

Bibliographic Databases

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Bibliographic Databases in Support of NSDD Evaluations

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1. Introduction

Bibliographic databases useful to nuclear structure and decay data (NSDD) evaluators are briefly described, along with examples of their usage. Authors' reference listings and other resources are also discussed. Nuclear Science References is the major bibliographic resource, and, therefore, most of the presentation is devoted to this database.

2. Nuclear Science References

Nuclear Science References (NSR) is the primary bibliographic resource for NSDD evaluators. Originally known as Nuclear Structure References; the name was changed in 1995 to reflect the extended coverage. The primary scanning effort is concentrated at the National Nuclear Data Center (NNDC), with some contributions from Russian groups that cover conferences and laboratory reports. As of 2006, personnel at the IAEA nuclear data section are preparing keywords for some European journals on a trial basis.

Over 80 journals are regularly scanned,¹. Several journals devoted completely to nuclear physics (*e.g.*, European Journal of Physics A, Nuclear Physics A, and Physical Review C) are completely indexed in NSR. Relevant information from laboratory reports, conference proceedings, theses, *etc.* is also indexed. NSR is a reference-oriented bibliography; *i.e.*, each entry represents one article. There are over 180000 entries with about 4500 added yearly. The database is considered "complete" for primary nuclear structure references (articles published in refereed journals) since 1967, and has references dating back to 1910.

HTML-formatted retrievals have links to other sources:

1. Evaluated Nuclear Structure Data File (ENSDF)
235 as of January 27, 2006
2. Experimental Unevaluated Nuclear Data Library (XUNDL)
1396 as of January 27, 2006
3. Journal abstract pages by means of Digital Object Identifiers (doi)
88033 as of January 27, 2006

The master NSR database is updated as entries are added or modified, and the NNDC Web site is updated approximately weekly. Weekly updates are sent to the IAEA Nuclear Data Section. NSDD evaluation centers receive mass-chain-specific updates and monthly updates in the exchange format are also sent to groups such as the Isotopes Project at LBNL, PNPI, and Sarov.

¹ See <http://www.nndc.bnl.gov/nsr/journals.html> for a list of these journals.

There are many ways to use NSR (*e.g.*, text searches of titles and keyword abstracts). The following six examples are relevant to ENSDF evaluations.

Example 1: Starting a New Mass Chain Evaluation²

When starting a new mass chain evaluation one should check NSR for entries added since the cut-off date of the previous evaluation, using the **Indexed search** option.

NSR Indexed Search

[[NSR Home](#)] [[Indexed Search](#)] [[Text Search](#)] [[Keynumber Search](#)] [[Help](#)]

Initialization Parameters:

Publication year range: 1910 to 2004
 Primary only: Require measured quantity:
 Output year order: Descending
 Output format: Normal
 Search all entries Search entries added since 6 / 19 / 1995 (month/day/year)

Search parameters

Search Reset

Nuclide A=45 browse...

AND
 (none) browse...

AND
 (none) browse...

Search Reset

Instructions: Choose a category from the drop-down boxes on the left, and type in a value to search for on the right. The "Browse" buttons can be used to list allowed values. For more information, see the [help page](#).

[[NSR Home](#)] [[Indexed Search](#)] [[Text Search](#)] [[Keynumber Search](#)] [[Help](#)]

1. Uncheck Primary only.³
2. Selection of descending Output year order should list published references before earlier related preliminary results.
3. Select Search entries added since, and use the ENSDF cut-off date for the mass chain as the criteria.
4. Select Nuclide and specify the mass as A=mmm to obtain all entries for nuclides with mass aaa.

² There is also a simplified interface that evaluators may use. See Example 6.

³ A primary reference is an article published in a refereed journal and is indicated by the last two characters of a keynumber being numeric. The last two characters being alphabetic indicate secondary references.

The resultant retrieval will look like:

NSR Query Results

Publication year range : 1910 to 2004
 Primary and secondary references.
 Search entries added since 6/19/1995.

Output year order : Descending
 Format : Normal

NSR database version of Apr 30, 2004.

Indexed quantity search: Nuclide=A=45

Found 133 matches. Showing 1 to 100. [\[Next\]](#)

[Back to query form](#)

2004AG02

Phys.Rev. C 69, 034602 (2004)
 M.Aggarwal

Hot rotating fp shell nuclei near proton drip

NUCLEAR STRUCTURE $^{44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60}\text{Fe}$; calculated proton separation energies, level density and deformation parameters vs temperature. $^{46,50,54,58}\text{Fe}$; calculated rotational bands energy vs spin, related features. Determination of particle stability discussed.

doi: [10.1103/PhysRevC.69.034602](https://doi.org/10.1103/PhysRevC.69.034602)

2004BE20

One should probably not select **Require measured quantity** in this initial survey, since you will want to check for relevant compilations and evaluations.

The retrieval should also be repeated by selecting A [range] instead of Nuclide and specifying the mass of interest. Such an approach is necessary to obtain NSR entries where the number of nuclides is too numerous to list, and again is useful to check for relevant compilations and evaluations. The two retrievals may be combined using a Boolean OR.

View and Combine NSR Retrievals - Netscape

File Edit View Go Bookmarks Tools Window Help

http://www.nndc.bnl.gov/nsr/comb_form.js Search

View and Combine NSR Retrievals

View and Combine Previous Retrievals

[[NSR Home](#)] [[Indexed Search](#)] [[Text Search](#)] [[Keynumber Search](#)] [[Combine/View Lists](#)] [[Help](#)]

Combine lists:

2 OR 3 Combine

Output format: Normal Output year order: Descending

Current lists:

List #	Search/Initialization strings	Number found	
1	Indexed quantity search: Nuclide=A=45 YLO:1910; YHI:2004; PRIM:no; EXPR:no; Cutoff:None	860	View
2	Indexed quantity search: Nuclide=A=45 YLO:1910; YHI:2004; PRIM:no; EXPR:no; Cutoff:6/19/1995	133	View
3	Indexed quantity search: A(range)=45 YLO:1910; YHI:2004; PRIM:no; EXPR:no; Cutoff:6/19/1995	201	View

[Clear Lists](#)

[[NSR Home](#)] [[Indexed Search](#)] [[Text Search](#)] [[Keynumber Search](#)] [[Combine/View Lists](#)] [[Help](#)]

Done

Example 2: Starting an Evaluation of a Nuclide⁴

The first step in starting an evaluation of a nuclide is similar to that for a mass chain. Instead of specifying A=mmm for the nuclide, define the nuclide. Also, the ENSDF cut-off date for the nuclide should be used.

NSR Indexed Search

[[NSR Home](#)] [[Indexed Search](#)] [[Text Search](#)] [[Keynumber Search](#)] [[Help](#)]

Initialization Parameters:

Publication year range: 1910 to 2004
 Primary only: Require measured quantity:
 Output year order: Descending
 Output format: Normal
 Search all entries Search entries added since 6 / 19 / 1995 (month/day/year)

Search parameters

Search Reset

Nuclide 45Sc browse...
 AND
 (none) browse...
 AND
 (none) browse...

Search Reset

Instructions: Choose a category from the drop-down boxes on the left, and type in a value to search for on the right. The "Browse" buttons can be used to list allowed values. For more information, see the [help page](#).

[[NSR Home](#)] [[Indexed Search](#)] [[Text Search](#)] [[Keynumber Search](#)] [[Help](#)]

- 1 May also be useful to undertake retrievals for A [range]⁵ and Z [range]⁵ and use a Boolean OR.

⁴ The simplified interface illustrated in Example 6 may also be used.

⁵ Note that the atomic number and not the chemical symbol is required for this option.

View and Combine NSR Retrievals - Netscape

File Edit View Go Bookmarks Tools Window Help

http://www.nndc.bnl.gov/nsr/comb_form.js Search

View and Combine NSR Retrievals

View and Combine Previous Retrievals

[\[NSR Home\]](#) [\[Indexed Search\]](#) [\[Text Search\]](#) [\[Keynumber Search\]](#) [\[Combine/View Lists\]](#) [\[Help\]](#)

Combine lists:

4 OR 5 Combine

Output format: Normal Output year order: Descending

Current lists:

List #	Search/Initialization strings	Number found	
1	Indexed quantity search: Nuclide=45Sc YLO:1910; YHI:2004; PRIM:no; EXPR:no; Cutoff:6/19/1995	38	View
2	Indexed quantity search: Z(range)=Sc YLO:1910; YHI:2004; PRIM:no; EXPR:no; Cutoff:6/19/1995	0	View
3	Indexed quantity search: Z(range)=21 YLO:1910; YHI:2004; PRIM:no; EXPR:no; Cutoff:6/19/1995	128	View
4	Indexed quantity search: A(range)=45 YLO:1910; YHI:2004; PRIM:no; EXPR:no; Cutoff:6/19/1995	201	View
5	List combine: 1 OR 3	166	View

[Clear Lists](#) [Hide Empty Lists](#)

[\[NSR Home\]](#) [\[Indexed Search\]](#) [\[Text Search\]](#) [\[Keynumber Search\]](#) [\[Combine/View Lists\]](#) [\[Help\]](#)

Example 3: As an Aid in Reviewing an ENSDF Evaluation

NSR may also aid the referee in checking for the completeness of an evaluation under review. Using the new cut-off date and the cut-off date of the previous evaluation and a Boolean NOT operation can be adopted to achieve this objective.

View and Combine Previous Retrievals

[\[NSR Home\]](#) [\[Indexed Search\]](#) [\[Text Search\]](#) [\[Keynumber Search\]](#) [\[Combine/View Lists\]](#) [\[Help\]](#)

Combine lists:

1 2

Output format: Output year order:

Current lists:

List #	Search/Initialization strings	Number found	
1	Indexed quantity search: Nuclide=A=45 YLO:1910; YHI:2004; PRIM:no; EXPR:no; Cutoff:6/19/1995	133	<input type="button" value="View"/>
2	Indexed quantity search: Nuclide=A=45 YLO:1910; YHI:2004; PRIM:no; EXPR:no; Cutoff:1/1/2004	10	<input type="button" value="View"/>
3	List combine: 1 AND NOT 2	123	<input type="button" value="View"/>

[\[NSR Home\]](#) [\[Indexed Search\]](#) [\[Text Search\]](#) [\[Keynumber Search\]](#) [\[Combine/View Lists\]](#) [\[Help\]](#)

Again, one should check for relevant compilations and evaluations.

Example 4: Searches by Publication Year and First Author

There may be instances when an evaluator finds a reference that does not seem to appear in NSR. This observation may occur if there is an error in NSR or if Selectors could not be generated for the NSR entry, and can be checked by means of the **Indexed search** option.

NSR Indexed Search

[[NSR Home](#)] [[Indexed Search](#)] [[Text Search](#)] [[Keynumber Search](#)] [[Help](#)]

Initialization Parameters:

Publication year range: 2003 to 2003

Primary only: Require measured quantity:

Output year order: Ascending

Output format: Normal

Search all entries Search entries added since 5 / 7 / 2004 (month/day/year)

Search parameters

Search Reset

FirstAuthor Audi browse...

AND (none) browse...

AND (none) browse...

Search Reset

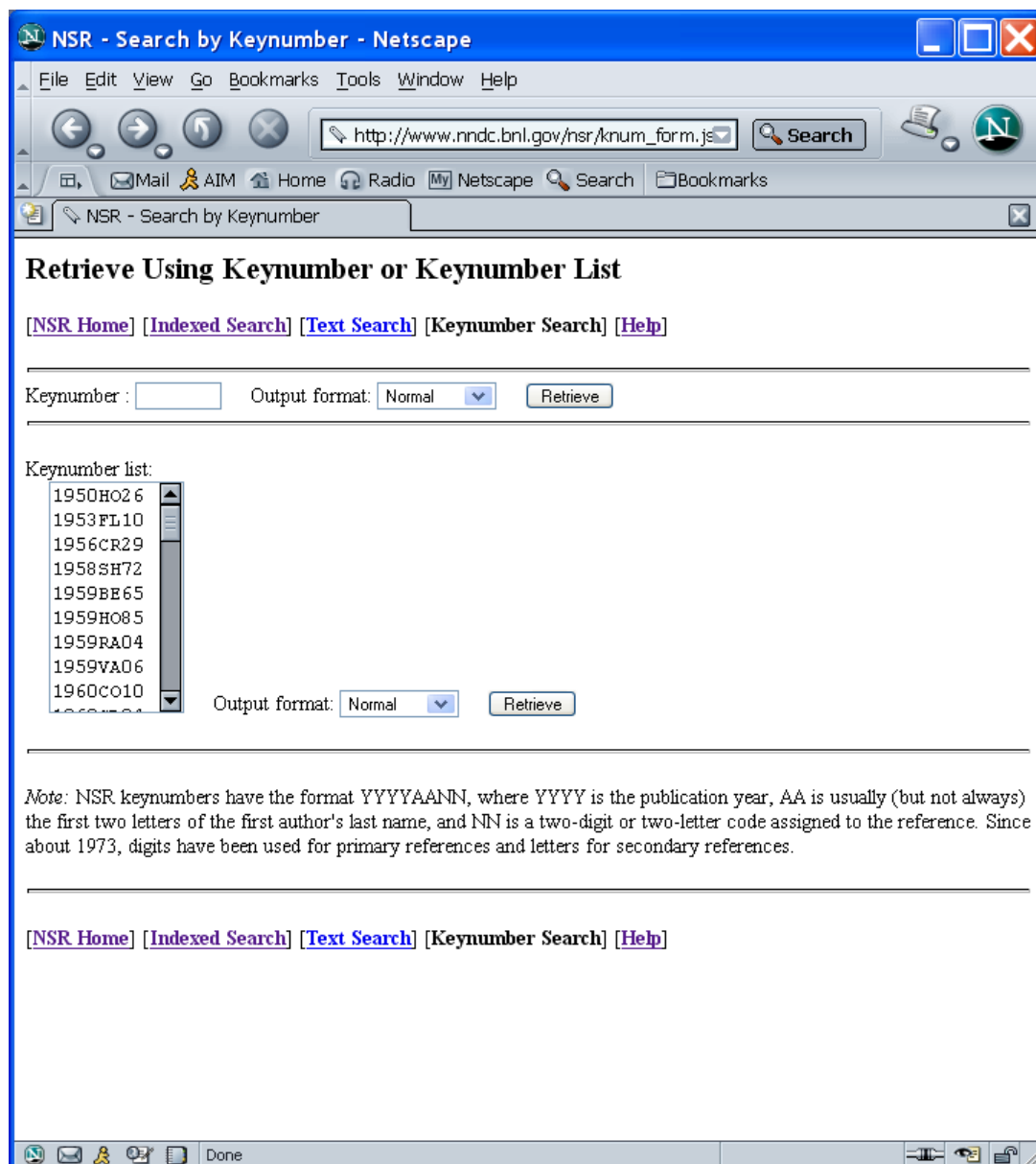
Instructions: Choose a category from the drop-down boxes on the left, and type in a value to search for on the right. The "Browse" buttons can be used to list allowed values. For more information, see the [help page](#).

[[NSR Home](#)] [[Indexed Search](#)] [[Text Search](#)] [[Keynumber Search](#)] [[Help](#)]

1. Specify the publication year range.
2. Deselect primary only.
3. Select **FirstAuthor**, and specify the last name of the first author.

Example 5: Checking Keynumber Lists

It is useful to check the keynumbers in an ENSDF evaluation prior to submission to the NNDC for typographical errors. Use the keynumber list generated by the ENSDAT (*E*valuated *N*uclear *S*tructure *D*rawings and *T*ables) program and the **Keynumber search** option of NSR.



1. Copy the keynumber file generated by ENSDAT to the clipboard.
2. Paste into the Keynumber list.
3. Check the results for missing entries or entries that have no relationship to your evaluation.

Example 6: Using Nuclear Science References (NSR) for Evaluators

NSR for Evaluators provides a simplified interface that may be used by ENSDF evaluators. A major advantage of this interface is that there is no restriction on the number of NSR entries that may be retrieved and will always retrieve both primary and secondary references. The following example shows how it might be used when beginning an ENSDF evaluation.

Nuclear Science References (NSR) for Evaluators

NSR for Evaluators provides a simplified interface to NSR with an ASCII text output that has no restrictions as to the number of NSR entries retrieved. For the full NSR interface, please go to <http://www.nndc.bnl.gov/nsr/>.

Nuclide: Enter a nuclide in the form AAAZZ where AAA is the atomic mass and ZZ is the chemical symbol (Use the last two digits of the atomic number for Z>110), "Z=" followed by the atomic number, or "A=" followed by the atomic mass.
Examples: 45SC, 235U, 239PU, 28011, Z=20, or A=100.

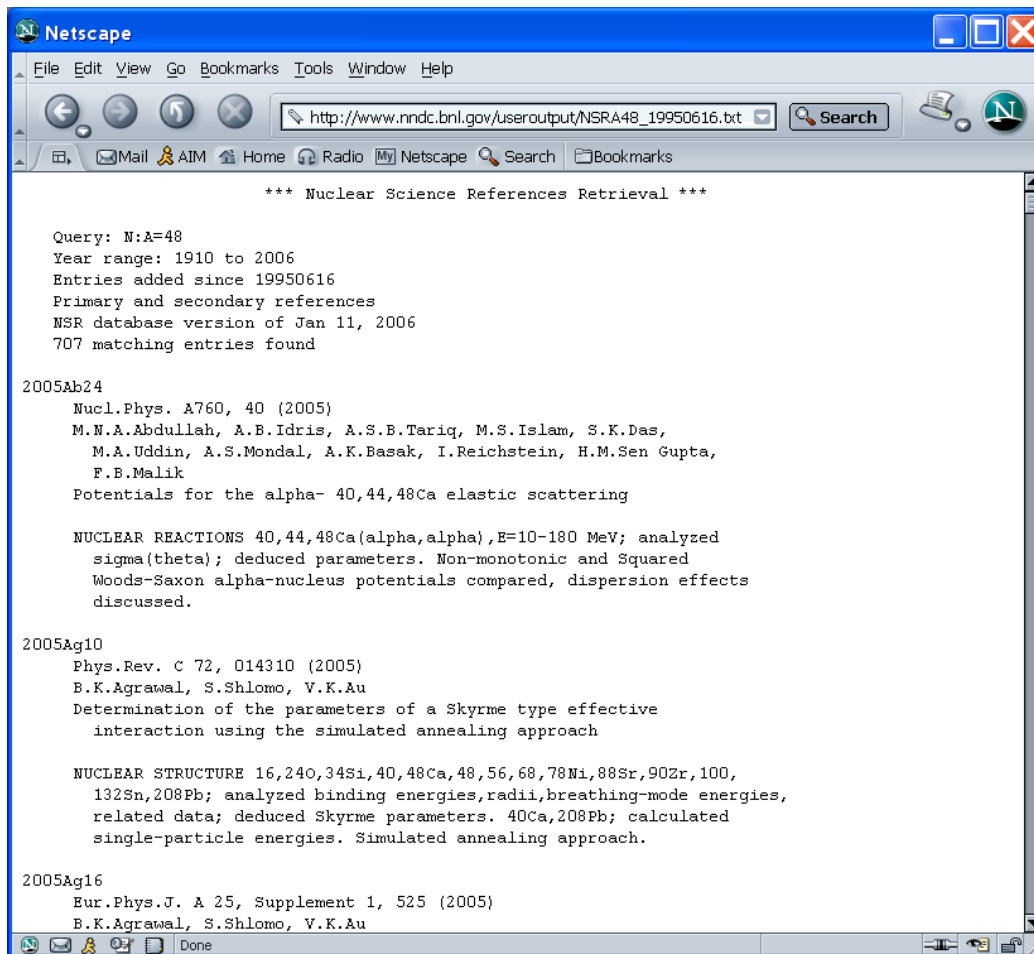
Search entries added since: * * * Year and month must be specified.

Output year order:

To: [NSDD Evaluators' Corner](#)
[Nuclear Science References](#)

Database Manager: David Winchell, NNDC, Brookhaven National Laboratory (nsr@bnl.gov)
Web and Programming: Thomas W. Burrows (nndctb@bnl.gov) and David Winchell (nsr@bnl.gov), NNDC, Brookhaven National Laboratory
Data Source: NSR is compiled at the National Nuclear Data Center (http://www.nndc.bnl.gov/)

1. Enter "A=" followed by the atomic mass
2. Enter the cutoff date of the last evaluation for **Search entries added since:**
3. Leave the default **Output year order:**



1. Note that 707 entries were found. This would require eight retrievals through the regular interface.
2. If this file is downloaded, it is easy to edit and may be used to keep track of one's decisions or actions on each article.

When using NSR as an NSDD evaluator, there are three points worth noting:

1. If you encounter a possible error in an NSR entry, please check the entry using the exchange format option that allows one to see the Selectors that have been generated from the keyword abstract. If this appears to confirm the problem, report your findings to Dave Winchell at Winchell@bnl.gov or nsr@bnl.gov.
2. All references cited in an ENSDF evaluation should have a keynumber assignment. If you encounter a reference which does not appear to be indexed in NSR, please note the following:
 - a. Check NSR using first author and publication year.
 - b. If it is a relatively recent secondary reference (*e.g.*, a private communication or preprint), may be useful to wait.
 - c. Except for major journals and conference proceedings, a copy of the reference is required for a keynumber assignment. For theses, this would be complete bibliographic information and the pages of text relevant to your evaluation. Conferences require complete bibliographic information and the article. Authors' names, file creation/modification and download dates, and hard copy or the files are required for data downloaded from the Internet.
 - d. Within your ENSDF evaluation use a "dummy" keynumber such as 2006BUAA. Start the sequences with "AA" and work down to avoid confusion with key numbers for secondary sources in NSR, which start with "ZZ" and work up.
 - e. Send the information to Jag Tuli (NNDC, BNL) with your submittal or update of an ENSDF evaluation along with the "dummy" keynumbers assigned.
3. If you have access to obscure laboratory reports, limited distribution conference proceedings, *etc.*, send a copy to the NNDC for inclusion in its library and scanning into NSR.

3. Authors' Reference Lists

The bibliography of an article should always be checked for relevant references that are not in NSR. These include private communications, preprints, obscure journal articles, conferences, laboratory reports, theses, and URLs. Particular care should be taken when using some of these sources, particularly Web-based information and data. Any discrepancies between the supporting data on a Web site and the published article should be resolved with the authors. Also, since the Web is somewhat ephemeral in nature, the data should be saved locally along with sufficient information to identify such material (authors and file creation, modification, and download dates).

3. Other Resources

3.a Web search engines

Web search engines such as Google seem to be of limited use at present for nuclear structure and decay data evaluators. They are primarily limited to what is available on the Web and, while major journal pages are indexed, it appears that the journal abstracts contained on the journal site are not. This may change in the future with plans by some of them to scan the contents of various libraries. However, even then there may be some difficulties in properly parsing and indexing the contents of nuclear physics articles.

3.b Online Databases

Online databases such as ISI Web of Knowledge or SPIN Web can be very useful in tracking down obscure references which may not have been indexed in NSR, although some care is needed in constructing the searches. A disadvantage of some of these is their expense.