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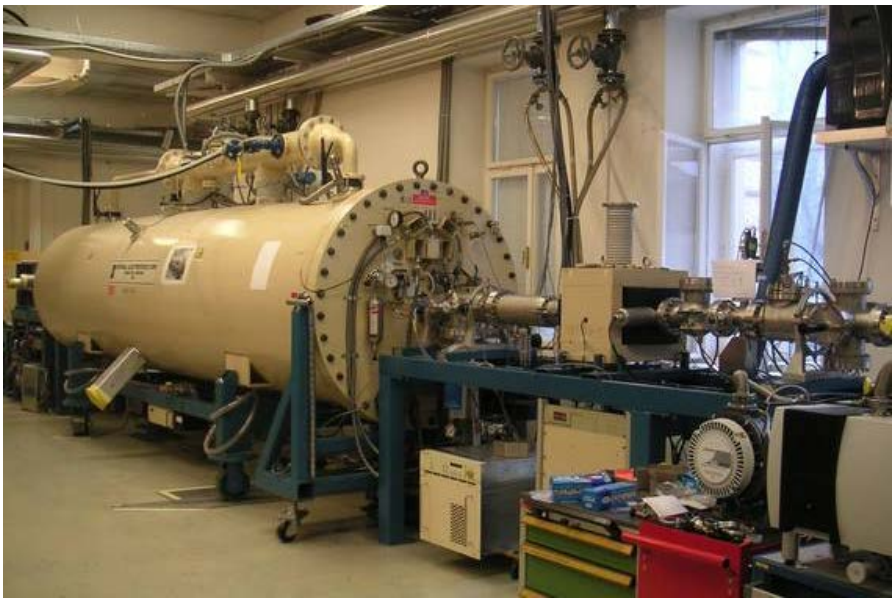
Isotope Research and Nuclear Physics



The Isotope Research and Nuclear Physics Group operates the Vienna Environmental Research Accelerator (VERA), a state-of-the-art facility for Accelerator Mass Spectrometry (AMS). Research projects focus on the exploration of our world by means of the "isotope language", utilizing both natural and anthropogenic long-lived radioisotopes. We pursue fundamental physics experiments and a large variety of interdisciplinary research programs. Research at VERA contributes to the faculty research area "Physics and the Environment". Further contributions to this research area are projects dealing with radioactivity from natural sources. Nuclear reaction studies are performed in international collaboration at research centers like CERN in Geneva, Switzerland or the Institute for Reference Materials and Measurements of the European Commission in Geel, Belgium

A good balance between technical developments and challenging applications is vital. The applications touch almost every issue of our environment at large, from archaeology to climate research. A main focus of research at the VERA laboratory is the prominent application of AMS in ^{14}C dating. The group is constantly striving for development to push the limits of the AMS ^{14}C method, e.g., of accuracy, reliability and sample size. Further the group participated in several notable multidisciplinary projects, which demonstrates the position of the laboratory as one of the internationally leading ^{14}C laboratories. Besides AMS ^{14}C dating, special emphasis is put on AMS applications within physics, i.e. Astrophysics, Nuclear Physics, and Atomic and Molecular Physics. Further emphasis is on the detection of the heaviest radioisotopes (^{236}U, ^{244}Pu). We strive to establish conditions which enable AMS of radioisotopes over the whole nuclear chart.

The radioactive noble gas radon, which contributes most to the radiation dose from natural sources, is subject of Austrian Government and European Commission research projects we contribute to.

Studies of neutron induced nuclear reactions performed in international collaborations are relevant for the understanding of astrophysical processes as well as for nuclear energy applications. The experimental methods employed and AMS complement each other in many cases.

Group members give lectures on topics related to our research fields and contribute also to general physics courses of the Faculty of Physics. Each semester two laboratory courses are offered to physics students.

Guest from various research institutes in Austria and abroad as well as group

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members give talks on their research in the VERA Seminar.