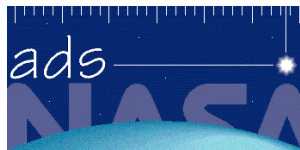


Linking Literature and Data

Status Report and Future Efforts

Alberto Accomazzi
Smithsonian Astrophysical Observatory
<http://ads.harvard.edu>



Links between Publications and Data Products

- Have existed between Data Centers and ADS since 1994
- Maintained by librarians, data archivists
- Bibcode-URL pairs, linking to either individual observations or aggregates
- Often part of data center's bibliographies, used to compute metrics

RX J1648.7+6109: Witnessing the Formation of a Massive Group/Poor Cluster and Its Brightest Galaxy

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Title: RX J1648.7+6109: Witnessing the Formation of a Massive Group/Poor Cluster and Its Brightest Galaxy
Authors: Jellema, Tesla E.; Mulchaey, John S.; Lubin, Lori M.
Affiliation: AA(Morrison Fellow, UCO/Lick Observatories, 1156 High Street, Santa Cruz, CA 95064; The Observatories of the Carnegie Institution of Washington, 813 Santa Barbara Street, Pasadena, CA 91101.), AC(Department of Physics, University of California at Davis, One Shields Avenue, Davis, CA 95616.)
Publication: The Astrophysical Journal, Volume 685, Issue 1, pp. 138-146. (ApJ Homepage)
Publication Date: 09/2008
Origin: UCP
ApJ Keywords: Galaxies: Clusters: General, galaxies: clusters: individual (RX J1648.7+6109), Galaxy clusters: general
DOI: 10.1086/590550
Bibliographic Code: 2008ApJ...685..138J

Abstract

Using deep Chandra and optical spectroscopic observations, we investigate an intriguing young massive group, RX J1648.7+6109, at $z=0.376$, and we combine these observations with previous measurements to fit the scaling relations of intermediate-redshift groups and poor clusters. RX J1648 appears to be in an early stage of formation; while it follows the scaling relations, its X-ray emission is highly elongated, and it lacks a central dominant BCG. Instead, RX J1648 contains a central string of seven bright galaxies, which have a smaller velocity dispersion, and have less star formation (lower EW([O III]) and EW(H β)) than other group members. The five brightest galaxies in this string should sink to the center and merge through dynamical friction. BCG consistent with a system of RX J1648's mass even if 5%-50% of the light is lost to an infalling filament.

RX J1648.7+6109: Witnessing the Formation of a Massive Group/Poor Cluster and Its Brightest Galaxy

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E-mail: tesla@ucolick.org
Journal: The Astrophysical Journal
Issue: Volume 685, Number 1
Citation: Tesla E. Jellema et al 2008 ApJ 685 138
doi: 10.1086/590550

Article

Tag this article Full text PDF (346 KB) View as HTML

ABSTRACT Using deep Chandra and optical spectroscopic observations, we investigate an intriguing young massive group, RX J1648.7+6109, at $z=0.376$, and we combine these observations with previous measurements to fit the scaling relations of intermediate-redshift groups and poor clusters. RX J1648 appears to be in an early stage of formation; while it follows the scaling relations, its X-ray emission is highly elongated, and it lacks a central dominant BCG. Instead, RX J1648 contains a central string of seven bright galaxies, which have a smaller velocity dispersion, and have less star formation (lower EW([O III]) and EW(H β)) than other group members. The five brightest galaxies in this string should sink to the center and merge through dynamical friction. BCG consistent with a system of RX J1648's mass even if 5%-50% of the light is lost to an infalling filament.

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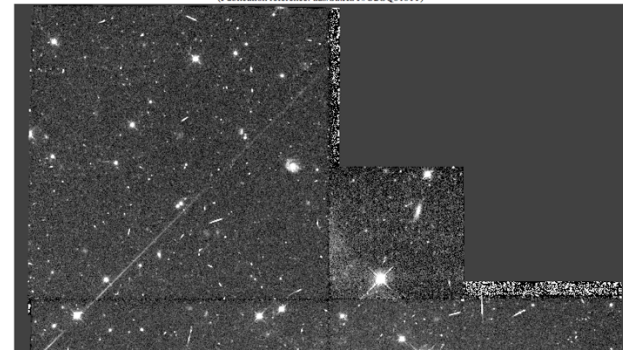
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Preview for U2OQ0101T

(Publication reference: adsSa.HST#U2OQ0101T)



SAO/NASA ADS Data Links
http://adsabs.harvard.edu/cgi-bin/nph-data_query?code=2008A...685..138J
aacomazzi@cfa.harvard.edu | my Account | Sign out

SAO/NASA ADS Abstract Service

Links for 2008ApJ...685..138J

European Southern Observatory
HST Proposal (ST-ECF)
Multimission Archive at STScI
MAST References (HST)

Resource at cda.harvard.edu
Chandra Data Archive Obsids 8472, 7903

SAO/NASA ADS Homepage | ADS Sitemap | Query For

Chandra Data Archive: Observation Viewer

http://cda.harvard.edu/chaser/dispatchOcatResults.do

Chandra X-ray Center New Search Retrieval List Help

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Observation ID: 7903

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Images
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Secondary
External links
Publications
Processing Status

Observation ID: 7903

For online support please contact the CXC Helpdesk.

http://cda.harvard.edu/chaser/viewerImageContents.do?imageType=hiresimg_jpg&obsid=7903

Problems

- Lots of effort required in tracking use of datasets in literature post-publication (curation)
- No standard way to refer to datasets in papers (nomenclature)
- No standard way to access the data (resolution)
- No guarantee of future access (persistence)

Curation

- In 2004, ApJ introduces the capability to reference datasets in manuscripts
- Tagging and verification of datasets during editorial process
- Goal: create links to data products in HTML version of manuscript
- Article-dataset correlation to be propagated back to data archives

Nomenclature

- In 2003, the IVOA adopts a draft for the syntax of IVOA Identifiers:

ivo://AuthorityID/ResourceKey

- In 2003, ADEC approves the definition of dataset identifiers:

ivo://ADS/FacilityId#PrivateId

- Properties: unique, permanent, resolvable
- Broad range of granularity
- Both Static and Dynamic Data product support

Nomenclature: Examples

ivo://ADS/Sa.CXO#obs/123

ivo://ADS/Sa.CXO#DefSet/ChandraDeepFieldN1

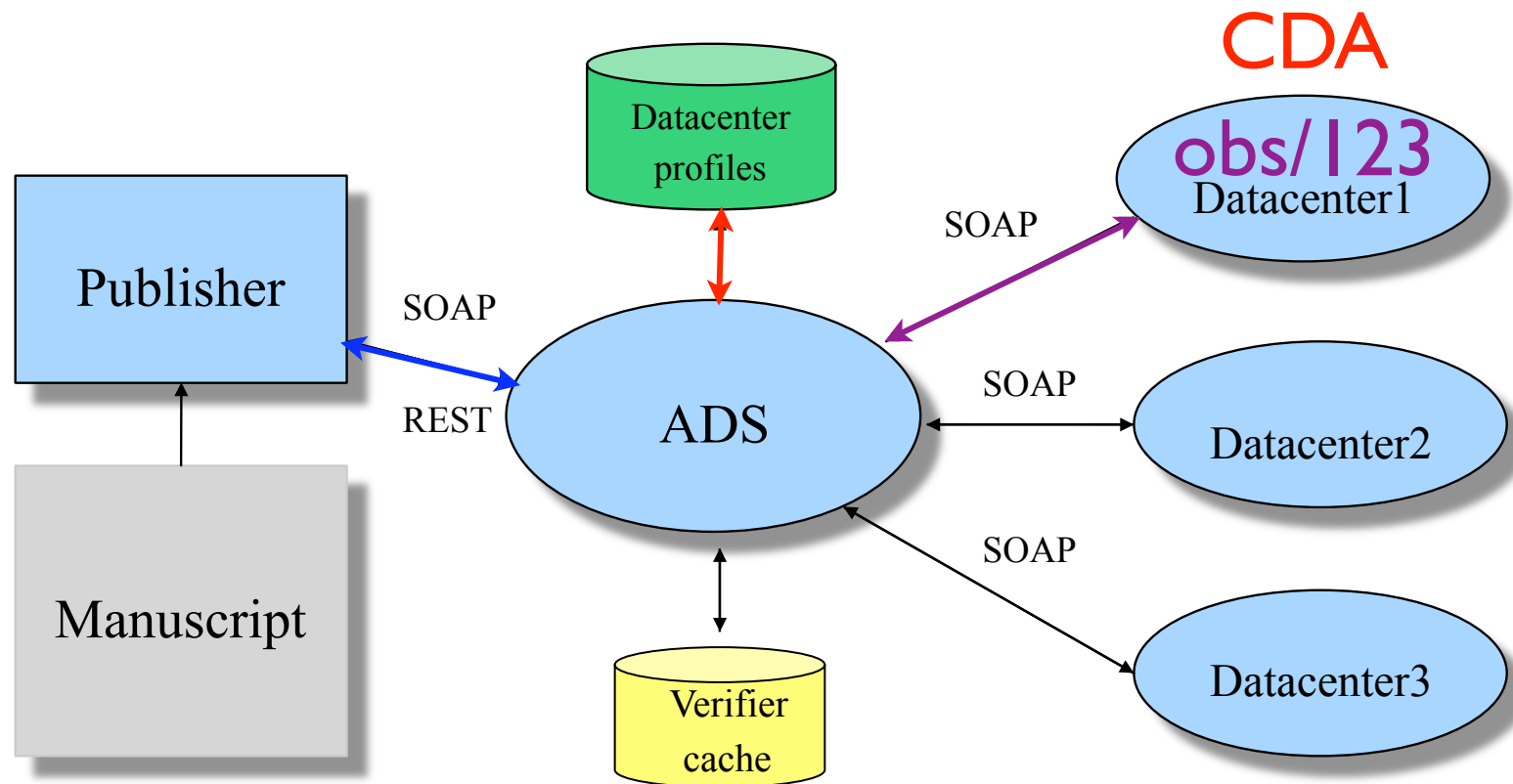
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Resolution & Persistence

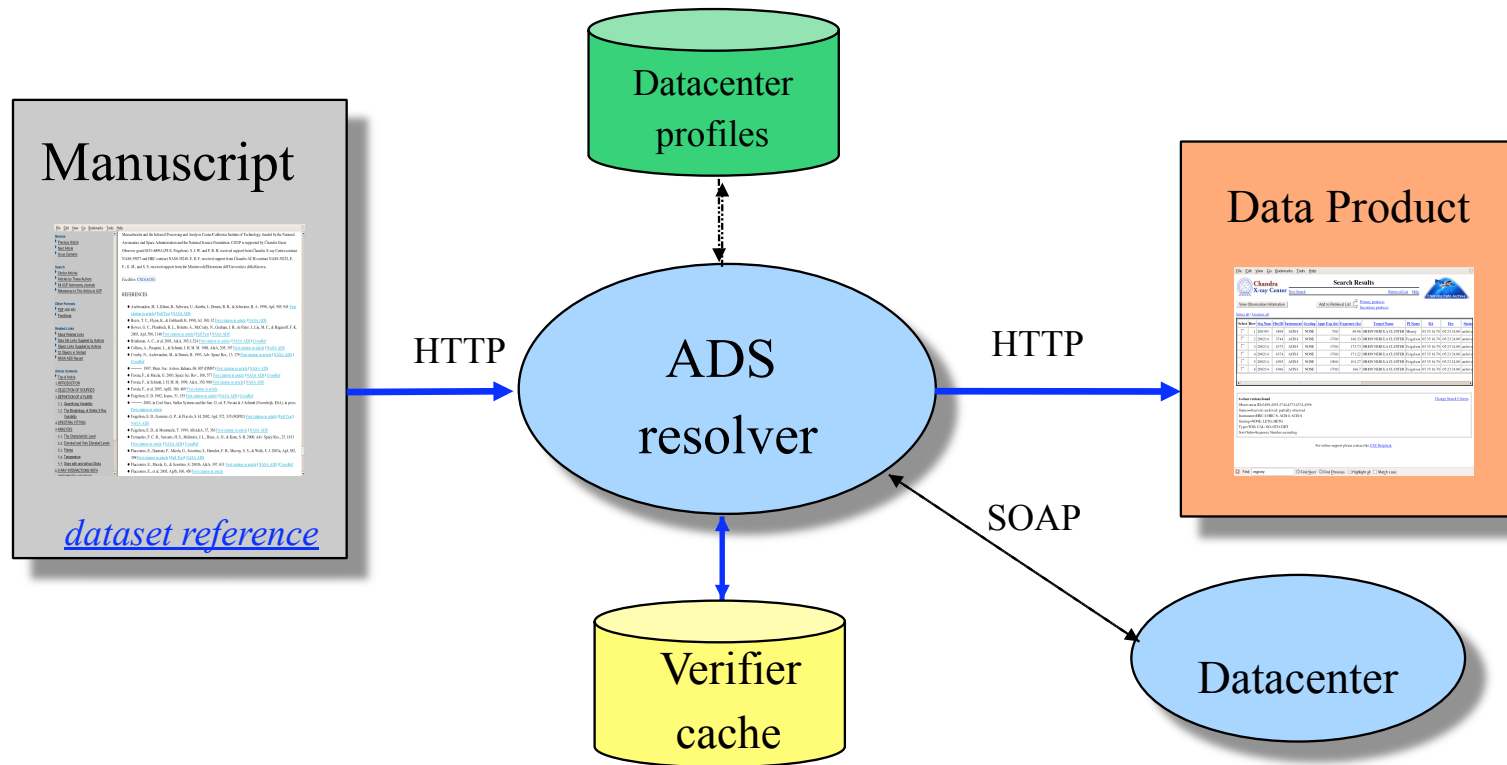
- ADS to act as the authority handling the resolution of a dataset ID on behalf of the community
- The FacilityID reflects the data archive or mission that generated the dataset (and whose location may change in time)
- The PrivateID is an opaque string which uniquely identifies the dataset within the FacilityID holdings

Implementation



ivo://ADS/Sa.CXO#obs/I23

Linking



Propagation of article-dataset links

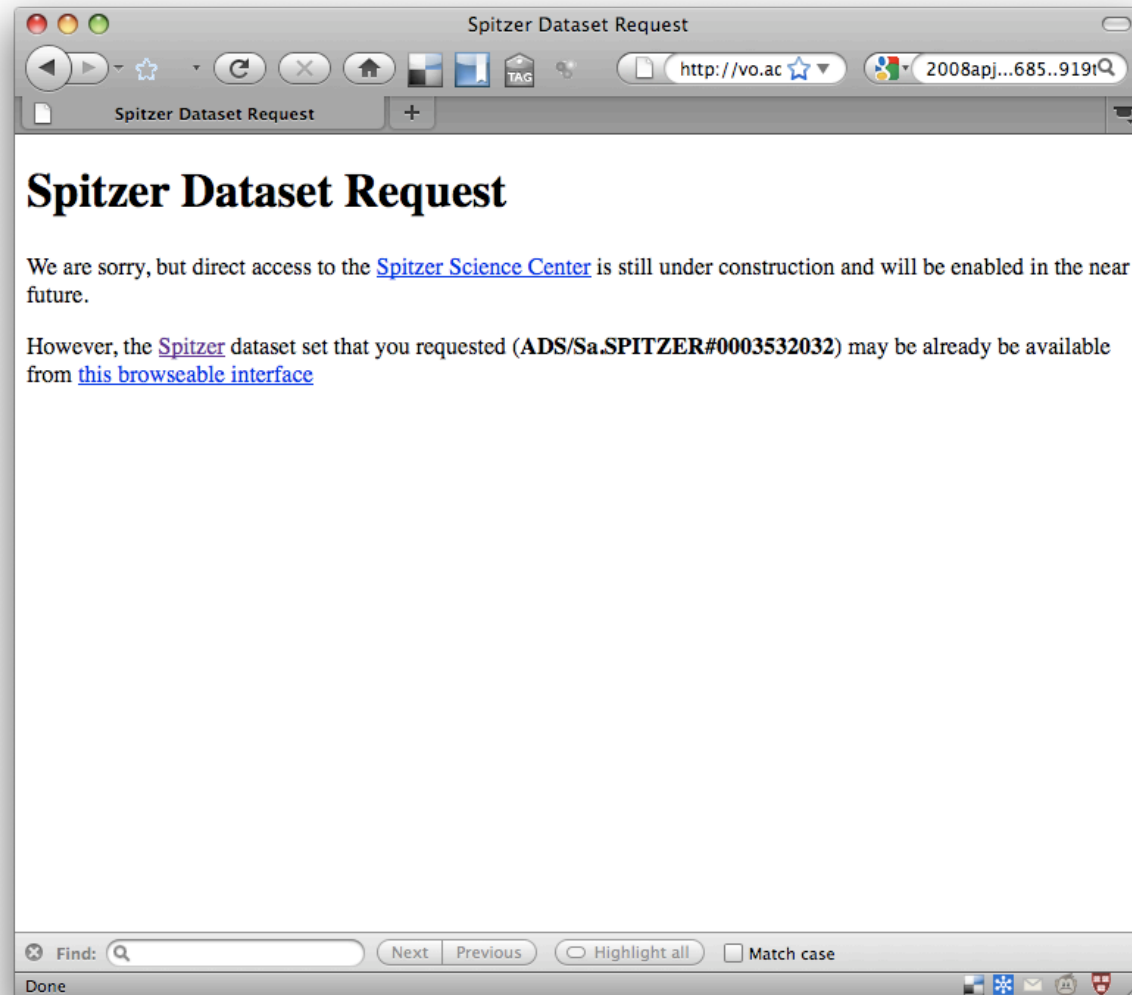
File Edit View Go Bookmarks Tools Help

Published Dataset Identifiers for Chandra Data Archive (at CfA/SAO) since
Thu Jan 1 00:00:00 1970 UTC

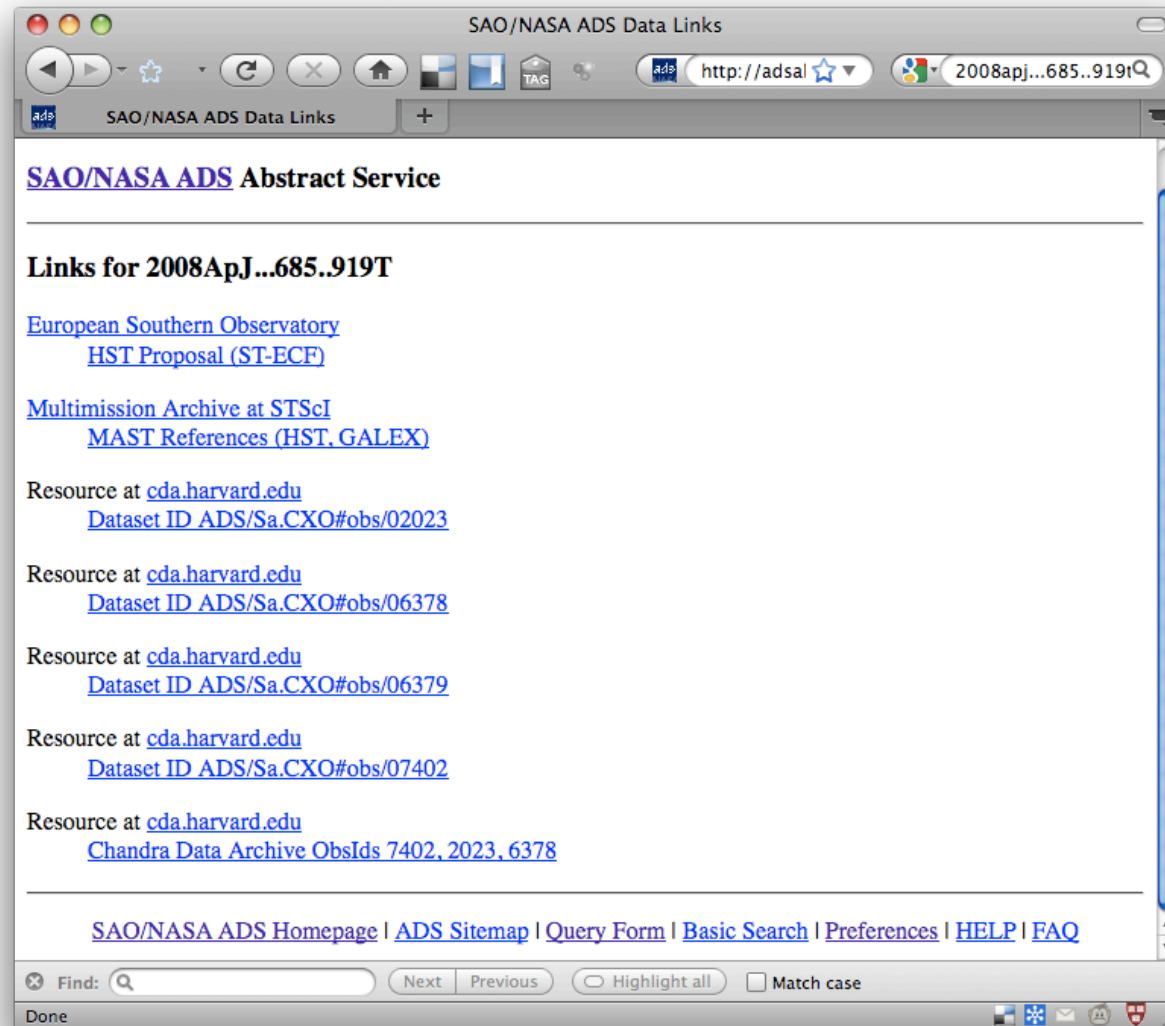
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Problem: lack of persistence

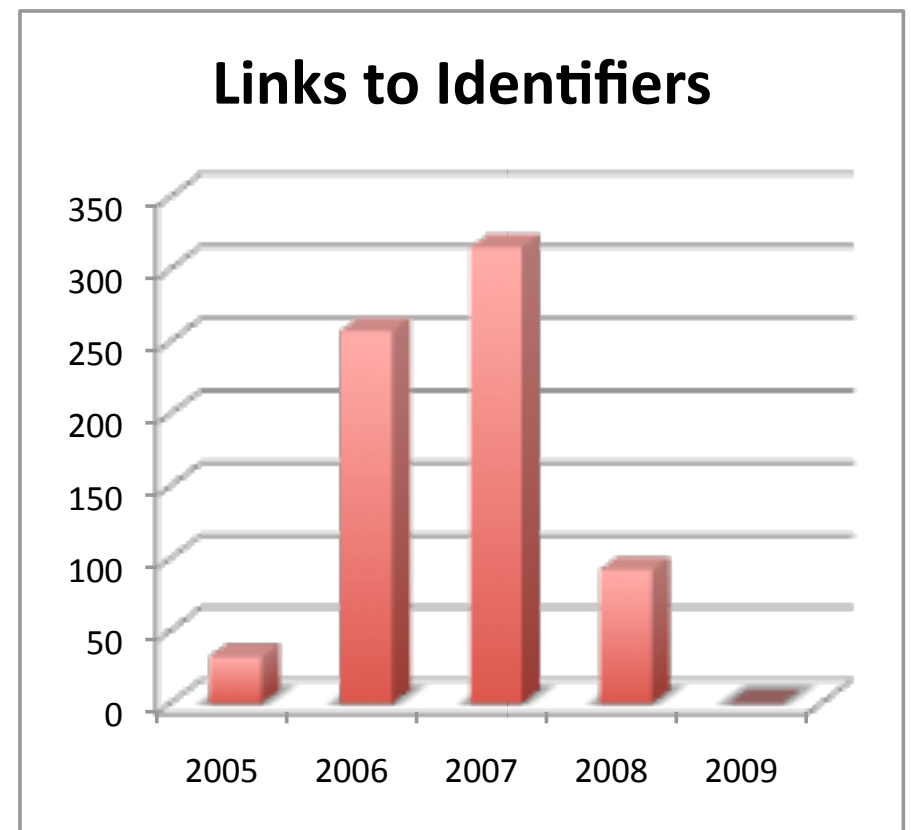


Problem: lack of uniqueness



Problem: lack of adoption

- only NASA centers participating
- only 5 active archives, down from 6 in 2005
- only AJ and ApJ
- only “ADS” identifiers



Lessons Learned

- Requires commitment from archives
- Requires effort from authors, editors
- Not enough community buy-in
- No enforcement “stick” for data centers
- No reward “carrot” for authors, editors
- No silver bullet for curators
- Many parties involved, many points of failure

A Way Forward

- Recast data linking in wider scope, the interlinking of digital assets in astronomy: articles, objects, datasets (R. Dave)
- Enable upload of high-level data products (plots, tables) to trusted, community-curated digital repository
- Provide infrastructure to enable minting of identifiers, exposing metadata, persistent link resolution
- Capture all identifiers and their inter-relationships during the peer review process
- Consider issues of branding, be realistic about goals

It's been done before...

- 1993: adoption of bibcodes by NED, SIMBAD, ADS
- 1993: ADS/SIMBAD search/linking established
- 1996: links from ApJ, data archives to ADS bibliographic records and vice-versa
- 1999: creation of CrossRef, DOI registration
- 2009: ApJ moves to IOP, the world does not end

Who needs to be involved

- Astrophysics Data Archives, IVOA members
- Learned societies and publishers
- Projects curating literature, catalogs, objects, datasets (ADS, NED, SIMBAD, VizieR, etc.)
- The NSF-funded DataNet program, the Data Conservancy

What works

- *archive* assets in a *trusted* repository, expose their metadata
- name them in a *simple* and *unique* way
- make it easy to *find* and *use* their metadata
- *require* that scientists properly *cite* them
- provide a simple way to *link* to them
- enforce *persistence* through *curation*, collaboration

Archiving

- Establish archive for user-contributed datasets and high-level processed data
- Mandate the uniform minting, resolution and consistent use of identifiers by all archives
- Deposit observational metadata in central curated registry to allow search and discovery, resolution and persistence of all digital assets

Keep it Simple

- Identification and naming:

ApJ, 685, 919

2008ApJ...685..919T

<http://adsabs.harvard.edu/abs/2008ApJ...685..919T>

10.1086/591019

<http://dx.doi.org/10.1086/591019>

- Finding and using metadata:

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Publishing

- Follow model for citations to other papers: if you have used it, cite it properly
- Does create more work for editors, staff...
- ... but brings added value to manuscripts ...
- ... and provides a testbed for infrastructure and workflow needed for integrating semantics in the publishing process

How to get there

- VAO Data Curation & Preservation workgroup to re-focus on data-literature links
- ADS, MSR project working on building semantic infrastructure for exposing and linking data, objects, and publications
- ADS & other projects (e.g. SIMBAD) to use text mining, metadata enrichment to “retrofit semantics” in existing literature

Help us!

- Commitment from multiple parties needed, result must be win-win-win...
- Technical requirements fairly simple, but difficult to do a good job on the cheap
- Stamp of approval from IVOA, US and European funding agencies important
- Engaging all partners early essential, requires long-term sustained commitment

