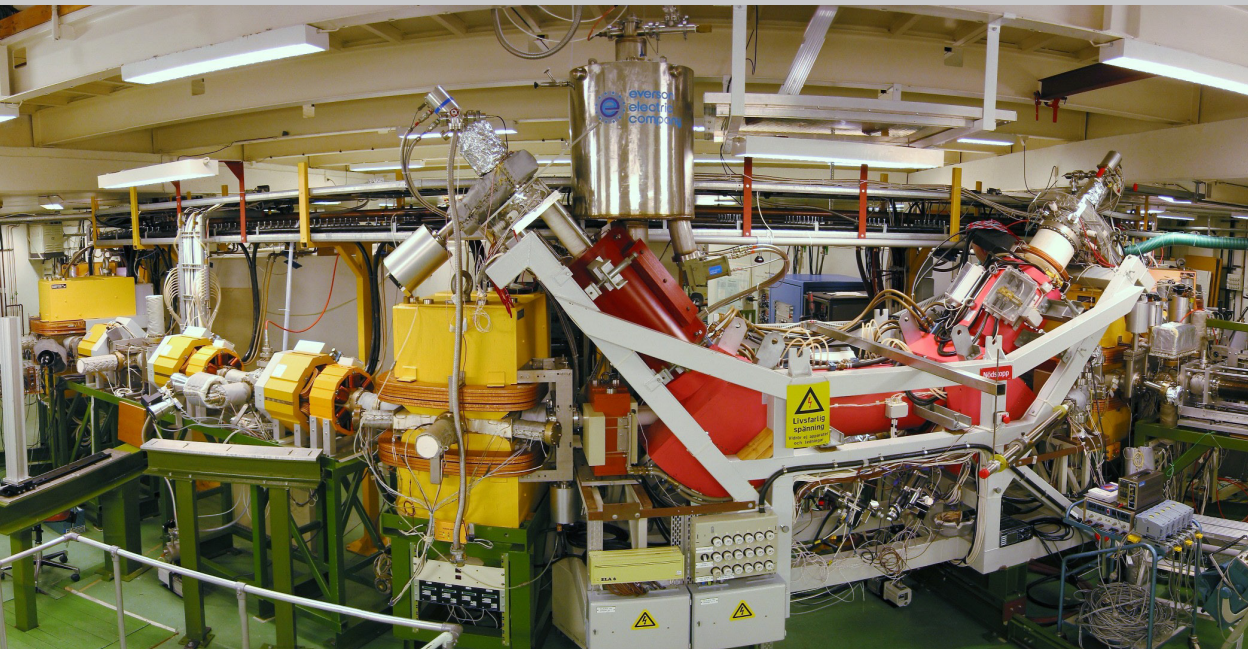


Publications and Dissertations from the CRYRING Facility 1992–2010

Stockholm 2010



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from the CRYRING Facility
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Manne Siegbahn Laboratory
Stockholm University
2010

Introduction

The CRYRING project was initiated at the then Research Institute of Physics, AFI, (later Manne Siegbahn Institute) in the early 1980's based on technology developed at, e.g., the low-energy antiproton ring LEAR at CERN. At that time, an electron-beam ion source (EBIS) was already being installed at the Institute, and the idea was to connect the EBIS and other ion sources "to a small synchrotron ring for studies of atomic, molecular and nuclear collisions, and in particular for experiments with interacting beams of ions, molecules, electrons and laser photons", quoting the title page of an early study. Major funding of the project, from the Knut and Alice Wallenberg Foundation, started in 1985, the first deuteron beam was stored in the ring in early 1991, and the experimental programme started the following year. The focus of the experimental activities has been on atomic and molecular physics, with some contributions of applied physics. Also accelerator physics has been pursued, together with continuous developments and improvements of the facility.

A year after the operation of the ring had started, the 1 July 1993, the Manne Siegbahn Institute was integrated into Stockholm University and the Royal Institute of Technology. The Institute's Accelerator Division was transferred to Stockholm University, and it there became the Manne Siegbahn Laboratory, MSL. Two years later, 1 July 1995, MSL became a national research facility, and the budget for the operation of MSL was transferred from the university to the Natural Sciences Research Council (NFR). The status as a national research facility was withdrawn again the 30 June 2003, and also the budget for the operation of MSL was withdrawn over a transitional period of three years. The experimental programme at CRYRING was continued at a reduced level until the end of 2009. At present, CRYRING is waiting for disassembly and transfer to the new FAIR facility in Darmstadt, Germany, where it is planned to use CRYRING as a deceleration ring for antiprotons and ions.

This publication list in a sense constitutes a complete summary, albeit brief, of the physics performed at CRYRING, except that there are a few papers still in preparation. The intention has been to collect all publications in refereed journals based on experimental results from CRYRING plus directly related theory papers. The list also contains a few invited contributions to books and annual reviews, but not un-refereed conference papers. It spans the time from 1992, the year when the experiments at the ring started, until present (June 2010). The name CRYRING here refers to the entire facility, so experiments with low-energy beams directly from the ion sources are included. The EBIS source, CRYSIS, came into operation gradually during in the late 1980's, before the actual CRYRING facility was completed, and there are thus papers from the

early experiments at CRYISIS which are not in the list. All doctoral and licenciate dissertations from the same period of time as the papers which to a significant fraction are based on CRYRING data are listed at the end.

The total number of publications in this list is 384. The papers have in total 3009 authors, and there are 449 distinct author last names. Approximately 2/3 of the 3009 names are from Stockholm, including postdocs and guest researchers who have spent in the order of one year or more here, and there are almost no papers completely without an author from Stockholm. Indeed, the user groups at the Physics Department of Stockholm University have been involved in almost all of the experiments. At the same time, approximately 2/3 of the 449 distinct author last names come from Swedish universities outside Stockholm and from abroad, showing strong collaborations and strong ties with the national and international physics communities. The four most common journals for publication of CRYRING papers are, in decending order, Physical Review A, Physica Scripta, Nuclear Instruments and Methods and Physical Review Letters. Perhaps most impressive is that as much as 43 students have got their Ph. D. degrees from experiments and theory at CRYRING, and in addition 39 licenciate theses have been produced.

Stockholm, June 2010

Håkan Danared

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