

Preface

from the Director

In the first two years of the third millennium, SRRC's light source has been operating smoothly with an average up-time ratio of more than 97%. Besides the routine operation, several new important tasks have been undertaken to bring the facility towards a new stage of development.

The four-year project to upgrade the RF system at Taiwan Light Source (TLS) by replacing the current cavities with a state-of-the-art superconducting radio frequency (SRF) module progressed very well. Commissioning of the SRF module with the cryogenic plant is scheduled for April 2003. The 6-Tesla superconducting wavelength shifter (SWLS) has been fabricated and installed in the storage ring in April 2002. The construction of a 3.2-Tesla superconducting multipole wiggler (SMPW) is under way and expected to be completed in 2003.

SRRC has now a total of twenty-five beamlines in operation or commission (including two Taiwan contract beamlines at SPring-8 and four diagnostic beamlines at TLS) and seven new beamlines are under design and construction. Excitingly, a world-record energy resolving power of greater than 100,000 (using the first order diffraction) has been obtained at the U9-CGM beamline. With the anticipated installations of SWLS and SMPW in the storage ring, the present attention of beamline development turns mainly to hard X-ray beamlines.

Taiwan contract beamlines at SPring-8 have been constructed successfully with the help of SPring-8 staff. The bending magnet beamline BL12B2 has been opened to users since May 2001. The undulator beamline BL12XU designed

for inelastic X-ray scattering was completed at the end of 2001 and is now in commissioning stage. The inelastic X-ray scattering spectrometer was installed to the beamline in April 2002. The project opens new opportunities in hard X-ray research to scientists in Taiwan and marks a milestone of international cooperation between Taiwan and Japan in science and technology.

The annual experiment-runs and user-runs have increased to 350 and 2100, respectively, for the year of 2001. The 7th SRRC Users' Meeting and a parallel workshop on "Strongly Correlated Electron Systems" were held from October 31 to November 2, 2001, with an attendance of about 280 participants. In this year's Activity Report, we invited 10 user groups to introduce their research with the hope to give readers an exciting overview on scientific activities carried out at SRRC.

In 1993, SRRC celebrated the inauguration of TLS, a third-generation synchrotron light source. As it proceeds into the tenth year of operation and with a new decade ahead, SRRC will face new challenges. This includes, among others, the upgrade of light source and experimental facilities to the highest standards, developing superconducting magnet hard X-ray beamlines, joining national and international research programs in genome and nano-technology, and the development of new experimental techniques for future science.



Dr. Chien-Te Chen

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Editorial Preface

SRRC published its first volume of the Annual Activity Report in 1997. In this SRRC Activity Report 2001/2002, we present the various activities of SRRC users and staff members with a new outlook. The former general summary of different research efforts has been replaced by 10 selected contributions of invited authors as Research Highlights. These Highlights span a wide range of diverse scientific fields written in article style and are intended to give "old hands" as well as non-experts and students a thorough overview of exciting research activities being carried out at SRRC. The article style has also been adapted for the R&D sections of Accelerator and Insertion Devices, Instrumentation and New Beamlines, and SRRC's Facility at SPring-8. The latter one will become an important part of our future annual reports in keeping the link to the activities at our branch in Japan.

Of course, it is the daily operation that keeps SRRC moving ahead smoothly. We summarize these parts of activities in a brief version so that our history is recorded annually. These sections include the Machine Status, Figures, and Facts. The final two sections are the appendixes which list the collected research abstracts and publications from users.

We like to thank all authors for their contributions and all users for their continuous support and hope everybody will enjoy reading this Activity Report 2001/2002.



The Editorial Committee
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