Deploying the AstroGrid: Science Use Ready

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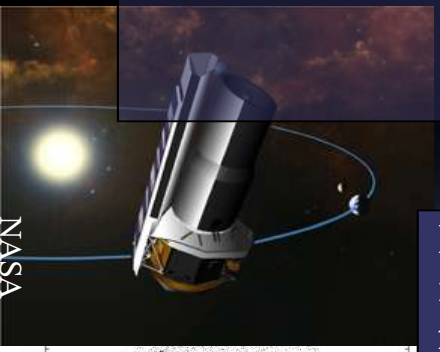
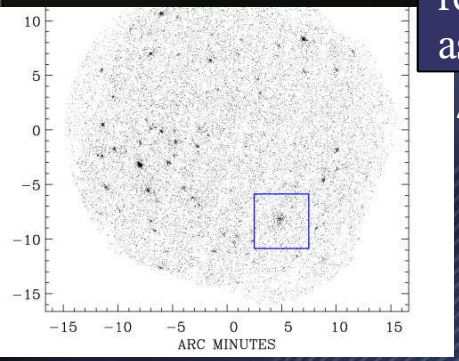
A PPARC funded project

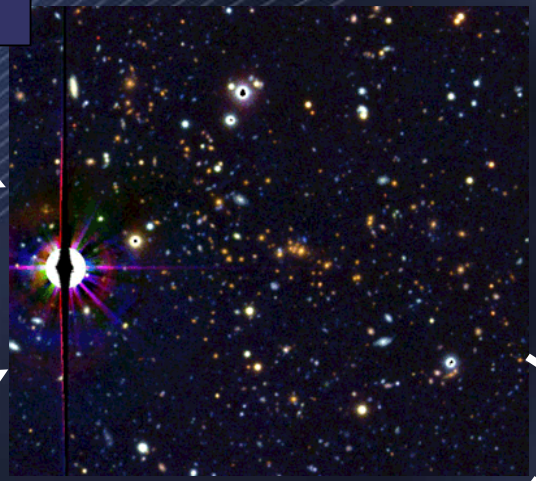
Recap: New & Improved Science: Cosmology



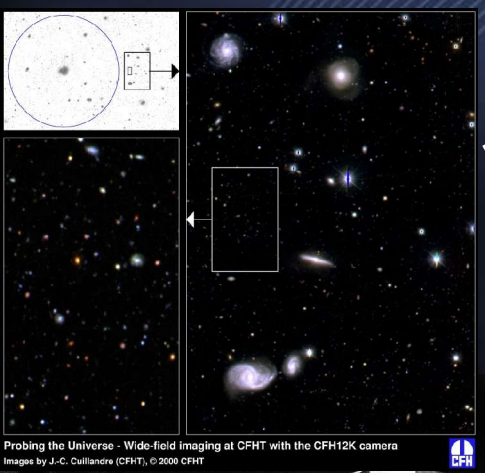
Multiple large image sources: registration & association

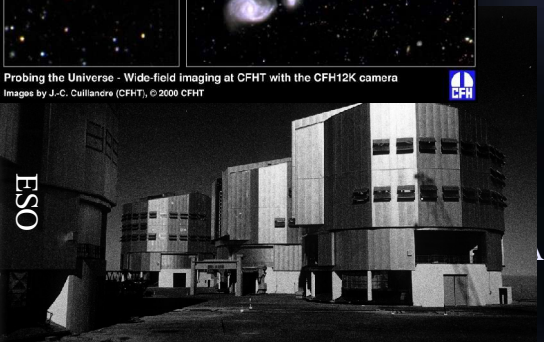


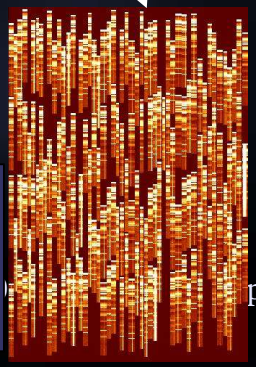
Automatic cluster finding techniques



X-ray cluster: Chandra X-ray (Mullis) overlaid on a deep BRI image (Clowe & Luppino).

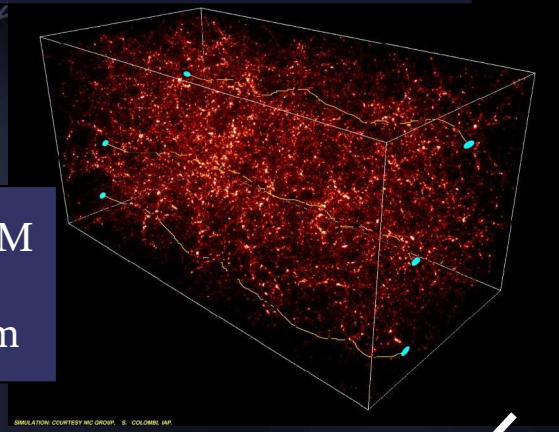




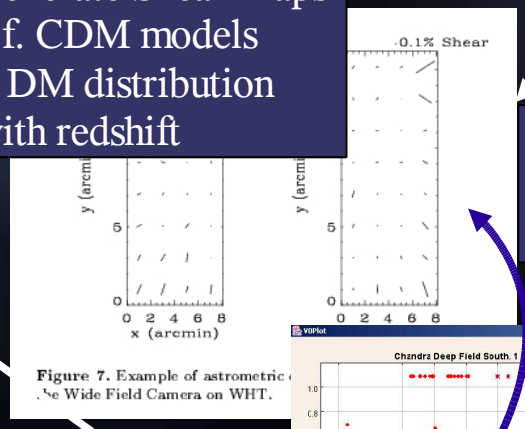


Source ID from multiplexed spectral data

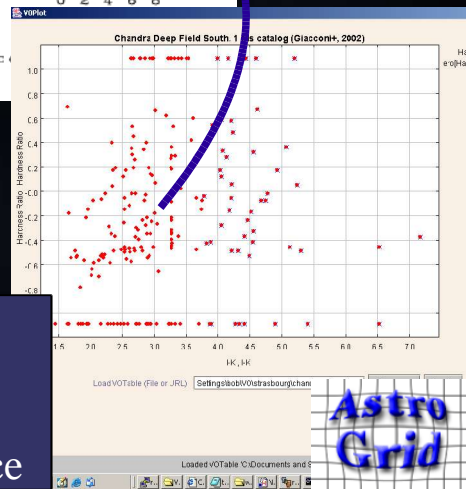
Multi-TB λCDM models, e.g. Millennium Sim



Generate Shear Maps c.f. CDM models > DM distribution with redshift



Remove stars correlate gal with z



Colour-Colour relationships classification in multi-phase space

AstroGrid (VO) Key Goals

Enable Science by:

- Improving the quality, ease, speed and cost effectiveness of on-line astronomy
- Making comparison and integration of data from diverse sources seamless and transparent
- Removing data analysis barriers to multiwavelength analysis
- Enabling access and manipulation of large data sets

Scoping the VOs

- All major projects – science input
  - AstroGrid: Science Advisory Group
  - AVO: Science Working Group
  - NVO: Science Advisory committee
- Projects define key science goals
  - Annual demos
    - Show early features and use matched to a specific science topic
    - Encourage early use
  - Capability increases year on year
  - Build towards full working systems
- AstroGrid: deployment of successive 'iteration' releases

AstroGrid 'Ten' Key Science Drivers

AgWiki . Astrogrid . **ScienceProblems**

AgWiki webs: Astrogrid | IVOA || AG-II | SSVO || e-Science | VO | Grid | Support || Main | TWiki | Know | Test

Astrogrid . { DocStore | Glossary | WPs || Home | Changes | Index | Search | Go || Portal | News | Forum }

AstroGrid Science Problems - 'The AstroGrid Ten'

This lists the science problems, abstracted from the more general ScienceProblemList held in the VO area, which AstroGrid aims to provide capabilities to meet in its initial three year project plan (9/2001 - 8/2004).

Case#	Case Name	Focus of Science Iteration #	Comments
1	BrownDwarfSelection	2	imaging
2	DeepFieldSurveys	2, 4	imaging, radio, multi-lambda
3	GalaxyClustering	2, 8	imaging, algorithms
4	HiZQuasars	2, 4	imaging, spectral
5	LowSurfaceBrightnessGalaxyDiscovery	6, 8	images, alogorithms
6	MagneticStormOnset	6, 8	STP
7	SolarCoronalWaves	6, 8	solar
8	SolarStellarFlareComparison	6, 8	astro, solar
9	STPSolarEventCoincidence	6, 8	solar, STP
10	SupernovaGalaxyEnvironment	4, 8	imaging, spectral

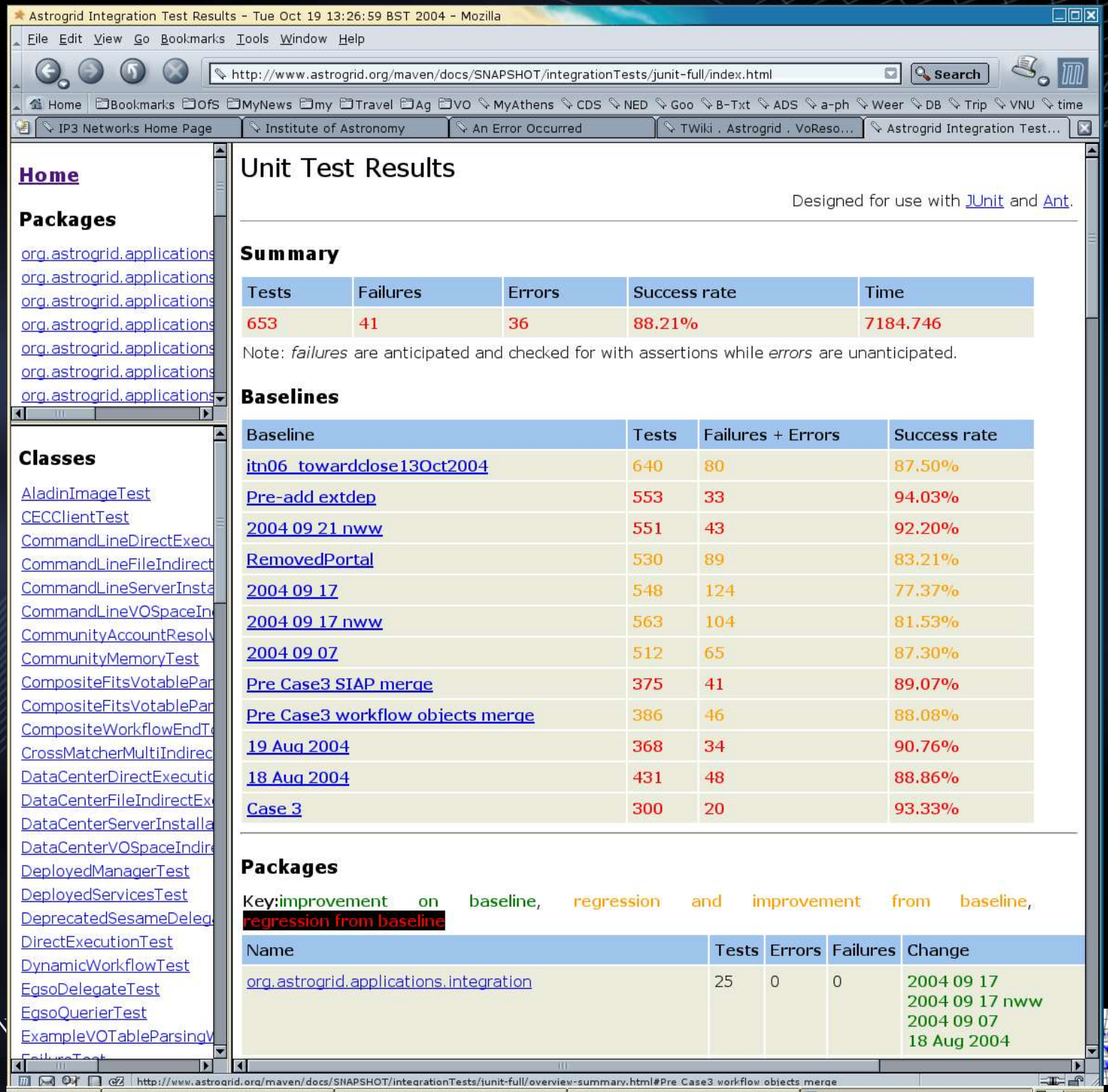
These science cases demand a well scoped range of functionality.

-- NicholasWalton - 07 June 2002

Deployment Strategy

- **Goal**: provide rapid operational feedback to ongoing development process
- AstroGrid has an iterative release cycle (ref: previous talk)
- Each release is deployed during the following 'iteration'
- Deployment
  - Release s/w components installed on the AstroGrid Testbed
  - Associated release documentation and walk throughs
  - Dedicated feedback reporting system
  - In use with 'beta-testers'
- Integration of AstroGrid testbed with AVO activities

Integration System: Maven



AstroGrid Beta Testing

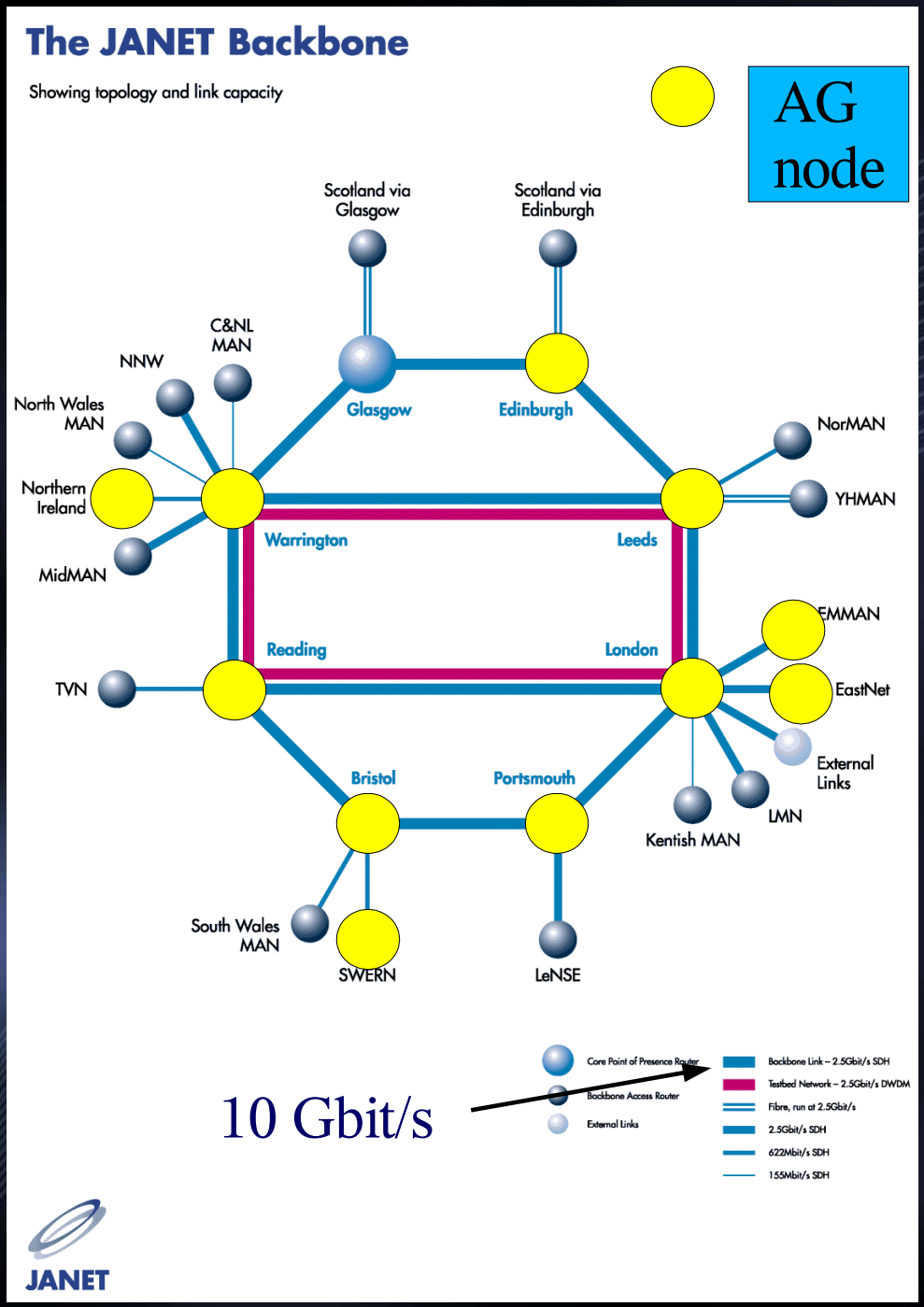
Early involvement of the end user community

- Beta testing programme to test product releases
  - Programme includes access to AVO tools
- Beta tester pool composes:
  - Science Advisory Group
  - eScience astronomy students
  - Interested astronomers
- Beta tester programme providing feedback
  - Usability > input to GUI design
  - Functionality > informs access to data and tools
  - Reliability > uptime, speed of response, bugs
- Beta testers welcome:
  http://wiki.astrogrid.org/bin/view/Astrogrid/BetaTesting

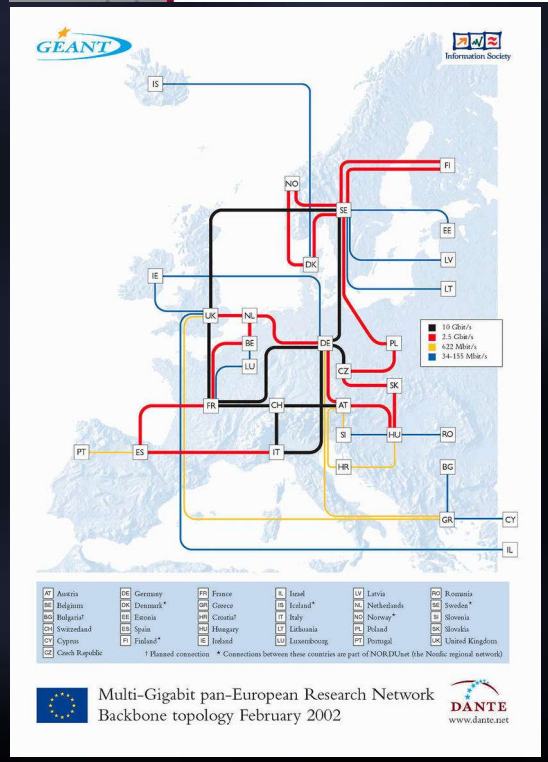
The AstroGrid Testbed

- Releases deployed on a functional 'Testbed'
  - Early release on simple resources
  - Increasing complexity of testbed with each release
  - Build to link full range of institutional resources
- Iteration Six Testbed consists of:
  - Publishing Registry (Harvesting NVO registry & CDS): Leicester
  - MySpace servers: Leicester
  - Applications servers: Manchester. MSSL
  - Datacenters: Cambridge, Edinburgh, MSSL

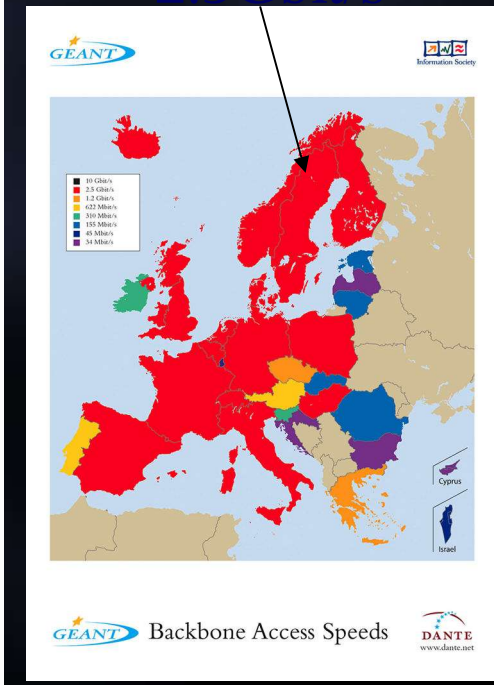
AstroGrid nodes: connected to fast backbone



>1 Gbit/sec

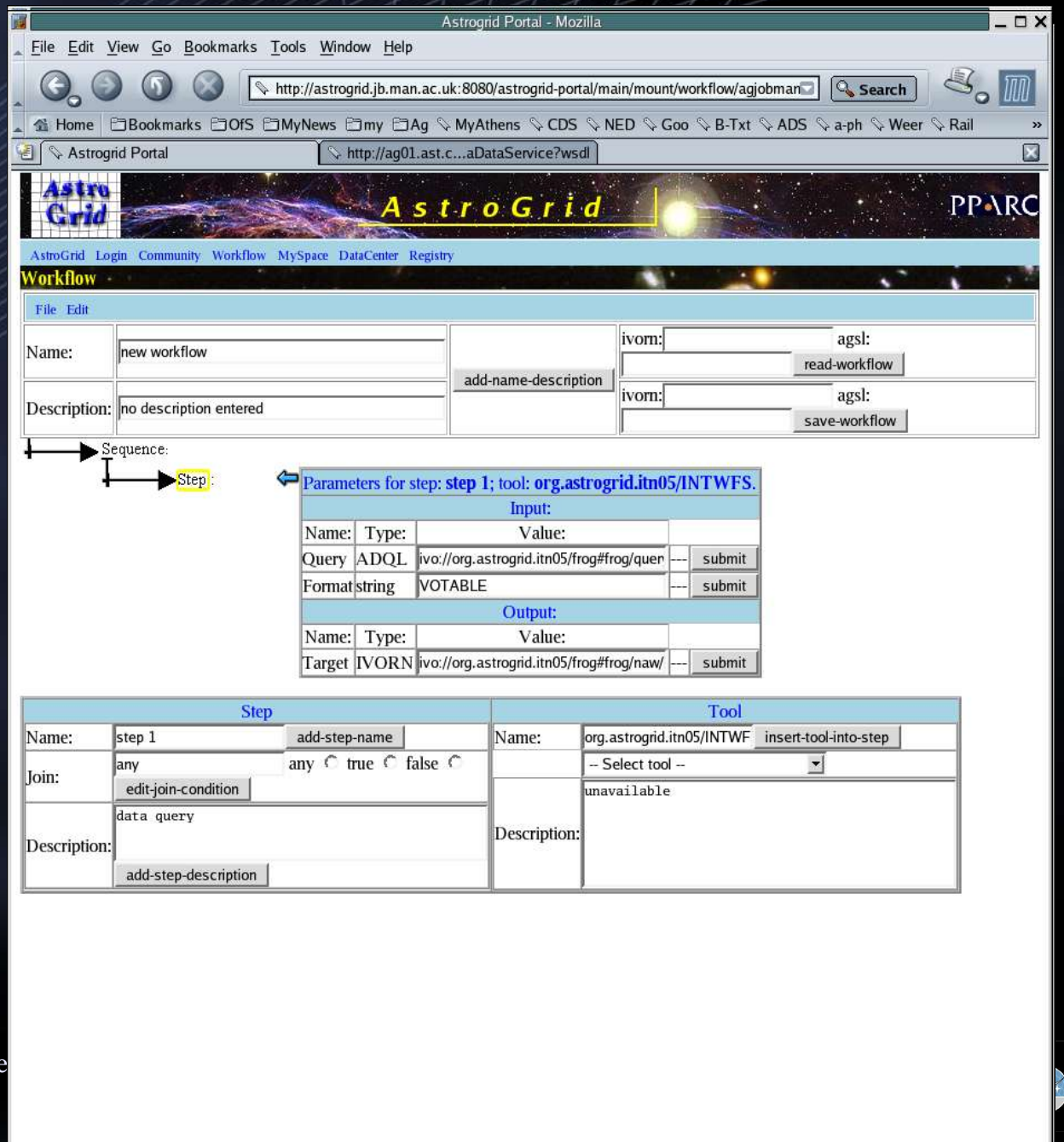


2.5Gbit/s

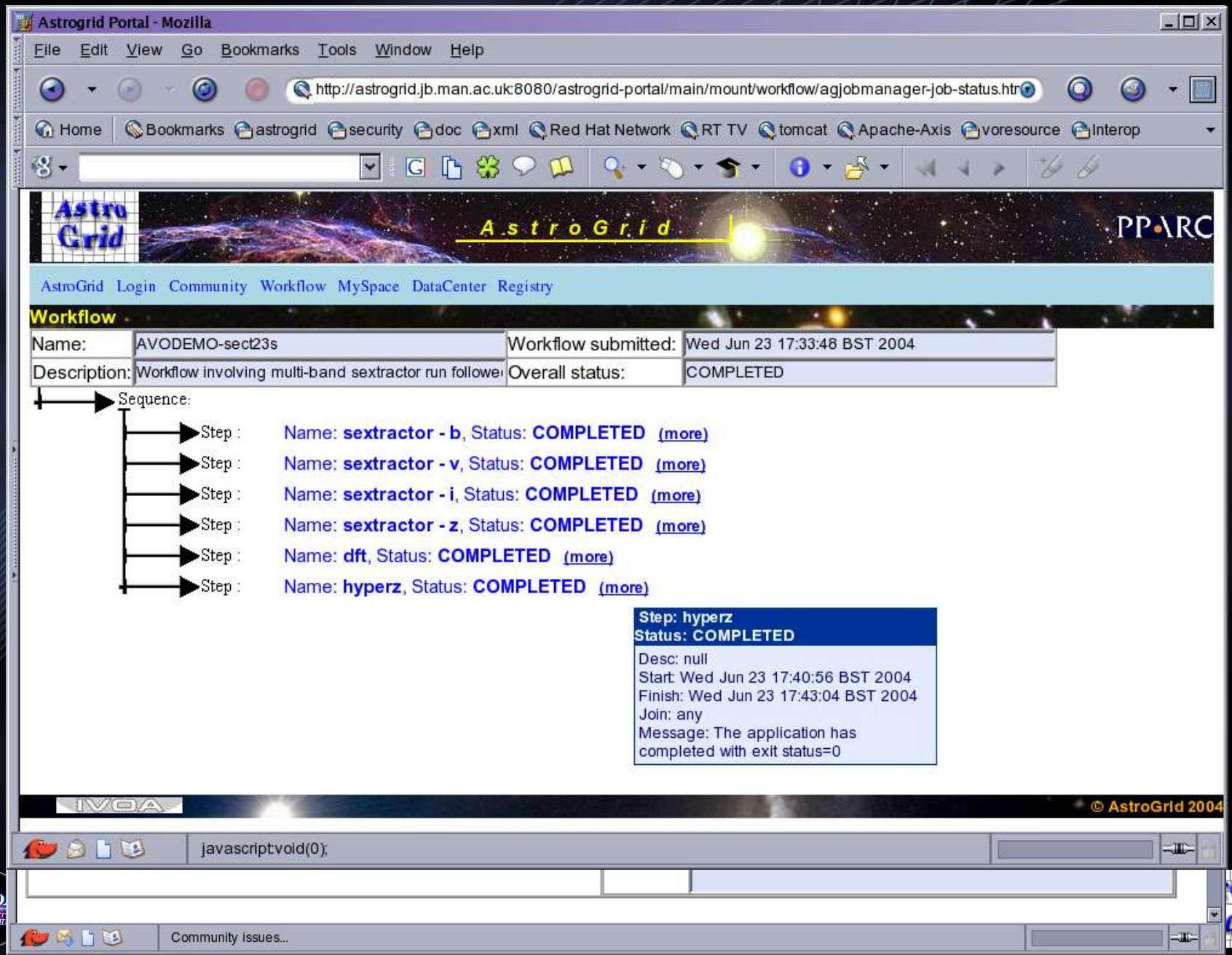


Iteration 05 Deployment Release

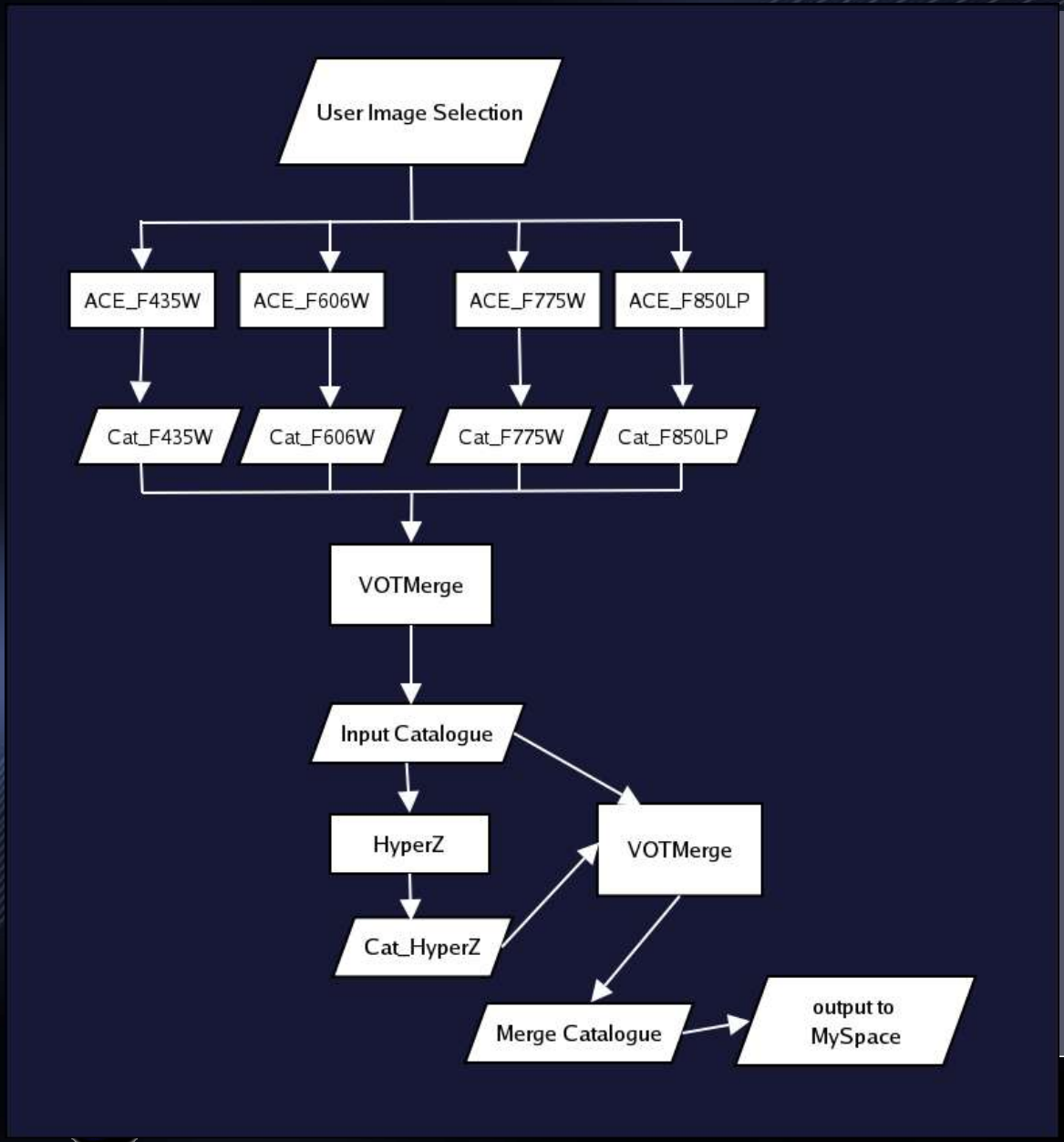
- Conforms to IVOA standards
- Single sign in
- User MySpace
  - secure
- Query building
  - Standard queries
- Build up workflow
  - reusability

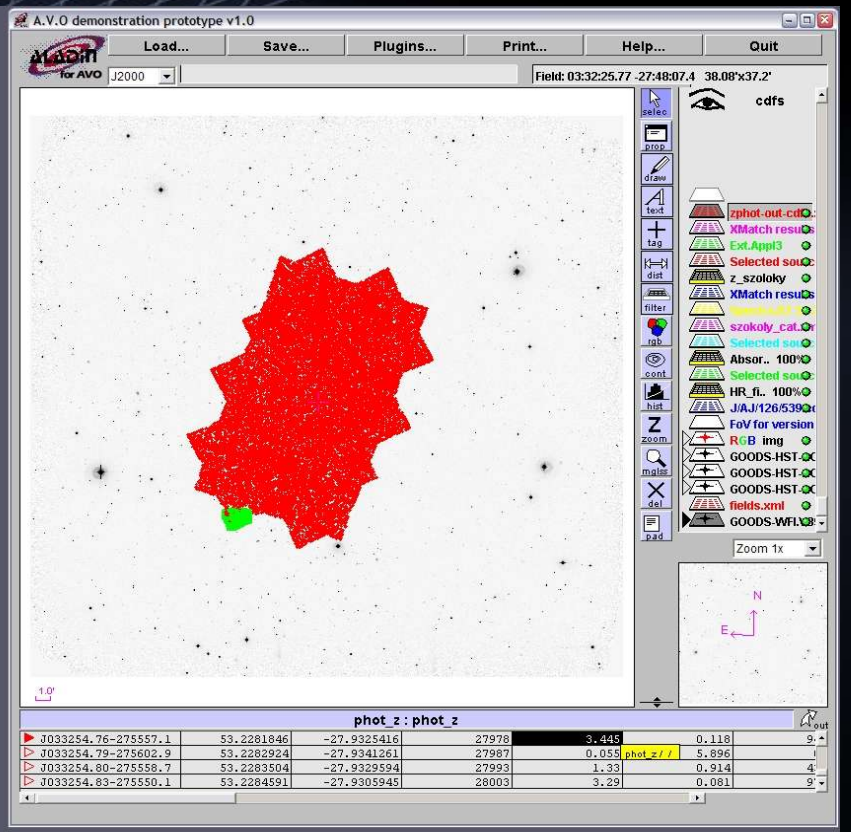


Iteration 05 Deployment Release
complex workflows



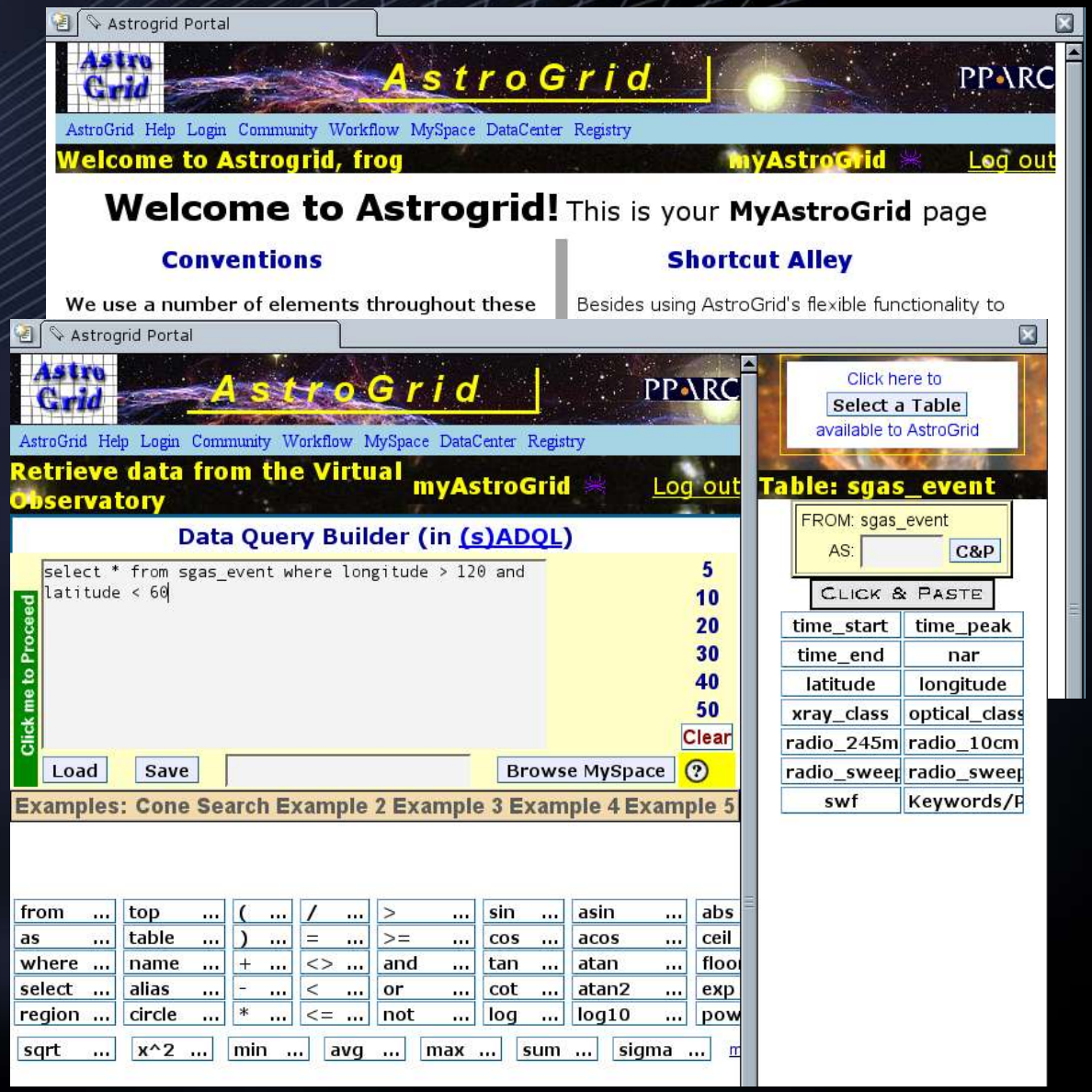
Itn05: use in AVO Demo: Jan 2004
discovering distant quasars from multi-λ data





Iteration 06 Deployment Release

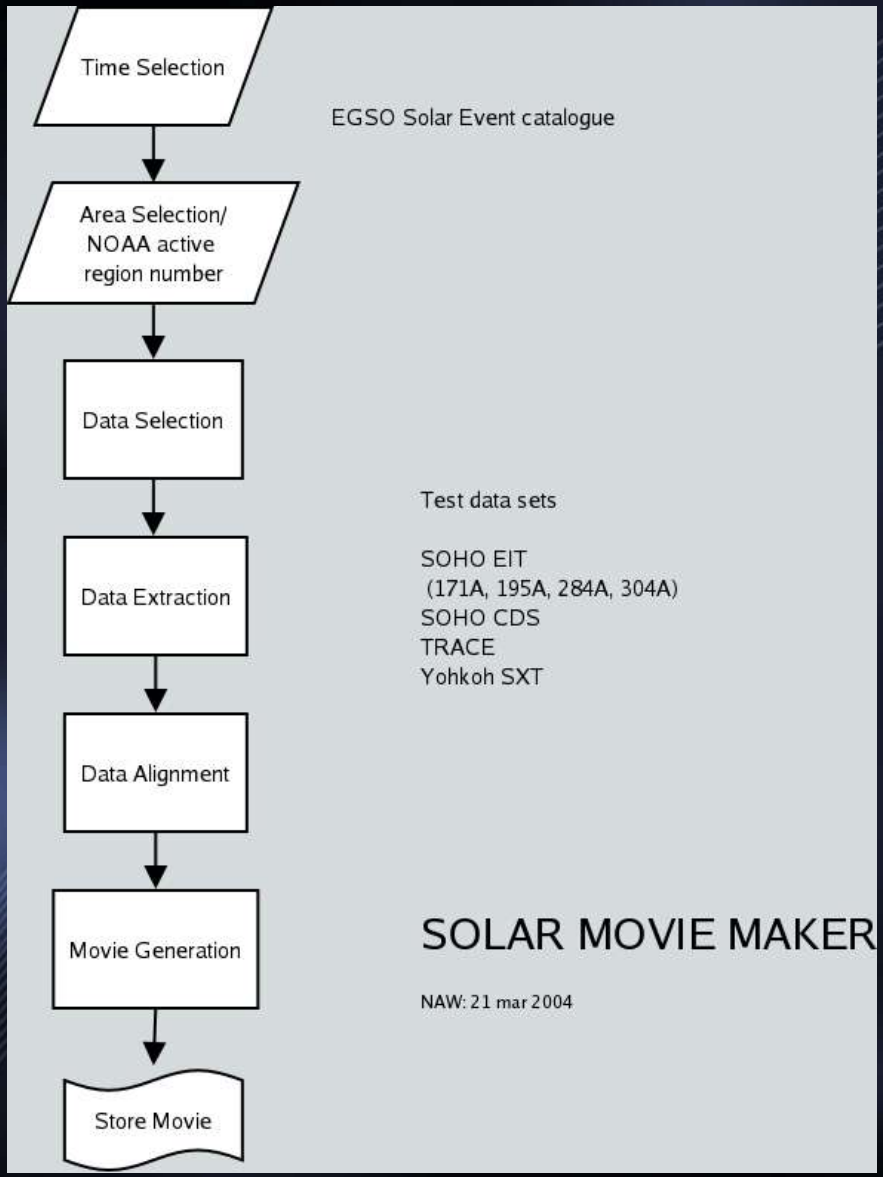
- More complex IVOA standard implementation
  - SIAP interface
- Query builder: interface
- Workflow: programmable
- Registry: harvesting
- Applications: varied
- Data: image and tabular

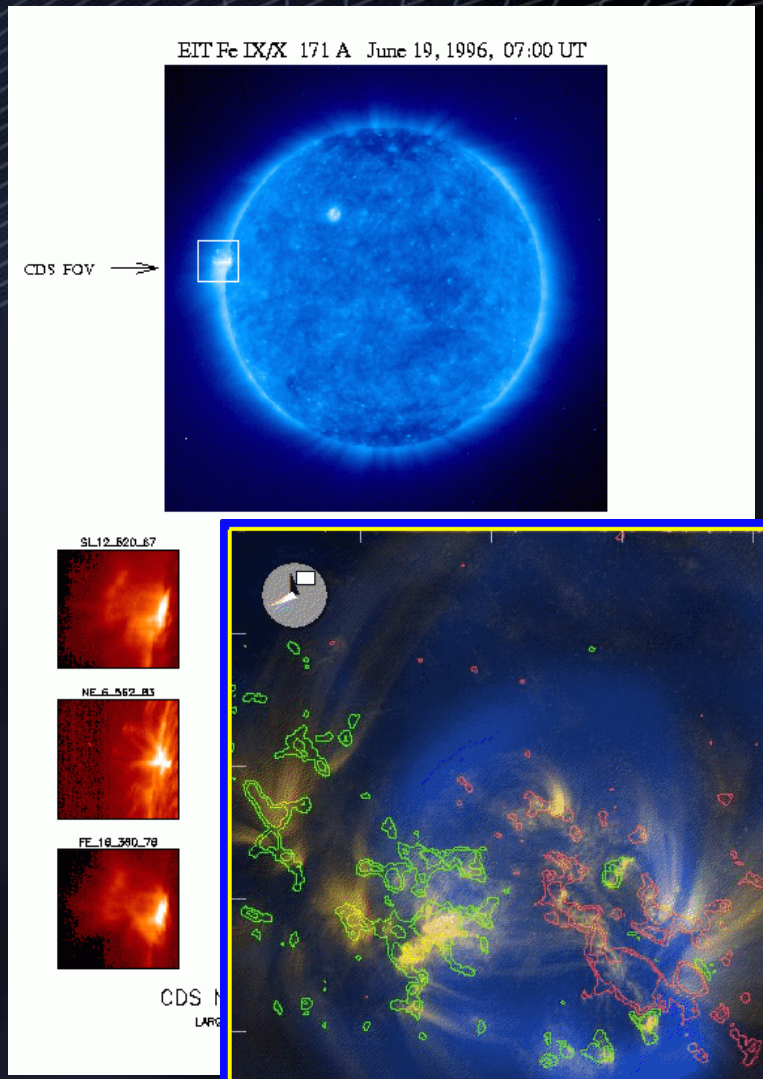


Iteration 06: Solar/STP

- Automatic overlaying of series of image data
  - using TRACE and SOHO/CDS as examples
- Supports Solar Coronal Waves case
- Workflow involves time selection of data
  - Solar coordinates
  - New data sets > RAL, MSSL
- Some manipulation of data required (via solarsoft)
- Target localisation
  - EGSO product – Solar Event catalogue [ref: P1.3.12]

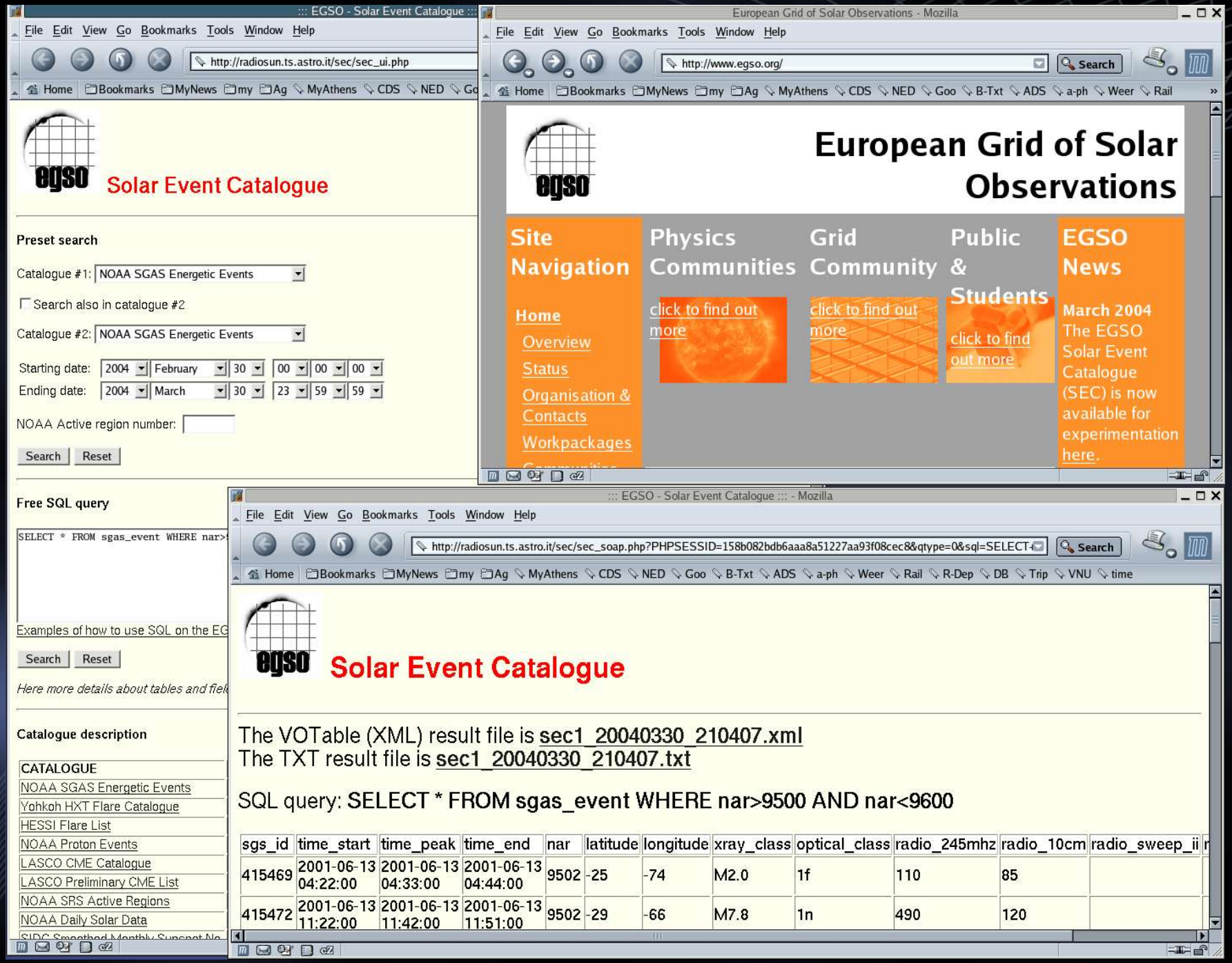
Movie Maker Workflow



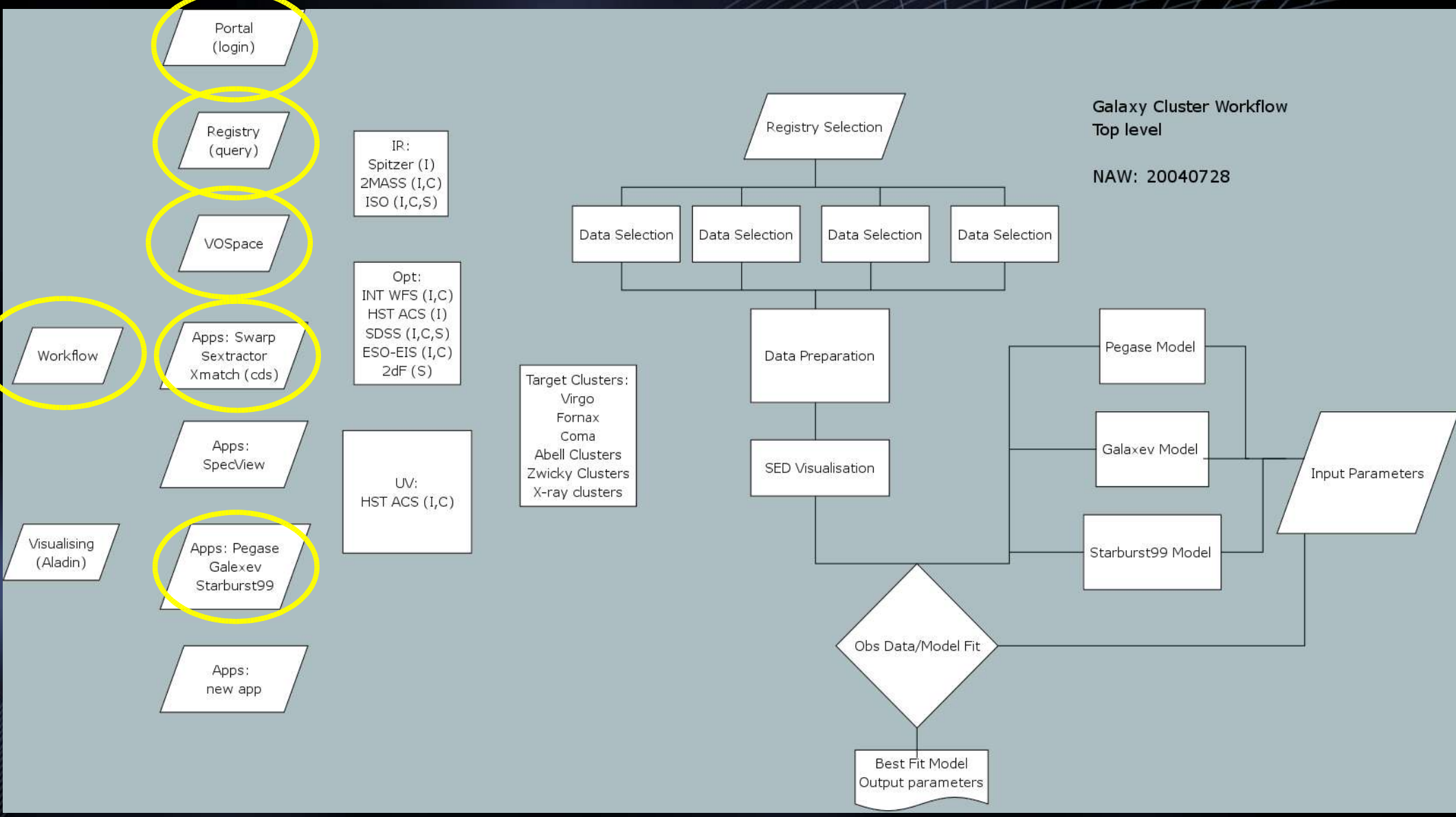


TRACE 171A : yellow, YOHKOH/SXT: blue, SOHO/MDI: green/red

Interface to EGSO service



AstroGrid Itn06: use in AVO Demo 2005



AstroGrid: Helper Applications

- Range of externally provided applications: tools to analyse and visualise end and intermediate data products
  - VOPlot: handles VOTable data
  - VOPlot3D: handles VOTable data – 3D visualisation
  - Topcat: tabular data and manipulation
  - VOSpec: spectral plotting and analysis package
  - Specview: spectral plotting and analysis package
  - Aladin: data visualisation and catalogue access
    - MySpace browser capability (read-only)
- See http://wiki.astrogrid.org/bin/view/Astrogrid/VoResources

Current Lessons Learned

- Functionality: not necessarily end to end
  - Limitations in operational science use
- Reliability: bug support limited
  - Limited time till release of next iteration
- Involvement: limited but increasing
  - Early releases complex with limited science functionality
- Standards: system built to comply
  - BUT: standards not always agreed and in place

Rapid deployment > lessons learned > feedback to development process > better end product

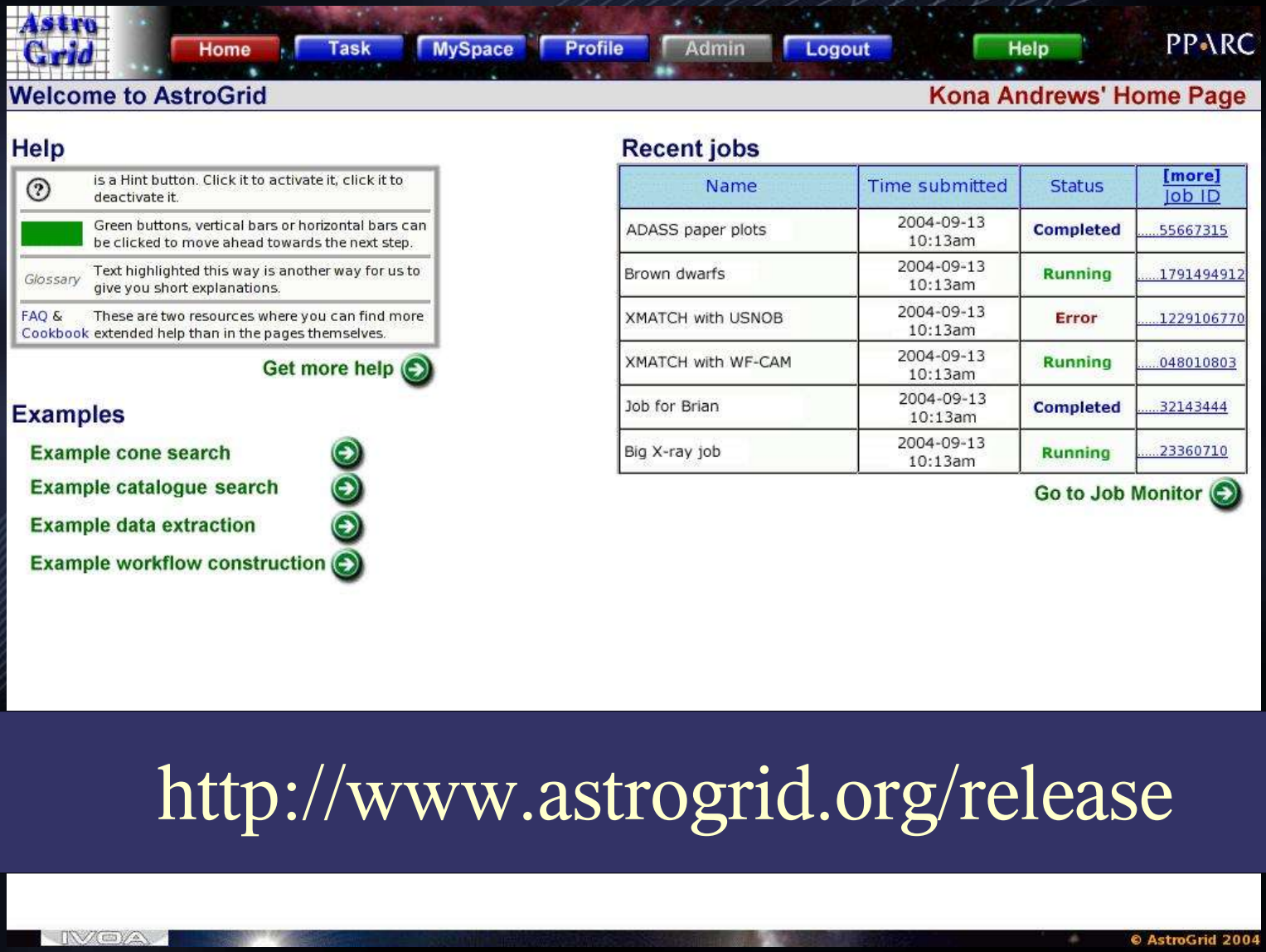
The Next Steps: Participant in VO Science Demos 2005

- AstroGrid: Consortium meeting: mid Dec 2004
  - Brown dwarf discovery
  - Solar coronal mass ejections
- NVO @ AAS, San Diego: Session: Weds 12 Jan 2005
  - Swift alerts
- Euro-VO: ESAC, Madrid: 25-26 Jan 2005
  - Star formation histories
  - AGB to PN transitions
- A Widening range of capabilities, data, applications
  - Increasing scientific usefulness

GOAL: end 2005 – science papers enabled by VOs

AstroGrid Version 1 Release: Jan 2005

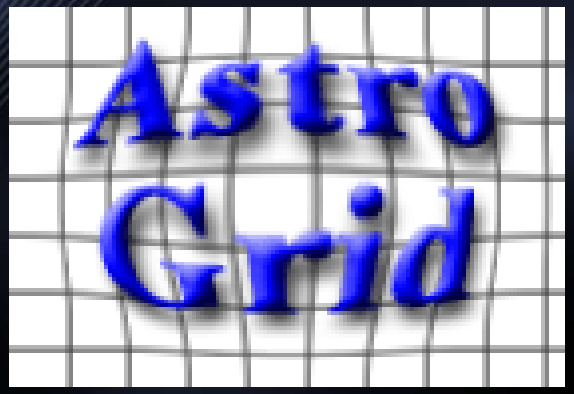
Prototype Virtual Observatory for the UK



http://www.astrogrid.org/release

AstroGrid Posters at ADASS

- [P1.1.7] MySpace: distributed data storage for the VO
- [P1.3.9] Portal and Workflow
- [P1.3.2] AstroGrid and the Registry: Enabling Resource Discovery
- [P1.3.11] Access Control in AstroGrid software
- [P1.3.4] The AstroGrid Common Execution Architecture
- [P1.3.6] The Publisher's AstroGrid Library



http://www.astrogrid.org
http://wiki.astrogrid.org
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