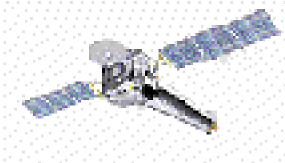


The Virtual Observatory

- The Virtual Observatory initiative - make astronomical archives and software interoperable.

- The IVOA (International Virtual Observatory Alliance) is the umbrella organization including the UK Astrogrid, Euro AVO, US NVO and other teams.

- CXC leads VO Data Model (DM) Working Group to determine standards by late 2004

- NVO is NSF funded in the US - CXC a major collaborator; 2 year program.

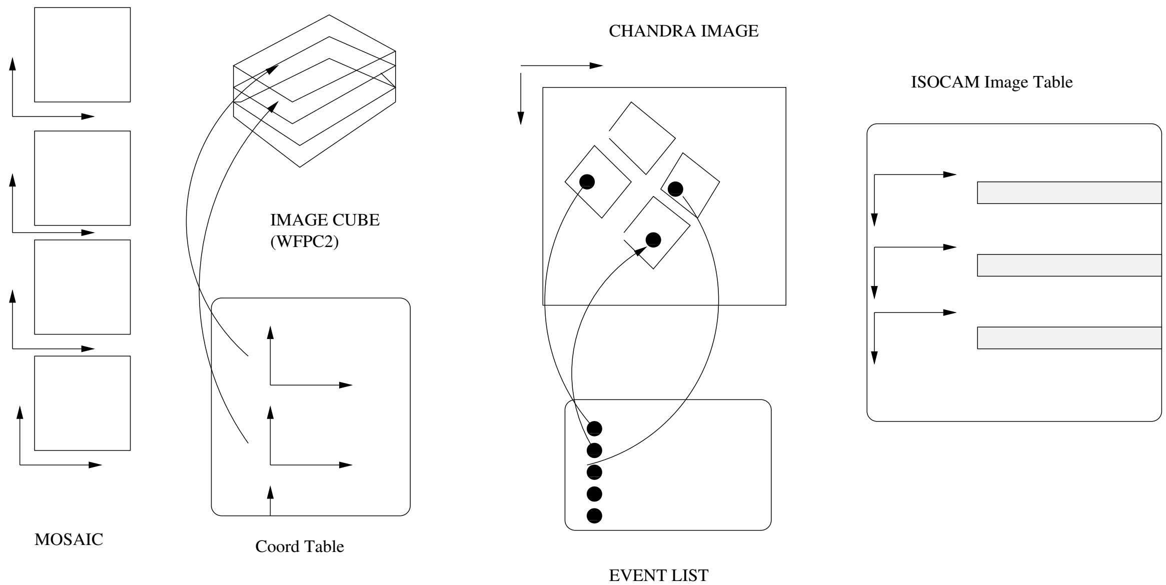
- CXC leading CfA NSF work to develop VO DM testbed, 2 year program.

- CXC, other NASA data centers proposing VO tool development initiative to NASA

VO Data Models

- VO to describe data in astronomy, not file format, terms

- Currently same information stored in incompatible ways, e.g. mosaic images



- VO models will allow transparent access to this heterogeneous data

Making CIAO ‘VO-Ready’

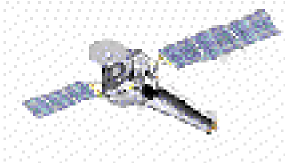
- Existing grants fund development of standards, infrastructure

- Do NOT fund upgrading CXC archives and applications to use standards.

- Astronomers will use the VO to request Chandra data; we must serve it up in a way that meets their needs

- X-ray astronomers using CIAO want to combine Chandra data with other VO data - CIAO tools should recognize the information provided by the VO to facilitate this process.

- CIAO tools should be scrubbed to be even less mission specific, new tools should be developed explicitly to combine Chandra results with other data.



Specific needs

- XML files will accompany our FITS files and describe the data in a standardized and structured way.

- Data descriptions will use `objects' (`classes', as in object oriented programming) to give this standard structure.

- Upgrade the Data Model library to read and write VO XML files and use the metadata in them - allowing us to robustly inter-operate Chandra and external VO data.

- Migrate tool development to explicitly use the VO object classes - this will ensure maximum generality for our tools.

- Create S-lang structures for these objects.

- Upgrade L1-L3 data products to include VO protocols.

Beyond Level 3

- In the VO paradigm astronomers will use the Chandra archive in a different way. May need special products and tools
- Level 3 archive, VO-enhanced, is a good basis for VO users.
- A standard adaptively smoothed image product would aid instant comparisons with image data at other wavebands (Hard to see typical low count density extended objects without smoothing)
- Improved tools to support multiresolution images to take full advantage of Chandra's spatial dynamic range
- Can we make model-independent flux estimates with reasonable errors, useful for adding X-ray points to SED plots?
- Flux/upper limit web service for any point in the sky