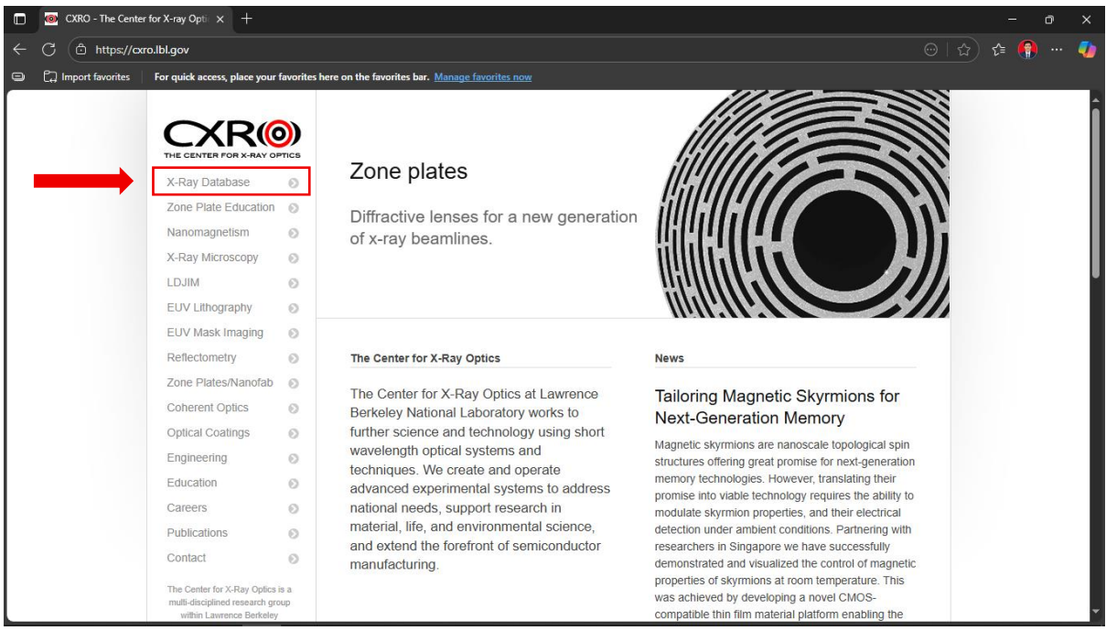
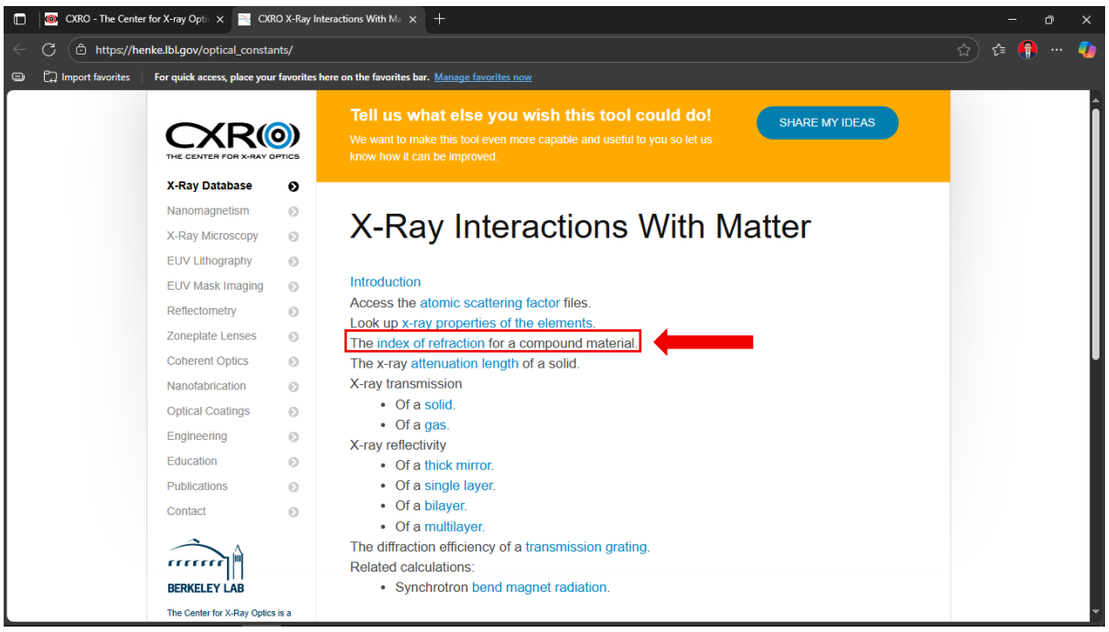
How to Retrieve Refractive Index Data from the CXRO Website

1. Go to the CXRO website (cxro.lbl.gov) then select the “X-Ray Database” menu on the left-hand side panel.



2. Choose the “index of refraction” option.



3. Fill all information related to the material being considered.

- Choose from a list of common materials: choose “Enter Formula” if you are looking for a material outside the given list.

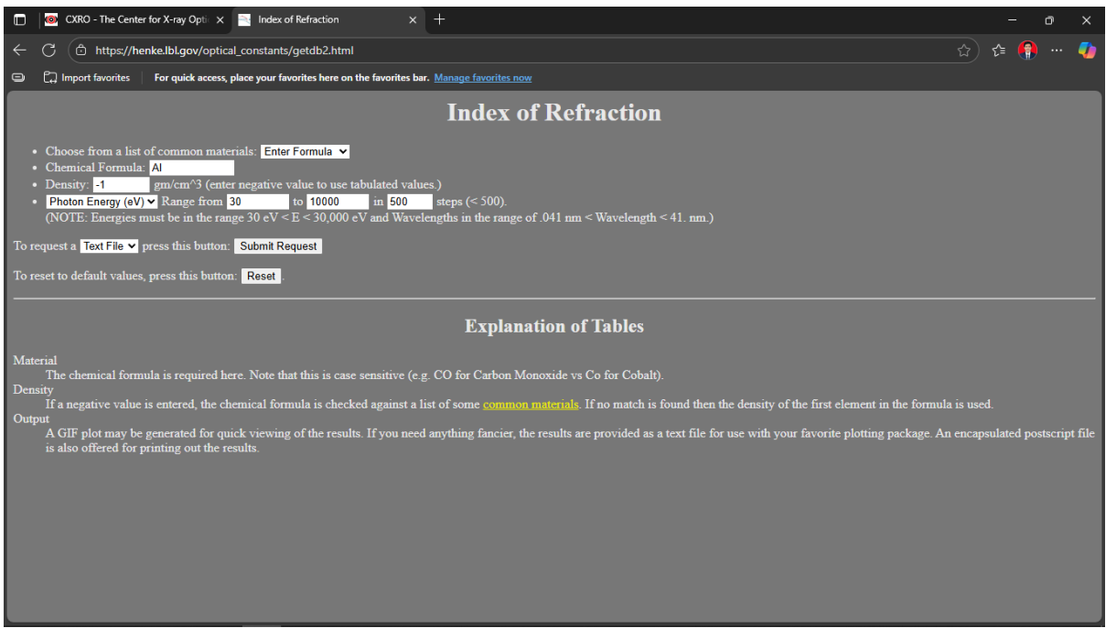
- Chemical formula: write down the chemical formula of your desired material.

- Density: enter -1 to use tabulated values.

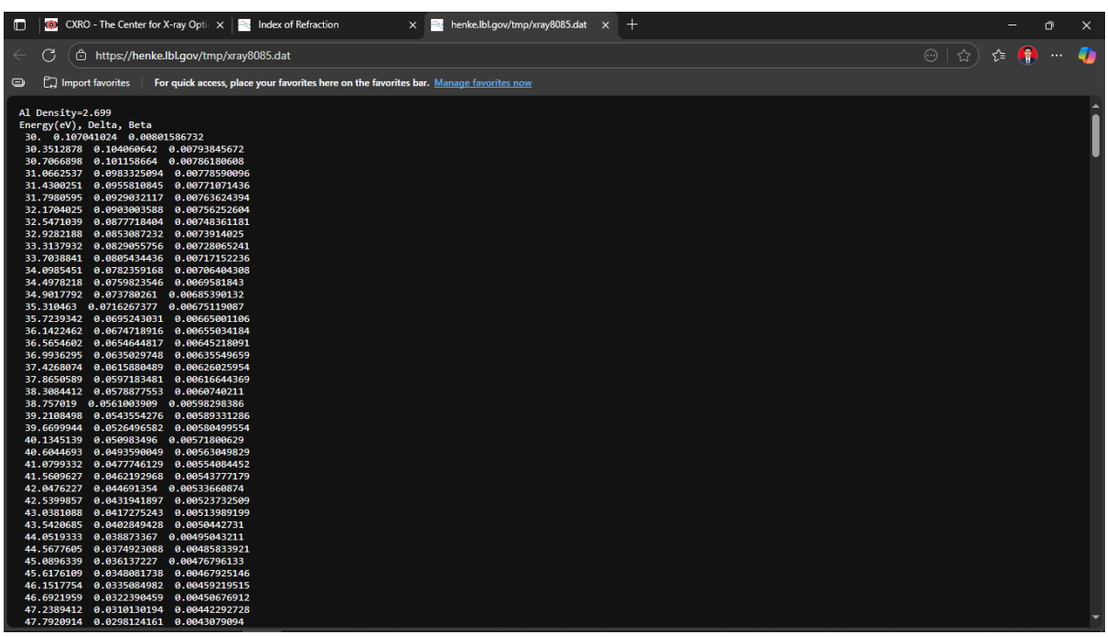
- If you want to retrieve refractive index data as a function of the incident wave energy, select “Photon Energy (eV)” then enter the energy range that you need. Keep in mind that the energy must be in the range 30 eV < E < 30,000 eV with a maximum of 500 data points (steps).

- Request a “Text File” then click “Submit Request”.

Below is an example on how to retrieve the refractive index data of aluminium (Al) for the energy range of 30 eV < E < 30,000 eV with 500 steps.



4. Wait until the refractive index data are shown and then click “CTRL+S” to save the text file. Make sure you save it as a .dat file with the format “sample.dat”, e.g. “Al.dat”. The .dat file consists of the real (“`Delta`”) and imaginary (“`Beta`”) refractive index component for each energy value.



5. Check your .dat file. Ensure you put it the same directory as RRE.ipynb notebook.

Additional notes:

- The energy values are given in a logarithmic scale. If you need a higher resolution, you can merge the refractive index data from different energy range inputs manually. Make sure that the first line of your .dat file is the density information and the second line is the columns label ("`Energy(eV), Delta, Beta`").

- You may request a "Plot" instead of a "Text File" and use the provided refractive index plot to verify your own plot.