

# — 第853回九大原子核セミナー —

講師 : Prof. Wolfgang Kretschmer

(Erlangen Univ., Germany)

演題 : The Erlangen AMS facility and its applications to interdisciplinary research

日時 : 3月23日(月) 16時00分~

† 今回は通常と曜日が異なりますのでご注意ください。

場所 : 理学部 物理大学院講義室 (理学部2号館2階2263室)

## 概要

Accelerator mass spectrometry (AMS) is an ultrasensitive method for the measurement of isotope ratios of a long lived radioisotope to a stable isotope (e.g.  $^{14}\text{C}/^{12}\text{C} = 10\exp(-12)$ ) with numerous applications in interdisciplinary research. The Erlangen AMS facility, based on an EN tandem accelerator and a sputter ion source for solid and gaseous samples is well suited for age determination of materials with carbon content for periods of more than 50.000 years. For archaeology most common samples are charcoal, wood, textile, paper and bone, but using new preparation methods ancient iron artefacts and lime mortar can be dated by the  $^{14}\text{C}$  method. Some interesting archaeological applications of AMS will be shown, e.g. the  $^{14}\text{C}$  dating of a Persian mummy. Biological applications involve the dating of soil and pollen in peat samples, from a simultaneous pollen analysis the vegetation history can be deduced. An important topic in environmental research is the origin of organic compounds in nature. This can be investigated by the determination of the  $^{14}\text{C}$  content of the compound, since an anthropogenic input can be deduced from industrial production via oil and coal which contain no  $^{14}\text{C}$ , compounds from biogenic sources have  $^{14}\text{C}$  concentration of living organisms. The problem with this application is the extremely low abundance of compounds of interest in natural samples, so that after concentration and fraction separation in a gas chromatograph (GC) only carbon masses in the microgram range are available for AMS measurements. To minimize any carbon contamination we have developed a closed system from the GC to the gas ion source. With this new facility the  $^{14}\text{C}$  content of monochloroacetic acid with carbon masses down to few microgram can be reliably determined.

連絡先 : 九州大学理学部物理学教室原子核理論研究室

TEL : 092-642-2111 (内線 8357)

角 剛典 (sumi@phys.kyushu-u.ac.jp)