

690th ASRC Seminar

Date: Tuesday, July 18, 13:30 ~15:00

Location: Room 103, ASRC bldg.

Speaker: Professor Michael BLOCK

(GSI Helmholtzzentrum für Schwerionenforschung,
Germany)

Title: Atomic physics studies of the heaviest
elements by laser spectroscopy

Abstract: The electronic structure of the heaviest elements is strongly affected by relativistic effects, quantum electrodynamics, and electron correlations. Precision measurements of atomic properties by laser spectroscopy allows probing these effects with high precision. However, ultra-sensitive methods have to be developed to deal with short half-lives and low yield in online experiments. Recently, a method based on resonant laser-ionization has been employed for optical spectroscopy of nobelium at GSI Darmstadt. In pioneering experiments, several atomic transitions in nobelium atoms were identified for the first time yielding an accurate value of nobelium's first ionization potential. In addition, from isotope shift measurements in $^{252-254}\text{No}$ and from hyperfine spectroscopy in ^{253}No changes in the mean square charge radius and nuclear moments were obtained. I will discuss the atomic structure of the heaviest elements, introduce laser spectroscopy techniques and will present recent results obtained at GSI.

<Contact>

Yuichiro Nagame (81-5416)

Advanced Science Research Center