

# *Recent Developments in NNDC Web Service*

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# NNDC Web Portal



## National Nuclear Data Center

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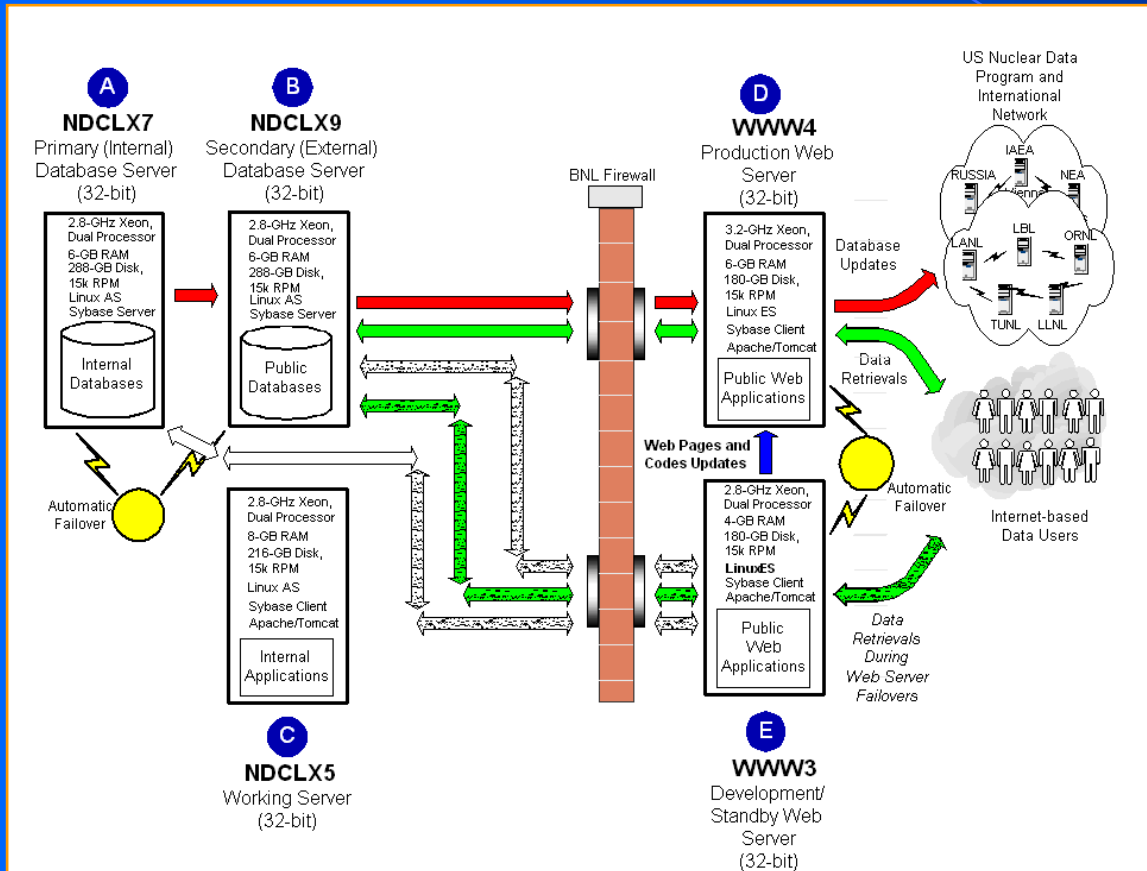
<p><b>AMDC</b> Atomic Mass Data Center, <b>Q-value Calculator</b></p>	<p><b>CapGam</b> Thermal Neutron Capture <math>\gamma</math>-rays</p>	<p><b>CINDA</b> Computer Index of Nuclear (reaction) Data</p>	<p><b>CSEWG</b> Cross Section Evaluation Working Group</p>
<p><b>CSISRS</b> <i>alias EXFOR</i> Nuclear reaction experimental data</p>	<p><b>Empire</b> Nuclear reaction model code</p>	<p><b>ENDF</b> Evaluated Nuclear (reaction) Data File</p>	<p><b>ENSDF</b> Evaluated Nuclear Structure Data File</p>
<p><b>For NMMSS &amp; DoE NMIRDC</b> safeguards &amp; inventory decay data standards</p>	<p><b>IRDF</b> International Reactor Dosimetry File</p>	<p><b>MIRD</b> Medical Internal Radiation Dose</p>	<p><b>NSR</b> Nuclear Science References</p>
<p><b>Nuclear Data Sheets</b> Nuclear structure and decay data journal</p>	<p><b>Nuclear Wallet Cards</b> Ground and isomeric states properties</p>	<p><b>Nuclear Wallet Cards for Homeland Security</b></p>	<p><b>NuDat</b> Nuclear structure and decay data</p>
<p><b>RIPL</b> Reference Input Parameter Library</p>	<p><b>USNDP</b> U.S. Nuclear Data Program</p>	<p><b>XUNDL</b> Experimental Un-evaluated Nuclear Data List</p>	<p style="color: red; font-weight: bold;">Coming March 2006: <b>Atlas of Neutron Resonances</b></p>

# ***FY2005 Highlights***

Nuclear Data Portal was launched on April 19, 2004. In FY2005 the following improvements were made:

- Web server was migrated from Tomcat 4 to Tomcat 5
- Improved Web Interfaces for ENSDF/XUNDL, NSR, NuDat
- New features for ENDF and EXFOR/CSISRS databases
- New applications development: Empire 2.19, QCalc, Nuclear Wallet Cards 2005, ...
- New template for NNDC Web pages
- Use of new technologies such as Macromedia Flash
- Contact Us Option
- Positive user response 777,686 data retrievals, 62.5% increase compare to FY2004

# Post-Migration Project Status



To satisfy cyber security needs Tomcat Web server was upgraded from version 4 to 5.

More details will be presented in the next talk by R. Arcilla.

# Improved Web Interfaces

## JavaScript Technologies in NuDat

### NuDat 2.1

NuDat allows to search and plot nuclear structure and nuclear decay data interactively. [More...](#)

Search Options:

#### Levels and Gammas

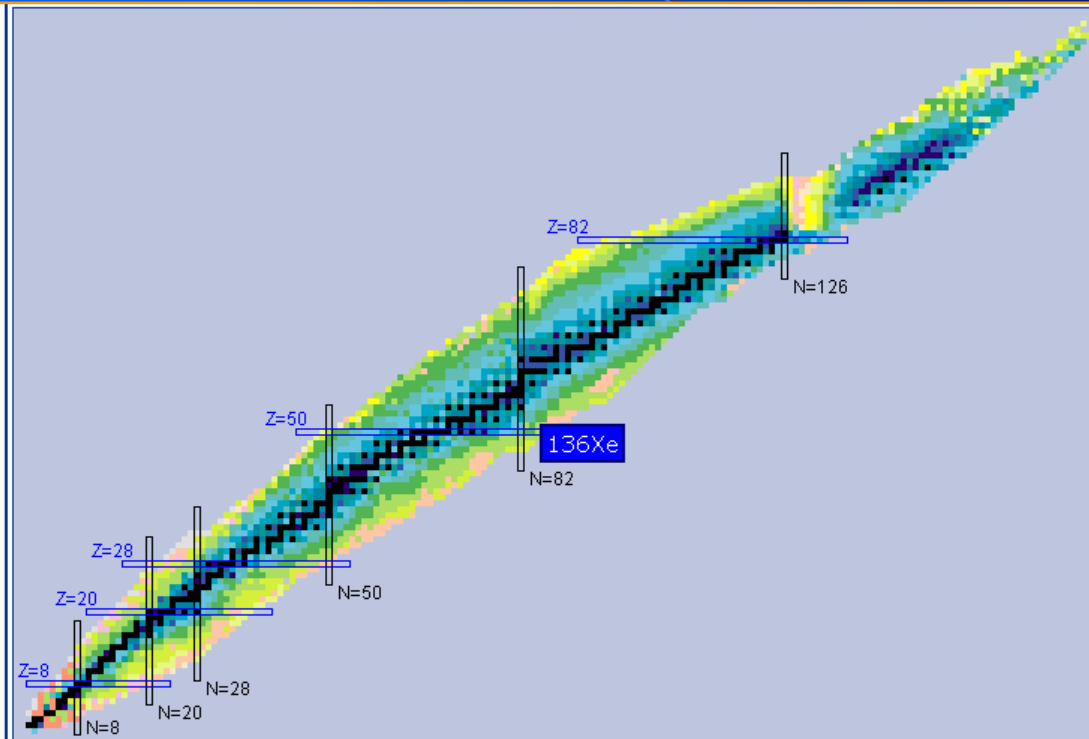
Search on ground and excited states level properties (energy, half-life, spin and parity, decay modes) and gamma-ray information (energy, branching ratio, multipolarity )

#### Nuclear Wallet Cards

Search on ground and isomeric states level properties, neutron resonance parameters and thermal cross sections

#### Decay Radiation

Search on radiation type, energy, intensity and dose following nuclear decay



Ground and isomeric state information for  $^{136}_{54}\text{Xe}$

E(level) (MeV)	J $\pi$	$\Delta$ (MeV)	T $_{1/2}$	Abundance	Decay Modes
0.0	0+	-86.4251	> 2.4E+21 y	8.857% 33	2 $\beta^-$

A list of levels and a level scheme are available

# New Features for EXFOR/CSISRS



## Direct links to Journals & Tabulated Format

Request #4715  
EXFOR Data Search... SQL... Reading...  
Results: Reactions: 8 Datasets: 144 Output...

**Data Selection**

Submit Reset

Data for Output:  Selected  Unselected  All

Output Formats:  EXFOR  Bibliography  Plot

Computational Output: 1) TAB  2) C4  +plot

Narrow Energy (optional), eV: Min:  Max:

n	Year	Author-1	Energy range, eV	Points
<input checked="" type="radio"/> 1		13-AL-27 (N, TOT) ,, SIG		
Quantity: [CS] Cross section				
<input type="checkbox"/> 1	1994	G.Rohr+	2.50e+5 2.00e+7	49709 C
<input type="checkbox"/> 2	1993	R.W.Finlay+	5.29e+6 6.00e+8	474 J
<input type="checkbox"/> 3	1991	J.R.Morales+	1.76e+7 1.98e+7	2 J
<input type="checkbox"/> 4	1990	L.Koester+	1.97e+3 1.97e+3	1 J
<input type="checkbox"/> 5	1988	J.Franz+	1.60e+8 5.75e+8	22 J
<input type="checkbox"/> 6	1984	H.Ohkubo	9.84e+3 9.35e+5	1010 W
<input type="checkbox"/> 7			7.12e+2 7.88e+4	927
<input type="checkbox"/> 8	1983	M.S.Gordon+	2.50e+7 4.50e+7	0 P
<input type="checkbox"/> 9	1981	V.E.Zhitarev+	2.05e-1 4.84e-1	8 J
<input type="checkbox"/> 10	1980	D.C.Larson+	2.00e+6 8.06e+7	685 C
<input type="checkbox"/> 11	1979	L.Koester+	1.26e+0 5.19e+0	2 J
<input type="checkbox"/> 12	1979	B.Grabcev+	4.00e-3 8.35e-2	15 J
<input type="checkbox"/> 13	1977	R.B.Royer+	1.86e+5 1.86e+5	1 J
<input type="checkbox"/> 14	1977	J.A.Harvey+	7.00e-3 2.56e+4	1052 W
<input type="checkbox"/> 15			1.10e-2 2.59e+4	5055
<input type="checkbox"/> 16	1975	P.V.R.Murthy+	3.40e+10 2.73e+11	7 J
<input type="checkbox"/> 17	1975	U.N.Singh+	4.06e+3 4.19e+5	432 J
<input type="checkbox"/> 18	1975	D.R.Waymire+	5.22e+6 7.24e+6	20 J, NP/A, 272, 107, 750127
<input type="checkbox"/> 19	1975	R.Maggi Ortega	1.84e+7 2.20e+7	11 R, INIS-MF-1743, 7505
<input type="checkbox"/> 20	1974	R.B.Schwartz+	4.95e+5 1.61e+7	3384 R, NBS-MONO-138, 197401

```
#AUTHORS      G.Rohr, R.Shelley, C.Nazareth, M.Moxon
#REFERENCE    Conf.on Nucl.Data for Sci.and Techn., Gatlinburg 1994 p.215
#YEAR        1994
#TITLE       RESONANCE PARAMETERS OF AL-27 + N FROM VERY HIGH
#           RESOLUTION TRANSMISSION MEASUREMENTS.
#+
#REACTION    13-AL-27 (N, TOT) ,, SIG
#QUANTITY   Cross section
#Ene, MeV   Sig, b      dSig, b
0.25001    2.69       0.5472
0.25002    2.441      0.5171
0.25003    1.773      0.5109
0.25004    3.583      0.5355
0.25004    2.478      0.4999
0.25005    2.666      0.5223
0.25006    2.265      0.5046
0.25007    2.56       0.4969
0.25008    2.687      0.5103
0.25009    2.107      0.5069
0.2501     1.988      0.4896
0.25011    2.378      0.4777
0.25012    3.105      0.5238
0.25012    2.169      0.47
0.25013    2.555      0.4883
0.25014    3.049      0.5058
0.25015    2.15       0.461
0.25016    3.241      0.4753
0.25017    2.176      0.446
0.25018    2.773      0.435
0.25019    3.104      0.4349
0.2502     3.173      0.4442
0.2502     1.751      0.4079
0.25021    3.225      0.4166
0.25022    3.099      0.4235
0.25023    2.196      0.404
0.25024    2.565      0.3873
0.25025    2.759      0.3862
0.25026    2.645      0.3746
0.25027    2.012      0.3622
0.25028    2.244      0.3642
0.25029    2.626      0.3826
0.25029    3.405      0.4172
```

SUBENT [22331004](#)

POINTS: 49709

Convert EXFOR to: [C4](#) (see [Guide](#))

Energy (eV)		
Min	Max	Reset
250010	1.9998e+07	
From	To	Submit
<input type="text" value="250010"/>	<input type="text" value="1.9998e+07"/>	

# New Applications Development



Utilize 2003 AME for Nuclear Reaction & Structure

**National Nuclear Data Center**

Search the NNDC:

Additional Resources

- Atomic Mass Data Center (AMDC)
- 2003 Atomic Mass Evaluation

## Q-value Calculator

QCalc calculates Q-values, including uncertainties mass values from the 2003 Atomic Mass Evaluation

Target(s)   
*56fe, Fe-56, 26056, cr50-fe56*

Projectile   
*4He, He-4, 2-he-4, a, alpha, 2004*

Ejectile   
*g, n, n+p, 2n+a, 2a+12c (reaction)  
 b-, ec, 2b-, b-n, ecp, 18O (decay)*

Input requirements

Reaction	
Single Channel	Multiple Channels
Target(s)	Target
Projectile	Projectile, $E_{lab}$
Ejectile	

Web programming: B. Pritychenko and A. Sonzogn  
 Data Source: Atomic Mass Data Center

**National Nuclear Data Center**

Search the NNDC:

Additional Resources

- Atomic Mass Data Center (AMDC)
- 2003 Atomic Mass Evaluation

## Q-value Calculator (QCalc)

Reaction Q-values for  $^{235}\text{U} + n(E_{lab} = \text{MeV})$

Reaction Products	Q-value (keV)	Threshold (keV)
$^{215}\text{Pb}+n+5\alpha$	24319.0 <i>411.0</i> SY	0.0 <i>0.0</i>
$^{220}\text{Po}+4\alpha$	23827.0 <i>359.0</i> SY	0.0 <i>0.0</i>
$^{224}\text{Rn}+3\alpha$	19277.0 <i>298.0</i> SY	0.0 <i>0.0</i>
$^{219}\text{Po}+n+4\alpha$	18419.0 <i>359.0</i> SY	0.0 <i>0.0</i>
$^{217}\text{Bi}+t+4\alpha$	15521.0 <i>196.0</i> SY	0.0 <i>0.0</i>
$^{228}\text{Ra}+2\alpha$	15200.15 <i>3.04</i>	0.0 <i>0.0</i>
$^{218}\text{Po}+2n+4\alpha$	14791.14 <i>3.0</i>	0.0 <i>0.0</i>
$^{223}\text{Rn}+n+3\alpha$	13349.0 <i>298.0</i> SY	0.0 <i>0.0</i>
$^{218}\text{Bi}+d+4\alpha$	12821.0 <i>359.0</i> SY	0.0 <i>0.0</i>
$^{232}\text{Th}+\alpha$	11118.55 <i>0.93</i>	0.0 <i>0.0</i>
$^{223}\text{At}+p+3\alpha$	10964.0 <i>401.0</i> SY	0.0 <i>0.0</i>
$^{218}\text{Bi}+n+p+4\alpha$	10597.0 <i>359.0</i> SY	0.0 <i>0.0</i>
$^{216}\text{Bi}+n+t+4\alpha$	10397.0 <i>11.3</i>	0.0 <i>0.0</i>
$^{221}\text{At}+t+3\alpha$	9954.0 <i>196.0</i> SY	0.0 <i>0.0</i>
$^{214}\text{Pb}+2t+4\alpha$	9573.76 <i>3.0</i>	0.0 <i>0.0</i>
$^{217}\text{Bi}+n+d+4\alpha$	9264.0 <i>196.0</i> SY	0.0 <i>0.0</i>
$^{222}\text{Rn}+2n+3\alpha$	9200.83 <i>2.98</i>	0.0 <i>0.0</i>
$^{227}\text{Ra}+n+2\alpha$	8891.64 <i>2.98</i>	0.0 <i>0.0</i>
$^{222}\text{At}+d+3\alpha$	7781.0 <i>298.0</i> SY	0.0 <i>0.0</i>

# New Web Template



**NNDC** National Nuclear Data Center

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Home

NNDC Databases: NuDat | NSR | XUNDL | ENSDF | MIRD | ENDF | CSISRS | CINDA

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USNDP

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2004

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**Need Help**

**Meeting Coordinator:**  
Nereida Santiago  
Phone: 631-344-5850  
Fax: 631-344-2806  
mailto:santiago@bnl.gov



## CSEWG & USNDP Meetings '2005

National Nuclear Data Center, Brookhaven National Laboratory  
Berkner Hall B and C

**CSEWG: November 8 - 10, 2005 (Tuesday - Thursday)**  
**USNDP: November 9 - 11, 2005 (Wednesday - Friday)**

**Registration - Registered Attendees - Agenda**

- **Registration:** Each participant must register, foreign nationals must register at least 4 weeks before the meeting.
- **Note:** Non-members of CSEWG and USNDP should seek explicit approval of the chair if they want to attend.
- **Accommodation:** Kindly do your own arrangements using [links](#) from the present webpage. For on-site housing, a block of efficiency apartments, dorm rooms and guest house rooms have been set aside for the meetings. Please use the #147225 confirmation number when making your reservation.
- **Transportation:** Several [Airport Limo Services](#) are available. We usually use Chrisdee with long experience servicing BNL. When doing your booking, make sure that the driver can enter BNL premises, meaning, among others, that he/she is US citizen.
- **Presentations:** Presentations in ppt or pdf should be submitted 1 week before the meeting so that we can produce a hand-out booklet as in the last year. Kindly send it to [pritychenko@bnl.gov](mailto:pritychenko@bnl.gov), copy to [oblozinsky@bnl.gov](mailto:oblozinsky@bnl.gov).



# Contact US, <http://www.nndc.bnl.gov/guestbook>



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NNDC Databases: NuDat | NSR | XUNDL | ENSDF | MIRD | ENDF | CSISRS | CINDA

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**Resources**

- Add New Message
- New Messages
- Recent Comments
- EXFOR Database Comments

**Add New Message**

We encourage our Web e-mail and t Recent Com

Message

Your e-mail

Your name/

Web: Boris Last Modifie

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**Resources**

- Add New Message
- New Messages
- EXFOR Database Comments
- Help

## Recent Comments

This page contains comments on NNDC Web Services received via "contact us" Java servlet or e-mail. Please feel free to submit your own comments or questions.

---

 Can you tell me whether your ENDF discrete-line decay-gamma spectra data, e.g., [http://www.nndc.bnl.gov/exfor/x4data/E4R1413\\_e4.txt](http://www.nndc.bnl.gov/exfor/x4data/E4R1413_e4.txt), are consistent with or identical to the data located on the LANL site, e.g., <http://t2.lanl.gov/cgi-bin/decay?203,3950>? The file formats differ, so I am having difficulty assessing similarities and differences. Thanks!

-- Submitted by: *Joe Durkee 09/30/05 (jdurkee@lanl.gov)*

**Response** to Joe from Dimitri, 9/30/2005 (drochman@bnl.gov)

Hello Joe, These two web pages present the same evaluation (or data) but with different format. At NNDC, it is the ENDF format and at Los Alamos, it is their own format (easier to read...)

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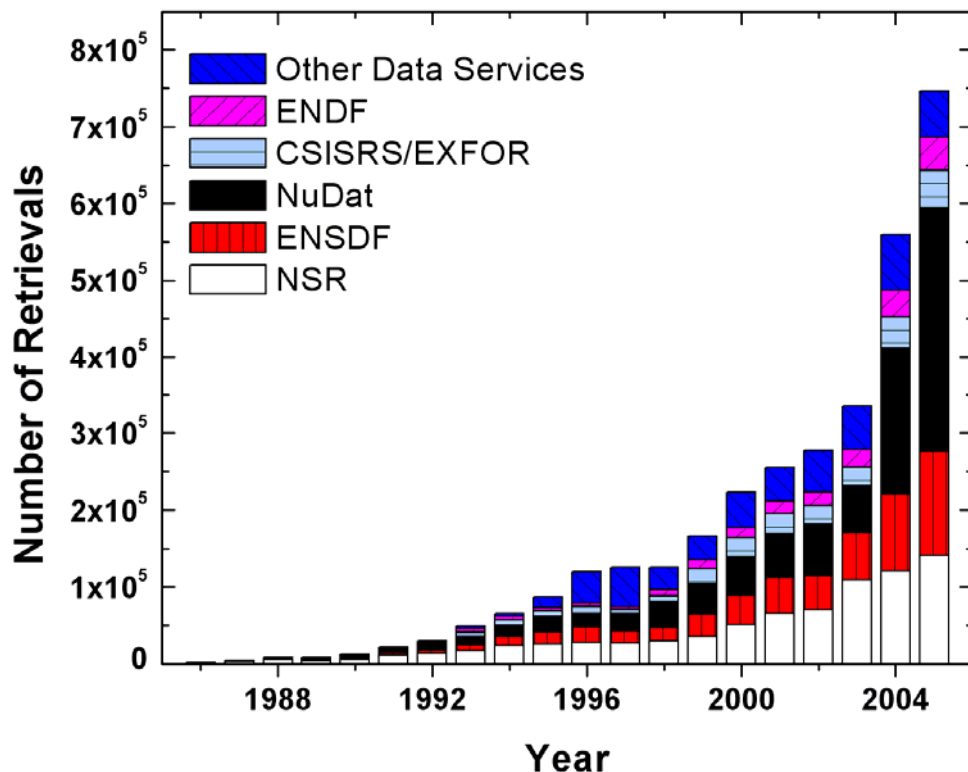
 Dr. Pritychenko, I am interested in obtaining several copies of the printed version of the Nuclear Wallet Cards for Radioactive Nuclides (Homeland Security). <http://www.nndc.bnl.gov/wallet/wchome.html> Can you point me to the individual who can help me with this request? Respectfully, Patrick A. Lofy

-- Submitted by: *Patrick A. Lofy 9/21/2005 (Patrick.Lofy@us.army.mil)*

**Response** to Patrick from Boris on 9/21/05 (pritychenko@bnl.gov)

Marion, Please provide Dr. P.Lofy with printed versions (booklets) of Nuclear Wallet Cards for Homeland Security. He really needs them. Thank you, Boris.

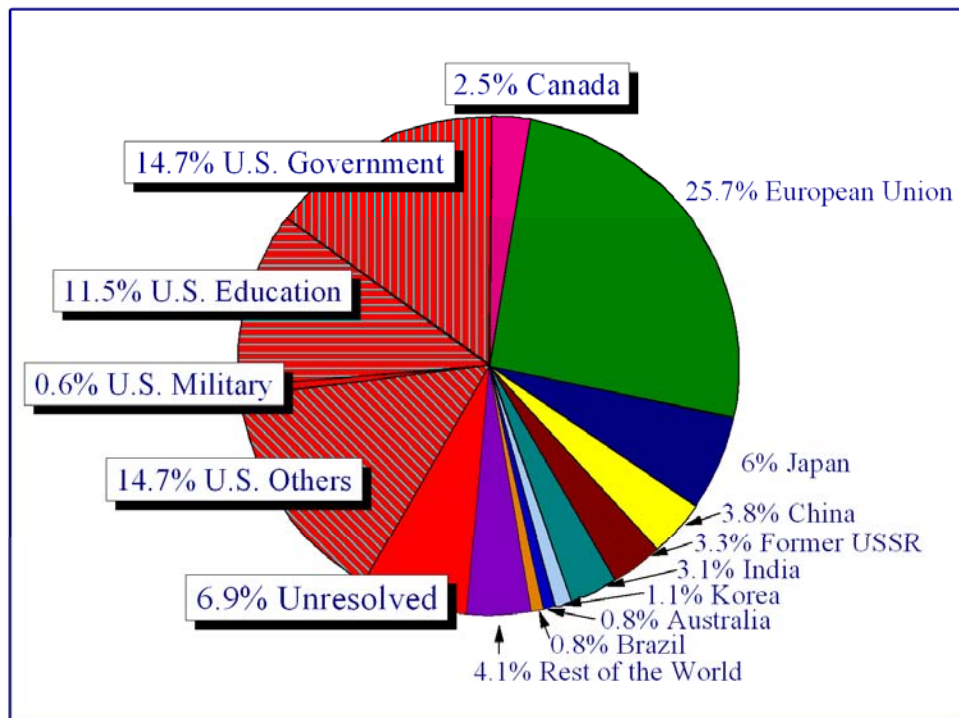
# 2005 Web Statistics



Portal was launched on April 19, 2004:

- Number of retrievals from 338K in 2003 to 560K in 2004, 66% calendar year increase
- Estimated number of retrievals for 2005 in 750 – 800 K range
- Number of database retrievals in FY2005 is 777,686

# Geographical Distribution of NNDC Users in 2004



- USA - 41.87%
- EU - 25.72%
- Japan - 6.06%
- China - 3.75%
- Russia - 3.28%
- India - 3.13%
- Canada - 2.47%
- Korea - 1.09%
- Australia - 0.78%
- Brazil - 0.77%

# FY2005 Web Service Conclusion & Outlook



- NNDC successfully operated Nuclear Data Web services during FY2005
- We have to increase NNDC Web Services usage
- New Web applications & product development
- Improve and simplify NNDC database interfaces (MIRD, ENSDF, ...)
- Improve user friendliness, i.e. Experimental Nuclear Reaction Data instead of Cross Section Information Storage & Retrieval System (CSISRS)
- Increase NNDC customer base (U.S. Education, Homeland Security, Nuclear Astrophysics)
- Proactive Customer Care with Contact Us option