Physical methods, often based on techniques and instruments from nuclear and particle physics, have become essential tools for the analysis, understanding, and preservation of our cultural heritage. Probably the best-known example is the radiocarbon dating method, which allows precise age determination of archeological objects as old as 50,000 years, by measuring the content of radioactive carbon-14 isotopes. Ion beams from particle accelerators can be used to analyse the chemical composition of antique alloys and glasses whereas neutron beams from reactors can help identify trace elements in ceramics, providing information about their origin.

The combination of different methods allows the precise, non-destructive determination of the age and provenance of archeological objects and artworks. Very important today, such techniques provide a way to distinguish genuine art from forgery! Sterilisation of valuable objects through radiation with gamma rays eliminates bioactivity such as bacteria or fungi, and contributes to their long-term preservation. Many of these methods cannot be applied to objects that are too large or too sensitive to be transported to reactors or accelerator laboratories. This limitation is increasingly overcome with a new generation of powerful yet small-size, portable particle accelerators, which can be brought into museums and archeological sites. Another nice example of particle physics application is the recent discovery of a void in the Great Pyramid on the Giza Plateau in Egypt, using portable detectors of the omnipresent cosmic ray muons.

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