VO/IVOA and The Astronomy Community

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VO and The Astronomy Community

- Why Should We (VO) Care?
  - Mission of Most (if not all) VO Projects
  - Most Projects Entering Operational Stage
  - Most Funding Agencies
    - Care About Demographics
    - Respond to User Input
    - Will Not Continue to Fund Projects Seen as Irrelevant
- Why Should We (IVOA) Care?

VO and The Astronomy Community

- Input From:
- US NVO Experience
  - Science Advisory Committee
  - VO Science Use Project
  - Summer Schools, “Test Particle” Projects
- Reports of Other IVOA Member Activities
  - Workshops
- Discussions with Astronomers
- - Not A Complete Sample

NVO Portal Science Use Cases

- Test Particles for Portal Capability
- Need “Real” Scientific Inquiry Questions
- 31 Test Queries Received
  - 8 From Team Members
  - 23 From Science Advisory Cte Plus Others
- Topics Included Stellar, Galactic, Extragalactic, Theory

Portal Science Use Cases

- Ranking of Queries – Not Ranked on Science
  - A: Simple, Well Defined, Portal Should Do Very Easily
  - B: MultiStep Inquiries; Otherwise Well Defined
  - C: MultiStep, Some Parts Not Well Defined
  - D: Not Well Defined; Need More Information
  - F: Not Applicable
  - A/D: Not Well Defined; Easily Fixed

Portal Science Use Cases

- Ranking of Queries – Some Ambiguous
  - A: Simple, Well Defined, Portal Should Do Very Easily - 12
  - B: MultiStep Inquiries; Otherwise Well Defined - 5
  - C: MultiStep, Some Parts Not Well Defined - 3
  - D: Not Well Defined; Need More Information - 2
  - F: Not Applicable - 0
  - A/D: Not Well Defined; Easily Fixed - 9

Portal Science Use Cases

- Class A Queries
  - In a sample of Chandra X-ray point sources, which have a counterpart at any other wavelength?
  - Make me an SED of a galaxy of N x 10 ^12 solar masses and redshift z whose stars all formed at a redshift of 2.
  - For all stars in a 1 degree circle around a given point in the sky that a) are in USNO-B, 2MASS, and SDSS, and for which b) the error in the star's proper motion is < 10 mas/yr, please return the USNO proper motion, the 2MASS position, and the SDSS colors and r magnitude.

Portal Science Use Cases

- Class A/D Queries
  - Make me an SED of a galaxy of N x 10 ^12 solar masses and redshift z, most of whose stars formed at z = 2, but is forming stars at a rate of 10 solar masses per year now.
  - What is the sample of known X-ray quasars which are even occasionally bright enough to achieve a decent X-ray spectrum within 1’ of a known cluster of galaxies?

Portal Science Use Cases

- Class A/D Queries – How Should the Portal Respond?
  - Which Abell clusters have steep spectrum radio sources and extended x-ray emission? Are there newly identified clusters (e.g., from SDSS) with similar properties?

Portal Science Use Cases

- Class A/D Queries – How Should the Portal Respond?
  - Which Abell clusters have steep spectrum radio sources and extended x-ray emission? Are there newly identified clusters (e.g., from SDSS) with similar properties?
  - Bad Response: "Poorly Defined – Go Away"
  - Other Response: "Please Define Steep Spectrum"
    - Reply: "Alpha > 1" OR "Alpha < 1" - Conventions!
    - Between What Frequencies?

US NVO Science Advisory Research Project

- Obtained *in situ* Feedback from Users
- Interviews, Observations (FOW), Surveys, Follow-Up Email
- Interviewed/Observed ~ 15 Astronomers from JHU & STScI plus ~ 10 Astronomers at Dec 2006 AAS Meeting

US NVO Science Advisory Research Project - Results

- Keep Interface SIMPLE
- Keep Interface SIMPLE
- Use Contextual Help
- Consistency in Applications
- Eliminate Jargon – e.g., Forbidden Words:
  - Registry
  - Cone Search
  - Metadata
  - “Service” (e.g., web service), SIAP, etc.

US NVO Science Advisory Research Project – Results (Cont'd)

- Need for Ability to Do Reconnaissance
- Applications Requiring Extensive Background Reading not Generally Useful

- Several NVO Specific Recommendations

Evolution of NVO Web Page

- 2007 Page

Evolution of NVO Web Page

- Current Page

An Interesting VO Model

- US Virtual Solar Observatory (F. Hill)
  - Provides Only Data – 67 Data Sets
  - Imaging and Spectroscopy
  - Single-Point One Stop Access
    - Web Based – No SQL, XML, HTML
  - Uses “Shopping Cart” Software
  - Average Data Retrieval – 3000 Carts/Yr
  - User Community Worldwide ~ 500
    - Average Usage Per Solar Astronomer Per Year – 6

General Community Views

- Most Astronomers Very Focused on Their Research
- Not Interested in Learning New Applications that Do What They Can Do Now
- Not Interested in “Potential” Improvements
- Not Interested in “Do Everything” Applications

General Community Views

- Most Astronomers DO NOT
  - Understand Java
  - Understand XML/HTML
  - Care About Elegant Code
  - Often Use SQL
- Most Astronomers DO
  - Want the Fastest/Easiest Way to Do Their Science

Some Requirements for Community Acceptance

- Ease of Access – No Jargon, No TLAs
- Tools & Services
  - Simple/Useful
  - “90/10” Rule
  - Relevant/Reliable
  - Multi-wavelength Imaging
  - Direct Access to Data

Some VO Related Workshops

- Spectroscopy – Euro-VO DCA/ESAC March 2007
  - Surveys, Standards, Visualization, Photometry
  - Successful Engagement of Astronomy Community
  - Meeting Driven by Astronomical Issues
  - Feedback to Projects?

VO Related Workshops

- Multi-Wavelength Astronomy – AIDA/ESAC Dec 2008
  - Data Access, Tools, Surveys
  - See P. Padovani Paper
- Some Major Issues –
  - Too Many Tools, Some Duplication
  - Searches Difficult
  - Quick Checks on All Data Difficult/Impossible

Relevance to IVOA

- IVOA Take-Up Committee
  - M. Allen, D. De Young (chair), E. Hatziminaoglou, A. Khembavi, A. Lawrence, P. Padovani
- Committee Recommendations to Date:
  - IVOA Should Promote Interface Between Astronomy and IT/Developer Communities
  - IVOA Should be a Clearinghouse for Workshop Information
  - IVOA Should Encourage Development of Useful Single Point Portals via Clearinghouse Activities

Relevance to IVOA

- Is There an Issue of Simplifying IVOA Standards?
  - Will This Assist in Take-up?
  - Consequences?
  - Short Term? Long Term?
- Other Possible IVOA Initiatives
  - E.g., VO Implementation Initiative

Conclusions

- Interaction with the Astronomy Community is Still a Critical Issue
- Sociological Changes in Astronomy –
  - ~ Experimental HEP
  - Long Time Scale
  - Does Not Remove the Problem
- IVOA Can Make Essential Contributions