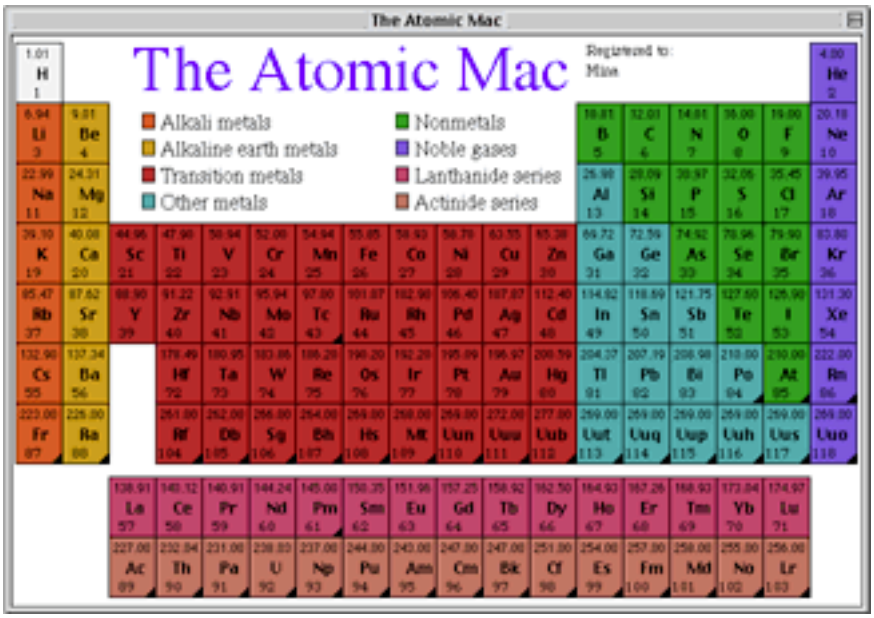
The Atomic Mac™ Version 5.3.0

Introduction

The Atomic Mac is a Periodic Table of the Elements for the Macintosh. It runs under both MacOS 9 and Mac OSX. The registration fee is only $24.99. Until you register, you will only be able to look at data for a few selected elements. Please take a look at the next chapter of this document to learn how to register your copy.



When you first launch the Atomic Mac, you see a normal presentation of the periodic table of the elements.

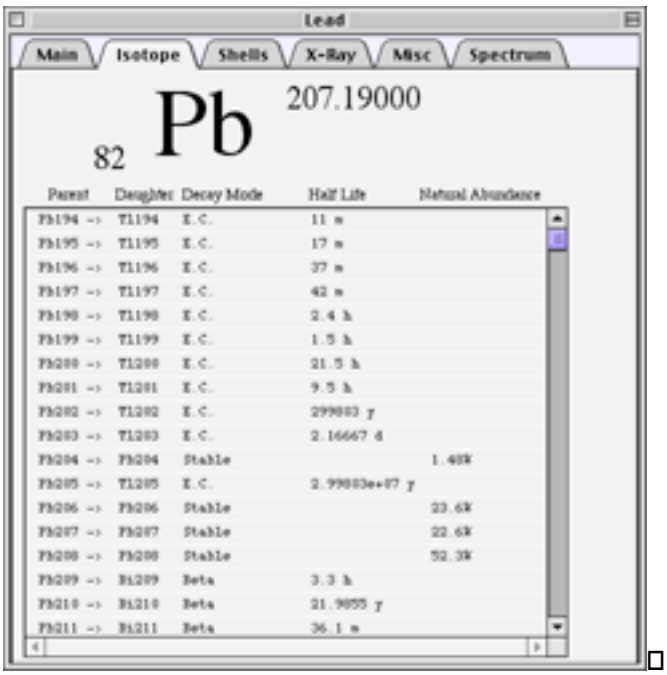
If you place the cursor over an element for a few seconds, you'll see the name of the element pop up.

Clicking on one of the elements brings up a window that contains detailed information about that element. There are six different sets of detailed information you can display, selected from the tabs in the window.

They are:

Physical View - a list of physical properties, such as density, melting point, etc.

Isotopes View - a list of all isotopes for this element, showing the atomic mass, decay mode, half life, and percent natural abundance. If there are too many isotopes to fit in the window, then you can scroll down the list.

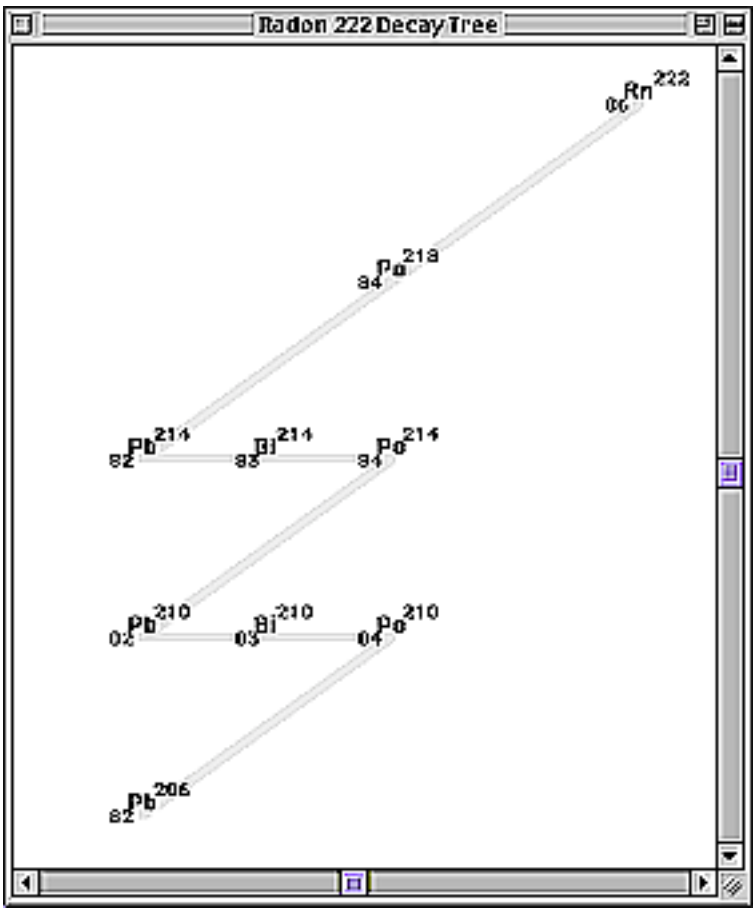


Isotope Detail View

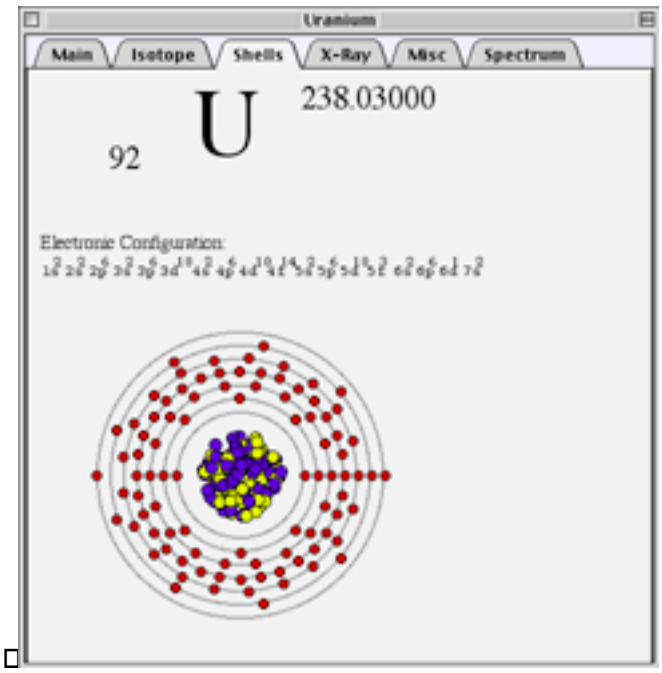
Double clicking on an isotope will bring up the another window, with detailed information, such as the number of protons and neutrons, atomic mass, mass excess, binding energy, natural abundance, decay mode and half life, nuclear spin, magnetic moment, and alpha and beta radiation energies. (Not all information is available for all isotopes) In addition, possible parent nuclides are also listed, as well as the daughter product.

Decay Tree

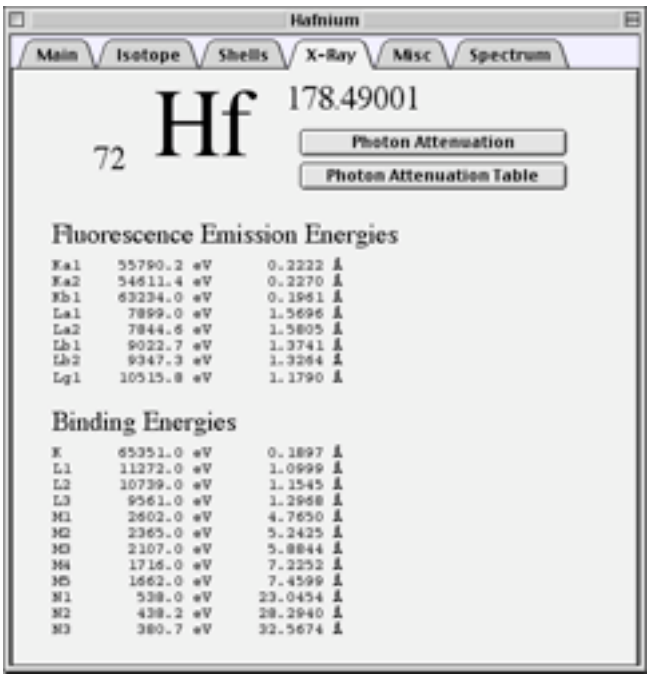
Clicking on the Decay Tree button will display the path taken by the nuclide as it and daughter products decay, until they become stable. This button is of course only visible for radioactive nuclides.



Shells View - a graphical display of the atom, showing the electron shells, along with the electronic configuration.



X-Ray View - A list of the K and L shell fluorescence energies, and K, L, M, and N shell binding energies. Clicking n the Photon Attenuation button will bring up a window showing the attenuation graph, while clicking on the Photon Attenuation Table button will bring up a tabular form of the same data. The information is based on the McMaster data.



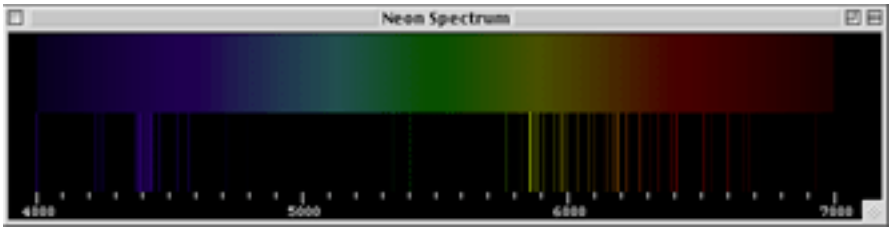
Misc View - General information showing the name of the discoverer of the element, and where and when it was discovered. Interesting bits of information are also displayed. If you have any other interesting facts about an element, let us know, and we'll be glad to add them to a future version.

Spectrum View - A list of the wavelengths and relative intensities of the

optical spectra of an element, including visible, UV, and IR.

Visible Spectrum Display

Clicking on the Visible Spectrum will bring up a window showing the visible line spectrum of the element, along with a complete (rainbow) spectrum for reference.



Property View

You can also alter the periodic table display to shade each element, by several properties, which include:

Density
Heat of Vaporization

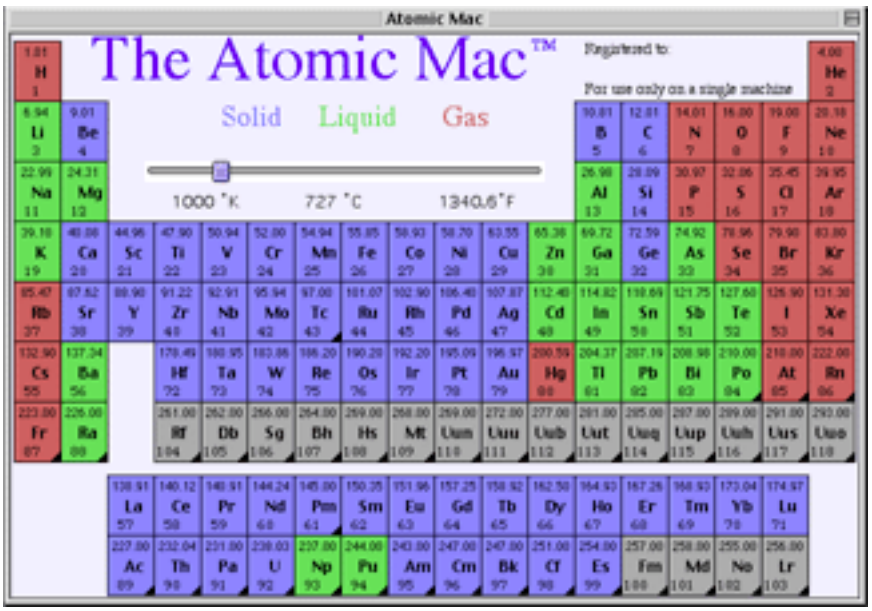
Heat of Fusion
Specific Heat
Thermal Conductivity
Linear Expansion Coefficient
Melting Point
Boiling Point
Atomic Radius
Covalent Radius
Magnetic Susceptability
Electrical Resistivity
Electron Affinity
Electric Dipole Polarizability
State (gas, liquid, solid)
Photoelectric Work Function
Electronegativity
Crystal Structure
Abundance in Crust
Abundance in Sea
Abundance in Atmosphere
Solar Abundance
Number of Isotopes
Number of Natural Isotopes
Number of Stable Isotopes
Atomic Mass
Superconducting Critical Temperaure

These properties are selected under the **View** menu. If you place the cursor over an element for a few seconds, you'll see the name of the element pop up, as well as the value for that view.

Temperature State View

When viewing the state, you can change the temperature using the slider control. The selected temperature is displayed below, in degrees Kelvin, Centigrade, and Fahrenheit.

The following picture shows the state of each element at 1000 degrees Kelvin:



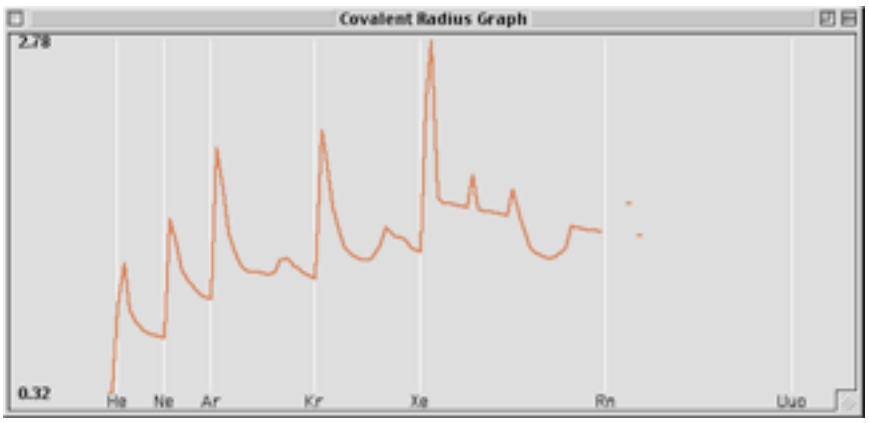
Also under the **View** menu is the **Molecular Weight Calculator**. Selecting this will display a text entry box just above the periodic table. You can enter a chemical formula into this box, and the molecular weight will be calculated for you. For example, entering H2O will compute the molecular weight of water. The text is case sensitive, so table salt must be entered as NaCl not NACL or nacl.

You can enter parenthesis in your formula, such as (H2O2)2

You can also enter in a hydrated compound using the • symbol (option 8 on your keyboard). An example: CuSO4•5H2O

Graphing Properties

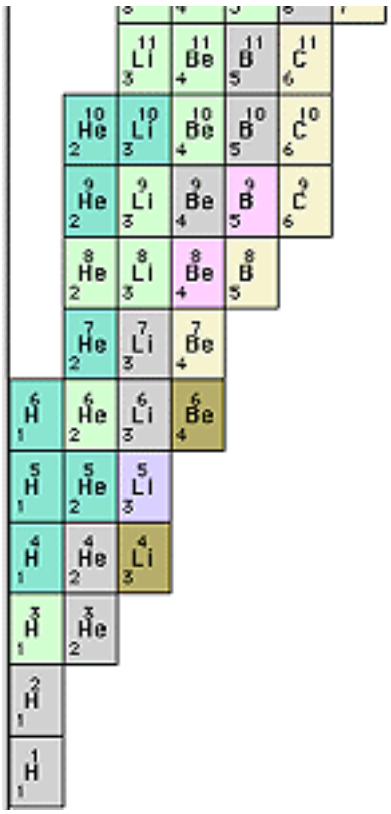
Also under the **View** menu is an option to graph the current view. Selecting this opens a window which shows a plot of the selected property against atomic number. The following picture shows a plot of the covalent radius:



Values of adjacent elements with known values are connected with a line. If an element is surrounded by two other elements with unknown values, it's value appears as an isolated dot.

Table Of Nuclides

By selecting **Table of Nuclides** from the **File** menu, you'll be presented with a large window showing all of the nuclides (isotopes) available. Clicking on one of them will bring up the window containing detailed information, such as nuclear spin, decay energies, etc. Here's a small portion of the table, the full table of course is huge, since The Atomic Mac has information regarding about 1600 nuclides!



Getting the latest copy of The Atomic Mac

You can always get the latest copy of The Atomic Mac from our web site, the URL is:
http://www.blackcatsystems.com/software/atomic.html

If you have Internet Config, or a recent version of MacOS, you can launch your web browser and automatically go to this page by selecting **Go To The Atomic Mac Website** from under the **Apple Menu.**

If you have suggestions for improving The Atomic Mac, please let us know!

You can send us email at atomic@blackcatsystems.com

Please take a look at the next chapter to learn how to register your copy of The Atomic Mac.

Registering

The Atomic Mac is shareware. The registration fee is only 24.99, allowing the use on a single computer. If you wish to run The Atomic Mac on multiple computers, you must obtain a license for each system, or the appropriate site license.

Site licenses are also available, allowing copies to be run on multiple computers at a single location (for example, a school or university, or office). Please contact Black Cat Systems for pricing and details about site licensing.

By registering your copy of The Atomic Mac, you'll help support our efforts to develop new versions with additional information. When you register, you'll be entitled to use all new releases and updates to The Atomic Mac released over the next year, free of charge.

When you register and receive your registration code, select **Enter Registration...** from the **Edit** menu, and enter the code. If you register and don't get your registration code within a week, please send us an email at atomic@blackcatsystems.com.

Thanks again for giving The Atomic Mac a try.

Black Cat Systems
PO Box 2293
Westminster, MD 21158

email: atomic@blackcatsystems.com
Web: http://www.blackcatsystems.com/software/atomic.html

Registering by Check or Money Order Form

To order by check, please fill out and mail the following form, along with your payment. You can pay with a wide variety of cash from different countries but at present if you pay via check, it must be a check or money order drawn in US Dollars. While there is the risk of loss in the mail, currency is also OK, including foreign currency.

Please make sure you include your email address with your payment. That way we can send the registration code to you. If you do not send us a valid email address, we have no way to send you the code.

I would like to order _____ copies of The Atomic Mac at $24.99 US each.

I would like to order _____ site licenses for The Atomic Mac at $250 US each.

Name: _____

Address: _____

City: _____ State/Province:_____

ZIP/Postal Code: _____ Country: _____

Email Address: _____

Macintosh Model: _____ System Version: _____

Enclosed, please find my check / money order / cash in the amount of $_____

Mail this form, along with payment, to:

Black Cat Systems
PO Box 2293
Westminster, MD 21158
USA

Registering Online

To register online with a credit card, go to the following URL:
http://www.blackcatsystems.com/register/atomic.html

You will be sent to our order page at Kagi. Kagi handles our credit card payment processing.

Please make sure you include your email address when you register online. That way we can send the registration code to you. If you do not send us a valid email address, we have no way to send you the code.

Registering by Credit Card

Note, if you'd like to register by credit card online, please read the next section.

Open the Register program that accompanies The Atomic Mac. Enter your name, your email address, and the number of single user licenses you desire for each program you wish to purchase. Save or Copy or Print the data from the Register program and send the data and payment to Kagi at sales@kagi.com. Kagi handles our credit card payment processing.

If paying with Credit Card or First Virtual, you can email or fax the data to Kagi. Their email address is sales@kagi.com and their fax number is +1 510 652-6589. You can either Copy the data from Register and paste into the body of an email message or you can Save the data to a file and you can attach that file to an email message. There is no need to compress the data file, it's already pretty small. If you have a fax modem, just Print the data to the Kagi fax number.

Payments sent via email are processed within 3 to 4 days. You will receive an email acknowledgement when it is processed. Payments sent via fax take up to 10 days and if you provide a correct internet email address you will receive an email acknowledgement.

If you are mailing your credit card payment to Kagi, send it to:

Kagi
1442-A Walnut Street PMB #392-SZ
Berkeley, California 94709-1405
USA

Please make sure you include your email address with your payment. That way we can send the registration code to you. If you do not send us a valid email address, we have no way to send you the code.

Revision History

5.3.0:
Added isotope data for abundance in universe and human body.
Added ability to copy most windows to the clipboard for other use.
Enhancements to the decay window.
Some graphs are now log based for better display.
Added/refined data for some nuclides.

5.2.1:
Misc Bug fixes.

5.2.0:
Added display of period, group, block, CAS Registry ID.

5.1.0:
Added window menu, showing list of available windows

5.0.2:
Error in U235 half life
Background of temperature slider not correct color.

5.0.1:
Fixed a bug that prevented the program from running under MacOS 8.1.

5.0.0:
Added pop-up names of elements and view value.
Added atmospheric abundance
Final release!

5.0.0 b2:
Third Carbon Release
Basically the full complement of features

5.0.0 b1:
Second Carbon Release
Added additional features from the 4.x versions.

5.0.0 b0:
Initial Carbon Release

Not all features implemented

4.6.1:
Fixed a bug where the name of the element would sometimes overwrite other information.

4.6.0:
Window locations (and in some cases size as well) are stored
Element name appears in main window when the cursor is over that element.

4.5.0:
Added Nuclides Table.

4.3.0:
Added data for atomic mass, mass excess, binding energy, and alpha and beta decay energies for most nuclides.

4.2.1:
Fixed a bug which could cause the element data window to not appear.

4.2.0:
Added NMR, magnetic moment, electric quadrupole moments.
Added display of additional information to Isotope information.
Added listing of possible parent nuclides.

4.1.0:
Added spectra information.

4.0.0:
Added table and graph of photon interaction data.
Added number of isotopes, stable, natural to graphing.

3.8.0:
Added views for abundance in the Earth's crust and sea, and solar system.
Added display of values in view mode.
Added data for several elements.

3.7.3:
Corrected density for sodium.
Added information for several elements.

3.7.2:
Fixed a bug that displayed a garbled registered user name.

3.7.1:
Compatability modifications.

3.7.0:
Added graphing display.

3.6.1:
More improvements to the decay window.

3.6.0:
Improvements to the decay window.

3.5.8:
The main table now prints in color.

3.5.7:
Added beta particle energies for some isotopes.
Changed Lawrencium symbol to Lr.
Fixed a bug which could cause a crash on some systems when an element window was closed.

3.5.6:
Added beta particle energies for some isotopes.
Fixed some small bugs.

3.5.5:
Added alpha particle energies for some isotopes.

3.5.1:
Fixed a bug which did not allow selecting the last isotope when following a decay series.
Fixed a bug which could cause a crash if the element information window was closed, and you attempted to increment or decrement to another element.
Added some information for a few of the super-heavy elements.

3.5.0:

Added Covalent Radius, Electronegativity, and Crystal Structure views and data.
Added interesting facts about each element.
Color-coded each series.
Lots of improvements to the display windows.

3.1.2:
Left and right arrow keys change the temperature by 1 degree K when displaying the states of matter.
Fixed a bug which caused an erroneous half life to be displayed for stable isotopes.

3.1.1:
Modified Molecular Calculator to allow use of parenthesis and • symbol.

3.1.0:
Added display of state (gas, liquid, solid), and temperature control.
Added ability to shrink window to small size.

3.0.0:
Added several more catagories of data
Added Molecular Weight calculator
Major changes to user interface

2.3.1:
Display and Human-Interface tweaks.

2.3.0:
Lots of GUI work.
Ability to enter registration code directly into the program.
Added several metastable isotopes.

2.2.0:
Added X-Ray information (fluorescence and binding energies).
License files now used to register the program.

2.1.0:
Updated data for several elements.

2.0.0:
Updated to FAT, native on both 68K and PPC systems.

1.4.3:
Isotope display now always reverts to the first page when you change elements.
(The version displayed in the program is 1.4.2, but check the Finder Info, it really is 1.4.3)

1.4.2:

Clicking on an element in the decay tree will jump to that element.

1.4.1:
Re-compiled for 68020 machines, some speed improvement
Changed About... window, it looks a little nicer now, and doesn't beep at you.

1.4.0:
Misc cleanup

1.3.1:
Added several additional isotopes.
Added Decay Tree window.

1.3.0:
Fixed bug which could cause crash upon launch on some systems.

1.2.2:
First Release.

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