



# Introduction to the UK NGS

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Connecting Infrastructure

Connecting Research



## Overview

- Our Mission and Goals
- Services and Resource Providers
- Supporting User Communities

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# NGS

## NGS Mission and Goal

*To enable coherent electronic access for UK researchers to all computational and data based resources and facilities required to carry out their research, independent of resource or researcher location.*

### Goal:

- To enable a production quality e-infrastructure
  - Expand towards all Higher Education Institutes and UK based research institutions
  - Continue to support cutting edge research
- To deliver core services and support
  - Research computing groups within universities and research organisations to help them support users
  - Highlight Collaborative research in key communities
- Integrate with international infrastructures following user community demand

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## Vision / What we do

- Enable Collaborative Research
- Support HEIs and Research Facilities
  - Enable sharing of resources
  - Tools / Services to integrate resources
- Gateways to European (international) e-infrastructure (NGI)
- Investigate new technologies and develop into production
- Centre of Excellence
  - Support Centre
  - Training
  - Outreach Activities
  - Deployment Expertise / Trial services
  - Standards engagement

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## Impact

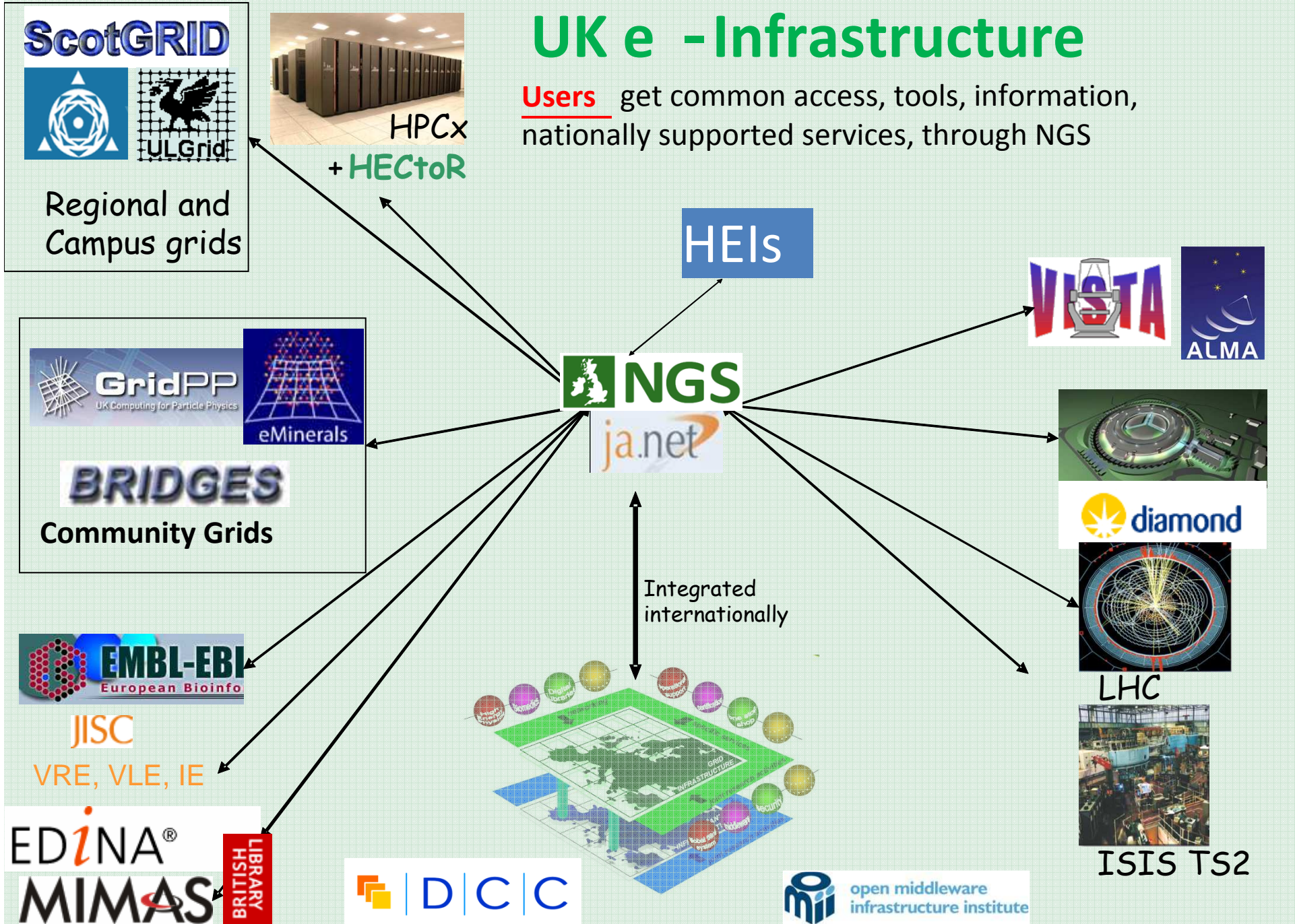
- Improve accessibility to local resources
- Widen accessibility to local resources
- Use once Use anywhere
- Share/Trade/Buy/Sell resources
- Facilitate collaboration nationally and internationally

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# UK e - Infrastructure

Users get common access, tools, information, nationally supported services, through NGS





# NGS

## Organisational Membership

- Personnel
  - Appointment of an institutional Campus Champion
  - Liaison between HEI/research organisation and NGS
- Resource Exchanging
  - Regularly tested installation of NGS defined interfaces as described in the NGS Site Level Services Document
  - Partner
    - Supporting access by a significant body of NGS users
    - Publish a service level description (SLD) detailing the services offered
  - Affiliate
    - Maintains control over permitted users



# NGS

## NGS Member Institutions, Autumn 2009



MANCHESTER  
1824



Imperial College  
London

Royal Holloway  
University of London

HPCx  
CAPABILITY COMPUTING

University of  
BRISTOL



Science & Technology Facilities Council  
Rutherford Appleton Laboratory



UNIVERSITY OF  
Southampton

University of Westminster



The University of Reading

CARDIFF  
UNIVERSITY



University  
of Glasgow

LANCASTER  
UNIVERSITY



Brunel  
UNIVERSITY  
WEST LONDON



KEELE  
UNIVERSITY



Durham  
University



UNIVERSITY OF  
BIRMINGHAM



UNIVERSITY OF  
LIVERPOOL



The  
University  
Of  
Sheffield.

THE UNIVERSITY of York

welcome trust  
sanger  
institute

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## What does the NGS offer users?

- Compute services
  - Access to more and different resources
  - Different ways of running jobs e.g. multi site MPI
- Data services
  - Access to data storage
  - Support and advice
  - New ways of accessing data
- Access Services
  - User facing services providing methods to use available resources
- Central Support services
  - Individual services needed to support user access, control and management



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## NGS Site Level Services

- Description of the different solutions to service requirements challenges
- A set of different modules describing a particular function, each with a number of solutions which are grouped together as profiles
- Supported interfaces are community driven, we will not/cannot dictate what we make available.
- Computational interfaces:
  - VDT
  - gLite
  - Globus 4
  - GridSAM
- Data Services
  - Databases (Oracle), SRB, global filesystems, Service access to structured data (OGSA-DAI)

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## Specialist services

### Westminster

- Operates and supports P-GRADE portal and GEMLCA legacy application support services



### Belfast e-Science Centre

- Web Service Hosting Container Service
  - Web service containers into which projects or VOs can deploy their own Web or Grid services, using automatic deployment technology

### Oxford e-Research Centre

- OMII-UK GridSAM
  - OGF HPC-Basic Profile compliant Job submission
  - Promoting interoperability with international grids
- Eucalyptus Cloud system
  - Exposing AWS compatible interfaces and functionality to NGS users

### Edinburgh

- Eucalyptus Cloud system

### STFC Rutherford Appleton Laboratory

- Visualisation using specialised cluster from within the STFC e-Science Viz group

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# User access



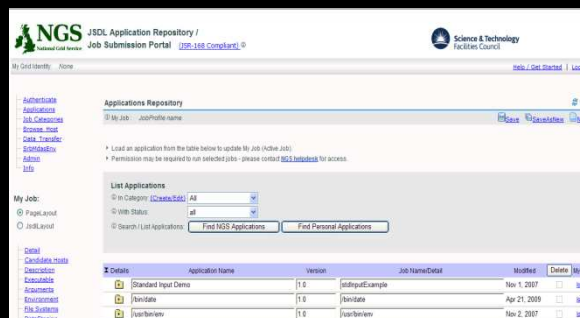
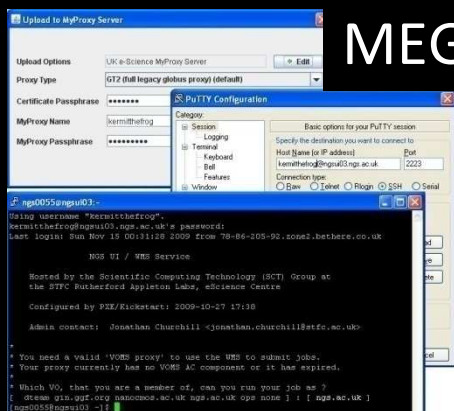
Direct access



GSI-SSH terminal



MEG



NGS Portal/  
Applications  
Repository

- SARoNGS
- WMS
- Application Hosting Environment (AHE)



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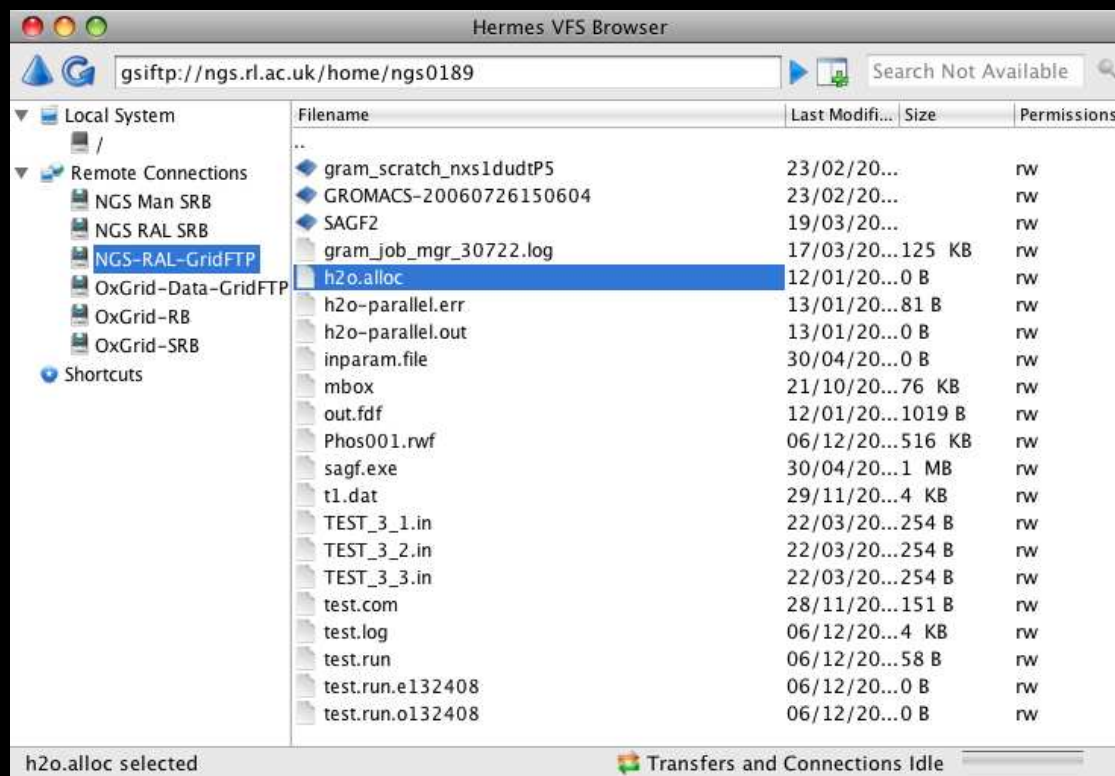
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## HERMES data client

- Drag and drop file movement between local filesystem, SCP, GridFTP, and SRB
- Java based desktop application
- Authentication and authorisation using UK e-Science certificates

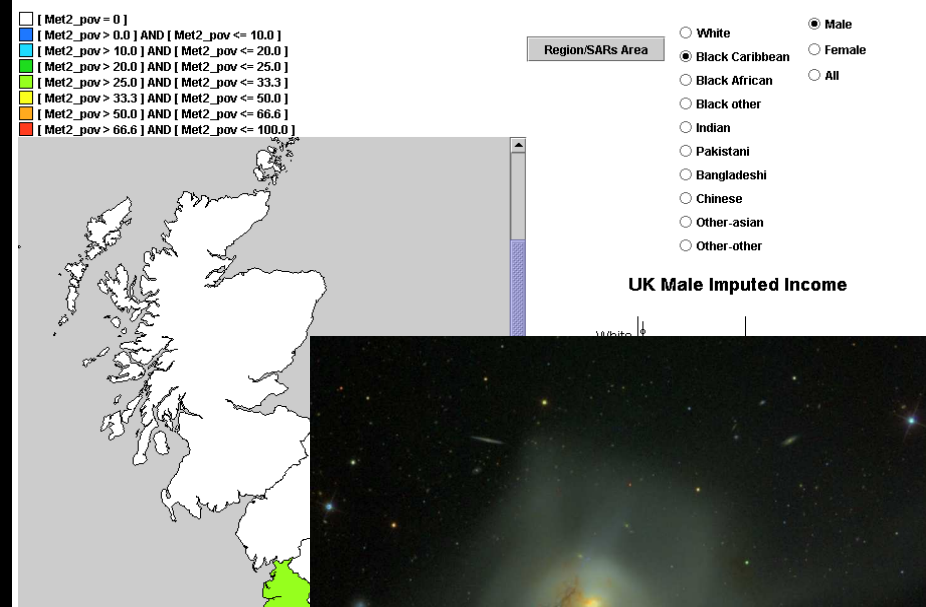
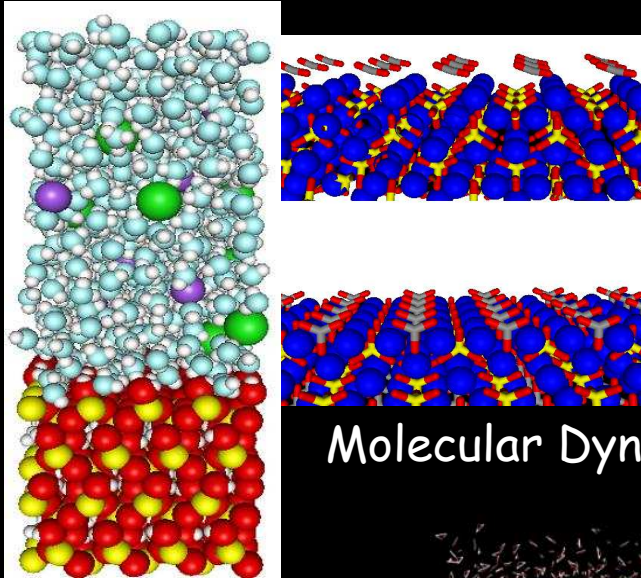




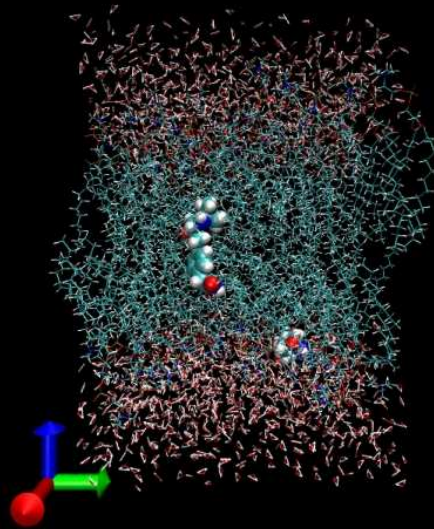
# NGS

# Examples

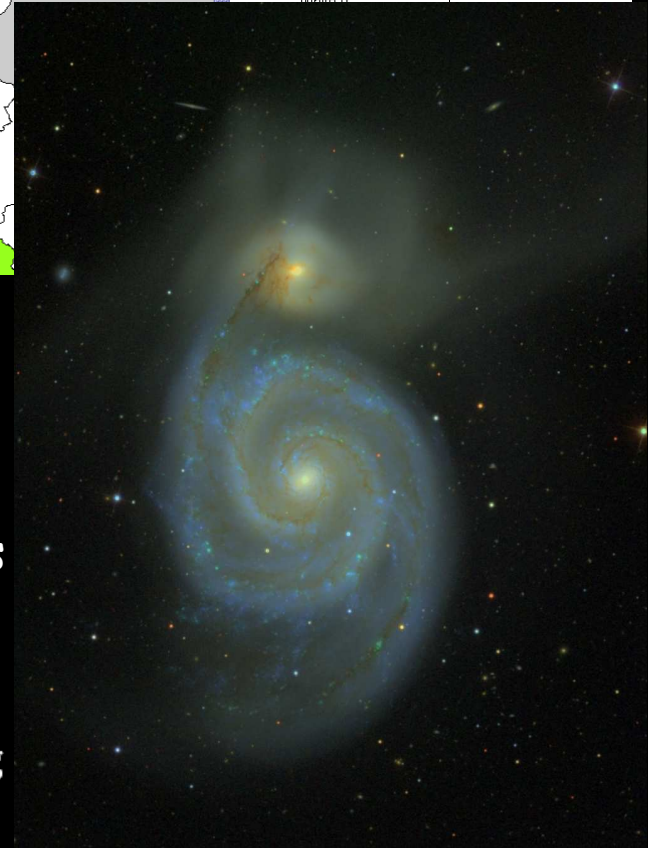
Econometric analysis



Protein - drug interactions



Astrophysics data storage and analysis





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## Prediction of dose in radiotherapy patients

### Climate modelling

**Godiva Viewer**

Setup

Data Service  
Data Server URL: <http://lovejoy.nerc-essc.ac> Connect

Dataset: OCCAM\_12

Variables:  
 sea\_water\_potential  
 barotropic\_eastward  
 barotropic\_northward  
 T\_point\_mask

Axis	Name	Start	Stride	Count
x	1	1	1	1
y	0	5	1	341
k	0	10	1	431
z	0	1	66	66

Get Data

RAL Service  
Vis. Server URL: <http://ws2.esc.rl.ac.uk/axis/> Connect

Manipulation: Density Calculation

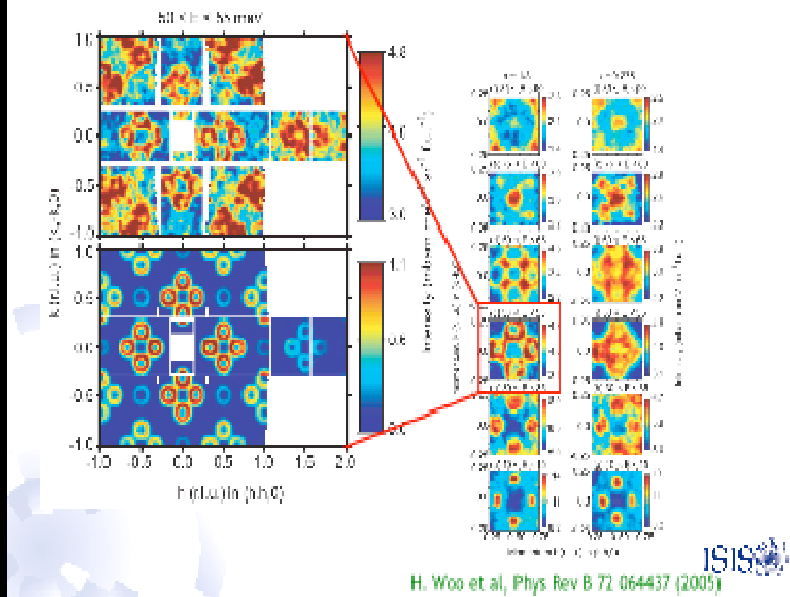
Visualisation: Marching Tetrahedron

Draw

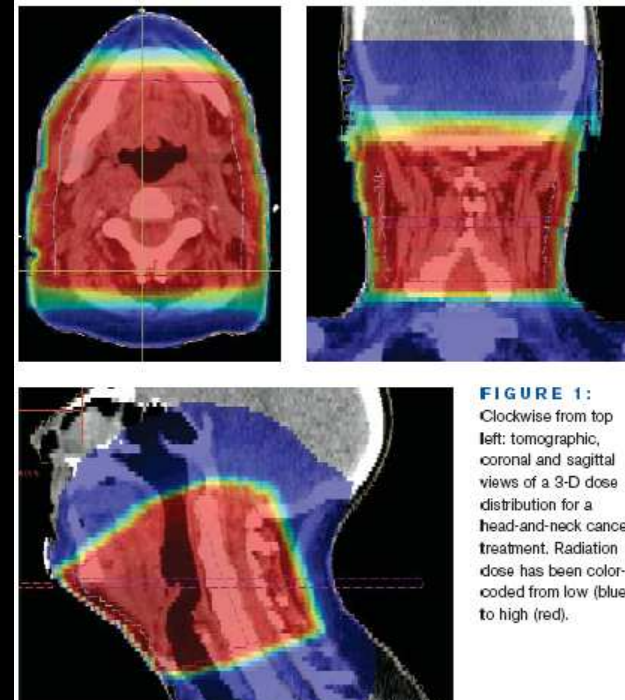
Information

Connected to RAL Service  
Connected to Gads Server

Example: L



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**FIGURE 1:** Clockwise from top left: tomographic, coronal and sagittal views of a 3-D dose distribution for a head-and-neck cancer treatment. Radiation dose has been color-coded from low (blue) to high (red).

**Meshalyzer Controls**

File Image Data Output IB Tools Integrative Biology

Display as:  
 Axes  
 Tet colour  
 Tetrahedral Mesh

Shell:  
 Vertices colour 1  
 Cables colour 1  
 Connections colour 1  
 Triangles colour 1  
 Surface colour 1

Highlight:  Color  Lights  Regions

Tetrahed:  on current surface  Triangle

Connection:  0  0  Cable

Vertex:  0  0  value

Pick Vertices: triangles attached plot time series

optimal: 0.082063 0.2 64  
 min: max: levels: colour scale

time: 5

#frames: 16 delay: 110

```

ATP.dat point50.cg.in point50.stim.orig point50.t8000
cainhibition.dat point50.cnt point50.t0 point50.t9000
data point50.cond point50.t10000 point50.tetras
wake_demo_pacing.sh point50.mem_cond point50.t2000 potassium.dat
wake_demo.sh point50.par point50.t3000 script_pbs_pacing.sh
memFem point50.pts point50.t4000 script_pbs.sh
meshalyzer_lakshmi point50.sil_stim point50.t5000
cainhibition.dat point50.spec point50.t6000
offMeshalyzer point50.stim point50.t7000
[Blanca@lpc74 point50]$ ./meshalyzer_lakshmi point50.cg.in
FLTK Stereo Not Supported
  
```

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## Conclusions

- NGS is here to support university research computing services support their research communities by making connection of ITS enabled resources easier
- Existing usage models of NGS enabled resources can be reused quickly and easily by different communities
- Connectivity using standard interfaces will include national data sources including EDINA, MIMAS, as well as experimental facilities such DIAMOND, e-Merlin, ISIS and JET
- The NGS should be a first port of call for large inter-institutional collaborative projects who require ITS enabled services



# NGS

Thank you

<http://www.ngs.ac.uk>

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