



Citing resources extracted from VO

G.Landais

What is citation ?



Citations in an article are the references list which credits the authors. A citation is not a footnote URL, an acknowledgment or any DOI string in the text. It ONLY refers to listing the reference in a reference list of an article. Citations use formats such as BibTeX or APA which include the basic DOI metadata. Many indexing services harvesting DOIs (from DataCite, Cross-Ref or other) extract metadata that they then format into web pages with sometimes in addition a citation service for the resources.

Citation

- Citation needs curation (title, authors, year...)
- The resource cited needs a PID, usually Bibcode or **DOI**
- Gives credits to authors

References or acknowledgement

Completes citation in footnotes or in the text

Citation policies



Cite data like article

Best Practices for Data publication in the Astronomical Literature

(DOI [10.3847/1538-4365/ac6268](https://doi.org/10.3847/1538-4365/ac6268))

Not in the authors habits yet !...

Curation expected

- Title, authors, year (, version)
- Softwares/APIs
- Publishers

Importance of the publisher

- Added curation
- Selection (columns, tables)
- Dedicated services (eg: TAP, HiPS...)

Eg: Gaia DR3 is available in ESA, CDS, Gavo

....



Chen et al.

3. *Provide full provenance of the data.* Ensure full reproducibility of the analysis performed in the paper by citing all data/sources/software used: explicitly list the data identifiers provided by the data center in a table or in the text. For example, if 2MASS data is used via TOPCAT accessing the VizieR table, then in addition to any preferred citations of the data itself, cite the software and compilation used, e.g., “2MASS (Skrutskie et al. 2006) as downloaded with TOPCAT (version 4.8–3, Taylor 2005) via VizieR (II/246, Cutri et al. 2003)”. It is also recommended to include the names of principal investigators who acquired the original data sets.

Citation policies in AAS journals

Citation Policies

Dataset Citations

The most critical element of data citation is the citation of the specific source of a dataset used in a new manuscript and the citation of that data's reference publication as required by the data creator's. By specific source of the data, we mean that if data is available from many sources, the one that must be cited is the one that was used to obtain the data. By reference publication, we mean that journal article (or other technical document) that describes the dataset used and is specified by the creators of a dataset as the preferred citation. We provide below a series of templates to highlight the various types of relationships that exist between reference publications and specific sources of data.

AAS Journal Table citation

The AAS Journals now provide [individual dataset DOIs and a dataset landing page](#) for articles with online-only content. In this citation example, an author is reusing the machine-readable table that has a dataset DOI in the published article. The resulting text gives attribution to the data creators by citing the reference publication (journal article) and gives precise information about the source of the data used, leading the reader directly to that data via the dataset citation.

“ We used CO (1-0) rovibrational line fluxes published by D. A. Dickson-Vandervelde et al. (2025a) in the original machine-readable format (D. A. Dickson-Vandervelde et al. 2025b, Table 2).

In LaTeX, using ADS bibcodes or dataset DOIs as reference keys

“ We used the catalog TESS-based short-period variables published by `\cite{2024AJ....168...83O}` as provided by VizieR `\citep{doi: 10.26093/cds/vizieer.51680083}`.

What to Cite/reference ?



- **Datasets**

- Use PID: **DOI**, Bibcode

"This research has made use of the VizieR catalogue access tool, CDS, Strasbourg, France \citep{10.26093/cds/vizier}. The original description of the VizieR service was published in \citet{vizier2000}."

- **Services**

- Use PID: DOI

Bibtex:

- **Softwares /API**

- use FOI,Ascl

```
@MISC{vizier,  
author = { Ochsenein F. et. al}  
title = "{ The VizieR database of astronomical catalogues }"  
doi = {10.26093/cds/vizier},  
}
```

- **Query**

- options:

VizieR citation in CDS pages

- A DOI by request (Canfar, VAMDC)

- Citing in the text

- eg: Best Practices for Data publication in the Astronomical Literature

- (DOI [10.3847/1538-4365/ac6268](https://doi.org/10.3847/1538-4365/ac6268))

- Software, publishers, ... + query ?

- **Objects or records** in a DataSet

“

```
\software{Astropy \citep{https://doi.org/10.1051/0004-6361/201322068,  
https://doi.org/10.3847/1538-3881/aabc4f,  
https://doi.org/10.3847/1538-4357/ac7c74},  
Matplotlib \citep{http://dx.doi.org/10.1109/MCSE.2007.55}}
```

AAS policy to cite softwares

How to retrieve the metadata ?



Citing Resources

- Ivoid is not citable

- Priviledge DOI

curl -LH "Accept: application/x-bibtex" https://doi.org/10.5270/esa-1ugzkg7

- In the publisher landing pages
- ADS/SciX
- In platforms such as EOSC

The screenshot shows a sidebar menu with the following items:

- FULL TEXT SOURCES
 - IOP
 - Preprint
- DATA PRODUCTS
 - SIMBAD (34) DATASOURCE (1)
 - CDS (1)
- RELATED MATERIALS (1)
 - Catalog: 2025yCat..51690045G

BibVO allows to add link to data (but not cite)

The screenshot shows a 'Cite' dialog box with the following metadata:

Type:	Dataset
Year:	2012-01-01
License:	
doi:	10.26093/cds/vizier.35490078
Hosted by:	Straasbourg Astronomical Data Center
URL:	https://dx.doi.org/10.26093/cds/vizier.35490078

Type:	Dataset
Year:	2012-01-01
License:	
Hosted by:	BDFIND
URL:	http://dx.doi.org/http://doi.org/10.26093/cds/vizier.35490078

The screenshot shows the SciX by ADS interface with a search filter set to 'Astrophysics' and navigation options like 'Tour', 'Feedback', 'ORCID', 'About', 'Help', and 'Account'.

The screenshot shows the VizieR Online Data Catalog interface. The search field contains 'vizier lamost'. The 'Export citation for VizieR Online Data Catalog: StarHorse data for 8 spectroscopic surveys (Queiroz+, 2023)' is selected. The 'Exporting record 1 to 1 (total: 1)' is shown. The 'Format' is set to 'BibTeX'. The 'Download to file' and 'Copy to Clipboard' buttons are visible. The citation text is:

```
@dataset(2023yCat..36730155O,  
author = {{Queiroz}, A.-B.-A.  
and {Anders}, F. and {Chiappini}, C.  
and {Khalatyan}, A. and {Santiago},  
B.-X. and {Wepal}, S. and  
{Steinmetz}, M. and {Gal'art}, C.  
and {Valentini}, M. and {Dal Ponte},  
M. and et al.},  
title = "{VizieR Online Data  
Catalog: StarHorse data for 8  
spectroscopic surveys (Queiroz+,  
2023)}",  
hostedIn = {VizieR On-Line Data  
Catalog: J/A+A/673/A155. Originally  
published in: 2023A&A...673A.155O},  
year = 2023,  
month = apr.,  
eid = {J/A+A/673/A155},
```

Extract citation metadata in the VO ?



Getting metadata to extract a citation in the VO

No direct way to propose citation, neither in IVOA web pages, nor in registries or API

- Registry
VOResource 1.2: it becomes possible to add alternate Identifier (DOI)
- DataOrigin (PEN note)

Populate good metadata with Good Practices

- DOI4Archive note
Focused on Archive/datasets and dedicated to publisher

```
[10]: print(f"Contact: {m31_dataorigin.query.contact}")

for origin in m31_dataorigin.origin:
    print(f"\nivoid: {origin.ivoid[0]}, citation={origin.citation[0]}\n")

    # Citation in APA style
    vo_elt = origin.get_votable_element()
    title = vo_elt.description if vo_elt else ""
    print(f"APA: {' '.join(origin.creator)} ({origin.publication_date[0]}).  
↵  
↵{title} [Dataset]. {m31_dataorigin.query.publisher}. {origin.citation[0]}")
```

Contact: cds-question@unistra.fr

ivoid: ivo://cds.vizier/j/aj/164/20, citation=doi:10.26093/cds/vizier.51640020

APA: Escala I. (2024-11-12). RGB radial velocities in M31 northeast shelf fields (Escala+, 2022) [Dataset]. CDS. doi:10.26093/cds/vizier.51640020



Best practices for the creation of and metadata for digital object identifiers in astronomy archives

Version 1.0

IVOA Note 2025-12-2r6

Interest Group
Data Curation and Preservation

This version
<https://www.ivoa.net/documents/DOI4Archives/2025122r6>

Latest version
<https://www.ivoa.net/documents/DOI4Archives>

Previous versions
This is a draft

Author(s)
August Muench, Gilles Landais, Raffaele D'Abrusco, Anne Catherine Raugh, Edwin Henneken, Baptiste Cecconi, Tim Jenness

DOI for archive (IVOA note)



DOI life-cycles wth report on good Practices

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Ivoid and DOI linking



- Use alternate identifier in both schema (DataCite and Registry)
- The DataCite IdentifierType is a free text (W3id or Purl would be better)

Example of an alternate identifier in a DataCite record using IVOID.

```
" identifiers ": [ {  
  " identifier ": "ivo://CDS.VizieR/j/mnras/320/451",  
  " identifierType ": "ivoid"}  
]
```

Example of DOI in a registry record:

```
< altIdentifier >doi:10.26093/cds/vizier.73200451</altIdentifier>
```

Naming objects



Naming objects in article

- Recommended to use name approved by UAI.
<https://cds.unistra.fr/cgi-bin/Dic-Simbad>
- How to specify the column in a table ? (UCD?)

Linking a record

- No recommendations today (meta.id;meta.main ? meta.record ?)

3. *Verify the name is unique.* The key to object designations is that each one must be unique when compared to objects identified at other observatories and wavelengths, especially within the same article. When creating new acronyms, please consult the IAU Dictionary of Nomenclature of Celestial Objects as noted in Section 2.1.1 to avoid reusing existing ones.



Full	_cite	objID	RA_ICRS deg	e arcsec	DE_ICRS deg	e arcsec	mode	q	cl	SDSS9	m	Im	SDSS-ID	Sp- ID	SpObjID	parentID
<u>1</u>	SDSS9 J030205.08+003428.9	<u>1237660241385423481</u>	045.521195	0.011	+00.574720	0.009	1	+	6	J030205.08+003428.9		Im	3438-301-5-0103-0633		0	<u>1237660241385423480</u>
<u>2</u>	SDSS9 J030205.08+003428.9	<u>1237659756074369349</u>	045.521195	0.009	+00.574704	0.008	2		6	J030205.08+003428.9	*	Im	3325-301-5-0412-0325		0	<u>1237659756074369348</u>

Conclusion



- Metadata exists in DOI and in IVOA to make clean citation (registry)
- Work to improve metadata:
DOI Best practice for data publisher in works
- **Citing ivoa is unnatural for a network invisible for users**
standards, ivoid and endpoint URL are not expected in articles
- **How to help authors/users/DataCenter or software dev ?**
 - Citation capabilities?
 - Recommendation for authors in IVOA web pages (acknowledgment) ?