

# Experimental Facilities

## -General-

### 1. Introduction

Activities of the Experimental Facilities Division, the Beamline Division and the Experimental Research Division broadly cover the areas of beamline commissioning, initiating public use, continuation of public beamline construction, consultation about contract beamline construction, utilization of beamlines, support of the Beamline Committee and the Proposal Review Committee (PRC), and international workshop and symposia. The beamlines, including the JAERI and RIKEN beamlines, were available for public use after completion. Following the first public use of eight public beamlines in October 1997, two beamlines for soft X-ray studies were commissioned in 1998.

### 2. Beamline Commissioning and Operation

After two months of summer shutdown for maintenance of accelerators and installation of additional beamlines, the commissioning of the beamlines was started in September 1998. There are now ten public beamlines for public use. In addition, we have the JAERI/RIKEN beamlines and contract beamlines, some of which are being used exclusively.

### 3. Beamline Construction: Public Beamlines

At SPring-8, each beamline consists of bending magnet source/insertion device, front end channel, transport channel including optics, experimental station equipment including additional optics, diffractometer, detector and data acquisition system, shielding hatches and interlock/beamline control systems. The Table shows the construction status for all of the beamlines as of the end of 1998. At SPring-8, 61 beamlines were to be initially constructed from the X-ray sources from the storage ring. However, SPring-8 decided to add a single beamline, drawn out from a crotch of the storage ring, for infrared studies. We thus were able to finish ten beamlines for public use in the second and third periods of utilization:

BL01B1	XAFS
BL02B1	Crystal Structure Analysis
BL04B1	High Temperature Research
BL08W	High Energy Inelastic Scattering
BL09XU	Nuclear Resonant Scattering
BL10XU	Extremely Dense State Research
BL25SU	Soft X-ray Spectroscopy of Solid
BL27SU	Soft X-ray Photochemistry
BL39XU	Physicochemical Analysis
BL41XU	Structural Biology I

An R&D beamline, BL47XU, was completed and

partly made available for public use mainly in the fields of imaging and detector development.

A Biomedical Imaging beamline, BL20B2, which extends over 200 meters from the X-ray source point, was completed in the winter of 1998. The experimental station was constructed outside of the experimental hall of the storage ring, and this beamline is now in commissioning for public use.

In 1998, there were several public beamlines under construction:

BL02B2	Powder Diffraction
BL04B2	High Energy X-ray Diffraction
BL20XU	Medical and Imaging II
BL28B2	White Beam X-ray Diffraction
BL35XU	High Resolution Inelastic Scattering
BL40XU	High Flux
BL40B2	Structural Biology II
BL43IR	Infrared Materials Science

Out of these, the bending magnet beamlines BL02B2, BL04B2, BL28B2 and BL40B2, will be finished by the end of FY1998, and will be for trial use next fiscal year. The second R&D beamline, BL46XU, will be completed with an experimental hatch attached for public use.

### 4. Beamline Construction: JAERI/RIKEN and Contract Beamlines

JAERI/RIKEN scientists have constructed six beamlines for their exclusive use:

BL11XU	Materials Science II (JAERI)
BL14B1	Materials Science I (JAERI)
BL23SU	Actinide Science (JAERI)
BL29XU	Coherent X-ray Optics (1km beamline) (RIKEN)
BL44B2	Structural Biology II (RIKEN)
BL45XU	Structural Biology I (RIKEN).

Out of these, the BL29XU undulator beamline will be extended out of the experimental hall to an experimental station placed 1km from the source. RIKEN also started construction of a 30 m long straight section beamline, BL19XU, from FY1998 and will complete it in FY2000. Several undulator units are to be installed for coherent hard X-ray studies. In addition to JAERI/RIKEN, several institutions and a consortium have their beamlines.

BL15XU	WEBRAM (Nat'l Inst. Res. Inorg. Mat.)
BL16XU	Industrial Consortium ID (Industrial Consortium)
BL16B2	Industrial Consortium BM (Industrial Consortium)
BL24XU	Hyogo (Hyogo Pref.)
BL33LEP	Laser-electron Photon (Osaka University)

BL44XU Macromolecular Assemblies  
(Osaka University)

## 5. Committee

At the beginning of FY1997, two committees had independent activities. The Public Beamline Committee that reviewed scientific and technical aspects of public beamline proposals, and the Contract Beamline Committee dealt with contract beamline proposals from institutions outside of the SPring-8 Project Team. The number of insertion device sources is limited at SPring-8 and many scientists hope to construct insertion device beamlines, therefore the Project Team reached the conclusion that the construction program should be reviewed and reported by a unified body. Therefore, the committee members were combined into a single body.

### 5.1 Public Beamline Committee

The SPring-8 Project Team were charged with establishing a master plan for the public beamline construction in the second phase of the project, *i.e.*, public beamlines from 11th to 20th, for 30 public beamlines in total. In 1998, the Committee called for letters of intent of beamline construction. The Committee submitted a second report to the SPring-8 Steering Committee that advised construction of the 11th to 20th public beamlines. Contrary to the first report, the Committee recommended construction of beamlines by considering beamline specifications in various scientific fields. As described above, most of this report was already budgeted, and construction was started. In the second half of the year, the Committee called for the letters of intent for the 21st to 30th public beamlines. There have been 27 proposals submitted, ten from which have been selected for asking to submit detailed plans for their beamline proposals.

### 5.2 Contract Beamline Committee

The contract beamlines are constructed according to the proposals by universities, national laboratories and industries with their expenses and are, in principle, used solely for their purposes. The Committee approved six beamline construction proposals as listed above. After receiving letters of intent from SRRC in Chinese Taipei, SPring-8 approved two beamline construction projects: one beamline from a bending magnet source and the other from an insertion device (BL12XU and BL12B2).

## 6. Proposal Review Committee

After the first period of public use, starting in October 1997 (Period 1997B), the second and third periods were successively made available for public use after a call for proposals.

Second period (Period 1998A)

April 1998 to November 1998

Number of shifts: 200

Number of proposals accepted: 229

Third period (Period 1999A)

November 1998 to June 1999

Number of shifts: 247

Number of proposals accepted: 258

These numbers do not include urgent proposals and various others. Details are shown elsewhere in this annual report.

## 7. Symposia and Workshops

Various symposia and workshops were held in 1998:

- The First SPring-8 Symposium, March 17-19
- The SPring-8 International Workshop on High Flux Detectors, August 14-26
- The Second International Conference on Synchrotron Radiation in Materials Science (Kobe), October 31-November 4
- The Second SPring-8 Symposium, December 2-4
- Harima International Forum, December 2-6

The meetings, unless otherwise stated, were all held at the SPring-8 site in Harima.

- The Three-way Workshop by APS, ESRF and SPring-8 was held in Argonne, Illinois, USA in September. The next workshop will be organized by SPring-8 in autumn, 1999.

## Beamlines at the SPring-8

-- Completed/under construction by the end of 1998 --

Beamline	Source*	Subject	Category**	Status***
BL01B1	BM	XAFS	Public	C
BL02B1	BM	Crystal Structure Analysis	Public	C
BL02B2	BM	Powder Diffraction	Public	UC
BL04B1	BM	High Temperature Research	Public	C
BL04B2	BM	High Energy X-ray Diffraction	Public	UC
BL08W	W	High Energy Inelastic Scattering	Public	C
BL09XU	U	Nuclear Resonant Scattering	Public	C
		Surface Science		
BL10XU		Extremely Dense State Research	Public	C
		High Brilliance XAFS		
BL11XU	U	Materials Science II	JAERI	UC
BL12IN	U	APCST ID	Taiwan	UC
BL12B2	BM	APCST BM	Taiwan	UC
BL14B1	BM	Materials Science I	JAERI	C
BL15XU	U	WEBRAM	NIRIM	UC
BL16XU	U	Industrial Consortium ID	Industry	UC
BL16B2	BM	Industrial Consortium BM	Industry	UC
BL19LXU	U	SR Physics	RIKEN	UC
		Coherent X-ray Studies		
BL20XU	U	Medical and Imaging II	Public	UC
BL20B2	BM	Medical and Imaging I	Public	C
BL23SU	U	Actinide Science	JAERI	C
BL24XU	U	Hyogo	Hyogo	C
BL25SU	U	Soft X-ray Spectroscopy of Solid	Public	C
BL27SU	U	Soft X-ray Photochemistry	Public	C
BL28B2	BM	White Beam X-ray Diffraction	Public	UC
BL29XU	U	Coherent X-ray Optics	RIKEN	UC
BL33LEP	BM	Laser-electron Photon	OU	UC
BL35XU	U	High Resolution Inelastic Scattering	Public	UC
BL39XU	U	Physicochemical Analysis	Public	C
BL40XU	U	High Flux	Public	UC
BL40B2	BM	Structural Biology II	Public	UC
BL41XU	U	Structural Biology I	Public	C
BL44XU	U	Macromolecular Assemblies	OU	UC
BL44B2	BM	Structural Biology II	RIKEN	C
BL45XU	U	Structural Biology I	RIKEN	C
BL46XU	U	R&D (2)	JASRI	UC
BL47XU	U	R&D (1)	JASRI	C

\* Source: BM, bending magnet; W, wiggler; U, undulator.

\*\* Category: Hyogo, contract beamline by Hyogo Prefecture; OU, contract beamline by Osaka University.

\*\*\*Status: C, completed and used for public use; UC, under construction.

The arrangement of the beamlines in the experimental hall of storage ring is shown elsewhere in this annual report.