

Visualisation @ iVEC

Paul Bourke

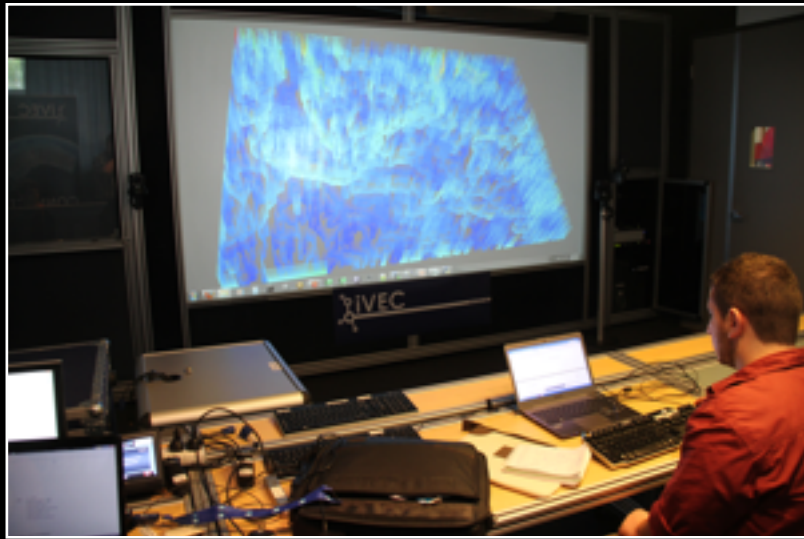
Introduction to iVEC

- Partnership between 5 organisations: UWA, Curtin, ECU, Murdoch, CSIRO.
- Partners subscribe to be members of iVEC => no end user charges.
- Funding model “roughly”
 - Infrastructure from Federal Government
 - Staff salaries from the State Government
 - Operational costs from the Partners
- Focus at the moment is on supercomputing, in particular the computation required for the ASKAP.
- Operates a number of programs
 - Supercomputing Technologies And Applications (STAP)
 - Education
 - Industry and Government Uptake (IGUP)
 - eResearch
 - Visualisation

Visualisation is the process of applying advanced computing techniques to data in order to provide insight into the underlying structures, relationships and processes.

Visualisation

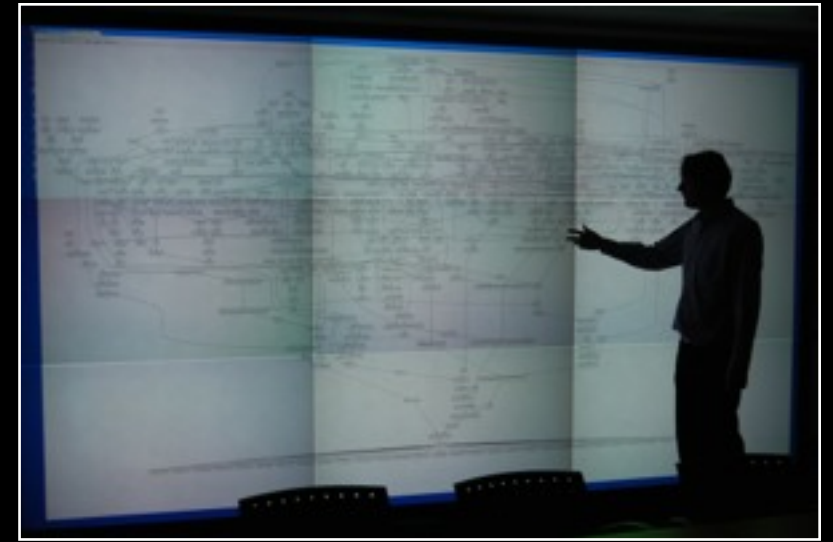
- In the sciences it is generally about data, observational or simulation.
- In both cases data capture devices are becoming increasingly sophisticated and high resolution, simulation sciences are benefitting from improvements in computing.
- Data that is ...
 - topologically complicated
 - large
 - high dimensional
- Can employ a range of senses
 - Sound = sonification
 - Touch = tactile visualisation
 - Vision
- Often employ specialise displays to fully leverage the human visual system.
 - stereopsis (depth perception from 2 eyes)
 - acuity (continuous real world vs discrete digital displays)
 - peripheral vision (sense of “being there”, immersion)



ARRC



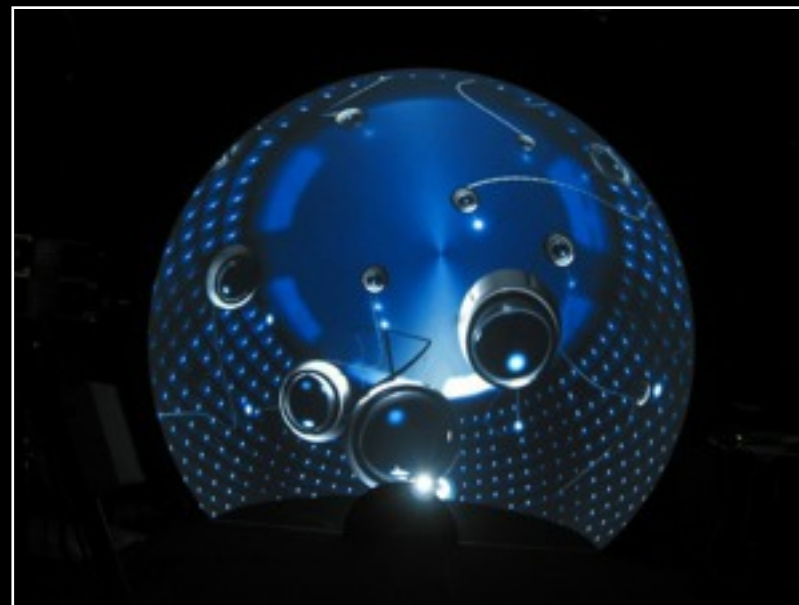
ECU



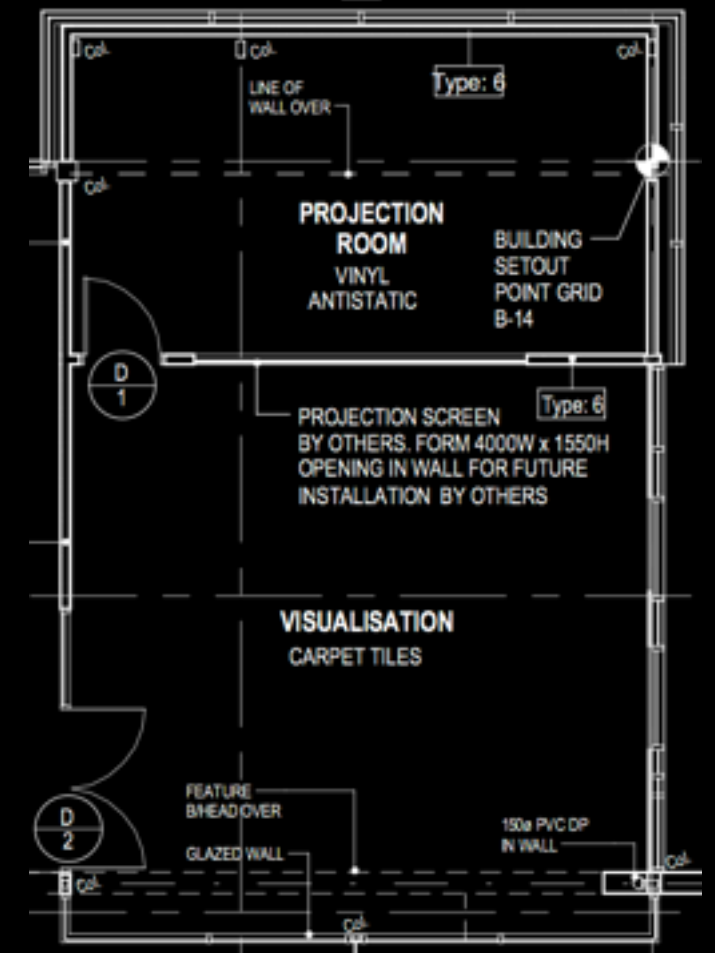
Murdoch



UWA



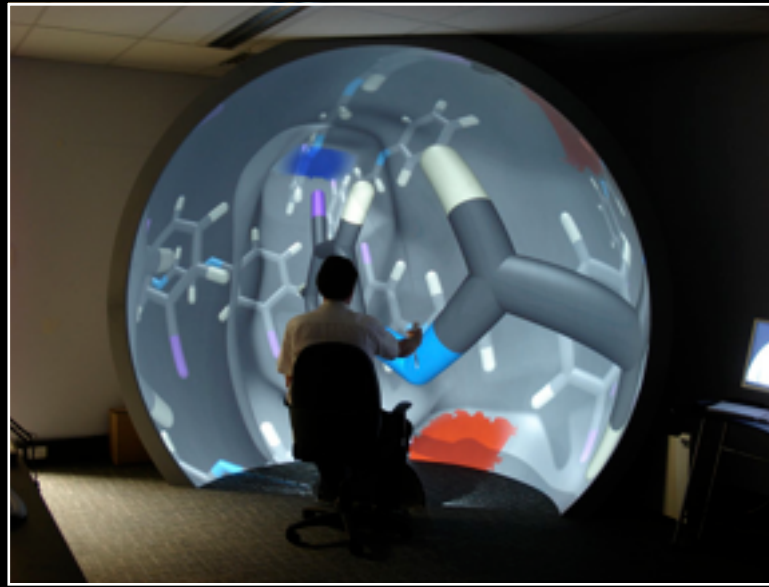
Curtin



Pawsey



3D cameras



Immersive displays



Specialist cameras



Stereoscopic displays

Software

High end visualisation workstations

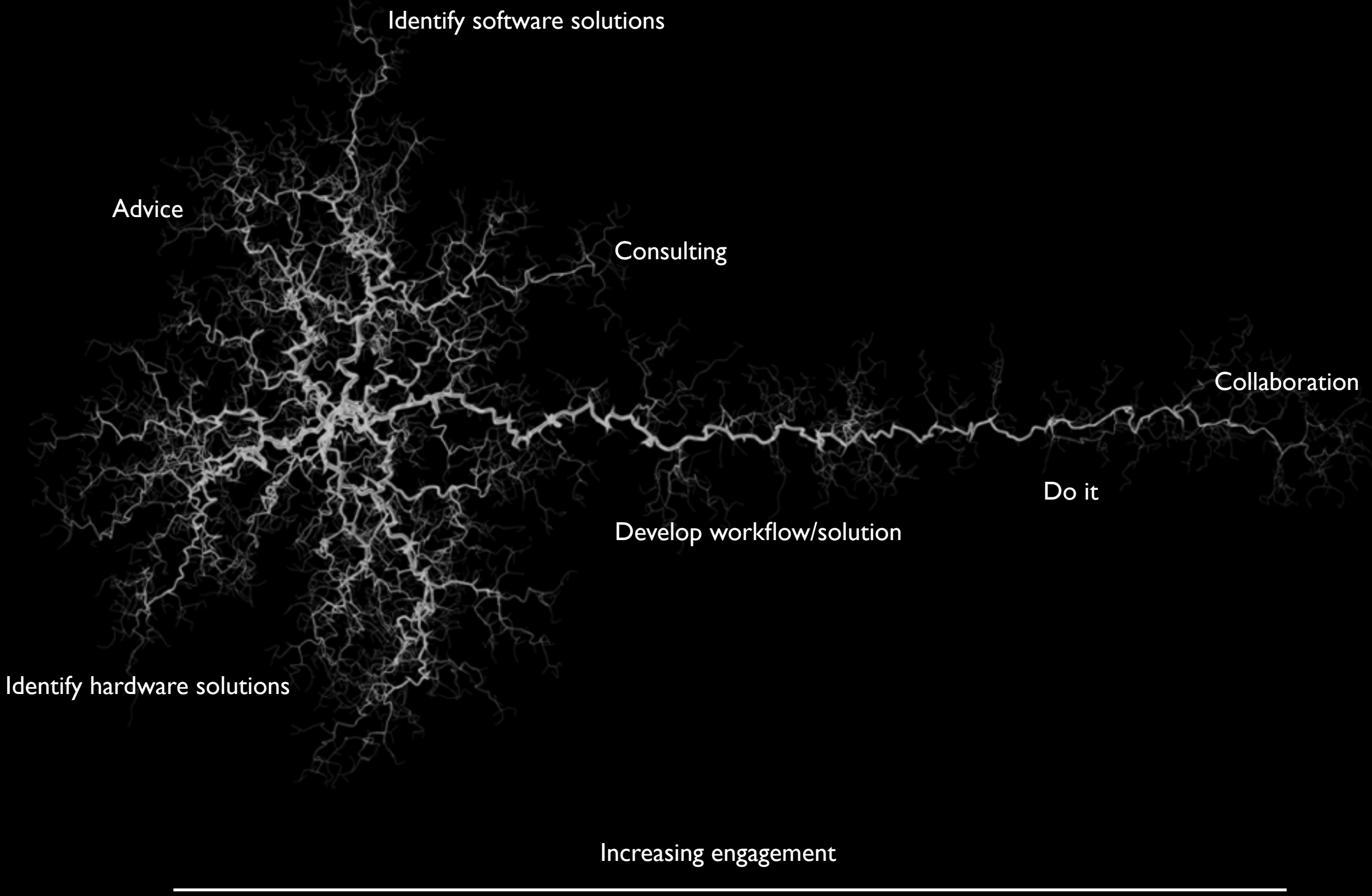


3D scanners



Unique displays

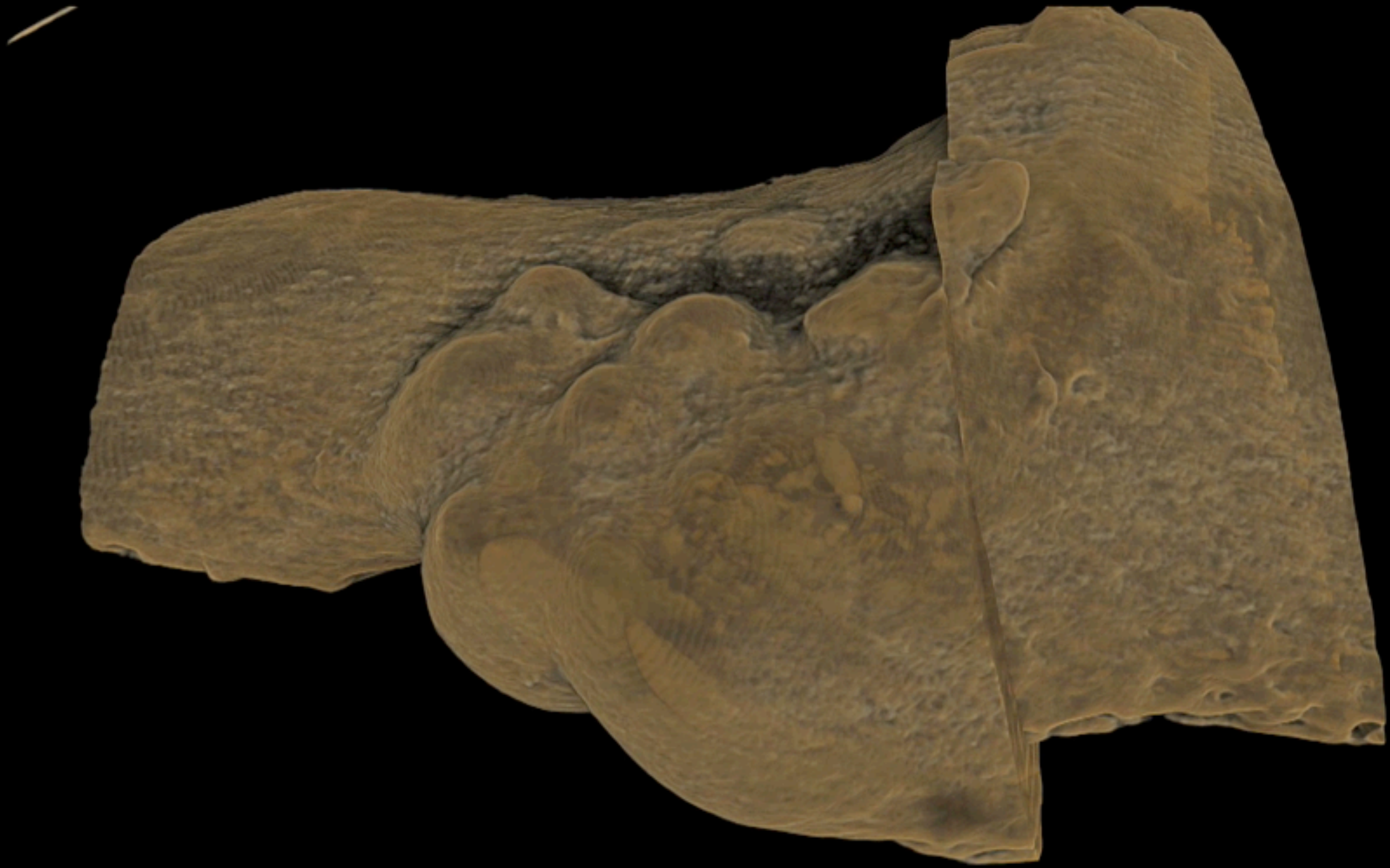
Staff engagement



Project examples

Paul Bourke

Volumetric visualisation



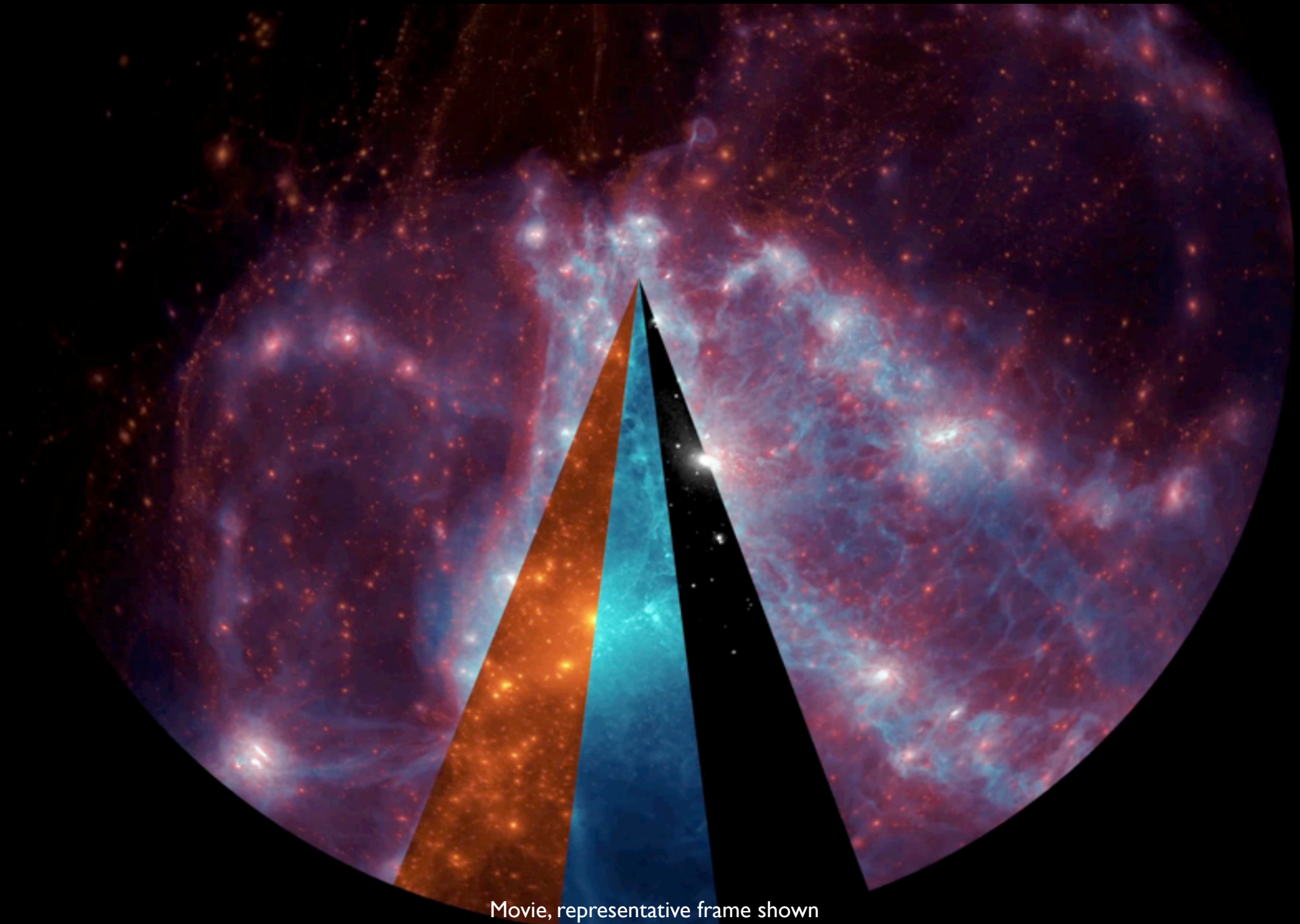
These tooth whorls appear very similar to modern day sharks, so it is concluded the Bullerichthyes did have upper jaw teeth.

Movie, representative frame shown

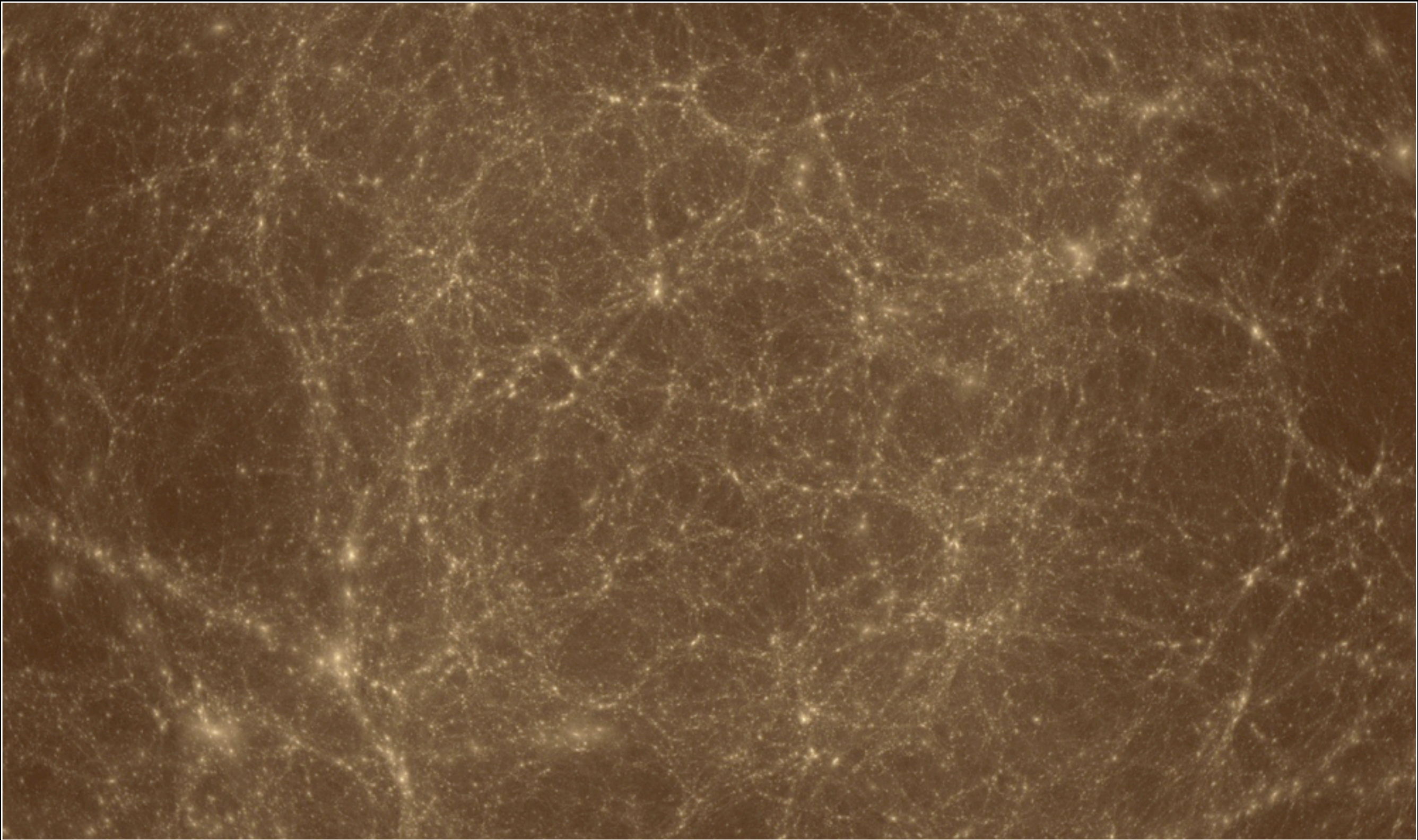


Movie, representative frame shown

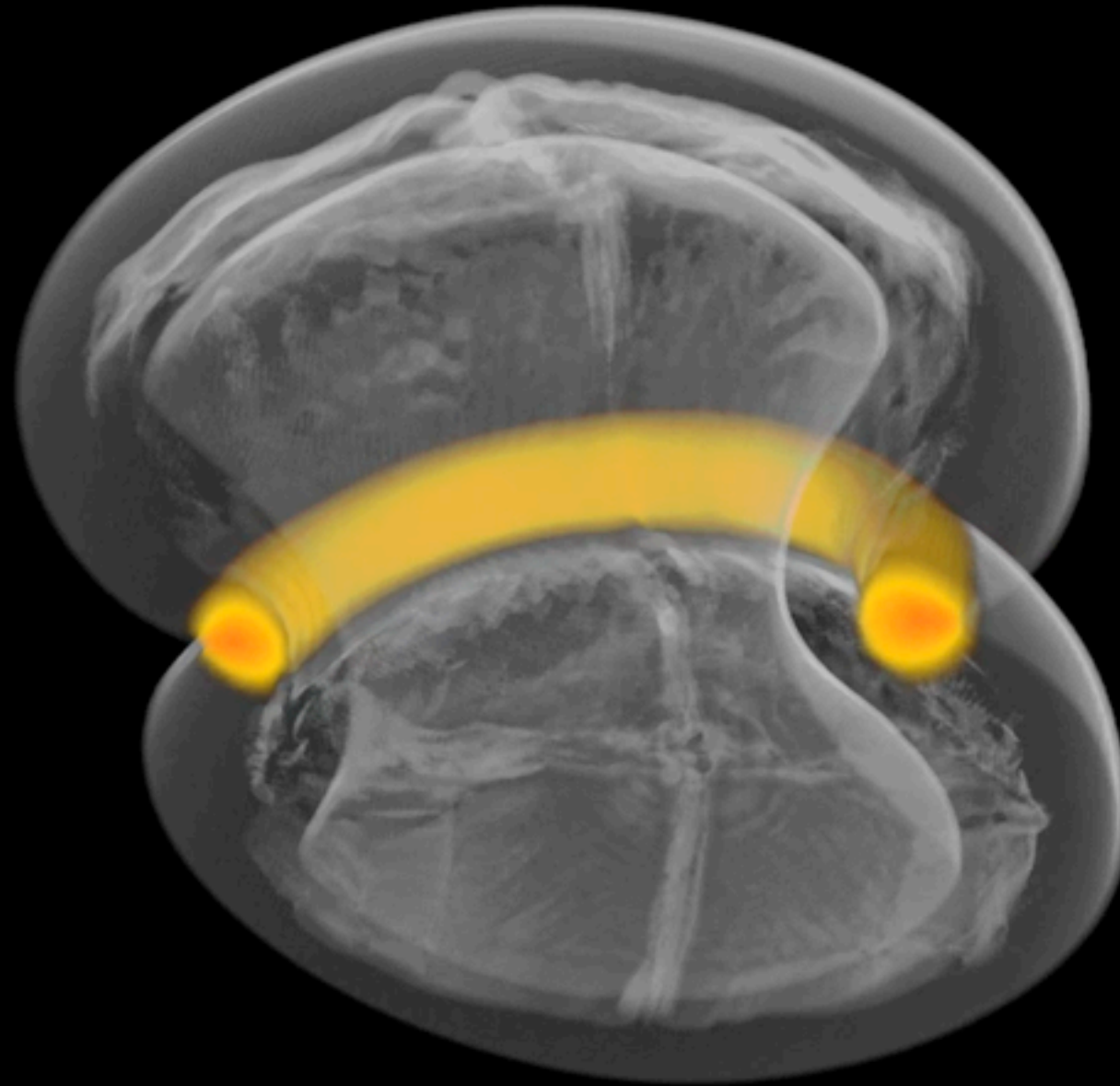
Astronomy simulations



Movie, representative frame shown



Movie, representative frame shown



Note the reflection shock and material blown off the ring. (The cross-shaped feature is an artifact).

Movie, representative frame shown

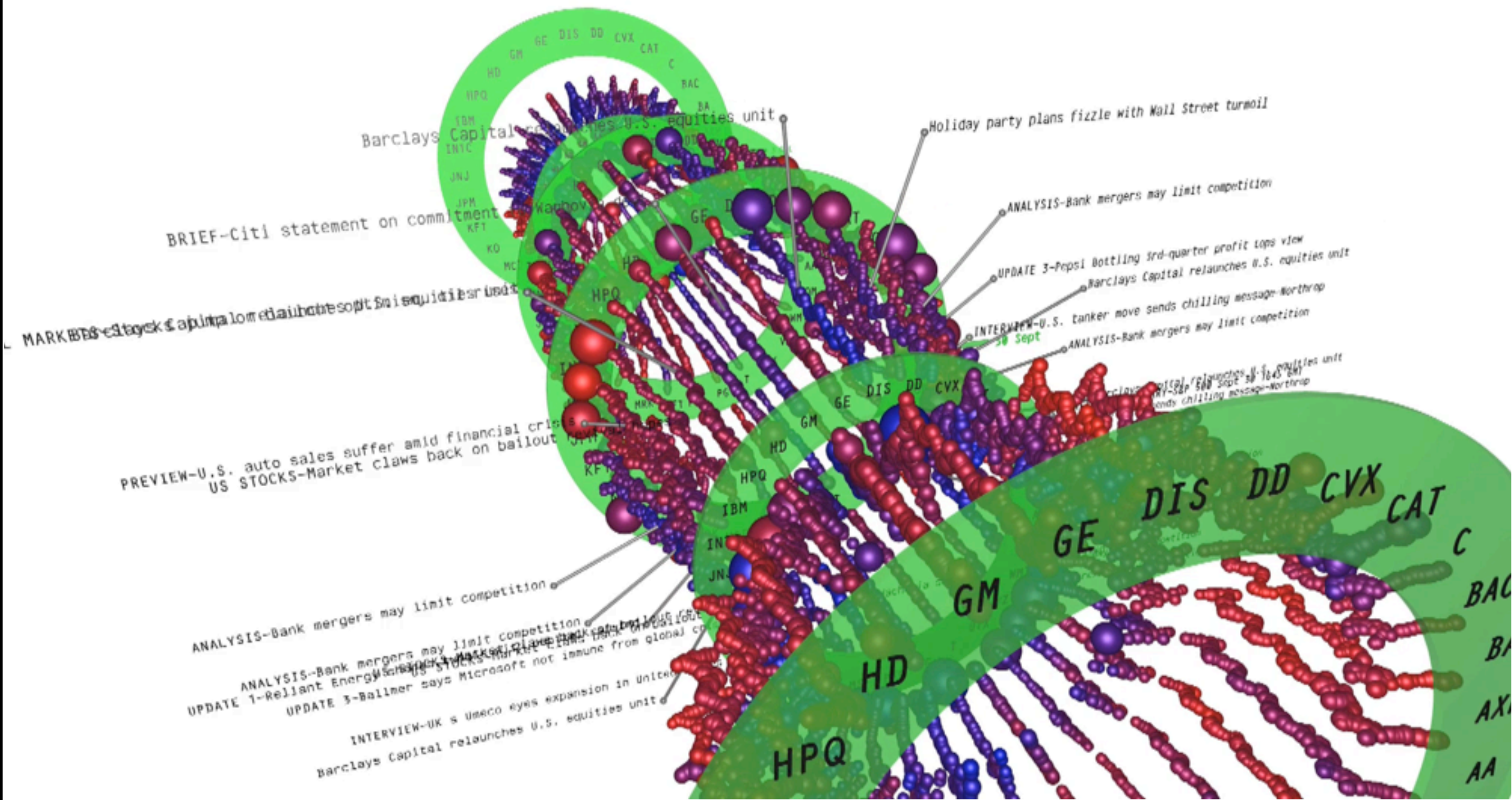
Chemistry



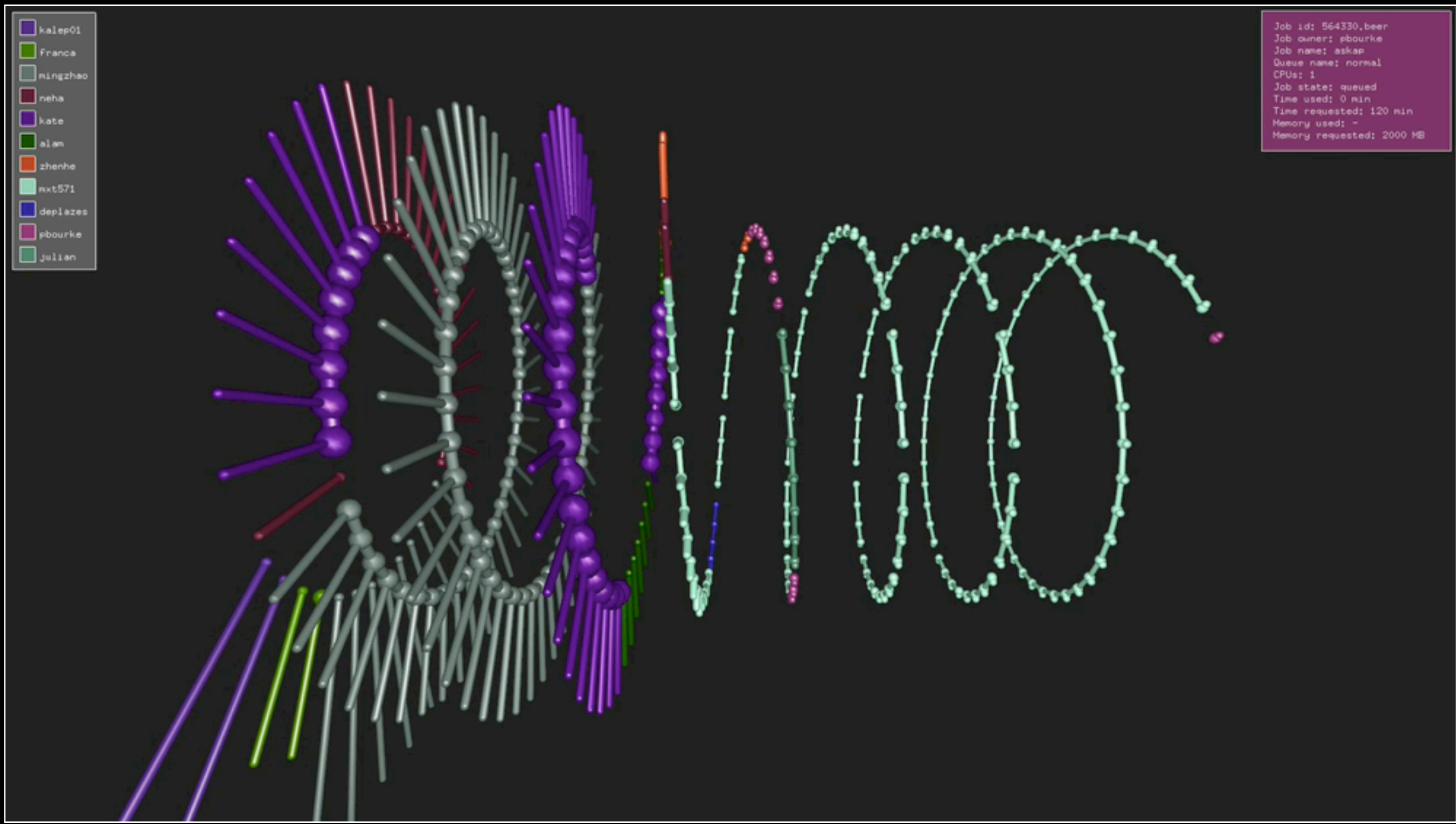
Movie, representative frame shown

Information visualisation

News feed data tagged to the appropriate company trace (in space and time).



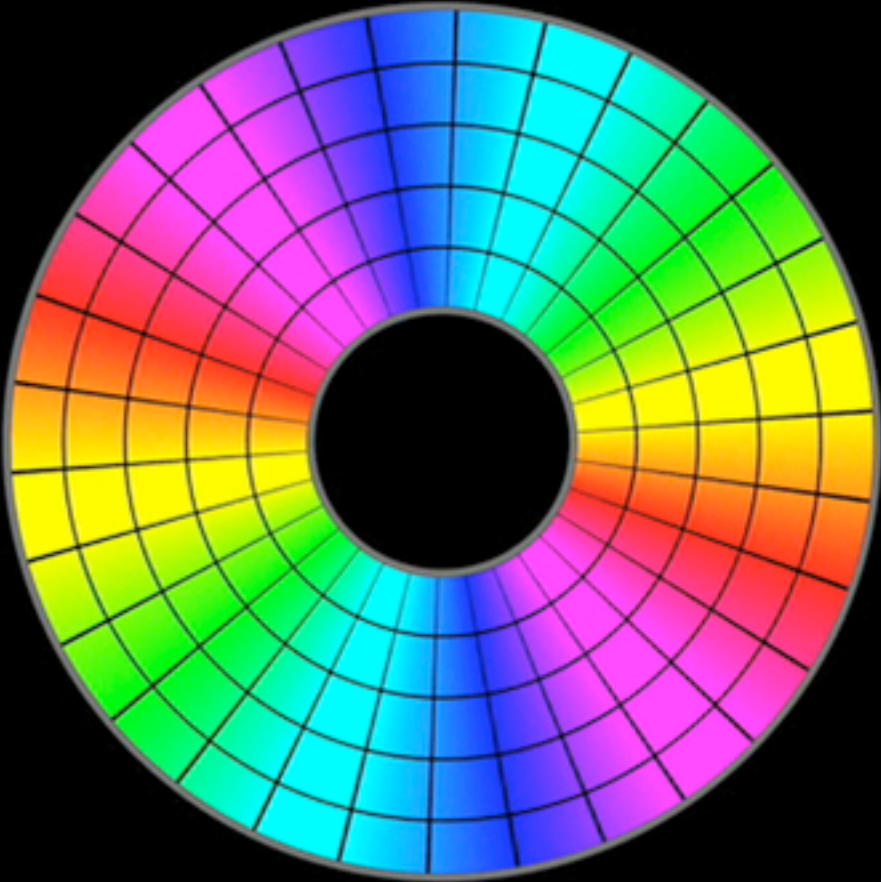
Movie, representative frame shown



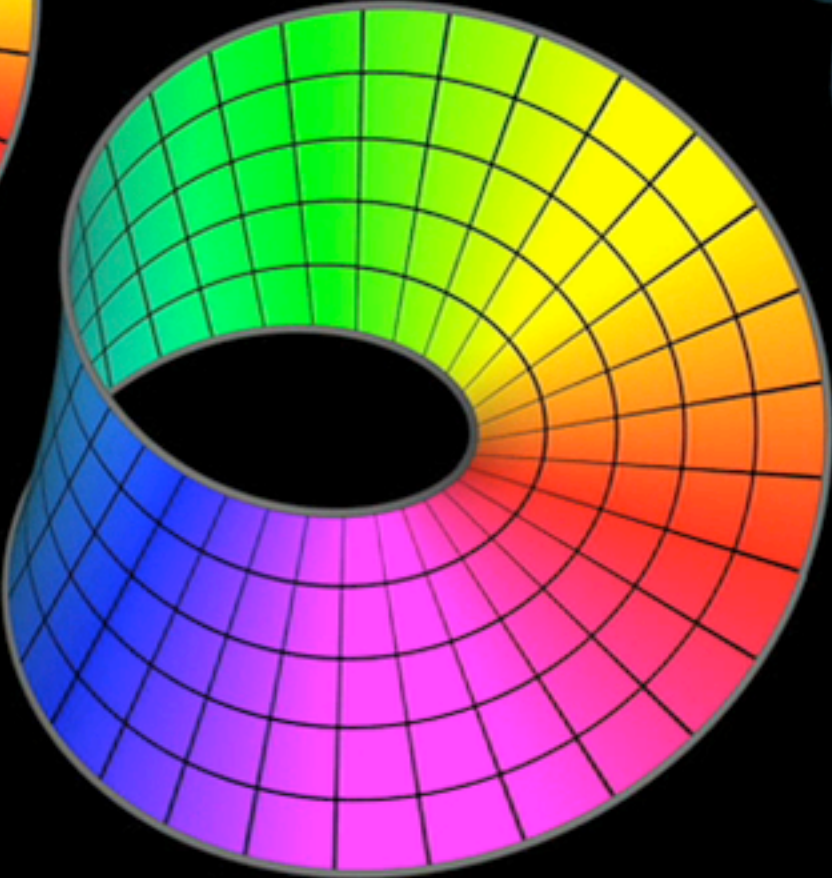
Movie, representative frame shown

Mathematics

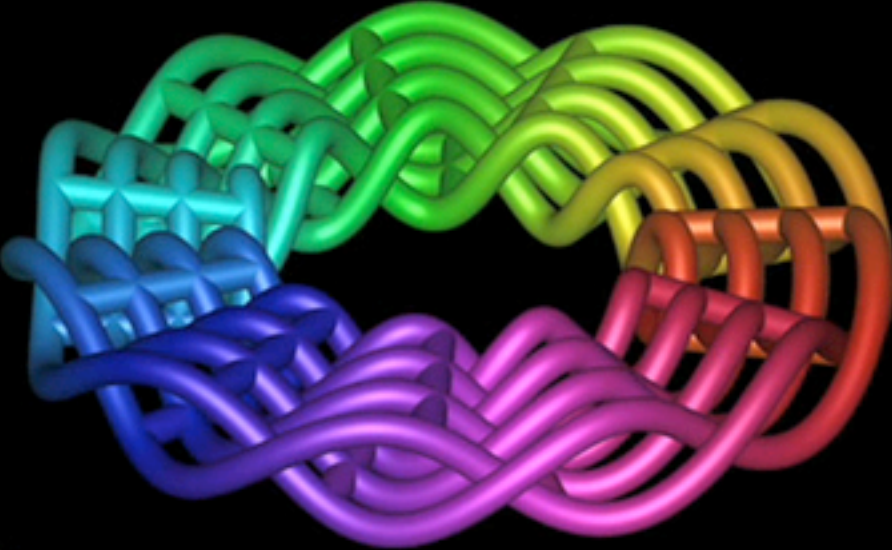
Evolution of synaptic strengths to their maximally stable configuration.



The global field (V1)



Input from global field form a Möbius projection



Movie, representative frame shown

Rock art - Archaeology





Movie, representative frame shown



Movie, representative frame shown

Cultural heritage projects

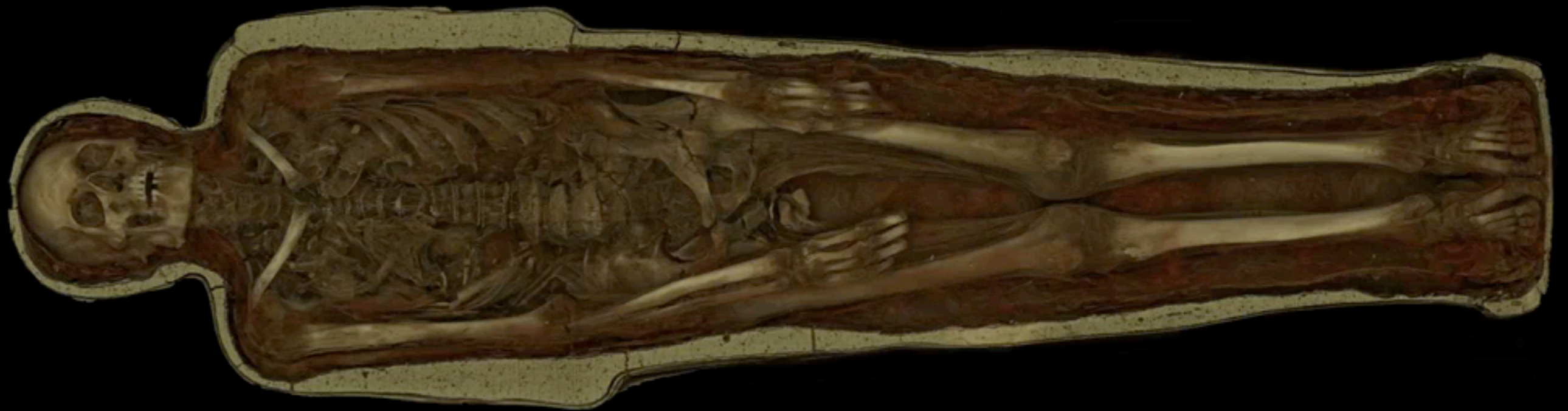


Movie, representative frame shown



Movie, representative frame shown

Volumetric visualisation : Pausiris



Movie, representative frame shown

