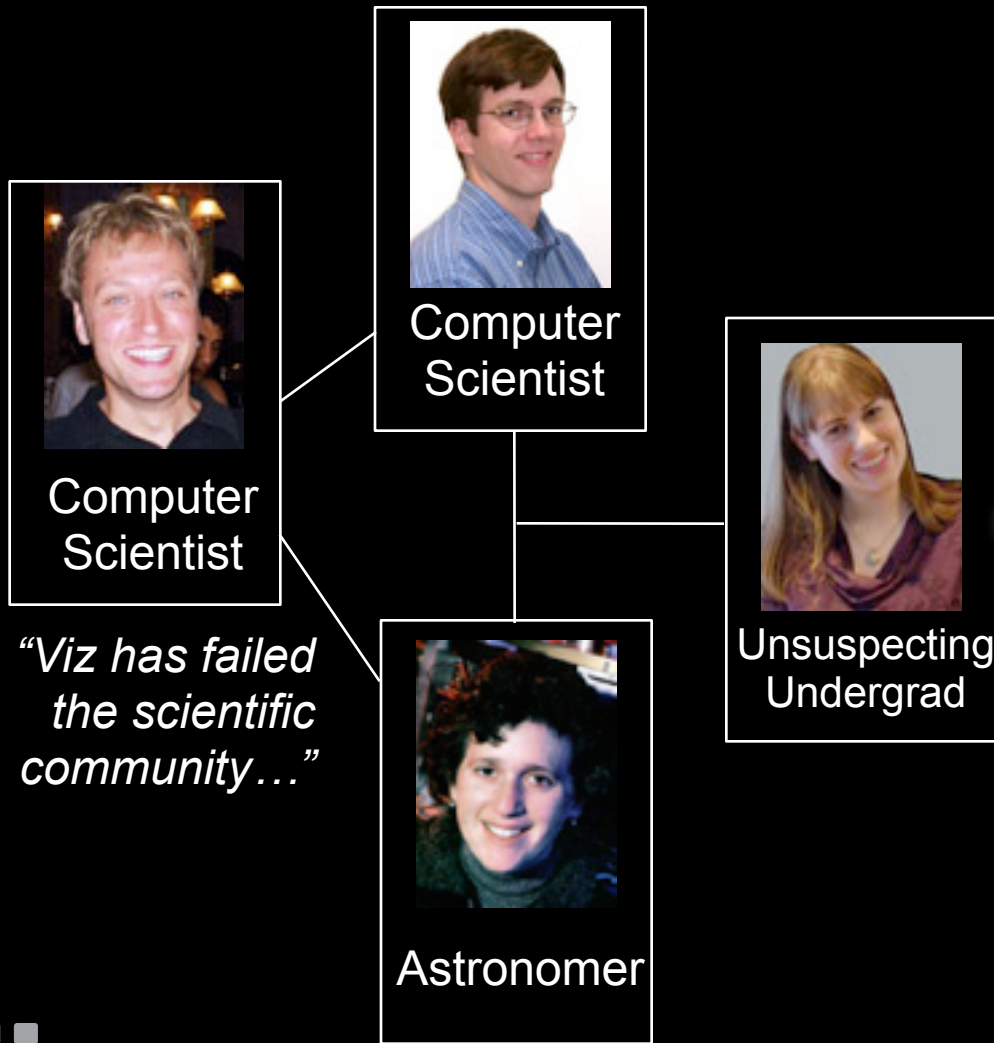

Computer Scientist

Computer Scientist

"Viz has failed the scientific community…"

Astronomer

Unsuspecting Undergrad

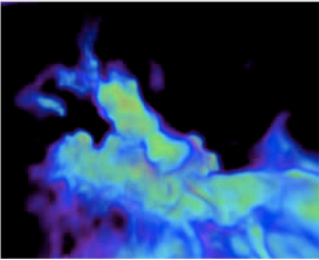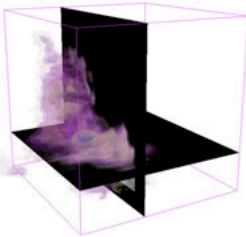### Initiative in Innovative Computing at Harvard

projects

Astronomical Medicine

Lead Investigators

Alyssa Goodman (FAS/Astronomy, IIC), Mike Halle (HMS/SPL of BWH, IIC), Ron Kikinis (HMS/SPL of BWH), David Kennedy (HMS/Martinos Center of Harvard, MIT and MGH)

Project Staff

Doug Alan, IIC-Sr. Software Engineer
Michelle Borkin, IIC-Research Associate
Jens Kauffmann - IIC-Post Doc

Description

The goal of the "AstroMed" project is to extend the state of the art of complex data understanding in two very different fields, astronomy and medical imaging, using a broad-based approach to data exploration and analysis.
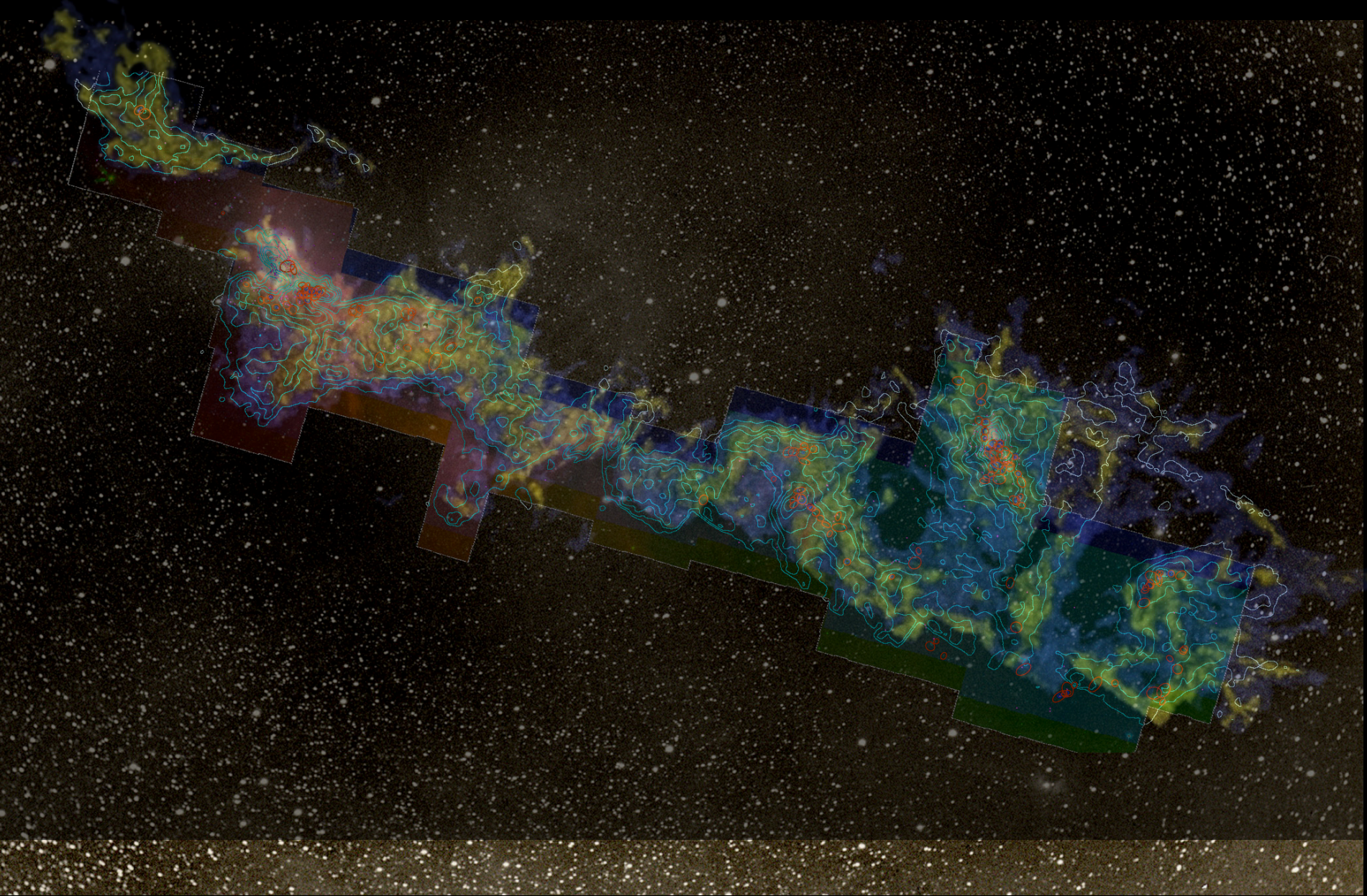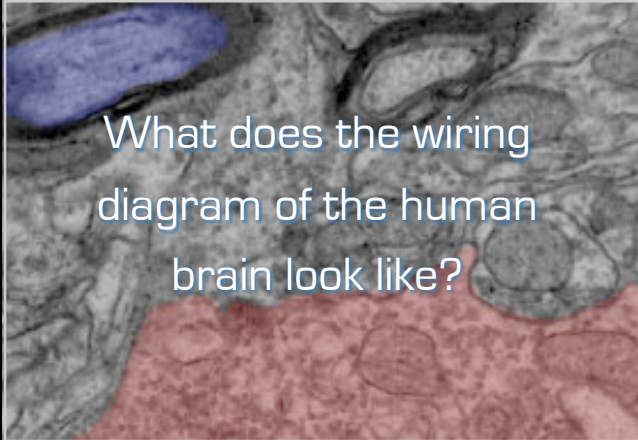
Real 3D space

Head "y"

Head "x"

"Position-Position-Velocity" Space

Sky "y" (Declination)

Sky "x" (Right Ascension)

AstroMed@iic

COMPLETE

Initiative in Innovative Computing at Harvard

What does the wiring diagram of the human brain look like?

How do stars form in our Galaxy today?

How is science best communicated?

What's "Dark Energy"?

What are the earliest structures in the Universe?

How should we model blood flow in the human body from atomic to physiological scales?
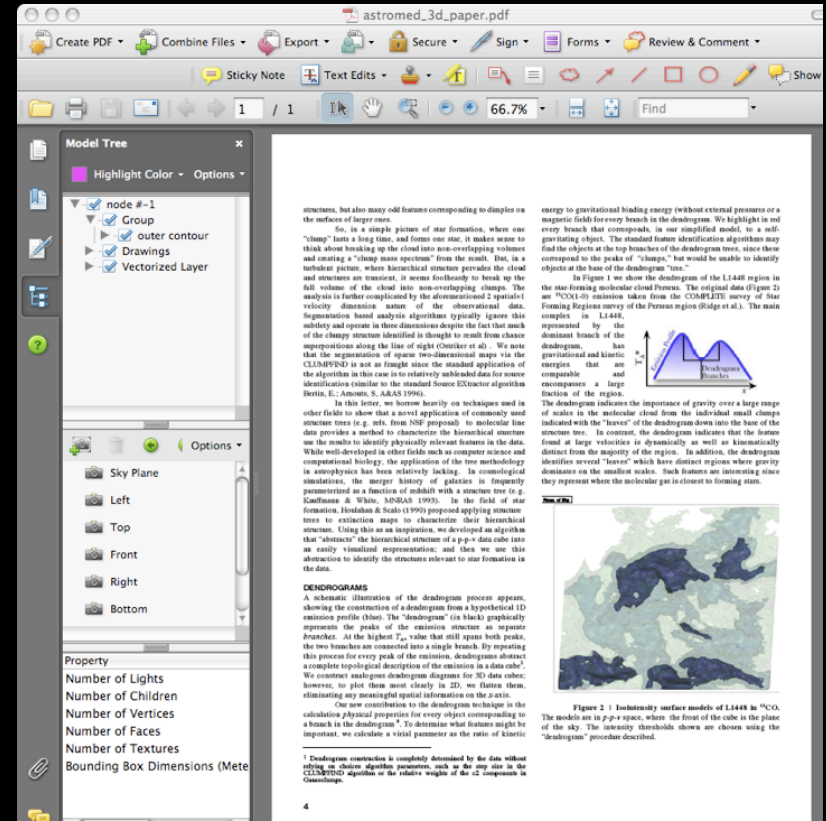
How should we use technology in teaching?

Generalizing & Sharing

Open-Source code released, and explained, as it is developed.

Changing the future of scientific publishing.

Scalability

10^6 pixels | this projector

10^7 voxels | an MRI of your brain, at 0.5 mm resolution

10^8 voxels | **Perseus COMPLETE data cube**

- -

10^{14} voxels | the **Connectome**, 0.5 mm^3 of brain tissue

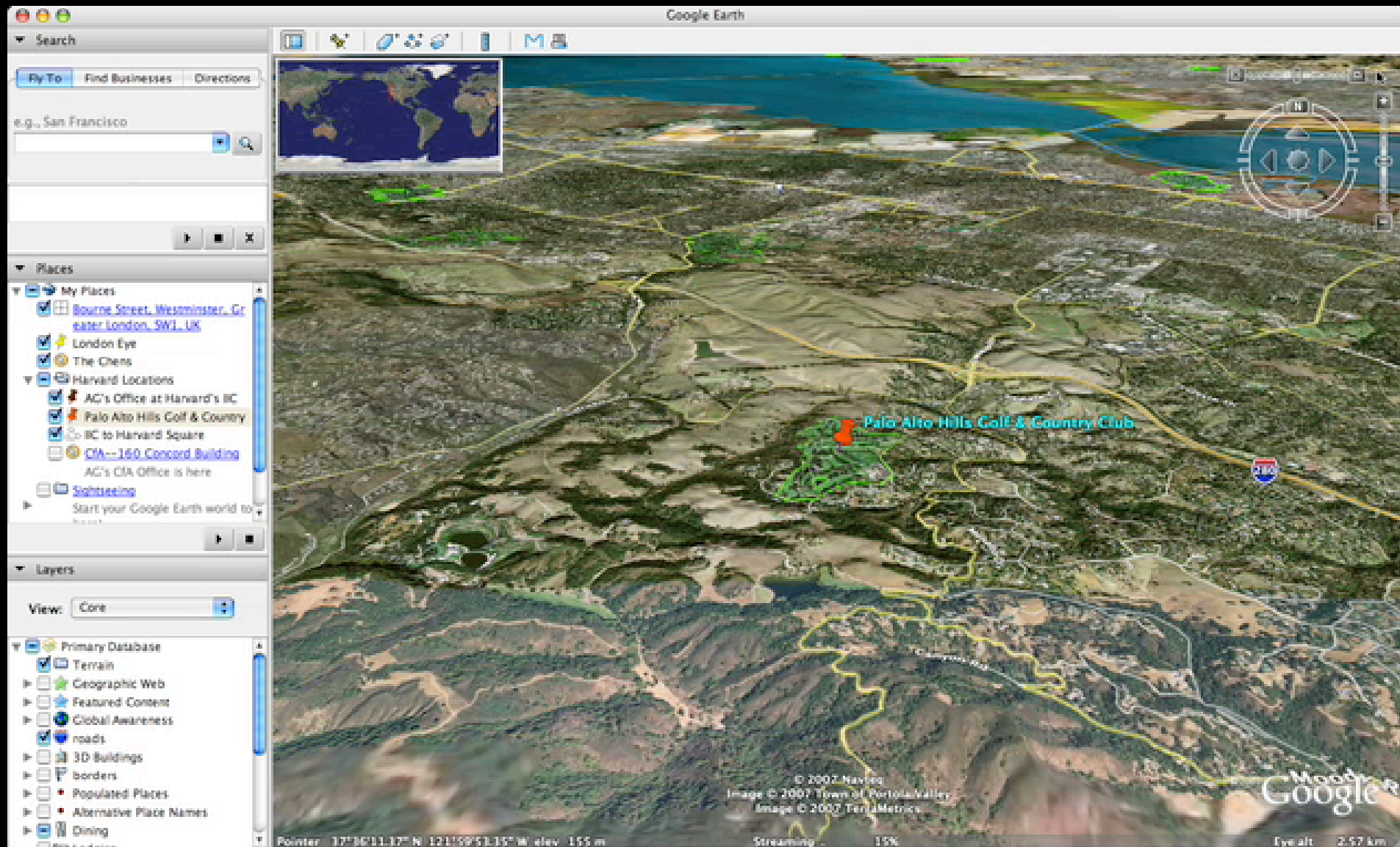10^{16} pixels | Google Earth Imagery at 1 foot resolution

10^{19} voxels | Google Earth 3D, ±1000 feet of elevation, 1ft. res.

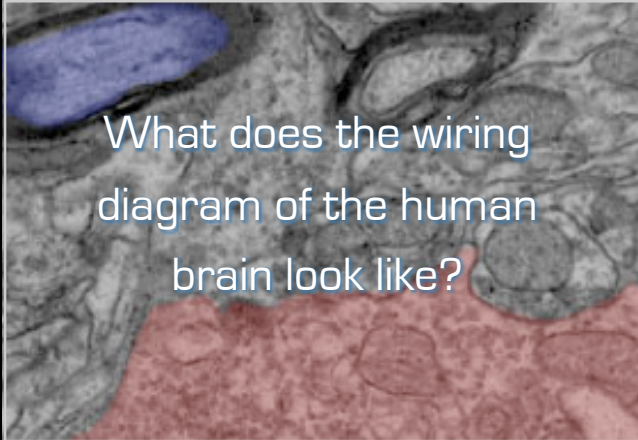10^{22} voxels | the Connectome, full human brain

Google Earth, 2007

51 second movie, downgraded to 640 x 480 (compressed to 19MB); original was 1440 x 900 (uncompressed .mov 1GB)

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