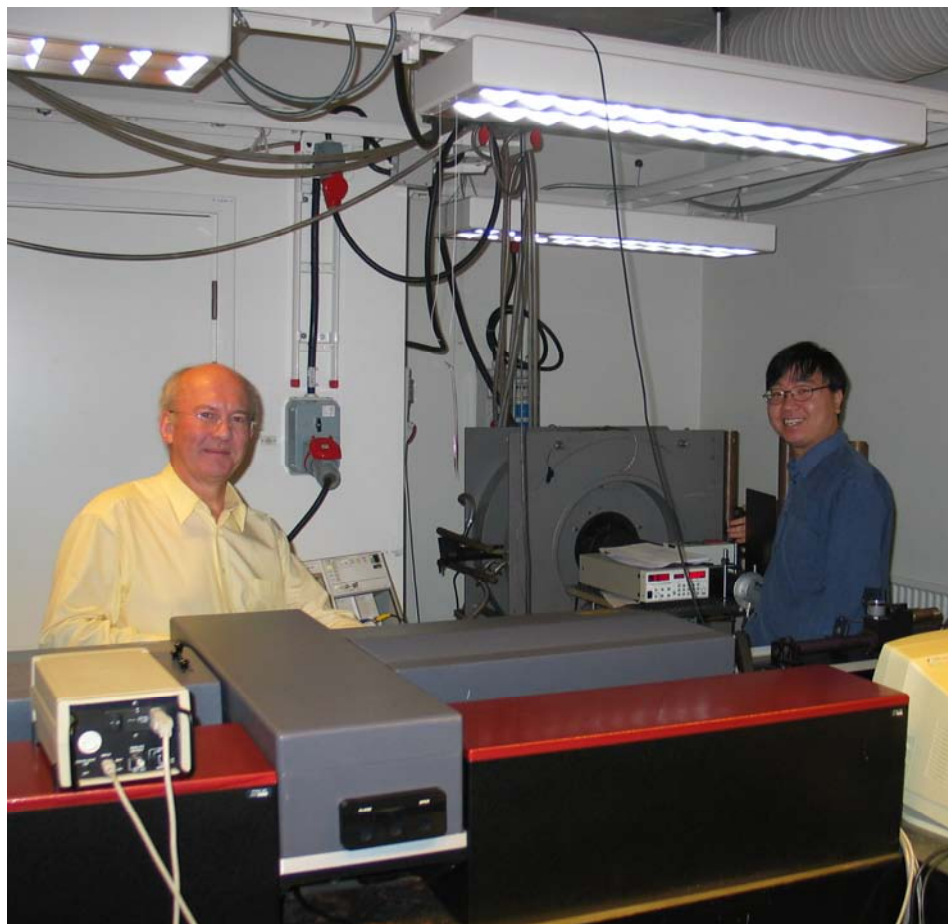


IPE

LASER
PHYSICS
EXPERIMENTS

EXPERIENCES EN
PHYSIQUE DES
LASERS



The advent of the laser, in the sixties, has opened the way to important developments in many fields of physics like atomic and molecular spectroscopy. The use of several types of lasers, including the dye-lasers, and the possibility of selective excitation of some atomic states allow to consider many new or unresolved problems.

We have been collaborating for several years and are still collaborating actively with the Lund Laser Centre (LLC) in Sweden (Prof. Svanberg and his team) on many different problems concerning atomic structure of heavy refractory elements including the rare-earth elements or ions. The time-resolved laser-induced fluorescence (LIF) technique is now becoming a widely used technique for lifetime measurements in neutral, singly-, doubly- or even trebly ionized heavy elements of the periodic table. In the framework of this collaboration including also several Chinese teams, some radiative lifetime measurements have been performed with a method of selective

L a s e r P h y s i c s E x p e r i m e n t s

excitation of an atomic or ionic plasma which was itself produced by a laser.

Radiative lifetime measurements of metastable states (i.e. long-lived low-lying states) in atoms or ions are very difficult and require the use of very sophisticated experimental devices like the heavy ion storage rings. In the framework of a very active collaboration with the University of Stockholm (Prof. S. Mannervik and his team), exciting new results have been obtained for rare gas ions and selected heavy ions using the CRYRING storage device of this university. The new results allow to test the most sophisticated theoretical models available.

Besides their interest for laboratory physics or plasma physics, the results obtained find applications in astrophysics where they are important for the determination of the chemical composition of the sun and of the stars. Some results are also useful in cosmochronology and in nucleosynthesis in relation with the history of star formation.



I.P.N.A.S. - Institut de Physique Nucléaire, Atomique et de Spectroscopie
Université de Liège, Sart Tilman B15, B4000 Liège, Belgique
<http://www.ipnas.org> (& <http://w3.umh.ac.be/~astro/indexgb.shtml>)

Contacts:
Professeur Emile BIEMONT
☎ +32 4 366 36 92
✉ E.Biemont@ulg.ac.be

Dr. Pascal QUINET
☎ +32 4 366 36 97
✉ P.Quinet@ulg.ac.be