

From the Neutrino to the Dating of Wine



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For more than 30 years a large number of physicists worldwide have been actively searching for a process called the neutrinoless double-beta decay, which corresponds to the simultaneous emission of only two electrons and no neutrino. If observed, this process will provide fundamental information on the nature of the neutrino. From theory, the half-life of this process is expected to be more than 10^{24} years, which implies an experimental observation of very few events per year. These experiments have to be carried out in deep, underground sites and be built from material with very low radioactivity levels. The development of ultra-low-level gamma-ray spectrometry has enabled the detection and measurement of radioactivity levels of as little as one-millionth of that found in the human body. These very sensitive gamma spectrometers can be used in other disciplines to trace natural and man-made radioisotopes. For example, this technique has been used for the last three years to measure the level of radioactivity in Bordeaux wine — the activity is strongly dependent on the age of the wine. In this presentation the origin of the radioactivity will be explained, and it will be shown how it is now possible to verify the millesime (year) of a wine without opening the bottle.

After the talk there will be a cheese and wine buffet

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